Appendix B

Internal Barr Memorandum from Miguel Wong to John Borovsky and Keith Pilgrim, dated July 18, 2007, Regarding Wet and Dry Periods of Precipitation

Internal Memorandum

To: John Borovsky, Keith Pilgrim

From: Miguel Wong

Subject: Wet and dry periods of precipitation

Date: May 18, 2007

Project: 23/69-862-015-074

c: Greg Williams

Introduction

This memo presents the results of the statistical analysis of precipitation data representative of the long-term climatic conditions in the Partridge River and Embarrass River watersheds. These results will be used as a reference to determine whether the periods of water quality monitoring in the two referred watersheds corresponded to wet or dry flow conditions; flow data is available for the Partridge River and Embarrass River, but such data do not necessarily cover the same periods of water quality monitoring.

Data Available

Water Quality Monitoring

Water quality data in the Partridge River watershed and/or Embarrass River watershed are available for the following periods:

- 1955-1966.
- 1974-1979.
- 2001-2002.
- 2004.
- 2006.

Most of the water quality data is from two periods: 1970's and 2000's.

USGS Flow Gaging Stations

Daily flow data in the Partridge River watershed and Embarrass River watershed are available for the following periods:

- USGS gaging station # 04015455, South Branch Partridge River near Babbitt – from June 1, 1977 to November 5, 1980.
- USGS gaging station # 04015475, Partridge River above Colby Lake at Hoyt Lakes – from September 19, 1978 to November 2, 1988.
- USGS gaging station # 04015500, Second Creek near Aurora – from April 1, 1955 to September 30, 1980.
- USGS gaging station # 04016000, Partridge River near Aurora – from August 1, 1942 to September 30, 1982.
- USGS gaging station # 04017000, Embarrass River at Embarrass – from August 1, 1942 to December 31, 1964.
- USGS gaging station # 04018000, Embarrass River near McKinley – from October 1, 1953 to September 30, 1962.

There is not flow gaging station that covers both the 1970's and the 2000's in either the Partridge River or the Embarrass River. Although the flow data available includes periods of wet and dry flows (see discussion in RS73B for the Partridge River, and in RS74 for the Embarrass River), a direct comparison of flows in the 1970's and 2000's is not possible from the flow data itself.

Precipitation

The Minnesota Department of Natural Resources (MnDNR) follows the definition given by the Climate Prediction Center of the National Weather Service (NWS), which considers a climate normal as that given by 30 years of recent data. The current definition corresponds to the period 1971-2001.

Monthly precipitation data is available from the NWS weather station (Coop ID) # 218311, Tower 3S – from January 1926 to March 2007. This precipitation record, limited to the period 1971-2001, has been used to obtain precipitation statistics that are considered representative for both the Partridge River and Embarrass River watersheds.

In addition, monthly precipitation data is available from the NWS weather station (Coop ID) # 210387, Babbitt (Partridge River watershed) – from June 1999 to March 2007, and from the NWS weather station (Coop ID) # 212576, Embarrass (Embarrass River watershed) – from January 1995 to

March 2007. Information for Water Years (October to September) 2005 and 2006 is incomplete in both the Babbitt and Embarrass precipitation records.

Statistical Analysis

A frequency analysis was conducted on the annual precipitation record of the weather station at Tower 3S for the period 1971-2001. A normal probability distribution provided a good fit of the transformed (cubic root) series of annual precipitation values (Shahin et al., 1993). The annual precipitation varied between a maximum of 38.4 inches and a minimum of 22.2 inches, with a mean annual value of 29.3 inches and a standard deviation of 5.1 inches.

Using the Tower 3S precipitation record and the normal probability distribution obtained from the statistical fitting described above, the probability of non-exceedance of precipitation (used as a proxy for flows) during 1955-1966 and 1974-1979 resulted in:

Water Year (October to September)	Probability of non-exceedance
1954	4.8%
1955	4.1%
1956	40.3%
1957	9.9%
1958	51.3%
1959	8.9%
1960	32.3%
1961	56.9%
1962	17.2%
1963	75.7%
1964	71.0%
1965	63.6%
1966	21.5%
1973	78.9%
1974	78.3%
1975	9.9%
1976	92.2%
1977	85.9%
1978	14.4%
1979	38.1%

Using the Babbitt (Partridge River watershed) precipitation record and the normal probability distribution obtained from the statistical fitting described above, the probability of non-exceedance of precipitation (used as a proxy for flows) during the 2000's resulted in:

Water Year (October to September)	Probability of non-exceedance
2000	96.5%
2001	34.3%
2002	16.9%
2003	13.7%
2004	69.3%

Using the Embarrass (Embarrass River watershed) precipitation record and the normal probability distribution obtained from the statistical fitting described above, the probability of non-exceedance of precipitation (used as a proxy for flows) during the 2000's resulted in:

Water Year (October to September)	Probability of non-exceedance
2000	72.8%
2001	28.9%
2002	24.1%
2003	15.6%
2004	30.0%

References

Shahin, M., van Oorschot, H.J.L., and De Lange, S.J. (1993). Statistical Analysis in Water Resources Engineering – Balkema, Rotterdam, the Netherlands. 393 pp.

Appendix C

Internal Barr Memorandum
From Miguel Wong
To Project File
Dated May 7, 2007
Regarding Embarrass River USGS Gage Flow Data

Internal Memorandum

To: Project File

From: Miguel Wong

Subject: Embarrass River - USGS Gage Flow Data

Date: May 7, 2007

Project: 23/69-862-015-074

c:

Introduction

This memo a) summarizes the information available on daily stream flows at USGS gaging stations located within the Embarrass River watershed, and b) provides flow estimates for average, wet and dry weather conditions at two surface water monitoring stations in the Embarrass River.

USGS Gage Flow Data

Daily flows in the Embarrass River watershed are available at:

- USGS gaging station # 04017000 – Embarrass River at Embarrass, Minnesota – Drainage area = 88.3 square miles – August 1, 1942 through December 31, 1964; and,
- USGS gaging station # 04018000 – Embarrass River near McKinley, Minnesota – Drainage area = 171.0 square miles – October 1, 1953 through September 30, 1962.

Figure 1 shows that the time series of flow per unit catchment area at the two USGS gaging stations of the Embarrass River are very similar for the coincident period of record October 1, 1953 through September 30, 1962; the coefficient of correlation is 0.90. Flows recorded in the gaging station Embarrass River at Embarrass during 1953-1962, denoted by the green double-arrow in Figure 2, were on the average 36% smaller than those recorded at the same gaging station during 1942-1953. Precipitation records indicate the annual average snowfall during 1953-1962 was 25% smaller than that recorded during the previous decade, and most of the difference in the annual average flows observed at the Embarrass River at Embarrass before and during the coincident period of record referred to above can be explained by the difference in high flows occurring during spring snowmelt events. The decrease in flows during 1953-1962 was thus in response to natural climatic variability. Therefore, the entire period of record of the gaging station Embarrass River at Embarrass has been selected as representative of the hydrology at the two surface water monitoring stations in the Embarrass River.

Flow Estimates

Three statistics have been computed for the time series of flow yields at the gaging station Embarrass River at Embarrass:

- Mean annual flow = 0.73 cubic feet per second per square mile of catchment area;
- Average of the 1-day maximum annual flows = 7.6 cubic feet per second per square mile of catchment area; and,
- Average of the 30-day minimum annual flows = 0.045 cubic feet per second per square mile of catchment area.

These flow yield statistics represent average, wet and dry weather conditions for the entire Embarrass River watershed, respectively. The corresponding flow values at the two surface water monitoring stations in the Embarrass River are:

Station PM-12 (18.9 square miles)

- Average flow = 13.8 cubic feet per second.
- Wet flow = 144.4 cubic feet per second.
- Dry flow = 0.9 cubic feet per second.

Station PM-13 (111.8 square miles)

- Average flow = 81.5 cubic feet per second.
- Wet flow = 853.1 cubic feet per second.
- Dry flow = 5.1 cubic feet per second.

Figure 1: Time series of flow yields at the two gaging stations in the Embarrass River for the coincident period of record 1953-1962

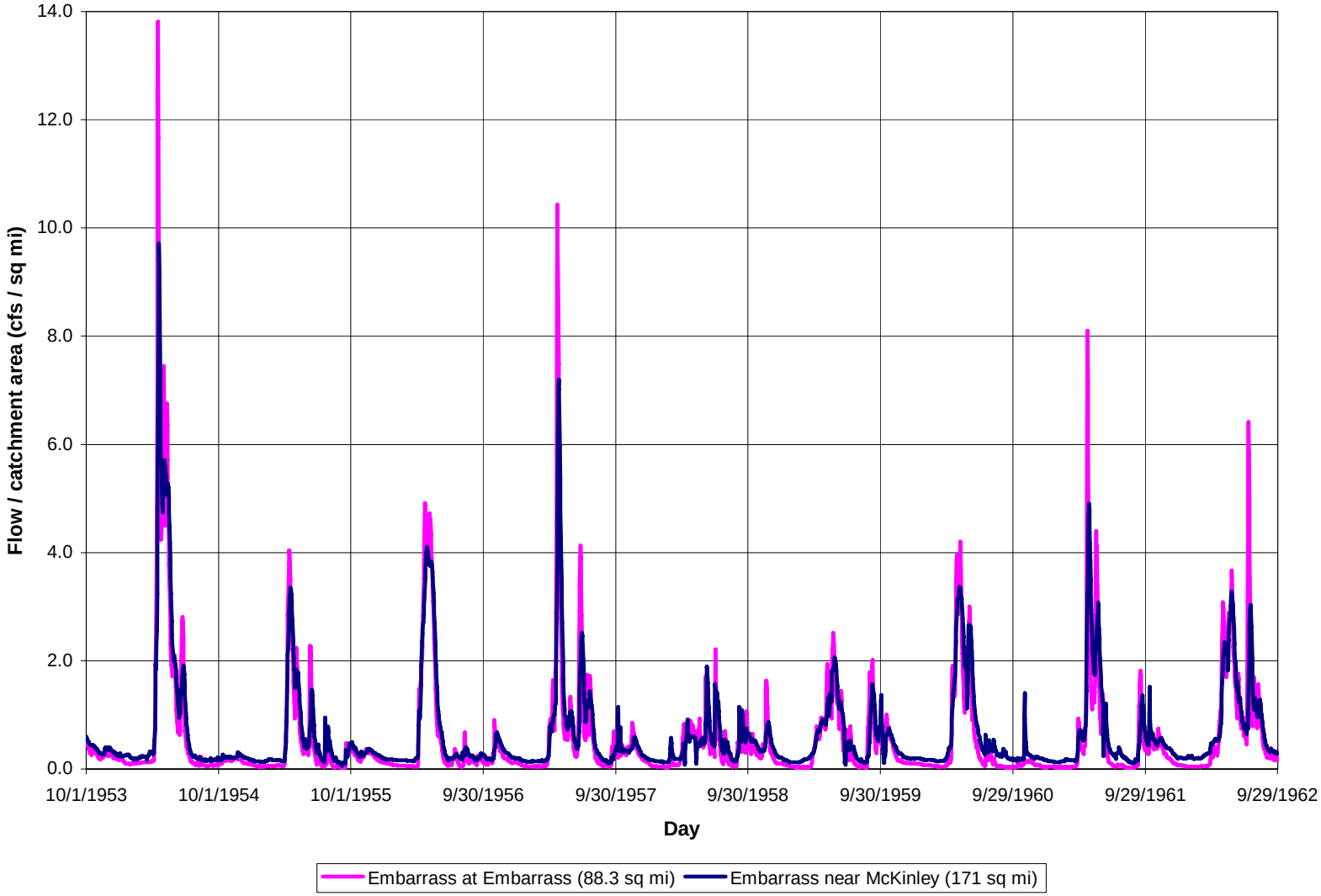
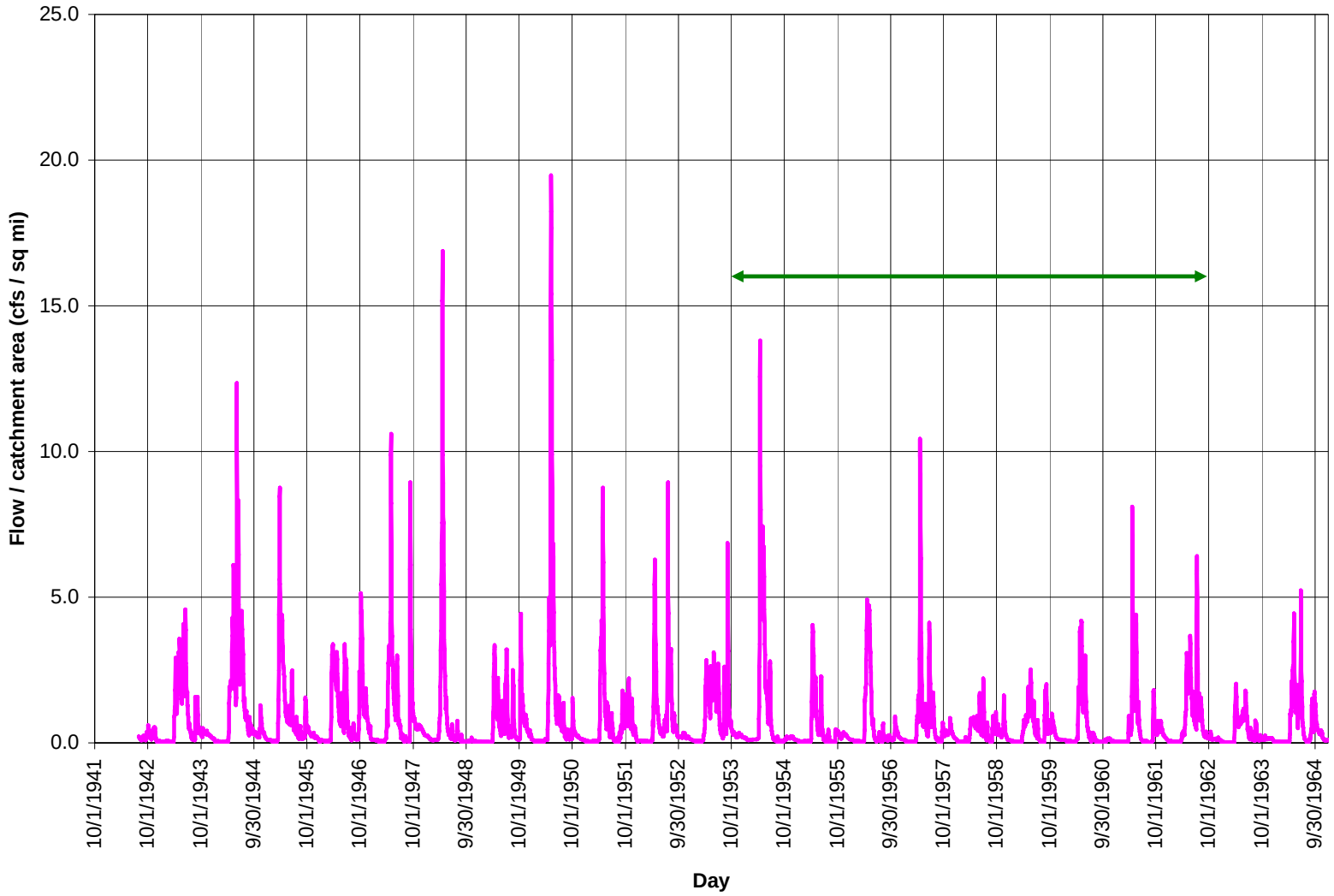


Figure 2: Time series of flow yields at the gaging station in the Embarrass River at Embarrass for the entire period of record 1942-1964



Appendix D

MPCA Baseline Water Quality Data: Quaternary Aquifer Wells within the Copper Nickel Study Area

MPCA Baseline Water Quality Data: Quaternary Aquifer Wells within the Copper Nickel Study Area

ID Number		GWMAP00716	GWMAP00906	GWMAP01189	GWMAP00759	GWMAP00889	GWMAP01038
Universal Trans Mercator - east		561261	556345	577699	577858	555921	553861
Universal Trans Mercator - north		5285293	5247911	5285468	5285406	5248401	5266949
County		St. Louis	St. Louis	St. Louis	St. Louis	St. Louis	St. Louis
MPCA Region		1	1	1	1	1	1
Well Use		Domestic	Domestic	Domestic	Domestic	Domestic	Domestic
Well Diameter	inch	4	4	6	4	4	6
CWI Aquifer Code		QBAA	QBAA	QBAA	QWTA	QWTA	QWTA
Aquifer		Buried artesian aquifer	Buried artesian aquifer	Buried artesian aquifer	Water table aquifer	Water table aquifer	Water table aquifer
Aquifer Group		buried Quaternary	buried Quaternary	buried Quaternary	surficial Quaternary	surficial Quaternary	surficial Quaternary
Well Depth	ft	136	117	152	151	148	86
Water Level	ft	10	25	12	0	14	35
Sampling Date		9/14/1995	8/22/1995	8/21/1996	9/14/1995	8/22/1995	6/5/1996
VOC Detected		yes	yes	no	no	no	no
Alkalinity	ug/L	112000	282000	125000	164000	290000	95000
Aluminum	ug/L	257.73	1.14	869.82	756.46	1.59	6.49
Antimony	ug/L	0.007	0.050	0.007	0.030	0.020	0.015
Arsenic	ug/L	12.800	2.950	1.670	6.140	2.510	0.090
Barium	ug/L	133.7	41.5	61.2	144.7	35.4	75.0
Beryllium	ug/L	0.0400	0.0050	0.0600	0.0600	0.0050	0.0050
Bismuth	ug/L	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300
Boron	ug/L	14.8	93.0	14.3	27.6	65.4	12.0
Bromide	ug/L	0.100	0.100	0.100	0.100	0.100	0.100
Cadmium	ug/L	0.010	0.010	0.030	0.190	0.010	0.110
Calcium	ug/L	35477	27306	37426	57016	47169	40874
Cesium	ug/L	0.070	0.360	0.110	0.060	0.270	0.009
Chloride	ug/L	520	16320	10340	16340	2020	6610
Chromium	ug/L	2.49	0.04	3.76	5.03	0.04	0.08
Cobalt	ug/L	0.780	0.170	2.403	1.870	0.300	0.779
Copper	ug/L	530.4	9.6	7.4	140.0	11.8	8.3
Dissolved oxygen	ug/L	290	290	290	290	290	290
Eh	mV	86	276	-28	186	260	174
Fluoride	ug/L	200	630		220	550	
Iron	ug/L	4173.5	252.0	2281.2	13773.6	894.7	461.3
Lead	ug/L	25.32	1.31	1.71	10.57	0.02	0.32
Lithium	ug/L	4.4	15.8	4.4	4.4	16.5	4.4
Magnesium	ug/L	6195	49755	10433	18118	37601	5356
Manganese	ug/L	466.5	94.4	166.2	300.8	288.2	202.6
Mercury							
Molybdenum	ug/L	4.10	9.40	4.10	4.10	10.00	4.10
Nickel	ug/L	6.60	11.90	5.90	8.50	12.80	5.90
Nitrate-N	ug/L	490	490	490	490	490	490
Oxidation-reduction potential	mV	-137	54	-248	-35	40	-47
pH		7.90	8.30	8.26	7.90	7.80	7.03
Total Phosphorus	ug/L	212.4	164.7	84.0	440.5	72.0	14.8
Potassium	ug/L	1637	2782	1691	2555	2705	1336
Rubidium	ug/L	555	555	555	555	555	555
Selenium	ug/L	3.4	2.5	0.9	9.0	3.7	0.9
Silica	ug/L	12998	5616	7221	12200	9129	7959

MPCA Baseline Water Quality Data: Quaternary Aquifer Wells within the Copper Nickel Study Area

ID Number		GWMAP00716	GWMAP00906	GWMAP01189	GWMAP00759	GWMAP00889	GWMAP01038
Silver	ug/L	0.008	0.020	0.008	0.030	0.008	0.008
Sodium	ug/L	3451	19119	4670	5152	11455	2498
Specific Conductance	mmhos/cm	0.215	0.586	0.277	0.405	0.544	0.260
Strontium	ug/L	136.5	282.5	133.4	156.6	212.2	91.8
Sulfate-S	ug/L	120	1500	2650	4860	90	5690
Sulfate	ug/L	360	4500	7950	14580	270	17070
Total Sulfur	ug/L	212	1678	2877	5059	160	5698
Temperature	°C	6.4	7.6	8.5	8.0	8.5	8.2
Thallium	ug/L	0.004	0.004	0.032	0.004	0.004	0.009
Tin	ug/L	0.650	0.050	0.030	0.110	0.030	0.310
Titanium	ug/L	0.0117	0.0062	0.0141	0.0176	0.0069	0.0034
Total dissolved solids	ug/L	156000	332000	168000	250000	344000	186000
Total organic carbon	ug/L	5600	1800	1800	2300	2600	1300
Total phosphate-P	ug/L	200	140	50	1020	40	10
Total suspended solids	ug/L	18000	2000	112000	26000	2000	2000
Tritium	ug/L		0.7	22.2			
Vanadium	ug/L	4.6	10.9	5.6	10.9	11.9	5.2
Zinc	ug/L	169.1	12.2	8.5	76.2	11.0	2.6
Zirconium	ug/L	0.280	0.040	0.650	0.230	0.090	0.020

Data from Minnesota Pollution Control Agency's Ground Water Monitoring and Assessment Program (GWMAP) Baseline Data Sets
http://www.pca.state.mn.us/water/groundwater/gwmap/gwbaseline.html

Appendix E

Calibration of Mass Balance Models for Embarrass River Watershed

Embarrass River Model - Calibration to Baseline Water Quality Data

Parameter: Silver

Input Flow Data	surface water flow into PM-12	Q_s12 =	12.60	(cfs)
	surface water flow into PM-13	Q_s13 =	48.51	(cfs)
	Babbitt WWTP discharge	Q_sBab =	0.33	(cfs)
	Area 5 Pit NW discharge	Q_spit =	1.99	(cfs)
	LTVSMC Tailings Basin seepage	Q_fs =	11.50	(cfs)
	Hydrometallurgical Residue Cells Liner Leakage	Q_rrs =	0.00	(cfs)
	ground water flow into PM-12	Q_g12 =	0.86	(cfs)
	ground water flow into PM-13	Q_g13 =	4.21	(cfs)

Input Concentration Data	concentration of surface water into PM-12	C_s12 =	0.11	(µg/l)
	concentration of surface water into PM-13	C_s13 =	0.11	(µg/l)
	concentration of WWTP discharge	C_sBab =	0.11	(µg/l)
	concentration of Area 5 Pit NW discharge	C_spit =	0.16	(µg/l)
	concentration of LTVSMC Tailings Basin seepage	C_fs =	0.1	(µg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	C_rrs =	0	
	concentration of ground water flow into PM-12	C_g12 =	0.008	(µg/l)
	concentration of ground water flow into PM-13	C_g13 =	0.008	(µg/l)

Water Balance	flow in river at PM-12	Q_r12 =	13.79	(cfs)
	flow in river at PM-13	Q_r13 =	80.00	(cfs)
	flow check	Q_ck =	80.00	(cfs)

Calculation of Mass Flux	mass flux of surface water into PM-12	M_s12 =	39	(µg/s)
	mass flux of surface water into PM-13	M_s13 =	151	(µg/s)
	mass flux of Babbitt WWTP	M_sBab =	1	(µg/s)
	concentration of Area 5 Pit NW discharge	M_spit =	9	(µg/s)
	concentration of LTVSMC Tailings Basin seepage	M_fs =	33	(µg/s)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	M_rrs =	0	(µg/s)
	mass flux of ground water into PM-12	M_g12 =	0	(µg/s)
	mass flux of ground water into PM-13	M_g13 =	1	(µg/s)

Mass Balance	mass flux in river at PM-12	M_r12 =	40	(µg/s)
	mass flux in river at PM-13	M_r13 =	234	(µg/s)

Calculated Concentration	concentration in river at PM-12	C_r12 =	0.10	(µg/l)
	concentration in river at PM-13	C_r13 =	0.10	(µg/l)

Observed Concentration	Observed concentration in river at PM-12		ND (0.2)	(µg/l)
	Observed concentration in river at PM-13		ND (0.2)	(µg/l)

Embarrass River Model - Calibration to Baseline Water Quality Data

Parameter: Aluminum

Input Flow Data	surface water flow into PM-12	Q_s12 =	11.54	(cfs)
	surface water flow into PM-13	Q_s13 =	43.27	(cfs)
	Babbitt WWTP discharge	Q_sBab =	0.33	(cfs)
	Area 5 Pit NW discharge	Q_spit =	1.99	(cfs)
	LTVSMC Tailings Basin seepage	Q_fs =	11.50	(cfs)
	Hydrometallurgical Residue Cells Liner Leakage	Q_rrs =	0.00	(cfs)
	ground water flow into PM-12	Q_g12 =	0.86	(cfs)
	ground water flow into PM-13	Q_g13 =	4.21	(cfs)

Input Concentration Data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/l)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/l)
	concentration of WWTP discharge	C_sBab =	0.1	(mg/l)
	concentration of Area 5 Pit NW discharge	C_spit =	0.0125	(mg/l)
	concentration of LTVSMC Tailings Basin seepage	C_fs =	1.5788	(mg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	C_rrs =	0	(mg/l)
	concentration of ground water flow into PM-12	C_g12 =	0.025	(mg/l)
	concentration of ground water flow into PM-13	C_g13 =	0.025	(mg/l)

Water Balance	flow in river at PM-12	Q_r12 =	12.73	(cfs)
	flow in river at PM-13	Q_r13 =	73.70	(cfs)
	flow check	Q_ck =	73.70	(cfs)

Calculation of Mass Flux	mass flux of surface water into PM-12	M_s12 =	33	(mg/l)
	mass flux of surface water into PM-13	M_s13 =	122	(mg/l)
	mass flux of Babbitt WWTP	M_sBab =	1	(mg/l)
	concentration of Area 5 Pit NW discharge	M_spit =	1	(mg/l)
	concentration of LTVSMC Tailings Basin seepage	M_fs =	514	(mg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	M_rrs =	0	(mg/l)
	mass flux of ground water into PM-12	M_g12 =	1	(mg/l)
	mass flux of ground water into PM-13	M_g13 =	3	(mg/l)

Mass Balance	mass flux in river at PM-12	M_r12 =	34	(mg/s)
	mass flux in river at PM-13	M_r13 =	674	(mg/s)

Calculated Concentration	concentration in river at PM-12	C_r12 =	0.09	(mg/l)
	concentration in river at PM-13	C_r13 =	0.32	(mg/l)

Observed Concentration	Observed concentration in river at PM-12		0.10	(mg/l)
	Observed concentration in river at PM-13		0.19	(mg/l)

Embarrass River Model - Calibration to Baseline Water Quality Data

Parameter: Arsenic

Input Flow Data	surface water flow into PM-12	Q_s12 =	12.60	(cfs)
	surface water flow into PM-13	Q_s13 =	48.51	(cfs)
	Babbitt WWTP discharge	Q_sBab =	0.33	(cfs)
	Area 5 Pit NW discharge	Q_spit =	1.99	(cfs)
	LTVSMC Tailings Basin seepage	Q_fs =	11.50	(cfs)
	Hydrometallurgical Residue Cells Liner Leakage	Q_rrs =	0.00	(cfs)
	ground water flow into PM-12	Q_g12 =	0.86	(cfs)
	ground water flow into PM-13	Q_g13 =	4.21	(cfs)

Input Concentration Data	concentration of surface water into PM-12	C_s12 =	0.75	(µg/l)
	concentration of surface water into PM-13	C_s13 =	0.75	(µg/l)
	concentration of WWTP discharge	C_sBab =	0.75	(µg/l)
	concentration of Area 5 Pit NW discharge	C_spit =	1	(µg/l)
	concentration of LTVSMC Tailings Basin seepage	C_fs =	2.905	(µg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	C_rrs =	0	
	concentration of ground water flow into PM-12	C_g12 =	2.73	(µg/l)
	concentration of ground water flow into PM-13	C_g13 =	2.73	(µg/l)

Water Balance	flow in river at PM-12	Q_r12 =	13.79	(cfs)
	flow in river at PM-13	Q_r13 =	80.00	(cfs)
	flow check	Q_ck =	80.00	(cfs)

Calculation of Mass Flux	mass flux of surface water into PM-12	M_s12 =	268	(µg/s)
	mass flux of surface water into PM-13	M_s13 =	1030	(µg/s)
	mass flux of Babbitt WWTP	M_sBab =	7	(µg/s)
	concentration of Area 5 Pit NW discharge	M_spit =	56	(µg/s)
	concentration of LTVSMC Tailings Basin seepage	M_fs =	945	(µg/s)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	M_rrs =	0	(µg/s)
	mass flux of ground water into PM-12	M_g12 =	66	(µg/s)
	mass flux of ground water into PM-13	M_g13 =	325	(µg/s)

Mass Balance	mass flux in river at PM-12	M_r12 =	341	(µg/s)
	mass flux in river at PM-13	M_r13 =	2698	(µg/s)

Calculated Concentration	concentration in river at PM-12	C_r12 =	0.87	(µg/l)
	concentration in river at PM-13	C_r13 =	1.19	(µg/l)

Observed Concentration	Observed concentration in river at PM-12		ND (2)	(µg/l)
	Observed concentration in river at PM-13		ND (2)	(µg/l)

Embarrass River Model - Calibration to Baseline Water Quality Data

Parameter: Boron

Input Flow Data	surface water flow into PM-12	Q_s12 =	12.60	(cfs)
	surface water flow into PM-13	Q_s13 =	48.51	(cfs)
	Babbitt WWTP discharge	Q_sBab =	0.33	(cfs)
	Area 5 Pit NW discharge	Q_spit =	1.99	(cfs)
	LTVSMC Tailings Basin seepage	Q_fs =	11.50	(cfs)
	Hydrometallurgical Residue Cells Liner Leakage	Q_rrs =	0.00	(cfs)
	ground water flow into PM-12	Q_g12 =	0.86	(cfs)
	ground water flow into PM-13	Q_g13 =	4.21	(cfs)

Input Concentration Data	concentration of surface water into PM-12	C_s12 =	12	(µg/l)
	concentration of surface water into PM-13	C_s13 =	12	(µg/l)
	concentration of WWTP discharge	C_sBab =	12	(µg/l)
	concentration of Area 5 Pit NW discharge	C_spit =	163	(µg/l)
	concentration of LTVSMC Tailings Basin seepage	C_fs =	330	(µg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	C_rrs =	0	
	concentration of ground water flow into PM-12	C_g12 =	21.2	(µg/l)
	concentration of ground water flow into PM-13	C_g13 =	21.2	(µg/l)

Water Balance	flow in river at PM-12	Q_r12 =	13.79	(cfs)
	flow in river at PM-13	Q_r13 =	80.00	(cfs)
	flow check	Q_ck =	80.00	(cfs)

Calculation of Mass Flux	mass flux of surface water into PM-12	M_s12 =	4280	(µg/s)
	mass flux of surface water into PM-13	M_s13 =	16473	(µg/s)
	mass flux of Babbitt WWTP	M_sBab =	112	(µg/s)
	concentration of Area 5 Pit NW discharge	M_spit =	9180	(µg/s)
	concentration of LTVSMC Tailings Basin seepage	M_fs =	107399	(µg/s)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	M_rrs =	0	(µg/s)
	mass flux of ground water into PM-12	M_g12 =	516	(µg/s)
	mass flux of ground water into PM-13	M_g13 =	2526	(µg/s)

Mass Balance	mass flux in river at PM-12	M_r12 =	4908	(µg/s)
	mass flux in river at PM-13	M_r13 =	140485	(µg/s)

Calculated Concentration	concentration in river at PM-12	C_r12 =	12.57	(µg/l)
	concentration in river at PM-13	C_r13 =	62.05	(µg/l)

Observed Concentration	Observed concentration in river at PM-12		ND (35)	(µg/l)
	Observed concentration in river at PM-13		68.9	(µg/l)

Embarrass River Model - Calibration to Baseline Water Quality Data

Parameter: Barium

Input Flow Data	surface water flow into PM-12	Q_s12 =	11.54	(cfs)
	surface water flow into PM-13	Q_s13 =	43.27	(cfs)
	Babbitt WWTP discharge	Q_sBab =	0.33	(cfs)
	Area 5 Pit NW discharge	Q_spit =	1.99	(cfs)
	LTVSMC Tailings Basin seepage	Q_fs =	11.50	(cfs)
	Hydrometallurgical Residue Cells Liner Leakage	Q_rrs =	0.00	(cfs)
	ground water flow into PM-12	Q_g12 =	0.86	(cfs)
	ground water flow into PM-13	Q_g13 =	4.21	(cfs)

Input Concentration Data	concentration of surface water into PM-12	C_s12 =	11	(µg/l)
	concentration of surface water into PM-13	C_s13 =	11	(µg/l)
	concentration of WWTP discharge	C_sBab =	11	(µg/l)
	concentration of Area 5 Pit NW discharge	C_spit =	5	(µg/l)
	concentration of LTVSMC Tailings Basin seepage	C_fs =	92.98	(µg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	C_rrs =	0	
	concentration of ground water flow into PM-12	C_g12 =	68.1	(µg/l)
	concentration of ground water flow into PM-13	C_g13 =	68.1	(µg/l)

Water Balance	flow in river at PM-12	Q_r12 =	12.73	(cfs)
	flow in river at PM-13	Q_r13 =	73.70	(cfs)
	flow check	Q_ck =	73.70	(cfs)

Calculation of Mass Flux	mass flux of surface water into PM-12	M_s12 =	3592	(µg/s)
	mass flux of surface water into PM-13	M_s13 =	13470	(µg/s)
	mass flux of Babbitt WWTP	M_sBab =	103	(µg/s)
	concentration of Area 5 Pit NW discharge	M_spit =	282	(µg/s)
	concentration of LTVSMC Tailings Basin seepage	M_fs =	30260	(µg/s)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	M_rrs =	0	(µg/s)
	mass flux of ground water into PM-12	M_g12 =	1657	(µg/s)
	mass flux of ground water into PM-13	M_g13 =	8114	(µg/s)

Mass Balance	mass flux in river at PM-12	M_r12 =	5352	(µg/s)
	mass flux in river at PM-13	M_r13 =	57478	(µg/s)

Calculated Concentration	concentration in river at PM-12	C_r12 =	14.86	(µg/l)
	concentration in river at PM-13	C_r13 =	27.56	(µg/l)

Observed Concentration	Observed concentration in river at PM-12		15.50	(µg/l)
	Observed concentration in river at PM-13		27.80	(µg/l)

Embarrass River Model - Calibration to Baseline Water Quality Data

Parameter: Beryllium

Input Flow Data	surface water flow into PM-12	Q_s12 =	12.60	(cfs)
	surface water flow into PM-13	Q_s13 =	48.51	(cfs)
	Babbitt WWTP discharge	Q_sBab =	0.33	(cfs)
	Area 5 Pit NW discharge	Q_spit =	1.99	(cfs)
	LTVSMC Tailings Basin seepage	Q_fs =	11.50	(cfs)
	Hydrometallurgical Residue Cells Liner Leakage	Q_rrs =	0.00	(cfs)
	ground water flow into PM-12	Q_g12 =	0.86	(cfs)
	ground water flow into PM-13	Q_g13 =	4.21	(cfs)

Input Concentration Data	concentration of surface water into PM-12	C_s12 =	0.1	(µg/l)
	concentration of surface water into PM-13	C_s13 =	0.1	(µg/l)
	concentration of WWTP discharge	C_sBab =	0.1	(µg/l)
	concentration of Area 5 Pit NW discharge	C_spit =	0.1	(µg/l)
	concentration of LTVSMC Tailings Basin seepage	C_fs =	0.75	(µg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	C_rrs =	0	
	concentration of ground water flow into PM-12	C_g12 =	0.023	(µg/l)
	concentration of ground water flow into PM-13	C_g13 =	0.023	(µg/l)

Water Balance	flow in river at PM-12	Q_r12 =	13.79	(cfs)
	flow in river at PM-13	Q_r13 =	80.00	(cfs)
	flow check	Q_ck =	80.00	(cfs)

Calculation of Mass Flux	mass flux of surface water into PM-12	M_s12 =	36	(µg/s)
	mass flux of surface water into PM-13	M_s13 =	137	(µg/s)
	mass flux of Babbitt WWTP	M_sBab =	1	(µg/s)
	concentration of Area 5 Pit NW discharge	M_spit =	6	(µg/s)
	concentration of LTVSMC Tailings Basin seepage	M_fs =	244	(µg/s)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	M_rrs =	0	(µg/s)
	mass flux of ground water into PM-12	M_g12 =	1	(µg/s)
	mass flux of ground water into PM-13	M_g13 =	3	(µg/s)

Mass Balance	mass flux in river at PM-12	M_r12 =	37	(µg/s)
	mass flux in river at PM-13	M_r13 =	427	(µg/s)

Calculated Concentration	concentration in river at PM-12	C_r12 =	0.10	(µg/l)
	concentration in river at PM-13	C_r13 =	0.19	(µg/l)

Observed Concentration	Observed concentration in river at PM-12		ND (0.2)	(µg/l)
	Observed concentration in river at PM-13		ND (0.2)	(µg/l)

Embarrass River Model - Calibration to Baseline Water Quality Data

Parameter: Calcium

Input Flow Data	surface water flow into PM-12	Q_s12 =	12.60	(cfs)
	surface water flow into PM-13	Q_s13 =	48.51	(cfs)
	Babbitt WWTP discharge	Q_sBab =	0.33	(cfs)
	Area 5 Pit NW discharge	Q_spit =	1.99	(cfs)
	LTVSMC Tailings Basin seepage	Q_fs =	11.50	(cfs)
	Hydrometallurgical Residue Cells Liner Leakage	Q_rrs =	0.00	(cfs)
	ground water flow into PM-12	Q_g12 =	0.86	(cfs)
	ground water flow into PM-13	Q_g13 =	4.21	(cfs)

Input Concentration Data	concentration of surface water into PM-12	C_s12 =	13	(mg/l)
	concentration of surface water into PM-13	C_s13 =	13	(mg/l)
	concentration of WWTP discharge	C_sBab =	13	(mg/l)
	concentration of Area 5 Pit NW discharge	C_spit =	98.7	(mg/l)
	concentration of LTVSMC Tailings Basin seepage	C_fs =	59.78	(mg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	C_rrs =	0	
	concentration of ground water flow into PM-12	C_g12 =	19	(mg/l)
	concentration of ground water flow into PM-13	C_g13 =	19	(mg/l)

Water Balance	flow in river at PM-12	Q_r12 =	13.79	(cfs)
	flow in river at PM-13	Q_r13 =	80.00	(cfs)
	flow check	Q_ck =	80.00	(cfs)

Calculation of Mass Flux	mass flux of surface water into PM-12	M_s12 =	4637	(µg/s)
	mass flux of surface water into PM-13	M_s13 =	17845	(mg/s)
	mass flux of Babbitt WWTP	M_sBab =	121	(mg/s)
	concentration of Area 5 Pit NW discharge	M_spit =	5558	(mg/s)
	concentration of LTVSMC Tailings Basin seepage	M_fs =	19455	(mg/s)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	M_rrs =	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2264	(mg/s)

Mass Balance	mass flux in river at PM-12	M_r12 =	5221	(mg/s)
	mass flux in river at PM-13	M_r13 =	50344	(mg/s)

Calculated Concentration	concentration in river at PM-12	C_r12 =	13.37	(mg/l)
	concentration in river at PM-13	C_r13 =	22.24	(mg/l)

Observed Concentration	Observed concentration in river at PM-12		13.4	(mg/l)
	Observed concentration in river at PM-13		19.9	(mg/l)

Embarrass River Model - Calibration to Baseline Water Quality Data

Parameter: Cadmium

Input Flow Data	surface water flow into PM-12	Q_s12 =	12.60	(cfs)
	surface water flow into PM-13	Q_s13 =	48.51	(cfs)
	Babbitt WWTP discharge	Q_sBab =	0.33	(cfs)
	Area 5 Pit NW discharge	Q_spit =	1.99	(cfs)
	LTVSMC Tailings Basin seepage	Q_fs =	11.50	(cfs)
	Hydrometallurgical Residue Cells Liner Leakage	Q_rrs =	0.00	(cfs)
	ground water flow into PM-12	Q_g12 =	0.86	(cfs)
	ground water flow into PM-13	Q_g13 =	4.21	(cfs)

Input Concentration Data	concentration of surface water into PM-12	C_s12 =	0.08	(µg/l)
	concentration of surface water into PM-13	C_s13 =	0.08	(µg/l)
	concentration of WWTP discharge	C_sBab =	0.08	(µg/l)
	concentration of Area 5 Pit NW discharge	C_spit =	0.1	(µg/l)
	concentration of LTVSMC Tailings Basin seepage	C_fs =	0.188	(µg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	C_rrs =	0	
	concentration of ground water flow into PM-12	C_g12 =	0.3	(µg/l)
	concentration of ground water flow into PM-13	C_g13 =	0.3	(µg/l)

Water Balance	flow in river at PM-12	Q_r12 =	13.79	(cfs)
	flow in river at PM-13	Q_r13 =	80.00	(cfs)
	flow check	Q_ck =	80.00	(cfs)

Calculation of Mass Flux	mass flux of surface water into PM-12	M_s12 =	29	(µg/s)
	mass flux of surface water into PM-13	M_s13 =	110	(µg/s)
	mass flux of Babbitt WWTP	M_sBab =	1	(µg/s)
	concentration of Area 5 Pit NW discharge	M_spit =	6	(µg/s)
	concentration of LTVSMC Tailings Basin seepage	M_fs =	61	(µg/s)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	M_rrs =	0	(µg/s)
	mass flux of ground water into PM-12	M_g12 =	7	(µg/s)
	mass flux of ground water into PM-13	M_g13 =	36	(µg/s)

Mass Balance	mass flux in river at PM-12	M_r12 =	37	(µg/s)
	mass flux in river at PM-13	M_r13 =	249	(µg/s)

Calculated Concentration	concentration in river at PM-12	C_r12 =	0.09	(µg/l)
	concentration in river at PM-13	C_r13 =	0.11	(µg/l)

Observed Concentration	Observed concentration in river at PM-12		ND (0.2)	(µg/l)
	Observed concentration in river at PM-13		ND (0.2)	(µg/l)

Embarrass River Model - Calibration to Baseline Water Quality Data

Parameter: Chloride

Input Flow Data	surface water flow into PM-12	Q_s12 =	0.30	(cfs)
	surface water flow into PM-13	Q_s13 =	0.30	(cfs)
	Babbitt WWTP discharge	Q_sBab =	0.33	(cfs)
	Area 5 Pit NW discharge	Q_spit =	0.00	(cfs)
	LTVSMC Tailings Basin seepage	Q_fs =	1.20	(cfs)
	Hydrometallurgical Residue Cells Liner Leakage	Q_rrs =	0.00	(cfs)
	ground water flow into PM-12	Q_g12 =	0.86	(cfs)
	ground water flow into PM-13	Q_g13 =	4.21	(cfs)

Input Concentration Data	concentration of surface water into PM-12	C_s12 =	10	(mg/l)
	concentration of surface water into PM-13	C_s13 =	10	(mg/l)
	concentration of WWTP discharge	C_sBab =	10	(mg/l)
	concentration of Area 5 Pit NW discharge	C_spit =	6.5	(mg/l)
	concentration of LTVSMC Tailings Basin seepage	C_fs =	21.54	(mg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	C_rrs =	0	(mg/l)
	concentration of ground water flow into PM-12	C_g12 =	1.8	(mg/l)
	concentration of ground water flow into PM-13	C_g13 =	1.8	(mg/l)

Water Balance	flow in river at PM-12	Q_r12 =	1.49	(cfs)
	flow in river at PM-13	Q_r13 =	7.20	(cfs)
	flow check	Q_ck =	7.20	(cfs)

Calculation of Mass Flux	mass flux of surface water into PM-12	M_s12 =	85	(mg/l)
	mass flux of surface water into PM-13	M_s13 =	85	(mg/l)
	mass flux of Babbitt WWTP	M_sBab =	93	(mg/l)
	concentration of Area 5 Pit NW discharge	M_spit =	0	(mg/l)
	concentration of LTVSMC Tailings Basin seepage	M_fs =	731	(mg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	M_rrs =	0	(mg/l)
	mass flux of ground water into PM-12	M_g12 =	44	(mg/l)
	mass flux of ground water into PM-13	M_g13 =	214	(mg/l)

Mass Balance	mass flux in river at PM-12	M_r12 =	222	(mg/s)
	mass flux in river at PM-13	M_r13 =	1253	(mg/s)

Calculated Concentration	concentration in river at PM-12	C_r12 =	5.27	(mg/l)
	concentration in river at PM-13	C_r13 =	6.15	(mg/l)

Observed Concentration	Observed concentration in river at PM-12		4.49	(mg/l)
	Observed concentration in river at PM-13		6.98	(mg/l)

Embarrass River Model - Calibration to Baseline Water Quality Data

Parameter: Cobalt

Input Flow Data	surface water flow into PM-12	Q_s12 =	12.60	(cfs)
	surface water flow into PM-13	Q_s13 =	48.51	(cfs)
	Babbitt WWTP discharge	Q_sBab =	0.33	(cfs)
	Area 5 Pit NW discharge	Q_spit =	1.99	(cfs)
	LTVSMC Tailings Basin seepage	Q_fs =	11.50	(cfs)
	Hydrometallurgical Residue Cells Liner Leakage	Q_rrs =	0.00	(cfs)
	ground water flow into PM-12	Q_g12 =	0.86	(cfs)
	ground water flow into PM-13	Q_g13 =	4.21	(cfs)

Input Concentration Data	concentration of surface water into PM-12	C_s12 =	0.6	(µg/l)
	concentration of surface water into PM-13	C_s13 =	0.6	(µg/l)
	concentration of WWTP discharge	C_sBab =	0.6	(µg/l)
	concentration of Area 5 Pit NW discharge	C_spit =	0.5	(µg/l)
	concentration of LTVSMC Tailings Basin seepage	C_fs =	1.556	(µg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	C_rrs =	0	(µg/l)
	concentration of ground water flow into PM-12	C_g12 =	1.1	(µg/l)
	concentration of ground water flow into PM-13	C_g13 =	1.1	(µg/l)

Water Balance	flow in river at PM-12	Q_r12 =	13.79	(cfs)
	flow in river at PM-13	Q_r13 =	80.00	(cfs)
	flow check	Q_ck =	80.00	(cfs)

Calculation of Mass Flux	mass flux of surface water into PM-12	M_s12 =	214	(µg/s)
	mass flux of surface water into PM-13	M_s13 =	824	(µg/s)
	mass flux of Babbitt WWTP	M_sBab =	6	(µg/s)
	concentration of Area 5 Pit NW discharge	M_spit =	28	(µg/s)
	concentration of LTVSMC Tailings Basin seepage	M_fs =	506	(µg/s)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	M_rrs =	0	(µg/s)
	mass flux of ground water into PM-12	M_g12 =	27	(µg/s)
	mass flux of ground water into PM-13	M_g13 =	131	(µg/s)

Mass Balance	mass flux in river at PM-12	M_r12 =	246	(µg/s)
	mass flux in river at PM-13	M_r13 =	1736	(µg/s)

Calculated Concentration	concentration in river at PM-12	C_r12 =	0.6	(µg/l)
	concentration in river at PM-13	C_r13 =	0.8	(µg/l)

Observed Concentration	Observed concentration in river at PM-12		0.58	(µg/l)
	Observed concentration in river at PM-13		ND (1)	(µg/l)

Embarrass River Model - Calibration to Baseline Water Quality Data

Parameter: Copper

Input Flow Data	surface water flow into PM-12	Q_s12 =	12.60	(cfs)
	surface water flow into PM-13	Q_s13 =	48.51	(cfs)
	Babbitt WWTP discharge	Q_sBab =	0.33	(cfs)
	Area 5 Pit NW discharge	Q_spit =	1.99	(cfs)
	LTVSMC Tailings Basin seepage	Q_fs =	11.50	(cfs)
	Hydrometallurgical Residue Cells Liner Leakage	Q_rrs =	0.00	(cfs)
	ground water flow into PM-12	Q_g12 =	0.86	(cfs)
	ground water flow into PM-13	Q_g13 =	4.21	(cfs)

Input Concentration Data	concentration of surface water into PM-12	C_s12 =	1.5	(µg/l)
	concentration of surface water into PM-13	C_s13 =	1.5	(µg/l)
	concentration of WWTP discharge	C_sBab =	1.5	(µg/l)
	concentration of Area 5 Pit NW discharge	C_spit =	2.5	(µg/l)
	concentration of LTVSMC Tailings Basin seepage	C_fs =	2.5	(µg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	C_rrs =	0	(µg/l)
	concentration of ground water flow into PM-12	C_g12 =	4	(µg/l)
	concentration of ground water flow into PM-13	C_g13 =	4	(µg/l)

Water Balance	flow in river at PM-12	Q_r12 =	13.79	(cfs)
	flow in river at PM-13	Q_r13 =	80.00	(cfs)
	flow check	Q_ck =	80.00	(cfs)

Calculation of Mass Flux	mass flux of surface water into PM-12	M_s12 =	535	(µg/s)
	mass flux of surface water into PM-13	M_s13 =	2059	(µg/s)
	mass flux of Babbitt WWTP	M_sBab =	14	(µg/s)
	concentration of Area 5 Pit NW discharge	M_spit =	141	(µg/s)
	concentration of LTVSMC Tailings Basin seepage	M_fs =	814	(µg/s)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	M_rrs =	0	(µg/s)
	mass flux of ground water into PM-12	M_g12 =	97	(µg/s)
	mass flux of ground water into PM-13	M_g13 =	477	(µg/s)

Mass Balance	mass flux in river at PM-12	M_r12 =	646	(µg/s)
	mass flux in river at PM-13	M_r13 =	4136	(µg/s)

Calculated Concentration	concentration in river at PM-12	C_r12 =	1.66	(µg/l)
	concentration in river at PM-13	C_r13 =	1.83	(µg/l)

Observed Concentration	Observed concentration in river at PM-12		1.53	(µg/l)
	Observed concentration in river at PM-13		2.00	(µg/l)

Embarrass River Model - Calibration to Baseline Water Quality Data

Parameter: Flouride

Input Flow Data	surface water flow into PM-12	Q_s12 =	12.60	(cfs)
	surface water flow into PM-13	Q_s13 =	48.51	(cfs)
	Babbitt WWTP discharge	Q_sBab =	0.33	(cfs)
	Area 5 Pit NW discharge	Q_spit =	1.99	(cfs)
	LTVSMC Tailings Basin seepage	Q_fs =	11.50	(cfs)
	Hydrometallurgical Residue Cells Liner Leakage	Q_rrs =	0.00	(cfs)
	ground water flow into PM-12	Q_g12 =	0.86	(cfs)
	ground water flow into PM-13	Q_g13 =	4.21	(cfs)

Input Concentration Data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/l)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/l)
	concentration of WWTP discharge	C_sBab =	0.1	(mg/l)
	concentration of Area 5 Pit NW discharge	C_spit =	0.2	(mg/l)
	concentration of LTVSMC Tailings Basin seepage	C_fs =	1.55	(mg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	C_rrs =	0	(mg/l)
	concentration of ground water flow into PM-12	C_g12 =	0.385	(mg/l)
	concentration of ground water flow into PM-13	C_g13 =	0.385	(mg/l)

Water Balance	flow in river at PM-12	Q_r12 =	13.79	(cfs)
	flow in river at PM-13	Q_r13 =	80.00	(cfs)
	flow check	Q_ck =	80.00	(cfs)

Calculation of Mass Flux	mass flux of surface water into PM-12	M_s12 =	36	(mg/l)
	mass flux of surface water into PM-13	M_s13 =	137	(mg/l)
	mass flux of Babbitt WWTP	M_sBab =	1	(mg/l)
	concentration of Area 5 Pit NW discharge	M_spit =	11	(mg/l)
	concentration of LTVSMC Tailings Basin seepage	M_fs =	504	(mg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	M_rrs =	0	(mg/l)
	mass flux of ground water into PM-12	M_g12 =	9	(mg/l)
	mass flux of ground water into PM-13	M_g13 =	46	(mg/l)

Mass Balance	mass flux in river at PM-12	M_r12 =	46	(mg/s)
	mass flux in river at PM-13	M_r13 =	745	(mg/s)

Calculated Concentration	concentration in river at PM-12	C_r12 =	0.12	(mg/l)
	concentration in river at PM-13	C_r13 =	0.33	(mg/l)

Observed Concentration	Observed concentration in river at PM-12		0.10	(mg/l)
	Observed concentration in river at PM-13		0.37	(mg/l)

Embarrass River Model - Calibration to Baseline Water Quality Data

Parameter: Iron

Input Flow Data	surface water flow into PM-12	Q_s12 =	0.77	(cfs)
	surface water flow into PM-13	Q_s13 =	2.63	(cfs)
	Babbitt WWTP discharge	Q_sBab =	0.33	(cfs)
	Area 5 Pit NW discharge	Q_spit =	0.00	(cfs)
	LTVSMC Tailings Basin seepage	Q_fs =	1.20	(cfs)
	Hydrometallurgical Residue Cells Liner Leakage	Q_rrs =	0.00	(cfs)
	ground water flow into PM-12	Q_g12 =	0.86	(cfs)
	ground water flow into PM-13	Q_g13 =	4.21	(cfs)

Input Concentration Data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/l)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/l)
	concentration of WWTP discharge	C_sBab =	2.9	(mg/l)
	concentration of Area 5 Pit NW discharge	C_spit =	0.038	(mg/l)
	concentration of LTVSMC Tailings Basin seepage	C_fs =	4.594	(mg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	C_rrs =	0	(mg/l)
	concentration of ground water flow into PM-12	C_g12 =	0.035	(mg/l)
	concentration of ground water flow into PM-13	C_g13 =	0.035	(mg/l)

Water Balance	flow in river at PM-12	Q_r12 =	1.96	(cfs)
	flow in river at PM-13	Q_r13 =	10.00	(cfs)
	flow check	Q_ck =	10.00	(cfs)

Calculation of Mass Flux	mass flux of surface water into PM-12	M_s12 =	64	(mg/l)
	mass flux of surface water into PM-13	M_s13 =	215	(mg/l)
	mass flux of Babbitt WWTP	M_sBab =	27	(mg/l)
	concentration of Area 5 Pit NW discharge	M_spit =	0	(mg/l)
	concentration of LTVSMC Tailings Basin seepage	M_fs =	156	(mg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	M_rrs =	0	(mg/l)
	mass flux of ground water into PM-12	M_g12 =	1	(mg/l)
	mass flux of ground water into PM-13	M_g13 =	4	(mg/l)

Mass Balance	mass flux in river at PM-12	M_r12 =	91	(mg/s)
	mass flux in river at PM-13	M_r13 =	467	(mg/s)

Calculated Concentration	concentration in river at PM-12	C_r12 =	1.65	(mg/l)
	concentration in river at PM-13	C_r13 =	1.65	(mg/l)

Observed Concentration	Observed concentration in river at PM-12		1.75	(mg/l)
	Observed concentration in river at PM-13		1.29	(mg/l)

Embarrass River Model - Calibration to Baseline Water Quality Data

Parameter: Hardness

Input Flow Data	surface water flow into PM-12	Q_s12 =	12.60	(cfs)
	surface water flow into PM-13	Q_s13 =	48.51	(cfs)
	Babbitt WWTP discharge	Q_sBab =	0.33	(cfs)
	Area 5 Pit NW discharge	Q_spit =	1.99	(cfs)
	LTVSMC Tailings Basin seepage	Q_fs =	11.50	(cfs)
	Hydrometallurgical Residue Cells Liner Leakage	Q_rrs =	0.00	(cfs)
	ground water flow into PM-12	Q_g12 =	0.86	(cfs)
	ground water flow into PM-13	Q_g13 =	4.21	(cfs)

Input Concentration Data	concentration of surface water into PM-12	C_s12 =	70	(mg/l)
	concentration of surface water into PM-13	C_s13 =	70	(mg/l)
	concentration of WWTP discharge	C_sBab =	70	(mg/l)
	concentration of Area 5 Pit NW discharge	C_spit =	925	(mg/l)
	concentration of LTVSMC Tailings Basin seepage	C_fs =	436.6	(mg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	C_rrs =	0	(mg/l)
	concentration of ground water flow into PM-12	C_g12 =	87.5	(mg/l)
	concentration of ground water flow into PM-13	C_g13 =	87.5	(mg/l)

Water Balance	flow in river at PM-12	Q_r12 =	13.79	(cfs)
	flow in river at PM-13	Q_r13 =	80.00	(cfs)
	flow check	Q_ck =	80.00	(cfs)

Calculation of Mass Flux	mass flux of surface water into PM-12	M_s12 =	24969	(mg/l)
	mass flux of surface water into PM-13	M_s13 =	96090	(mg/l)
	mass flux of Babbitt WWTP	M_sBab =	654	(mg/l)
	concentration of Area 5 Pit NW discharge	M_spit =	52093	(mg/l)
	concentration of LTVSMC Tailings Basin seepage	M_fs =	142091	(mg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	M_rrs =	0	(mg/l)
	mass flux of ground water into PM-12	M_g12 =	2130	(mg/l)
	mass flux of ground water into PM-13	M_g13 =	10425	(mg/l)

Mass Balance	mass flux in river at PM-12	M_r12 =	27752	(mg/s)
	mass flux in river at PM-13	M_r13 =	328452	(mg/s)

Calculated Concentration	concentration in river at PM-12	C_r12 =	71.09	(mg/l)
	concentration in river at PM-13	C_r13 =	145.08	(mg/l)

Observed Concentration	Observed concentration in river at PM-12		61.70	(mg/l)
	Observed concentration in river at PM-13		143.50	(mg/l)

Embarrass River Model - Calibration to Baseline Water Quality Data

Parameter: Potassium

Input Flow Data	surface water flow into PM-12	Q_s12 =	0.30	(cfs)
	surface water flow into PM-13	Q_s13 =	0.30	(cfs)
	Babbitt WWTP discharge	Q_sBab =	0.33	(cfs)
	Area 5 Pit NW discharge	Q_spit =	0.00	(cfs)
	LTVSMC Tailings Basin seepage	Q_fs =	1.20	(cfs)
	Hydrometallurgical Residue Cells Liner Leakage	Q_rrs =	0.00	(cfs)
	ground water flow into PM-12	Q_g12 =	0.86	(cfs)
	ground water flow into PM-13	Q_g13 =	4.21	(cfs)

Input Concentration Data	concentration of surface water into PM-12	C_s12 =	3.7	(mg/l)
	concentration of surface water into PM-13	C_s13 =	3.7	(mg/l)
	concentration of WWTP discharge	C_sBab =	3.7	(mg/l)
	concentration of Area 5 Pit NW discharge	C_spit =	48.6	(mg/l)
	concentration of LTVSMC Tailings Basin seepage	C_fs =	7.77	(mg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	C_rrs =	0	
	concentration of ground water flow into PM-12	C_g12 =	1.6	(mg/l)
	concentration of ground water flow into PM-13	C_g13 =	1.6	(mg/l)

Water Balance	flow in river at PM-12	Q_r12 =	1.49	(cfs)
	flow in river at PM-13	Q_r13 =	7.20	(cfs)
	flow check	Q_ck =	7.20	(cfs)

Calculation of Mass Flux	mass flux of surface water into PM-12	M_s12 =	32	(µg/s)
	mass flux of surface water into PM-13	M_s13 =	31	(mg/s)
	mass flux of Babbitt WWTP	M_sBab =	35	(mg/s)
	concentration of Area 5 Pit NW discharge	M_spit =	0	(mg/s)
	concentration of LTVSMC Tailings Basin seepage	M_fs =	264	(mg/s)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	M_rrs =	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	39	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	191	(mg/s)

Mass Balance	mass flux in river at PM-12	M_r12 =	105	(mg/s)
	mass flux in river at PM-13	M_r13 =	591	(mg/s)

Calculated Concentration	concentration in river at PM-12	C_r12 =	2.49	(mg/l)
	concentration in river at PM-13	C_r13 =	2.90	(mg/l)

Observed Concentration	Observed concentration in river at PM-12		0.78	(mg/l)
	Observed concentration in river at PM-13		2.31	(mg/l)

Embarrass River Model - Calibration to Baseline Water Quality Data

Parameter: Magnesium

Input Flow Data	surface water flow into PM-12	Q_s12 =	12.60	(cfs)
	surface water flow into PM-13	Q_s13 =	48.51	(cfs)
	Babbitt WWTP discharge	Q_sBab =	0.33	(cfs)
	Area 5 Pit NW discharge	Q_spit =	1.99	(cfs)
	LTVSMC Tailings Basin seepage	Q_fs =	11.50	(cfs)
	Hydrometallurgical Residue Cells Liner Leakage	Q_rrs =	0.00	(cfs)
	ground water flow into PM-12	Q_g12 =	0.86	(cfs)
	ground water flow into PM-13	Q_g13 =	4.21	(cfs)

Input Concentration Data	concentration of surface water into PM-12	C_s12 =	6	(mg/l)
	concentration of surface water into PM-13	C_s13 =	6	(mg/l)
	concentration of WWTP discharge	C_sBab =	6	(mg/l)
	concentration of Area 5 Pit NW discharge	C_spit =	252	(mg/l)
	concentration of LTVSMC Tailings Basin seepage	C_fs =	69.97	(mg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	C_rrs =	0	
	concentration of ground water flow into PM-12	C_g12 =	10.65	(mg/l)
	concentration of ground water flow into PM-13	C_g13 =	10.65	(mg/l)

Water Balance	flow in river at PM-12	Q_r12 =	13.79	(cfs)
	flow in river at PM-13	Q_r13 =	80.00	(cfs)
	flow check	Q_ck =	80.00	(cfs)

Calculation of Mass Flux	mass flux of surface water into PM-12	M_s12 =	2140	(µg/s)
	mass flux of surface water into PM-13	M_s13 =	8236	(mg/s)
	mass flux of Babbitt WWTP	M_sBab =	56	(mg/s)
	concentration of Area 5 Pit NW discharge	M_spit =	14192	(mg/s)
	concentration of LTVSMC Tailings Basin seepage	M_fs =	22772	(mg/s)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	M_rrs =	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1269	(mg/s)

Mass Balance	mass flux in river at PM-12	M_r12 =	2455	(mg/s)
	mass flux in river at PM-13	M_r13 =	48924	(mg/s)

Calculated Concentration	concentration in river at PM-12	C_r12 =	6.29	(mg/l)
	concentration in river at PM-13	C_r13 =	21.61	(mg/l)

Observed Concentration	Observed concentration in river at PM-12		6.2	(mg/l)
	Observed concentration in river at PM-13		15.9	(mg/l)

Embarrass River Model - Calibration to Baseline Water Quality Data

Parameter: Manganese

Input Flow Data	surface water flow into PM-12	Q_s12 =	0.30	(cfs)
	surface water flow into PM-13	Q_s13 =	0.30	(cfs)
	Babbitt WWTP discharge	Q_sBab =	0.33	(cfs)
	Area 5 Pit NW discharge	Q_spit =	0.00	(cfs)
	LTVSMC Tailings Basin seepage	Q_fs =	1.20	(cfs)
	Hydrometallurgical Residue Cells Liner Leakage	Q_rrs =	0.00	(cfs)
	ground water flow into PM-12	Q_g12 =	0.86	(cfs)
	ground water flow into PM-13	Q_g13 =	4.21	(cfs)

Input Concentration Data	concentration of surface water into PM-12	C_s12 =	0.3	(mg/l)
	concentration of surface water into PM-13	C_s13 =	0.3	(mg/l)
	concentration of WWTP discharge	C_sBab =	0.3	(mg/l)
	concentration of Area 5 Pit NW discharge	C_spit =	0.65	(mg/l)
	concentration of LTVSMC Tailings Basin seepage	C_fs =	1.183	(mg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	C_rrs =	0	
	concentration of ground water flow into PM-12	C_g12 =	0.188	(mg/l)
	concentration of ground water flow into PM-13	C_g13 =	0.188	(mg/l)

Water Balance	flow in river at PM-12	Q_r12 =	1.49	(cfs)
	flow in river at PM-13	Q_r13 =	7.20	(cfs)
	flow check	Q_ck =	7.20	(cfs)

Calculation of Mass Flux	mass flux of surface water into PM-12	M_s12 =	3	(µg/s)
	mass flux of surface water into PM-13	M_s13 =	3	(mg/s)
	mass flux of Babbitt WWTP	M_sBab =	3	(mg/s)
	concentration of Area 5 Pit NW discharge	M_spit =	0	(mg/s)
	concentration of LTVSMC Tailings Basin seepage	M_fs =	40	(mg/s)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	M_rrs =	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	5	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	22	(mg/s)

Mass Balance	mass flux in river at PM-12	M_r12 =	10	(mg/s)
	mass flux in river at PM-13	M_r13 =	75	(mg/s)

Calculated Concentration	concentration in river at PM-12	C_r12 =	0.24	(mg/l)
	concentration in river at PM-13	C_r13 =	0.37	(mg/l)

Observed Concentration	Observed concentration in river at PM-12		0.34	(mg/l)
	Observed concentration in river at PM-13		0.20	(mg/l)

Embarrass River Model - Calibration to Baseline Water Quality Data

Parameter: Sodium

Input Flow Data	surface water flow into PM-12	Q_s12 =	12.60	(cfs)
	surface water flow into PM-13	Q_s13 =	48.51	(cfs)
	Babbitt WWTP discharge	Q_sBab =	0.33	(cfs)
	Area 5 Pit NW discharge	Q_spit =	1.99	(cfs)
	LTVSMC Tailings Basin seepage	Q_fs =	11.50	(cfs)
	Hydrometallurgical Residue Cells Liner Leakage	Q_rrs =	0.00	(cfs)
	ground water flow into PM-12	Q_g12 =	0.86	(cfs)
	ground water flow into PM-13	Q_g13 =	4.21	(cfs)

Input Concentration Data	concentration of surface water into PM-12	C_s12 =	3.5	(mg/l)
	concentration of surface water into PM-13	C_s13 =	3.5	(mg/l)
	concentration of WWTP discharge	C_sBab =	3.5	(mg/l)
	concentration of Area 5 Pit NW discharge	C_spit =	119	(mg/l)
	concentration of LTVSMC Tailings Basin seepage	C_fs =	44.31	(mg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	C_rrs =	0	
	concentration of ground water flow into PM-12	C_g12 =	4.9	(mg/l)
	concentration of ground water flow into PM-13	C_g13 =	4.9	(mg/l)

Water Balance	flow in river at PM-12	Q_r12 =	13.79	(cfs)
	flow in river at PM-13	Q_r13 =	80.00	(cfs)
	flow check	Q_ck =	80.00	(cfs)

Calculation of Mass Flux	mass flux of surface water into PM-12	M_s12 =	1248	(µg/s)
	mass flux of surface water into PM-13	M_s13 =	4804	(mg/s)
	mass flux of Babbitt WWTP	M_sBab =	33	(mg/s)
	concentration of Area 5 Pit NW discharge	M_spit =	6702	(mg/s)
	concentration of LTVSMC Tailings Basin seepage	M_fs =	14421	(mg/s)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	M_rrs =	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	584	(mg/s)

Mass Balance	mass flux in river at PM-12	M_r12 =	1400	(mg/s)
	mass flux in river at PM-13	M_r13 =	27911	(mg/s)

Calculated Concentration	concentration in river at PM-12	C_r12 =	3.59	(mg/l)
	concentration in river at PM-13	C_r13 =	12.33	(mg/l)

Observed Concentration	Observed concentration in river at PM-12		3.0	(mg/l)
	Observed concentration in river at PM-13		12.7	(mg/l)

Embarrass River Model - Calibration to Baseline Water Quality Data

Parameter: Nickel

Input Flow Data	surface water flow into PM-12	Q_s12 =	12.60	(cfs)
	surface water flow into PM-13	Q_s13 =	48.51	(cfs)
	Babbitt WWTP discharge	Q_sBab =	0.33	(cfs)
	Area 5 Pit NW discharge	Q_spit =	1.99	(cfs)
	LTVSMC Tailings Basin seepage	Q_fs =	11.50	(cfs)
	Hydrometallurgical Residue Cells Liner Leakage	Q_rrs =	0.00	(cfs)
	ground water flow into PM-12	Q_g12 =	0.86	(cfs)
	ground water flow into PM-13	Q_g13 =	4.21	(cfs)

Input Concentration Data	concentration of surface water into PM-12	C_s12 =	1.2	(µg/l)
	concentration of surface water into PM-13	C_s13 =	1.2	(µg/l)
	concentration of WWTP discharge	C_sBab =	1.2	(µg/l)
	concentration of Area 5 Pit NW discharge	C_spit =	2.5	(µg/l)
	concentration of LTVSMC Tailings Basin seepage	C_fs =	6.88	(µg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	C_rrs =	0	(µg/l)
	concentration of ground water flow into PM-12	C_g12 =	7	(µg/l)
	concentration of ground water flow into PM-13	C_g13 =	7	(µg/l)

Water Balance	flow in river at PM-12	Q_r12 =	13.79	(cfs)
	flow in river at PM-13	Q_r13 =	80.00	(cfs)
	flow check	Q_ck =	80.00	(cfs)

Calculation of Mass Flux	mass flux of surface water into PM-12	M_s12 =	428	(µg/s)
	mass flux of surface water into PM-13	M_s13 =	1647	(µg/s)
	mass flux of Babbitt WWTP	M_sBab =	11	(µg/s)
	concentration of Area 5 Pit NW discharge	M_spit =	141	(µg/s)
	concentration of LTVSMC Tailings Basin seepage	M_fs =	2239	(µg/s)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	M_rrs =	0	(µg/s)
	mass flux of ground water into PM-12	M_g12 =	170	(µg/s)
	mass flux of ground water into PM-13	M_g13 =	834	(µg/s)

Mass Balance	mass flux in river at PM-12	M_r12 =	610	(µg/s)
	mass flux in river at PM-13	M_r13 =	5471	(µg/s)

Calculated Concentration	concentration in river at PM-12	C_r12 =	1.6	(µg/l)
	concentration in river at PM-13	C_r13 =	2.4	(µg/l)

Observed Concentration	Observed concentration in river at PM-12		1.9	(µg/l)
	Observed concentration in river at PM-13		2.1	(µg/l)

Embarrass River Model - Calibration to Baseline Water Quality Data

Parameter: Lead

Input Flow Data	surface water flow into PM-12	Q_s12 =	12.60	(cfs)
	surface water flow into PM-13	Q_s13 =	48.51	(cfs)
	Babbitt WWTP discharge	Q_sBab =	0.33	(cfs)
	Area 5 Pit NW discharge	Q_spit =	1.99	(cfs)
	LTVSMC Tailings Basin seepage	Q_fs =	11.50	(cfs)
	Hydrometallurgical Residue Cells Liner Leakage	Q_rrs =	0.00	(cfs)
	ground water flow into PM-12	Q_g12 =	0.86	(cfs)
	ground water flow into PM-13	Q_g13 =	4.21	(cfs)

Input Concentration Data	concentration of surface water into PM-12	C_s12 =	0	(µg/l)
	concentration of surface water into PM-13	C_s13 =	0	(µg/l)
	concentration of WWTP discharge	C_sBab =	0	(µg/l)
	concentration of Area 5 Pit NW discharge	C_spit =	0.5	(µg/l)
	concentration of LTVSMC Tailings Basin seepage	C_fs =	1.2	(µg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	C_rrs =	0	
	concentration of ground water flow into PM-12	C_g12 =	1.2	(µg/l)
	concentration of ground water flow into PM-13	C_g13 =	1.2	(µg/l)

Water Balance	flow in river at PM-12	Q_r12 =	13.79	(cfs)
	flow in river at PM-13	Q_r13 =	80.00	(cfs)
	flow check	Q_ck =	80.00	(cfs)

Calculation of Mass Flux	mass flux of surface water into PM-12	M_s12 =	0	(µg/s)
	mass flux of surface water into PM-13	M_s13 =	0	(µg/s)
	mass flux of Babbitt WWTP	M_sBab =	0	(µg/s)
	concentration of Area 5 Pit NW discharge	M_spit =	28	(µg/s)
	concentration of LTVSMC Tailings Basin seepage	M_fs =	391	(µg/s)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	M_rrs =	0	(µg/s)
	mass flux of ground water into PM-12	M_g12 =	29	(µg/s)
	mass flux of ground water into PM-13	M_g13 =	143	(µg/s)

Mass Balance	mass flux in river at PM-12	M_r12 =	29	(µg/s)
	mass flux in river at PM-13	M_r13 =	591	(µg/s)

Calculated Concentration	concentration in river at PM-12	C_r12 =	0.07	(µg/l)
	concentration in river at PM-13	C_r13 =	0.26	(µg/l)

Observed Concentration	Observed concentration in river at PM-12		ND (0.30)	(µg/l)
	Observed concentration in river at PM-13		0.27	(µg/l)

Embarrass River Model - Calibration to Baseline Water Quality Data

Parameter: Antimony

Input Flow Data	surface water flow into PM-12	Q_s12 =	12.60	(cfs)
	surface water flow into PM-13	Q_s13 =	48.51	(cfs)
	Babbitt WWTP discharge	Q_sBab =	0.33	(cfs)
	Area 5 Pit NW discharge	Q_spit =	1.99	(cfs)
	LTVSMC Tailings Basin seepage	Q_fs =	11.50	(cfs)
	Hydrometallurgical Residue Cells Liner Leakage	Q_rrs =	0.00	(cfs)
	ground water flow into PM-12	Q_g12 =	0.86	(cfs)
	ground water flow into PM-13	Q_g13 =	4.21	(cfs)

Input Concentration Data	concentration of surface water into PM-12	C_s12 =	0.02	(µg/l)
	concentration of surface water into PM-13	C_s13 =	0.02	(µg/l)
	concentration of WWTP discharge	C_sBab =	0.02	(µg/l)
	concentration of Area 5 Pit NW discharge	C_spit =	1.5	(µg/l)
	concentration of LTVSMC Tailings Basin seepage	C_fs =	0.25	(µg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	C_rrs =	0	
	concentration of ground water flow into PM-12	C_g12 =	1.5	(µg/l)
	concentration of ground water flow into PM-13	C_g13 =	1.5	(µg/l)

Water Balance	flow in river at PM-12	Q_r12 =	13.79	(cfs)
	flow in river at PM-13	Q_r13 =	80.00	(cfs)
	flow check	Q_ck =	80.00	(cfs)

Calculation of Mass Flux	mass flux of surface water into PM-12	M_s12 =	7	(µg/s)
	mass flux of surface water into PM-13	M_s13 =	27	(µg/s)
	mass flux of Babbitt WWTP	M_sBab =	0	(µg/s)
	concentration of Area 5 Pit NW discharge	M_spit =	84	(µg/s)
	concentration of LTVSMC Tailings Basin seepage	M_fs =	81	(µg/s)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	M_rrs =	0	(µg/s)
	mass flux of ground water into PM-12	M_g12 =	37	(µg/s)
	mass flux of ground water into PM-13	M_g13 =	179	(µg/s)

Mass Balance	mass flux in river at PM-12	M_r12 =	44	(µg/s)
	mass flux in river at PM-13	M_r13 =	416	(µg/s)

Calculated Concentration	concentration in river at PM-12	C_r12 =	0.11	(µg/l)
	concentration in river at PM-13	C_r13 =	0.18	(µg/l)

Observed Concentration	Observed concentration in river at PM-12		ND (0.3)	(µg/l)
	Observed concentration in river at PM-13		ND (0.3)	(µg/l)

Embarrass River Model - Calibration to Baseline Water Quality Data

Parameter: Selenium

Input Flow Data	surface water flow into PM-12	Q_s12 =	12.60	(cfs)
	surface water flow into PM-13	Q_s13 =	48.51	(cfs)
	Babbitt WWTP discharge	Q_sBab =	0.33	(cfs)
	Area 5 Pit NW discharge	Q_spit =	1.99	(cfs)
	LTVSMC Tailings Basin seepage	Q_fs =	11.50	(cfs)
	Hydrometallurgical Residue Cells Liner Leakage	Q_rrs =	0.00	(cfs)
	ground water flow into PM-12	Q_g12 =	0.86	(cfs)
	ground water flow into PM-13	Q_g13 =	4.21	(cfs)

Input Concentration Data	concentration of surface water into PM-12	C_s12 =	0.3	(µg/l)
	concentration of surface water into PM-13	C_s13 =	0.3	(µg/l)
	concentration of WWTP discharge	C_sBab =	0.3	(µg/l)
	concentration of Area 5 Pit NW discharge	C_spit =	1	(µg/l)
	concentration of LTVSMC Tailings Basin seepage	C_fs =	1.09	(µg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	C_rrs =	0	
	concentration of ground water flow into PM-12	C_g12 =	2.95	(µg/l)
	concentration of ground water flow into PM-13	C_g13 =	2.95	(µg/l)

Water Balance	flow in river at PM-12	Q_r12 =	13.79	(cfs)
	flow in river at PM-13	Q_r13 =	80.00	(cfs)
	flow check	Q_ck =	80.00	(cfs)

Calculation of Mass Flux	mass flux of surface water into PM-12	M_s12 =	107	(µg/s)
	mass flux of surface water into PM-13	M_s13 =	412	(µg/s)
	mass flux of Babbitt WWTP	M_sBab =	3	(µg/s)
	concentration of Area 5 Pit NW discharge	M_spit =	56	(µg/s)
	concentration of LTVSMC Tailings Basin seepage	M_fs =	355	(µg/s)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	M_rrs =	0	(µg/s)
	mass flux of ground water into PM-12	M_g12 =	72	(µg/s)
	mass flux of ground water into PM-13	M_g13 =	351	(µg/s)

Mass Balance	mass flux in river at PM-12	M_r12 =	182	(µg/s)
	mass flux in river at PM-13	M_r13 =	1356	(µg/s)

Calculated Concentration	concentration in river at PM-12	C_r12 =	0.47	(µg/l)
	concentration in river at PM-13	C_r13 =	0.60	(µg/l)

Observed Concentration	Observed concentration in river at PM-12		ND (1)	(µg/l)
	Observed concentration in river at PM-13		ND (1)	(µg/l)

Embarrass River Model - Calibration to Baseline Water Quality Data

Parameter: Sulfate

Input Flow Data	surface water flow into PM-12	Q_s12 =	12.60	(cfs)
	surface water flow into PM-13	Q_s13 =	48.51	(cfs)
	Babbitt WWTP discharge	Q_sBab =	0.33	(cfs)
	Area 5 Pit NW discharge	Q_spit =	1.99	(cfs)
	LTVSMC Tailings Basin seepage	Q_fs =	11.50	(cfs)
	Hydrometallurgical Residue Cells Liner Leakage	Q_rrs =	0.00	(cfs)
	ground water flow into PM-12	Q_g12 =	0.86	(cfs)
	ground water flow into PM-13	Q_g13 =	4.21	(cfs)

Input Concentration Data	concentration of surface water into PM-12	C_s12 =	4	(mg/l)
	concentration of surface water into PM-13	C_s13 =	4	(mg/l)
	concentration of WWTP discharge	C_sBab =	4	(mg/l)
	concentration of Area 5 Pit NW discharge	C_spit =	1042	(mg/l)
	concentration of LTVSMC Tailings Basin seepage	C_fs =	152.4	(mg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	C_rrs =	0	
	concentration of ground water flow into PM-12	C_g12 =	8.5	(mg/l)
	concentration of ground water flow into PM-13	C_g13 =	8.5	(mg/l)

Water Balance	flow in river at PM-12	Q_r12 =	13.79	(cfs)
	flow in river at PM-13	Q_r13 =	80.00	(cfs)
	flow check	Q_ck =	80.00	(cfs)

Calculation of Mass Flux	mass flux of surface water into PM-12	M_s12 =	1427	(µg/s)
	mass flux of surface water into PM-13	M_s13 =	5491	(mg/s)
	mass flux of Babbitt WWTP	M_sBab =	37	(mg/s)
	concentration of Area 5 Pit NW discharge	M_spit =	58682	(mg/s)
	concentration of LTVSMC Tailings Basin seepage	M_fs =	49599	(mg/s)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	M_rrs =	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	207	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1013	(mg/s)

Mass Balance	mass flux in river at PM-12	M_r12 =	1671	(mg/s)
	mass flux in river at PM-13	M_r13 =	116455	(mg/s)

Calculated Concentration	concentration in river at PM-12	C_r12 =	4.3	(mg/l)
	concentration in river at PM-13	C_r13 =	51.4	(mg/l)

Observed Concentration	Observed concentration in river at PM-12		4.7	(mg/l)
	Observed concentration in river at PM-13		36.1	(mg/l)

Embarrass River Model - Calibration to Baseline Water Quality Data

Parameter: Thallium

Input Flow Data	surface water flow into PM-12	Q_s12 =	12.60	(cfs)
	surface water flow into PM-13	Q_s13 =	48.51	(cfs)
	Babbitt WWTP discharge	Q_sBab =	0.33	(cfs)
	Area 5 Pit NW discharge	Q_spit =	1.99	(cfs)
	LTVSMC Tailings Basin seepage	Q_fs =	11.50	(cfs)
	Hydrometallurgical Residue Cells Liner Leakage	Q_rrs =	0.00	(cfs)
	ground water flow into PM-12	Q_g12 =	0.86	(cfs)
	ground water flow into PM-13	Q_g13 =	4.21	(cfs)

Input Concentration Data	concentration of surface water into PM-12	C_s12 =	0.2	(mg/l)
	concentration of surface water into PM-13	C_s13 =	0.2	(mg/l)
	concentration of WWTP discharge	C_sBab =	0.2	(mg/l)
	concentration of Area 5 Pit NW discharge	C_spit =	1	(mg/l)
	concentration of LTVSMC Tailings Basin seepage	C_fs =	0.2	(mg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	C_rrs =	0	
	concentration of ground water flow into PM-12	C_g12 =	0.004	(mg/l)
	concentration of ground water flow into PM-13	C_g13 =	0.004	(mg/l)

Water Balance	flow in river at PM-12	Q_r12 =	13.79	(cfs)
	flow in river at PM-13	Q_r13 =	80.00	(cfs)
	flow check	Q_ck =	80.00	(cfs)

Calculation of Mass Flux	mass flux of surface water into PM-12	M_s12 =	71	(µg/s)
	mass flux of surface water into PM-13	M_s13 =	275	(mg/s)
	mass flux of Babbitt WWTP	M_sBab =	2	(mg/s)
	concentration of Area 5 Pit NW discharge	M_spit =	56	(mg/s)
	concentration of LTVSMC Tailings Basin seepage	M_fs =	65	(mg/s)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	M_rrs =	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0	(mg/s)

Mass Balance	mass flux in river at PM-12	M_r12 =	73	(mg/s)
	mass flux in river at PM-13	M_r13 =	470	(mg/s)

Calculated Concentration	concentration in river at PM-12	C_r12 =	0.19	(mg/l)
	concentration in river at PM-13	C_r13 =	0.21	(mg/l)

Observed Concentration	Observed concentration in river at PM-12		ND (0.4)	(µg/l)
	Observed concentration in river at PM-13		ND (0.4)	(µg/l)

Embarrass River Model - Calibration to Baseline Water Quality Data

Parameter: Zinc

Input Flow Data	surface water flow into PM-12	Q_s12 =	12.60	(cfs)
	surface water flow into PM-13	Q_s13 =	48.51	(cfs)
	Babbitt WWTP discharge	Q_sBab =	0.33	(cfs)
	Area 5 Pit NW discharge	Q_spit =	1.99	(cfs)
	LTVSMC Tailings Basin seepage	Q_fs =	11.50	(cfs)
	Hydrometallurgical Residue Cells Liner Leakage	Q_rrs =	0.00	(cfs)
	ground water flow into PM-12	Q_g12 =	0.86	(cfs)
	ground water flow into PM-13	Q_g13 =	4.21	(cfs)

Input Concentration Data	concentration of surface water into PM-12	C_s12 =	16	(µg/l)
	concentration of surface water into PM-13	C_s13 =	16	(µg/l)
	concentration of WWTP discharge	C_sBab =	16	(µg/l)
	concentration of Area 5 Pit NW discharge	C_spit =	5	(µg/l)
	concentration of LTVSMC Tailings Basin seepage	C_fs =	14.35	(µg/l)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	C_rrs =	0	
	concentration of ground water flow into PM-12	C_g12 =	11.5	(µg/l)
	concentration of ground water flow into PM-13	C_g13 =	11.5	(µg/l)

Water Balance	flow in river at PM-12	Q_r12 =	13.79	(cfs)
	flow in river at PM-13	Q_r13 =	80.00	(cfs)
	flow check	Q_ck =	80.00	(cfs)

Calculation of Mass Flux	mass flux of surface water into PM-12	M_s12 =	5707	(µg/s)
	mass flux of surface water into PM-13	M_s13 =	21963	(µg/s)
	mass flux of Babbitt WWTP	M_sBab =	149	(µg/s)
	concentration of Area 5 Pit NW discharge	M_spit =	282	(µg/s)
	concentration of LTVSMC Tailings Basin seepage	M_fs =	4670	(µg/s)
	concentration of Hydrometallurgical Residue Cells Liner Leakage	M_rrs =	0	(µg/s)
	mass flux of ground water into PM-12	M_g12 =	280	(µg/s)
	mass flux of ground water into PM-13	M_g13 =	1370	(µg/s)

Mass Balance	mass flux in river at PM-12	M_r12 =	6137	(µg/s)
	mass flux in river at PM-13	M_r13 =	34422	(µg/s)

Calculated Concentration	concentration in river at PM-12	C_r12 =	15.72	(µg/l)
	concentration in river at PM-13	C_r13 =	15.20	(µg/l)

Observed Concentration	Observed concentration in river at PM-12		18.3	(µg/l)
	Observed concentration in river at PM-13		12.3	(µg/l)

Appendix F

Predicted Concentrations Using Mass-Balance Models for Embarrass River Watershed

Tailings Basin - Proposed Action

Tailings Basin - Geotechnical Mitigation

Appendix F.1
Embarrass River
Proposed Action
Year 1

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

FLOWS

Case Flows	Year 1 Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	0.86	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	6.27	(cfs)	PM-13
	flow check	Q_ck_L =	6.27	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.00	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.00	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	0.34	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	0.86	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Year 1 Average Flow Conditions (mean annual)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12
	flow in river at PM-13	Q_r13_M =	92.68	(cfs)	PM-13
	flow check	Q_ck_M =	92.68	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	3.19	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_M =	7.96	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13

Case Flow	Year 1 High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	864.23	(cfs)	PM-13
	flow check	Q_ck_H =	864.23	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	3.19	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	7.96	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 1
Parameter	Silver

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00096	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000008	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.19	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.01	(mg/s)		0.35	(mg/s)		2.75	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 1
Parameter	Aluminum

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.18	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.025	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	35.69	(mg/s)	405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)	0.61	(mg/s)	0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.93	(mg/s)	0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	174.13	(mg/s)	1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.98	(mg/s)	2.98	(mg/s)	2.98	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.75	(mg/s)	0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.10	(mg/s)	0.90	(mg/s)	0.90	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	38.29	(mg/s)	355.65	(mg/s)	355.65	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.61	(mg/s)	37.23	(mg/s)	406.69	(mg/s)
	mass flux in river at PM-13	M_r13 =	41.98	(mg/s)	571.64	(mg/s)	2,755.13	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.025	(mg/L)	0.095	(mg/L)	0.100	(mg/L)
	concentration in river at PM-13	C_r13 =	0.237	(mg/L)	0.218	(mg/L)	0.113	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 1
Parameter	Arsenic

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.005946518	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00273	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.27	(mg/s)	3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.31	(mg/s)	15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.33	(mg/s)	0.33	(mg/s)	0.33	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.06	(mg/s)	0.54	(mg/s)	0.54	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.07	(mg/s)	0.65	(mg/s)	0.65	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.34	(mg/s)	3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.52	(mg/s)	3.24	(mg/s)	19.61	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.003	(mg/L)	0.001	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 1
Parameter	Boron

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.138981444	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0212	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	4.28	(mg/s)	49	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)	0.52	(mg/s)	0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.11	(mg/s)	0.11	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	20.90	(mg/s)	239	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.53	(mg/s)	2.53	(mg/s)	2.53	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	7.41	(mg/s)	7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.35	(mg/s)	12.53	(mg/s)	12.53	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	8.00	(mg/s)	74.34	(mg/s)	74.34	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.52	(mg/s)	4.91	(mg/s)	49.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	12.40	(mg/s)	122.61	(mg/s)	384.63	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.021	(mg/L)	0.013	(mg/L)	0.012	(mg/L)
	concentration in river at PM-13	C_r13 =	0.070	(mg/L)	0.047	(mg/L)	0.016	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 1
Parameter	Barium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.29E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0681	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	3.93	(mg/s)	45	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)	1.66	(mg/s)	1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	19.15	(mg/s)	219	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	8.11	(mg/s)	8.11	(mg/s)	8.11	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.51	(mg/s)	4.77	(mg/s)	4.77	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	2.26	(mg/s)	20.95	(mg/s)	20.95	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.66	(mg/s)	5.69	(mg/s)	46.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	12.54	(mg/s)	58.92	(mg/s)	299.10	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.068	(mg/L)	0.015	(mg/L)	0.011	(mg/L)
	concentration in river at PM-13	C_r13 =	0.071	(mg/L)	0.022	(mg/L)	0.012	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 1**
Parameter	**Beryllium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000271356	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000023	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.17	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.00	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.02	(mg/s)		0.41	(mg/s)		2.60	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 1
Parameter	Calcium

Input concentration data	concentration of surface water into PM-12	C_s12 =	13	(mg/L)
	concentration of surface water into PM-13	C_s13 =	13	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	13	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	45.78662467	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	19	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	4,639.22	(mg/s)	52,669	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)	462.42	(mg/s)	462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	121.41	(mg/s)	121.41	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	22,636.89	(mg/s)	258,461	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2,263.72	(mg/s)	2,263.72	(mg/s)	2,263.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	5,369.83	(mg/s)	5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	444.46	(mg/s)	4,128.35	(mg/s)	4,128.35	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	12.28	(mg/s)	12.28	(mg/s)	12.28	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,449.83	(mg/s)	13,466.52	(mg/s)	1.77	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	462.42	(mg/s)	5,223.05	(mg/s)	53,252.39	(mg/s)
	mass flux in river at PM-13	M_r13 =	4,632.71	(mg/s)	53,100.63	(mg/s)	323,489.12	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	19.000	(mg/L)	13.374	(mg/l)	13.036	(mg/l)
	concentration in river at PM-13	C_r13 =	26.104	(mg/L)	20.246	(mg/l)	13.227	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 1
Parameter	Cadmium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000117453	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0003	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.03	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.14	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.00	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)	0.04	(mg/s)	0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.05	(mg/s)	0.27	(mg/s)	2.02	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 1
Parameter	Chloride

Input concentration data	concentration of surface water into PM-12	C_s12 =	10	(mg/L)
	concentration of surface water into PM-13	C_s13 =	10	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	10	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.89E+01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.8	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	3,568.63	(mg/s)	40,514	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)	43.81	(mg/s)	43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	93.39	(mg/s)	93.39	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	17,412.99	(mg/s)	198,816	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	214.46	(mg/s)	214.46	(mg/s)	214.46	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	335.09	(mg/s)	335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	183.09	(mg/s)	1,700.65	(mg/s)	1,700.65	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	51.97	(mg/s)	51.97	(mg/s)	51.97	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	522.40	(mg/s)	4,852.27	(mg/s)	4,852.27	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	43.81	(mg/s)	3,705.83	(mg/s)	40,651.48	(mg/s)
	mass flux in river at PM-13	M_r13 =	1,015.74	(mg/s)	28,273.26	(mg/s)	246,621.91	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.800	(mg/L)	9.489	(mg/L)	9.951	(mg/L)
	concentration in river at PM-13	C_r13 =	5.723	(mg/L)	10.780	(mg/L)	10.084	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 1
Parameter	Cobalt

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001174401	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0011	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.21	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.04	(mg/s)	12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.13	(mg/s)	0.13	(mg/s)	0.13	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)	0.11	(mg/s)	0.11	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.04	(mg/s)	0.35	(mg/s)	0.35	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)	0.25	(mg/s)	2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.21	(mg/s)	1.91	(mg/s)	15.01	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)	0.001	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 1
Parameter	Copper

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.005888719	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.004	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.54	(mg/s)	6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	2.61	(mg/s)	30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.48	(mg/s)	0.48	(mg/s)	0.48	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.19	(mg/s)	0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.06	(mg/s)	0.53	(mg/s)	0.53	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.11	(mg/s)	1.03	(mg/s)	1.03	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.10	(mg/s)	0.65	(mg/s)	6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.74	(mg/s)	5.49	(mg/s)	38.24	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.004	(mg/L)	0.002	(mg/L)	0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.004	(mg/L)	0.002	(mg/L)	0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 1
Parameter	Fluoride

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	4.57E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.385	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		35.69	(mg/s)		405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)		9.37	(mg/s)		9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.93	(mg/s)		0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		174.13	(mg/s)		1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	45.87	(mg/s)		45.87	(mg/s)		45.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		7.04	(mg/s)		7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	44.38	(mg/s)		412.18	(mg/s)		412.18	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.08	(mg/s)		0.08	(mg/s)		0.08	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	37.59	(mg/s)		349.17	(mg/s)		349.17	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	9.37	(mg/s)		45.99	(mg/s)		415.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	137.29	(mg/s)		1,034.46	(mg/s)		3,217.94	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.385	(mg/L)		0.118	(mg/L)		0.102	(mg/L)
	concentration in river at PM-13	C_r13 =	0.774	(mg/L)		0.394	(mg/L)		0.132	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 1
Parameter	Iron

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	4.00E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.035	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	1,034.90	(mg/s)	11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)	0.85	(mg/s)	0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	27.08	(mg/s)	27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	5,049.77	(mg/s)	57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	4.17	(mg/s)	4.17	(mg/s)	4.17	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	2.13	(mg/s)	2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.04	(mg/s)	0.36	(mg/s)	0.36	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	111.42	(mg/s)	1,034.88	(mg/s)	1,034.88	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.85	(mg/s)	1,062.84	(mg/s)	11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	116.49	(mg/s)	7,154.16	(mg/s)	70,475.26	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.035	(mg/L)	2.721	(mg/L)	2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	0.656	(mg/L)	2.728	(mg/L)	2.882	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 1**
Parameter	**Hardness**

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	3.15E+02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8.61E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	87.5	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		24,980.41	(mg/s)		283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)		2,129.58	(mg/s)		2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		653.73	(mg/s)		653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		121,890.93	(mg/s)		1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	10,425.01	(mg/s)		10,425.01	(mg/s)		10,425.01	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		53,090.84	(mg/s)		53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3,057.32	(mg/s)		28,397.48	(mg/s)		28,397.48	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	254.25	(mg/s)		254.25	(mg/s)		254.25	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	10,588.73	(mg/s)		98,352.01	(mg/s)		98,352.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,129.58	(mg/s)		27,763.72	(mg/s)		286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	26,454.88	(mg/s)		340,174.23	(mg/s)		1,868,614.78	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	87.500	(mg/L)		71.091	(mg/L)		70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	149.066	(mg/L)		129.701	(mg/L)		76.402	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 1
Parameter	Potassium

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	9.15	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.60	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,320.39	(mg/s)		14,990	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)		38.94	(mg/s)		38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.05	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,442.81	(mg/s)		73,562	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	190.63	(mg/s)		190.63	(mg/s)		190.63	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		34.55	(mg/s)		34.55	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		3,029.85	(mg/s)		3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	88.87	(mg/s)		825.45	(mg/s)		825.45	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	188.44	(mg/s)		1,750.33	(mg/s)		1,750.33	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	38.99	(mg/s)		1,359.39	(mg/s)		15,029.28	(mg/s)
	mass flux in river at PM-13	M_r13 =	506.94	(mg/s)		13,633.01	(mg/s)		94,422.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.602	(mg/L)		3.481	(mg/L)		3.679	(mg/l)
	concentration in river at PM-13	C_r13 =	2.856	(mg/L)		5.198	(mg/L)		3.861	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 1
Parameter	Magnesium

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	48.72	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	10.65	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	2,141.18	(mg/s)	24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)	259.20	(mg/s)	259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	56.03	(mg/s)	56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	10,447.79	(mg/s)	119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,268.87	(mg/s)	1,268.87	(mg/s)	1,268.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	15,261.91	(mg/s)	15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	472.92	(mg/s)	4,392.66	(mg/s)	4,392.66	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	6.29	(mg/s)	6.29	(mg/s)	6.29	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,696.96	(mg/s)	15,762.00	(mg/s)	15,762.00	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	259.20	(mg/s)	2,456.41	(mg/s)	24,623.80	(mg/s)
	mass flux in river at PM-13	M_r13 =	3,704.25	(mg/s)	49,595.94	(mg/s)	180,605.13	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	10.650	(mg/L)	6.290	(mg/l)	6.028	(mg/l)
	concentration in river at PM-13	C_r13 =	20.872	(mg/L)	18.910	(mg/l)	7.384	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 1**
Parameter	**Manganese**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.29	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.19	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		107.06	(mg/s)		1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)		4.58	(mg/s)		4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		2.80	(mg/s)		2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		522.39	(mg/s)		5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	22.40	(mg/s)		22.40	(mg/s)		22.40	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		27.31	(mg/s)		27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2.81	(mg/s)		26.10	(mg/s)		26.10	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	28.69	(mg/s)		266.49	(mg/s)		266.49	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	4.58	(mg/s)		114.44	(mg/s)		1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	58.48	(mg/s)		979.13	(mg/s)		7,529.59	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.188	(mg/L)		0.293	(mg/l)		0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.329	(mg/L)		0.373	(mg/l)		0.308	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 1
Parameter	Sodium

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.50	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.50	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.50	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	66.13	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	4.90	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	1,249.02	(mg/s)	14,180	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)	119.26	(mg/s)	119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	32.69	(mg/s)	32.69	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	6,094.55	(mg/s)	69,586	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	583.80	(mg/s)	583.80	(mg/s)	583.80	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	6,729.88	(mg/s)	6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	641.91	(mg/s)	5,962.27	(mg/s)	5,962.27	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	7.53	(mg/s)	7.53	(mg/s)	7.53	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,074.64	(mg/s)	9,981.63	(mg/s)	9,981.63	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	119.26	(mg/s)	1,400.96	(mg/s)	14,331.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	2,427.13	(mg/s)	30,760.62	(mg/s)	107,182.65	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	4.900	(mg/L)	3.587	(mg/l)	3.508	(mg/l)
	concentration in river at PM-13	C_r13 =	13.676	(mg/L)	11.728	(mg/l)	4.382	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 1
Parameter	Nickel

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.009513833	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.007	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.43	(mg/s)	5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)	0.17	(mg/s)	0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	2.09	(mg/s)	24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.83	(mg/s)	0.83	(mg/s)	0.83	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.29	(mg/s)	0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.09	(mg/s)	0.86	(mg/s)	0.86	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.17	(mg/s)	1.55	(mg/s)	1.55	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.17	(mg/s)	0.61	(mg/s)	5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.27	(mg/s)	6.24	(mg/s)	32.44	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.007	(mg/L)	0.002	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.007	(mg/L)	0.002	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 1
Parameter	Lead

Input concentration data	concentration of surface water into PM-12	C_s12 =	0	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000585798	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0012	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.14	(mg/s)		0.14	(mg/s)		0.14	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.03	(mg/s)		0.27	(mg/s)		0.27	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.21	(mg/s)		0.51	(mg/s)		0.51	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 1
Parameter	Antimony

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	4.83E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.50E-03	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.01	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.03	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.18	(mg/s)	0.18	(mg/s)	0.18	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.05	(mg/s)	0.44	(mg/s)	0.44	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)	0.06	(mg/s)	0.06	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)	0.04	(mg/s)	0.12	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.27	(mg/s)	0.76	(mg/s)	1.20	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 1
Parameter	Selenium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000967892	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00295	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.11	(mg/s)	1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.52	(mg/s)	6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.35	(mg/s)	0.35	(mg/s)	0.35	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.09	(mg/s)	0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)	0.09	(mg/s)	0.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.03	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.18	(mg/s)	1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.46	(mg/s)	1.48	(mg/s)	8.03	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.003	(mg/L)	0.001	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 1
Parameter	Sulfate

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	142.79	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	8.50	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,427.45	(mg/s)		16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)		206.87	(mg/s)		206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		37.36	(mg/s)		37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,965.20	(mg/s)		79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,012.72	(mg/s)		1,012.72	(mg/s)		1,012.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		58,922.60	(mg/s)		58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,386.13	(mg/s)		12,874.84	(mg/s)		12,874.84	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	216.95	(mg/s)		216.95	(mg/s)		216.95	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,696.11	(mg/s)		34,330.84	(mg/s)		34,330.84	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	206.87	(mg/s)		1,671.68	(mg/s)		16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	6,518.78	(mg/s)		115,994.83	(mg/s)		203,334.29	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	8.500	(mg/L)		4.280	(mg/l)		4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	36.732	(mg/L)		44.226	(mg/l)		8.314	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 1**
Parameter	**Thallium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00096816	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000004	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.35	(mg/s)		4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.07	(mg/s)		0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.01	(mg/s)		0.59	(mg/s)		4.96	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 1**
Parameter	**Zinc**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.009842772	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0115	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5.71	(mg/s)		65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)		0.28	(mg/s)		0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		27.86	(mg/s)		318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1.37	(mg/s)		1.37	(mg/s)		1.37	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.10	(mg/s)		0.89	(mg/s)		0.89	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.35	(mg/s)		3.23	(mg/s)		3.23	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.28	(mg/s)		6.14	(mg/s)		65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	2.09	(mg/s)		39.66	(mg/s)		389.02	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.012	(mg/L)		0.016	(mg/L)		0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.012	(mg/L)		0.015	(mg/L)		0.016	(mg/L)

Appendix F.2
Embarrass River
Proposed Action
Year 5

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

FLOWS

Case Flows	Year 5 Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	0.86	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	6.28	(cfs)	PM-13
	flow check	Q_ck_L =	6.28	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.00	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.00	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	0.41	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.01	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	0.79	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Year 5 Average Flow Conditions (mean annual)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12
	flow in river at PM-13	Q_r13_M =	93.61	(cfs)	PM-13
	flow check	Q_ck_M =	93.61	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	4.10	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.01	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_M =	7.96	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13

Case Flow	Year 5 High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	865.16	(cfs)	PM-13
	flow check	Q_ck_H =	865.16	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	4.10	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.01	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	7.96	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 5
Parameter	Silver

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00090	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000008	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.04	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.19	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)	0.02	(mg/s)	0.02	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)	0.04	(mg/s)	0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.01	(mg/s)	0.37	(mg/s)	2.77	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 5
Parameter	Aluminum

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	9.61E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.025	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	35.69	(mg/s)	405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)	0.61	(mg/s)	0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.93	(mg/s)	0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	174.13	(mg/s)	1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.98	(mg/s)	2.98	(mg/s)	2.98	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.75	(mg/s)	0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.11	(mg/s)	11.16	(mg/s)	11.16	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.08	(mg/s)	0.08	(mg/s)	0.08	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	35.38	(mg/s)	355.65	(mg/s)	355.65	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.61	(mg/s)	37.23	(mg/s)	406.69	(mg/s)
	mass flux in river at PM-13	M_r13 =	40.15	(mg/s)	581.97	(mg/s)	2,765.46	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.025	(mg/L)	0.095	(mg/L)	0.100	(mg/L)
	concentration in river at PM-13	C_r13 =	0.226	(mg/L)	0.220	(mg/L)	0.113	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Arsenic**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.006775027	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00273	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.27	(mg/s)		3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1.31	(mg/s)		15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.33	(mg/s)		0.33	(mg/s)		0.33	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.08	(mg/s)		0.79	(mg/s)		0.79	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.07	(mg/s)		0.65	(mg/s)		0.65	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)		0.34	(mg/s)		3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.54	(mg/s)		3.49	(mg/s)		19.87	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)		0.001	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.003	(mg/L)		0.001	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Boron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.135355742	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0212	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		4.28	(mg/s)		49	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)		0.52	(mg/s)		0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.11	(mg/s)		0.11	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		20.90	(mg/s)		239	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.53	(mg/s)		2.53	(mg/s)		2.53	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		7.41	(mg/s)		7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.56	(mg/s)		15.72	(mg/s)		15.72	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.05	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	7.40	(mg/s)		74.34	(mg/s)		74.34	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.52	(mg/s)		4.91	(mg/s)		49.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	12.05	(mg/s)		125.84	(mg/s)		387.86	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.021	(mg/L)		0.013	(mg/L)		0.012	(mg/L)
	concentration in river at PM-13	C_r13 =	0.068	(mg/L)		0.048	(mg/L)		0.016	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 5
Parameter	Barium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.03E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0681	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	3.93	(mg/s)	45	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)	1.66	(mg/s)	1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	19.15	(mg/s)	219	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	8.11	(mg/s)	8.11	(mg/s)	8.11	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.58	(mg/s)	5.84	(mg/s)	5.84	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	2.08	(mg/s)	20.95	(mg/s)	20.95	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.66	(mg/s)	5.69	(mg/s)	46.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	12.44	(mg/s)	59.99	(mg/s)	300.17	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.068	(mg/L)	0.015	(mg/L)	0.011	(mg/L)
	concentration in river at PM-13	C_r13 =	0.070	(mg/L)	0.023	(mg/L)	0.012	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 5
Parameter	Beryllium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000454842	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000023	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.17	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.03	(mg/s)		0.44	(mg/s)		2.62	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 5
Parameter	Calcium

Input concentration data	concentration of surface water into PM-12	C_s12 =	13	(mg/L)
	concentration of surface water into PM-13	C_s13 =	13	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	13	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	55.55427025	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	19	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	4,639.22	(mg/s)	52,669	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)	462.42	(mg/s)	462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	121.41	(mg/s)	121.41	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	22,636.89	(mg/s)	258,461	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2,263.72	(mg/s)	2,263.72	(mg/s)	2,263.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	5,369.83	(mg/s)	5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	641.67	(mg/s)	6,450.21	(mg/s)	6,450.21	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	176.59	(mg/s)	176.59	(mg/s)	176.59	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,339.65	(mg/s)	13,466.52	(mg/s)	25.38	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	462.42	(mg/s)	5,223.05	(mg/s)	53,252.39	(mg/s)
	mass flux in river at PM-13	M_r13 =	4,884.05	(mg/s)	55,586.80	(mg/s)	325,998.90	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	19.000	(mg/L)	13.374	(mg/l)	13.036	(mg/l)
	concentration in river at PM-13	C_r13 =	27.459	(mg/L)	20.983	(mg/l)	13.315	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 5
Parameter	Cadmium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000238486	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0003	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.03	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.14	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.00	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)	0.04	(mg/s)	0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.05	(mg/s)	0.29	(mg/s)	2.03	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Chloride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	10	(mg/L)
	concentration of surface water into PM-13	C_s13 =	10	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	10	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.07E+01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.8	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	3,568.63	(mg/s)	40,514	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)	43.81	(mg/s)	43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	93.39	(mg/s)	93.39	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	17,412.99	(mg/s)	198,816	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	214.46	(mg/s)	214.46	(mg/s)	214.46	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	335.09	(mg/s)	335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	123.84	(mg/s)	1,244.90	(mg/s)	1,244.90	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	747.10	(mg/s)	747.10	(mg/s)	747.10	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	482.71	(mg/s)	4,852.27	(mg/s)	4,852.27	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	43.81	(mg/s)	3,705.83	(mg/s)	40,651.48	(mg/s)
	mass flux in river at PM-13	M_r13 =	1,611.91	(mg/s)	28,512.64	(mg/s)	246,861.29	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.800	(mg/L)	9.489	(mg/L)	9.951	(mg/L)
	concentration in river at PM-13	C_r13 =	9.063	(mg/L)	10.763	(mg/L)	10.083	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 5
Parameter	Cobalt

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00200513	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0011	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.21	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.04	(mg/s)	12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.13	(mg/s)	0.13	(mg/s)	0.13	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)	0.23	(mg/s)	0.23	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.03	(mg/s)	0.35	(mg/s)	0.35	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)	0.25	(mg/s)	2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.22	(mg/s)	2.04	(mg/s)	15.14	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)	0.001	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 5
Parameter	Copper

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.007797191	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.004	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.54	(mg/s)	6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	2.61	(mg/s)	30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.48	(mg/s)	0.48	(mg/s)	0.48	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.19	(mg/s)	0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.09	(mg/s)	0.91	(mg/s)	0.91	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.10	(mg/s)	1.03	(mg/s)	1.03	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.10	(mg/s)	0.65	(mg/s)	6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.77	(mg/s)	5.86	(mg/s)	38.61	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.004	(mg/L)	0.002	(mg/L)	0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.004	(mg/L)	0.002	(mg/L)	0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Fluoride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	2.25E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.385	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		35.69	(mg/s)		405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)		9.37	(mg/s)		9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.93	(mg/s)		0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		174.13	(mg/s)		1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	45.87	(mg/s)		45.87	(mg/s)		45.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		7.04	(mg/s)		7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	25.95	(mg/s)		260.89	(mg/s)		260.89	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	1.21	(mg/s)		1.21	(mg/s)		1.21	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	34.74	(mg/s)		349.17	(mg/s)		349.17	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	9.37	(mg/s)		45.99	(mg/s)		415.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	117.14	(mg/s)		884.30	(mg/s)		3,067.79	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.385	(mg/L)		0.118	(mg/L)		0.102	(mg/L)
	concentration in river at PM-13	C_r13 =	0.659	(mg/L)		0.334	(mg/L)		0.125	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 5
Parameter	Iron

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.96E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.035	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,034.90	(mg/s)		11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)		0.85	(mg/s)		0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		27.08	(mg/s)		27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		5,049.77	(mg/s)		57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	4.17	(mg/s)		4.17	(mg/s)		4.17	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		2.13	(mg/s)		2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.69	(mg/s)		6.92	(mg/s)		6.92	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.17	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	102.95	(mg/s)		1,034.88	(mg/s)		1,034.88	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.85	(mg/s)		1,062.84	(mg/s)		11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	108.83	(mg/s)		7,160.87	(mg/s)		70,481.98	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.035	(mg/L)		2.721	(mg/L)		2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	0.612	(mg/L)		2.703	(mg/L)		2.879	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Hardness**

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	2.61E+02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8.61E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	87.5	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		24,980.41	(mg/s)		283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)		2,129.58	(mg/s)		2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		653.73	(mg/s)		653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		121,890.93	(mg/s)		1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	10,425.01	(mg/s)		10,425.01	(mg/s)		10,425.01	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		53,090.84	(mg/s)		53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3,017.90	(mg/s)		30,336.71	(mg/s)		30,336.71	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	3,654.83	(mg/s)		3,654.83	(mg/s)		3,654.83	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	9,784.08	(mg/s)		98,352.01	(mg/s)		98,352.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,129.58	(mg/s)		27,763.72	(mg/s)		286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	29,011.40	(mg/s)		345,514.05	(mg/s)		1,873,954.60	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	87.500	(mg/L)		71.091	(mg/L)		70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	163.109	(mg/L)		130.427	(mg/L)		76.538	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Potassium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	7.67	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.60	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,320.39	(mg/s)		14,990	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)		38.94	(mg/s)		38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.76	(mg/s)		0.76	(mg/s)		0.76	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,442.81	(mg/s)		73,562	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	190.63	(mg/s)		190.63	(mg/s)		190.63	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		34.55	(mg/s)		34.55	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		3,029.85	(mg/s)		3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	88.61	(mg/s)		890.78	(mg/s)		890.78	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	174.12	(mg/s)		1,750.33	(mg/s)		1,750.33	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	39.70	(mg/s)		1,360.10	(mg/s)		15,029.99	(mg/s)
	mass flux in river at PM-13	M_r13 =	493.07	(mg/s)		13,699.05	(mg/s)		94,488.05	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.631	(mg/L)		3.483	(mg/L)		3.679	(mg/l)
	concentration in river at PM-13	C_r13 =	2.772	(mg/L)		5.171	(mg/L)		3.859	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 5
Parameter	Magnesium

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	29.76	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	10.65	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,141.18	(mg/s)		24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)		259.20	(mg/s)		259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		56.03	(mg/s)		56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,447.79	(mg/s)		119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,268.87	(mg/s)		1,268.87	(mg/s)		1,268.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		15,261.91	(mg/s)		15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	343.77	(mg/s)		3,455.69	(mg/s)		3,455.69	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	90.42	(mg/s)		90.42	(mg/s)		90.42	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,568.01	(mg/s)		15,762.00	(mg/s)		15,762.00	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	259.20	(mg/s)		2,456.41	(mg/s)		24,623.80	(mg/s)
	mass flux in river at PM-13	M_r13 =	3,530.27	(mg/s)		48,743.09	(mg/s)		179,752.28	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	10.650	(mg/L)		6.290	(mg/l)		6.028	(mg/l)
	concentration in river at PM-13	C_r13 =	19.848	(mg/L)		18.400	(mg/l)		7.342	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 5
Parameter	Manganese

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.31	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.19	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	107.06	(mg/s)	1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)	4.58	(mg/s)	4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	2.80	(mg/s)	2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	522.39	(mg/s)	5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	22.40	(mg/s)	22.40	(mg/s)	22.40	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	27.31	(mg/s)	27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3.58	(mg/s)	36.00	(mg/s)	36.00	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	26.51	(mg/s)	266.49	(mg/s)	266.49	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	4.58	(mg/s)	114.44	(mg/s)	1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	57.07	(mg/s)	989.03	(mg/s)	7,539.49	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.188	(mg/L)	0.293	(mg/l)	0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.321	(mg/L)	0.373	(mg/l)	0.308	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 5
Parameter	Sodium

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.50	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.50	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.50	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	34.82	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	4.90	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	1,249.02	(mg/s)	14,180	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)	119.26	(mg/s)	119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	32.69	(mg/s)	32.69	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	6,094.55	(mg/s)	69,586	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	583.80	(mg/s)	583.80	(mg/s)	583.80	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	6,729.88	(mg/s)	6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	402.15	(mg/s)	4,042.46	(mg/s)	4,042.46	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	108.24	(mg/s)	108.24	(mg/s)	108.24	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	992.97	(mg/s)	9,981.63	(mg/s)	9,981.63	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	119.26	(mg/s)	1,400.96	(mg/s)	14,331.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	2,206.42	(mg/s)	28,941.52	(mg/s)	105,363.55	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	4.900	(mg/L)	3.587	(mg/l)	3.508	(mg/l)
	concentration in river at PM-13	C_r13 =	12.405	(mg/L)	10.925	(mg/l)	4.303	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Nickel**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.029814715	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.007	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.43	(mg/s)		5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.09	(mg/s)		24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.83	(mg/s)		0.83	(mg/s)		0.83	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.29	(mg/s)		0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.34	(mg/s)		3.46	(mg/s)		3.46	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.15	(mg/s)		1.55	(mg/s)		1.55	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.17	(mg/s)		0.61	(mg/s)		5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.54	(mg/s)		8.88	(mg/s)		35.08	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.007	(mg/L)		0.002	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.009	(mg/L)		0.003	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 5
Parameter	Lead

Input concentration data	concentration of surface water into PM-12	C_s12 =	0	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000769203	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0012	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.14	(mg/s)	0.14	(mg/s)	0.14	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.02	(mg/s)	0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)	0.09	(mg/s)	0.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.03	(mg/s)	0.27	(mg/s)	0.27	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.21	(mg/s)	0.55	(mg/s)	0.55	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 5
Parameter	Antimony

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.47E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.50E-03	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.01	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.03	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.18	(mg/s)	0.18	(mg/s)	0.18	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.07	(mg/s)	0.75	(mg/s)	0.75	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)	0.06	(mg/s)	0.06	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)	0.04	(mg/s)	0.12	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.30	(mg/s)	1.08	(mg/s)	1.52	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 5
Parameter	Selenium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001159434	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00295	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.11	(mg/s)	1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.52	(mg/s)	6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.35	(mg/s)	0.35	(mg/s)	0.35	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.09	(mg/s)	0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)	0.13	(mg/s)	0.13	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.02	(mg/s)	0.02	(mg/s)	0.02	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.18	(mg/s)	1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.48	(mg/s)	1.55	(mg/s)	8.10	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.003	(mg/L)	0.001	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 5
Parameter	Sulfate

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	140.42	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	8.50	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	1,427.45	(mg/s)	16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)	206.87	(mg/s)	206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	37.36	(mg/s)	37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	6,965.20	(mg/s)	79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,012.72	(mg/s)	1,012.72	(mg/s)	1,012.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	58,922.60	(mg/s)	58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,621.93	(mg/s)	16,304.02	(mg/s)	16,304.02	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	3,118.71	(mg/s)	3,118.71	(mg/s)	3,118.71	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,415.24	(mg/s)	34,330.84	(mg/s)	34,330.84	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	206.87	(mg/s)	1,671.68	(mg/s)	16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	9,375.46	(mg/s)	122,325.77	(mg/s)	209,665.23	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	8.500	(mg/L)	4.280	(mg/l)	4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	52.711	(mg/L)	46.176	(mg/l)	8.563	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Thallium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000906999	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000004	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.35	(mg/s)		4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.11	(mg/s)		0.11	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.07	(mg/s)		0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.02	(mg/s)		0.61	(mg/s)		4.97	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Zinc**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.017646569	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0115	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5.71	(mg/s)		65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)		0.28	(mg/s)		0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		27.86	(mg/s)		318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1.37	(mg/s)		1.37	(mg/s)		1.37	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.20	(mg/s)		2.05	(mg/s)		2.05	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.32	(mg/s)		3.23	(mg/s)		3.23	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.28	(mg/s)		6.14	(mg/s)		65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	2.18	(mg/s)		40.82	(mg/s)		390.18	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.012	(mg/L)		0.016	(mg/L)		0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.012	(mg/L)		0.015	(mg/L)		0.016	(mg/L)

Appendix F.3
Embarrass River
Proposed Action
Year 8

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

FLOWS

Case Flows	Year 8 Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	0.86	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	6.28	(cfs)	PM-13
	flow check	Q_ck_L =	6.28	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.00	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.00	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	0.45	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.01	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	0.75	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Year 8 Average Flow Conditions (mean annual)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12
	flow in river at PM-13	Q_r13_M =	94.29	(cfs)	PM-13
	flow check	Q_ck_M =	94.29	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	4.79	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.01	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_M =	7.96	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13

Case Flow	Year 8 High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	865.84	(cfs)	PM-13
	flow check	Q_ck_H =	865.84	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	4.79	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.01	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	7.96	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 8
Parameter	Silver

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00089	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000008	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.19	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.12	(mg/s)		0.12	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.01	(mg/s)		0.38	(mg/s)		2.79	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 8
Parameter	Aluminum

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.01E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.025	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	35.69	(mg/s)	405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)	0.61	(mg/s)	0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.93	(mg/s)	0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	174.13	(mg/s)	1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.98	(mg/s)	2.98	(mg/s)	2.98	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.75	(mg/s)	0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.28	(mg/s)	13.63	(mg/s)	13.63	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.06	(mg/s)	0.06	(mg/s)	0.06	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	33.47	(mg/s)	355.65	(mg/s)	355.65	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.61	(mg/s)	37.23	(mg/s)	406.69	(mg/s)
	mass flux in river at PM-13	M_r13 =	38.40	(mg/s)	584.42	(mg/s)	2,767.91	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.025	(mg/L)	0.095	(mg/L)	0.100	(mg/L)
	concentration in river at PM-13	C_r13 =	0.216	(mg/L)	0.219	(mg/L)	0.113	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Arsenic**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.007035766	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00273	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.27	(mg/s)	3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.31	(mg/s)	15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.33	(mg/s)	0.33	(mg/s)	0.33	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.09	(mg/s)	0.95	(mg/s)	0.95	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.06	(mg/s)	0.65	(mg/s)	0.65	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.34	(mg/s)	3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.54	(mg/s)	3.66	(mg/s)	20.03	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.003	(mg/L)	0.001	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 8
Parameter	Boron

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.140897597	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0212	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	4.28	(mg/s)	49	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)	0.52	(mg/s)	0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.11	(mg/s)	0.11	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	20.90	(mg/s)	239	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.53	(mg/s)	2.53	(mg/s)	2.53	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	7.41	(mg/s)	7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.80	(mg/s)	19.10	(mg/s)	19.10	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	7.00	(mg/s)	74.34	(mg/s)	74.34	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.52	(mg/s)	4.91	(mg/s)	49.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	11.87	(mg/s)	129.21	(mg/s)	391.23	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.021	(mg/L)	0.013	(mg/L)	0.012	(mg/L)
	concentration in river at PM-13	C_r13 =	0.067	(mg/L)	0.048	(mg/L)	0.016	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 8
Parameter	Barium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.04E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0681	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	3.93	(mg/s)	45	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)	1.66	(mg/s)	1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	19.15	(mg/s)	219	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	8.11	(mg/s)	8.11	(mg/s)	8.11	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.64	(mg/s)	6.84	(mg/s)	6.84	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1.97	(mg/s)	20.95	(mg/s)	20.95	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.66	(mg/s)	5.69	(mg/s)	46.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	12.39	(mg/s)	60.98	(mg/s)	301.17	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.068	(mg/L)	0.015	(mg/L)	0.011	(mg/L)
	concentration in river at PM-13	C_r13 =	0.070	(mg/L)	0.023	(mg/L)	0.012	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 8
Parameter	Beryllium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000543459	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000023	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.17	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.03	(mg/s)		0.46	(mg/s)		2.65	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Calcium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	13	(mg/L)
	concentration of surface water into PM-13	C_s13 =	13	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	13	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	72.53696661	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	19	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		4,639.22	(mg/s)		52,669	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)		462.42	(mg/s)		462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		121.41	(mg/s)		121.41	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		22,636.89	(mg/s)		258,461	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2,263.72	(mg/s)		2,263.72	(mg/s)		2,263.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		5,369.83	(mg/s)		5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	925.47	(mg/s)		9,833.30	(mg/s)		9,833.30	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	132.27	(mg/s)		132.27	(mg/s)		132.27	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,267.42	(mg/s)		13,466.52	(mg/s)		19.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	462.42	(mg/s)		5,223.05	(mg/s)		53,252.39	(mg/s)
	mass flux in river at PM-13	M_r13 =	5,051.30	(mg/s)		58,925.58	(mg/s)		329,331.31	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	19.000	(mg/L)		13.374	(mg/l)		13.036	(mg/l)
	concentration in river at PM-13	C_r13 =	28.417	(mg/L)		22.082	(mg/l)		13.440	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Cadmium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000383404	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0003	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.03	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.14	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.00	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)		0.04	(mg/s)		0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.05	(mg/s)		0.31	(mg/s)		2.06	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 8
Parameter	Chloride

Input concentration data	concentration of surface water into PM-12	C_s12 =	10	(mg/L)
	concentration of surface water into PM-13	C_s13 =	10	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	10	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.07E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.8	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		3,568.63	(mg/s)		40,514	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)		43.81	(mg/s)		43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		93.39	(mg/s)		93.39	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		17,412.99	(mg/s)		198,816	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	214.46	(mg/s)		214.46	(mg/s)		214.46	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		335.09	(mg/s)		335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	77.48	(mg/s)		823.25	(mg/s)		823.25	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	559.62	(mg/s)		559.62	(mg/s)		559.62	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	456.68	(mg/s)		4,852.27	(mg/s)		4,852.27	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	43.81	(mg/s)		3,705.83	(mg/s)		40,651.48	(mg/s)
	mass flux in river at PM-13	M_r13 =	1,352.05	(mg/s)		27,903.51	(mg/s)		246,252.16	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.800	(mg/L)		9.489	(mg/L)		9.951	(mg/L)
	concentration in river at PM-13	C_r13 =	7.606	(mg/L)		10.457	(mg/L)		10.050	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 8
Parameter	Cobalt

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.002321539	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0011	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.21	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.04	(mg/s)	12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.13	(mg/s)	0.13	(mg/s)	0.13	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.03	(mg/s)	0.31	(mg/s)	0.31	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.03	(mg/s)	0.35	(mg/s)	0.35	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)	0.25	(mg/s)	2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.22	(mg/s)	2.12	(mg/s)	15.22	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)	0.001	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 8
Parameter	Copper

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00854201	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.004	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.54	(mg/s)	6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	2.61	(mg/s)	30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.48	(mg/s)	0.48	(mg/s)	0.48	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.19	(mg/s)	0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.11	(mg/s)	1.16	(mg/s)	1.16	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.10	(mg/s)	1.03	(mg/s)	1.03	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.10	(mg/s)	0.65	(mg/s)	6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.78	(mg/s)	6.11	(mg/s)	38.87	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.004	(mg/L)	0.002	(mg/L)	0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.004	(mg/L)	0.002	(mg/L)	0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Fluoride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	7.89E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.385	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		35.69	(mg/s)		405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)		9.37	(mg/s)		9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.93	(mg/s)		0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		174.13	(mg/s)		1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	45.87	(mg/s)		45.87	(mg/s)		45.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		7.04	(mg/s)		7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	10.06	(mg/s)		106.94	(mg/s)		106.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.91	(mg/s)		0.91	(mg/s)		0.91	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	32.86	(mg/s)		349.17	(mg/s)		349.17	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	9.37	(mg/s)		45.99	(mg/s)		415.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	99.07	(mg/s)		730.04	(mg/s)		2,913.52	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.385	(mg/L)		0.118	(mg/L)		0.102	(mg/L)
	concentration in river at PM-13	C_r13 =	0.557	(mg/L)		0.274	(mg/L)		0.119	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Iron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.80E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.035	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,034.90	(mg/s)		11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)		0.85	(mg/s)		0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		27.08	(mg/s)		27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		5,049.77	(mg/s)		57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	4.17	(mg/s)		4.17	(mg/s)		4.17	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		2.13	(mg/s)		2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.74	(mg/s)		7.86	(mg/s)		7.86	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.13	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	97.40	(mg/s)		1,034.88	(mg/s)		1,034.88	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.85	(mg/s)		1,062.84	(mg/s)		11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	103.29	(mg/s)		7,161.77	(mg/s)		70,482.88	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.035	(mg/L)		2.721	(mg/L)		2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	0.581	(mg/L)		2.684	(mg/L)		2.876	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 8
Parameter	Hardness

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	2.52E+02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8.61E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	87.5	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		24,980.41	(mg/s)		283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)		2,129.58	(mg/s)		2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		653.73	(mg/s)		653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		121,890.93	(mg/s)		1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	10,425.01	(mg/s)		10,425.01	(mg/s)		10,425.01	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		53,090.84	(mg/s)		53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3,221.47	(mg/s)		34,228.62	(mg/s)		34,228.62	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	2,737.70	(mg/s)		2,737.70	(mg/s)		2,737.70	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	9,256.51	(mg/s)		98,352.01	(mg/s)		98,352.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,129.58	(mg/s)		27,763.72	(mg/s)		286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	27,770.27	(mg/s)		348,488.83	(mg/s)		1,876,929.38	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	87.500	(mg/L)		71.091	(mg/L)		70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	156.224	(mg/L)		130.596	(mg/L)		76.599	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Potassium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.73	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.60	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,320.39	(mg/s)		14,990	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)		38.94	(mg/s)		38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.57	(mg/s)		0.57	(mg/s)		0.57	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,442.81	(mg/s)		73,562	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	190.63	(mg/s)		190.63	(mg/s)		190.63	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		34.55	(mg/s)		34.55	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		3,029.85	(mg/s)		3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	85.90	(mg/s)		912.75	(mg/s)		912.75	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	164.73	(mg/s)		1,750.33	(mg/s)		1,750.33	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	39.51	(mg/s)		1,359.91	(mg/s)		15,029.80	(mg/s)
	mass flux in river at PM-13	M_r13 =	480.78	(mg/s)		13,720.83	(mg/s)		94,509.83	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.624	(mg/L)		3.482	(mg/L)		3.679	(mg/l)
	concentration in river at PM-13	C_r13 =	2.705	(mg/L)		5.142	(mg/L)		3.857	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Magnesium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	17.33	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	10.65	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,141.18	(mg/s)		24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)		259.20	(mg/s)		259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		56.03	(mg/s)		56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,447.79	(mg/s)		119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,268.87	(mg/s)		1,268.87	(mg/s)		1,268.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		15,261.91	(mg/s)		15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	221.12	(mg/s)		2,349.41	(mg/s)		2,349.41	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	67.73	(mg/s)		67.73	(mg/s)		67.73	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,483.46	(mg/s)		15,762.00	(mg/s)		15,762.00	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	259.20	(mg/s)		2,456.41	(mg/s)		24,623.80	(mg/s)
	mass flux in river at PM-13	M_r13 =	3,300.38	(mg/s)		47,614.12	(mg/s)		178,623.31	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	10.650	(mg/L)		6.290	(mg/l)		6.028	(mg/l)
	concentration in river at PM-13	C_r13 =	18.567	(mg/L)		17.843	(mg/l)		7.290	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 8
Parameter	Manganese

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.30	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.19	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	107.06	(mg/s)	1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)	4.58	(mg/s)	4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	2.80	(mg/s)	2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	522.39	(mg/s)	5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	22.40	(mg/s)	22.40	(mg/s)	22.40	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	27.31	(mg/s)	27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3.79	(mg/s)	40.29	(mg/s)	40.29	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	25.08	(mg/s)	266.49	(mg/s)	266.49	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	4.58	(mg/s)	114.44	(mg/s)	1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	55.85	(mg/s)	993.32	(mg/s)	7,543.78	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.188	(mg/L)	0.293	(mg/l)	0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.314	(mg/L)	0.372	(mg/l)	0.308	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 8
Parameter	Sodium

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.50	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.50	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.50	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	18.93	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	4.90	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,249.02	(mg/s)		14,180	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)		119.26	(mg/s)		119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		32.69	(mg/s)		32.69	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,094.55	(mg/s)		69,586	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	583.80	(mg/s)		583.80	(mg/s)		583.80	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		6,729.88	(mg/s)		6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	241.52	(mg/s)		2,566.23	(mg/s)		2,566.23	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	81.08	(mg/s)		81.08	(mg/s)		81.08	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	939.43	(mg/s)		9,981.63	(mg/s)		9,981.63	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	119.26	(mg/s)		1,400.96	(mg/s)		14,331.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	1,965.10	(mg/s)		27,438.13	(mg/s)		103,860.16	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	4.900	(mg/L)		3.587	(mg/l)		3.508	(mg/l)
	concentration in river at PM-13	C_r13 =	11.055	(mg/L)		10.282	(mg/l)		4.239	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Nickel**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.038551821	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.007	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.43	(mg/s)		5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.09	(mg/s)		24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.83	(mg/s)		0.83	(mg/s)		0.83	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.29	(mg/s)		0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.49	(mg/s)		5.23	(mg/s)		5.23	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.15	(mg/s)		1.55	(mg/s)		1.55	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.17	(mg/s)		0.61	(mg/s)		5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.67	(mg/s)		10.63	(mg/s)		36.84	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.007	(mg/L)		0.002	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.009	(mg/L)		0.004	(mg/L)		0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 8
Parameter	Lead

Input concentration data	concentration of surface water into PM-12	C_s12 =	0	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001239552	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0012	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.14	(mg/s)		0.14	(mg/s)		0.14	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.03	(mg/s)		0.27	(mg/s)		0.27	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.21	(mg/s)		0.63	(mg/s)		0.63	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Antimony**

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	8.28E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.50E-03	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.01	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.03	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.18	(mg/s)	0.18	(mg/s)	0.18	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.11	(mg/s)	1.12	(mg/s)	1.12	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)	0.06	(mg/s)	0.06	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)	0.04	(mg/s)	0.12	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.33	(mg/s)	1.45	(mg/s)	1.89	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)	0.001	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 8
Parameter	Selenium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001331851	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00295	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.11	(mg/s)	1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.52	(mg/s)	6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.35	(mg/s)	0.35	(mg/s)	0.35	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.09	(mg/s)	0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)	0.18	(mg/s)	0.18	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.02	(mg/s)	0.02	(mg/s)	0.02	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.18	(mg/s)	1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.48	(mg/s)	1.59	(mg/s)	8.14	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.003	(mg/L)	0.001	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 8
Parameter	Sulfate

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	153.28	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	8.50	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	1,427.45	(mg/s)	16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)	206.87	(mg/s)	206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	37.36	(mg/s)	37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	6,965.20	(mg/s)	79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,012.72	(mg/s)	1,012.72	(mg/s)	1,012.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	58,922.60	(mg/s)	58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,955.65	(mg/s)	20,779.12	(mg/s)	20,779.12	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	2,336.11	(mg/s)	2,336.11	(mg/s)	2,336.11	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,231.09	(mg/s)	34,330.84	(mg/s)	34,330.84	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	206.87	(mg/s)	1,671.68	(mg/s)	16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	8,742.44	(mg/s)	126,018.27	(mg/s)	213,357.73	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	8.500	(mg/L)	4.280	(mg/l)	4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	49.181	(mg/L)	47.225	(mg/l)	8.707	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Thallium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000934618	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000004	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.35	(mg/s)		4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.07	(mg/s)		0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.02	(mg/s)		0.63	(mg/s)		4.99	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Zinc**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.029073121	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0115	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	5.71	(mg/s)	65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)	0.28	(mg/s)	0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.15	(mg/s)	0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	27.86	(mg/s)	318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1.37	(mg/s)	1.37	(mg/s)	1.37	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.17	(mg/s)	0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.37	(mg/s)	3.94	(mg/s)	3.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.30	(mg/s)	3.23	(mg/s)	3.23	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.28	(mg/s)	6.14	(mg/s)	65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	2.33	(mg/s)	42.72	(mg/s)	392.07	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.012	(mg/L)	0.016	(mg/L)	0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.013	(mg/L)	0.016	(mg/L)	0.016	(mg/L)

Appendix F.4
Embarrass River
Proposed Action
Year 9

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

FLOWS

Case Flows	Year 9 Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	0.86	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	6.28	(cfs)	PM-13
	flow check	Q_ck_L =	6.28	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.00	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.00	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	0.48	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.01	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	0.72	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Year 9 Average Flow Conditions (mean annual)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12
	flow in river at PM-13	Q_r13_M =	94.76	(cfs)	PM-13
	flow check	Q_ck_M =	94.76	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	5.26	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.01	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_M =	7.96	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13

Case Flow	Year 9 High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	866.31	(cfs)	PM-13
	flow check	Q_ck_H =	866.31	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	5.26	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.01	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	7.96	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 9
Parameter	Silver

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00090	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000008	(mg/L)

			Low Flow						High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)					0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)					0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)					0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)					2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)					0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)					0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)					0.13	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)					0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)					0.02	(mg/s)
			Low Flow						High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)					0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.02	(mg/s)					2.80	(mg/s)
			Low Flow						High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)					0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)					0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Aluminum**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.07E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.025	(mg/L)

			Low Flow						High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)					405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)					0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)					0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)					1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.98	(mg/s)					2.98	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)					0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.44	(mg/s)					15.88	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.07	(mg/s)					0.07	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	32.29	(mg/s)					355.65	(mg/s)
			Low Flow						**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.61	(mg/s)					406.69	(mg/s)
	mass flux in river at PM-13	M_r13 =	37.38	(mg/s)					2,770.18	(mg/s)
			Low Flow						**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.025	(mg/L)					0.100	(mg/L)
	concentration in river at PM-13	C_r13 =	0.210	(mg/L)					0.113	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 9
Parameter	Arsenic

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.007592467	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00273	(mg/L)

			Low Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)		0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.33	(mg/s)		0.33	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.10	(mg/s)		1.13	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.06	(mg/s)		0.65	(mg/s)
			Low Flow			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)		3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.56	(mg/s)		20.21	(mg/s)
			Low Flow			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.003	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 9
Parameter	Boron

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.145082047	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0212	(mg/L)

			Low Flow						High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)					49	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)					0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)					0.11	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)					239	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.53	(mg/s)					2.53	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)					7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.96	(mg/s)					21.59	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.04	(mg/s)					0.04	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	6.75	(mg/s)					74.34	(mg/s)
			Low Flow						High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.52	(mg/s)					49.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	11.79	(mg/s)					393.72	(mg/s)
			Low Flow						High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.021	(mg/L)					0.012	(mg/L)
	concentration in river at PM-13	C_r13 =	0.066	(mg/L)					0.016	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Barium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.05E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0681	(mg/L)

			Low Flow						High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)					45	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)					1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)					0.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)					219	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	8.11	(mg/s)					8.11	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)					0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.68	(mg/s)					7.51	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)					0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1.90	(mg/s)					20.95	(mg/s)
			Low Flow						**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.66	(mg/s)					46.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	12.36	(mg/s)					301.85	(mg/s)
			Low Flow						**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.068	(mg/L)					0.011	(mg/L)
	concentration in river at PM-13	C_r13 =	0.069	(mg/L)					0.012	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Beryllium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00056357	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000023	(mg/L)

			Low Flow						High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)					0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)					0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)					0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)					2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)					0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)					0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)					0.08	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)					-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)					0.17	(mg/s)
			Low Flow						**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)					0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.03	(mg/s)					2.66	(mg/s)
			Low Flow						**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)					0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)					0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 9
Parameter	Calcium

Input concentration data	concentration of surface water into PM-12	C_s12 =	13	(mg/L)
	concentration of surface water into PM-13	C_s13 =	13	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	13	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	75.53238205	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	19	(mg/L)

			Low Flow						High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)					52,669	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)					462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)					121.41	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)					258,461	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2,263.72	(mg/s)					2,263.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)					5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,020.37	(mg/s)					11,239.50	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	156.22	(mg/s)					156.22	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,222.55	(mg/s)					22.45	(mg/s)
			Low Flow						High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	462.42	(mg/s)					53,252.39	(mg/s)
	mass flux in river at PM-13	M_r13 =	5,125.29	(mg/s)					330,764.89	(mg/s)
			Low Flow						High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	19.000	(mg/L)					13.036	(mg/l)
	concentration in river at PM-13	C_r13 =	28.823	(mg/L)					13.491	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Cadmium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000407879	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0003	(mg/L)

			Low Flow						High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)					0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)					0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)					0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)					2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.04	(mg/s)					0.04	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)					0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)					0.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)					0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)					0.04	(mg/s)
			Low Flow						**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)					0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.05	(mg/s)					2.07	(mg/s)
			Low Flow						**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)					0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)					0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 9
Parameter	Chloride

Input concentration data	concentration of surface water into PM-12	C_s12 =	10	(mg/L)
	concentration of surface water into PM-13	C_s13 =	10	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	10	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.89E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.8	(mg/L)

			Low Flow						High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)					40,514	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)					43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)					93.39	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)					198,816	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	214.46	(mg/s)					214.46	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)					335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	79.55	(mg/s)					876.22	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	660.93	(mg/s)					660.93	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	440.51	(mg/s)					4,852.27	(mg/s)
			Low Flow						High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	43.81	(mg/s)					40,651.48	(mg/s)
	mass flux in river at PM-13	M_r13 =	1,439.26	(mg/s)					246,406.43	(mg/s)
			Low Flow						High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.800	(mg/L)					9.951	(mg/L)
	concentration in river at PM-13	C_r13 =	8.094	(mg/L)					10.051	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Cobalt**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.002481389	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0011	(mg/L)

			Low Flow						High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)					2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)					0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)					0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)					12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.13	(mg/s)					0.13	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)					0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.03	(mg/s)					0.37	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)					0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.03	(mg/s)					0.35	(mg/s)
			Low Flow						**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)					2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.23	(mg/s)					15.28	(mg/s)
			Low Flow						**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)					0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)					0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Copper**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.008625606	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.004	(mg/L)

			Low Flow						**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)					6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)					0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)					0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)					30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.48	(mg/s)					0.48	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)					0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.12	(mg/s)					1.28	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)					0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.09	(mg/s)					1.03	(mg/s)
			Low Flow						**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.10	(mg/s)					6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.78	(mg/s)					38.99	(mg/s)
			Low Flow						**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.004	(mg/L)					0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.004	(mg/L)					0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Fluoride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.91E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.385	(mg/L)

			Low Flow						High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)					405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)					9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)					0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)					1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	45.87	(mg/s)					45.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)					7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	9.34	(mg/s)					102.84	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	1.07	(mg/s)					1.07	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	31.70	(mg/s)					349.17	(mg/s)
			Low Flow						**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	9.37	(mg/s)					415.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	97.35	(mg/s)					2,909.59	(mg/s)
			Low Flow						**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.385	(mg/L)					0.102	(mg/L)
	concentration in river at PM-13	C_r13 =	0.547	(mg/L)					0.119	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Iron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.91E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.035	(mg/L)

			Low Flow						**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)					11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)					0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)					27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)					57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	4.17	(mg/s)					4.17	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)					2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.80	(mg/s)					8.80	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.15	(mg/s)					0.15	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	93.95	(mg/s)					1,034.88	(mg/s)
			Low Flow						**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.85	(mg/s)					11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	99.92	(mg/s)					70,483.84	(mg/s)
			Low Flow						**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.035	(mg/L)					2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	0.562	(mg/L)					2.875	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Hardness**

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	2.56E+02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8.61E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	87.5	(mg/L)

			Low Flow						High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)					283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)					2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)					653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)					1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	10,425.01	(mg/s)					10,425.01	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)					53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3,453.69	(mg/s)					38,042.63	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	3,233.31	(mg/s)					3,233.31	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	8,928.86	(mg/s)					98,352.01	(mg/s)
			Low Flow						**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,129.58	(mg/s)					286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	28,170.45	(mg/s)					1,881,239.00	(mg/s)
			Low Flow						**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	87.500	(mg/L)					70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	158.424	(mg/L)					76.733	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 9
Parameter	Potassium

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	7.04	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.60	(mg/L)

			Low Flow						High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)					14,990	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)					38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.68	(mg/s)					0.68	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)					73,562	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	190.63	(mg/s)					190.63	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)					34.55	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)					3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	95.16	(mg/s)					1,048.24	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	158.90	(mg/s)					1,750.33	(mg/s)
			Low Flow						High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	39.62	(mg/s)					15,029.90	(mg/s)
	mass flux in river at PM-13	M_r13 =	484.31	(mg/s)					94,645.42	(mg/s)
			Low Flow						High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.628	(mg/L)					3.679	(mg/l)
	concentration in river at PM-13	C_r13 =	2.724	(mg/L)					3.860	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Magnesium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	16.28	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	10.65	(mg/L)

			Low Flow						High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)					24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)					259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)					56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)					119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,268.87	(mg/s)					1,268.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)					15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	219.96	(mg/s)					2,422.93	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	79.99	(mg/s)					79.99	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,430.95	(mg/s)					15,762.00	(mg/s)
			Low Flow						**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	259.20	(mg/s)					24,623.80	(mg/s)
	mass flux in river at PM-13	M_r13 =	3,258.97	(mg/s)					178,709.09	(mg/s)
			Low Flow						**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	10.650	(mg/L)					6.028	(mg/l)
	concentration in river at PM-13	C_r13 =	18.328	(mg/L)					7.289	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Manganese**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.29	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.19	(mg/L)

			Low Flow						High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)					1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)					4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)					2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)					5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	22.40	(mg/s)					22.40	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)					27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3.90	(mg/s)					42.96	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)					0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	24.19	(mg/s)					266.49	(mg/s)
			Low Flow						**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	4.58	(mg/s)					1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	55.07	(mg/s)					7,546.45	(mg/s)
			Low Flow						**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.188	(mg/L)					0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.310	(mg/L)					0.308	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Sodium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.50	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.50	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.50	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	22.11	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	4.90	(mg/L)

			Low Flow						**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)					14,180	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)					119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)					32.69	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)					69,586	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	583.80	(mg/s)					583.80	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)					6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	298.66	(mg/s)					3,289.71	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	95.76	(mg/s)					95.76	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	906.18	(mg/s)					9,981.63	(mg/s)
			Low Flow						**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	119.26	(mg/s)					14,331.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	2,003.65	(mg/s)					104,598.32	(mg/s)
			Low Flow						**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	4.900	(mg/L)					3.508	(mg/l)
	concentration in river at PM-13	C_r13 =	11.268	(mg/L)					4.266	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Nickel**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.041162911	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.007	(mg/L)

			Low Flow						**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)					5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)					0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)					0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)					24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.83	(mg/s)					0.83	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)					0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.56	(mg/s)					6.13	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.04	(mg/s)					0.04	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.14	(mg/s)					1.55	(mg/s)
			Low Flow						**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.17	(mg/s)					5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.74	(mg/s)					37.74	(mg/s)
			Low Flow						**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.007	(mg/L)					0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.010	(mg/L)					0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 9
Parameter	Lead

Input concentration data	concentration of surface water into PM-12	C_s12 =	0	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001749429	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0012	(mg/L)

			Low Flow						High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)					-	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)					0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)					-	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)					-	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.14	(mg/s)					0.14	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)					0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)					0.26	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)					0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)					0.27	(mg/s)
			Low Flow						High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)					0.03	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.22	(mg/s)					0.72	(mg/s)
			Low Flow						High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)					0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)					0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Antimony**

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	8.83E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.50E-03	(mg/L)

			Low Flow						High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)					0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)					0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)					0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)					0	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.18	(mg/s)					0.18	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)					0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.12	(mg/s)					1.31	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)					0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)					0.06	(mg/s)
			Low Flow						**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)					0.12	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.34	(mg/s)					2.08	(mg/s)
			Low Flow						**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)					0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)					0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Selenium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001403839	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00295	(mg/L)

			Low Flow						High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)					1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)					0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)					0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)					6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.35	(mg/s)					0.35	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)					0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)					0.21	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.02	(mg/s)					0.02	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)					0.25	(mg/s)
			Low Flow						**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)					1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.48	(mg/s)					8.17	(mg/s)
			Low Flow						**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)					0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.003	(mg/L)					0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Sulfate**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	166.62	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	8.50	(mg/L)

			Low Flow						**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)					16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)					206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)					37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)					79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,012.72	(mg/s)					1,012.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)					58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2,250.82	(mg/s)					24,792.97	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	2,759.02	(mg/s)					2,759.02	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,116.72	(mg/s)					34,330.84	(mg/s)
			Low Flow						**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	206.87	(mg/s)					16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	9,346.14	(mg/s)					217,794.48	(mg/s)
			Low Flow						**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	8.500	(mg/L)					4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	52.561	(mg/L)					8.884	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Thallium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000967503	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000004	(mg/L)

			Low Flow						High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)					1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)					0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)					0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)					4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)					0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)					0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)					0.14	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)					0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)					0.05	(mg/s)
			Low Flow						**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)					0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.02	(mg/s)					5.01	(mg/s)
			Low Flow						**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)					0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)					0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Zinc**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.039738069	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0115	(mg/L)

			Low Flow						High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)					65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)					0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)					0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)					318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1.37	(mg/s)					1.37	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)					0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.54	(mg/s)					5.91	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)					0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.29	(mg/s)					3.23	(mg/s)
			Low Flow						**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.28	(mg/s)					65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	2.48	(mg/s)					394.05	(mg/s)
			Low Flow						**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.012	(mg/L)					0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.014	(mg/L)					0.016	(mg/L)

Appendix F.5
Embarrass River
Proposed Action
Year 15

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

FLOWS

Case Flows	Year 15 Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	0.86	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	6.29	(cfs)	PM-13
	flow check	Q_ck_L =	6.29	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.00	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.00	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	0.50	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.02	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	0.70	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Year 15 Average Flow Conditions (mean annual)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12
	flow in river at PM-13	Q_r13_M =	95.15	(cfs)	PM-13
	flow check	Q_ck_M =	95.15	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	5.65	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.02	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_M =	7.96	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13

Case Flow	Year 15 High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	866.70	(cfs)	PM-13
	flow check	Q_ck_H =	866.70	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	5.65	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.02	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	7.96	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Silver**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00122	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000000	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.19	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)		0.19	(mg/s)		0.19	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.02	(mg/s)		0.46	(mg/s)		2.86	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Aluminum**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	4.43E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		35.69	(mg/s)		405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)		0.61	(mg/s)		0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.93	(mg/s)		0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		174.13	(mg/s)		1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.75	(mg/s)		0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	6.25	(mg/s)		70.86	(mg/s)		70.86	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.09	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	31.37	(mg/s)		355.65	(mg/s)		355.65	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.61	(mg/s)		37.23	(mg/s)		406.69	(mg/s)
	mass flux in river at PM-13	M_r13 =	38.31	(mg/s)		638.71	(mg/s)		2,822.19	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.025	(mg/L)		0.095	(mg/L)		0.100	(mg/L)
	concentration in river at PM-13	C_r13 =	0.215	(mg/L)		0.237	(mg/L)		0.115	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Arsenic**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.015514819	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.27	(mg/s)		3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1.31	(mg/s)		15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.22	(mg/s)		2.48	(mg/s)		2.48	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.06	(mg/s)		0.65	(mg/s)		0.65	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)		0.34	(mg/s)		3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.34	(mg/s)		4.86	(mg/s)		21.23	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)		0.001	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)		0.002	(mg/L)		0.001	(mg/L)

1.99
5.646967273

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Boron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.173169588	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		4.28	(mg/s)		49	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)		0.52	(mg/s)		0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.11	(mg/s)		0.11	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		20.90	(mg/s)		239	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		7.41	(mg/s)		7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2.44	(mg/s)		27.67	(mg/s)		27.67	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.05	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	6.56	(mg/s)		74.34	(mg/s)		74.34	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.52	(mg/s)		4.91	(mg/s)		49.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	9.57	(mg/s)		135.28	(mg/s)		397.30	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.021	(mg/L)		0.013	(mg/L)		0.012	(mg/L)
	concentration in river at PM-13	C_r13 =	0.054	(mg/L)		0.050	(mg/L)		0.016	(mg/L)

1.99
5.646967273

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 15
Parameter	Barium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.35E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		3.93	(mg/s)		45	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)		1.66	(mg/s)		1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.10	(mg/s)		0.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		19.15	(mg/s)		219	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.25	(mg/s)		0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.89	(mg/s)		10.14	(mg/s)		10.14	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1.85	(mg/s)		20.95	(mg/s)		20.95	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.66	(mg/s)		5.69	(mg/s)		46.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	4.40	(mg/s)		56.18	(mg/s)		296.36	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.068	(mg/L)		0.015	(mg/L)		0.011	(mg/L)
	concentration in river at PM-13	C_r13 =	0.025	(mg/L)		0.021	(mg/L)		0.012	(mg/L)

1.99
5.646967273

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Beryllium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001410903	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.17	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)		0.23	(mg/s)		0.23	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.04	(mg/s)		0.61	(mg/s)		2.79	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 15
Parameter	Calcium

Input concentration data	concentration of surface water into PM-12	C_s12 =	13	(mg/L)
	concentration of surface water into PM-13	C_s13 =	13	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	13	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	95.38057957	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		4,639.22	(mg/s)		52,669	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)		462.42	(mg/s)		462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		121.41	(mg/s)		121.41	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		22,636.89	(mg/s)		258,461	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		5,369.83	(mg/s)		5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,344.25	(mg/s)		15,242.69	(mg/s)		15,242.69	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	205.46	(mg/s)		205.46	(mg/s)		205.46	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,187.61	(mg/s)		13,466.52	(mg/s)		29.52	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	462.42	(mg/s)		5,223.05	(mg/s)		53,252.39	(mg/s)
	mass flux in river at PM-13	M_r13 =	3,199.75	(mg/s)		62,144.43	(mg/s)		332,560.68	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	19.000	(mg/L)		13.374	(mg/l)		13.036	(mg/l)
	concentration in river at PM-13	C_r13 =	17.983	(mg/L)		23.077	(mg/l)		13.559	(mg/l)

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Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 15
Parameter	Cadmium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000705708	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.03	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.14	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.11	(mg/s)		0.11	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)		0.04	(mg/s)		0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.02	(mg/s)		0.34	(mg/s)		2.08	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 15
Parameter	Chloride

Input concentration data	concentration of surface water into PM-12	C_s12 =	10	(mg/L)
	concentration of surface water into PM-13	C_s13 =	10	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	10	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	7.60E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	3,568.63	(mg/s)	40,514	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)	43.81	(mg/s)	43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	93.39	(mg/s)	93.39	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	17,412.99	(mg/s)	198,816	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	335.09	(mg/s)	335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	107.17	(mg/s)	1,215.25	(mg/s)	1,215.25	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	869.24	(mg/s)	869.24	(mg/s)	869.24	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	427.92	(mg/s)	4,852.27	(mg/s)	4,852.27	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	43.81	(mg/s)	3,705.83	(mg/s)	40,651.48	(mg/s)
	mass flux in river at PM-13	M_r13 =	1,448.15	(mg/s)	28,390.67	(mg/s)	246,739.32	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.800	(mg/L)	9.489	(mg/L)	9.951	(mg/L)
	concentration in river at PM-13	C_r13 =	8.139	(mg/L)	10.543	(mg/L)	10.060	(mg/L)

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Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Cobalt**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.008661931	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.21	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1.04	(mg/s)		12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.12	(mg/s)		1.38	(mg/s)		1.38	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.03	(mg/s)		0.35	(mg/s)		0.35	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.25	(mg/s)		2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.18	(mg/s)		3.06	(mg/s)		16.16	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.001	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.001	(mg/L)		0.001	(mg/L)

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Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Copper**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.020766721	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.54	(mg/s)		6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)		0.10	(mg/s)		0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.61	(mg/s)		30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.19	(mg/s)		0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.29	(mg/s)		3.32	(mg/s)		3.32	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.09	(mg/s)		1.03	(mg/s)		1.03	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.10	(mg/s)		0.65	(mg/s)		6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.48	(mg/s)		7.80	(mg/s)		40.55	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.004	(mg/L)		0.002	(mg/L)		0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.003	(mg/L)		0.003	(mg/L)		0.002	(mg/L)

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Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Fluoride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	8.26E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		35.69	(mg/s)		405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)		9.37	(mg/s)		9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.93	(mg/s)		0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		174.13	(mg/s)		1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		7.04	(mg/s)		7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	11.65	(mg/s)		132.08	(mg/s)		132.08	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	1.41	(mg/s)		1.41	(mg/s)		1.41	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	30.79	(mg/s)		349.17	(mg/s)		349.17	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	9.37	(mg/s)		45.99	(mg/s)		415.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	53.22	(mg/s)		709.81	(mg/s)		2,893.30	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.385	(mg/L)		0.118	(mg/L)		0.102	(mg/L)
	concentration in river at PM-13	C_r13 =	0.299	(mg/L)		0.264	(mg/L)		0.118	(mg/L)

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Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Iron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	9.82E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,034.90	(mg/s)		11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)		0.85	(mg/s)		0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		27.08	(mg/s)		27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		5,049.77	(mg/s)		57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		2.13	(mg/s)		2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.38	(mg/s)		15.69	(mg/s)		15.69	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.20	(mg/s)		0.20	(mg/s)		0.20	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	91.27	(mg/s)		1,034.88	(mg/s)		1,034.88	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.85	(mg/s)		1,062.84	(mg/s)		11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	93.70	(mg/s)		7,165.50	(mg/s)		70,486.61	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.035	(mg/L)		2.721	(mg/L)		2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	0.527	(mg/L)		2.661	(mg/L)		2.874	(mg/L)

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Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 15
Parameter	Hardness

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	3.20E+02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8.61E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		24,980.41	(mg/s)		283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)		2,129.58	(mg/s)		2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		653.73	(mg/s)		653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		121,890.93	(mg/s)		1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		53,090.84	(mg/s)		53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	4,507.05	(mg/s)		51,106.04	(mg/s)		51,106.04	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	4,252.38	(mg/s)		4,252.38	(mg/s)		4,252.38	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	8,673.67	(mg/s)		98,352.01	(mg/s)		98,352.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,129.58	(mg/s)		27,763.72	(mg/s)		286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	19,562.68	(mg/s)		356,455.91	(mg/s)		1,884,896.46	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	87.500	(mg/L)		71.091	(mg/L)		70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	109.943	(mg/L)		132.370	(mg/L)		76.848	(mg/L)

1.99
5.646967273

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Potassium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	14.58	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,320.39	(mg/s)		14,990	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)		38.94	(mg/s)		38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.89	(mg/s)		0.89	(mg/s)		0.89	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,442.81	(mg/s)		73,562	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		34.55	(mg/s)		34.55	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		3,029.85	(mg/s)		3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	205.50	(mg/s)		2,330.24	(mg/s)		2,330.24	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	154.36	(mg/s)		1,750.33	(mg/s)		1,750.33	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	39.83	(mg/s)		1,360.22	(mg/s)		15,030.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	399.70	(mg/s)		14,948.01	(mg/s)		95,737.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.637	(mg/L)		3.483	(mg/L)		3.679	(mg/l)
	concentration in river at PM-13	C_r13 =	2.246	(mg/L)		5.551	(mg/L)		3.903	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Magnesium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	19.82	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,141.18	(mg/s)		24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)		259.20	(mg/s)		259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		56.03	(mg/s)		56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,447.79	(mg/s)		119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		15,261.91	(mg/s)		15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	279.37	(mg/s)		3,167.81	(mg/s)		3,167.81	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	105.20	(mg/s)		105.20	(mg/s)		105.20	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,390.05	(mg/s)		15,762.00	(mg/s)		15,762.00	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	259.20	(mg/s)		2,456.41	(mg/s)		24,623.80	(mg/s)
	mass flux in river at PM-13	M_r13 =	2,033.82	(mg/s)		47,201.12	(mg/s)		178,210.31	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	10.650	(mg/L)		6.290	(mg/l)		6.028	(mg/l)
	concentration in river at PM-13	C_r13 =	11.430	(mg/L)		17.528	(mg/l)		7.266	(mg/l)

1.99
5.646967273

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Manganese**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.43	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		107.06	(mg/s)		1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)		4.58	(mg/s)		4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		2.80	(mg/s)		2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		522.39	(mg/s)		5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		27.31	(mg/s)		27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	6.09	(mg/s)		69.10	(mg/s)		69.10	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	23.50	(mg/s)		266.49	(mg/s)		266.49	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	4.58	(mg/s)		114.44	(mg/s)		1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	34.17	(mg/s)		999.74	(mg/s)		7,550.19	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.188	(mg/L)		0.293	(mg/l)		0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.192	(mg/L)		0.371	(mg/l)		0.308	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Sodium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.50	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.50	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.50	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	22.52	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,249.02	(mg/s)		14,180	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)		119.26	(mg/s)		119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		32.69	(mg/s)		32.69	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,094.55	(mg/s)		69,586	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		6,729.88	(mg/s)		6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	317.45	(mg/s)		3,599.56	(mg/s)		3,599.56	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	125.94	(mg/s)		125.94	(mg/s)		125.94	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	880.28	(mg/s)		9,981.63	(mg/s)		9,981.63	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	119.26	(mg/s)		1,400.96	(mg/s)		14,331.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	1,442.92	(mg/s)		27,932.52	(mg/s)		104,354.55	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	4.900	(mg/L)		3.587	(mg/l)		3.508	(mg/l)
	concentration in river at PM-13	C_r13 =	8.109	(mg/L)		10.373	(mg/l)		4.255	(mg/l)

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5.646967273

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Nickel**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.153655831	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.43	(mg/s)		5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.09	(mg/s)		24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.29	(mg/s)		0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2.17	(mg/s)		24.56	(mg/s)		24.56	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.05	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.14	(mg/s)		1.55	(mg/s)		1.55	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.17	(mg/s)		0.61	(mg/s)		5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	2.52	(mg/s)		29.15	(mg/s)		55.35	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.007	(mg/L)		0.002	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.014	(mg/L)		0.011	(mg/L)		0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Lead**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.002409879	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.03	(mg/s)		0.39	(mg/s)		0.39	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)		0.27	(mg/s)		0.27	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.09	(mg/s)		0.70	(mg/s)		0.70	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

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5.646967273

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Antimony**

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.13E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00E+00	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.01	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.03	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.16	(mg/s)		1.81	(mg/s)		1.81	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)		0.04	(mg/s)		0.12	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.20	(mg/s)		1.96	(mg/s)		2.40	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.001	(mg/L)		0.000	(mg/L)

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5.646967273

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Selenium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.002521801	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.11	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.52	(mg/s)		6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.04	(mg/s)		0.40	(mg/s)		0.40	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)		0.25	(mg/s)		0.25	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)		0.18	(mg/s)		1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.16	(mg/s)		1.47	(mg/s)		8.02	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.001	(mg/L)		0.000	(mg/L)

1.99
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Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Sulfate**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	241.92	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,427.45	(mg/s)		16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)		206.87	(mg/s)		206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		37.36	(mg/s)		37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,965.20	(mg/s)		79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		58,922.60	(mg/s)		58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3,409.53	(mg/s)		38,661.16	(mg/s)		38,661.16	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	3,628.60	(mg/s)		3,628.60	(mg/s)		3,628.60	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,027.64	(mg/s)		34,330.84	(mg/s)		34,330.84	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	206.87	(mg/s)		1,671.68	(mg/s)		16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	10,272.65	(mg/s)		144,180.08	(mg/s)		231,519.54	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	8.500	(mg/L)		4.280	(mg/l)		4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	57.733	(mg/L)		53.541	(mg/l)		9.439	(mg/l)

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Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Thallium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001193197	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.35	(mg/s)		4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)		0.19	(mg/s)		0.19	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.07	(mg/s)		0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.02	(mg/s)		0.69	(mg/s)		5.06	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Zinc**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.081197396	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	5.71	(mg/s)	65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)	0.28	(mg/s)	0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.15	(mg/s)	0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	27.86	(mg/s)	318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.17	(mg/s)	0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.14	(mg/s)	12.98	(mg/s)	12.98	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.29	(mg/s)	3.23	(mg/s)	3.23	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.28	(mg/s)	6.14	(mg/s)	65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.71	(mg/s)	50.38	(mg/s)	399.74	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.012	(mg/L)	0.016	(mg/L)	0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.010	(mg/L)	0.019	(mg/L)	0.016	(mg/L)

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Appendix F.6
Embarrass River
Proposed Action
Year 20

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

FLOWS

Case Flows	Year 20 Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	0.86	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	6.29	(cfs)	PM-13
	flow check	Q_ck_L =	6.29	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.00	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.00	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	0.51	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.02	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	0.69	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Year 20 Average Flow Conditions (mean annual)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12
	flow in river at PM-13	Q_r13_M =	95.48	(cfs)	PM-13
	flow check	Q_ck_M =	95.48	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	5.97	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.02	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_M =	7.96	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13

Case Flow	Year 20 High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	867.03	(cfs)	PM-13
	flow check	Q_ck_H =	867.03	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	5.97	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.02	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	7.96	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 20
Parameter	Silver

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00124	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000008	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.04	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.19	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)	0.21	(mg/s)	0.21	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)	0.02	(mg/s)	0.02	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)	0.04	(mg/s)	0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.02	(mg/s)	0.47	(mg/s)	2.88	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 20
Parameter	Aluminum

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	3.74E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.025	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		35.69	(mg/s)		405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)		0.61	(mg/s)		0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.93	(mg/s)		0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		174.13	(mg/s)		1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.98	(mg/s)		2.98	(mg/s)		2.98	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.75	(mg/s)		0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	5.44	(mg/s)		63.12	(mg/s)		63.12	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.10	(mg/s)		0.10	(mg/s)		0.10	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	30.64	(mg/s)		355.65	(mg/s)		355.65	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.61	(mg/s)		37.23	(mg/s)		406.69	(mg/s)
	mass flux in river at PM-13	M_r13 =	39.76	(mg/s)		633.96	(mg/s)		2,817.44	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.025	(mg/L)		0.095	(mg/L)		0.100	(mg/L)
	concentration in river at PM-13	C_r13 =	0.223	(mg/L)		0.235	(mg/L)		0.115	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 20
Parameter	Arsenic

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.014389887	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00273	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.27	(mg/s)	3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.31	(mg/s)	15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.33	(mg/s)	0.33	(mg/s)	0.33	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.21	(mg/s)	2.43	(mg/s)	2.43	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.06	(mg/s)	0.65	(mg/s)	0.65	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.34	(mg/s)	3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.66	(mg/s)	5.14	(mg/s)	21.51	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.004	(mg/L)	0.002	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Boron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.174123916	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0212	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		4.28	(mg/s)		49	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)		0.52	(mg/s)		0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.11	(mg/s)		0.11	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		20.90	(mg/s)		239	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.53	(mg/s)		2.53	(mg/s)		2.53	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		7.41	(mg/s)		7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2.53	(mg/s)		29.42	(mg/s)		29.42	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.06	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	6.40	(mg/s)		74.34	(mg/s)		74.34	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.52	(mg/s)		4.91	(mg/s)		49.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	12.04	(mg/s)		139.56	(mg/s)		401.58	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.021	(mg/L)		0.013	(mg/L)		0.012	(mg/L)
	concentration in river at PM-13	C_r13 =	0.068	(mg/L)		0.052	(mg/L)		0.016	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Barium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.60E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0681	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		3.93	(mg/s)		45	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)		1.66	(mg/s)		1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.10	(mg/s)		0.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		19.15	(mg/s)		219	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	8.11	(mg/s)		8.11	(mg/s)		8.11	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.25	(mg/s)		0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.96	(mg/s)		11.15	(mg/s)		11.15	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1.80	(mg/s)		20.95	(mg/s)		20.95	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.66	(mg/s)		5.69	(mg/s)		46.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	12.54	(mg/s)		65.30	(mg/s)		305.49	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.068	(mg/L)		0.015	(mg/L)		0.011	(mg/L)
	concentration in river at PM-13	C_r13 =	0.070	(mg/L)		0.024	(mg/L)		0.012	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 20
Parameter	Beryllium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00131326	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000023	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.17	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)		0.22	(mg/s)		0.22	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.04	(mg/s)		0.61	(mg/s)		2.79	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 20
Parameter	Calcium

Input concentration data	concentration of surface water into PM-12	C_s12 =	13	(mg/L)
	concentration of surface water into PM-13	C_s13 =	13	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	13	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	76.37590202	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	19	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	4,639.22	(mg/s)	52,669	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)	462.42	(mg/s)	462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	121.41	(mg/s)	121.41	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	22,636.89	(mg/s)	258,461	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2,263.72	(mg/s)	2,263.72	(mg/s)	2,263.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	5,369.83	(mg/s)	5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,111.71	(mg/s)	12,906.03	(mg/s)	12,906.03	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	227.25	(mg/s)	227.25	(mg/s)	227.25	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,159.99	(mg/s)	13,466.52	(mg/s)	32.66	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	462.42	(mg/s)	5,223.05	(mg/s)	53,252.39	(mg/s)
	mass flux in river at PM-13	M_r13 =	5,225.09	(mg/s)	62,093.28	(mg/s)	332,512.66	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	19.000	(mg/L)	13.374	(mg/l)	13.036	(mg/l)
	concentration in river at PM-13	C_r13 =	29.357	(mg/L)	22.980	(mg/l)	13.552	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Cadmium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000534314	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0003	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.03	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.14	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)		0.04	(mg/s)		0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.05	(mg/s)		0.35	(mg/s)		2.10	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 20
Parameter	Chloride

Input concentration data	concentration of surface water into PM-12	C_s12 =	10	(mg/L)
	concentration of surface water into PM-13	C_s13 =	10	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	10	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	7.66E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.8	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	3,568.63	(mg/s)	40,514	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)	43.81	(mg/s)	43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	93.39	(mg/s)	93.39	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	17,412.99	(mg/s)	198,816	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	214.46	(mg/s)	214.46	(mg/s)	214.46	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	335.09	(mg/s)	335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	111.46	(mg/s)	1,293.94	(mg/s)	1,293.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	961.45	(mg/s)	961.45	(mg/s)	961.45	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	417.97	(mg/s)	4,852.27	(mg/s)	4,852.27	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	43.81	(mg/s)	3,705.83	(mg/s)	40,651.48	(mg/s)
	mass flux in river at PM-13	M_r13 =	1,749.14	(mg/s)	28,776.03	(mg/s)	247,124.68	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.800	(mg/L)	9.489	(mg/L)	9.951	(mg/L)
	concentration in river at PM-13	C_r13 =	9.827	(mg/L)	10.650	(mg/L)	10.072	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 20
Parameter	Cobalt

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.007940593	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0011	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.21	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.04	(mg/s)	12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.13	(mg/s)	0.13	(mg/s)	0.13	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.12	(mg/s)	1.34	(mg/s)	1.34	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.03	(mg/s)	0.35	(mg/s)	0.35	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)	0.25	(mg/s)	2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.31	(mg/s)	3.15	(mg/s)	16.25	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)	0.001	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Copper**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.020208301	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.004	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.54	(mg/s)		6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)		0.10	(mg/s)		0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.61	(mg/s)		30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.48	(mg/s)		0.48	(mg/s)		0.48	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.19	(mg/s)		0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.29	(mg/s)		3.41	(mg/s)		3.41	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.09	(mg/s)		1.03	(mg/s)		1.03	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.10	(mg/s)		0.65	(mg/s)		6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.96	(mg/s)		8.37	(mg/s)		41.12	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.004	(mg/L)		0.002	(mg/L)		0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.005	(mg/L)		0.003	(mg/L)		0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Fluoride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	7.70E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.385	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		35.69	(mg/s)		405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)		9.37	(mg/s)		9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.93	(mg/s)		0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		174.13	(mg/s)		1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	45.87	(mg/s)		45.87	(mg/s)		45.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		7.04	(mg/s)		7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	11.21	(mg/s)		130.19	(mg/s)		130.19	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	1.56	(mg/s)		1.56	(mg/s)		1.56	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	30.08	(mg/s)		349.17	(mg/s)		349.17	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	9.37	(mg/s)		45.99	(mg/s)		415.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	98.09	(mg/s)		753.94	(mg/s)		2,937.43	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.385	(mg/L)		0.118	(mg/L)		0.102	(mg/L)
	concentration in river at PM-13	C_r13 =	0.551	(mg/L)		0.279	(mg/L)		0.120	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 20
Parameter	Iron

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	8.72E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.035	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,034.90	(mg/s)		11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)		0.85	(mg/s)		0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		27.08	(mg/s)		27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		5,049.77	(mg/s)		57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	4.17	(mg/s)		4.17	(mg/s)		4.17	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		2.13	(mg/s)		2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.27	(mg/s)		14.74	(mg/s)		14.74	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.22	(mg/s)		0.22	(mg/s)		0.22	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	89.14	(mg/s)		1,034.88	(mg/s)		1,034.88	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.85	(mg/s)		1,062.84	(mg/s)		11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	95.65	(mg/s)		7,168.74	(mg/s)		70,489.85	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.035	(mg/L)		2.721	(mg/L)		2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	0.537	(mg/L)		2.653	(mg/L)		2.873	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 20
Parameter	Hardness

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	2.71E+02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8.61E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	87.5	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		24,980.41	(mg/s)		283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)		2,129.58	(mg/s)		2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		653.73	(mg/s)		653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		121,890.93	(mg/s)		1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	10,425.01	(mg/s)		10,425.01	(mg/s)		10,425.01	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		53,090.84	(mg/s)		53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3,941.56	(mg/s)		45,758.38	(mg/s)		45,758.38	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	4,703.46	(mg/s)		4,703.46	(mg/s)		4,703.46	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	8,471.90	(mg/s)		98,352.01	(mg/s)		98,352.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,129.58	(mg/s)		27,763.72	(mg/s)		286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	29,671.51	(mg/s)		361,984.35	(mg/s)		1,890,424.90	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	87.500	(mg/L)		71.091	(mg/L)		70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	166.706	(mg/L)		133.964	(mg/L)		77.044	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 20
Parameter	Potassium

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	13.45	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.60	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,320.39	(mg/s)		14,990	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)		38.94	(mg/s)		38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.98	(mg/s)		0.98	(mg/s)		0.98	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,442.81	(mg/s)		73,562	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	190.63	(mg/s)		190.63	(mg/s)		190.63	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		34.55	(mg/s)		34.55	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		3,029.85	(mg/s)		3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	195.74	(mg/s)		2,272.35	(mg/s)		2,272.35	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	150.77	(mg/s)		1,750.33	(mg/s)		1,750.33	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	39.92	(mg/s)		1,360.32	(mg/s)		15,030.21	(mg/s)
	mass flux in river at PM-13	M_r13 =	577.06	(mg/s)		15,080.85	(mg/s)		95,869.85	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.640	(mg/L)		3.483	(mg/L)		3.679	(mg/l)
	concentration in river at PM-13	C_r13 =	3.242	(mg/L)		5.581	(mg/L)		3.907	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 20
Parameter	Magnesium

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	19.45	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	10.65	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,141.18	(mg/s)		24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)		259.20	(mg/s)		259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		56.03	(mg/s)		56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,447.79	(mg/s)		119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,268.87	(mg/s)		1,268.87	(mg/s)		1,268.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		15,261.91	(mg/s)		15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	283.06	(mg/s)		3,286.07	(mg/s)		3,286.07	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	116.36	(mg/s)		116.36	(mg/s)		116.36	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,357.72	(mg/s)		15,762.00	(mg/s)		15,762.00	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	259.20	(mg/s)		2,456.41	(mg/s)		24,623.80	(mg/s)
	mass flux in river at PM-13	M_r13 =	3,285.20	(mg/s)		48,599.41	(mg/s)		179,608.60	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	10.650	(mg/L)		6.290	(mg/l)		6.028	(mg/l)
	concentration in river at PM-13	C_r13 =	18.458	(mg/L)		17.986	(mg/l)		7.320	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 20
Parameter	Manganese

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.45	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.19	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	107.06	(mg/s)	1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)	4.58	(mg/s)	4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	2.80	(mg/s)	2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	522.39	(mg/s)	5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	22.40	(mg/s)	22.40	(mg/s)	22.40	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	27.31	(mg/s)	27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	6.56	(mg/s)	76.11	(mg/s)	76.11	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	22.96	(mg/s)	266.49	(mg/s)	266.49	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	4.58	(mg/s)	114.44	(mg/s)	1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	56.49	(mg/s)	1,029.15	(mg/s)	7,579.60	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.188	(mg/L)	0.293	(mg/l)	0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.317	(mg/L)	0.381	(mg/l)	0.309	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Sodium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.50	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.50	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.50	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	19.36	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	4.90	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,249.02	(mg/s)		14,180	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)		119.26	(mg/s)		119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		32.69	(mg/s)		32.69	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,094.55	(mg/s)		69,586	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	583.80	(mg/s)		583.80	(mg/s)		583.80	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		6,729.88	(mg/s)		6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	281.86	(mg/s)		3,272.20	(mg/s)		3,272.20	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	139.30	(mg/s)		139.30	(mg/s)		139.30	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	859.80	(mg/s)		9,981.63	(mg/s)		9,981.63	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	119.26	(mg/s)		1,400.96	(mg/s)		14,331.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	1,984.02	(mg/s)		28,202.32	(mg/s)		104,624.34	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	4.900	(mg/L)		3.587	(mg/l)		3.508	(mg/l)
	concentration in river at PM-13	C_r13 =	11.147	(mg/L)		10.437	(mg/l)		4.264	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Nickel**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.141786777	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.007	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.43	(mg/s)		5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.09	(mg/s)		24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.83	(mg/s)		0.83	(mg/s)		0.83	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.29	(mg/s)		0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2.06	(mg/s)		23.96	(mg/s)		23.96	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.05	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.13	(mg/s)		1.55	(mg/s)		1.55	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.17	(mg/s)		0.61	(mg/s)		5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	3.26	(mg/s)		29.39	(mg/s)		55.59	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.007	(mg/L)		0.002	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.018	(mg/L)		0.011	(mg/L)		0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 20
Parameter	Lead

Input concentration data	concentration of surface water into PM-12	C_s12 =	0	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001841737	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0012	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.14	(mg/s)		0.14	(mg/s)		0.14	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.03	(mg/s)		0.31	(mg/s)		0.31	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)		0.27	(mg/s)		0.27	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.22	(mg/s)		0.77	(mg/s)		0.77	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Antimony**

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.02E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.50E-03	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.01	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.03	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.18	(mg/s)	0.18	(mg/s)	0.18	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.15	(mg/s)	1.73	(mg/s)	1.73	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)	0.06	(mg/s)	0.06	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)	0.04	(mg/s)	0.12	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.37	(mg/s)	2.06	(mg/s)	2.50	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)	0.001	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 20
Parameter	Selenium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.002326015	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00295	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.11	(mg/s)	1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.52	(mg/s)	6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.35	(mg/s)	0.35	(mg/s)	0.35	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.09	(mg/s)	0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.03	(mg/s)	0.39	(mg/s)	0.39	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.18	(mg/s)	1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.51	(mg/s)	1.81	(mg/s)	8.36	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.003	(mg/L)	0.001	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 20
Parameter	Sulfate

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	211.97	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	8.50	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,427.45	(mg/s)		16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)		206.87	(mg/s)		206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		37.36	(mg/s)		37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,965.20	(mg/s)		79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,012.72	(mg/s)		1,012.72	(mg/s)		1,012.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		58,922.60	(mg/s)		58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3,085.44	(mg/s)		35,819.52	(mg/s)		35,819.52	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	4,013.51	(mg/s)		4,013.51	(mg/s)		4,013.51	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	2,957.21	(mg/s)		34,330.84	(mg/s)		34,330.84	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	206.87	(mg/s)		1,671.68	(mg/s)		16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	11,275.75	(mg/s)		142,736.07	(mg/s)		230,075.53	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	8.500	(mg/L)		4.280	(mg/l)		4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	63.351	(mg/L)		52.824	(mg/l)		9.377	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Thallium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001147722	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000004	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.35	(mg/s)		4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)		0.19	(mg/s)		0.19	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.07	(mg/s)		0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.02	(mg/s)		0.69	(mg/s)		5.06	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Zinc**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.061124366	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0115	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5.71	(mg/s)		65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)		0.28	(mg/s)		0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		27.86	(mg/s)		318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1.37	(mg/s)		1.37	(mg/s)		1.37	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.89	(mg/s)		10.33	(mg/s)		10.33	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.28	(mg/s)		3.23	(mg/s)		3.23	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.28	(mg/s)		6.14	(mg/s)		65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	2.82	(mg/s)		49.11	(mg/s)		398.46	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.012	(mg/L)		0.016	(mg/L)		0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.016	(mg/L)		0.018	(mg/L)		0.016	(mg/L)

Appendix F.7

Embarrass River

Proposed Action

Closure

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

FLOWS

Case Flows	Closure Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	0.86	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	6.27	(cfs)	PM-13
	flow check	Q_ck_L =	6.27	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.00	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.00	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	0.51	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	0.69	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Closure Average Flow Conditions (mean annual)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12
	flow in river at PM-13	Q_r13_M =	87.35	(cfs)	PM-13
	flow check	Q_ck_M =	87.35	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	2.45	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_M =	3.37	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13

Case Flow	Closure High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	858.90	(cfs)	PM-13
	flow check	Q_ck_H =	858.90	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	2.45	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	3.37	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Closure
Parameter	Silver

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00097	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000008	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.19	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.02	(mg/s)		0.32	(mg/s)		2.72	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Closure
Parameter	Aluminum

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.37E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.025	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	35.69	(mg/s)	405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)	0.61	(mg/s)	0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.93	(mg/s)	0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	174.13	(mg/s)	1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.98	(mg/s)	2.98	(mg/s)	2.98	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.75	(mg/s)	0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	9.11	(mg/s)	44.20	(mg/s)	44.20	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	31.04	(mg/s)	150.57	(mg/s)	150.57	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.61	(mg/s)	37.23	(mg/s)	406.69	(mg/s)
	mass flux in river at PM-13	M_r13 =	43.75	(mg/s)	409.87	(mg/s)	2,593.35	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.025	(mg/L)	0.095	(mg/L)	0.100	(mg/L)
	concentration in river at PM-13	C_r13 =	0.246	(mg/L)	0.166	(mg/L)	0.107	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Closure
Parameter	Arsenic

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.012359831	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00273	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.27	(mg/s)		3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1.31	(mg/s)		15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.33	(mg/s)		0.33	(mg/s)		0.33	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.18	(mg/s)		0.86	(mg/s)		0.86	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.06	(mg/s)		0.28	(mg/s)		0.28	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)		0.34	(mg/s)		3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.63	(mg/s)		3.18	(mg/s)		19.56	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)		0.001	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.004	(mg/L)		0.001	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Closure
Parameter	Boron

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.198832748	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0212	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	4.28	(mg/s)	49	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)	0.52	(mg/s)	0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.11	(mg/s)	0.11	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	20.90	(mg/s)	239	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.53	(mg/s)	2.53	(mg/s)	2.53	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	7.41	(mg/s)	7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2.84	(mg/s)	13.79	(mg/s)	13.79	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	6.49	(mg/s)	31.47	(mg/s)	31.47	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.52	(mg/s)	4.91	(mg/s)	49.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	12.38	(mg/s)	81.01	(mg/s)	343.02	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.021	(mg/L)	0.013	(mg/L)	0.012	(mg/L)
	concentration in river at PM-13	C_r13 =	0.070	(mg/L)	0.033	(mg/L)	0.014	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Closure
Parameter	Barium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	4.81E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0681	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	3.93	(mg/s)	45	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)	1.66	(mg/s)	1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	19.15	(mg/s)	219	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	8.11	(mg/s)	8.11	(mg/s)	8.11	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.69	(mg/s)	3.34	(mg/s)	3.34	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1.83	(mg/s)	8.87	(mg/s)	8.87	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.66	(mg/s)	5.69	(mg/s)	46.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	12.29	(mg/s)	45.41	(mg/s)	285.59	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.068	(mg/L)	0.015	(mg/L)	0.011	(mg/L)
	concentration in river at PM-13	C_r13 =	0.069	(mg/L)	0.018	(mg/L)	0.012	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Closure
Parameter	Beryllium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000808254	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000023	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.17	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.03	(mg/s)		0.35	(mg/s)		2.53	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Closure
Parameter	Calcium

Input concentration data	concentration of surface water into PM-12	C_s12 =	13	(mg/L)
	concentration of surface water into PM-13	C_s13 =	13	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	13	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	59.94387899	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	19	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	4,639.22	(mg/s)	52,669	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)	462.42	(mg/s)	462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	121.41	(mg/s)	121.41	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	22,636.89	(mg/s)	258,461	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2,263.72	(mg/s)	2,263.72	(mg/s)	2,263.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	5,369.83	(mg/s)	5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	857.11	(mg/s)	4,157.57	(mg/s)	4,157.57	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	19.51	(mg/s)	19.51	(mg/s)	19.51	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,175.36	(mg/s)	5,701.28	(mg/s)	2.80	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	462.42	(mg/s)	5,223.05	(mg/s)	53,252.39	(mg/s)
	mass flux in river at PM-13	M_r13 =	4,778.13	(mg/s)	45,371.84	(mg/s)	323,526.61	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	19.000	(mg/L)	13.374	(mg/l)	13.036	(mg/l)
	concentration in river at PM-13	C_r13 =	26.921	(mg/L)	18.354	(mg/l)	13.310	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Closure**
Parameter	**Cadmium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000227872	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0003	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.03	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.14	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.00	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)		0.04	(mg/s)		0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.05	(mg/s)		0.25	(mg/s)		2.00	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Closure
Parameter	Chloride

Input concentration data	concentration of surface water into PM-12	C_s12 =	10	(mg/L)
	concentration of surface water into PM-13	C_s13 =	10	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	10	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.29E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.8	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	3,568.63	(mg/s)	40,514	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)	43.81	(mg/s)	43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	93.39	(mg/s)	93.39	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	17,412.99	(mg/s)	198,816	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	214.46	(mg/s)	214.46	(mg/s)	214.46	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	335.09	(mg/s)	335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	89.94	(mg/s)	436.24	(mg/s)	436.24	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	82.56	(mg/s)	82.56	(mg/s)	82.56	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	423.51	(mg/s)	2,054.29	(mg/s)	2,054.29	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	43.81	(mg/s)	3,705.83	(mg/s)	40,651.48	(mg/s)
	mass flux in river at PM-13	M_r13 =	854.27	(mg/s)	24,241.46	(mg/s)	242,590.11	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.800	(mg/L)	9.489	(mg/L)	9.951	(mg/L)
	concentration in river at PM-13	C_r13 =	4.813	(mg/L)	9.806	(mg/L)	9.980	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Closure**
Parameter	**Cobalt**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001356866	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0011	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.21	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1.04	(mg/s)		12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.13	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.03	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.25	(mg/s)		2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.21	(mg/s)		1.70	(mg/s)		14.80	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.001	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.001	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Closure
Parameter	Copper

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.018240705	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.004	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.54	(mg/s)	6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	2.61	(mg/s)	30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.48	(mg/s)	0.48	(mg/s)	0.48	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.19	(mg/s)	0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.26	(mg/s)	1.27	(mg/s)	1.27	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.09	(mg/s)	0.43	(mg/s)	0.43	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.10	(mg/s)	0.65	(mg/s)	6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.92	(mg/s)	5.63	(mg/s)	38.38	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.004	(mg/L)	0.002	(mg/L)	0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.005	(mg/L)	0.002	(mg/L)	0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Closure
Parameter	Fluoride

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.82E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.385	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		35.69	(mg/s)		405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)		9.37	(mg/s)		9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.93	(mg/s)		0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		174.13	(mg/s)		1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	45.87	(mg/s)		45.87	(mg/s)		45.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		7.04	(mg/s)		7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.26	(mg/s)		1.27	(mg/s)		1.27	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.13	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	30.48	(mg/s)		147.83	(mg/s)		147.83	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	9.37	(mg/s)		45.99	(mg/s)		415.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	86.11	(mg/s)		422.25	(mg/s)		2,605.74	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.385	(mg/L)		0.118	(mg/L)		0.102	(mg/L)
	concentration in river at PM-13	C_r13 =	0.485	(mg/L)		0.171	(mg/L)		0.107	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Closure
Parameter	Iron

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.75E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.035	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	1,034.90	(mg/s)	11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)	0.85	(mg/s)	0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	27.08	(mg/s)	27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	5,049.77	(mg/s)	57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	4.17	(mg/s)	4.17	(mg/s)	4.17	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	2.13	(mg/s)	2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	9.65	(mg/s)	46.80	(mg/s)	46.80	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.02	(mg/s)	0.02	(mg/s)	0.02	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	90.32	(mg/s)	438.13	(mg/s)	438.13	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.85	(mg/s)	1,062.84	(mg/s)	11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	105.01	(mg/s)	6,603.85	(mg/s)	69,924.96	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.035	(mg/L)	2.721	(mg/L)	2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	0.592	(mg/L)	2.671	(mg/L)	2.877	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Closure
Parameter	Hardness

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	227	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8610	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	87.5	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	24,980.41	(mg/s)	283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)	2,129.58	(mg/s)	2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	653.73	(mg/s)	653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	121,890.93	(mg/s)	1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	10,425.01	(mg/s)	10,425.01	(mg/s)	10,425.01	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	53,090.84	(mg/s)	53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3,251.11	(mg/s)	15,770.06	(mg/s)	15,770.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	403.90	(mg/s)	403.90	(mg/s)	403.90	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	8,584.18	(mg/s)	41,638.98	(mg/s)	41,638.98	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,129.58	(mg/s)	27,763.72	(mg/s)	286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	24,793.78	(mg/s)	270,983.44	(mg/s)	1,799,423.99	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	87.500	(mg/L)	71.091	(mg/L)	70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	139.693	(mg/L)	109.618	(mg/L)	74.029	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Closure
Parameter	Potassium

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	13.37	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.60	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,320.39	(mg/s)		14,990	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)		38.94	(mg/s)		38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.08	(mg/s)		0.08	(mg/s)		0.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,442.81	(mg/s)		73,562	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	190.63	(mg/s)		190.63	(mg/s)		190.63	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		34.55	(mg/s)		34.55	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		3,029.85	(mg/s)		3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	191.19	(mg/s)		927.38	(mg/s)		927.38	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	152.77	(mg/s)		741.03	(mg/s)		741.03	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	39.03	(mg/s)		1,359.42	(mg/s)		15,029.31	(mg/s)
	mass flux in river at PM-13	M_r13 =	573.61	(mg/s)		12,725.67	(mg/s)		93,514.67	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.603	(mg/L)		3.481	(mg/L)		3.679	(mg/l)
	concentration in river at PM-13	C_r13 =	3.232	(mg/L)		5.148	(mg/L)		3.847	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Closure**
Parameter	**Magnesium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	18.87	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	10.65	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,141.18	(mg/s)		24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)		259.20	(mg/s)		259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		56.03	(mg/s)		56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,447.79	(mg/s)		119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,268.87	(mg/s)		1,268.87	(mg/s)		1,268.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		15,261.91	(mg/s)		15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	269.77	(mg/s)		1,308.55	(mg/s)		1,308.55	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	9.99	(mg/s)		9.99	(mg/s)		9.99	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,375.71	(mg/s)		6,673.11	(mg/s)		6,673.11	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	259.20	(mg/s)		2,456.41	(mg/s)		24,623.80	(mg/s)
	mass flux in river at PM-13	M_r13 =	3,183.54	(mg/s)		37,426.64	(mg/s)		168,435.83	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	10.650	(mg/L)		6.290	(mg/l)		6.028	(mg/l)
	concentration in river at PM-13	C_r13 =	17.937	(mg/L)		15.140	(mg/l)		6.930	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Closure
Parameter	Manganese

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.28	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.19	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		107.06	(mg/s)		1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)		4.58	(mg/s)		4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		2.80	(mg/s)		2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		522.39	(mg/s)		5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	22.40	(mg/s)		22.40	(mg/s)		22.40	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		27.31	(mg/s)		27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3.95	(mg/s)		19.17	(mg/s)		19.17	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	23.26	(mg/s)		112.82	(mg/s)		112.82	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	4.58	(mg/s)		114.44	(mg/s)		1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	54.19	(mg/s)		818.53	(mg/s)		7,368.99	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.188	(mg/L)		0.293	(mg/l)		0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.305	(mg/L)		0.331	(mg/l)		0.303	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Closure
Parameter	Sodium

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.50	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.50	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.50	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	12.15	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	4.90	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,249.02	(mg/s)		14,180	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)		119.26	(mg/s)		119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		32.69	(mg/s)		32.69	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,094.55	(mg/s)		69,586	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	583.80	(mg/s)		583.80	(mg/s)		583.80	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		6,729.88	(mg/s)		6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	173.73	(mg/s)		842.70	(mg/s)		842.70	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	11.96	(mg/s)		11.96	(mg/s)		11.96	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	871.20	(mg/s)		4,225.89	(mg/s)		4,225.89	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	119.26	(mg/s)		1,400.96	(mg/s)		14,331.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	1,759.95	(mg/s)		19,889.75	(mg/s)		96,311.77	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	4.900	(mg/L)		3.587	(mg/l)		3.508	(mg/l)
	concentration in river at PM-13	C_r13 =	9.916	(mg/L)		8.046	(mg/l)		3.962	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Closure
Parameter	Nickel

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.015125217	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.007	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.43	(mg/s)		5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.09	(mg/s)		24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.83	(mg/s)		0.83	(mg/s)		0.83	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.29	(mg/s)		0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.22	(mg/s)		1.05	(mg/s)		1.05	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.14	(mg/s)		0.66	(mg/s)		0.66	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.17	(mg/s)		0.61	(mg/s)		5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.36	(mg/s)		5.54	(mg/s)		31.74	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.007	(mg/L)		0.002	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.008	(mg/L)		0.002	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Closure
Parameter	Lead

Input concentration data	concentration of surface water into PM-12	C_s12 =	0	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001097329	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0012	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.14	(mg/s)		0.14	(mg/s)		0.14	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)		0.08	(mg/s)		0.08	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)		0.11	(mg/s)		0.11	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.21	(mg/s)		0.38	(mg/s)		0.38	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Closure
Parameter	Antimony

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.37E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.50E-03	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.01	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.03	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.18	(mg/s)	0.18	(mg/s)	0.18	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.08	(mg/s)	0.37	(mg/s)	0.37	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)	0.02	(mg/s)	0.02	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)	0.04	(mg/s)	0.12	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.30	(mg/s)	0.67	(mg/s)	1.10	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Closure
Parameter	Selenium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001503093	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00295	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.11	(mg/s)	1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.52	(mg/s)	6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.35	(mg/s)	0.35	(mg/s)	0.35	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.09	(mg/s)	0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.18	(mg/s)	1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.47	(mg/s)	1.36	(mg/s)	7.91	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.003	(mg/L)	0.001	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Closure**
Parameter	**Sulfate**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	110.25	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	8.50	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	1,427.45	(mg/s)	16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)	206.87	(mg/s)	206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	37.36	(mg/s)	37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	6,965.20	(mg/s)	79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,012.72	(mg/s)	1,012.72	(mg/s)	1,012.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	58,922.60	(mg/s)	58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,576.45	(mg/s)	7,646.82	(mg/s)	7,646.82	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	344.66	(mg/s)	344.66	(mg/s)	344.66	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	2,996.40	(mg/s)	14,534.54	(mg/s)	14,534.54	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	206.87	(mg/s)	1,671.68	(mg/s)	16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	6,137.09	(mg/s)	91,098.21	(mg/s)	178,437.67	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	8.500	(mg/L)	4.280	(mg/l)	4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	34.578	(mg/L)	36.851	(mg/l)	7.341	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Closure
Parameter	Thallium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000917488	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000004	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.35	(mg/s)		4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.07	(mg/s)		0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.02	(mg/s)		0.54	(mg/s)		4.91	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Closure
Parameter	Zinc

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.020231354	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0115	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	5.71	(mg/s)	65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)	0.28	(mg/s)	0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.15	(mg/s)	0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	27.86	(mg/s)	318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1.37	(mg/s)	1.37	(mg/s)	1.37	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.17	(mg/s)	0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.29	(mg/s)	1.40	(mg/s)	1.40	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.28	(mg/s)	1.37	(mg/s)	1.37	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.28	(mg/s)	6.14	(mg/s)	65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	2.22	(mg/s)	38.31	(mg/s)	387.67	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.012	(mg/L)	0.016	(mg/L)	0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.013	(mg/L)	0.015	(mg/L)	0.016	(mg/L)

Appendix F.8
Embarrass River
Proposed Action
Post-Closure

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

FLOWS

Case Flows	Post-Closure Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	0.86	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	6.27	(cfs)	PM-13
	flow check	Q_ck_L =	6.27	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.00	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.00	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	0.77	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	0.43	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Post-Closure Average Flow Conditions (mean annual)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12
	flow in river at PM-13	Q_r13_M =	85.33	(cfs)	PM-13
	flow check	Q_ck_M =	85.33	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	2.45	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_M =	1.35	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13

Case Flow	Post-Closure High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	856.88	(cfs)	PM-13
	flow check	Q_ck_H =	856.88	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	2.45	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	1.35	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Silver**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00097	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000008	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.19	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.02	(mg/s)		0.31	(mg/s)		2.71	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Post-Closure
Parameter	Aluminum

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.37E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.025	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	35.69	(mg/s)	405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)	0.61	(mg/s)	0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.93	(mg/s)	0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	174.13	(mg/s)	1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.98	(mg/s)	2.98	(mg/s)	2.98	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.75	(mg/s)	0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	13.96	(mg/s)	44.20	(mg/s)	44.20	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	19.04	(mg/s)	60.32	(mg/s)	60.32	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.61	(mg/s)	37.23	(mg/s)	406.69	(mg/s)
	mass flux in river at PM-13	M_r13 =	36.59	(mg/s)	319.61	(mg/s)	2,503.10	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.025	(mg/L)	0.095	(mg/L)	0.100	(mg/L)
	concentration in river at PM-13	C_r13 =	0.206	(mg/L)	0.132	(mg/L)	0.103	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Post-Closure
Parameter	Arsenic

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.012359831	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00273	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.27	(mg/s)	3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.31	(mg/s)	15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.33	(mg/s)	0.33	(mg/s)	0.33	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.27	(mg/s)	0.86	(mg/s)	0.86	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.04	(mg/s)	0.11	(mg/s)	0.11	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.34	(mg/s)	3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.70	(mg/s)	3.02	(mg/s)	19.39	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.0027	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.0039	(mg/L)	0.001	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Boron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.198832748	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0212	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		4.28	(mg/s)		49	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)		0.52	(mg/s)		0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.11	(mg/s)		0.11	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		20.90	(mg/s)		239	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.53	(mg/s)		2.53	(mg/s)		2.53	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		7.41	(mg/s)		7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	4.35	(mg/s)		13.79	(mg/s)		13.79	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3.98	(mg/s)		12.61	(mg/s)		12.61	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.52	(mg/s)		4.91	(mg/s)		49.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	11.38	(mg/s)		62.14	(mg/s)		324.16	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.021	(mg/L)		0.013	(mg/L)		0.012	(mg/L)
	concentration in river at PM-13	C_r13 =	0.064	(mg/L)		0.026	(mg/L)		0.013	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Barium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	4.81E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0681	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		3.93	(mg/s)		45	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)		1.66	(mg/s)		1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.10	(mg/s)		0.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		19.15	(mg/s)		219	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	8.11	(mg/s)		8.11	(mg/s)		8.11	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.25	(mg/s)		0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.05	(mg/s)		3.34	(mg/s)		3.34	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1.12	(mg/s)		3.55	(mg/s)		3.55	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.66	(mg/s)		5.69	(mg/s)		46.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	11.95	(mg/s)		40.09	(mg/s)		280.28	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.068	(mg/L)		0.015	(mg/L)		0.011	(mg/L)
	concentration in river at PM-13	C_r13 =	0.067	(mg/L)		0.017	(mg/L)		0.012	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Beryllium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000808254	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000023	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.17	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.03	(mg/s)		0.30	(mg/s)		2.49	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Post-Closure
Parameter	Calcium

Input concentration data	concentration of surface water into PM-12	C_s12 =	13	(mg/L)
	concentration of surface water into PM-13	C_s13 =	13	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	13	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	59.94387899	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	19	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	4,639.22	(mg/s)	52,669	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)	462.42	(mg/s)	462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	121.41	(mg/s)	121.41	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	22,636.89	(mg/s)	258,461	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2,263.72	(mg/s)	2,263.72	(mg/s)	2,263.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	5,369.83	(mg/s)	5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,312.64	(mg/s)	4,157.57	(mg/s)	4,157.57	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	19.51	(mg/s)	19.51	(mg/s)	19.51	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	721.08	(mg/s)	2,283.89	(mg/s)	2.80	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	462.42	(mg/s)	5,223.05	(mg/s)	53,252.39	(mg/s)
	mass flux in river at PM-13	M_r13 =	4,779.37	(mg/s)	41,954.45	(mg/s)	323,526.61	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	19.000	(mg/L)	13.374	(mg/l)	13.036	(mg/l)
	concentration in river at PM-13	C_r13 =	26.928	(mg/L)	17.373	(mg/l)	13.341	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Post-Closure
Parameter	Cadmium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000227872	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0003	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.03	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.14	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.00	(mg/s)	0.02	(mg/s)	0.02	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)	0.04	(mg/s)	0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.05	(mg/s)	0.24	(mg/s)	1.99	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Post-Closure
Parameter	Chloride

Input concentration data	concentration of surface water into PM-12	C_s12 =	10	(mg/L)
	concentration of surface water into PM-13	C_s13 =	10	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	10	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.29E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.8	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	3,568.63	(mg/s)	40,514	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)	43.81	(mg/s)	43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	93.39	(mg/s)	93.39	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	17,412.99	(mg/s)	198,816	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	214.46	(mg/s)	214.46	(mg/s)	214.46	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	335.09	(mg/s)	335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	137.73	(mg/s)	436.24	(mg/s)	436.24	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	82.56	(mg/s)	82.56	(mg/s)	82.56	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	259.82	(mg/s)	822.94	(mg/s)	822.94	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	43.81	(mg/s)	3,705.83	(mg/s)	40,651.48	(mg/s)
	mass flux in river at PM-13	M_r13 =	738.38	(mg/s)	23,010.11	(mg/s)	241,358.76	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.800	(mg/L)	9.489	(mg/L)	9.951	(mg/L)
	concentration in river at PM-13	C_r13 =	4.160	(mg/L)	9.528	(mg/L)	9.953	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Cobalt**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001356866	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0011	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.21	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1.04	(mg/s)		12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.13	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.03	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.25	(mg/s)		2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.21	(mg/s)		1.61	(mg/s)		14.71	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.001	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.001	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Copper**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.018240705	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.004	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.54	(mg/s)		6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)		0.10	(mg/s)		0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.61	(mg/s)		30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.48	(mg/s)		0.48	(mg/s)		0.48	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.19	(mg/s)		0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.40	(mg/s)		1.27	(mg/s)		1.27	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.05	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.10	(mg/s)		0.65	(mg/s)		6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.03	(mg/s)		5.37	(mg/s)		38.12	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.00400	(mg/L)		0.002	(mg/L)		0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.00579	(mg/L)		0.002	(mg/L)		0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Fluoride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.82E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.385	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		35.69	(mg/s)		405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)		9.37	(mg/s)		9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.93	(mg/s)		0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		174.13	(mg/s)		1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	45.87	(mg/s)		45.87	(mg/s)		45.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		7.04	(mg/s)		7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.40	(mg/s)		1.27	(mg/s)		1.27	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.13	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	18.70	(mg/s)		59.22	(mg/s)		59.22	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	9.37	(mg/s)		45.99	(mg/s)		415.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	74.47	(mg/s)		333.65	(mg/s)		2,517.13	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.385	(mg/L)		0.118	(mg/L)		0.102	(mg/L)
	concentration in river at PM-13	C_r13 =	0.420	(mg/L)		0.138	(mg/L)		0.104	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Iron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.75E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.035	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	1,034.90	(mg/s)	11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)	0.85	(mg/s)	0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	27.08	(mg/s)	27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	5,049.77	(mg/s)	57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	4.17	(mg/s)	4.17	(mg/s)	4.17	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	2.13	(mg/s)	2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	14.78	(mg/s)	46.80	(mg/s)	46.80	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.02	(mg/s)	0.02	(mg/s)	0.02	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	55.41	(mg/s)	175.51	(mg/s)	175.51	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.85	(mg/s)	1,062.84	(mg/s)	11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	75.23	(mg/s)	6,341.23	(mg/s)	69,662.34	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.035	(mg/L)	2.721	(mg/L)	2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	0.424	(mg/L)	2.626	(mg/L)	2.873	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Post-Closure
Parameter	Hardness

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	2.27E+02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8.61E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	87.5	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		24,980.41	(mg/s)		283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)		2,129.58	(mg/s)		2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		653.73	(mg/s)		653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		121,890.93	(mg/s)		1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	10,425.01	(mg/s)		10,425.01	(mg/s)		10,425.01	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		53,090.84	(mg/s)		53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	4,978.97	(mg/s)		15,770.06	(mg/s)		15,770.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	403.90	(mg/s)		403.90	(mg/s)		403.90	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	5,266.36	(mg/s)		16,680.30	(mg/s)		16,680.30	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,129.58	(mg/s)		27,763.72	(mg/s)		286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	23,203.82	(mg/s)		246,024.76	(mg/s)		1,774,465.31	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	87.500	(mg/L)		71.091	(mg/L)		70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	130.735	(mg/L)		101.877	(mg/L)		73.175	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Potassium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	13.37	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.60	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,320.39	(mg/s)		14,990	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)		38.94	(mg/s)		38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.08	(mg/s)		0.08	(mg/s)		0.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,442.81	(mg/s)		73,562	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	190.63	(mg/s)		190.63	(mg/s)		190.63	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		34.55	(mg/s)		34.55	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		3,029.85	(mg/s)		3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	292.79	(mg/s)		927.38	(mg/s)		927.38	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	93.72	(mg/s)		296.85	(mg/s)		296.85	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	39.03	(mg/s)		1,359.42	(mg/s)		15,029.31	(mg/s)
	mass flux in river at PM-13	M_r13 =	616.17	(mg/s)		12,281.49	(mg/s)		93,070.49	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.603	(mg/L)		3.481	(mg/L)		3.679	(mg/l)
	concentration in river at PM-13	C_r13 =	3.472	(mg/L)		5.086	(mg/L)		3.838	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Magnesium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	18.87	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	10.65	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,141.18	(mg/s)		24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)		259.20	(mg/s)		259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		56.03	(mg/s)		56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,447.79	(mg/s)		119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,268.87	(mg/s)		1,268.87	(mg/s)		1,268.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		15,261.91	(mg/s)		15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	413.14	(mg/s)		1,308.55	(mg/s)		1,308.55	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	9.99	(mg/s)		9.99	(mg/s)		9.99	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	843.99	(mg/s)		2,673.20	(mg/s)		2,673.20	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	259.20	(mg/s)		2,456.41	(mg/s)		24,623.80	(mg/s)
	mass flux in river at PM-13	M_r13 =	2,795.20	(mg/s)		33,426.73	(mg/s)		164,435.92	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	10.650	(mg/L)		6.290	(mg/l)		6.028	(mg/l)
	concentration in river at PM-13	C_r13 =	15.749	(mg/L)		13.842	(mg/l)		6.781	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Manganese**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.28	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.19	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		107.06	(mg/s)		1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)		4.58	(mg/s)		4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		2.80	(mg/s)		2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		522.39	(mg/s)		5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	22.40	(mg/s)		22.40	(mg/s)		22.40	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		27.31	(mg/s)		27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	6.05	(mg/s)		19.17	(mg/s)		19.17	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	14.27	(mg/s)		45.20	(mg/s)		45.20	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	4.58	(mg/s)		114.44	(mg/s)		1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	47.30	(mg/s)		750.91	(mg/s)		7,301.36	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.188	(mg/L)		0.293	(mg/l)		0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.266	(mg/L)		0.311	(mg/l)		0.301	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Sodium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.50	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.50	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.50	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	12.15	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	4.90	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,249.02	(mg/s)		14,180	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)		119.26	(mg/s)		119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		32.69	(mg/s)		32.69	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,094.55	(mg/s)		69,586	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	583.80	(mg/s)		583.80	(mg/s)		583.80	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		6,729.88	(mg/s)		6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	266.06	(mg/s)		842.70	(mg/s)		842.70	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	11.96	(mg/s)		11.96	(mg/s)		11.96	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	534.48	(mg/s)		1,692.86	(mg/s)		1,692.86	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	119.26	(mg/s)		1,400.96	(mg/s)		14,331.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	1,515.56	(mg/s)		17,356.72	(mg/s)		93,778.75	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	4.900	(mg/L)		3.587	(mg/l)		3.508	(mg/l)
	concentration in river at PM-13	C_r13 =	8.539	(mg/L)		7.187	(mg/l)		3.867	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Nickel**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.015125217	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.007	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.43	(mg/s)	5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)	0.17	(mg/s)	0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	2.09	(mg/s)	24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.83	(mg/s)	0.83	(mg/s)	0.83	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.29	(mg/s)	0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.33	(mg/s)	1.05	(mg/s)	1.05	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.08	(mg/s)	0.26	(mg/s)	0.26	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.17	(mg/s)	0.61	(mg/s)	5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.42	(mg/s)	5.14	(mg/s)	31.34	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.007	(mg/L)	0.002	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.008	(mg/L)	0.002	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Lead**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001097329	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0012	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.14	(mg/s)		0.14	(mg/s)		0.14	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)		0.08	(mg/s)		0.08	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.21	(mg/s)		0.31	(mg/s)		0.31	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Antimony**

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.37E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.50E-03	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.01	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.03	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.18	(mg/s)	0.18	(mg/s)	0.18	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.12	(mg/s)	0.37	(mg/s)	0.37	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)	0.04	(mg/s)	0.12	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.34	(mg/s)	0.65	(mg/s)	1.09	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Post-Closure
Parameter	Selenium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001503093	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00295	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.11	(mg/s)	1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.52	(mg/s)	6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.35	(mg/s)	0.35	(mg/s)	0.35	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.09	(mg/s)	0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.03	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.18	(mg/s)	1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.47	(mg/s)	1.29	(mg/s)	7.84	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.003	(mg/L)	0.001	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Sulfate**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	110.25	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	8.50	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	1,427.45	(mg/s)	16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)	206.87	(mg/s)	206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	37.36	(mg/s)	37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	6,965.20	(mg/s)	79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,012.72	(mg/s)	1,012.72	(mg/s)	1,012.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	58,922.60	(mg/s)	58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2,414.28	(mg/s)	7,646.82	(mg/s)	7,646.82	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	344.66	(mg/s)	344.66	(mg/s)	344.66	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,838.28	(mg/s)	5,822.44	(mg/s)	5,822.44	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	206.87	(mg/s)	1,671.68	(mg/s)	16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	5,816.80	(mg/s)	82,386.11	(mg/s)	169,725.57	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	8.500	(mg/L)	4.280	(mg/l)	4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	32.773	(mg/L)	34.116	(mg/l)	6.999	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Thallium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000917488	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000004	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.35	(mg/s)		4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.07	(mg/s)		0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.02	(mg/s)		0.53	(mg/s)		4.89	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Zinc**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.020231354	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0115	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5.71	(mg/s)		65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)		0.28	(mg/s)		0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		27.86	(mg/s)		318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1.37	(mg/s)		1.37	(mg/s)		1.37	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.44	(mg/s)		1.40	(mg/s)		1.40	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.17	(mg/s)		0.55	(mg/s)		0.55	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.28	(mg/s)		6.14	(mg/s)		65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	2.27	(mg/s)		37.49	(mg/s)		386.85	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.012	(mg/L)		0.016	(mg/L)		0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.013	(mg/L)		0.016	(mg/L)		0.016	(mg/L)

Appendix F.9

Embarrass River

Geotechnical Mitigation

Year 1

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

FLOWS

Case Flows	Year 1 Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	0.86	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	6.27	(cfs)	PM-13
	flow check	Q_ck_L =	6.27	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.00	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.00	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	0.37	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	0.83	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Year 1 Average Flow Conditions (mean annual)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12
	flow in river at PM-13	Q_r13_M =	93.06	(cfs)	PM-13
	flow check	Q_ck_M =	93.06	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	3.56	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_M =	7.96	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13

Case Flow	Year 1 High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	864.61	(cfs)	PM-13
	flow check	Q_ck_H =	864.61	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	3.56	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	7.96	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	Year 1
Parameter	Silver

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00086	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000008	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.19	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.01	(mg/s)		0.35	(mg/s)		2.75	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	Year 1
Parameter	Aluminum

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.18	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.025	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		35.69	(mg/s)		405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)		0.61	(mg/s)		0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.93	(mg/s)		0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		174.13	(mg/s)		1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.98	(mg/s)		2.98	(mg/s)		2.98	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.75	(mg/s)		0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.11	(mg/s)		1.01	(mg/s)		1.01	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	37.03	(mg/s)		355.65	(mg/s)		355.65	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.61	(mg/s)		37.23	(mg/s)		406.69	(mg/s)
	mass flux in river at PM-13	M_r13 =	40.73	(mg/s)		571.75	(mg/s)		2,755.24	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.025	(mg/L)		0.095	(mg/L)		0.100	(mg/L)
	concentration in river at PM-13	C_r13 =	0.229	(mg/L)		0.217	(mg/L)		0.113	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	Year 1
Parameter	Arsenic

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.006769615	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00273	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.27	(mg/s)	3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.31	(mg/s)	15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.33	(mg/s)	0.33	(mg/s)	0.33	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.07	(mg/s)	0.68	(mg/s)	0.68	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.07	(mg/s)	0.65	(mg/s)	0.65	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.34	(mg/s)	3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.53	(mg/s)	3.38	(mg/s)	19.76	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.003	(mg/L)	0.001	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Boron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.137838474	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0212	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		4.28	(mg/s)		49	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)		0.52	(mg/s)		0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.11	(mg/s)		0.11	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		20.90	(mg/s)		239	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.53	(mg/s)		2.53	(mg/s)		2.53	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		7.41	(mg/s)		7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.45	(mg/s)		13.91	(mg/s)		13.91	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	7.74	(mg/s)		74.34	(mg/s)		74.34	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.52	(mg/s)		4.91	(mg/s)		49.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	12.23	(mg/s)		123.98	(mg/s)		386.00	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.021	(mg/L)		0.013	(mg/L)		0.012	(mg/L)
	concentration in river at PM-13	C_r13 =	0.069	(mg/L)		0.047	(mg/L)		0.016	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	Year 1
Parameter	Barium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.05E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0681	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	3.93	(mg/s)	45	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)	1.66	(mg/s)	1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	19.15	(mg/s)	219	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	8.11	(mg/s)	8.11	(mg/s)	8.11	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.53	(mg/s)	5.09	(mg/s)	5.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	2.18	(mg/s)	20.95	(mg/s)	20.95	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.66	(mg/s)	5.69	(mg/s)	46.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	12.48	(mg/s)	59.24	(mg/s)	299.42	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.068	(mg/L)	0.015	(mg/L)	0.011	(mg/L)
	concentration in river at PM-13	C_r13 =	0.070	(mg/L)	0.022	(mg/L)	0.012	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	Year 1
Parameter	Beryllium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000376001	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000023	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.17	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.00	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.02	(mg/s)		0.43	(mg/s)		2.61	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	Year 1
Parameter	Calcium

Input concentration data	concentration of surface water into PM-12	C_s12 =	13	(mg/L)
	concentration of surface water into PM-13	C_s13 =	13	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	13	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	77.28097689	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	19	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	4,639.22	(mg/s)	52,669	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)	462.42	(mg/s)	462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	121.41	(mg/s)	121.41	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	22,636.89	(mg/s)	258,461	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2,263.72	(mg/s)	2,263.72	(mg/s)	2,263.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	5,369.83	(mg/s)	5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	811.79	(mg/s)	7,796.40	(mg/s)	7,796.40	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	12.28	(mg/s)	12.28	(mg/s)	12.28	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,402.18	(mg/s)	13,466.52	(mg/s)	1.77	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	462.42	(mg/s)	5,223.05	(mg/s)	53,252.39	(mg/s)
	mass flux in river at PM-13	M_r13 =	4,952.39	(mg/s)	56,768.68	(mg/s)	327,157.17	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	19.000	(mg/L)	13.374	(mg/l)	13.036	(mg/l)
	concentration in river at PM-13	C_r13 =	27.905	(mg/L)	21.557	(mg/l)	13.371	(mg/l)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	Year 1
Parameter	Cadmium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00032784	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0003	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.03	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.14	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.00	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)		0.04	(mg/s)		0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.05	(mg/s)		0.29	(mg/s)		2.04	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Chloride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	10	(mg/L)
	concentration of surface water into PM-13	C_s13 =	10	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	10	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.52E+01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.8	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		3,568.63	(mg/s)		40,514	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)		43.81	(mg/s)		43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		93.39	(mg/s)		93.39	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		17,412.99	(mg/s)		198,816	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	214.46	(mg/s)		214.46	(mg/s)		214.46	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		335.09	(mg/s)		335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	160.16	(mg/s)		1,538.17	(mg/s)		1,538.17	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	51.97	(mg/s)		51.97	(mg/s)		51.97	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	505.23	(mg/s)		4,852.27	(mg/s)		4,852.27	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	43.81	(mg/s)		3,705.83	(mg/s)		40,651.48	(mg/s)
	mass flux in river at PM-13	M_r13 =	975.63	(mg/s)		28,110.78	(mg/s)		246,459.43	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.800	(mg/L)		9.489	(mg/L)		9.951	(mg/L)
	concentration in river at PM-13	C_r13 =	5.497	(mg/L)		10.674	(mg/L)		10.073	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Cobalt**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001495727	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0011	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.21	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.04	(mg/s)	12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.13	(mg/s)	0.13	(mg/s)	0.13	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)	0.15	(mg/s)	0.15	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.04	(mg/s)	0.35	(mg/s)	0.35	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)	0.25	(mg/s)	2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.21	(mg/s)	1.96	(mg/s)	15.06	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)	0.001	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	Year 1
Parameter	Copper

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.0068095	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.004	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.54	(mg/s)	6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	2.61	(mg/s)	30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.48	(mg/s)	0.48	(mg/s)	0.48	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.19	(mg/s)	0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.07	(mg/s)	0.69	(mg/s)	0.69	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.11	(mg/s)	1.03	(mg/s)	1.03	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.10	(mg/s)	0.65	(mg/s)	6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.75	(mg/s)	5.64	(mg/s)	38.39	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.004	(mg/L)	0.002	(mg/L)	0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.004	(mg/L)	0.002	(mg/L)	0.002	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Fluoride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	2.90E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.385	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		35.69	(mg/s)		405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)		9.37	(mg/s)		9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.93	(mg/s)		0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		174.13	(mg/s)		1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	45.87	(mg/s)		45.87	(mg/s)		45.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		7.04	(mg/s)		7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	30.50	(mg/s)		292.90	(mg/s)		292.90	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.08	(mg/s)		0.08	(mg/s)		0.08	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	36.36	(mg/s)		349.17	(mg/s)		349.17	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	9.37	(mg/s)		45.99	(mg/s)		415.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	122.18	(mg/s)		915.18	(mg/s)		3,098.67	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.385	(mg/L)		0.118	(mg/L)		0.102	(mg/L)
	concentration in river at PM-13	C_r13 =	0.688	(mg/L)		0.348	(mg/L)		0.127	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Iron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	4.00E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.035	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,034.90	(mg/s)		11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)		0.85	(mg/s)		0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		27.08	(mg/s)		27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		5,049.77	(mg/s)		57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	4.17	(mg/s)		4.17	(mg/s)		4.17	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		2.13	(mg/s)		2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.04	(mg/s)		0.40	(mg/s)		0.40	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	107.76	(mg/s)		1,034.88	(mg/s)		1,034.88	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.85	(mg/s)		1,062.84	(mg/s)		11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	112.83	(mg/s)		7,154.20	(mg/s)		70,475.31	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.035	(mg/L)		2.721	(mg/L)		2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	0.636	(mg/L)		2.717	(mg/L)		2.880	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	Year 1
Parameter	Hardness

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	3.74E+02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8.61E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	87.5	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	24,980.41	(mg/s)	283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)	2,129.58	(mg/s)	2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	653.73	(mg/s)	653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	121,890.93	(mg/s)	1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	10,425.01	(mg/s)	10,425.01	(mg/s)	10,425.01	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	53,090.84	(mg/s)	53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3,931.55	(mg/s)	37,758.64	(mg/s)	37,758.64	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	254.25	(mg/s)	254.25	(mg/s)	254.25	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	10,240.73	(mg/s)	98,352.01	(mg/s)	98,352.01	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,129.58	(mg/s)	27,763.72	(mg/s)	286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	26,981.12	(mg/s)	349,535.40	(mg/s)	1,877,975.95	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	87.500	(mg/L)	71.091	(mg/L)	70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	152.032	(mg/L)	132.728	(mg/L)	76.751	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Potassium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	9.31	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.60	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,320.39	(mg/s)		14,990	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)		38.94	(mg/s)		38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.05	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,442.81	(mg/s)		73,562	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	190.63	(mg/s)		190.63	(mg/s)		190.63	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		34.55	(mg/s)		34.55	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		3,029.85	(mg/s)		3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	97.76	(mg/s)		938.93	(mg/s)		938.93	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	182.25	(mg/s)		1,750.33	(mg/s)		1,750.33	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	38.99	(mg/s)		1,359.39	(mg/s)		15,029.28	(mg/s)
	mass flux in river at PM-13	M_r13 =	509.64	(mg/s)		13,746.49	(mg/s)		94,535.49	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.602	(mg/L)		3.481	(mg/L)		3.679	(mg/l)
	concentration in river at PM-13	C_r13 =	2.872	(mg/L)		5.220	(mg/L)		3.864	(mg/l)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	Year 1
Parameter	Magnesium

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	44.03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	10.65	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,141.18	(mg/s)		24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)		259.20	(mg/s)		259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		56.03	(mg/s)		56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,447.79	(mg/s)		119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,268.87	(mg/s)		1,268.87	(mg/s)		1,268.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		15,261.91	(mg/s)		15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	462.49	(mg/s)		4,441.73	(mg/s)		4,441.73	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	6.29	(mg/s)		6.29	(mg/s)		6.29	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,641.19	(mg/s)		15,762.00	(mg/s)		15,762.00	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	259.20	(mg/s)		2,456.41	(mg/s)		24,623.80	(mg/s)
	mass flux in river at PM-13	M_r13 =	3,638.04	(mg/s)		49,645.00	(mg/s)		180,654.19	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	10.650	(mg/L)		6.290	(mg/l)		6.028	(mg/l)
	concentration in river at PM-13	C_r13 =	20.499	(mg/L)		18.851	(mg/l)		7.383	(mg/l)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Manganese**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.24	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.19	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		107.06	(mg/s)		1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)		4.58	(mg/s)		4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		2.80	(mg/s)		2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		522.39	(mg/s)		5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	22.40	(mg/s)		22.40	(mg/s)		22.40	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		27.31	(mg/s)		27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2.52	(mg/s)		24.25	(mg/s)		24.25	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	27.75	(mg/s)		266.49	(mg/s)		266.49	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	4.58	(mg/s)		114.44	(mg/s)		1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	57.25	(mg/s)		977.28	(mg/s)		7,527.74	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.188	(mg/L)		0.293	(mg/l)		0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.323	(mg/L)		0.371	(mg/l)		0.308	(mg/l)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	Year 1
Parameter	Sodium

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.50	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.50	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.50	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	52.95	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	4.90	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,249.02	(mg/s)		14,180	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)		119.26	(mg/s)		119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		32.69	(mg/s)		32.69	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,094.55	(mg/s)		69,586	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	583.80	(mg/s)		583.80	(mg/s)		583.80	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		6,729.88	(mg/s)		6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	556.20	(mg/s)		5,341.70	(mg/s)		5,341.70	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	7.53	(mg/s)		7.53	(mg/s)		7.53	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,039.32	(mg/s)		9,981.63	(mg/s)		9,981.63	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	119.26	(mg/s)		1,400.96	(mg/s)		14,331.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	2,306.10	(mg/s)		30,140.04	(mg/s)		106,562.07	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	4.900	(mg/L)		3.587	(mg/l)		3.508	(mg/l)
	concentration in river at PM-13	C_r13 =	12.994	(mg/L)		11.445	(mg/l)		4.355	(mg/l)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	Year 1
Parameter	Nickel

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.019144051	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.007	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.43	(mg/s)	5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)	0.17	(mg/s)	0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	2.09	(mg/s)	24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.83	(mg/s)	0.83	(mg/s)	0.83	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.29	(mg/s)	0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.20	(mg/s)	1.93	(mg/s)	1.93	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.16	(mg/s)	1.55	(mg/s)	1.55	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.17	(mg/s)	0.61	(mg/s)	5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.37	(mg/s)	7.31	(mg/s)	33.51	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.007	(mg/L)	0.002	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.008	(mg/L)	0.003	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	Year 1
Parameter	Lead

Input concentration data	concentration of surface water into PM-12	C_s12 =	0	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000886329	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0012	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.14	(mg/s)	0.14	(mg/s)	0.14	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.02	(mg/s)	0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)	0.09	(mg/s)	0.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.03	(mg/s)	0.27	(mg/s)	0.27	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.21	(mg/s)	0.55	(mg/s)	0.55	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	Year 1
Parameter	Antimony

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	8.05E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.50E-03	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.01	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.03	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.18	(mg/s)	0.18	(mg/s)	0.18	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.08	(mg/s)	0.81	(mg/s)	0.81	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)	0.06	(mg/s)	0.06	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)	0.04	(mg/s)	0.12	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.31	(mg/s)	1.14	(mg/s)	1.58	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	Year 1
Parameter	Selenium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001106406	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00295	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.11	(mg/s)	1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.52	(mg/s)	6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.35	(mg/s)	0.35	(mg/s)	0.35	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.09	(mg/s)	0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)	0.11	(mg/s)	0.11	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.03	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.18	(mg/s)	1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.46	(mg/s)	1.50	(mg/s)	8.05	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.003	(mg/L)	0.001	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	Year 1
Parameter	Sulfate

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	190.00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	8.50	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,427.45	(mg/s)		16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)		206.87	(mg/s)		206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		37.36	(mg/s)		37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,965.20	(mg/s)		79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,012.72	(mg/s)		1,012.72	(mg/s)		1,012.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		58,922.60	(mg/s)		58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,995.81	(mg/s)		19,167.71	(mg/s)		19,167.71	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	216.95	(mg/s)		216.95	(mg/s)		216.95	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,574.64	(mg/s)		34,330.84	(mg/s)		34,330.84	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	206.87	(mg/s)		1,671.68	(mg/s)		16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	7,006.99	(mg/s)		122,287.70	(mg/s)		209,627.16	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	8.500	(mg/L)		4.280	(mg/l)		4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	39.483	(mg/L)		46.436	(mg/l)		8.567	(mg/l)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Thallium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000907911	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000004	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.35	(mg/s)		4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.07	(mg/s)		0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.01	(mg/s)		0.59	(mg/s)		4.96	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Zinc**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.0182086	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0115	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5.71	(mg/s)		65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)		0.28	(mg/s)		0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		27.86	(mg/s)		318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1.37	(mg/s)		1.37	(mg/s)		1.37	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.19	(mg/s)		1.84	(mg/s)		1.84	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.34	(mg/s)		3.23	(mg/s)		3.23	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.28	(mg/s)		6.14	(mg/s)		65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	2.18	(mg/s)		40.61	(mg/s)		389.97	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.012	(mg/L)		0.016	(mg/L)		0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.012	(mg/L)		0.015	(mg/L)		0.016	(mg/L)

Appendix F.10
Embarrass River
Geotechnical Mitigation
Year 5

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

FLOWS

Case Flows	Year 5 Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	0.86	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	6.28	(cfs)	PM-13
	flow check	Q_ck_L =	6.28	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.00	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.00	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	0.46	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.01	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	0.74	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Year 5 Average Flow Conditions (mean annual)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12
	flow in river at PM-13	Q_r13_M =	94.54	(cfs)	PM-13
	flow check	Q_ck_M =	94.54	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	5.04	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.01	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_M =	7.96	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13

Case Flow	Year 5 High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	866.09	(cfs)	PM-13
	flow check	Q_ck_H =	866.09	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	5.04	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.01	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	7.96	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 5
Parameter	Silver

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00086	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000008	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.19	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.12	(mg/s)		0.12	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.01	(mg/s)		0.39	(mg/s)		2.79	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 5
Parameter	Aluminum

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.00E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.025	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		35.69	(mg/s)		405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)		0.61	(mg/s)		0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.93	(mg/s)		0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		174.13	(mg/s)		1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.98	(mg/s)		2.98	(mg/s)		2.98	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.75	(mg/s)		0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.13	(mg/s)		1.42	(mg/s)		1.42	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.08	(mg/s)		0.08	(mg/s)		0.08	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	32.84	(mg/s)		355.65	(mg/s)		355.65	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.61	(mg/s)		37.23	(mg/s)		406.69	(mg/s)
	mass flux in river at PM-13	M_r13 =	36.64	(mg/s)		572.24	(mg/s)		2,755.72	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.025	(mg/L)		0.095	(mg/L)		0.100	(mg/L)
	concentration in river at PM-13	C_r13 =	0.206	(mg/L)		0.214	(mg/L)		0.112	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 5
Parameter	Arsenic

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.006769615	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00273	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.27	(mg/s)	3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.31	(mg/s)	15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.33	(mg/s)	0.33	(mg/s)	0.33	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.09	(mg/s)	0.96	(mg/s)	0.96	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.06	(mg/s)	0.65	(mg/s)	0.65	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.34	(mg/s)	3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.54	(mg/s)	3.67	(mg/s)	20.04	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.003	(mg/L)	0.001	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Boron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.137838474	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0212	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		4.28	(mg/s)		49	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)		0.52	(mg/s)		0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.11	(mg/s)		0.11	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		20.90	(mg/s)		239	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.53	(mg/s)		2.53	(mg/s)		2.53	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		7.41	(mg/s)		7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.81	(mg/s)		19.64	(mg/s)		19.64	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.05	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	6.86	(mg/s)		74.34	(mg/s)		74.34	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.52	(mg/s)		4.91	(mg/s)		49.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	11.77	(mg/s)		129.76	(mg/s)		391.78	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.021	(mg/L)		0.013	(mg/L)		0.012	(mg/L)
	concentration in river at PM-13	C_r13 =	0.066	(mg/L)		0.049	(mg/L)		0.016	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 5
Parameter	Barium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.05E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0681	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	3.93	(mg/s)	45	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)	1.66	(mg/s)	1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	19.15	(mg/s)	219	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	8.11	(mg/s)	8.11	(mg/s)	8.11	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.66	(mg/s)	7.19	(mg/s)	7.19	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1.93	(mg/s)	20.95	(mg/s)	20.95	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.66	(mg/s)	5.69	(mg/s)	46.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	12.37	(mg/s)	61.34	(mg/s)	301.52	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.068	(mg/L)	0.015	(mg/L)	0.011	(mg/L)
	concentration in river at PM-13	C_r13 =	0.070	(mg/L)	0.023	(mg/L)	0.012	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Beryllium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000376001	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000023	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.17	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.00	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.02	(mg/s)		0.44	(mg/s)		2.63	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 5
Parameter	Calcium

Input concentration data	concentration of surface water into PM-12	C_s12 =	13	(mg/L)
	concentration of surface water into PM-13	C_s13 =	13	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	13	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	77.28097689	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	19	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	4,639.22	(mg/s)	52,669	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)	462.42	(mg/s)	462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	121.41	(mg/s)	121.41	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	22,636.89	(mg/s)	258,461	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2,263.72	(mg/s)	2,263.72	(mg/s)	2,263.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	5,369.83	(mg/s)	5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,016.90	(mg/s)	11,012.42	(mg/s)	11,012.42	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	176.59	(mg/s)	176.59	(mg/s)	176.59	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,243.51	(mg/s)	13,466.52	(mg/s)	25.38	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	462.42	(mg/s)	5,223.05	(mg/s)	53,252.39	(mg/s)
	mass flux in river at PM-13	M_r13 =	5,163.14	(mg/s)	60,149.00	(mg/s)	330,561.10	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	19.000	(mg/L)	13.374	(mg/l)	13.036	(mg/l)
	concentration in river at PM-13	C_r13 =	29.028	(mg/L)	22.481	(mg/l)	13.487	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Cadmium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00032784	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0003	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.03	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.14	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.00	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)		0.04	(mg/s)		0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.05	(mg/s)		0.31	(mg/s)		2.05	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 5
Parameter	Chloride

Input concentration data	concentration of surface water into PM-12	C_s12 =	10	(mg/L)
	concentration of surface water into PM-13	C_s13 =	10	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	10	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.52E+01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.8	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	3,568.63	(mg/s)	40,514	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)	43.81	(mg/s)	43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	93.39	(mg/s)	93.39	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	17,412.99	(mg/s)	198,816	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	214.46	(mg/s)	214.46	(mg/s)	214.46	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	335.09	(mg/s)	335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	200.63	(mg/s)	2,172.67	(mg/s)	2,172.67	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	747.10	(mg/s)	747.10	(mg/s)	747.10	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	448.06	(mg/s)	4,852.27	(mg/s)	4,852.27	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	43.81	(mg/s)	3,705.83	(mg/s)	40,651.48	(mg/s)
	mass flux in river at PM-13	M_r13 =	1,654.05	(mg/s)	29,440.40	(mg/s)	247,789.05	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.800	(mg/L)	9.489	(mg/L)	9.951	(mg/L)
	concentration in river at PM-13	C_r13 =	9.299	(mg/L)	11.004	(mg/L)	10.110	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 5
Parameter	Cobalt

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001495727	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0011	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.21	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.04	(mg/s)	12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.13	(mg/s)	0.13	(mg/s)	0.13	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)	0.21	(mg/s)	0.21	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.03	(mg/s)	0.35	(mg/s)	0.35	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)	0.25	(mg/s)	2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.21	(mg/s)	2.02	(mg/s)	15.12	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)	0.001	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 5
Parameter	Copper

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.0068095	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.004	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.54	(mg/s)	6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	2.61	(mg/s)	30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.48	(mg/s)	0.48	(mg/s)	0.48	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.19	(mg/s)	0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.09	(mg/s)	0.97	(mg/s)	0.97	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.09	(mg/s)	1.03	(mg/s)	1.03	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.10	(mg/s)	0.65	(mg/s)	6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.76	(mg/s)	5.93	(mg/s)	38.68	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.004	(mg/L)	0.002	(mg/L)	0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.004	(mg/L)	0.002	(mg/L)	0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Fluoride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	2.90E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.385	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		35.69	(mg/s)		405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)		9.37	(mg/s)		9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.93	(mg/s)		0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		174.13	(mg/s)		1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	45.87	(mg/s)		45.87	(mg/s)		45.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		7.04	(mg/s)		7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	38.20	(mg/s)		413.72	(mg/s)		413.72	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	1.21	(mg/s)		1.21	(mg/s)		1.21	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	32.24	(mg/s)		349.17	(mg/s)		349.17	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	9.37	(mg/s)		45.99	(mg/s)		415.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	126.90	(mg/s)		1,037.13	(mg/s)		3,220.61	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.385	(mg/L)		0.118	(mg/L)		0.102	(mg/L)
	concentration in river at PM-13	C_r13 =	0.713	(mg/L)		0.388	(mg/L)		0.131	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 5
Parameter	Iron

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	4.00E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.035	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	1,034.90	(mg/s)	11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)	0.85	(mg/s)	0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	27.08	(mg/s)	27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	5,049.77	(mg/s)	57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	4.17	(mg/s)	4.17	(mg/s)	4.17	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	2.13	(mg/s)	2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.05	(mg/s)	0.57	(mg/s)	0.57	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.17	(mg/s)	0.17	(mg/s)	0.17	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	95.56	(mg/s)	1,034.88	(mg/s)	1,034.88	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.85	(mg/s)	1,062.84	(mg/s)	11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	100.81	(mg/s)	7,154.52	(mg/s)	70,475.63	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.035	(mg/L)	2.721	(mg/L)	2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	0.567	(mg/L)	2.674	(mg/L)	2.875	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 5
Parameter	Hardness

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	3.74E+02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8.61E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	87.5	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	24,980.41	(mg/s)	283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)	2,129.58	(mg/s)	2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	653.73	(mg/s)	653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	121,890.93	(mg/s)	1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	10,425.01	(mg/s)	10,425.01	(mg/s)	10,425.01	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	53,090.84	(mg/s)	53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	4,924.93	(mg/s)	53,334.08	(mg/s)	53,334.08	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	3,654.83	(mg/s)	3,654.83	(mg/s)	3,654.83	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	9,081.94	(mg/s)	98,352.01	(mg/s)	98,352.01	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,129.58	(mg/s)	27,763.72	(mg/s)	286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	30,216.30	(mg/s)	368,511.42	(mg/s)	1,896,951.97	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	87.500	(mg/L)	71.091	(mg/L)	70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	169.883	(mg/L)	137.736	(mg/L)	77.394	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 5
Parameter	Potassium

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	9.31	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.60	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,320.39	(mg/s)		14,990	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)		38.94	(mg/s)		38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.76	(mg/s)		0.76	(mg/s)		0.76	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,442.81	(mg/s)		73,562	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	190.63	(mg/s)		190.63	(mg/s)		190.63	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		34.55	(mg/s)		34.55	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		3,029.85	(mg/s)		3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	122.47	(mg/s)		1,326.24	(mg/s)		1,326.24	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	161.63	(mg/s)		1,750.33	(mg/s)		1,750.33	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	39.70	(mg/s)		1,360.10	(mg/s)		15,029.99	(mg/s)
	mass flux in river at PM-13	M_r13 =	514.43	(mg/s)		14,134.51	(mg/s)		94,923.51	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.631	(mg/L)		3.483	(mg/L)		3.679	(mg/l)
	concentration in river at PM-13	C_r13 =	2.892	(mg/L)		5.283	(mg/L)		3.873	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 5
Parameter	Magnesium

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	44.03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	10.65	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,141.18	(mg/s)		24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)		259.20	(mg/s)		259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		56.03	(mg/s)		56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,447.79	(mg/s)		119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,268.87	(mg/s)		1,268.87	(mg/s)		1,268.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		15,261.91	(mg/s)		15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	579.34	(mg/s)		6,273.94	(mg/s)		6,273.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	90.42	(mg/s)		90.42	(mg/s)		90.42	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,455.48	(mg/s)		15,762.00	(mg/s)		15,762.00	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	259.20	(mg/s)		2,456.41	(mg/s)		24,623.80	(mg/s)
	mass flux in river at PM-13	M_r13 =	3,653.31	(mg/s)		51,561.34	(mg/s)		182,570.53	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	10.650	(mg/L)		6.290	(mg/l)		6.028	(mg/l)
	concentration in river at PM-13	C_r13 =	20.540	(mg/L)		19.272	(mg/l)		7.449	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 5
Parameter	Manganese

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.24	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.19	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		107.06	(mg/s)		1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)		4.58	(mg/s)		4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		2.80	(mg/s)		2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		522.39	(mg/s)		5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	22.40	(mg/s)		22.40	(mg/s)		22.40	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		27.31	(mg/s)		27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3.16	(mg/s)		34.25	(mg/s)		34.25	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	24.61	(mg/s)		266.49	(mg/s)		266.49	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	4.58	(mg/s)		114.44	(mg/s)		1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	54.75	(mg/s)		987.28	(mg/s)		7,537.74	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.188	(mg/L)		0.293	(mg/l)		0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.308	(mg/L)		0.369	(mg/l)		0.308	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Sodium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.50	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.50	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.50	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	52.95	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	4.90	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,249.02	(mg/s)		14,180	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)		119.26	(mg/s)		119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		32.69	(mg/s)		32.69	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,094.55	(mg/s)		69,586	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	583.80	(mg/s)		583.80	(mg/s)		583.80	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		6,729.88	(mg/s)		6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	696.73	(mg/s)		7,545.15	(mg/s)		7,545.15	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	108.24	(mg/s)		108.24	(mg/s)		108.24	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	921.72	(mg/s)		9,981.63	(mg/s)		9,981.63	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	119.26	(mg/s)		1,400.96	(mg/s)		14,331.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	2,429.74	(mg/s)		32,444.21	(mg/s)		108,866.24	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	4.900	(mg/L)		3.587	(mg/l)		3.508	(mg/l)
	concentration in river at PM-13	C_r13 =	13.661	(mg/L)		12.126	(mg/l)		4.442	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Nickel**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.019144051	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.007	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.43	(mg/s)	5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)	0.17	(mg/s)	0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	2.09	(mg/s)	24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.83	(mg/s)	0.83	(mg/s)	0.83	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.29	(mg/s)	0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.25	(mg/s)	2.73	(mg/s)	2.73	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.14	(mg/s)	1.55	(mg/s)	1.55	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.17	(mg/s)	0.61	(mg/s)	5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.44	(mg/s)	8.15	(mg/s)	34.35	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.007	(mg/L)	0.002	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.008	(mg/L)	0.003	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 5
Parameter	Lead

Input concentration data	concentration of surface water into PM-12	C_s12 =	0	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000886329	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0012	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.14	(mg/s)		0.14	(mg/s)		0.14	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)		0.27	(mg/s)		0.27	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.21	(mg/s)		0.59	(mg/s)		0.59	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 5
Parameter	Antimony

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	8.05E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.50E-03	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.01	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.03	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.18	(mg/s)	0.18	(mg/s)	0.18	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.11	(mg/s)	1.15	(mg/s)	1.15	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)	0.06	(mg/s)	0.06	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)	0.04	(mg/s)	0.12	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.33	(mg/s)	1.48	(mg/s)	1.91	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)	0.001	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Selenium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001106406	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00295	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.11	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.52	(mg/s)		6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.35	(mg/s)		0.35	(mg/s)		0.35	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.16	(mg/s)		0.16	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.02	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)		0.25	(mg/s)		0.25	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)		0.18	(mg/s)		1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.48	(mg/s)		1.57	(mg/s)		8.12	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.003	(mg/L)		0.001	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Sulfate**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	190.00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	8.50	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,427.45	(mg/s)		16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)		206.87	(mg/s)		206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		37.36	(mg/s)		37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,965.20	(mg/s)		79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,012.72	(mg/s)		1,012.72	(mg/s)		1,012.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		58,922.60	(mg/s)		58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2,500.08	(mg/s)		27,074.39	(mg/s)		27,074.39	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	3,118.71	(mg/s)		3,118.71	(mg/s)		3,118.71	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,170.15	(mg/s)		34,330.84	(mg/s)		34,330.84	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	206.87	(mg/s)		1,671.68	(mg/s)		16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	10,008.53	(mg/s)		133,096.13	(mg/s)		220,435.59	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	8.500	(mg/L)		4.280	(mg/l)		4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	56.270	(mg/L)		49.746	(mg/l)		8.994	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Thallium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000907911	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000004	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.35	(mg/s)		4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.07	(mg/s)		0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.02	(mg/s)		0.63	(mg/s)		5.00	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Zinc**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.0182086	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0115	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	5.71	(mg/s)	65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)	0.28	(mg/s)	0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.15	(mg/s)	0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	27.86	(mg/s)	318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1.37	(mg/s)	1.37	(mg/s)	1.37	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.17	(mg/s)	0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.24	(mg/s)	2.59	(mg/s)	2.59	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.30	(mg/s)	3.23	(mg/s)	3.23	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.28	(mg/s)	6.14	(mg/s)	65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	2.19	(mg/s)	41.37	(mg/s)	390.73	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.012	(mg/L)	0.016	(mg/L)	0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.012	(mg/L)	0.015	(mg/L)	0.016	(mg/L)

Appendix F.11
Embarrass River
Geotechnical Mitigation
Year 10

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

FLOWS

Case Flows	Year 10 Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	0.86	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	6.29	(cfs)	PM-13
	flow check	Q_ck_L =	6.29	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.00	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.00	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	0.49	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.02	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	0.71	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Year 10 Average Flow Conditions (mean annual)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12
	flow in river at PM-13	Q_r13_M =	95.05	(cfs)	PM-13
	flow check	Q_ck_M =	95.05	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	5.55	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.02	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_M =	7.96	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13

Case Flow	Year 10 High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	866.60	(cfs)	PM-13
	flow check	Q_ck_H =	866.60	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	5.55	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.02	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	7.96	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 10
Parameter	Silver

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00084	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000008	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.19	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.01	(mg/s)		0.40	(mg/s)		2.80	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Aluminum**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.25E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.025	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		35.69	(mg/s)		405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)		0.61	(mg/s)		0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.93	(mg/s)		0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		174.13	(mg/s)		1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.98	(mg/s)		2.98	(mg/s)		2.98	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.75	(mg/s)		0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.75	(mg/s)		19.65	(mg/s)		19.65	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.09	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	31.60	(mg/s)		355.65	(mg/s)		355.65	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.61	(mg/s)		37.23	(mg/s)		406.69	(mg/s)
	mass flux in river at PM-13	M_r13 =	37.02	(mg/s)		590.47	(mg/s)		2,773.96	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.025	(mg/L)		0.095	(mg/L)		0.100	(mg/L)
	concentration in river at PM-13	C_r13 =	0.208	(mg/L)		0.220	(mg/L)		0.113	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 10
Parameter	Arsenic

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.009432521	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00273	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.27	(mg/s)	3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.31	(mg/s)	15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.33	(mg/s)	0.33	(mg/s)	0.33	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.13	(mg/s)	1.48	(mg/s)	1.48	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.06	(mg/s)	0.65	(mg/s)	0.65	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.34	(mg/s)	3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.58	(mg/s)	4.18	(mg/s)	20.56	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.003	(mg/L)	0.002	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Boron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.149974322	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0212	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		4.28	(mg/s)		49	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)		0.52	(mg/s)		0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.11	(mg/s)		0.11	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		20.90	(mg/s)		239	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.53	(mg/s)		2.53	(mg/s)		2.53	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		7.41	(mg/s)		7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2.09	(mg/s)		23.55	(mg/s)		23.55	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.05	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	6.60	(mg/s)		74.34	(mg/s)		74.34	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.52	(mg/s)		4.91	(mg/s)		49.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	11.79	(mg/s)		133.68	(mg/s)		395.69	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.021	(mg/L)		0.013	(mg/L)		0.012	(mg/L)
	concentration in river at PM-13	C_r13 =	0.066	(mg/L)		0.050	(mg/L)		0.016	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 10
Parameter	Barium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	4.92E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0681	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	3.93	(mg/s)	45	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)	1.66	(mg/s)	1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	19.15	(mg/s)	219	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	8.11	(mg/s)	8.11	(mg/s)	8.11	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.69	(mg/s)	7.73	(mg/s)	7.73	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1.86	(mg/s)	20.95	(mg/s)	20.95	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.66	(mg/s)	5.69	(mg/s)	46.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	12.32	(mg/s)	61.88	(mg/s)	302.06	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.068	(mg/L)	0.015	(mg/L)	0.011	(mg/L)
	concentration in river at PM-13	C_r13 =	0.069	(mg/L)	0.023	(mg/L)	0.012	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 10
Parameter	Beryllium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000587308	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000023	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.17	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.03	(mg/s)		0.48	(mg/s)		2.66	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 10
Parameter	Calcium

Input concentration data	concentration of surface water into PM-12	C_s12 =	13	(mg/L)
	concentration of surface water into PM-13	C_s13 =	13	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	13	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	107.272439	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	19	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	4,639.22	(mg/s)	52,669	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)	462.42	(mg/s)	462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	121.41	(mg/s)	121.41	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	22,636.89	(mg/s)	258,461	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2,263.72	(mg/s)	2,263.72	(mg/s)	2,263.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	5,369.83	(mg/s)	5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,496.20	(mg/s)	16,841.82	(mg/s)	16,841.82	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	202.28	(mg/s)	202.28	(mg/s)	202.28	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,196.34	(mg/s)	13,466.52	(mg/s)	29.07	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	462.42	(mg/s)	5,223.05	(mg/s)	53,252.39	(mg/s)
	mass flux in river at PM-13	M_r13 =	5,620.95	(mg/s)	66,004.10	(mg/s)	336,419.89	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	19.000	(mg/L)	13.374	(mg/l)	13.036	(mg/l)
	concentration in river at PM-13	C_r13 =	31.591	(mg/L)	24.536	(mg/l)	13.717	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Cadmium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000645923	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0003	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.03	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.14	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.10	(mg/s)		0.10	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)		0.04	(mg/s)		0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.06	(mg/s)		0.36	(mg/s)		2.11	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 10
Parameter	Chloride

Input concentration data	concentration of surface water into PM-12	C_s12 =	10	(mg/L)
	concentration of surface water into PM-13	C_s13 =	10	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	10	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.09E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.8	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	3,568.63	(mg/s)	40,514	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)	43.81	(mg/s)	43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	93.39	(mg/s)	93.39	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	17,412.99	(mg/s)	198,816	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	214.46	(mg/s)	214.46	(mg/s)	214.46	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	335.09	(mg/s)	335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	71.00	(mg/s)	799.23	(mg/s)	799.23	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	855.78	(mg/s)	855.78	(mg/s)	855.78	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	431.07	(mg/s)	4,852.27	(mg/s)	4,852.27	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	43.81	(mg/s)	3,705.83	(mg/s)	40,651.48	(mg/s)
	mass flux in river at PM-13	M_r13 =	1,616.12	(mg/s)	28,175.65	(mg/s)	246,524.30	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.800	(mg/L)	9.489	(mg/L)	9.951	(mg/L)
	concentration in river at PM-13	C_r13 =	9.083	(mg/L)	10.474	(mg/L)	10.052	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Cobalt**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001629161	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0011	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.21	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.04	(mg/s)	12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.13	(mg/s)	0.13	(mg/s)	0.13	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)	0.26	(mg/s)	0.26	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.03	(mg/s)	0.35	(mg/s)	0.35	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)	0.25	(mg/s)	2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.21	(mg/s)	2.06	(mg/s)	15.16	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)	0.001	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Copper**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.006983188	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.004	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.54	(mg/s)		6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)		0.10	(mg/s)		0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.61	(mg/s)		30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.48	(mg/s)		0.48	(mg/s)		0.48	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.19	(mg/s)		0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.10	(mg/s)		1.10	(mg/s)		1.10	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.09	(mg/s)		1.03	(mg/s)		1.03	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.10	(mg/s)		0.65	(mg/s)		6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.76	(mg/s)		6.05	(mg/s)		38.80	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.004	(mg/L)		0.002	(mg/L)		0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.004	(mg/L)		0.002	(mg/L)		0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Fluoride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.07E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.385	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		35.69	(mg/s)		405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)		9.37	(mg/s)		9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.93	(mg/s)		0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		174.13	(mg/s)		1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	45.87	(mg/s)		45.87	(mg/s)		45.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		7.04	(mg/s)		7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	7.07	(mg/s)		79.61	(mg/s)		79.61	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	1.39	(mg/s)		1.39	(mg/s)		1.39	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	31.02	(mg/s)		349.17	(mg/s)		349.17	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	9.37	(mg/s)		45.99	(mg/s)		415.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	94.72	(mg/s)		703.19	(mg/s)		2,886.67	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.385	(mg/L)		0.118	(mg/L)		0.102	(mg/L)
	concentration in river at PM-13	C_r13 =	0.532	(mg/L)		0.261	(mg/L)		0.118	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Iron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	3.97E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.035	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,034.90	(mg/s)		11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)		0.85	(mg/s)		0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		27.08	(mg/s)		27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		5,049.77	(mg/s)		57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	4.17	(mg/s)		4.17	(mg/s)		4.17	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		2.13	(mg/s)		2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.55	(mg/s)		6.24	(mg/s)		6.24	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.19	(mg/s)		0.19	(mg/s)		0.19	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	91.94	(mg/s)		1,034.88	(mg/s)		1,034.88	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.85	(mg/s)		1,062.84	(mg/s)		11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	97.71	(mg/s)		7,160.21	(mg/s)		70,481.32	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.035	(mg/L)		2.721	(mg/L)		2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	0.549	(mg/L)		2.662	(mg/L)		2.874	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Hardness**

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	3.11E+02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8.61E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	87.5	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		24,980.41	(mg/s)		283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)		2,129.58	(mg/s)		2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		653.73	(mg/s)		653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		121,890.93	(mg/s)		1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	10,425.01	(mg/s)		10,425.01	(mg/s)		10,425.01	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		53,090.84	(mg/s)		53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	4,335.31	(mg/s)		48,800.08	(mg/s)		48,800.08	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	4,186.52	(mg/s)		4,186.52	(mg/s)		4,186.52	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	8,737.40	(mg/s)		98,352.01	(mg/s)		98,352.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,129.58	(mg/s)		27,763.72	(mg/s)		286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	29,813.82	(mg/s)		364,509.11	(mg/s)		1,892,949.66	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	87.500	(mg/L)		71.091	(mg/L)		70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	167.562	(mg/L)		135.503	(mg/L)		77.185	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Potassium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	7.98	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.60	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,320.39	(mg/s)		14,990	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)		38.94	(mg/s)		38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.88	(mg/s)		0.88	(mg/s)		0.88	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,442.81	(mg/s)		73,562	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	190.63	(mg/s)		190.63	(mg/s)		190.63	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		34.55	(mg/s)		34.55	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		3,029.85	(mg/s)		3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	111.28	(mg/s)		1,252.62	(mg/s)		1,252.62	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	155.50	(mg/s)		1,750.33	(mg/s)		1,750.33	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	39.82	(mg/s)		1,360.21	(mg/s)		15,030.10	(mg/s)
	mass flux in river at PM-13	M_r13 =	497.22	(mg/s)		14,061.01	(mg/s)		94,850.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.636	(mg/L)		3.483	(mg/L)		3.679	(mg/l)
	concentration in river at PM-13	C_r13 =	2.795	(mg/L)		5.227	(mg/L)		3.867	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Magnesium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	10.43	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	10.65	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,141.18	(mg/s)		24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)		259.20	(mg/s)		259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		56.03	(mg/s)		56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,447.79	(mg/s)		119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,268.87	(mg/s)		1,268.87	(mg/s)		1,268.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		15,261.91	(mg/s)		15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	145.53	(mg/s)		1,638.19	(mg/s)		1,638.19	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	103.57	(mg/s)		103.57	(mg/s)		103.57	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,400.27	(mg/s)		15,762.00	(mg/s)		15,762.00	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	259.20	(mg/s)		2,456.41	(mg/s)		24,623.80	(mg/s)
	mass flux in river at PM-13	M_r13 =	3,177.44	(mg/s)		46,938.74	(mg/s)		177,947.93	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	10.650	(mg/L)		6.290	(mg/l)		6.028	(mg/l)
	concentration in river at PM-13	C_r13 =	17.858	(mg/L)		17.449	(mg/l)		7.256	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Manganese**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.16	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.19	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		107.06	(mg/s)		1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)		4.58	(mg/s)		4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		2.80	(mg/s)		2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		522.39	(mg/s)		5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	22.40	(mg/s)		22.40	(mg/s)		22.40	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		27.31	(mg/s)		27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2.21	(mg/s)		24.88	(mg/s)		24.88	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	23.67	(mg/s)		266.49	(mg/s)		266.49	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	4.58	(mg/s)		114.44	(mg/s)		1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	52.86	(mg/s)		977.91	(mg/s)		7,528.37	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.188	(mg/L)		0.293	(mg/l)		0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.297	(mg/L)		0.364	(mg/l)		0.307	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Sodium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.50	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.50	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.50	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	31.37	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	4.90	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,249.02	(mg/s)		14,180	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)		119.26	(mg/s)		119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		32.69	(mg/s)		32.69	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,094.55	(mg/s)		69,586	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	583.80	(mg/s)		583.80	(mg/s)		583.80	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		6,729.88	(mg/s)		6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	437.49	(mg/s)		4,924.53	(mg/s)		4,924.53	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	123.99	(mg/s)		123.99	(mg/s)		123.99	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	886.75	(mg/s)		9,981.63	(mg/s)		9,981.63	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	119.26	(mg/s)		1,400.96	(mg/s)		14,331.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	2,151.28	(mg/s)		29,839.34	(mg/s)		106,261.36	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	4.900	(mg/L)		3.587	(mg/l)		3.508	(mg/l)
	concentration in river at PM-13	C_r13 =	12.091	(mg/L)		11.092	(mg/l)		4.333	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Nickel**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.024818317	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.007	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.43	(mg/s)	5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)	0.17	(mg/s)	0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	2.09	(mg/s)	24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.83	(mg/s)	0.83	(mg/s)	0.83	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.29	(mg/s)	0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.35	(mg/s)	3.90	(mg/s)	3.90	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.05	(mg/s)	0.05	(mg/s)	0.05	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.14	(mg/s)	1.55	(mg/s)	1.55	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.17	(mg/s)	0.61	(mg/s)	5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.54	(mg/s)	9.32	(mg/s)	35.52	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.007	(mg/L)	0.002	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.009	(mg/L)	0.003	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Lead**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.002998768	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0012	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.14	(mg/s)		0.14	(mg/s)		0.14	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.04	(mg/s)		0.47	(mg/s)		0.47	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)		0.27	(mg/s)		0.27	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.24	(mg/s)		0.93	(mg/s)		0.93	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 10
Parameter	Antimony

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.17E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.50E-03	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.01	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.03	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.18	(mg/s)	0.18	(mg/s)	0.18	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.16	(mg/s)	1.84	(mg/s)	1.84	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)	0.06	(mg/s)	0.06	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)	0.04	(mg/s)	0.12	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.39	(mg/s)	2.17	(mg/s)	2.61	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)	0.001	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Selenium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00156894	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00295	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.11	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.52	(mg/s)		6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.35	(mg/s)		0.35	(mg/s)		0.35	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)		0.25	(mg/s)		0.25	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)		0.25	(mg/s)		0.25	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)		0.18	(mg/s)		1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.49	(mg/s)		1.66	(mg/s)		8.21	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.003	(mg/L)		0.001	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Sulfate**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	223.12	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	8.50	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,427.45	(mg/s)		16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)		206.87	(mg/s)		206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		37.36	(mg/s)		37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,965.20	(mg/s)		79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,012.72	(mg/s)		1,012.72	(mg/s)		1,012.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		58,922.60	(mg/s)		58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3,111.94	(mg/s)		35,029.37	(mg/s)		35,029.37	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	3,572.40	(mg/s)		3,572.40	(mg/s)		3,572.40	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,049.89	(mg/s)		34,330.84	(mg/s)		34,330.84	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	206.87	(mg/s)		1,671.68	(mg/s)		16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	10,953.82	(mg/s)		141,504.80	(mg/s)		228,844.26	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	8.500	(mg/L)		4.280	(mg/l)		4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	61.563	(mg/L)		52.603	(mg/l)		9.331	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Thallium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001032064	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000004	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.35	(mg/s)		4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.16	(mg/s)		0.16	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.07	(mg/s)		0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.02	(mg/s)		0.66	(mg/s)		5.03	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Zinc**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.063569909	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0115	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5.71	(mg/s)		65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)		0.28	(mg/s)		0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		27.86	(mg/s)		318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1.37	(mg/s)		1.37	(mg/s)		1.37	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.89	(mg/s)		9.98	(mg/s)		9.98	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.29	(mg/s)		3.23	(mg/s)		3.23	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.28	(mg/s)		6.14	(mg/s)		65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	2.83	(mg/s)		48.76	(mg/s)		398.11	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.012	(mg/L)		0.016	(mg/L)		0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.016	(mg/L)		0.018	(mg/L)		0.016	(mg/L)

Appendix F.12
Embarrass River
Geotechnical Mitigation
Year 15

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

FLOWS

Case Flows	Year 15 Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	0.86	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	6.29	(cfs)	PM-13
	flow check	Q_ck_L =	6.29	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.00	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.00	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	0.52	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.02	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	0.68	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Year 15 Average Flow Conditions (mean annual)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12
	flow in river at PM-13	Q_r13_M =	95.52	(cfs)	PM-13
	flow check	Q_ck_M =	95.52	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	6.02	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.02	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_M =	7.96	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13

Case Flow	Year 15 High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	867.07	(cfs)	PM-13
	flow check	Q_ck_H =	867.07	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	6.02	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.02	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	7.96	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 15
Parameter	Silver

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00089	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000008	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.19	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.02	(mg/s)		0.42	(mg/s)		2.82	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Aluminum**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	8.74E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.025	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		35.69	(mg/s)		405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)		0.61	(mg/s)		0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.93	(mg/s)		0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		174.13	(mg/s)		1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.98	(mg/s)		2.98	(mg/s)		2.98	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.75	(mg/s)		0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.28	(mg/s)		14.87	(mg/s)		14.87	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.09	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	30.54	(mg/s)		355.65	(mg/s)		355.65	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.61	(mg/s)		37.23	(mg/s)		406.69	(mg/s)
	mass flux in river at PM-13	M_r13 =	35.49	(mg/s)		585.70	(mg/s)		2,769.19	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.025	(mg/L)		0.095	(mg/L)		0.100	(mg/L)
	concentration in river at PM-13	C_r13 =	0.199	(mg/L)		0.217	(mg/L)		0.113	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 15
Parameter	Arsenic

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.007825647	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00273	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.27	(mg/s)	3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.31	(mg/s)	15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.33	(mg/s)	0.33	(mg/s)	0.33	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.11	(mg/s)	1.33	(mg/s)	1.33	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.06	(mg/s)	0.65	(mg/s)	0.65	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.34	(mg/s)	3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.56	(mg/s)	4.04	(mg/s)	20.41	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.003	(mg/L)	0.001	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Boron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.153530941	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0212	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		4.28	(mg/s)		49	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)		0.52	(mg/s)		0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.11	(mg/s)		0.11	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		20.90	(mg/s)		239	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.53	(mg/s)		2.53	(mg/s)		2.53	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		7.41	(mg/s)		7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2.24	(mg/s)		26.14	(mg/s)		26.14	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.05	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	6.38	(mg/s)		74.34	(mg/s)		74.34	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.52	(mg/s)		4.91	(mg/s)		49.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	11.72	(mg/s)		136.27	(mg/s)		398.29	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.021	(mg/L)		0.013	(mg/L)		0.012	(mg/L)
	concentration in river at PM-13	C_r13 =	0.066	(mg/L)		0.050	(mg/L)		0.016	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 15
Parameter	Barium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.00E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0681	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	3.93	(mg/s)	45	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)	1.66	(mg/s)	1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	19.15	(mg/s)	219	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	8.11	(mg/s)	8.11	(mg/s)	8.11	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.73	(mg/s)	8.50	(mg/s)	8.50	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1.80	(mg/s)	20.95	(mg/s)	20.95	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.66	(mg/s)	5.69	(mg/s)	46.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	12.30	(mg/s)	62.65	(mg/s)	302.84	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.068	(mg/L)	0.015	(mg/L)	0.011	(mg/L)
	concentration in river at PM-13	C_r13 =	0.069	(mg/L)	0.023	(mg/L)	0.012	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Beryllium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000487063	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000023	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.17	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.08	(mg/s)		0.08	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.02	(mg/s)		0.47	(mg/s)		2.66	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 15
Parameter	Calcium

Input concentration data	concentration of surface water into PM-12	C_s12 =	13	(mg/L)
	concentration of surface water into PM-13	C_s13 =	13	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	13	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	81.6110992	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	19	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		4,639.22	(mg/s)		52,669	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)		462.42	(mg/s)		462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		121.41	(mg/s)		121.41	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		22,636.89	(mg/s)		258,461	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2,263.72	(mg/s)		2,263.72	(mg/s)		2,263.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		5,369.83	(mg/s)		5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,192.96	(mg/s)		13,893.59	(mg/s)		13,893.59	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	205.46	(mg/s)		205.46	(mg/s)		205.46	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,156.29	(mg/s)		13,466.52	(mg/s)		29.52	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	462.42	(mg/s)		5,223.05	(mg/s)		53,252.39	(mg/s)
	mass flux in river at PM-13	M_r13 =	5,280.84	(mg/s)		63,059.05	(mg/s)		333,475.30	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	19.000	(mg/L)		13.374	(mg/L)		13.036	(mg/l)
	concentration in river at PM-13	C_r13 =	29.679	(mg/L)		23.327	(mg/L)		13.590	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Cadmium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000567381	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0003	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.03	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.14	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)	0.04	(mg/s)	0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.06	(mg/s)	0.36	(mg/s)	2.10	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 15
Parameter	Chloride

Input concentration data	concentration of surface water into PM-12	C_s12 =	10	(mg/L)
	concentration of surface water into PM-13	C_s13 =	10	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	10	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.66E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.8	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	3,568.63	(mg/s)	40,514	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)	43.81	(mg/s)	43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	93.39	(mg/s)	93.39	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	17,412.99	(mg/s)	198,816	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	214.46	(mg/s)	214.46	(mg/s)	214.46	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	335.09	(mg/s)	335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	82.77	(mg/s)	963.96	(mg/s)	963.96	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	869.24	(mg/s)	869.24	(mg/s)	869.24	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	416.64	(mg/s)	4,852.27	(mg/s)	4,852.27	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	43.81	(mg/s)	3,705.83	(mg/s)	40,651.48	(mg/s)
	mass flux in river at PM-13	M_r13 =	1,626.91	(mg/s)	28,353.84	(mg/s)	246,702.49	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.800	(mg/L)	9.489	(mg/L)	9.951	(mg/L)
	concentration in river at PM-13	C_r13 =	9.143	(mg/L)	10.489	(mg/L)	10.054	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 15
Parameter	Cobalt

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001926627	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0011	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.21	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.04	(mg/s)	12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.13	(mg/s)	0.13	(mg/s)	0.13	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.03	(mg/s)	0.33	(mg/s)	0.33	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.03	(mg/s)	0.35	(mg/s)	0.35	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)	0.25	(mg/s)	2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.22	(mg/s)	2.13	(mg/s)	15.24	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)	0.001	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 15
Parameter	Copper

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.009053616	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.004	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.54	(mg/s)	6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	2.61	(mg/s)	30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.48	(mg/s)	0.48	(mg/s)	0.48	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.19	(mg/s)	0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.13	(mg/s)	1.54	(mg/s)	1.54	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.09	(mg/s)	1.03	(mg/s)	1.03	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.10	(mg/s)	0.65	(mg/s)	6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.80	(mg/s)	6.50	(mg/s)	39.25	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.004	(mg/L)	0.002	(mg/L)	0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.004	(mg/L)	0.002	(mg/L)	0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Fluoride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.63E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.385	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		35.69	(mg/s)		405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)		9.37	(mg/s)		9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.93	(mg/s)		0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		174.13	(mg/s)		1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	45.87	(mg/s)		45.87	(mg/s)		45.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		7.04	(mg/s)		7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	8.23	(mg/s)		95.87	(mg/s)		95.87	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	1.41	(mg/s)		1.41	(mg/s)		1.41	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	29.98	(mg/s)		349.17	(mg/s)		349.17	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	9.37	(mg/s)		45.99	(mg/s)		415.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	94.86	(mg/s)		719.47	(mg/s)		2,902.96	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.385	(mg/L)		0.118	(mg/L)		0.102	(mg/L)
	concentration in river at PM-13	C_r13 =	0.533	(mg/L)		0.266	(mg/L)		0.118	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Iron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	3.86E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.035	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,034.90	(mg/s)		11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)		0.85	(mg/s)		0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		27.08	(mg/s)		27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		5,049.77	(mg/s)		57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	4.17	(mg/s)		4.17	(mg/s)		4.17	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		2.13	(mg/s)		2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.56	(mg/s)		6.57	(mg/s)		6.57	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.20	(mg/s)		0.20	(mg/s)		0.20	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	88.86	(mg/s)		1,034.88	(mg/s)		1,034.88	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.85	(mg/s)		1,062.84	(mg/s)		11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	94.64	(mg/s)		7,160.55	(mg/s)		70,481.66	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.035	(mg/L)		2.721	(mg/L)		2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	0.532	(mg/L)		2.649	(mg/L)		2.872	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 15
Parameter	Hardness

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	2.55E+02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8.61E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	87.5	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	24,980.41	(mg/s)	283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)	2,129.58	(mg/s)	2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	653.73	(mg/s)	653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	121,890.93	(mg/s)	1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	10,425.01	(mg/s)	10,425.01	(mg/s)	10,425.01	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	53,090.84	(mg/s)	53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3,722.89	(mg/s)	43,358.02	(mg/s)	43,358.02	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	4,252.38	(mg/s)	4,252.38	(mg/s)	4,252.38	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	8,444.89	(mg/s)	98,352.01	(mg/s)	98,352.01	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,129.58	(mg/s)	27,763.72	(mg/s)	286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	28,974.75	(mg/s)	359,132.91	(mg/s)	1,887,573.46	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	87.500	(mg/L)	71.091	(mg/L)	70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	162.839	(mg/L)	132.850	(mg/L)	76.924	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 15
Parameter	Potassium

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.68	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.60	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,320.39	(mg/s)		14,990	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)		38.94	(mg/s)		38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.89	(mg/s)		34.55	(mg/s)		0.89	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,442.81	(mg/s)		73,562	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	190.63	(mg/s)		190.63	(mg/s)		190.63	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		3,029.85	(mg/s)		34.55	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		1,137.30	(mg/s)		3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	97.65	(mg/s)		0.89	(mg/s)		1,137.30	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	150.29	(mg/s)		1,750.33	(mg/s)		1,750.33	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	39.83	(mg/s)		1,393.89	(mg/s)		15,030.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	478.40	(mg/s)		13,945.70	(mg/s)		94,734.70	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.637	(mg/L)		3.569	(mg/L)		3.679	(mg/l)
	concentration in river at PM-13	C_r13 =	2.689	(mg/L)		5.159	(mg/L)		3.861	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 15
Parameter	Magnesium

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	12.36	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	10.65	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,141.18	(mg/s)		24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)		259.20	(mg/s)		259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		56.03	(mg/s)		56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,447.79	(mg/s)		119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,268.87	(mg/s)		1,268.87	(mg/s)		1,268.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		15,261.91	(mg/s)		15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	180.69	(mg/s)		2,104.35	(mg/s)		2,104.35	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	105.20	(mg/s)		105.20	(mg/s)		105.20	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,353.39	(mg/s)		15,762.00	(mg/s)		15,762.00	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	259.20	(mg/s)		2,456.41	(mg/s)		24,623.80	(mg/s)
	mass flux in river at PM-13	M_r13 =	3,167.35	(mg/s)		47,406.54	(mg/s)		178,415.73	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	10.650	(mg/L)		6.290	(mg/L)		6.028	(mg/l)
	concentration in river at PM-13	C_r13 =	17.801	(mg/L)		17.537	(mg/L)		7.271	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Manganese**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.19	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.19	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		107.06	(mg/s)		1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)		4.58	(mg/s)		4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		2.80	(mg/s)		2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		522.39	(mg/s)		5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	22.40	(mg/s)		22.40	(mg/s)		22.40	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		27.31	(mg/s)		27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2.83	(mg/s)		33.00	(mg/s)		33.00	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	22.88	(mg/s)		266.49	(mg/s)		266.49	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	4.58	(mg/s)		114.44	(mg/s)		1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	52.69	(mg/s)		986.03	(mg/s)		7,536.49	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.188	(mg/L)		0.293	(mg/L)		0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.296	(mg/L)		0.365	(mg/L)		0.307	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 15
Parameter	Sodium

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.50	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.50	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.50	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	26.02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	4.90	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,249.02	(mg/s)		14,180	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)		119.26	(mg/s)		119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		32.69	(mg/s)		32.69	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,094.55	(mg/s)		69,586	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	583.80	(mg/s)		583.80	(mg/s)		583.80	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		6,729.88	(mg/s)		6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	380.42	(mg/s)		4,430.53	(mg/s)		4,430.53	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	125.94	(mg/s)		125.94	(mg/s)		125.94	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	857.06	(mg/s)		9,981.63	(mg/s)		9,981.63	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	119.26	(mg/s)		1,400.96	(mg/s)		14,331.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	2,066.48	(mg/s)		29,347.29	(mg/s)		105,769.32	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	4.900	(mg/L)		3.587	(mg/L)		3.508	(mg/l)
	concentration in river at PM-13	C_r13 =	11.614	(mg/L)		10.856	(mg/L)		4.310	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Nickel**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.022174447	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.007	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.43	(mg/s)		5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.09	(mg/s)		24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.83	(mg/s)		0.83	(mg/s)		0.83	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.29	(mg/s)		0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.32	(mg/s)		3.78	(mg/s)		3.78	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.05	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.13	(mg/s)		1.55	(mg/s)		1.55	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.17	(mg/s)		0.61	(mg/s)		5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.51	(mg/s)		9.20	(mg/s)		35.40	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.007	(mg/L)		0.002	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.008	(mg/L)		0.003	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 15
Parameter	Lead

Input concentration data	concentration of surface water into PM-12	C_s12 =	0	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.002700416	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0012	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.14	(mg/s)	0.14	(mg/s)	0.14	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.02	(mg/s)	0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.04	(mg/s)	0.46	(mg/s)	0.46	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)	0.27	(mg/s)	0.27	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.24	(mg/s)	0.92	(mg/s)	0.92	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Antimony**

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	9.29E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.50E-03	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.01	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.03	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.18	(mg/s)	0.18	(mg/s)	0.18	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.14	(mg/s)	1.58	(mg/s)	1.58	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)	0.06	(mg/s)	0.06	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)	0.04	(mg/s)	0.12	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.36	(mg/s)	1.91	(mg/s)	2.35	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)	0.001	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 15
Parameter	Selenium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001534421	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00295	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.11	(mg/s)	1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.52	(mg/s)	6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.35	(mg/s)	0.35	(mg/s)	0.35	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.09	(mg/s)	0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)	0.26	(mg/s)	0.26	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.18	(mg/s)	1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.49	(mg/s)	1.68	(mg/s)	8.23	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.003	(mg/L)	0.001	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Sulfate**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	183.93	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	8.50	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,427.45	(mg/s)		16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)		206.87	(mg/s)		206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		37.36	(mg/s)		37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,965.20	(mg/s)		79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,012.72	(mg/s)		1,012.72	(mg/s)		1,012.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		58,922.60	(mg/s)		58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2,688.59	(mg/s)		31,312.16	(mg/s)		31,312.16	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	3,628.60	(mg/s)		3,628.60	(mg/s)		3,628.60	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	2,947.78	(mg/s)		34,330.84	(mg/s)		34,330.84	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	206.87	(mg/s)		1,671.68	(mg/s)		16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	10,484.55	(mg/s)		137,843.80	(mg/s)		225,183.26	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	8.500	(mg/L)		4.280	(mg/L)		4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	58.924	(mg/L)		50.991	(mg/L)		9.177	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Thallium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001032291	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000004	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.35	(mg/s)		4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)		0.18	(mg/s)		0.18	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.07	(mg/s)		0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.02	(mg/s)		0.68	(mg/s)		5.04	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Zinc**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.066565637	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0115	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5.71	(mg/s)		65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)		0.28	(mg/s)		0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		27.86	(mg/s)		318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1.37	(mg/s)		1.37	(mg/s)		1.37	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.97	(mg/s)		11.33	(mg/s)		11.33	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.28	(mg/s)		3.23	(mg/s)		3.23	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.28	(mg/s)		6.14	(mg/s)		65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	2.91	(mg/s)		50.11	(mg/s)		399.47	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.012	(mg/L)		0.016	(mg/L)		0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.016	(mg/L)		0.019	(mg/L)		0.016	(mg/L)

Appendix F.13
Embarrass River
Geotechnical Mitigation
Year 20

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

FLOWS

Case Flows	Year 20 Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	0.86	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	6.29	(cfs)	PM-13
	flow check	Q_ck_L =	6.29	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.00	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.00	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	0.54	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.02	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	0.66	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Year 20 Average Flow Conditions (mean annual)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12
	flow in river at PM-13	Q_r13_M =	95.97	(cfs)	PM-13
	flow check	Q_ck_M =	95.97	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	6.46	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.02	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_M =	7.96	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13

Case Flow	Year 20 High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	867.52	(cfs)	PM-13
	flow check	Q_ck_H =	867.52	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	6.46	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.02	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	7.96	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 20
Parameter	Silver

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00095	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000008	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.19	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.02	(mg/s)		0.44	(mg/s)		2.84	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 20
Parameter	Aluminum

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.88E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.025	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		35.69	(mg/s)		405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)		0.61	(mg/s)		0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.93	(mg/s)		0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		174.13	(mg/s)		1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.98	(mg/s)		2.98	(mg/s)		2.98	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.75	(mg/s)		0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.05	(mg/s)		12.58	(mg/s)		12.58	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.10	(mg/s)		0.10	(mg/s)		0.10	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	29.59	(mg/s)		355.65	(mg/s)		355.65	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.61	(mg/s)		37.23	(mg/s)		406.69	(mg/s)
	mass flux in river at PM-13	M_r13 =	34.33	(mg/s)		583.41	(mg/s)		2,766.90	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.025	(mg/L)		0.095	(mg/L)		0.100	(mg/L)
	concentration in river at PM-13	C_r13 =	0.193	(mg/L)		0.215	(mg/L)		0.113	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 20
Parameter	Arsenic

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.007453418	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00273	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.27	(mg/s)		3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1.31	(mg/s)		15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.33	(mg/s)		0.33	(mg/s)		0.33	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.11	(mg/s)		1.36	(mg/s)		1.36	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.05	(mg/s)		0.65	(mg/s)		0.65	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)		0.34	(mg/s)		3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.56	(mg/s)		4.07	(mg/s)		20.44	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)		0.001	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.003	(mg/L)		0.001	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Boron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.158659552	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0212	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		4.28	(mg/s)		49	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)		0.52	(mg/s)		0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.11	(mg/s)		0.11	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		20.90	(mg/s)		239	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.53	(mg/s)		2.53	(mg/s)		2.53	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		7.41	(mg/s)		7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2.41	(mg/s)		29.01	(mg/s)		29.01	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.06	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	6.19	(mg/s)		74.34	(mg/s)		74.34	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.52	(mg/s)		4.91	(mg/s)		49.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	11.70	(mg/s)		139.15	(mg/s)		401.17	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.021	(mg/L)		0.013	(mg/L)		0.012	(mg/L)
	concentration in river at PM-13	C_r13 =	0.066	(mg/L)		0.051	(mg/L)		0.016	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 20
Parameter	Barium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.40E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0681	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	3.93	(mg/s)	45	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)	1.66	(mg/s)	1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	19.15	(mg/s)	219	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	8.11	(mg/s)	8.11	(mg/s)	8.11	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.82	(mg/s)	9.87	(mg/s)	9.87	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1.74	(mg/s)	20.95	(mg/s)	20.95	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.66	(mg/s)	5.69	(mg/s)	46.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	12.34	(mg/s)	64.02	(mg/s)	304.21	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.068	(mg/L)	0.015	(mg/L)	0.011	(mg/L)
	concentration in river at PM-13	C_r13 =	0.069	(mg/L)	0.024	(mg/L)	0.012	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 20
Parameter	Beryllium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000472927	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000023	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.17	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.02	(mg/s)		0.48	(mg/s)		2.66	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 20
Parameter	Calcium

Input concentration data	concentration of surface water into PM-12	C_s12 =	13	(mg/L)
	concentration of surface water into PM-13	C_s13 =	13	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	13	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	65.23766506	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	19	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	4,639.22	(mg/s)	52,669	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)	462.42	(mg/s)	462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	121.41	(mg/s)	121.41	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	22,636.89	(mg/s)	258,461	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2,263.72	(mg/s)	2,263.72	(mg/s)	2,263.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	5,369.83	(mg/s)	5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	992.61	(mg/s)	11,928.83	(mg/s)	11,928.83	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	227.25	(mg/s)	227.25	(mg/s)	227.25	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,120.56	(mg/s)	13,466.52	(mg/s)	32.66	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	462.42	(mg/s)	5,223.05	(mg/s)	53,252.39	(mg/s)
	mass flux in river at PM-13	M_r13 =	5,066.56	(mg/s)	61,116.09	(mg/s)	331,535.47	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	19.000	(mg/L)	13.374	(mg/l)	13.036	(mg/l)
	concentration in river at PM-13	C_r13 =	28.466	(mg/L)	22.503	(mg/l)	13.504	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 20
Parameter	Cadmium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000503271	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0003	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.03	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.14	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)	0.09	(mg/s)	0.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)	0.04	(mg/s)	0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.05	(mg/s)	0.35	(mg/s)	2.10	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 20
Parameter	Chloride

Input concentration data	concentration of surface water into PM-12	C_s12 =	10	(mg/L)
	concentration of surface water into PM-13	C_s13 =	10	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	10	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.85E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.8	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	3,568.63	(mg/s)	40,514	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)	43.81	(mg/s)	43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	93.39	(mg/s)	93.39	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	17,412.99	(mg/s)	198,816	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	214.46	(mg/s)	214.46	(mg/s)	214.46	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	335.09	(mg/s)	335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	89.08	(mg/s)	1,070.58	(mg/s)	1,070.58	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	961.45	(mg/s)	961.45	(mg/s)	961.45	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	403.76	(mg/s)	4,852.27	(mg/s)	4,852.27	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	43.81	(mg/s)	3,705.83	(mg/s)	40,651.48	(mg/s)
	mass flux in river at PM-13	M_r13 =	1,712.56	(mg/s)	28,552.66	(mg/s)	246,901.31	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.800	(mg/L)	9.489	(mg/L)	9.951	(mg/L)
	concentration in river at PM-13	C_r13 =	9.622	(mg/L)	10.513	(mg/L)	10.057	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 20
Parameter	Cobalt

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00218589	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0011	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.21	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.04	(mg/s)	12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.13	(mg/s)	0.13	(mg/s)	0.13	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.03	(mg/s)	0.40	(mg/s)	0.40	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.03	(mg/s)	0.35	(mg/s)	0.35	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)	0.25	(mg/s)	2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.22	(mg/s)	2.21	(mg/s)	15.31	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)	0.001	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 20
Parameter	Copper

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.011428793	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.004	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.54	(mg/s)	6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	2.61	(mg/s)	30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.48	(mg/s)	0.48	(mg/s)	0.48	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.19	(mg/s)	0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.17	(mg/s)	2.09	(mg/s)	2.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.09	(mg/s)	1.03	(mg/s)	1.03	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.10	(mg/s)	0.65	(mg/s)	6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.83	(mg/s)	7.05	(mg/s)	39.80	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.004	(mg/L)	0.002	(mg/L)	0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.005	(mg/L)	0.003	(mg/L)	0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Fluoride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.99E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.385	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		35.69	(mg/s)		405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)		9.37	(mg/s)		9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.93	(mg/s)		0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		174.13	(mg/s)		1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	45.87	(mg/s)		45.87	(mg/s)		45.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		7.04	(mg/s)		7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	9.12	(mg/s)		109.60	(mg/s)		109.60	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	1.56	(mg/s)		1.56	(mg/s)		1.56	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	29.05	(mg/s)		349.17	(mg/s)		349.17	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	9.37	(mg/s)		45.99	(mg/s)		415.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	94.97	(mg/s)		733.35	(mg/s)		2,916.84	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.385	(mg/L)		0.118	(mg/L)		0.102	(mg/L)
	concentration in river at PM-13	C_r13 =	0.534	(mg/L)		0.270	(mg/L)		0.119	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Iron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	2.17E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.035	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,034.90	(mg/s)		11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)		0.85	(mg/s)		0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		27.08	(mg/s)		27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		5,049.77	(mg/s)		57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	4.17	(mg/s)		4.17	(mg/s)		4.17	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		2.13	(mg/s)		2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.33	(mg/s)		3.97	(mg/s)		3.97	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.22	(mg/s)		0.22	(mg/s)		0.22	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	86.11	(mg/s)		1,034.88	(mg/s)		1,034.88	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.85	(mg/s)		1,062.84	(mg/s)		11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	91.68	(mg/s)		7,157.97	(mg/s)		70,479.08	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.035	(mg/L)		2.721	(mg/L)		2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	0.515	(mg/L)		2.636	(mg/L)		2.871	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 20
Parameter	Hardness

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	2.18E+02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8.61E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	87.5	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		24,980.41	(mg/s)		283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)		2,129.58	(mg/s)		2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		653.73	(mg/s)		653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		121,890.93	(mg/s)		1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	10,425.01	(mg/s)		10,425.01	(mg/s)		10,425.01	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		53,090.84	(mg/s)		53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3,320.52	(mg/s)		39,904.86	(mg/s)		39,904.86	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	4,703.46	(mg/s)		4,703.46	(mg/s)		4,703.46	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	8,183.95	(mg/s)		98,352.01	(mg/s)		98,352.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,129.58	(mg/s)		27,763.72	(mg/s)		286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	28,762.52	(mg/s)		356,130.83	(mg/s)		1,884,571.38	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	87.500	(mg/L)		71.091	(mg/L)		70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	161.599	(mg/L)		131.125	(mg/L)		76.762	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 20
Parameter	Potassium

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.23	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.60	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,320.39	(mg/s)		14,990	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)		38.94	(mg/s)		38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.98	(mg/s)		0.98	(mg/s)		0.98	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,442.81	(mg/s)		73,562	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	190.63	(mg/s)		190.63	(mg/s)		190.63	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		34.55	(mg/s)		34.55	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		3,029.85	(mg/s)		3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	94.77	(mg/s)		1,138.87	(mg/s)		1,138.87	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	145.65	(mg/s)		1,750.33	(mg/s)		1,750.33	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	39.92	(mg/s)		1,360.32	(mg/s)		15,030.21	(mg/s)
	mass flux in river at PM-13	M_r13 =	470.97	(mg/s)		13,947.36	(mg/s)		94,736.36	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.640	(mg/L)		3.483	(mg/L)		3.679	(mg/l)
	concentration in river at PM-13	C_r13 =	2.646	(mg/L)		5.135	(mg/L)		3.859	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 20
Parameter	Magnesium

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	13.44	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	10.65	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,141.18	(mg/s)		24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)		259.20	(mg/s)		259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		56.03	(mg/s)		56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,447.79	(mg/s)		119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,268.87	(mg/s)		1,268.87	(mg/s)		1,268.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		15,261.91	(mg/s)		15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	204.46	(mg/s)		2,457.15	(mg/s)		2,457.15	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	116.36	(mg/s)		116.36	(mg/s)		116.36	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,311.57	(mg/s)		15,762.00	(mg/s)		15,762.00	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	259.20	(mg/s)		2,456.41	(mg/s)		24,623.80	(mg/s)
	mass flux in river at PM-13	M_r13 =	3,160.46	(mg/s)		47,770.50	(mg/s)		178,779.69	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	10.650	(mg/L)		6.290	(mg/l)		6.028	(mg/l)
	concentration in river at PM-13	C_r13 =	17.757	(mg/L)		17.589	(mg/l)		7.282	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 20
Parameter	Manganese

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.23	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.19	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		107.06	(mg/s)		1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)		4.58	(mg/s)		4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		2.80	(mg/s)		2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		522.39	(mg/s)		5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	22.40	(mg/s)		22.40	(mg/s)		22.40	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		27.31	(mg/s)		27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3.51	(mg/s)		42.20	(mg/s)		42.20	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	22.18	(mg/s)		266.49	(mg/s)		266.49	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	4.58	(mg/s)		114.44	(mg/s)		1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	52.66	(mg/s)		995.23	(mg/s)		7,545.69	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.188	(mg/L)		0.293	(mg/l)		0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.296	(mg/L)		0.366	(mg/l)		0.307	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 20
Parameter	Sodium

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.50	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.50	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.50	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	22.22	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	4.90	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,249.02	(mg/s)		14,180	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)		119.26	(mg/s)		119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		32.69	(mg/s)		32.69	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,094.55	(mg/s)		69,586	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	583.80	(mg/s)		583.80	(mg/s)		583.80	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		6,729.88	(mg/s)		6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	338.03	(mg/s)		4,062.28	(mg/s)		4,062.28	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	139.30	(mg/s)		139.30	(mg/s)		139.30	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	830.58	(mg/s)		9,981.63	(mg/s)		9,981.63	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	119.26	(mg/s)		1,400.96	(mg/s)		14,331.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	2,010.96	(mg/s)		28,992.40	(mg/s)		105,414.43	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	4.900	(mg/L)		3.587	(mg/l)		3.508	(mg/l)
	concentration in river at PM-13	C_r13 =	11.298	(mg/L)		10.675	(mg/l)		4.294	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Nickel**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.023571036	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.007	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.43	(mg/s)		5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.09	(mg/s)		24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.83	(mg/s)		0.83	(mg/s)		0.83	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.29	(mg/s)		0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.36	(mg/s)		4.31	(mg/s)		4.31	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.05	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.13	(mg/s)		1.55	(mg/s)		1.55	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.17	(mg/s)		0.61	(mg/s)		5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.55	(mg/s)		9.74	(mg/s)		35.94	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.007	(mg/L)		0.002	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.009	(mg/L)		0.004	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 20
Parameter	Lead

Input concentration data	concentration of surface water into PM-12	C_s12 =	0	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.002295615	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0012	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.14	(mg/s)		0.14	(mg/s)		0.14	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.03	(mg/s)		0.42	(mg/s)		0.42	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)		0.27	(mg/s)		0.27	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.23	(mg/s)		0.88	(mg/s)		0.88	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 20
Parameter	Antimony

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	8.78E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.50E-03	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.01	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.03	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.18	(mg/s)	0.18	(mg/s)	0.18	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.13	(mg/s)	1.61	(mg/s)	1.61	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)	0.06	(mg/s)	0.06	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)	0.04	(mg/s)	0.12	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.36	(mg/s)	1.94	(mg/s)	2.37	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)	0.001	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 20
Parameter	Selenium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001434159	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00295	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.11	(mg/s)	1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.52	(mg/s)	6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.35	(mg/s)	0.35	(mg/s)	0.35	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.09	(mg/s)	0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)	0.26	(mg/s)	0.26	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.18	(mg/s)	1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.50	(mg/s)	1.68	(mg/s)	8.23	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.003	(mg/L)	0.001	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Sulfate**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	163.33	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	8.50	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,427.45	(mg/s)		16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)		206.87	(mg/s)		206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		37.36	(mg/s)		37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,965.20	(mg/s)		79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,012.72	(mg/s)		1,012.72	(mg/s)		1,012.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		58,922.60	(mg/s)		58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2,485.06	(mg/s)		29,864.60	(mg/s)		29,864.60	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	4,013.51	(mg/s)		4,013.51	(mg/s)		4,013.51	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	2,856.70	(mg/s)		34,330.84	(mg/s)		34,330.84	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	206.87	(mg/s)		1,671.68	(mg/s)		16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	10,574.86	(mg/s)		136,781.15	(mg/s)		224,120.61	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	8.500	(mg/L)		4.280	(mg/l)		4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	59.414	(mg/L)		50.362	(mg/l)		9.129	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Thallium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001001115	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000004	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.35	(mg/s)		4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)		0.18	(mg/s)		0.18	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.07	(mg/s)		0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.02	(mg/s)		0.68	(mg/s)		5.05	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 20
Parameter	Zinc

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.058688337	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0115	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5.71	(mg/s)		65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)		0.28	(mg/s)		0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		27.86	(mg/s)		318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1.37	(mg/s)		1.37	(mg/s)		1.37	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.89	(mg/s)		10.73	(mg/s)		10.73	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.27	(mg/s)		3.23	(mg/s)		3.23	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.28	(mg/s)		6.14	(mg/s)		65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	2.82	(mg/s)		49.51	(mg/s)		398.87	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.012	(mg/L)		0.016	(mg/L)		0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.016	(mg/L)		0.018	(mg/L)		0.016	(mg/L)

Appendix F.14
Embarrass River
Geotechnical Mitigation
Closure

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

FLOWS

Case Flows	Closure Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	0.86	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	6.27	(cfs)	PM-13
	flow check	Q_ck_L =	6.27	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.00	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.00	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	0.41	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	0.79	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Closure Average Flow Conditions (mean annual)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12
	flow in river at PM-13	Q_r13_M =	86.63	(cfs)	PM-13
	flow check	Q_ck_M =	86.63	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	1.73	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_M =	3.37	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13

Case Flow	Closure High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	858.18	(cfs)	PM-13
	flow check	Q_ck_H =	858.18	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	1.73	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	3.37	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Closure
Parameter	Silver

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00124	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000008	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.19	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.02	(mg/s)		0.31	(mg/s)		2.71	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Closure
Parameter	Aluminum

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.15E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.025	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		35.69	(mg/s)		405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)		0.61	(mg/s)		0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.93	(mg/s)		0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		174.13	(mg/s)		1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.98	(mg/s)		2.98	(mg/s)		2.98	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.75	(mg/s)		0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	7.09	(mg/s)		30.13	(mg/s)		30.13	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	35.42	(mg/s)		150.57	(mg/s)		150.57	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.61	(mg/s)		37.23	(mg/s)		406.69	(mg/s)
	mass flux in river at PM-13	M_r13 =	46.10	(mg/s)		395.79	(mg/s)		2,579.28	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.025	(mg/L)		0.095	(mg/L)		0.100	(mg/L)
	concentration in river at PM-13	C_r13 =	0.260	(mg/L)		0.161	(mg/L)		0.106	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Closure
Parameter	Arsenic

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.027915158	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00273	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.27	(mg/s)	3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.31	(mg/s)	15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.33	(mg/s)	0.33	(mg/s)	0.33	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.32	(mg/s)	1.37	(mg/s)	1.37	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.07	(mg/s)	0.28	(mg/s)	0.28	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.34	(mg/s)	3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.78	(mg/s)	3.69	(mg/s)	20.07	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.004	(mg/L)	0.002	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Closure
Parameter	Boron

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.150573845	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0212	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	4.28	(mg/s)	49	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)	0.52	(mg/s)	0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.11	(mg/s)	0.11	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	20.90	(mg/s)	239	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.53	(mg/s)	2.53	(mg/s)	2.53	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	7.41	(mg/s)	7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.74	(mg/s)	7.38	(mg/s)	7.38	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	7.40	(mg/s)	31.47	(mg/s)	31.47	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.52	(mg/s)	4.91	(mg/s)	49.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	12.19	(mg/s)	74.59	(mg/s)	336.61	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.021	(mg/L)	0.013	(mg/L)	0.012	(mg/L)
	concentration in river at PM-13	C_r13 =	0.069	(mg/L)	0.030	(mg/L)	0.014	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Closure
Parameter	Barium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.95E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0681	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	3.93	(mg/s)	45	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)	1.66	(mg/s)	1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	19.15	(mg/s)	219	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	8.11	(mg/s)	8.11	(mg/s)	8.11	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.22	(mg/s)	0.95	(mg/s)	0.95	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	2.09	(mg/s)	8.87	(mg/s)	8.87	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.66	(mg/s)	5.69	(mg/s)	46.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	12.08	(mg/s)	43.02	(mg/s)	283.21	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.068	(mg/L)	0.015	(mg/L)	0.011	(mg/L)
	concentration in river at PM-13	C_r13 =	0.068	(mg/L)	0.018	(mg/L)	0.012	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Closure
Parameter	Beryllium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001323498	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000023	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.17	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.04	(mg/s)		0.36	(mg/s)		2.54	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Closure
Parameter	Calcium

Input concentration data	concentration of surface water into PM-12	C_s12 =	13	(mg/L)
	concentration of surface water into PM-13	C_s13 =	13	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	13	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	68.73996034	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	19	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	4,639.22	(mg/s)	52,669	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)	462.42	(mg/s)	462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	121.41	(mg/s)	121.41	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	22,636.89	(mg/s)	258,461	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2,263.72	(mg/s)	2,263.72	(mg/s)	2,263.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	5,369.83	(mg/s)	5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	792.25	(mg/s)	3,367.90	(mg/s)	3,367.90	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	19.51	(mg/s)	19.51	(mg/s)	19.51	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,341.15	(mg/s)	5,701.28	(mg/s)	2.80	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	462.42	(mg/s)	5,223.05	(mg/s)	53,252.39	(mg/s)
	mass flux in river at PM-13	M_r13 =	4,879.05	(mg/s)	44,582.17	(mg/s)	322,736.94	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	19.000	(mg/L)	13.374	(mg/l)	13.036	(mg/l)
	concentration in river at PM-13	C_r13 =	27.489	(mg/L)	18.184	(mg/l)	13.289	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Closure
Parameter	Cadmium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001182282	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0003	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.03	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.14	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)		0.04	(mg/s)		0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.06	(mg/s)		0.29	(mg/s)		2.04	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Closure
Parameter	Chloride

Input concentration data	concentration of surface water into PM-12	C_s12 =	10	(mg/L)
	concentration of surface water into PM-13	C_s13 =	10	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	10	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	3.97E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.8	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	3,568.63	(mg/s)	40,514	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)	43.81	(mg/s)	43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	93.39	(mg/s)	93.39	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	17,412.99	(mg/s)	198,816	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	214.46	(mg/s)	214.46	(mg/s)	214.46	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	335.09	(mg/s)	335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	45.80	(mg/s)	194.68	(mg/s)	194.68	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	82.56	(mg/s)	82.56	(mg/s)	82.56	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	483.24	(mg/s)	2,054.29	(mg/s)	2,054.29	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	43.81	(mg/s)	3,705.83	(mg/s)	40,651.48	(mg/s)
	mass flux in river at PM-13	M_r13 =	869.87	(mg/s)	23,999.89	(mg/s)	242,348.54	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.800	(mg/L)	9.489	(mg/L)	9.951	(mg/L)
	concentration in river at PM-13	C_r13 =	4.901	(mg/L)	9.789	(mg/L)	9.979	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Closure
Parameter	Cobalt

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.002707554	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0011	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.21	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.04	(mg/s)	12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.13	(mg/s)	0.13	(mg/s)	0.13	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.03	(mg/s)	0.13	(mg/s)	0.13	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.03	(mg/s)	0.15	(mg/s)	0.15	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)	0.25	(mg/s)	2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.22	(mg/s)	1.73	(mg/s)	14.84	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)	0.001	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Closure
Parameter	Copper

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.014116893	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.004	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.54	(mg/s)	6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	2.61	(mg/s)	30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.48	(mg/s)	0.48	(mg/s)	0.48	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.19	(mg/s)	0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.16	(mg/s)	0.69	(mg/s)	0.69	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.10	(mg/s)	0.43	(mg/s)	0.43	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.10	(mg/s)	0.65	(mg/s)	6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.84	(mg/s)	5.06	(mg/s)	37.81	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.004	(mg/L)	0.002	(mg/L)	0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.005	(mg/L)	0.002	(mg/L)	0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Closure
Parameter	Fluoride

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.14E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.385	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		35.69	(mg/s)		405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)		9.37	(mg/s)		9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.93	(mg/s)		0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		174.13	(mg/s)		1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	45.87	(mg/s)		45.87	(mg/s)		45.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		7.04	(mg/s)		7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	13.10	(mg/s)		55.70	(mg/s)		55.70	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.13	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	34.77	(mg/s)		147.83	(mg/s)		147.83	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	9.37	(mg/s)		45.99	(mg/s)		415.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	103.25	(mg/s)		476.69	(mg/s)		2,660.18	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.385	(mg/L)		0.118	(mg/L)		0.102	(mg/L)
	concentration in river at PM-13	C_r13 =	0.582	(mg/L)		0.194	(mg/L)		0.110	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Closure
Parameter	Iron

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	9.94E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.035	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,034.90	(mg/s)		11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)		0.85	(mg/s)		0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		27.08	(mg/s)		27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		5,049.77	(mg/s)		57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	4.17	(mg/s)		4.17	(mg/s)		4.17	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		2.13	(mg/s)		2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.15	(mg/s)		4.87	(mg/s)		4.87	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.02	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	103.06	(mg/s)		438.13	(mg/s)		438.13	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.85	(mg/s)		1,062.84	(mg/s)		11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	109.25	(mg/s)		6,561.92	(mg/s)		69,883.03	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.035	(mg/L)		2.721	(mg/L)		2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	0.616	(mg/L)		2.676	(mg/L)		2.877	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Closure
Parameter	Hardness

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	402	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8610	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	87.5	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	24,980.41	(mg/s)	283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)	2,129.58	(mg/s)	2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	653.73	(mg/s)	653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	121,890.93	(mg/s)	1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	10,425.01	(mg/s)	10,425.01	(mg/s)	10,425.01	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	53,090.84	(mg/s)	53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	4,633.95	(mg/s)	19,699.16	(mg/s)	19,699.16	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	403.90	(mg/s)	403.90	(mg/s)	403.90	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	9,794.98	(mg/s)	41,638.98	(mg/s)	41,638.98	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,129.58	(mg/s)	27,763.72	(mg/s)	286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	27,387.42	(mg/s)	274,912.54	(mg/s)	1,803,353.09	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	87.500	(mg/L)	71.091	(mg/L)	70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	154.306	(mg/L)	112.131	(mg/L)	74.253	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Closure
Parameter	Potassium

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	21.31	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.60	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,320.39	(mg/s)		14,990	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)		38.94	(mg/s)		38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.08	(mg/s)		0.08	(mg/s)		0.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,442.81	(mg/s)		73,562	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	190.63	(mg/s)		190.63	(mg/s)		190.63	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		34.55	(mg/s)		34.55	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		3,029.85	(mg/s)		3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	245.57	(mg/s)		1,043.93	(mg/s)		1,043.93	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	174.32	(mg/s)		741.03	(mg/s)		741.03	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	39.03	(mg/s)		1,359.42	(mg/s)		15,029.31	(mg/s)
	mass flux in river at PM-13	M_r13 =	649.54	(mg/s)		12,842.22	(mg/s)		93,631.22	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.603	(mg/L)		3.481	(mg/L)		3.679	(mg/l)
	concentration in river at PM-13	C_r13 =	3.660	(mg/L)		5.238	(mg/L)		3.855	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Closure
Parameter	Magnesium

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	55.96	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	10.65	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,141.18	(mg/s)		24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)		259.20	(mg/s)		259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		56.03	(mg/s)		56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,447.79	(mg/s)		119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,268.87	(mg/s)		1,268.87	(mg/s)		1,268.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		15,261.91	(mg/s)		15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	644.90	(mg/s)		2,741.51	(mg/s)		2,741.51	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	9.99	(mg/s)		9.99	(mg/s)		9.99	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,569.75	(mg/s)		6,673.11	(mg/s)		6,673.11	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	259.20	(mg/s)		2,456.41	(mg/s)		24,623.80	(mg/s)
	mass flux in river at PM-13	M_r13 =	3,752.72	(mg/s)		38,859.59	(mg/s)		169,868.78	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	10.650	(mg/L)		6.290	(mg/l)		6.028	(mg/l)
	concentration in river at PM-13	C_r13 =	21.144	(mg/L)		15.850	(mg/l)		6.994	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Closure
Parameter	Manganese

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.14	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.19	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		107.06	(mg/s)		1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)		4.58	(mg/s)		4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		2.80	(mg/s)		2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		522.39	(mg/s)		5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	22.40	(mg/s)		22.40	(mg/s)		22.40	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		27.31	(mg/s)		27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.65	(mg/s)		7.03	(mg/s)		7.03	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	26.54	(mg/s)		112.82	(mg/s)		112.82	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	4.58	(mg/s)		114.44	(mg/s)		1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	55.17	(mg/s)		806.39	(mg/s)		7,356.85	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.188	(mg/L)		0.293	(mg/l)		0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.311	(mg/L)		0.329	(mg/l)		0.303	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Closure
Parameter	Sodium

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.50	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.50	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.50	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	26.63	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	4.90	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,249.02	(mg/s)		14,180	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)		119.26	(mg/s)		119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		32.69	(mg/s)		32.69	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,094.55	(mg/s)		69,586	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	583.80	(mg/s)		583.80	(mg/s)		583.80	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		6,729.88	(mg/s)		6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	306.88	(mg/s)		1,304.55	(mg/s)		1,304.55	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	11.96	(mg/s)		11.96	(mg/s)		11.96	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	994.08	(mg/s)		4,225.89	(mg/s)		4,225.89	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	119.26	(mg/s)		1,400.96	(mg/s)		14,331.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	2,015.98	(mg/s)		20,351.60	(mg/s)		96,773.63	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	4.900	(mg/L)		3.587	(mg/l)		3.508	(mg/l)
	concentration in river at PM-13	C_r13 =	11.358	(mg/L)		8.301	(mg/l)		3.985	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Closure
Parameter	Nickel

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.005498724	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.007	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.43	(mg/s)		5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.09	(mg/s)		24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.83	(mg/s)		0.83	(mg/s)		0.83	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.29	(mg/s)		0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.06	(mg/s)		0.27	(mg/s)		0.27	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.15	(mg/s)		0.66	(mg/s)		0.66	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.17	(mg/s)		0.61	(mg/s)		5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.23	(mg/s)		4.76	(mg/s)		30.96	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.007	(mg/L)		0.002	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.007	(mg/L)		0.002	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Closure
Parameter	Lead

Input concentration data	concentration of surface water into PM-12	C_s12 =	0	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00095888	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0012	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.14	(mg/s)		0.14	(mg/s)		0.14	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.03	(mg/s)		0.11	(mg/s)		0.11	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.21	(mg/s)		0.35	(mg/s)		0.35	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Closure
Parameter	Antimony

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.16E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.50E-03	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.01	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.03	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.18	(mg/s)	0.18	(mg/s)	0.18	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)	0.06	(mg/s)	0.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)	0.02	(mg/s)	0.02	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)	0.04	(mg/s)	0.12	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.23	(mg/s)	0.35	(mg/s)	0.79	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Closure
Parameter	Selenium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.003346354	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00295	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.11	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.52	(mg/s)		6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.35	(mg/s)		0.35	(mg/s)		0.35	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.04	(mg/s)		0.16	(mg/s)		0.16	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)		0.10	(mg/s)		0.10	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)		0.18	(mg/s)		1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.49	(mg/s)		1.42	(mg/s)		7.97	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.003	(mg/L)		0.001	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Closure
Parameter	Sulfate

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	176.50	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	8.50	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,427.45	(mg/s)		16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)		206.87	(mg/s)		206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		37.36	(mg/s)		37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,965.20	(mg/s)		79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,012.72	(mg/s)		1,012.72	(mg/s)		1,012.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		58,922.60	(mg/s)		58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2,034.18	(mg/s)		8,647.39	(mg/s)		8,647.39	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	344.66	(mg/s)		344.66	(mg/s)		344.66	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,419.05	(mg/s)		14,534.54	(mg/s)		14,534.54	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	206.87	(mg/s)		1,671.68	(mg/s)		16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	7,017.47	(mg/s)		92,098.78	(mg/s)		179,438.24	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	8.500	(mg/L)		4.280	(mg/l)		4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	39.538	(mg/L)		37.565	(mg/l)		7.388	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Closure
Parameter	Thallium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000106288	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000004	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.07	(mg/s)	1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.35	(mg/s)	4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.00	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)	0.02	(mg/s)	0.02	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)	0.07	(mg/s)	0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.01	(mg/s)	0.48	(mg/s)	4.85	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Closure
Parameter	Zinc

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.012754048	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0115	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	5.71	(mg/s)	65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)	0.28	(mg/s)	0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.15	(mg/s)	0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	27.86	(mg/s)	318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1.37	(mg/s)	1.37	(mg/s)	1.37	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.17	(mg/s)	0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.15	(mg/s)	0.62	(mg/s)	0.62	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.32	(mg/s)	1.37	(mg/s)	1.37	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.28	(mg/s)	6.14	(mg/s)	65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	2.12	(mg/s)	37.53	(mg/s)	386.89	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.012	(mg/L)	0.016	(mg/L)	0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.012	(mg/L)	0.015	(mg/L)	0.016	(mg/L)

Appendix F.15
Embarrass River
Geotechnical Mitigation
Post-Closure

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

FLOWS

Case Flows	Post-Closure Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	0.86	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	6.27	(cfs)	PM-13
	flow check	Q_ck_L =	6.27	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.00	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.00	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	0.67	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	0.53	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Post-Closure Average Flow Conditions (mean annual)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12
	flow in river at PM-13	Q_r13_M =	84.61	(cfs)	PM-13
	flow check	Q_ck_M =	84.61	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	1.73	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_M =	1.35	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13

Case Flow	Post-Closure High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	856.16	(cfs)	PM-13
	flow check	Q_ck_H =	856.16	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	1.73	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	1.35	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Post-Closure
Parameter	Silver

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00124	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000008	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.19	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.03	(mg/s)		0.31	(mg/s)		2.71	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Post-Closure
Parameter	Aluminum

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.15E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.025	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	35.69	(mg/s)	405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)	0.61	(mg/s)	0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.93	(mg/s)	0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	174.13	(mg/s)	1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.98	(mg/s)	2.98	(mg/s)	2.98	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.75	(mg/s)	0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	11.73	(mg/s)	30.13	(mg/s)	30.13	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	23.49	(mg/s)	60.32	(mg/s)	60.32	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.61	(mg/s)	37.23	(mg/s)	406.69	(mg/s)
	mass flux in river at PM-13	M_r13 =	38.82	(mg/s)	305.54	(mg/s)	2,489.02	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.025	(mg/L)	0.095	(mg/L)	0.100	(mg/L)
	concentration in river at PM-13	C_r13 =	0.219	(mg/L)	0.128	(mg/L)	0.103	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Post-Closure
Parameter	Arsenic

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.027915158	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00273	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.27	(mg/s)		3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1.31	(mg/s)		15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.33	(mg/s)		0.33	(mg/s)		0.33	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.53	(mg/s)		1.37	(mg/s)		1.37	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.04	(mg/s)		0.11	(mg/s)		0.11	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)		0.34	(mg/s)		3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.97	(mg/s)		3.53	(mg/s)		19.90	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)		0.001	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.005	(mg/L)		0.001	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Boron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.150573845	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0212	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		4.28	(mg/s)		49	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)		0.52	(mg/s)		0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.11	(mg/s)		0.11	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		20.90	(mg/s)		239	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.53	(mg/s)		2.53	(mg/s)		2.53	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		7.41	(mg/s)		7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2.87	(mg/s)		7.38	(mg/s)		7.38	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	4.91	(mg/s)		12.61	(mg/s)		12.61	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.52	(mg/s)		4.91	(mg/s)		49.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	10.83	(mg/s)		55.73	(mg/s)		317.75	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.021	(mg/L)		0.013	(mg/L)		0.012	(mg/L)
	concentration in river at PM-13	C_r13 =	0.061	(mg/L)		0.023	(mg/L)		0.013	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Barium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.95E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0681	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		3.93	(mg/s)		45	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)		1.66	(mg/s)		1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.10	(mg/s)		0.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		19.15	(mg/s)		219	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	8.11	(mg/s)		8.11	(mg/s)		8.11	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.25	(mg/s)		0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.37	(mg/s)		0.95	(mg/s)		0.95	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1.38	(mg/s)		3.55	(mg/s)		3.55	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.66	(mg/s)		5.69	(mg/s)		46.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	11.53	(mg/s)		37.71	(mg/s)		277.89	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.068	(mg/L)		0.015	(mg/L)		0.011	(mg/L)
	concentration in river at PM-13	C_r13 =	0.065	(mg/L)		0.016	(mg/L)		0.011	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Beryllium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001323498	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000023	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.17	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.03	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.04	(mg/s)		0.31	(mg/s)		2.50	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Post-Closure
Parameter	Calcium

Input concentration data	concentration of surface water into PM-12	C_s12 =	13	(mg/L)
	concentration of surface water into PM-13	C_s13 =	13	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	13	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	68.73996034	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	19	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	4,639.22	(mg/s)	52,669	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)	462.42	(mg/s)	462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	121.41	(mg/s)	121.41	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	22,636.89	(mg/s)	258,461	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2,263.72	(mg/s)	2,263.72	(mg/s)	2,263.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	5,369.83	(mg/s)	5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,311.63	(mg/s)	3,367.90	(mg/s)	3,367.90	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	19.51	(mg/s)	19.51	(mg/s)	19.51	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	889.46	(mg/s)	2,283.89	(mg/s)	2.80	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	462.42	(mg/s)	5,223.05	(mg/s)	53,252.39	(mg/s)
	mass flux in river at PM-13	M_r13 =	4,946.75	(mg/s)	41,164.78	(mg/s)	322,736.94	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	19.000	(mg/L)	13.374	(mg/l)	13.036	(mg/l)
	concentration in river at PM-13	C_r13 =	27.871	(mg/L)	17.191	(mg/l)	13.320	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Post-Closure
Parameter	Cadmium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001182282	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0003	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.03	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.14	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)	0.06	(mg/s)	0.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)	0.04	(mg/s)	0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.07	(mg/s)	0.28	(mg/s)	2.03	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Post-Closure
Parameter	Chloride

Input concentration data	concentration of surface water into PM-12	C_s12 =	10	(mg/L)
	concentration of surface water into PM-13	C_s13 =	10	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	10	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	3.97E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.8	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	3,568.63	(mg/s)	40,514	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)	43.81	(mg/s)	43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	93.39	(mg/s)	93.39	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	17,412.99	(mg/s)	198,816	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	214.46	(mg/s)	214.46	(mg/s)	214.46	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	335.09	(mg/s)	335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	75.82	(mg/s)	194.68	(mg/s)	194.68	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	82.56	(mg/s)	82.56	(mg/s)	82.56	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	320.49	(mg/s)	822.94	(mg/s)	822.94	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	43.81	(mg/s)	3,705.83	(mg/s)	40,651.48	(mg/s)
	mass flux in river at PM-13	M_r13 =	737.14	(mg/s)	22,768.54	(mg/s)	241,117.19	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.800	(mg/L)	9.489	(mg/L)	9.951	(mg/L)
	concentration in river at PM-13	C_r13 =	4.153	(mg/L)	9.509	(mg/L)	9.951	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Post-Closure
Parameter	Cobalt

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.002707554	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0011	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.21	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.04	(mg/s)	12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.13	(mg/s)	0.13	(mg/s)	0.13	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.05	(mg/s)	0.13	(mg/s)	0.13	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)	0.06	(mg/s)	0.06	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)	0.25	(mg/s)	2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.23	(mg/s)	1.65	(mg/s)	14.75	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)	0.001	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Post-Closure
Parameter	Copper

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.014116893	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.004	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.54	(mg/s)	6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	2.61	(mg/s)	30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.48	(mg/s)	0.48	(mg/s)	0.48	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.19	(mg/s)	0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.27	(mg/s)	0.69	(mg/s)	0.69	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.07	(mg/s)	0.17	(mg/s)	0.17	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.10	(mg/s)	0.65	(mg/s)	6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.91	(mg/s)	4.80	(mg/s)	37.55	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.004	(mg/L)	0.002	(mg/L)	0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.005	(mg/L)	0.002	(mg/L)	0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Post-Closure
Parameter	Fluoride

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.1	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.1	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.1	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.14E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.385	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		35.69	(mg/s)		405	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)		9.37	(mg/s)		9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.93	(mg/s)		0.93	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		174.13	(mg/s)		1,988	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	45.87	(mg/s)		45.87	(mg/s)		45.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		7.04	(mg/s)		7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	21.69	(mg/s)		55.70	(mg/s)		55.70	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.13	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	23.06	(mg/s)		59.22	(mg/s)		59.22	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	9.37	(mg/s)		45.99	(mg/s)		415.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	100.13	(mg/s)		388.09	(mg/s)		2,571.57	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.385	(mg/L)		0.118	(mg/L)		0.102	(mg/L)
	concentration in river at PM-13	C_r13 =	0.564	(mg/L)		0.162	(mg/L)		0.106	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Iron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	9.94E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.035	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,034.90	(mg/s)		11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)		0.85	(mg/s)		0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		27.08	(mg/s)		27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		5,049.77	(mg/s)		57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	4.17	(mg/s)		4.17	(mg/s)		4.17	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		2.13	(mg/s)		2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.90	(mg/s)		4.87	(mg/s)		4.87	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.02	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	68.35	(mg/s)		175.51	(mg/s)		175.51	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.85	(mg/s)		1,062.84	(mg/s)		11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	75.29	(mg/s)		6,299.30	(mg/s)		69,620.41	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.035	(mg/L)		2.721	(mg/L)		2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	0.424	(mg/L)		2.631	(mg/L)		2.873	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Post-Closure
Parameter	Hardness

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	4.02E+02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8.61E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	87.5	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	24,980.41	(mg/s)	283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)	2,129.58	(mg/s)	2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	653.73	(mg/s)	653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	121,890.93	(mg/s)	1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	10,425.01	(mg/s)	10,425.01	(mg/s)	10,425.01	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	53,090.84	(mg/s)	53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	7,671.85	(mg/s)	19,699.16	(mg/s)	19,699.16	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	403.90	(mg/s)	403.90	(mg/s)	403.90	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	6,496.16	(mg/s)	16,680.30	(mg/s)	16,680.30	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,129.58	(mg/s)	27,763.72	(mg/s)	286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	27,126.50	(mg/s)	249,953.86	(mg/s)	1,778,394.41	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	87.500	(mg/L)	71.091	(mg/L)	70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	152.836	(mg/L)	104.385	(mg/L)	73.398	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Post-Closure
Parameter	Potassium

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	21.31	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.60	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,320.39	(mg/s)		14,990	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)		38.94	(mg/s)		38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.08	(mg/s)		0.08	(mg/s)		0.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,442.81	(mg/s)		73,562	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	190.63	(mg/s)		190.63	(mg/s)		190.63	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		34.55	(mg/s)		34.55	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		3,029.85	(mg/s)		3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	406.56	(mg/s)		1,043.93	(mg/s)		1,043.93	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	115.61	(mg/s)		296.85	(mg/s)		296.85	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	39.03	(mg/s)		1,359.42	(mg/s)		15,029.31	(mg/s)
	mass flux in river at PM-13	M_r13 =	751.82	(mg/s)		12,398.04	(mg/s)		93,187.04	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.603	(mg/L)		3.481	(mg/L)		3.679	(mg/l)
	concentration in river at PM-13	C_r13 =	4.236	(mg/L)		5.178	(mg/L)		3.846	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Post-Closure
Parameter	Magnesium

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	55.96	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	10.65	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,141.18	(mg/s)		24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)		259.20	(mg/s)		259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		56.03	(mg/s)		56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,447.79	(mg/s)		119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,268.87	(mg/s)		1,268.87	(mg/s)		1,268.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		15,261.91	(mg/s)		15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,067.68	(mg/s)		2,741.51	(mg/s)		2,741.51	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	9.99	(mg/s)		9.99	(mg/s)		9.99	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,041.08	(mg/s)		2,673.20	(mg/s)		2,673.20	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	259.20	(mg/s)		2,456.41	(mg/s)		24,623.80	(mg/s)
	mass flux in river at PM-13	M_r13 =	3,646.83	(mg/s)		34,859.69	(mg/s)		165,868.88	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	10.650	(mg/L)		6.290	(mg/l)		6.028	(mg/l)
	concentration in river at PM-13	C_r13 =	20.547	(mg/L)		14.558	(mg/l)		6.846	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Post-Closure
Parameter	Manganese

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.14	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.19	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		107.06	(mg/s)		1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)		4.58	(mg/s)		4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		2.80	(mg/s)		2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		522.39	(mg/s)		5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	22.40	(mg/s)		22.40	(mg/s)		22.40	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		27.31	(mg/s)		27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2.74	(mg/s)		7.03	(mg/s)		7.03	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	17.60	(mg/s)		45.20	(mg/s)		45.20	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	4.58	(mg/s)		114.44	(mg/s)		1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	47.32	(mg/s)		738.77	(mg/s)		7,289.23	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.188	(mg/L)		0.293	(mg/l)		0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.267	(mg/L)		0.309	(mg/l)		0.301	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Post-Closure
Parameter	Sodium

Input concentration data	concentration of surface water into PM-12	C_s12 =	3.50	(mg/L)
	concentration of surface water into PM-13	C_s13 =	3.50	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	3.50	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	26.63	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	4.90	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,249.02	(mg/s)		14,180	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)		119.26	(mg/s)		119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		32.69	(mg/s)		32.69	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,094.55	(mg/s)		69,586	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	583.80	(mg/s)		583.80	(mg/s)		583.80	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		6,729.88	(mg/s)		6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	508.06	(mg/s)		1,304.55	(mg/s)		1,304.55	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	11.96	(mg/s)		11.96	(mg/s)		11.96	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	659.29	(mg/s)		1,692.86	(mg/s)		1,692.86	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	119.26	(mg/s)		1,400.96	(mg/s)		14,331.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	1,882.37	(mg/s)		17,818.57	(mg/s)		94,240.60	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	4.900	(mg/L)		3.587	(mg/l)		3.508	(mg/l)
	concentration in river at PM-13	C_r13 =	10.606	(mg/L)		7.441	(mg/l)		3.890	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Nickel**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.005498724	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.007	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.43	(mg/s)	5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)	0.17	(mg/s)	0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	2.09	(mg/s)	24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.83	(mg/s)	0.83	(mg/s)	0.83	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.29	(mg/s)	0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.10	(mg/s)	0.27	(mg/s)	0.27	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.10	(mg/s)	0.26	(mg/s)	0.26	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.17	(mg/s)	0.61	(mg/s)	5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.22	(mg/s)	4.36	(mg/s)	30.56	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.007	(mg/L)	0.002	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.007	(mg/L)	0.002	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Post-Closure
Parameter	Lead

Input concentration data	concentration of surface water into PM-12	C_s12 =	0	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00095888	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0012	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.14	(mg/s)		0.14	(mg/s)		0.14	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.21	(mg/s)		0.28	(mg/s)		0.28	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Antimony**

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.16E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.50E-03	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.01	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.03	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.18	(mg/s)	0.18	(mg/s)	0.18	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)	0.06	(mg/s)	0.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)	0.04	(mg/s)	0.12	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.24	(mg/s)	0.34	(mg/s)	0.77	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Post-Closure
Parameter	Selenium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.003346354	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00295	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.11	(mg/s)	1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.52	(mg/s)	6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.35	(mg/s)	0.35	(mg/s)	0.35	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)	0.09	(mg/s)	0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.06	(mg/s)	0.16	(mg/s)	0.16	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.02	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.18	(mg/s)	1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.51	(mg/s)	1.35	(mg/s)	7.90	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.003	(mg/L)	0.001	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Sulfate**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	176.50	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	8.50	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,427.45	(mg/s)		16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)		206.87	(mg/s)		206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		37.36	(mg/s)		37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,965.20	(mg/s)		79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,012.72	(mg/s)		1,012.72	(mg/s)		1,012.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		58,922.60	(mg/s)		58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3,367.73	(mg/s)		8,647.39	(mg/s)		8,647.39	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	344.66	(mg/s)		344.66	(mg/s)		344.66	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	2,267.55	(mg/s)		5,822.44	(mg/s)		5,822.44	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	206.87	(mg/s)		1,671.68	(mg/s)		16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	7,199.53	(mg/s)		83,386.68	(mg/s)		170,726.14	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	8.500	(mg/L)		4.280	(mg/l)		4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	40.563	(mg/L)		34.824	(mg/l)		7.046	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Thallium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000106288	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000004	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.35	(mg/s)		4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.07	(mg/s)		0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.01	(mg/s)		0.47	(mg/s)		4.84	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Zinc**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.012754048	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0115	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5.71	(mg/s)		65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)		0.28	(mg/s)		0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	-	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		27.86	(mg/s)		318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1.37	(mg/s)		1.37	(mg/s)		1.37	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	-	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.24	(mg/s)		0.62	(mg/s)		0.62	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.21	(mg/s)		0.55	(mg/s)		0.55	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.28	(mg/s)		6.14	(mg/s)		65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	2.11	(mg/s)		36.71	(mg/s)		386.07	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.012	(mg/L)		0.016	(mg/L)		0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.012	(mg/L)		0.015	(mg/L)		0.016	(mg/L)

Appendix G

Culpability Analysis of Plant Site, Tailings Basin and Embarrass River Watershed

Tailings Basin - Proposed Action

G.1 Tailings Basin

G.2 Embarrass River Watershed

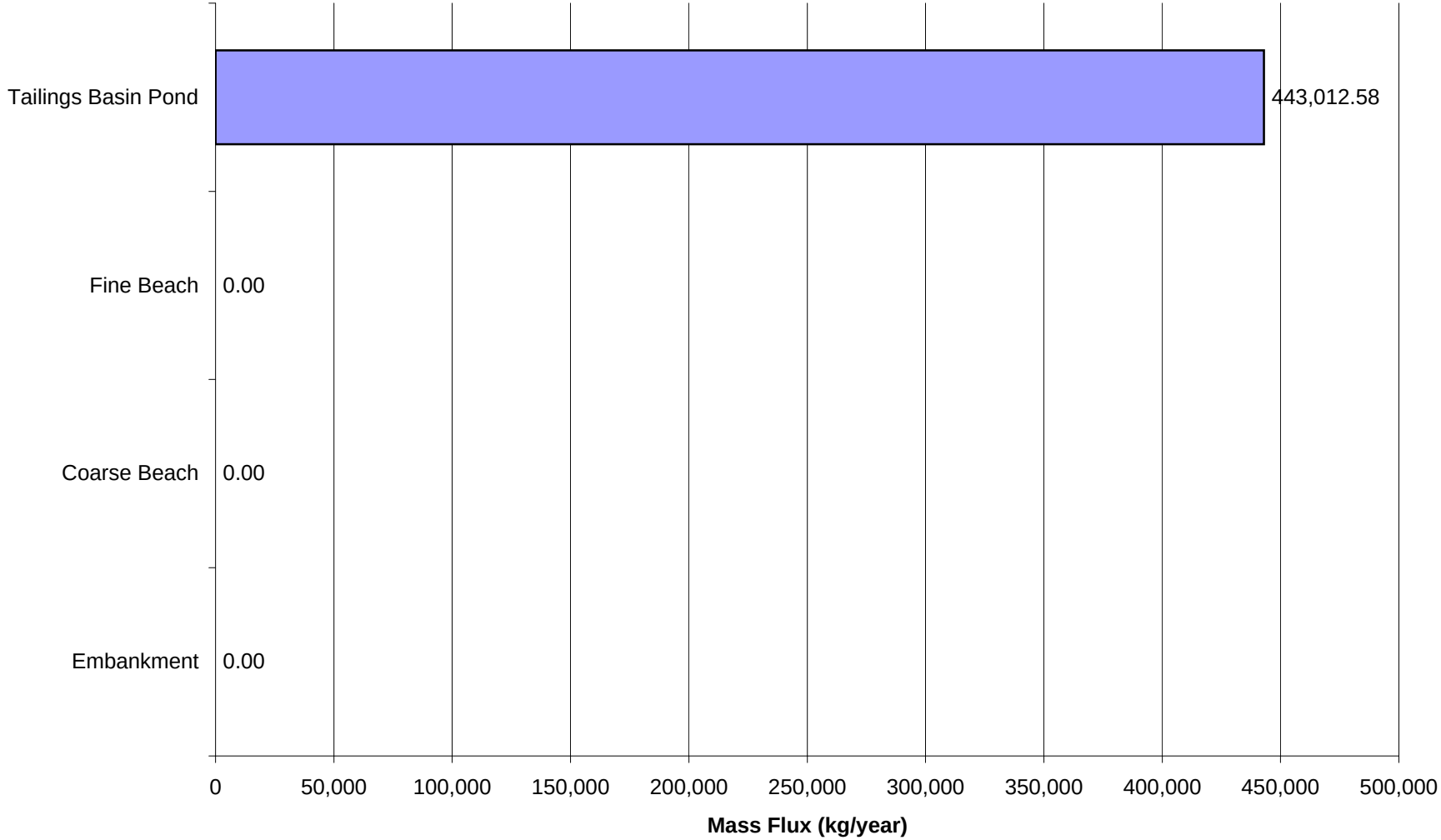
Tailings Basin - Geotechnical Mitigation

G.3 Tailings Basin

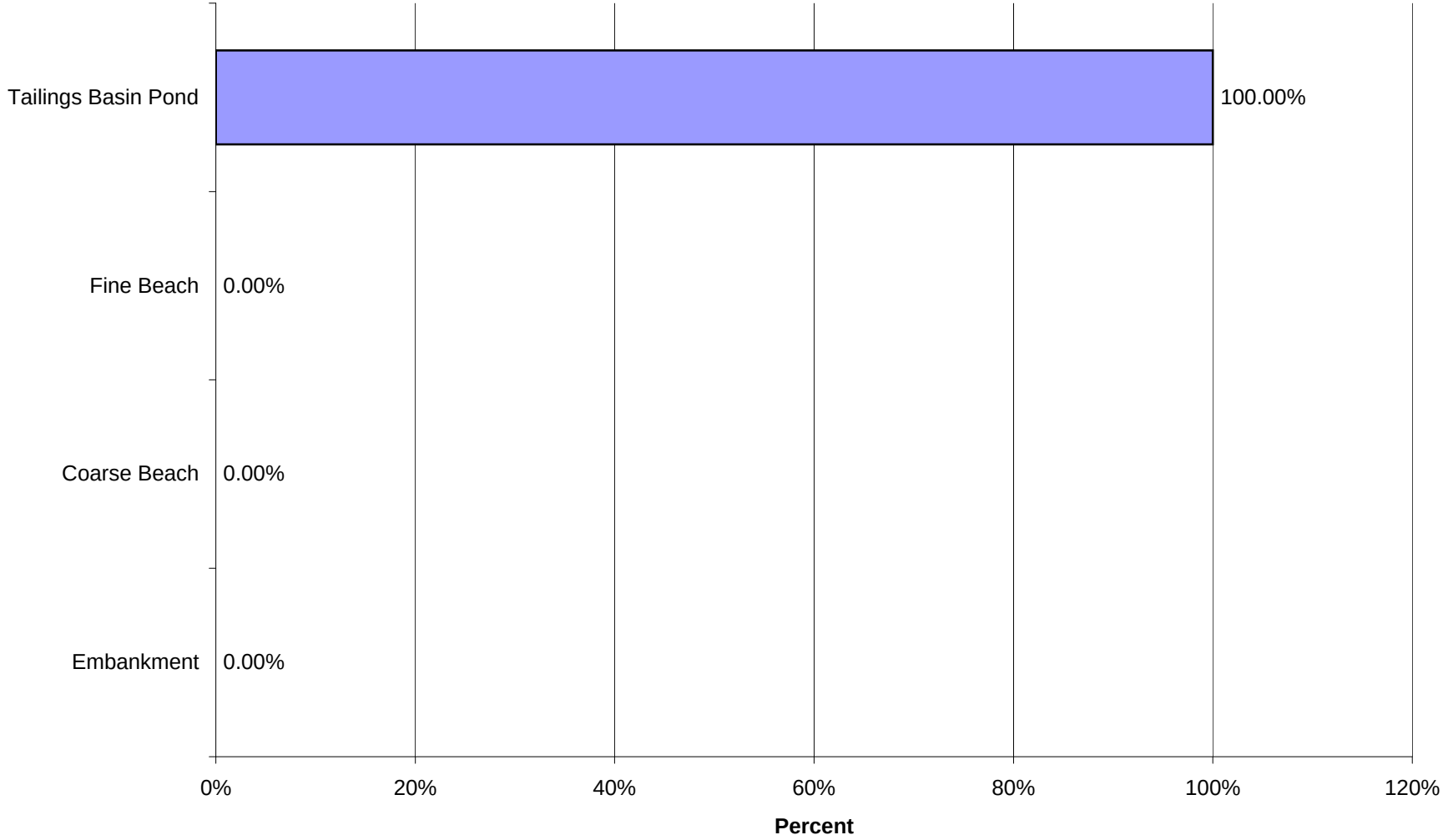
G.4 Embarrass River Watershed

Appendix G.1
Tailings Basin
Proposed Action

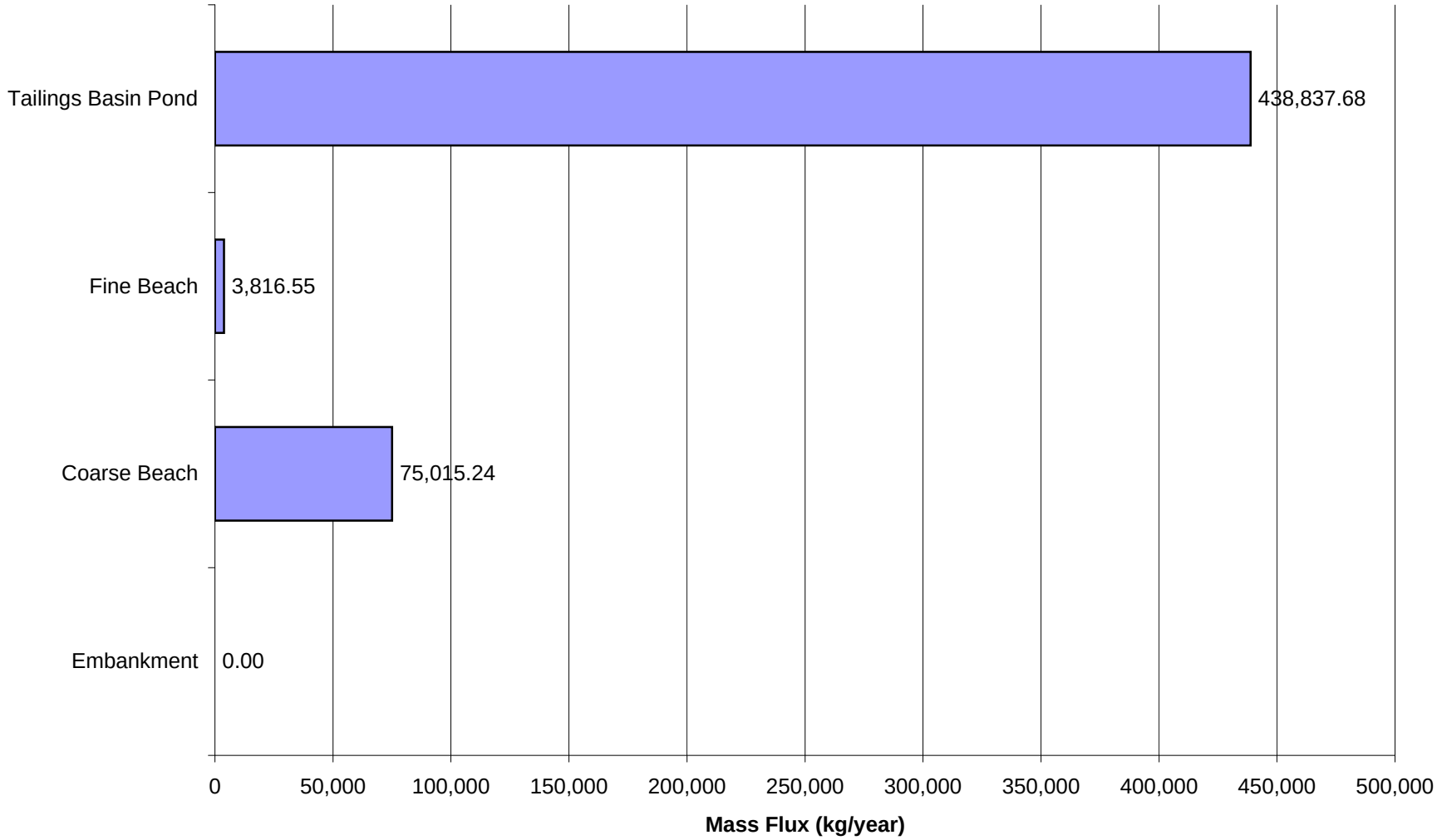
Proposed Action: Mass Flux (kg/year) of Tailings Basin Features in Year 1 for Sulfate (SO_4)



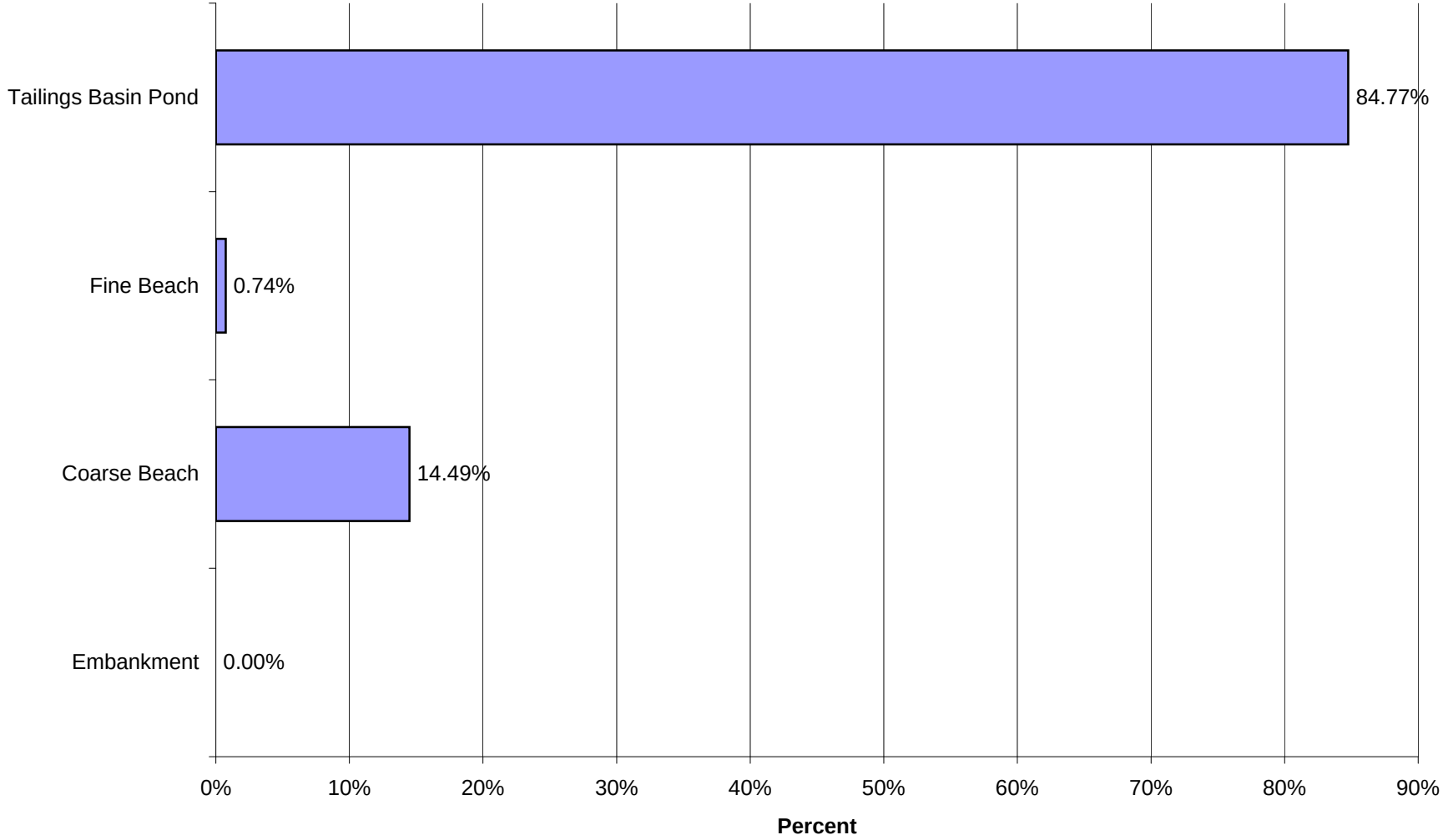
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 1 for Sulfate (SO_4)



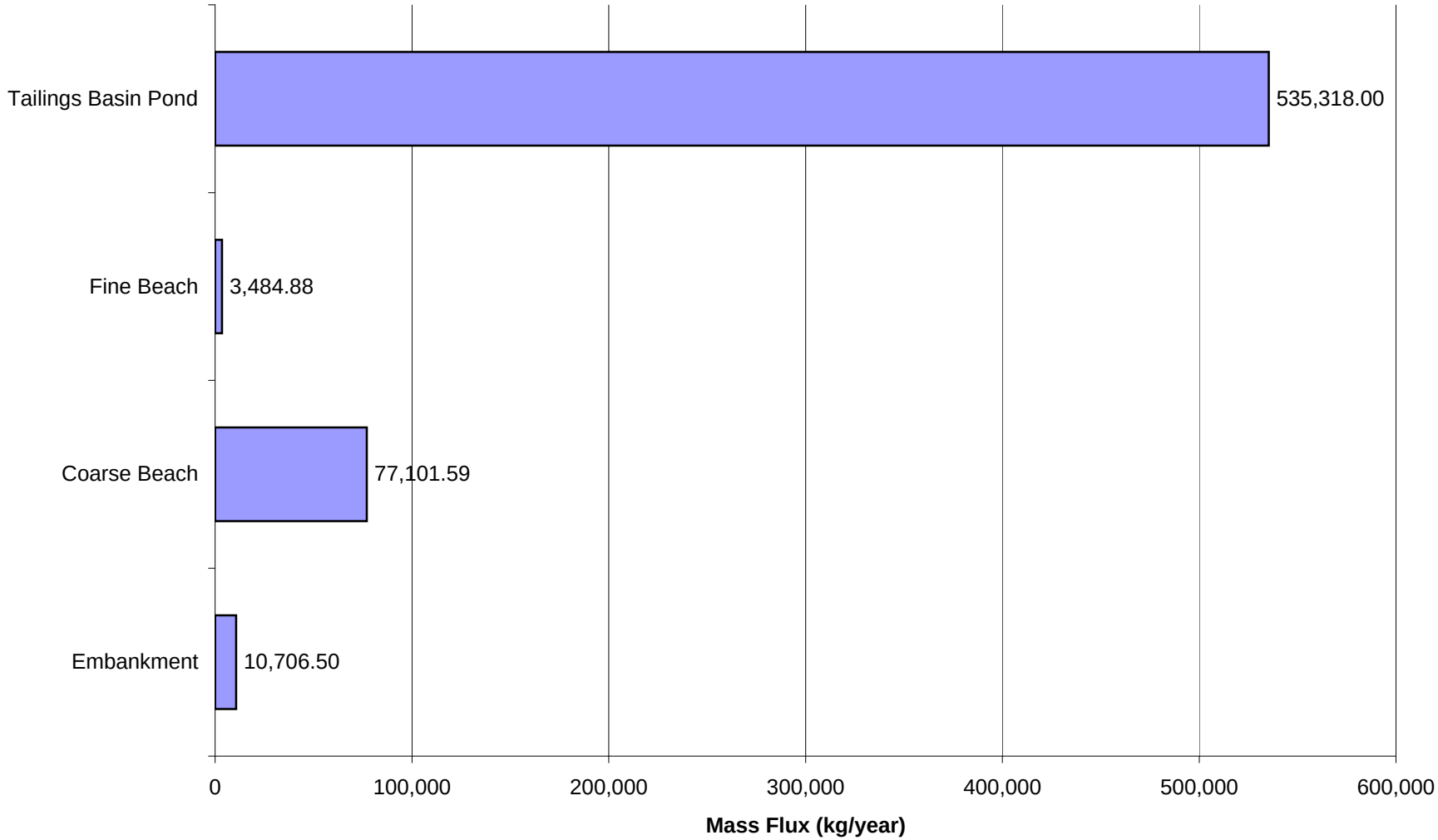
Proposed Action: Mass Flux (kg/year) of Tailings Basin Features in Year 5 for Sulfate (SO_4)



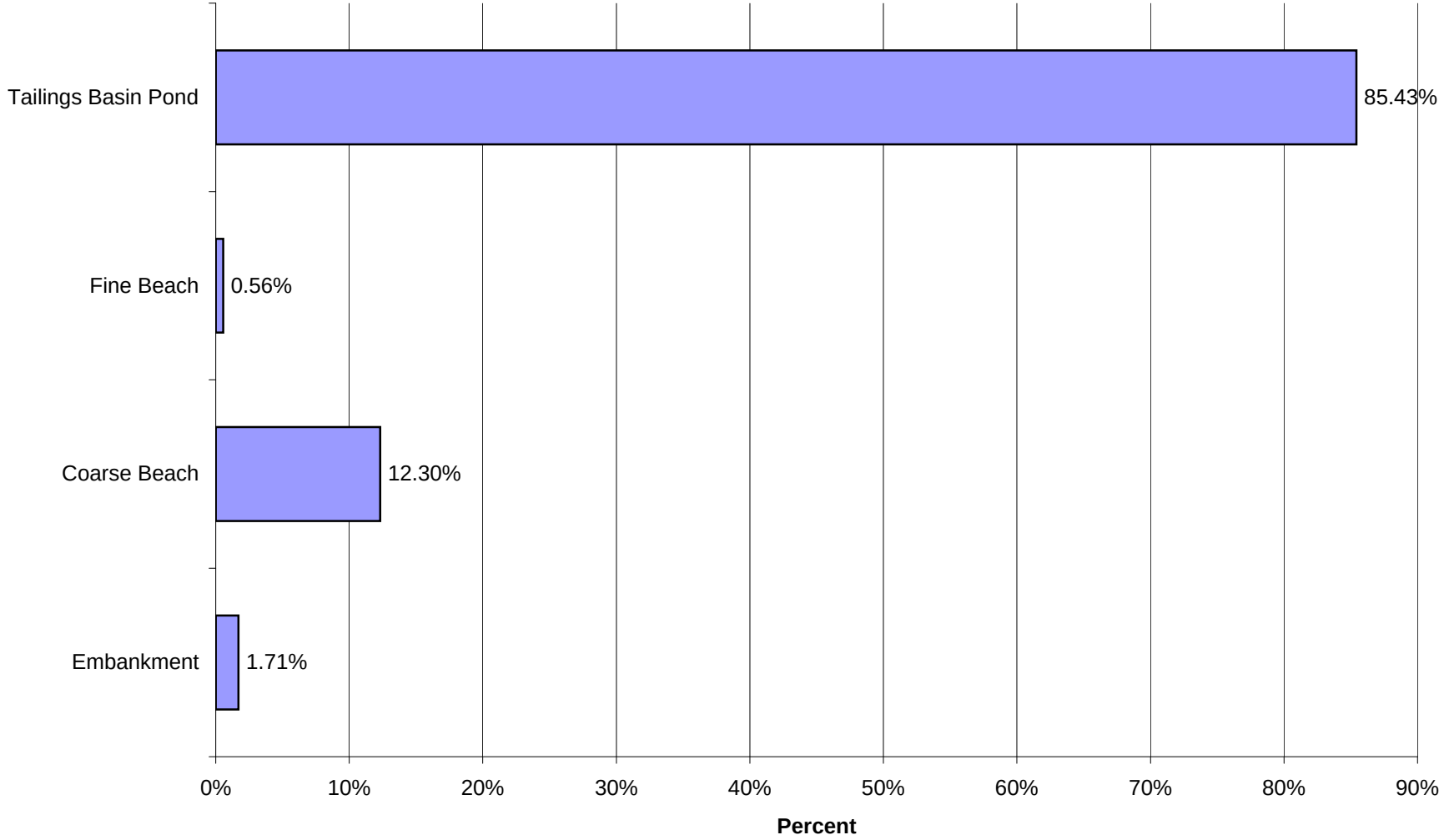
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 5 for Sulfate (SO_4)



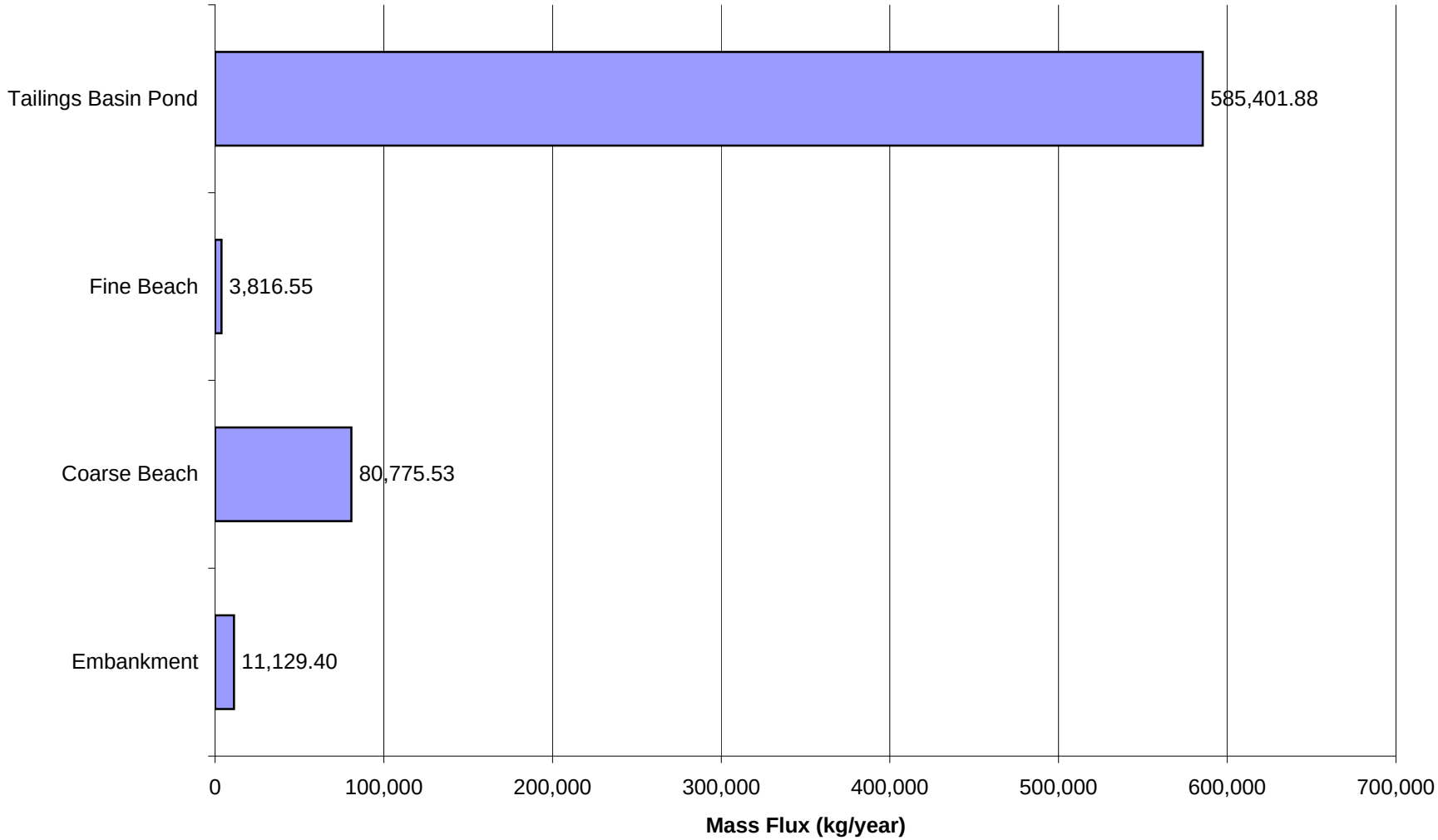
Proposed Action: Mass Flux (kg/year) of Tailings Basin Features in Year 8 for Sulfate (SO_4)



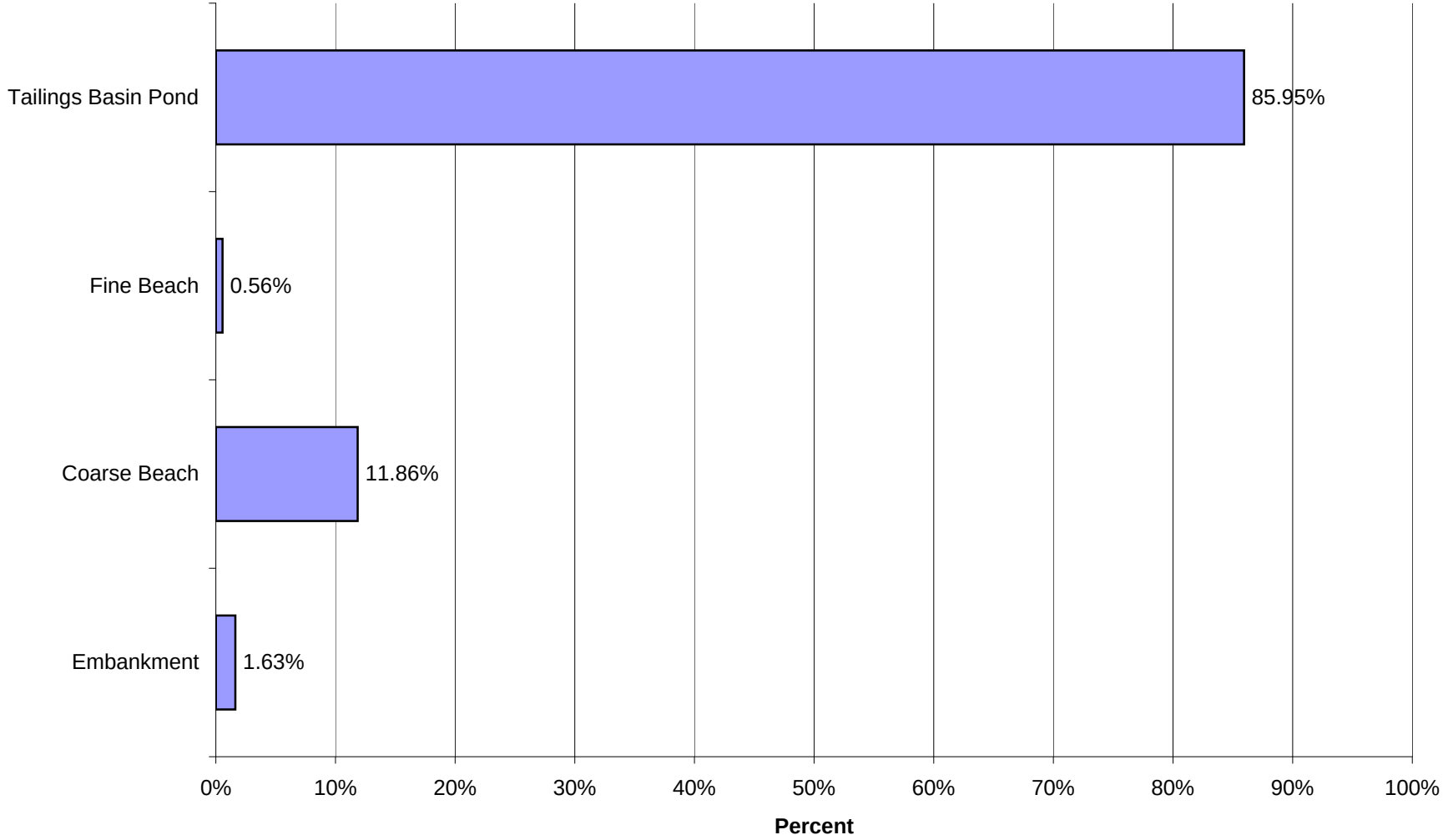
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 8 for Sulfate (SO_4)

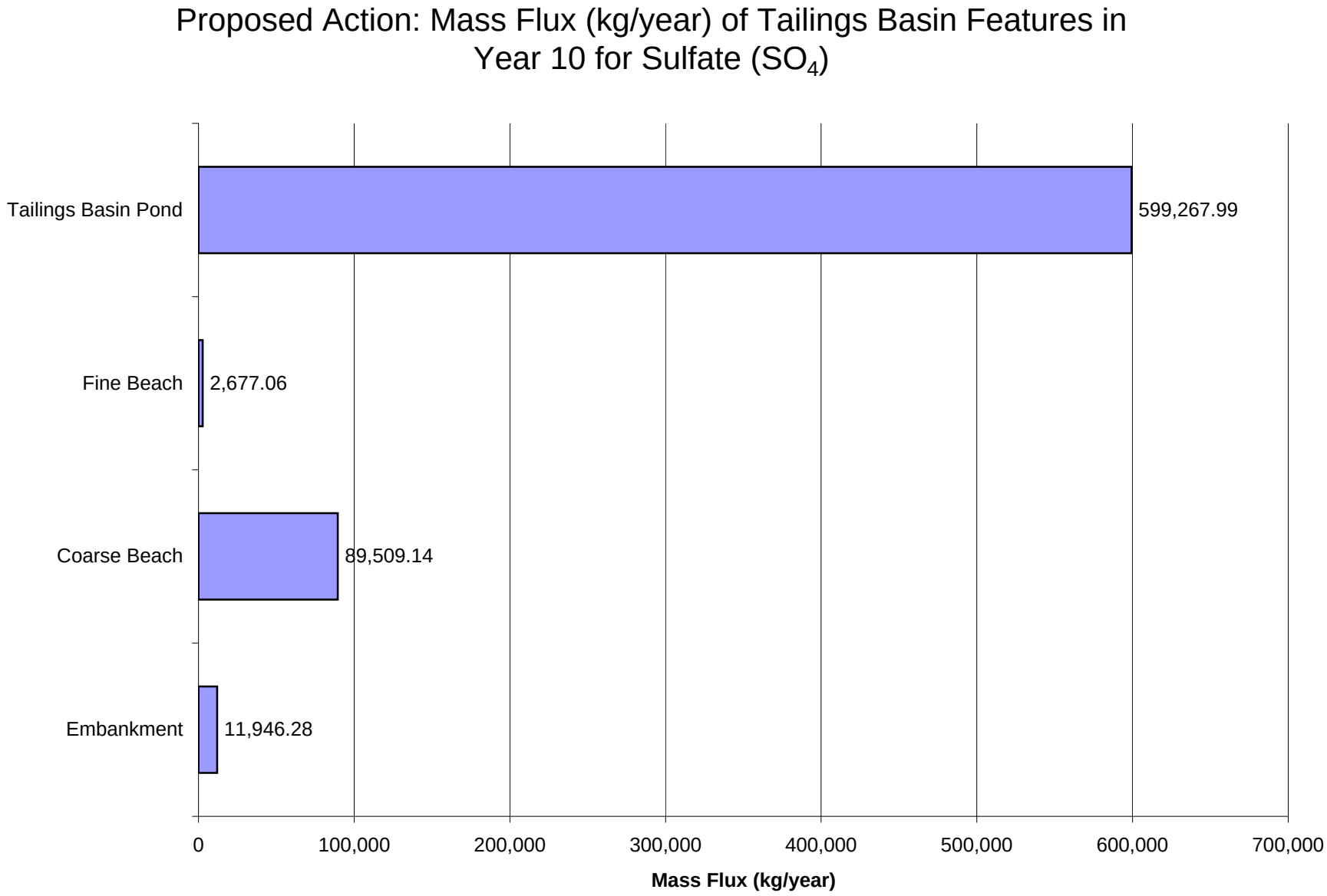


Proposed Action: Mass Flux (kg/year) of Tailings Basin Features in Year 9 for Sulfate (SO_4)

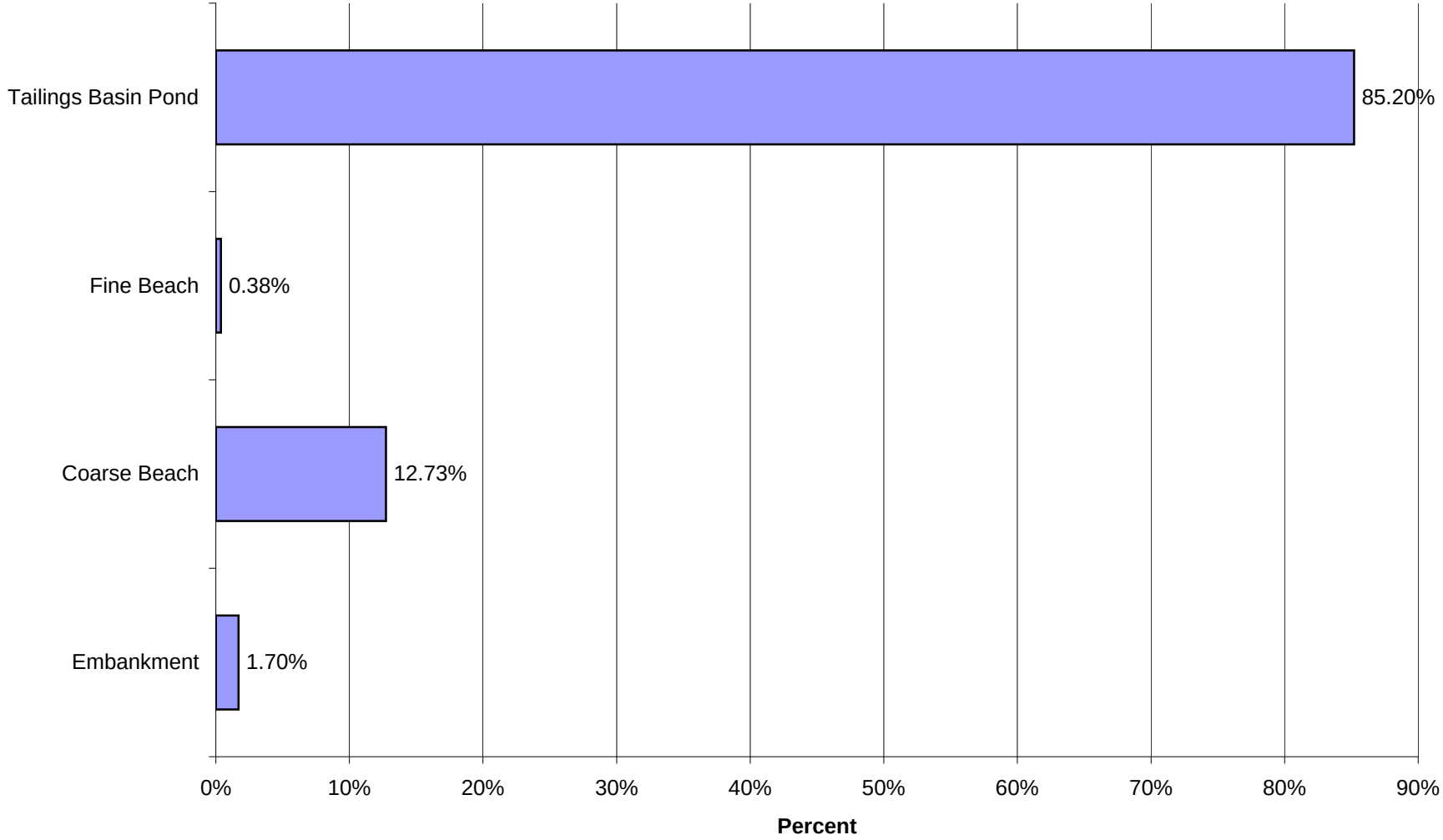


Proposed Action: Percent of Tailings Basin Features' Impacts in Year 9 for Sulfate (SO_4)

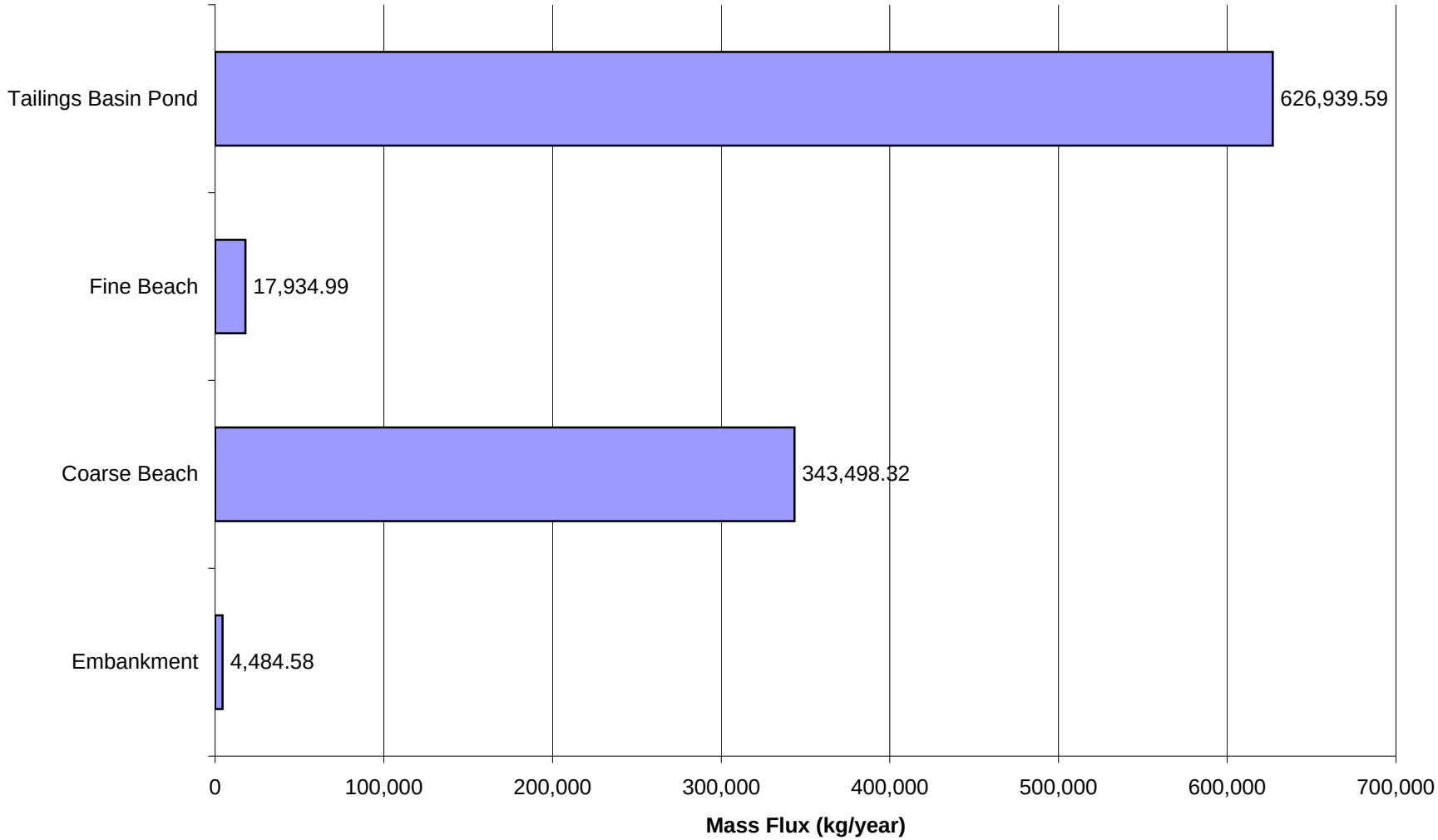



Proposed Action: Mass Flux (kg/year) of Tailings Basin Features in Year 10 for Sulfate (SO_4)
Tailings Basin Pond
599,267.99
Fine Beach
2,677.06
Coarse Beach
89,509.14
Embankment
11,946.28
0
100,000
200,000
300,000
400,000
500,000
600,000
700,000
Mass Flux (kg/year)

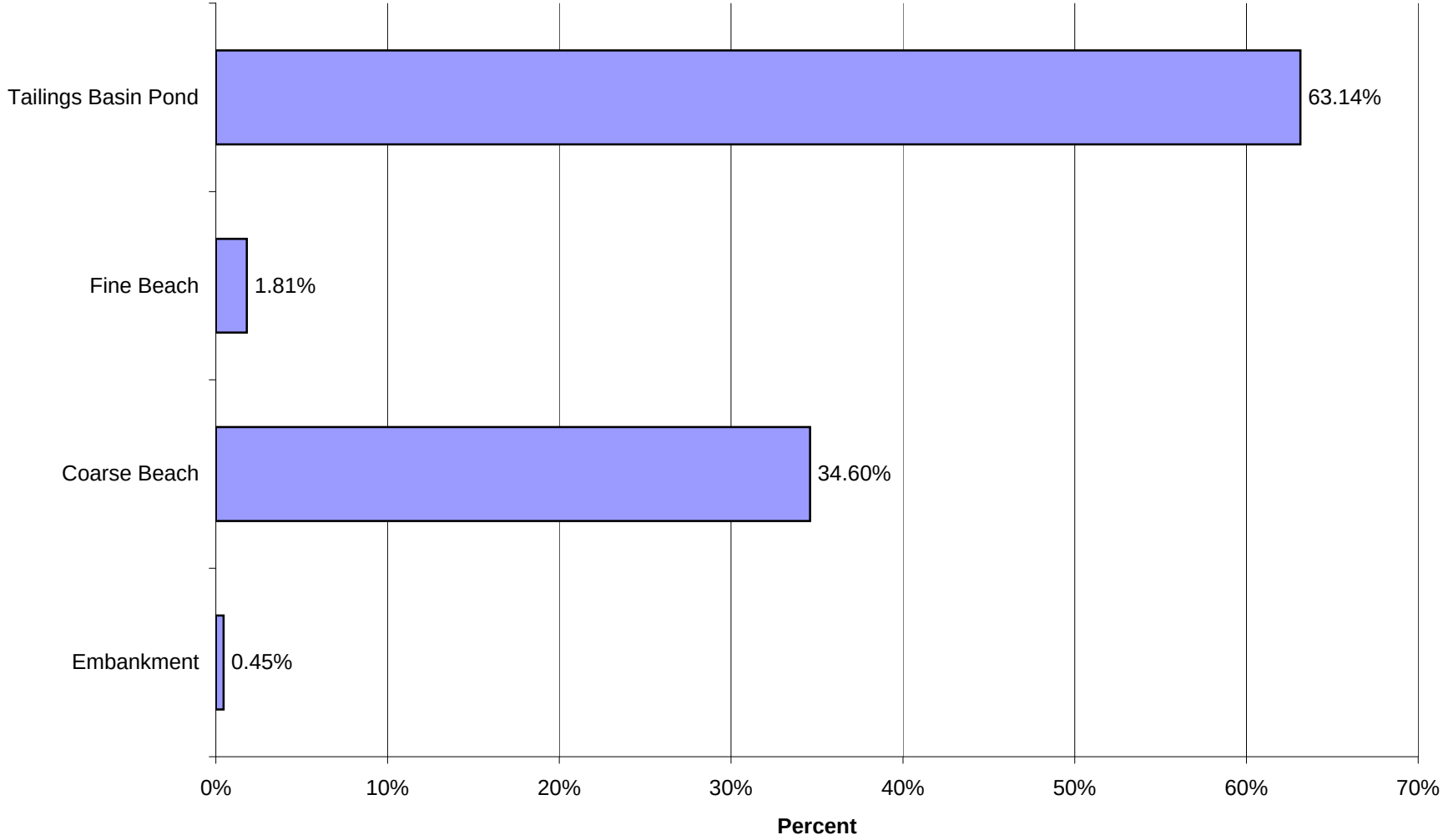
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 10 for Sulfate (SO_4)

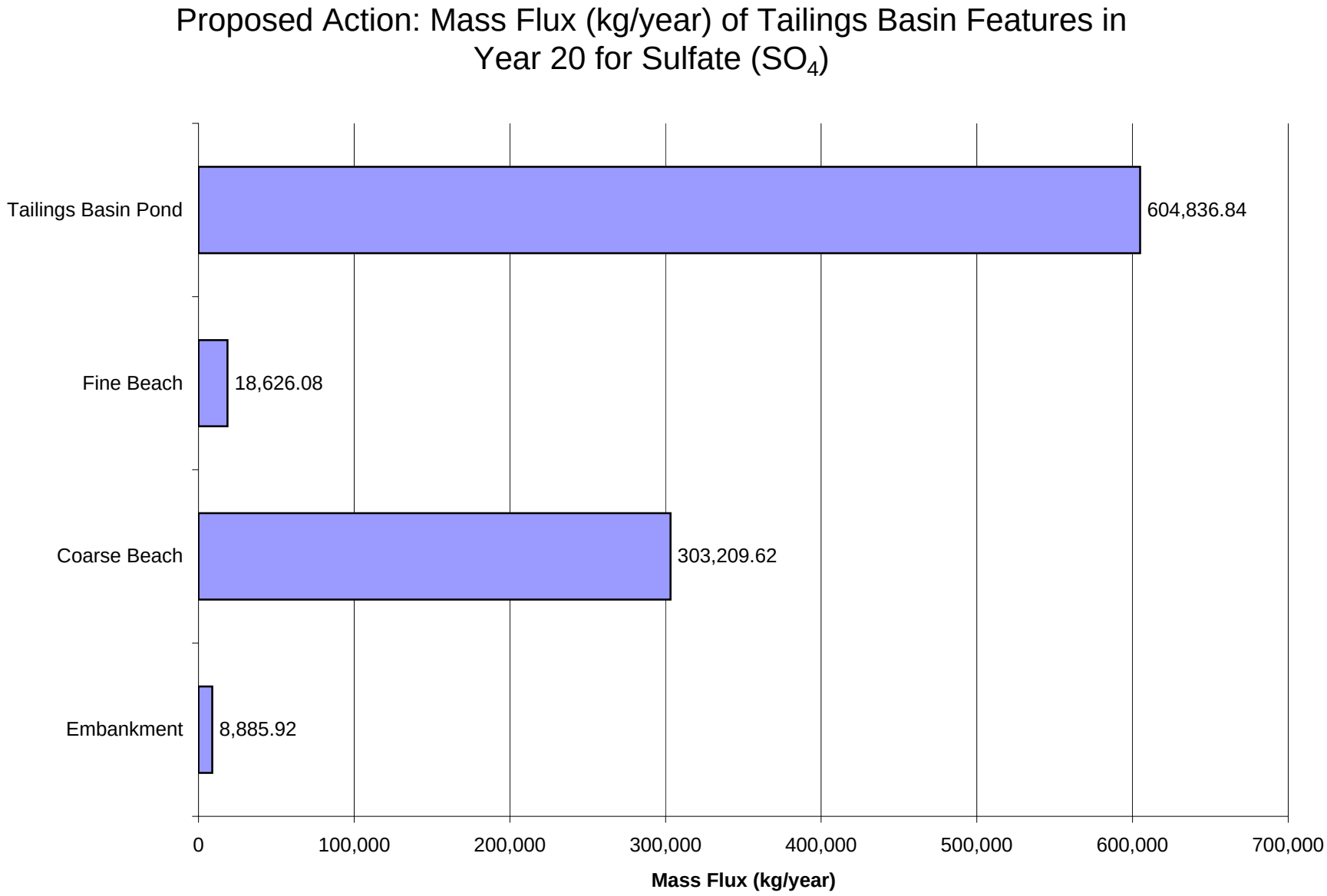


Proposed Action: Mass Flux (kg/year) of Tailings Basin Features in Year 15 for Sulfate (SO_4)

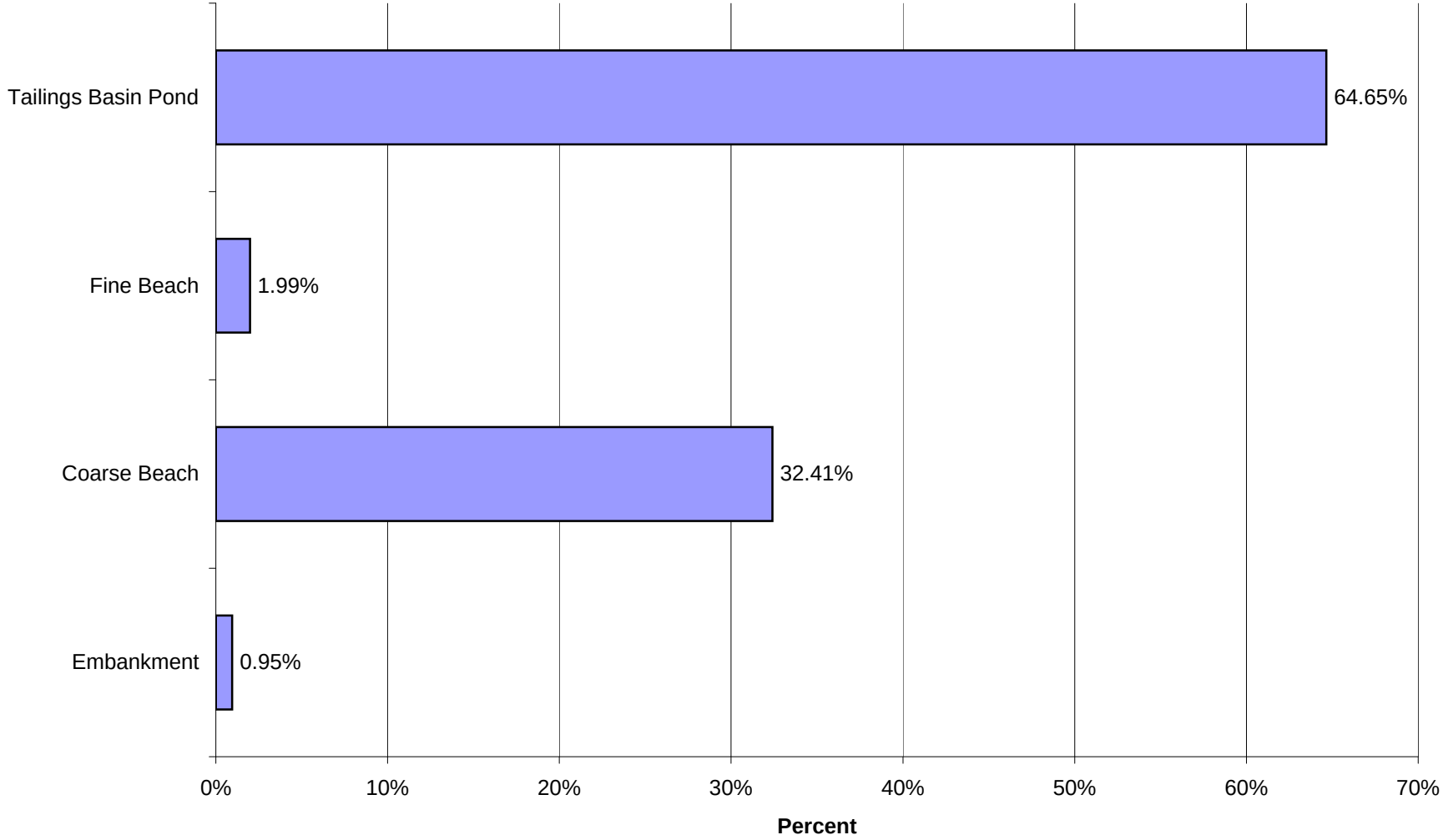


Proposed Action: Percent of Tailings Basin Features' Impacts in Year 15 for Sulfate (SO_4)

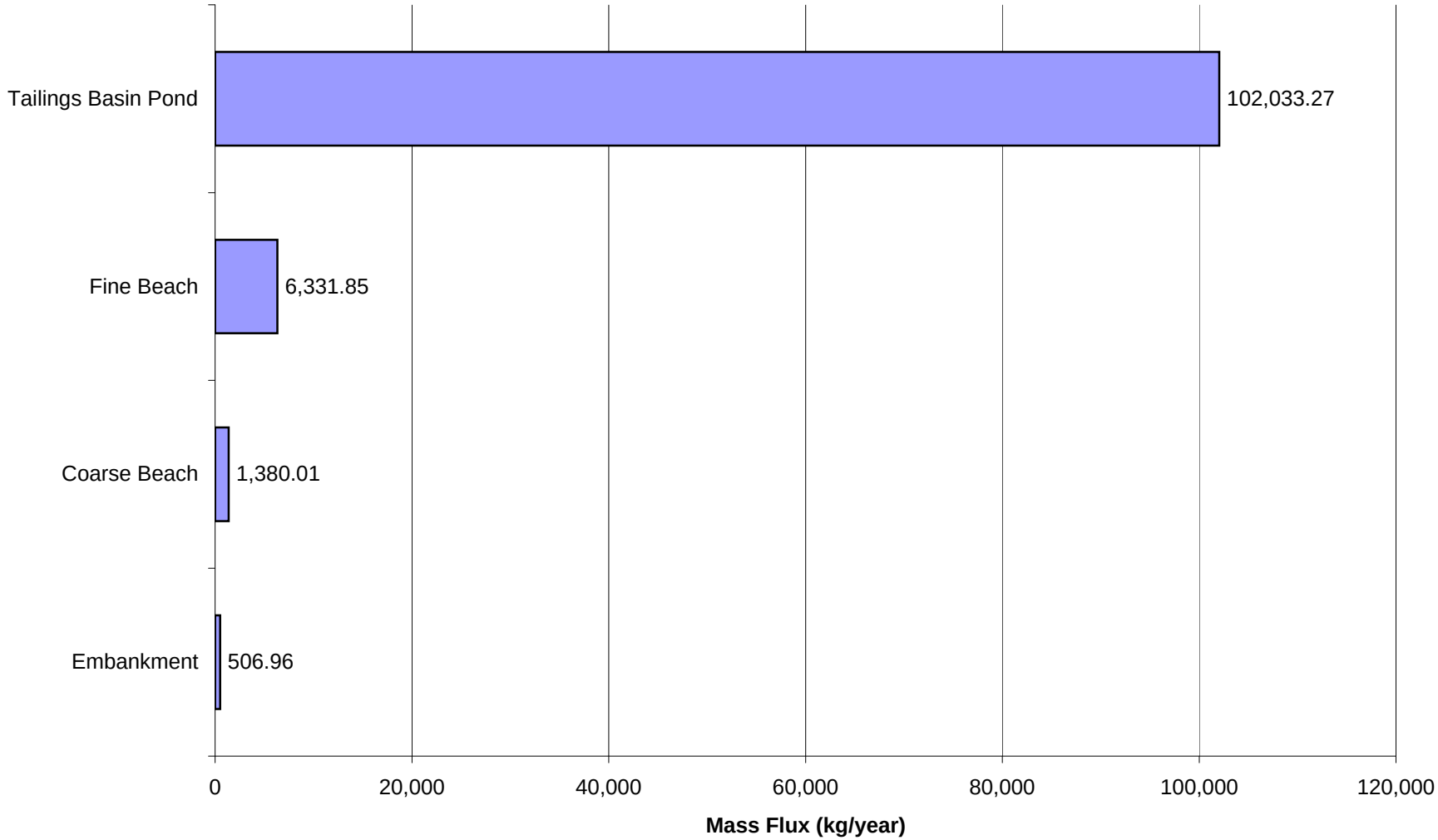



Proposed Action: Mass Flux (kg/year) of Tailings Basin Features in Year 20 for Sulfate (SO_4)
Tailings Basin Pond
604,836.84
Fine Beach
18,626.08
Coarse Beach
303,209.62
Embankment
8,885.92
0
100,000
200,000
300,000
400,000
500,000
600,000
700,000
Mass Flux (kg/year)

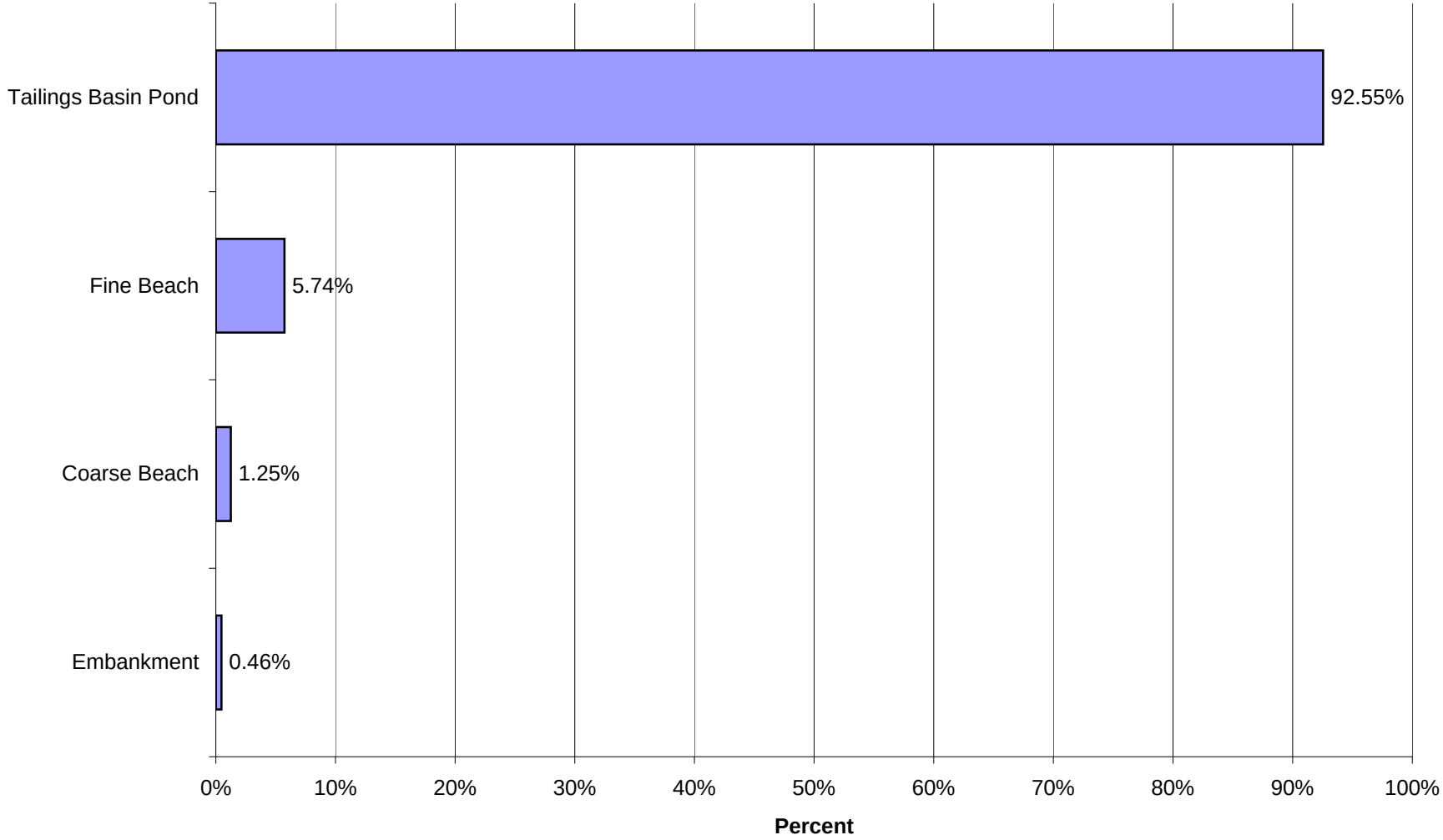
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 20 for Sulfate (SO_4)



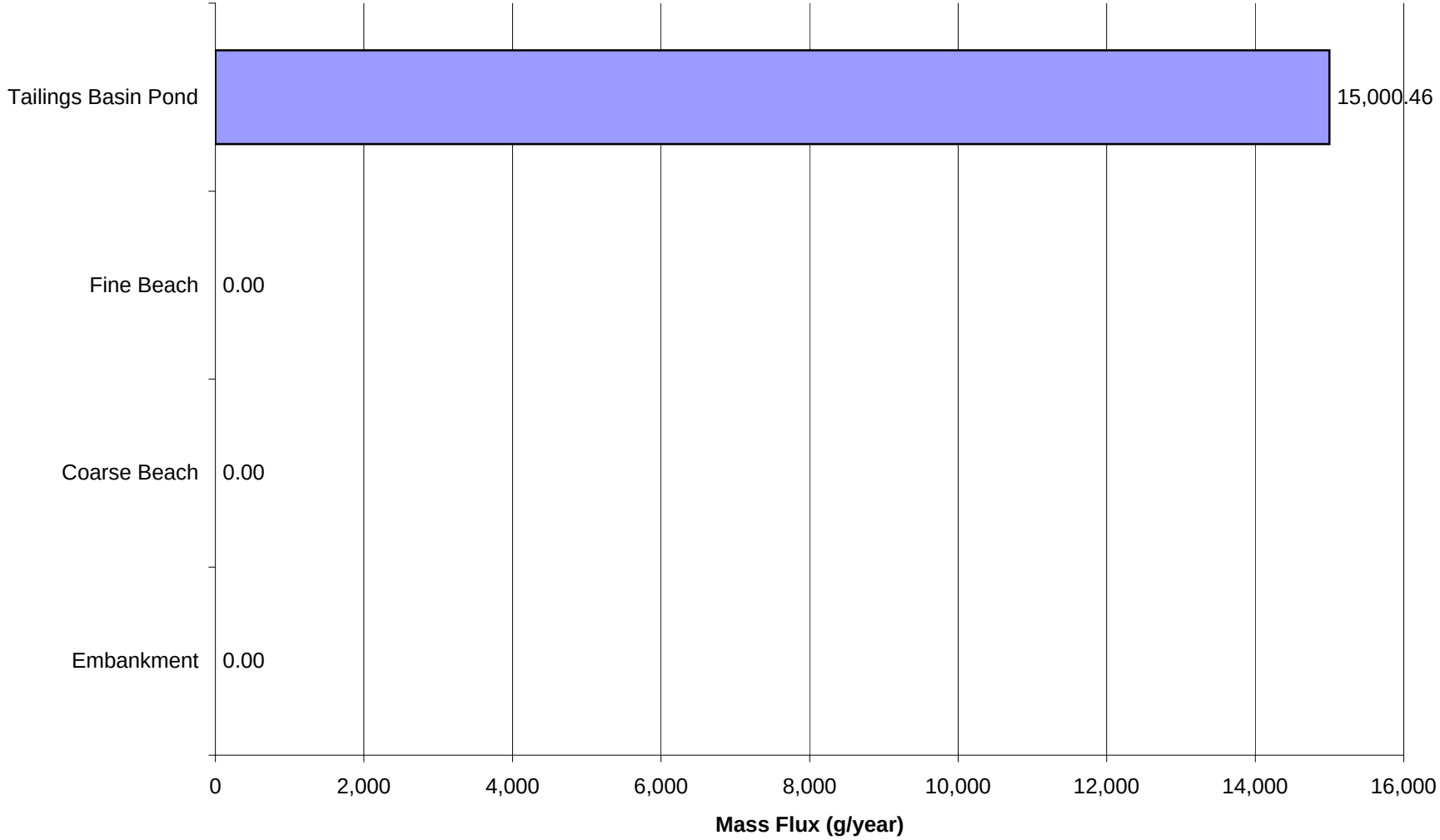
Proposed Action: Mass Flux (kg/year) of Tailings Basin Features in Closure for Sulfate (SO_4)



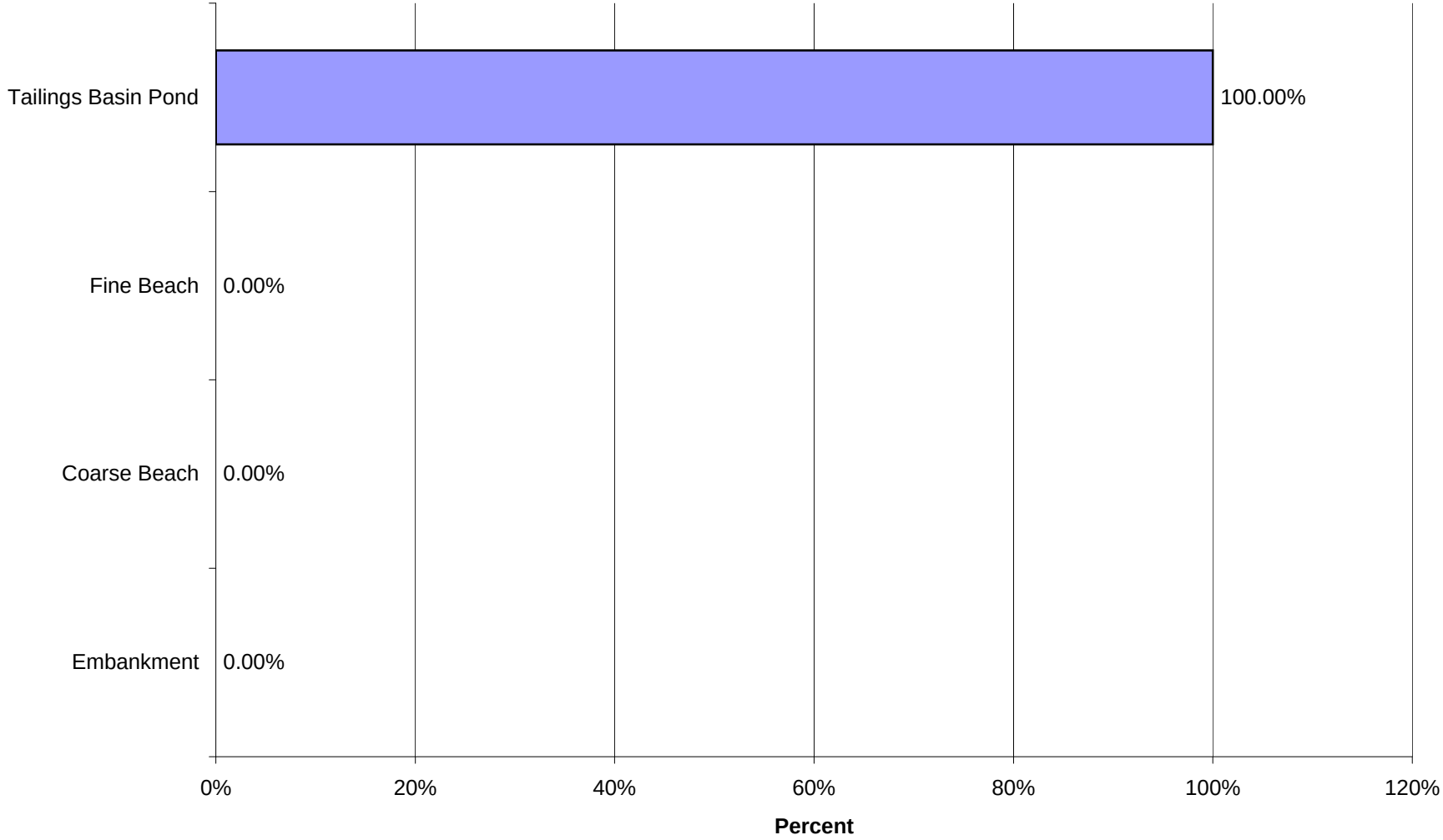
Proposed Action: Percent of Tailings Basin Features' Impacts in Closure for Sulfate (SO_4)



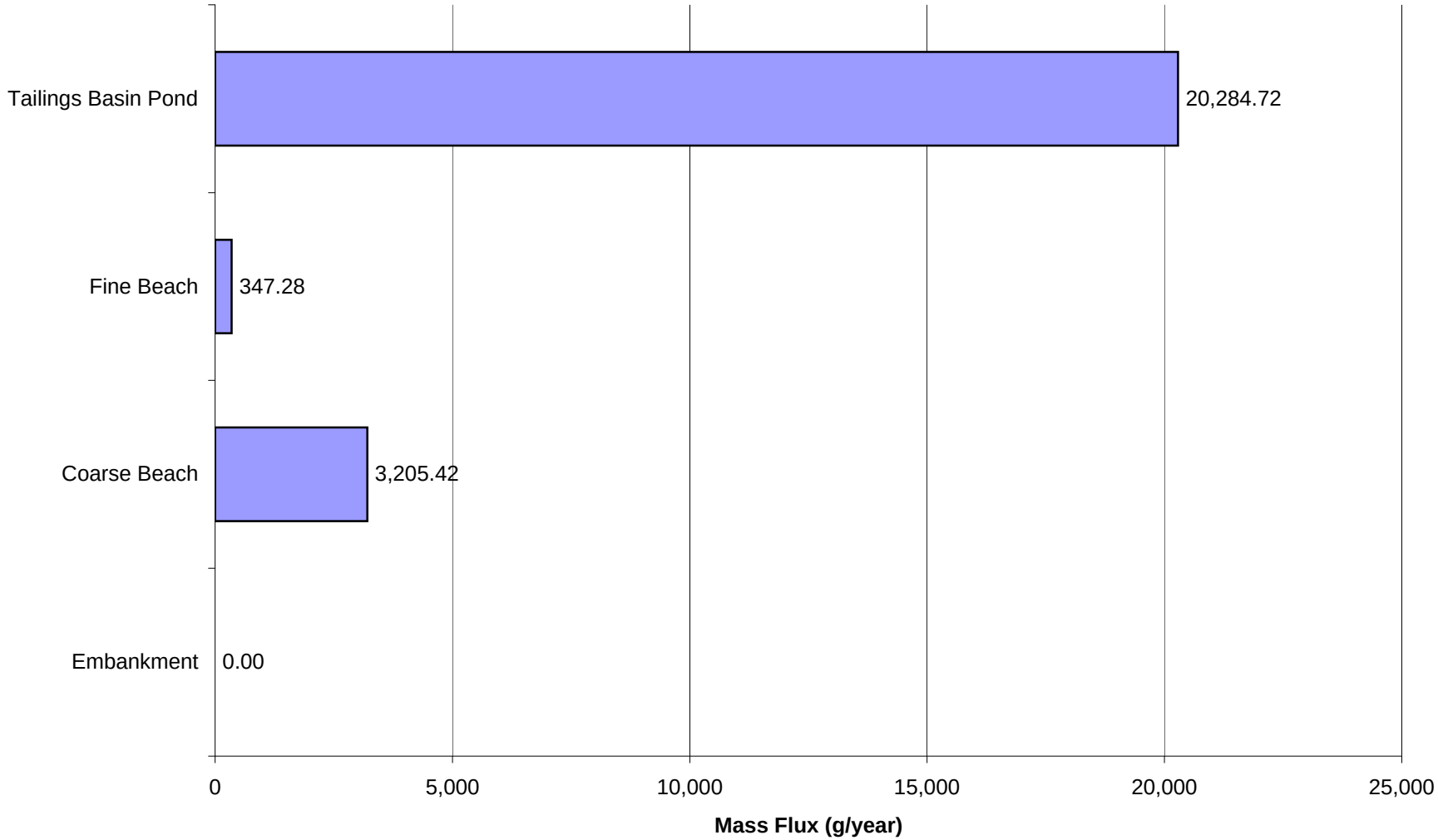
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 1 for Antimony (Sb)



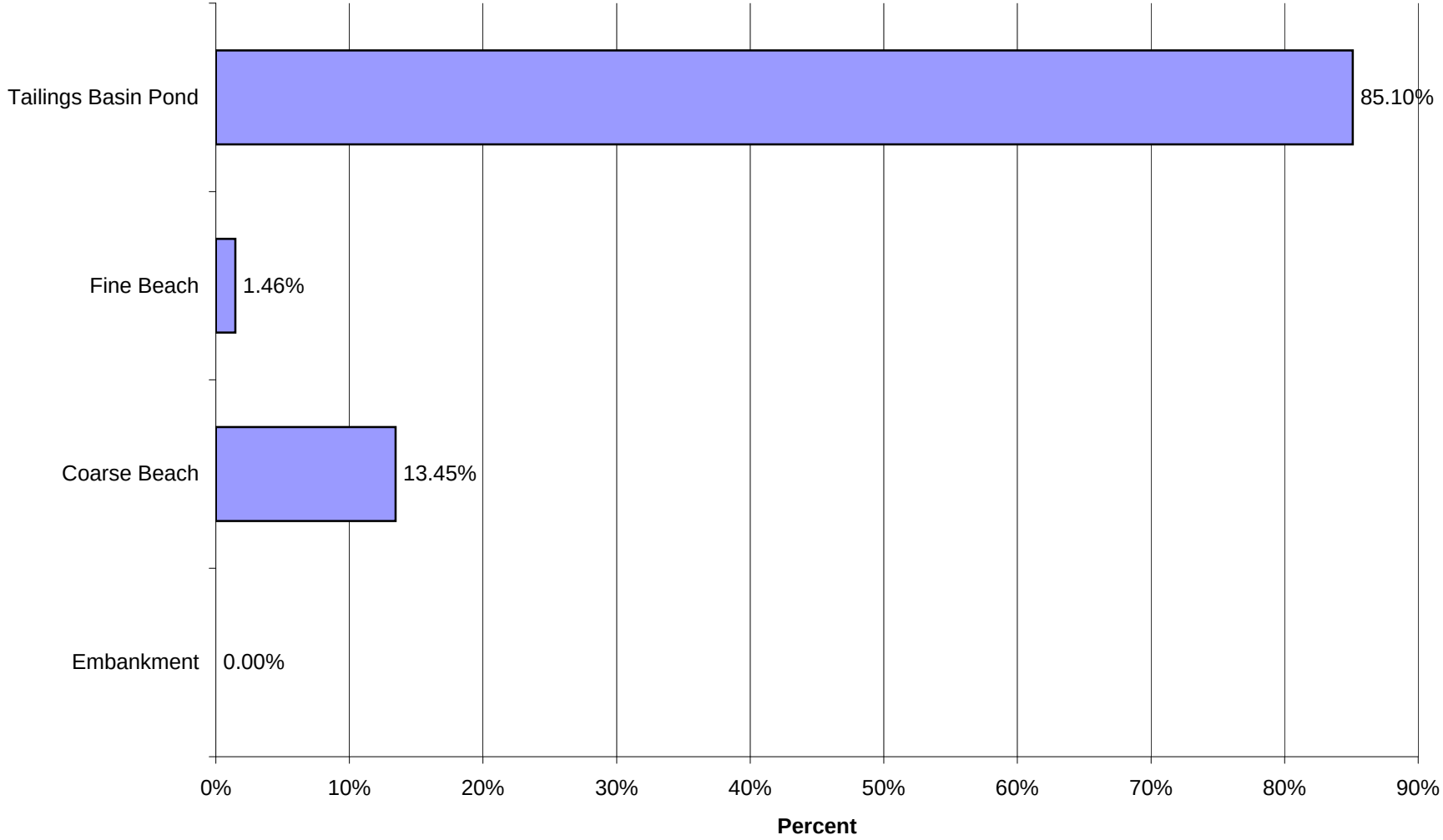
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 1 for Antimony (Sb)



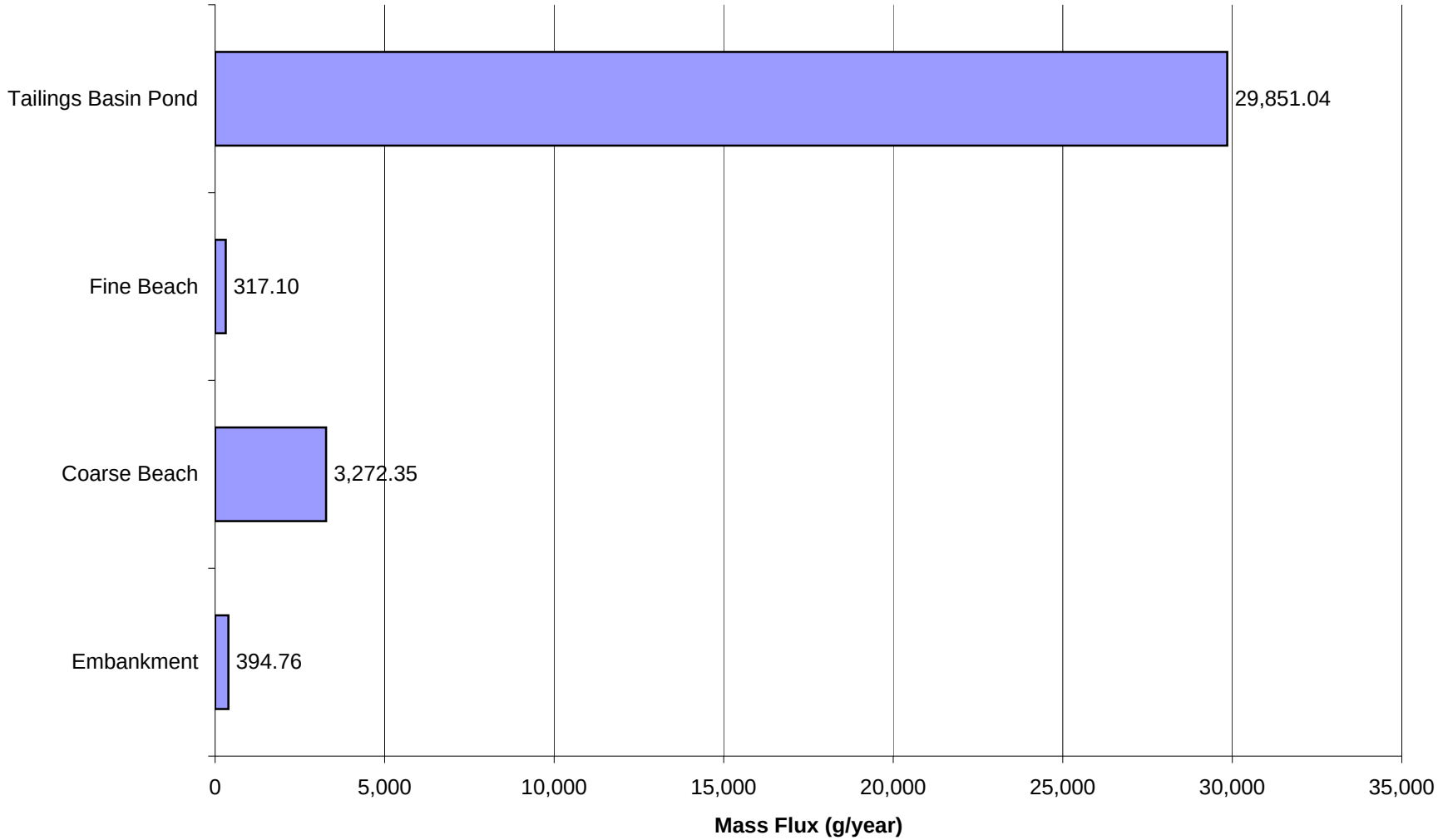
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 5 for Antimony (Sb)



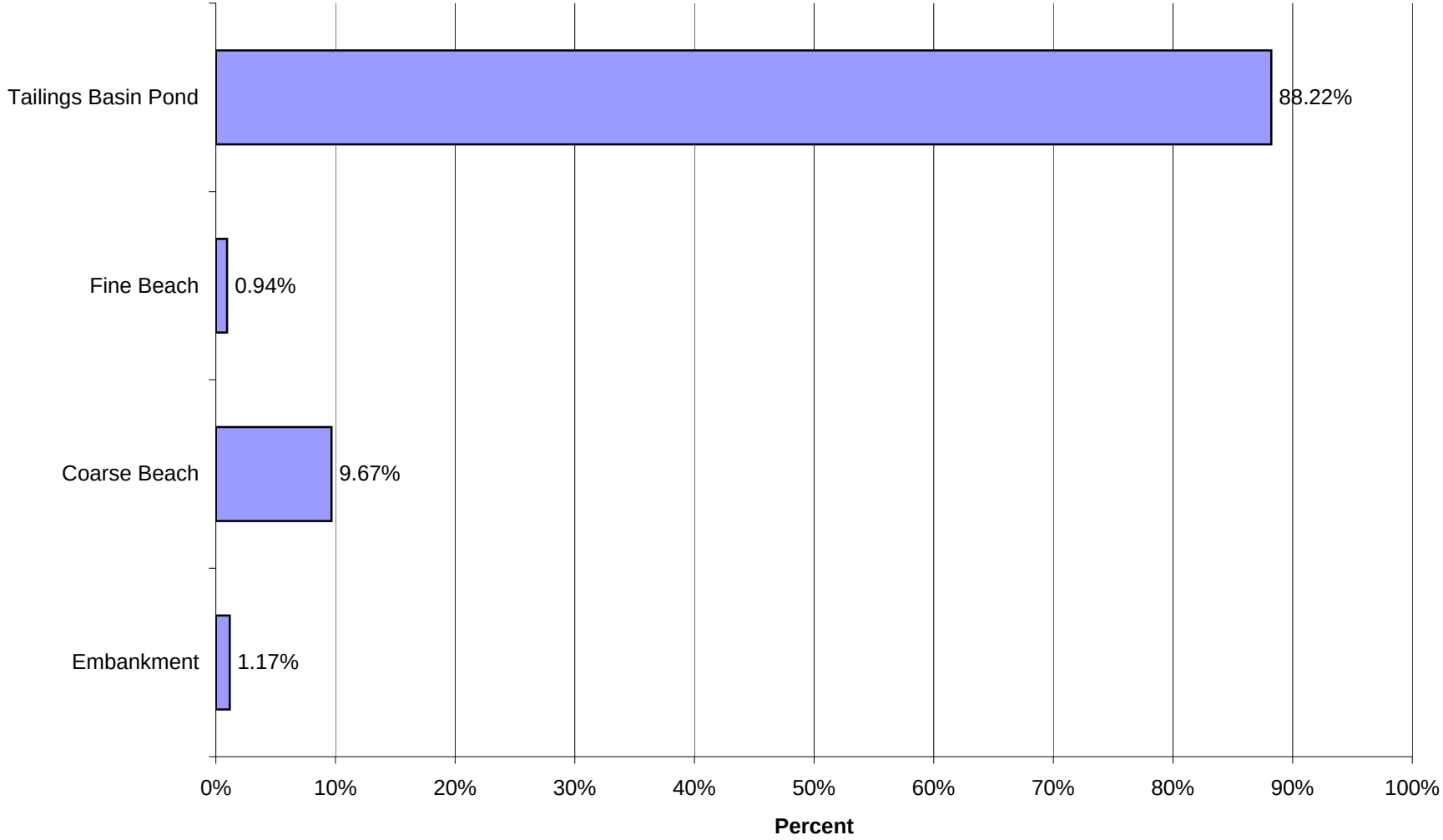
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 5 for Antimony (Sb)



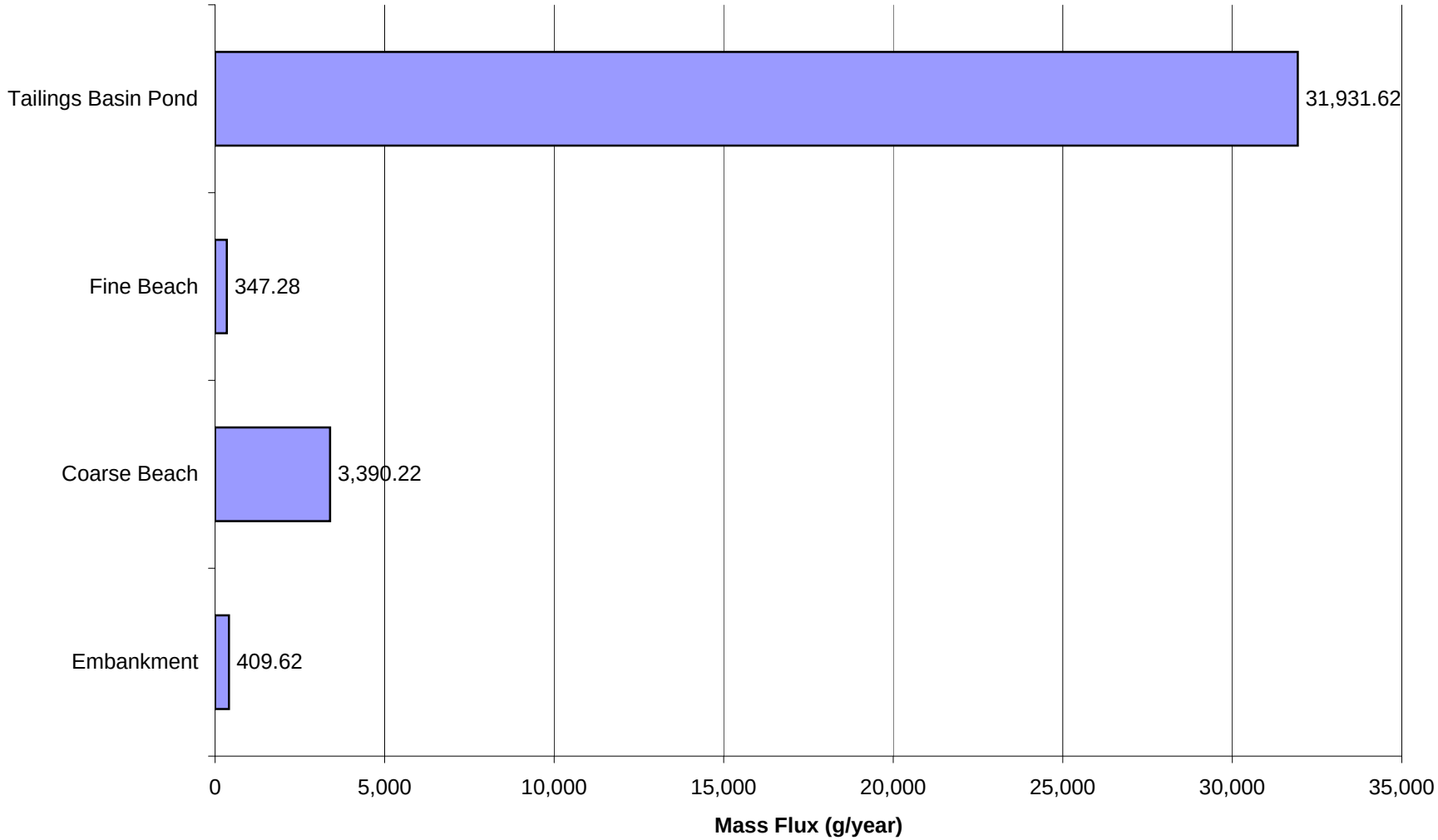
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 8 for Antimony (Sb)



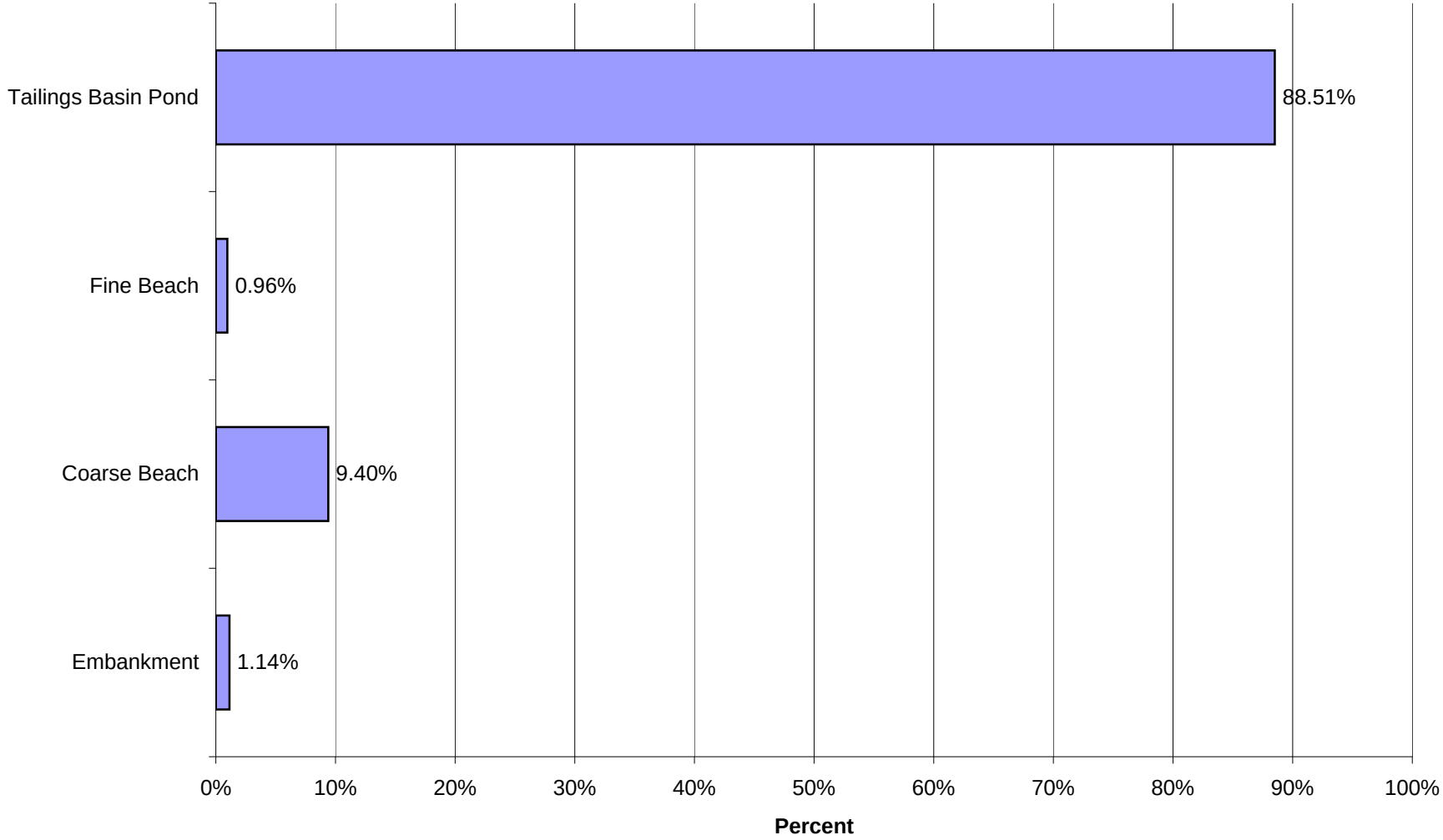
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 8 for Antimony (Sb)



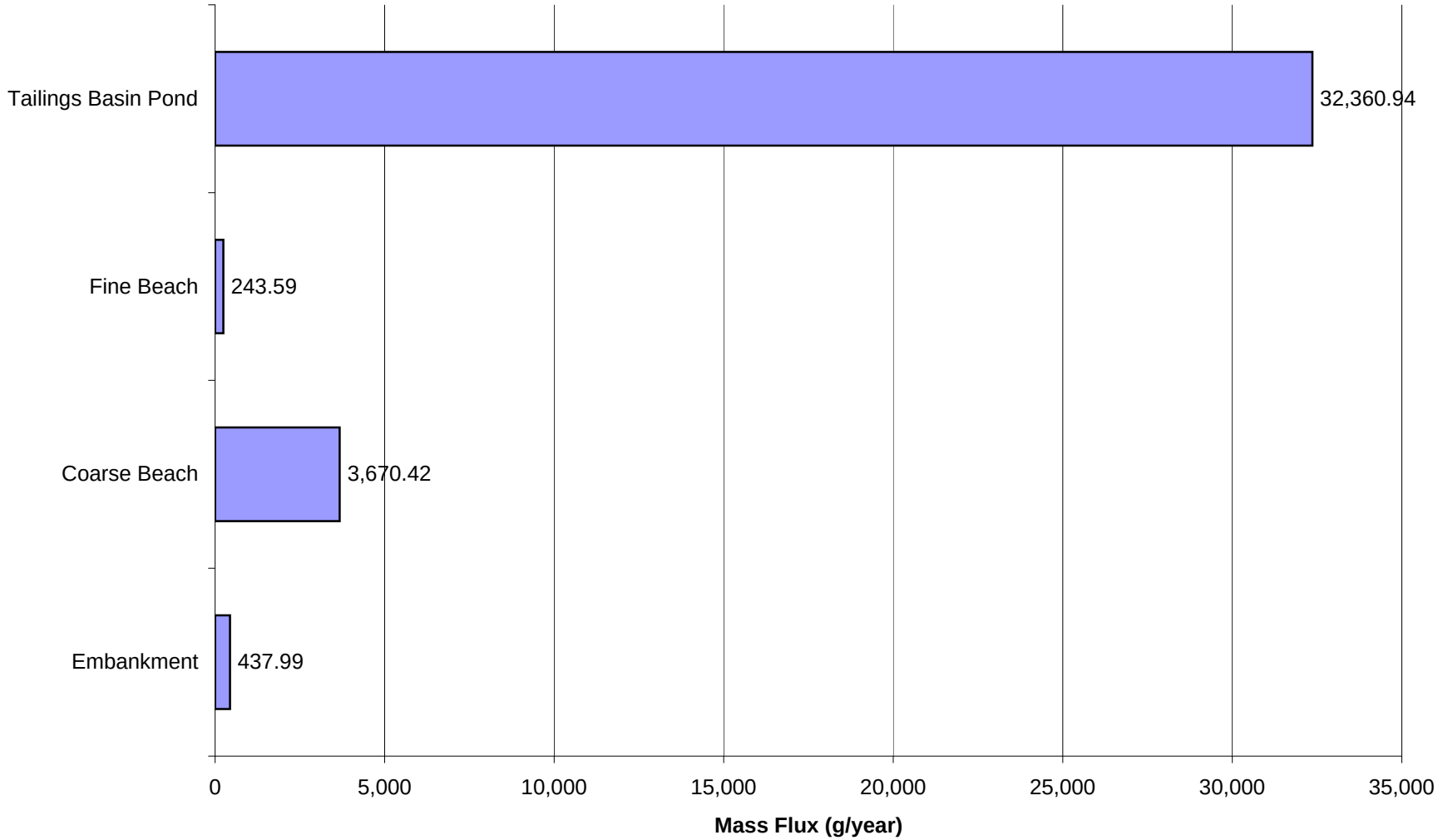
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 9 for Antimony (Sb)



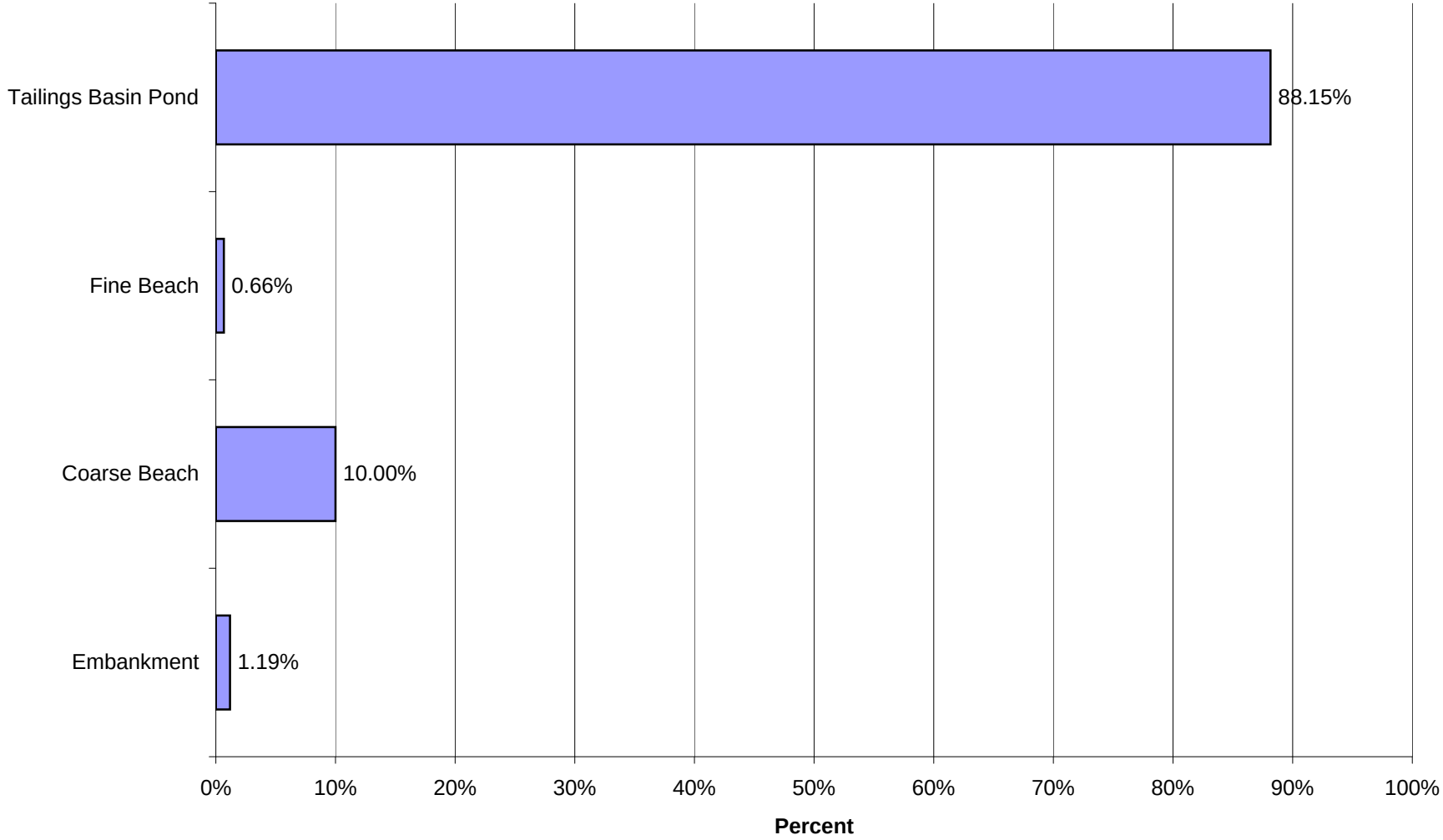
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 9 for Antimony (Sb)



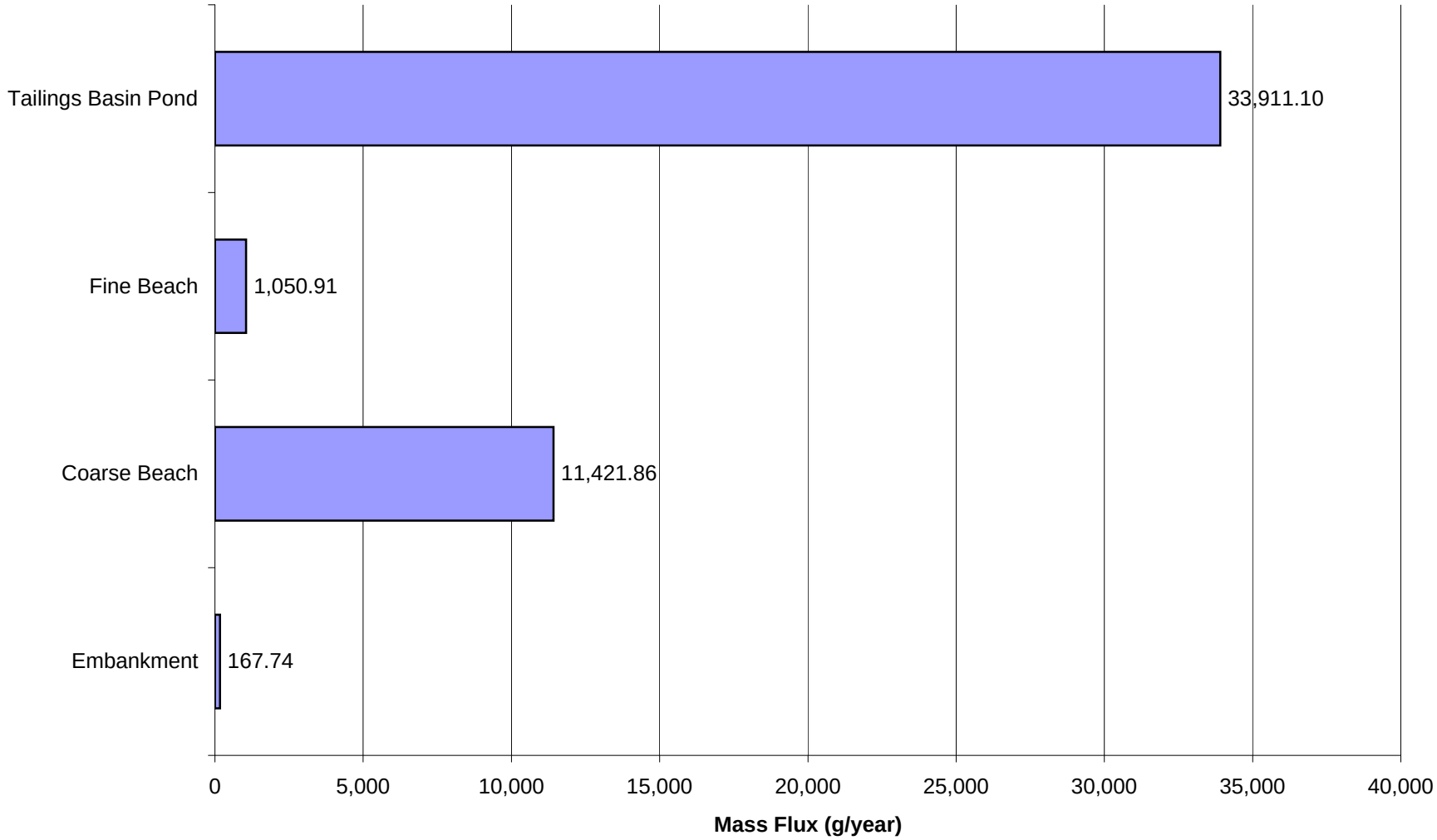
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 10 for Antimony (Sb)



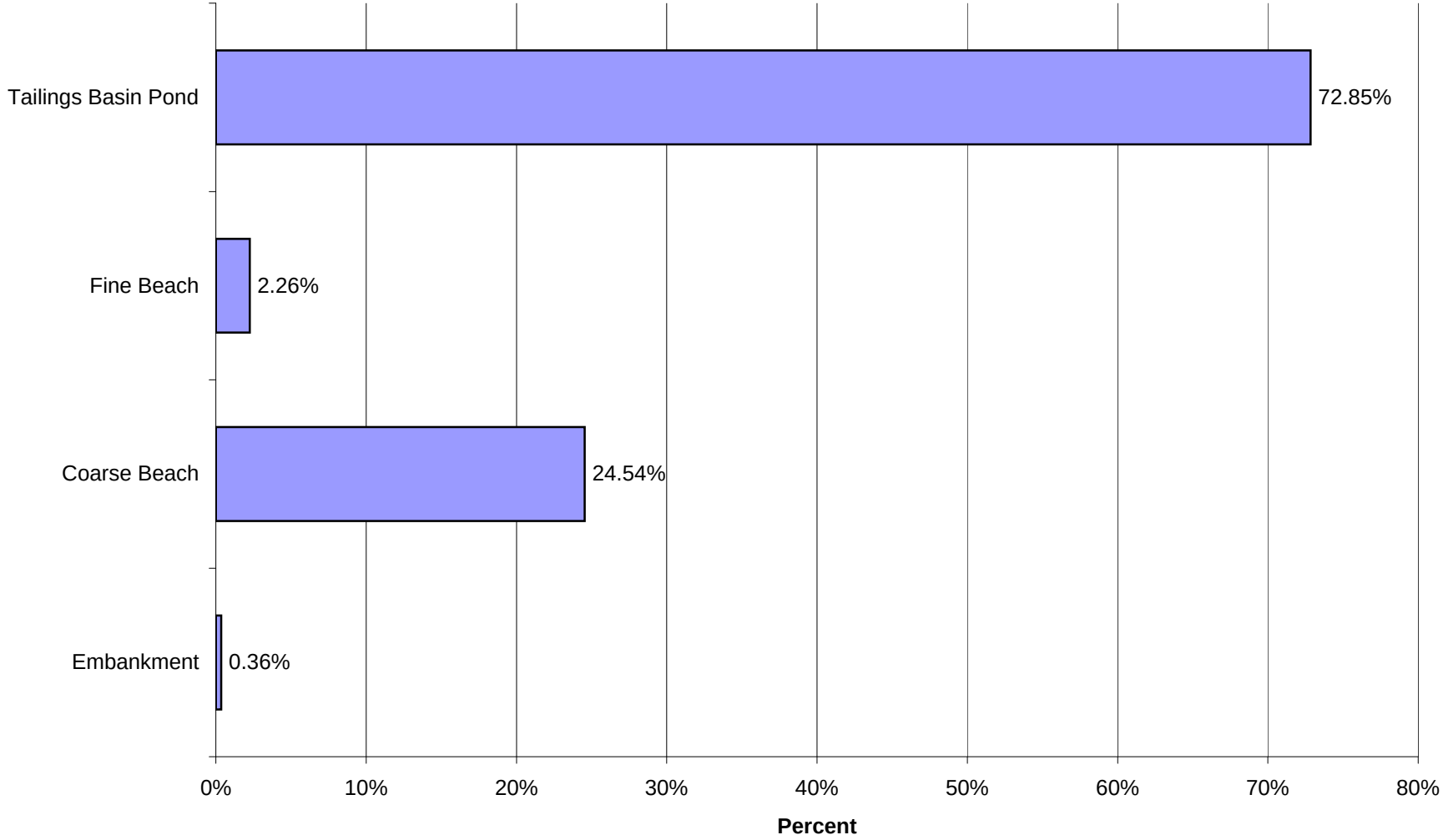
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 10 for Antimony (Sb)



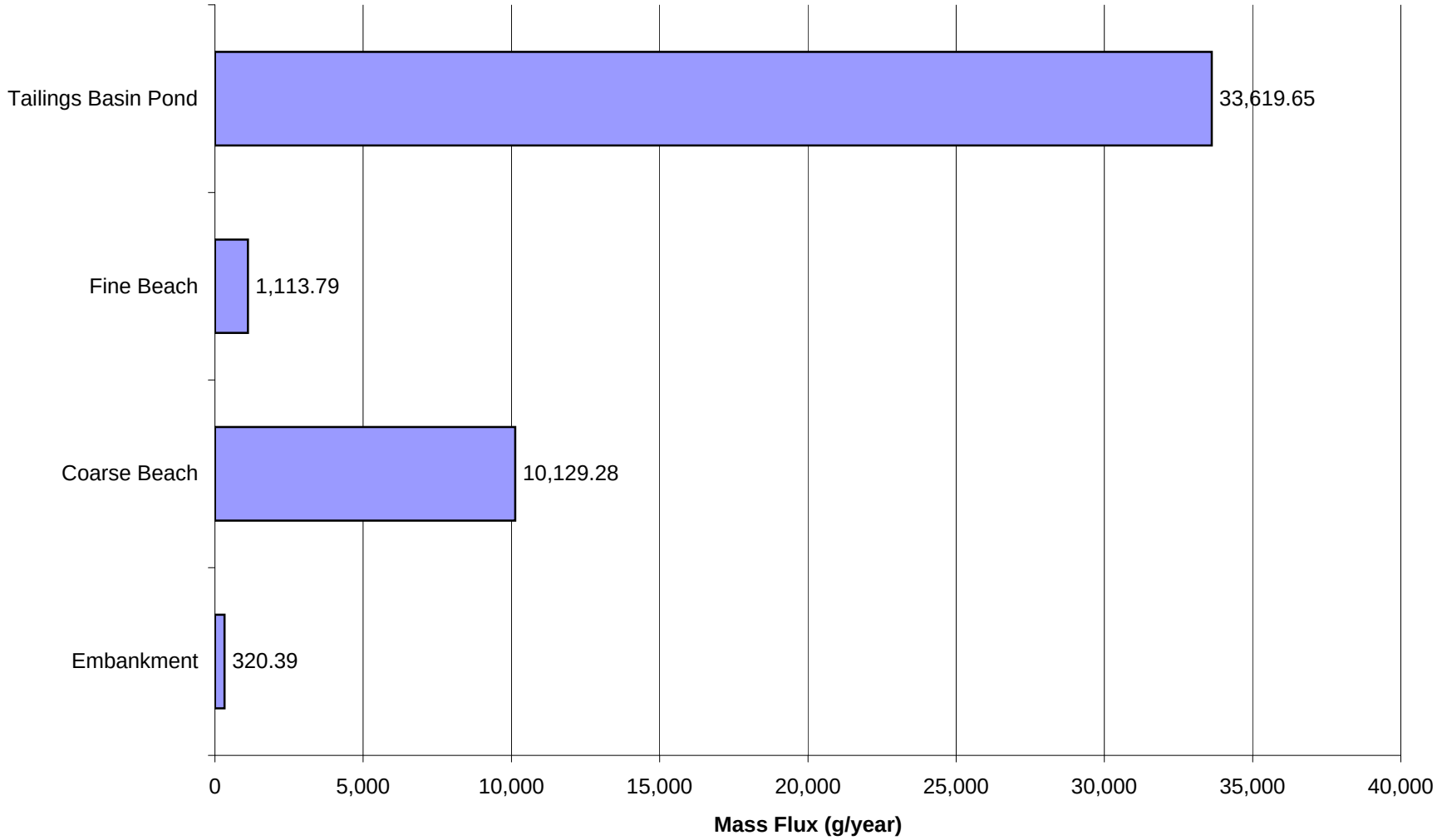
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 15 for Antimony (Sb)



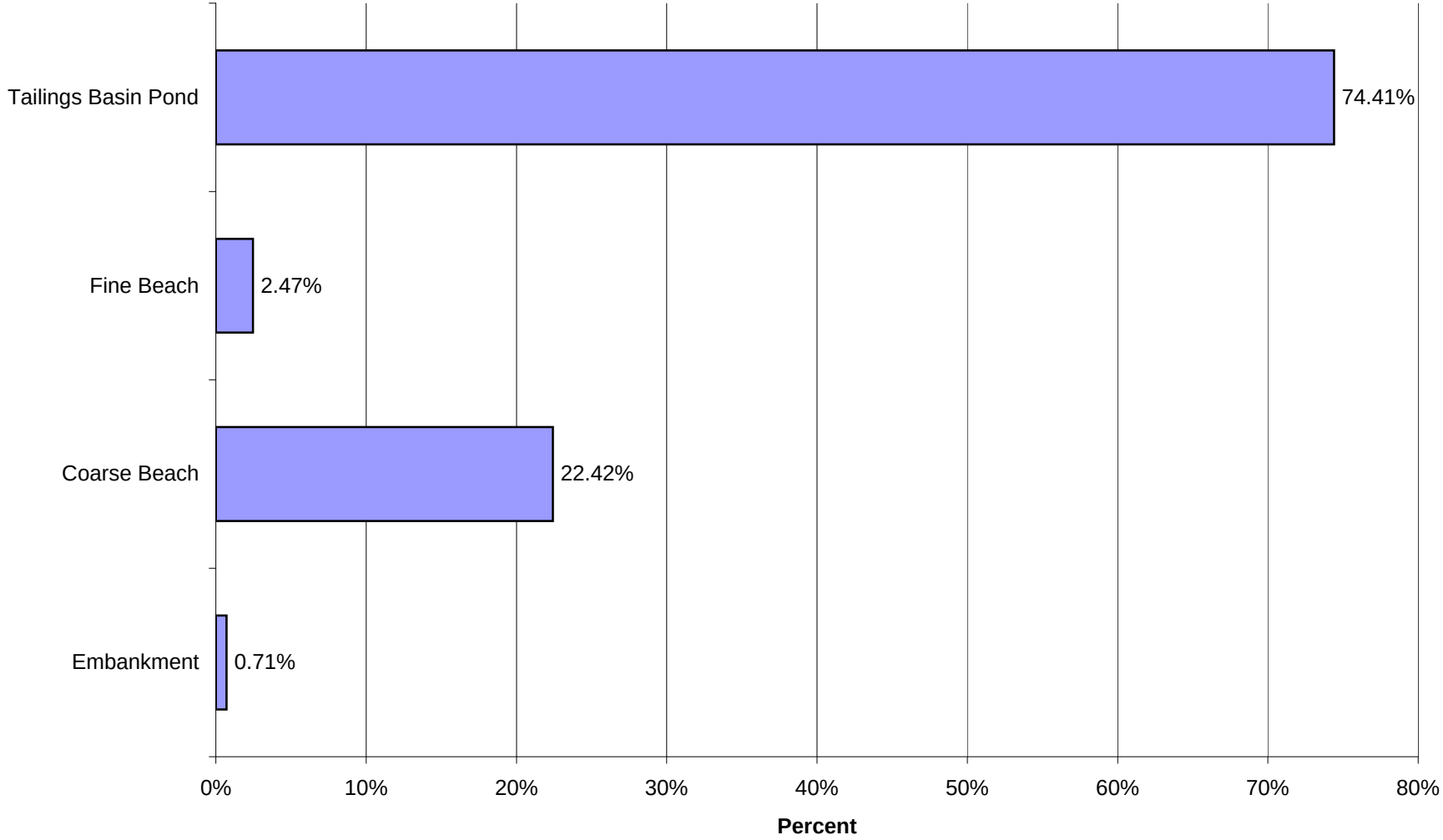
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 15 for Antimony (Sb)



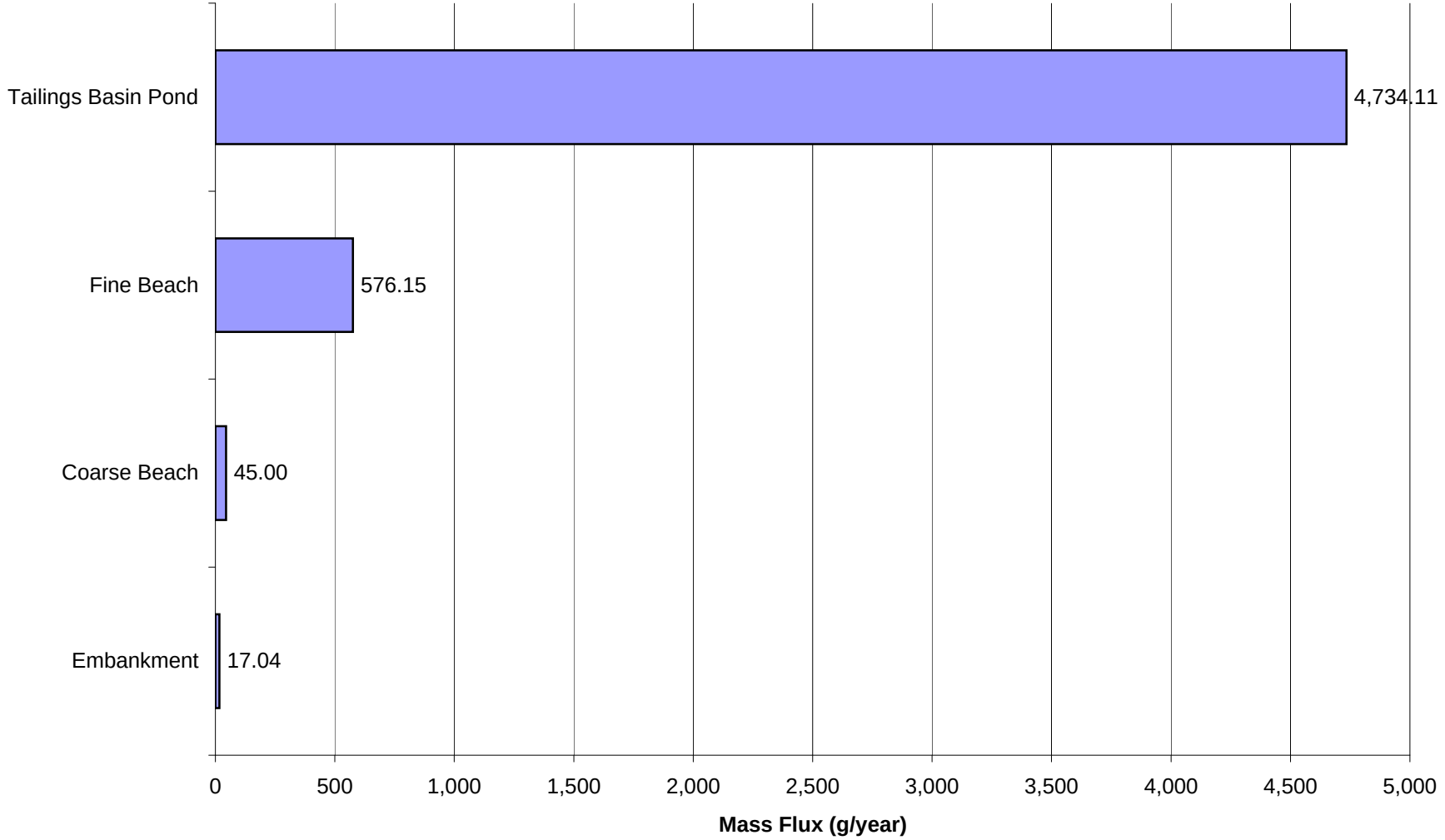
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 20 for Antimony (Sb)



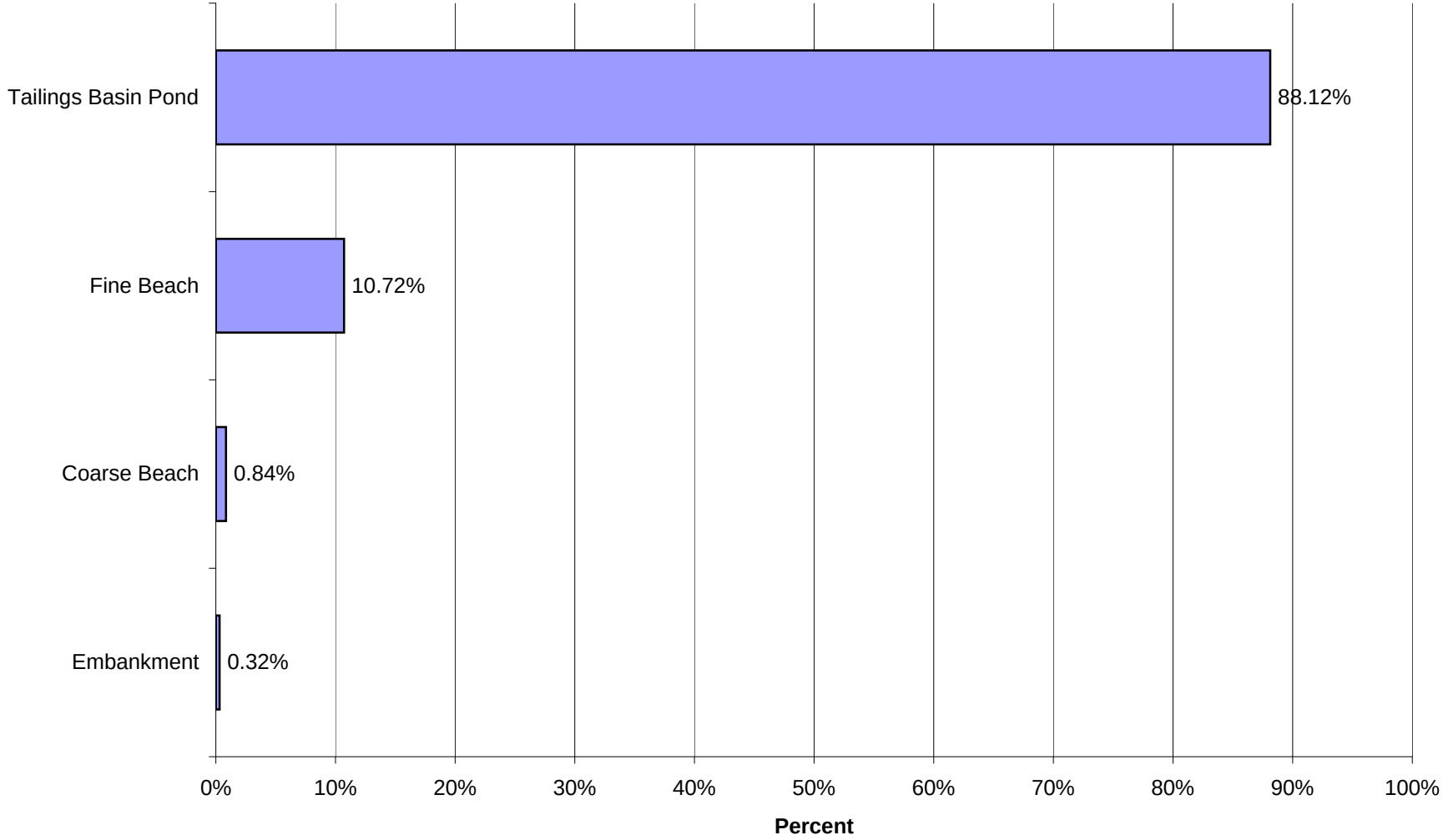
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 20 for Antimony (Sb)



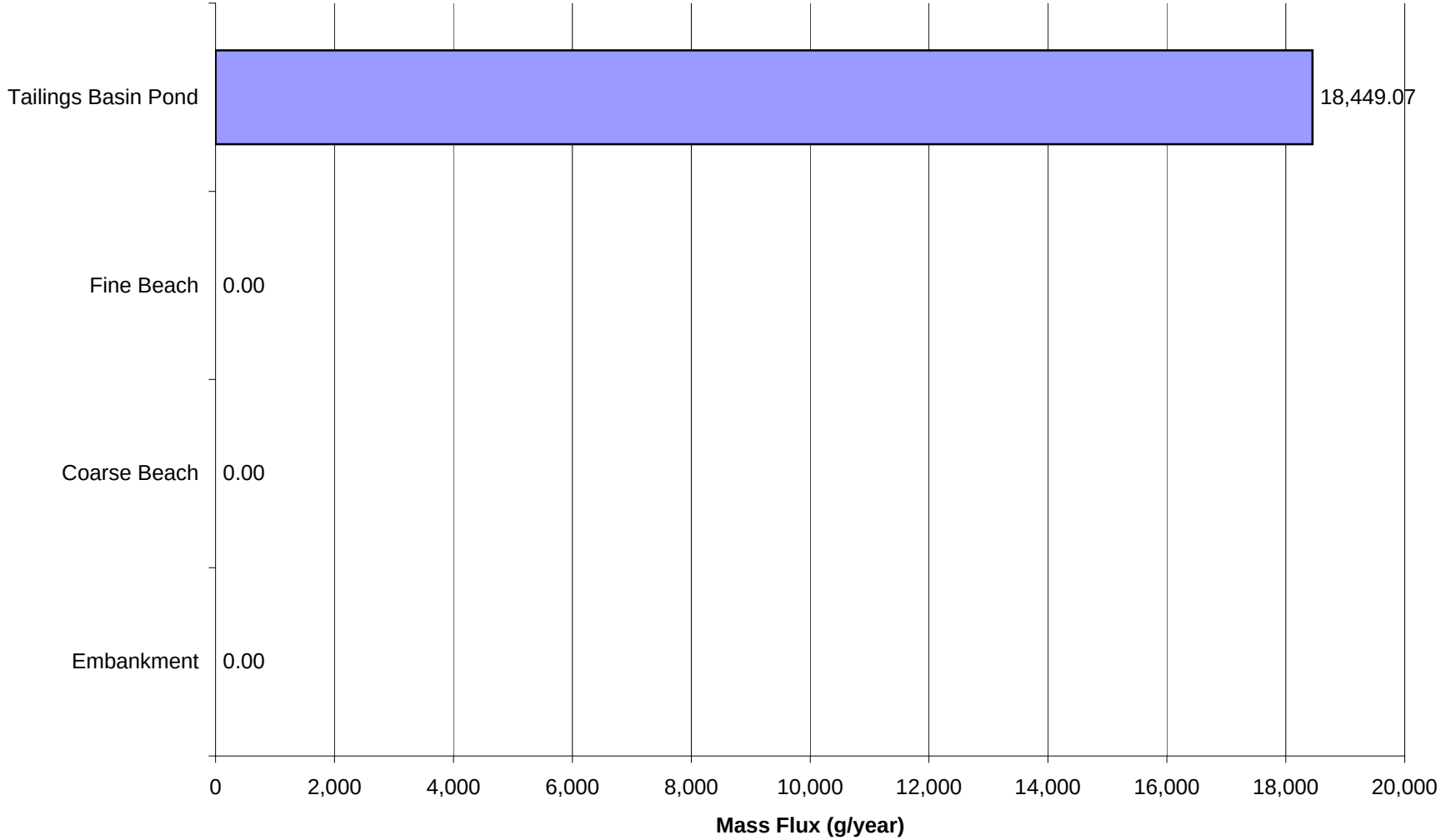
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Closure for Antimony (Sb)



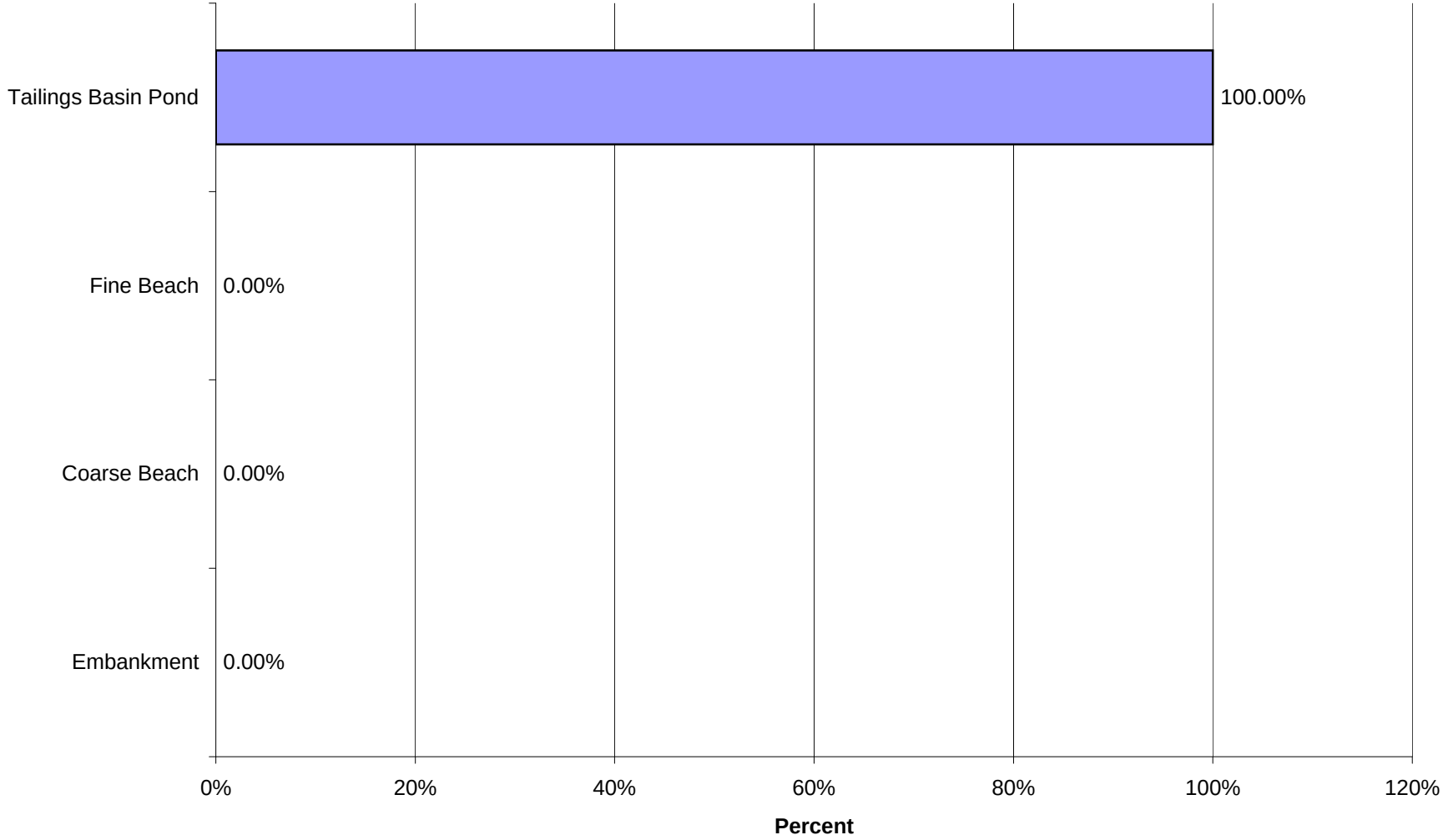
Proposed Action: Percent of Tailings Basin Features' Impacts in Closure for Antimony (Sb)



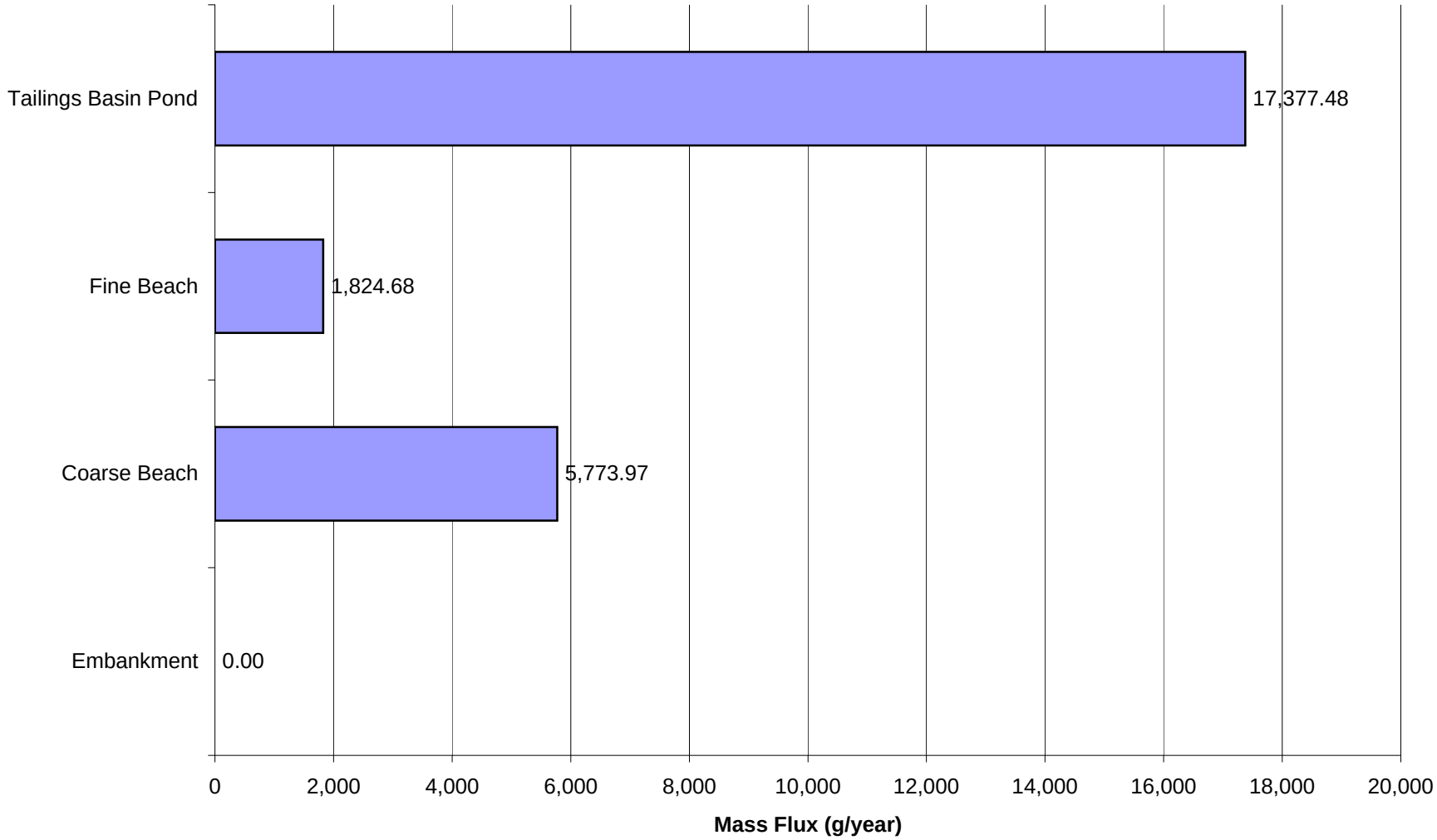
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 1 for Arsenic (As)



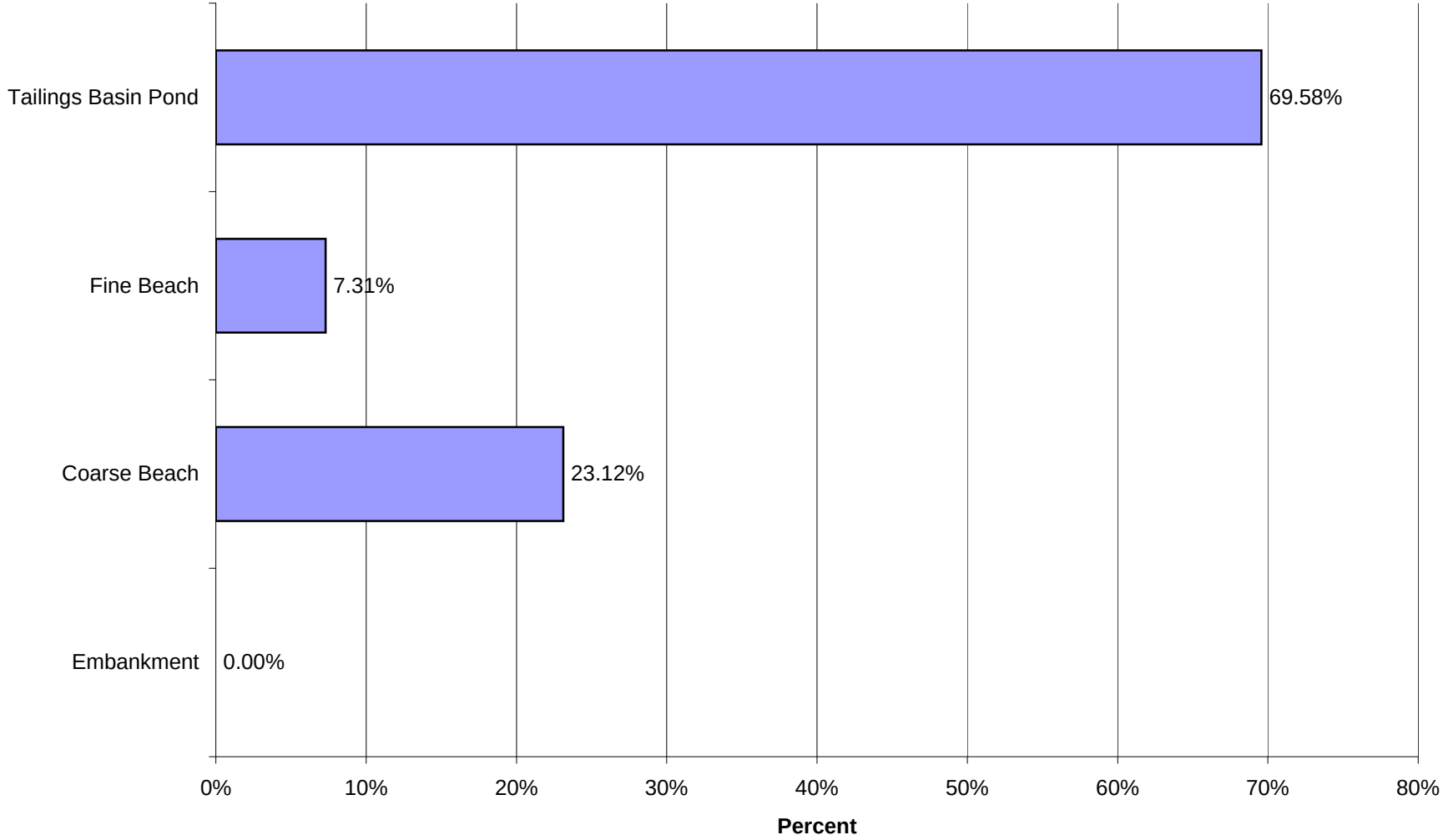
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 1 for Arsenic (As)



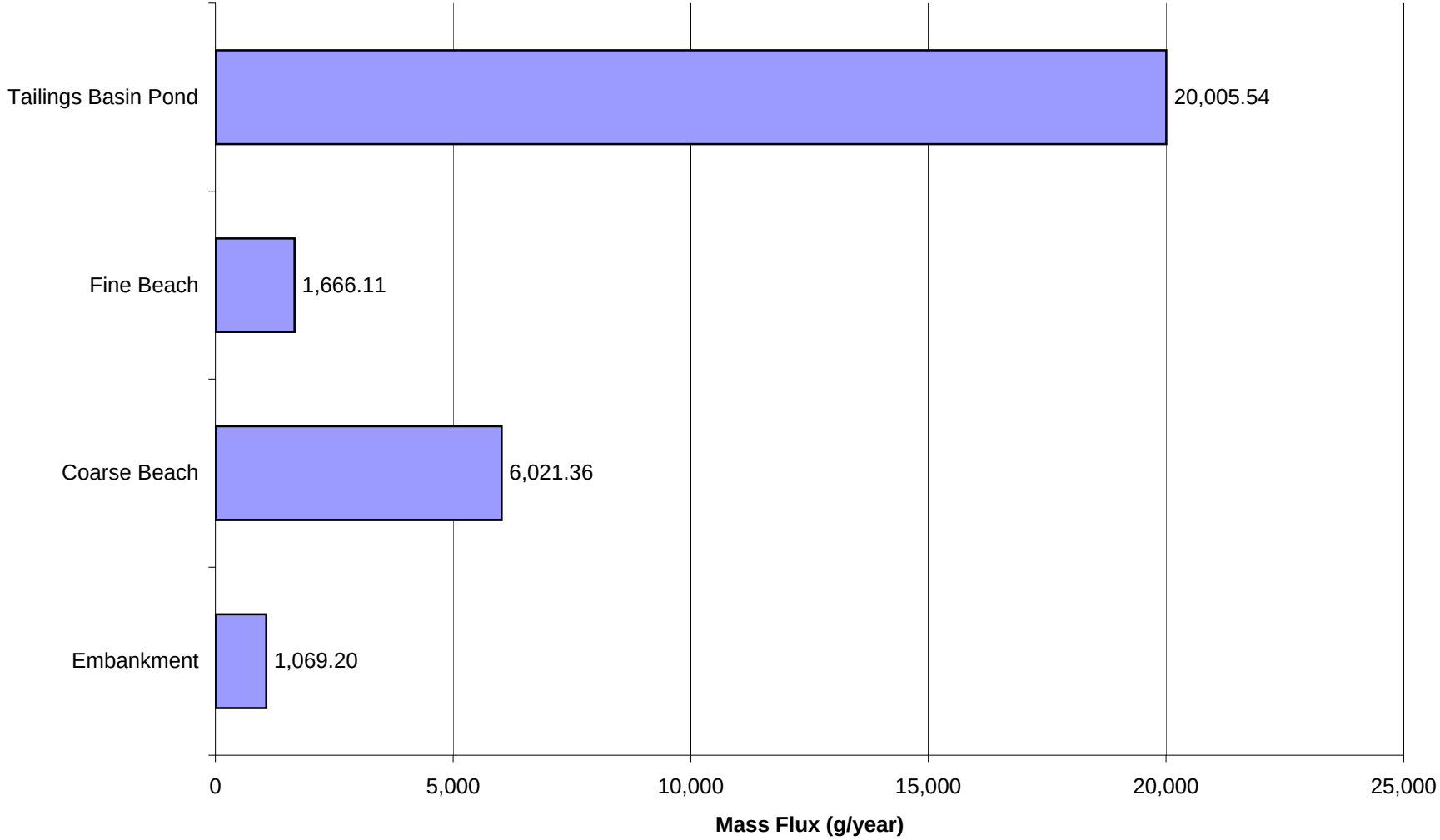
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 5 for Arsenic (As)



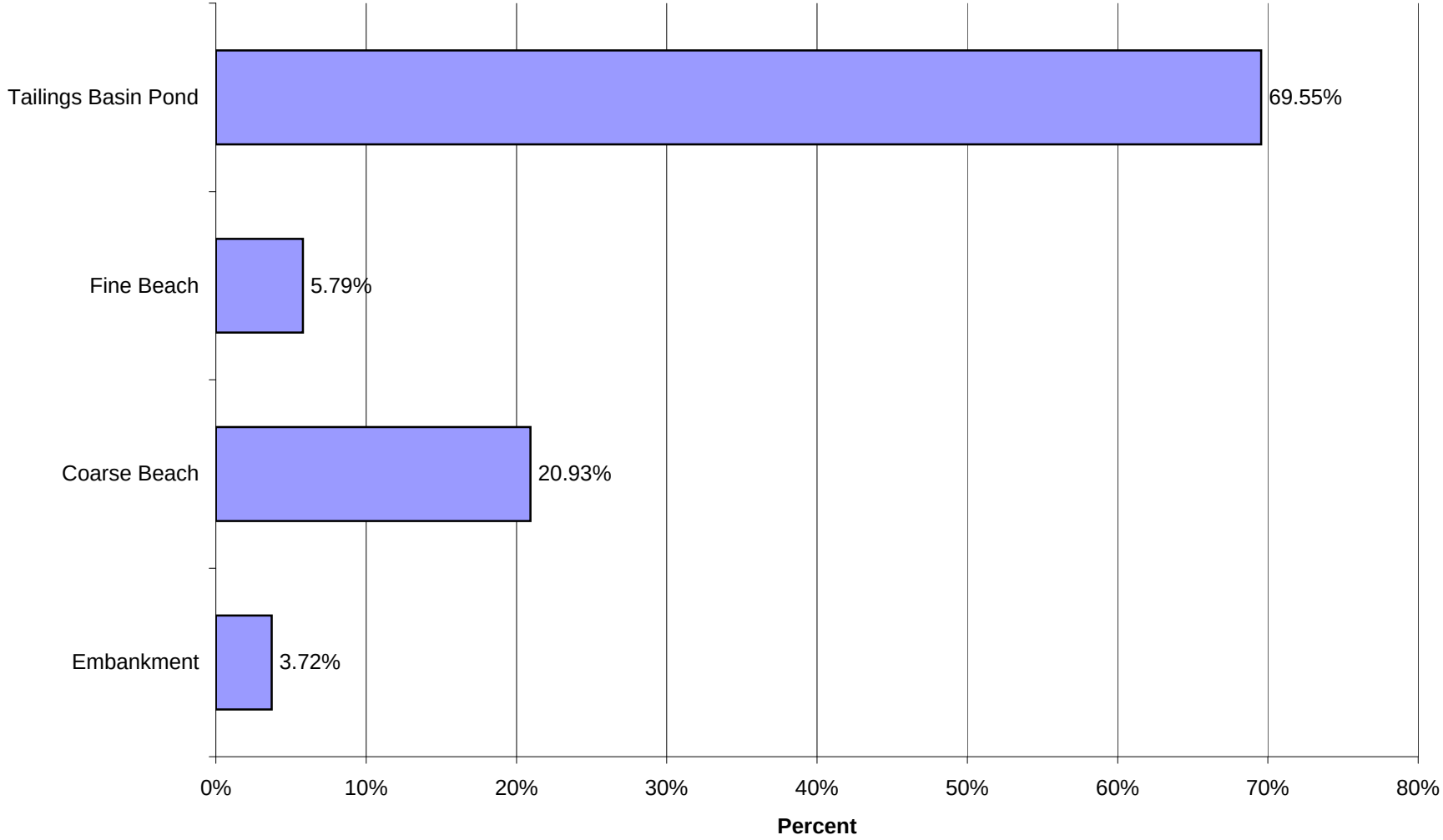
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 5 for Arsenic (As)



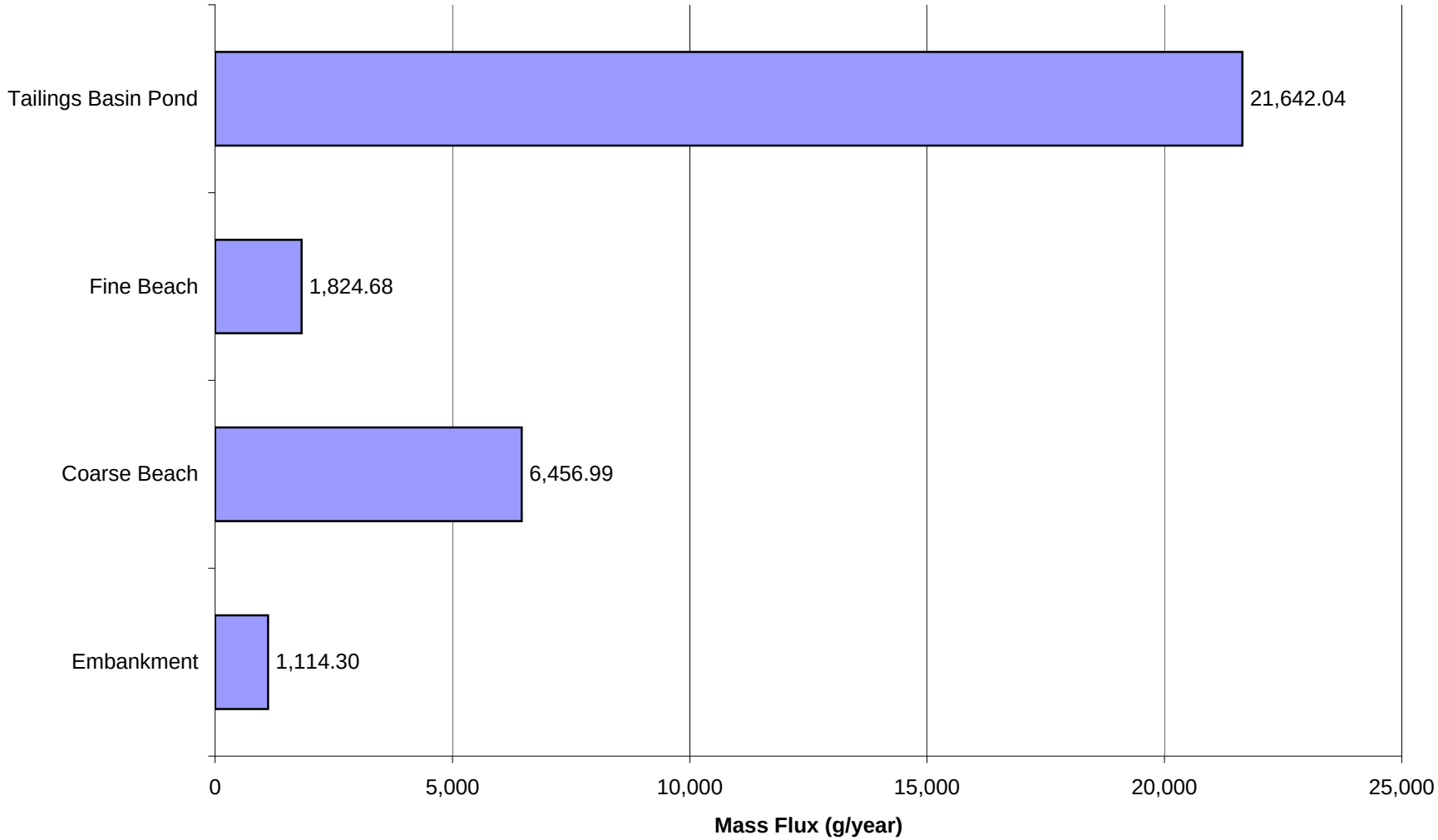
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 8 for Arsenic (As)



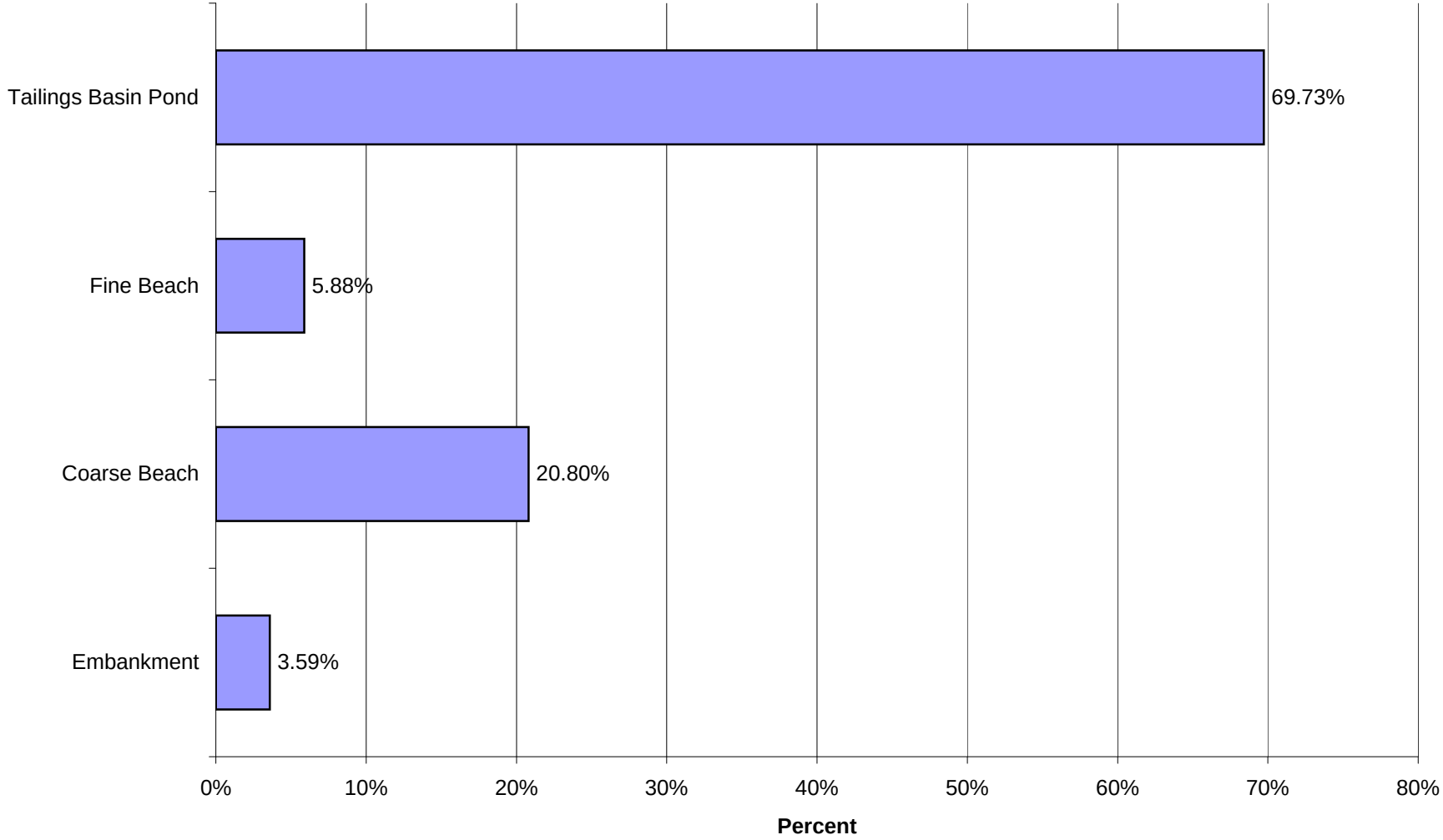
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 8 for Arsenic (As)



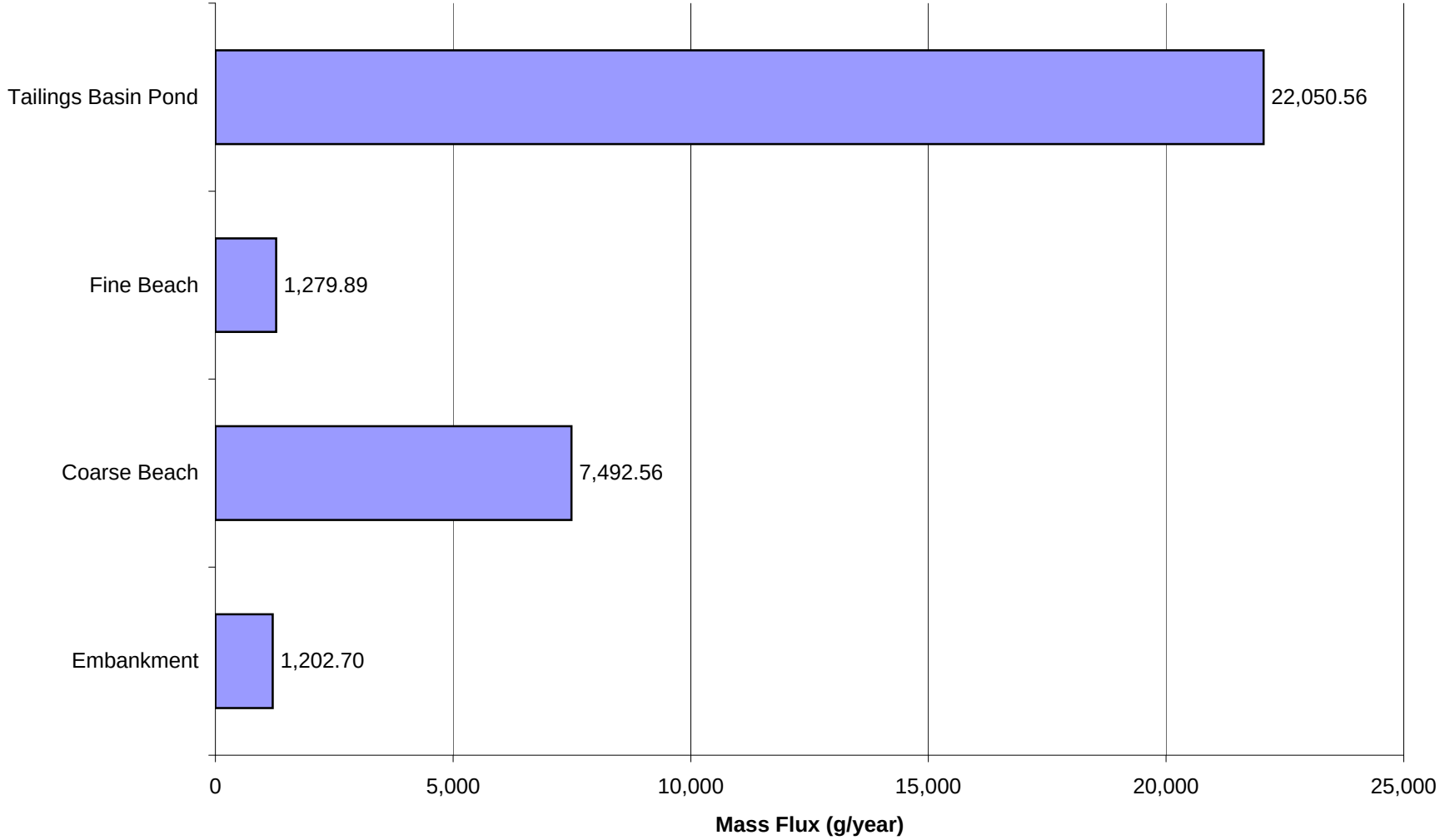
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 9 for Arsenic (As)



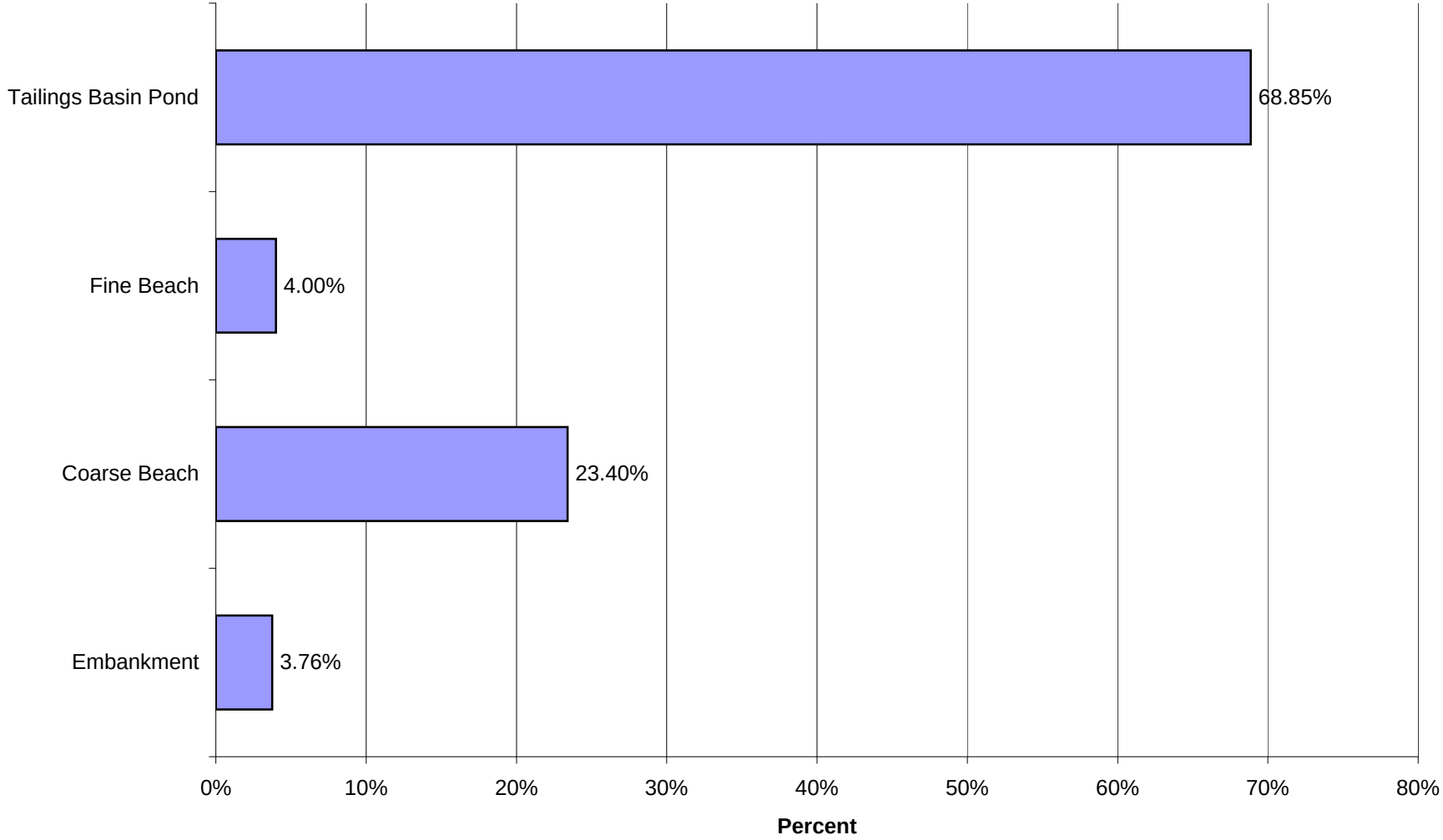
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 9 for Arsenic (As)

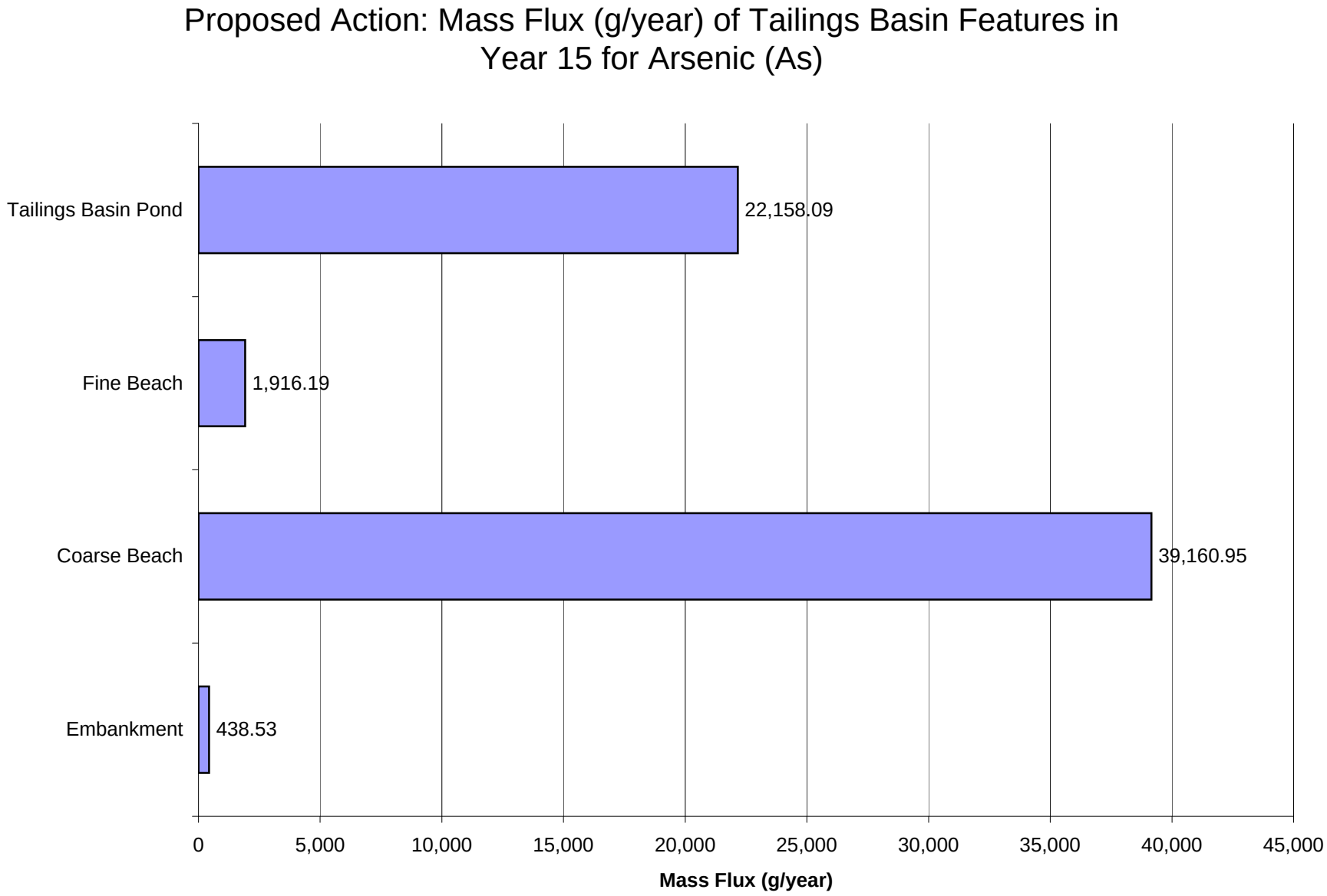


Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 10 for Arsenic (As)

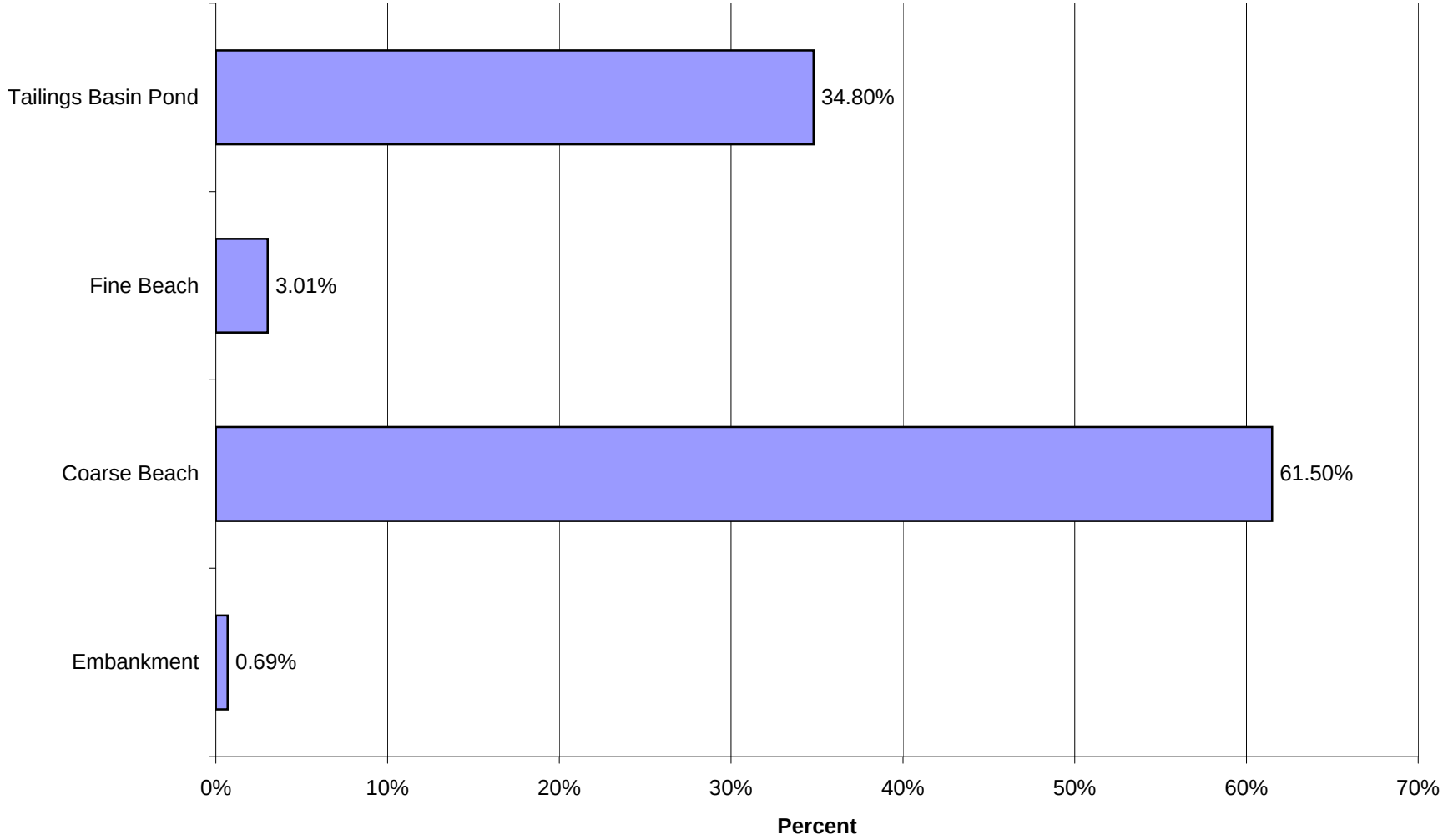


Proposed Action: Percent of Tailings Basin Features' Impacts in Year 10 for Arsenic (As)

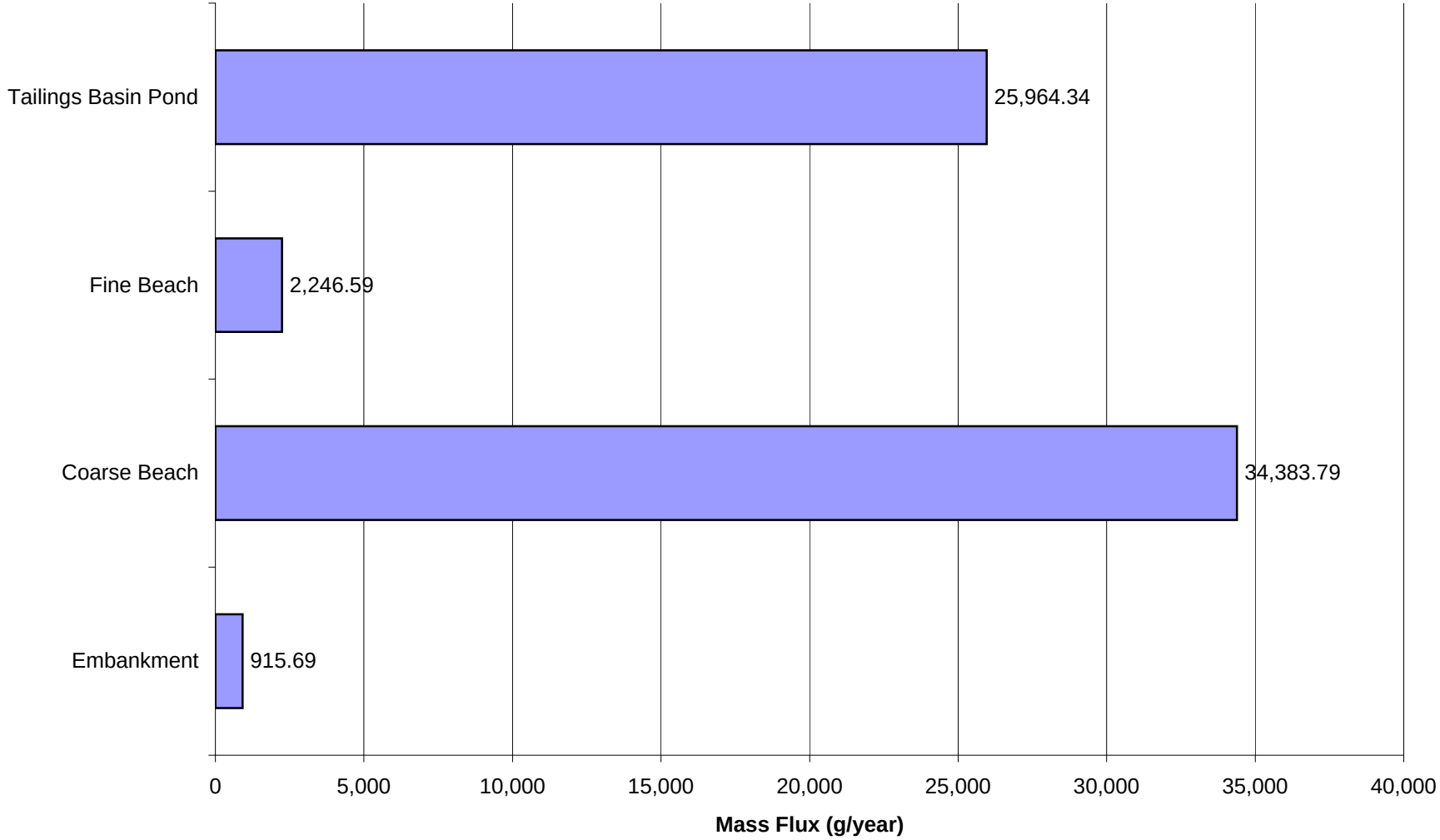



Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 15 for Arsenic (As)
Tailings Basin Pond
22,158.09
Fine Beach
1,916.19
Coarse Beach
39,160.95
Embankment
438.53
0
5,000
10,000
15,000
20,000
25,000
30,000
35,000
40,000
45,000
Mass Flux (g/year)

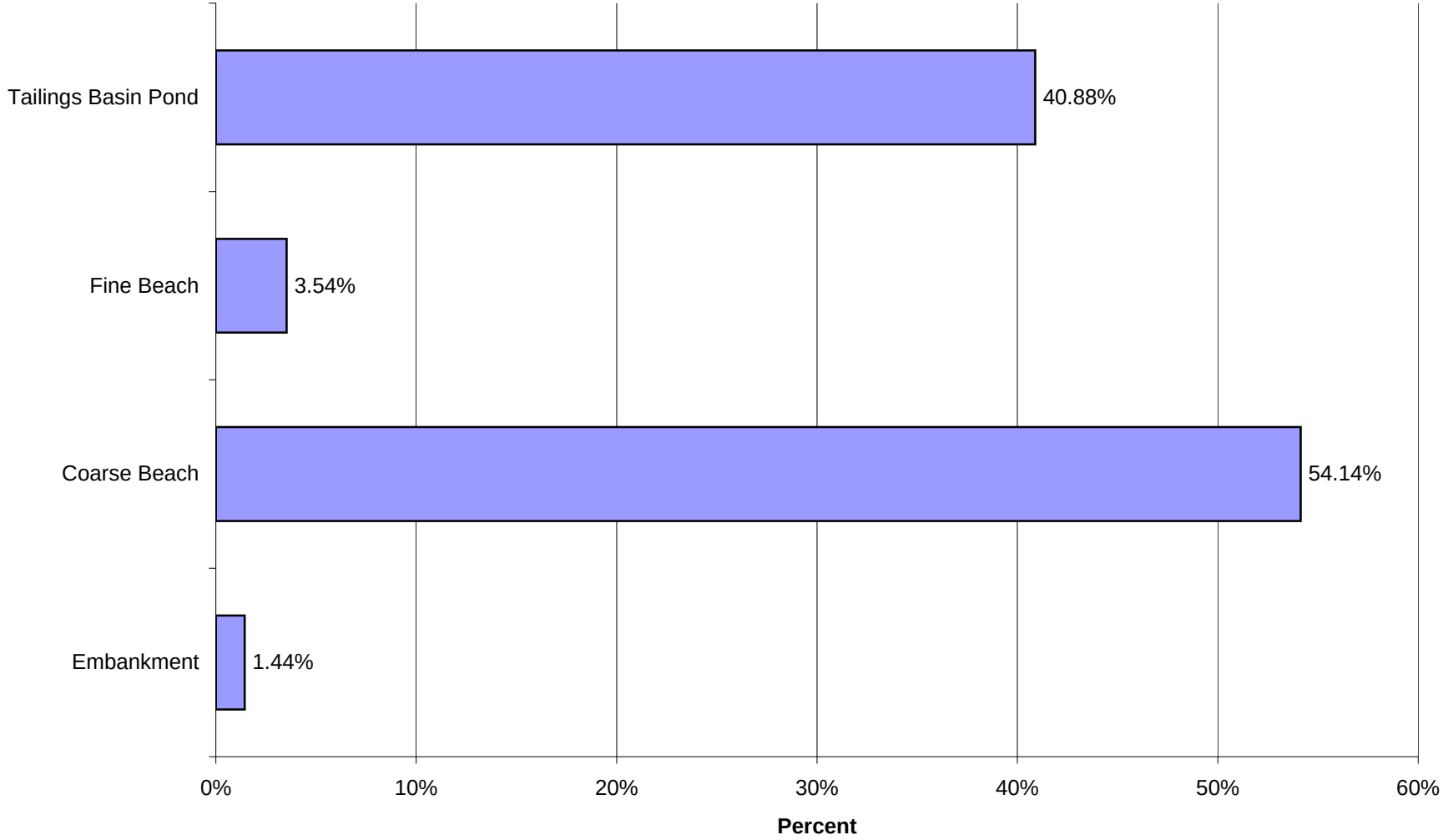
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 15 for Arsenic (As)



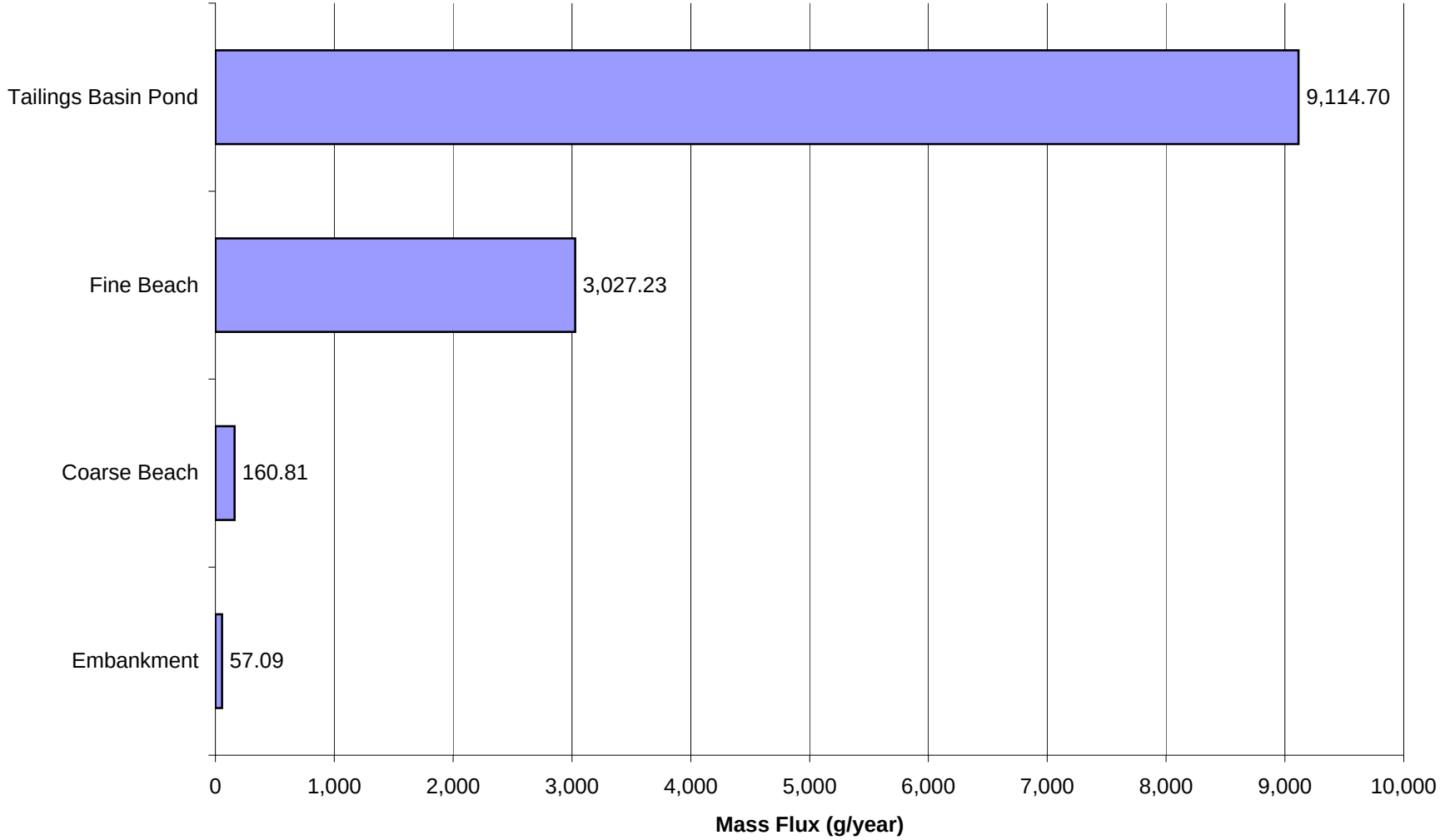
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 20 for Arsenic (As)



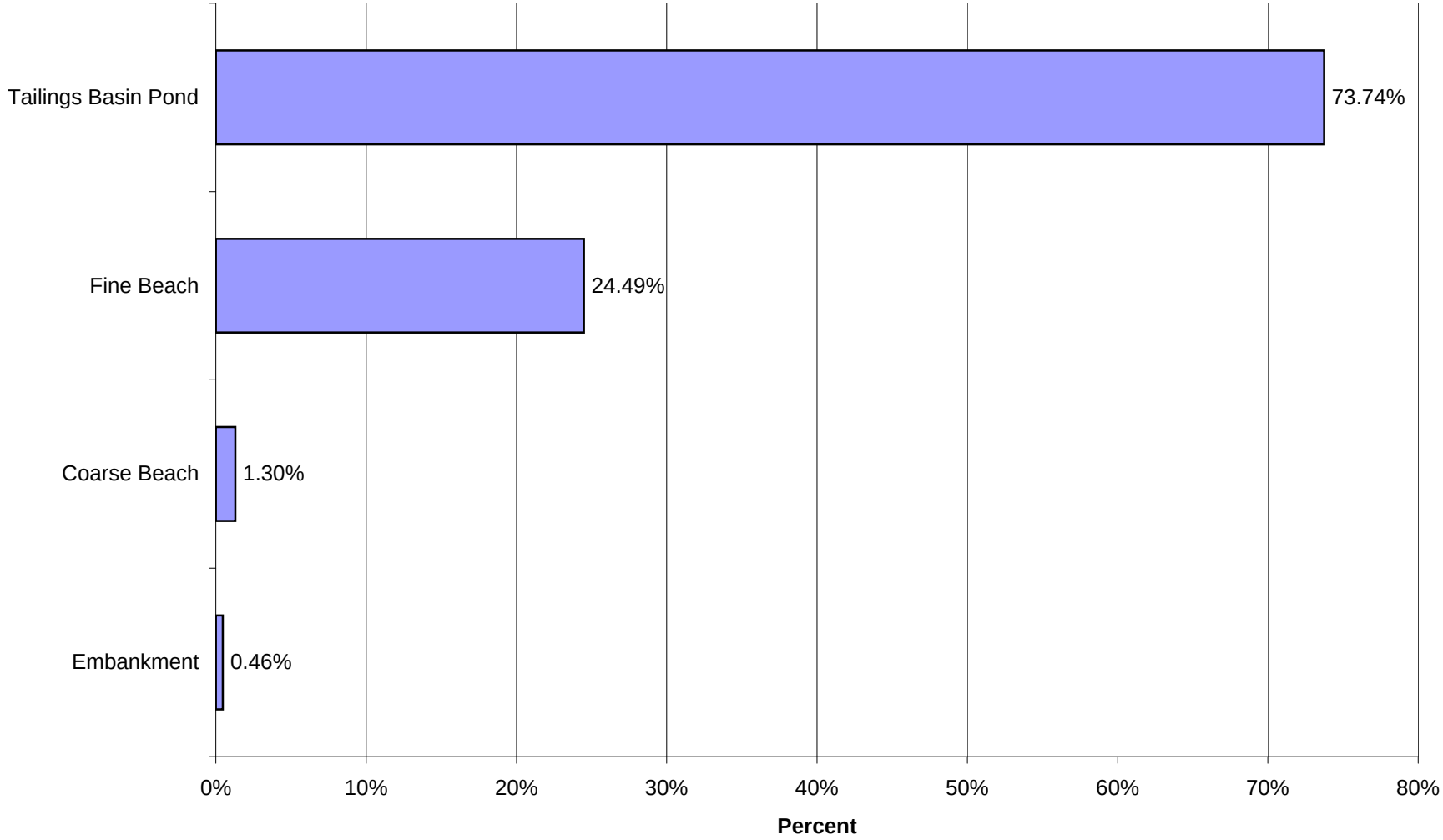
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 20 for Arsenic (As)



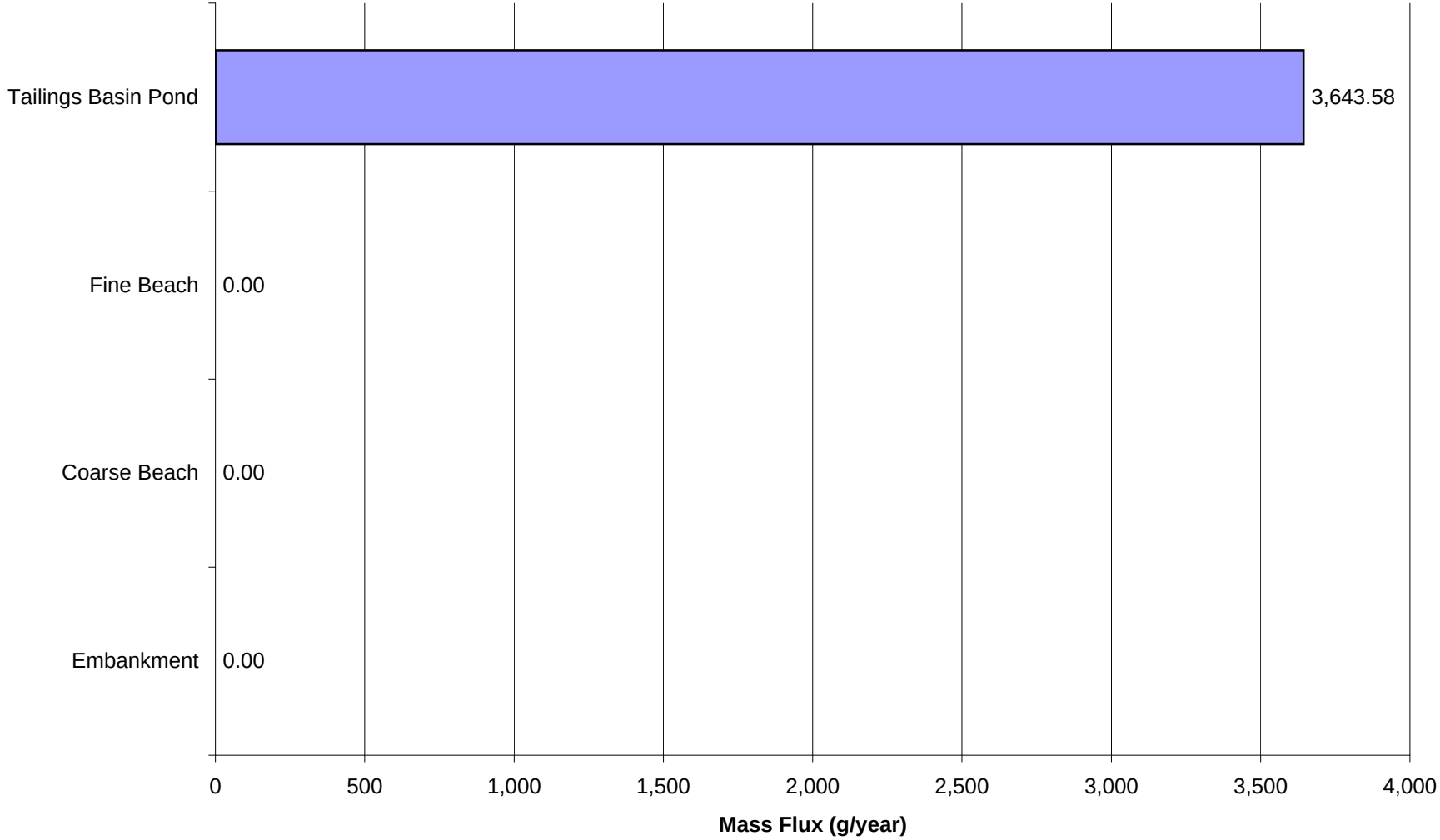
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Closure for Arsenic (As)



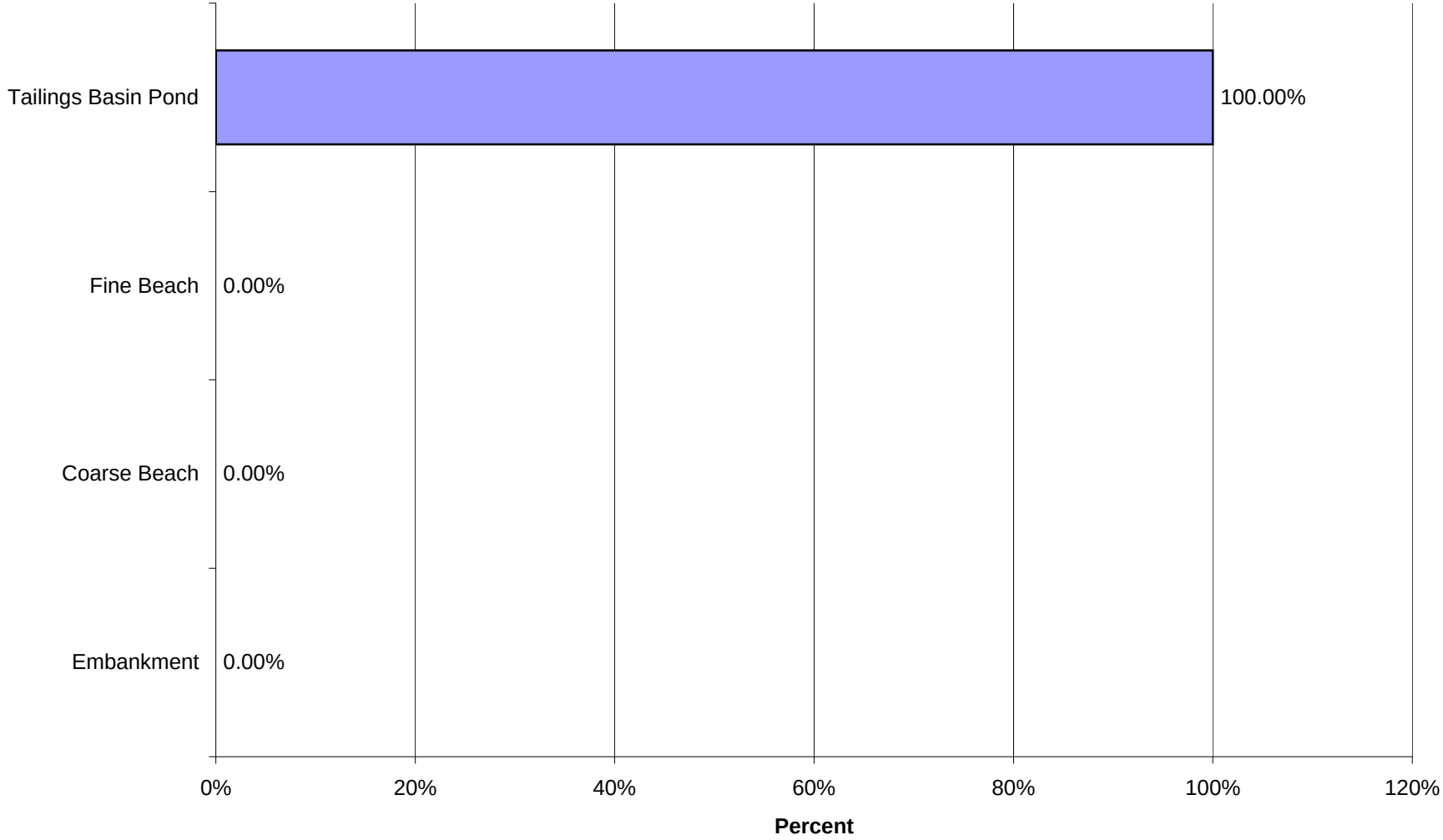
Proposed Action: Percent of Tailings Basin Features' Impacts in Closure for Arsenic (As)



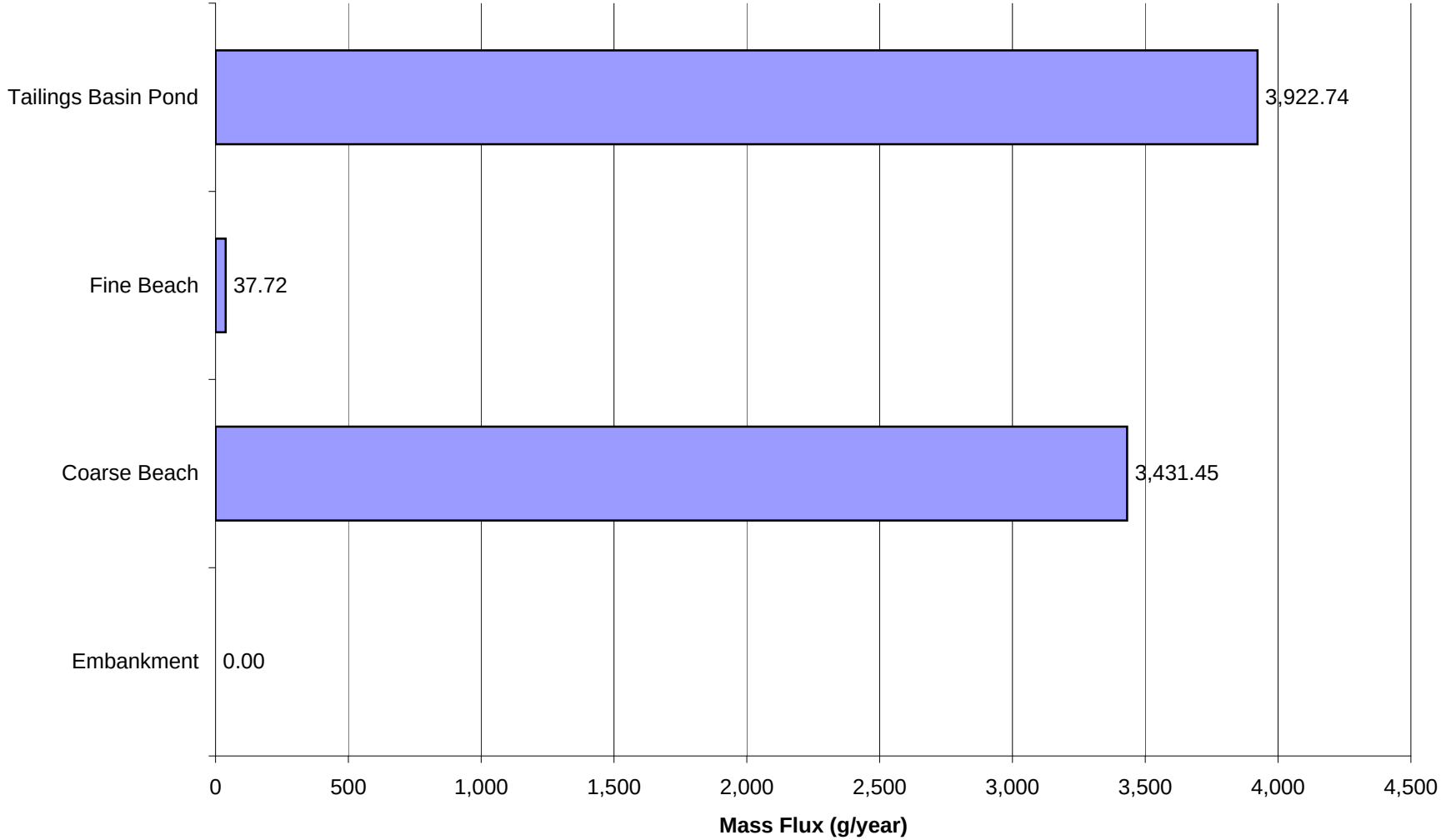
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 1 for Cobalt (Co)



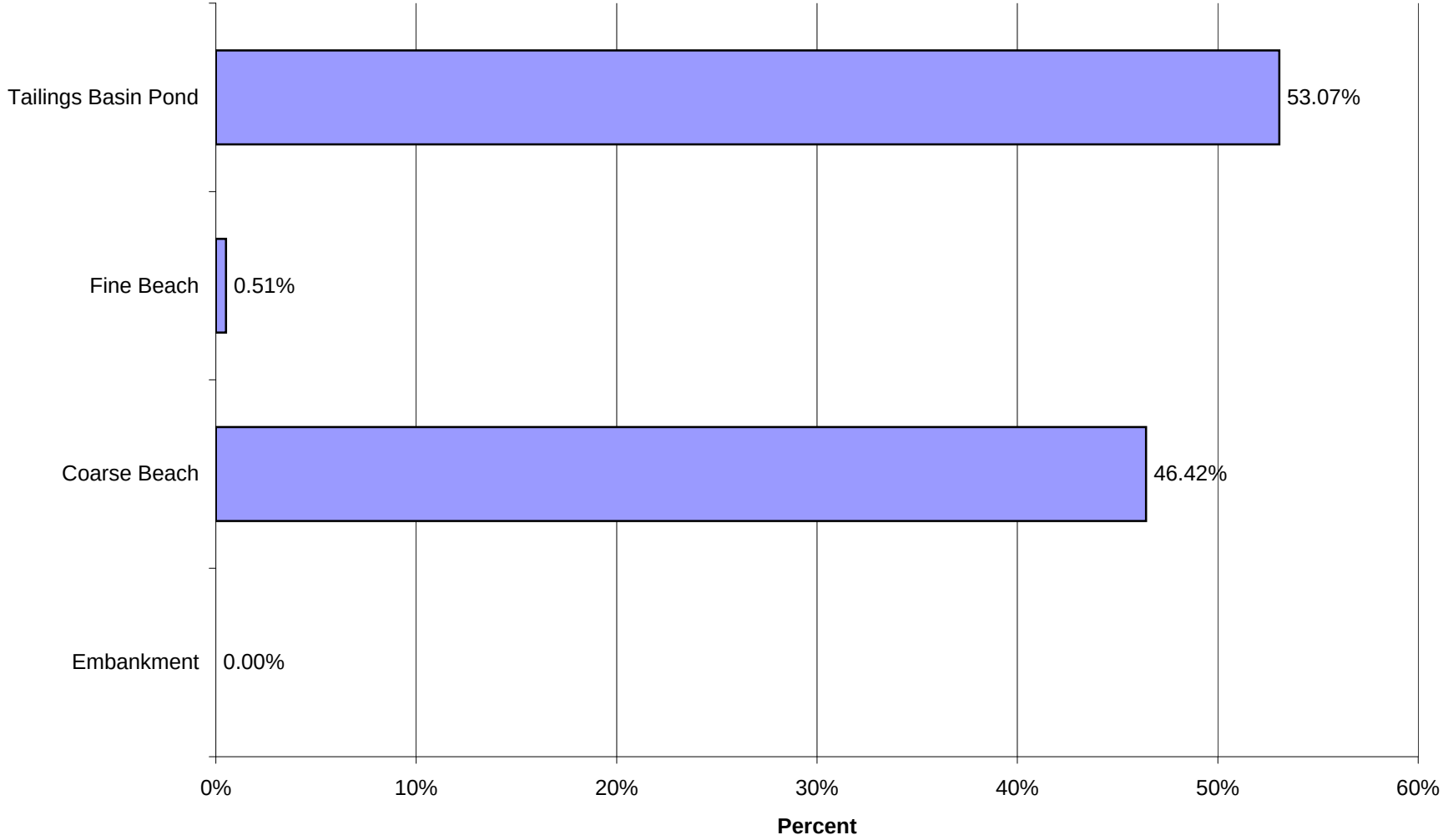
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 1 for Cobalt (Co)



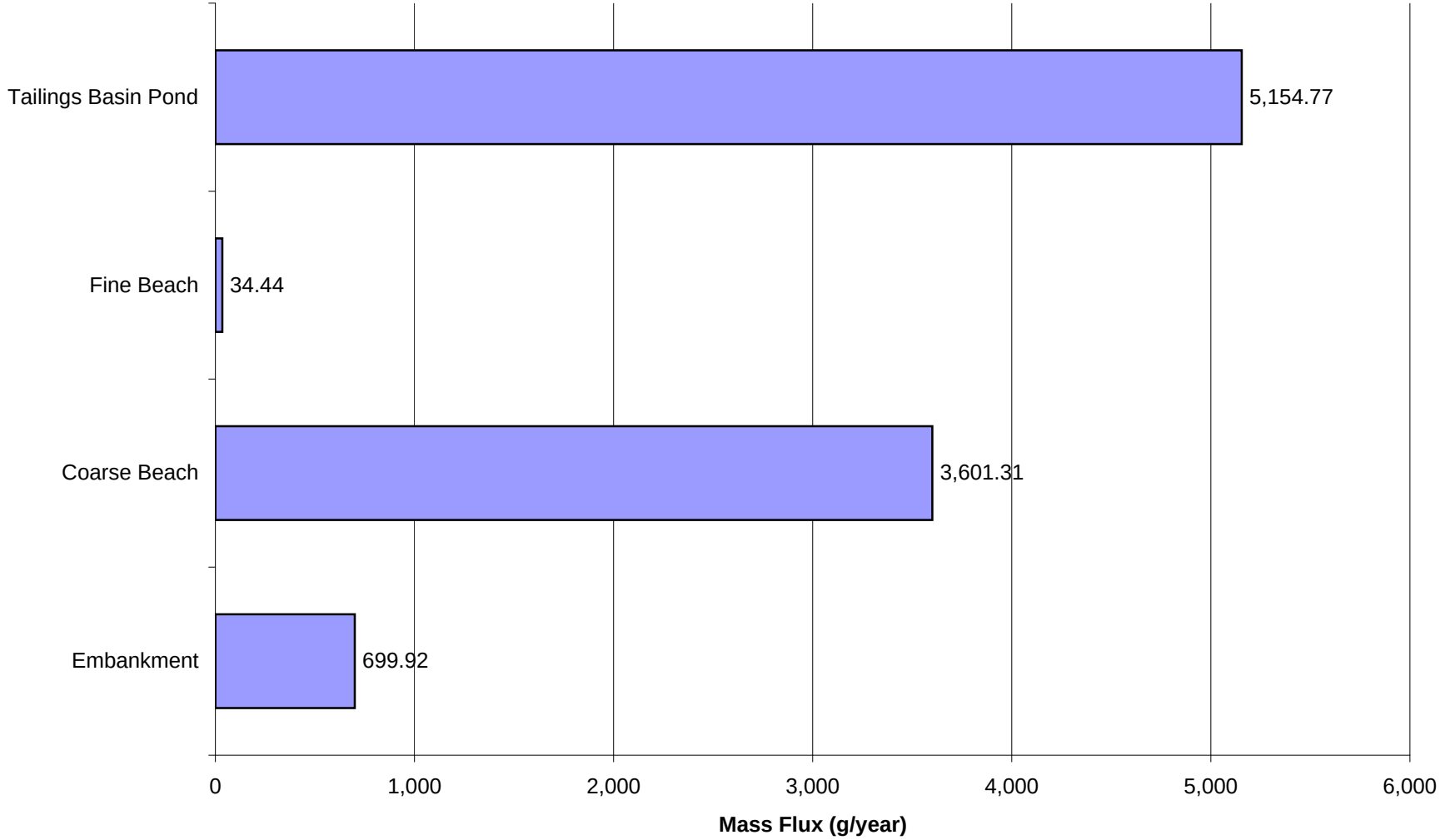
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 5 for Cobalt (Co)



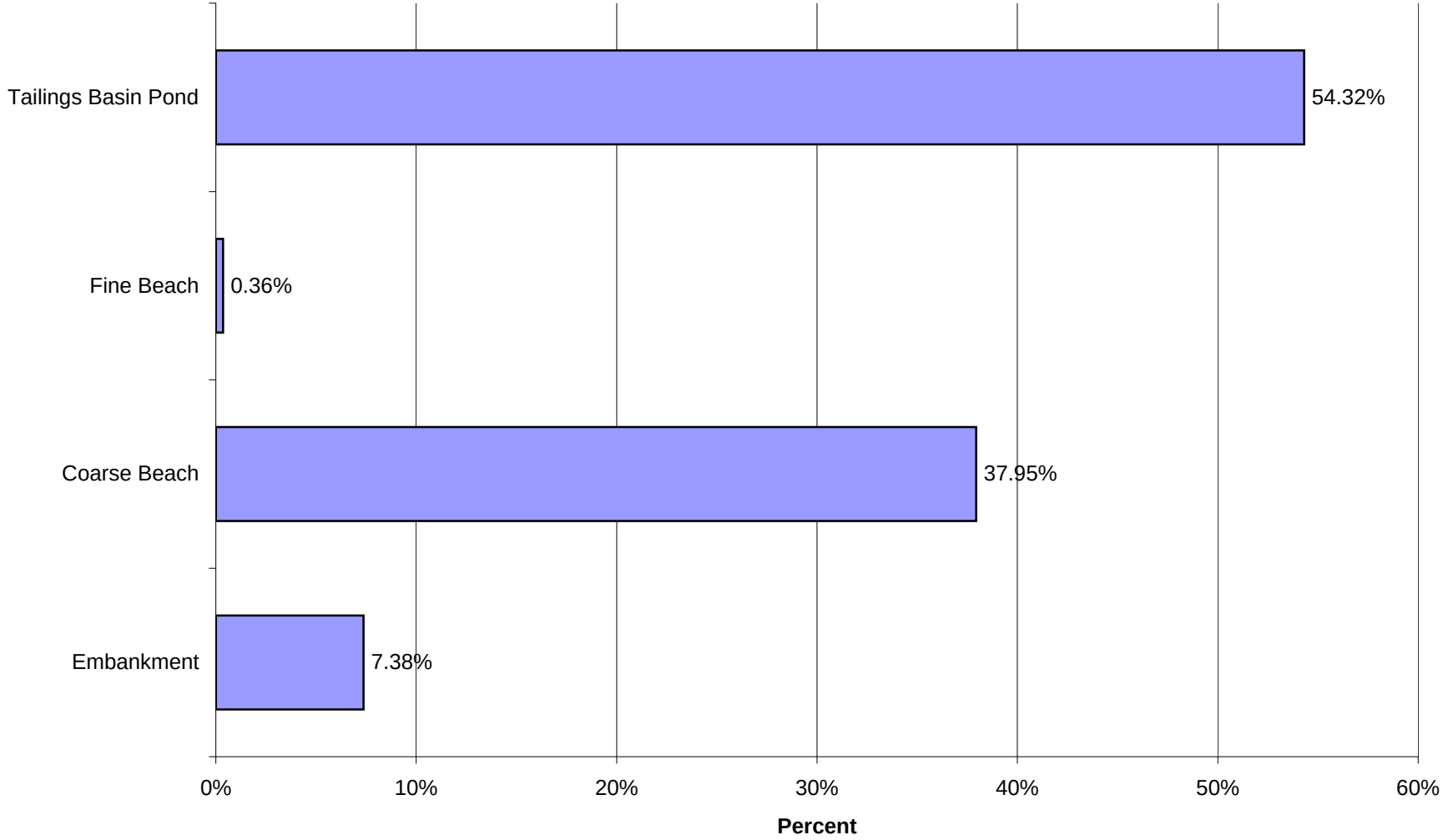
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 5 for Cobalt (Co)



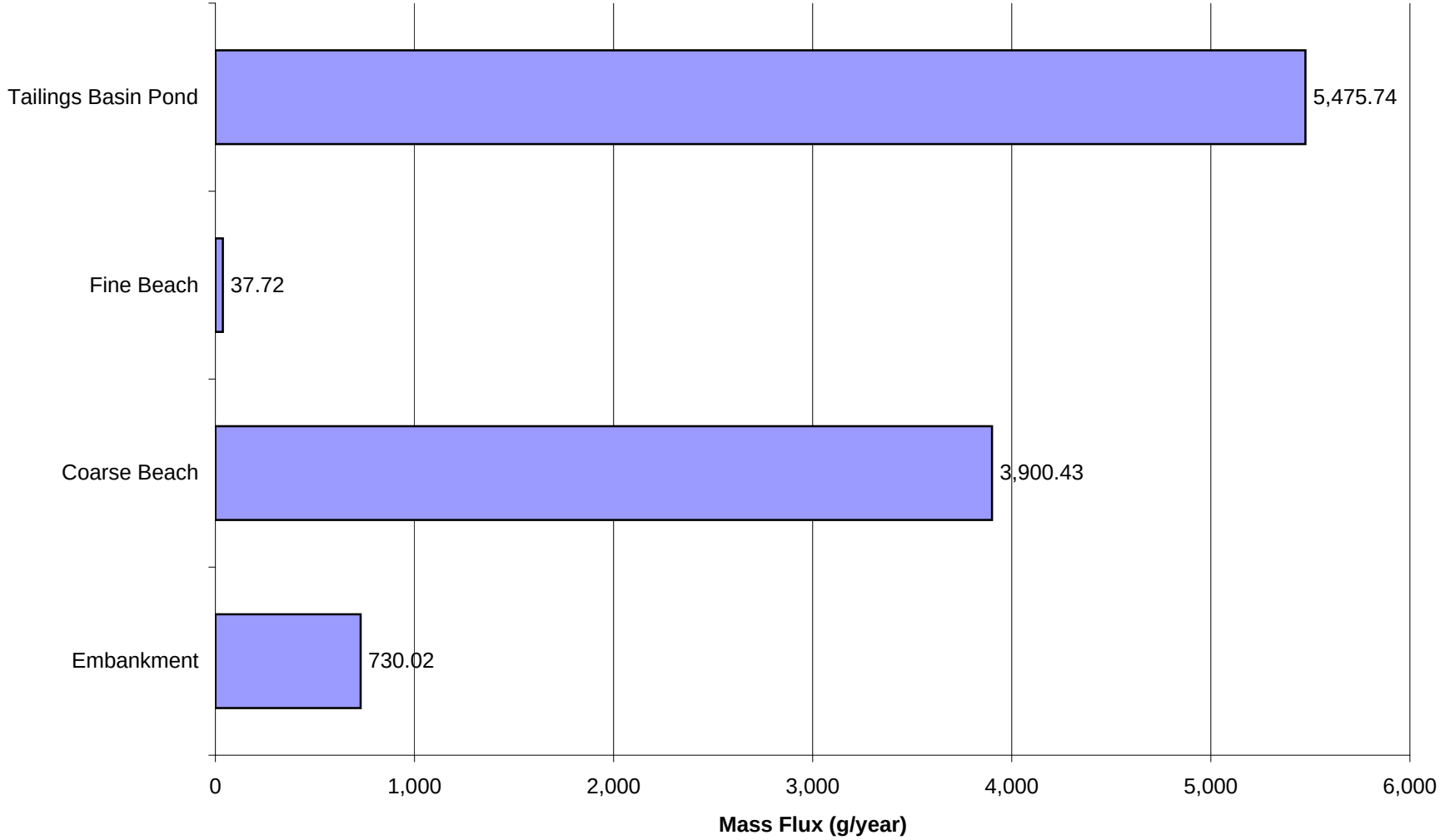
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 8 for Cobalt (Co)



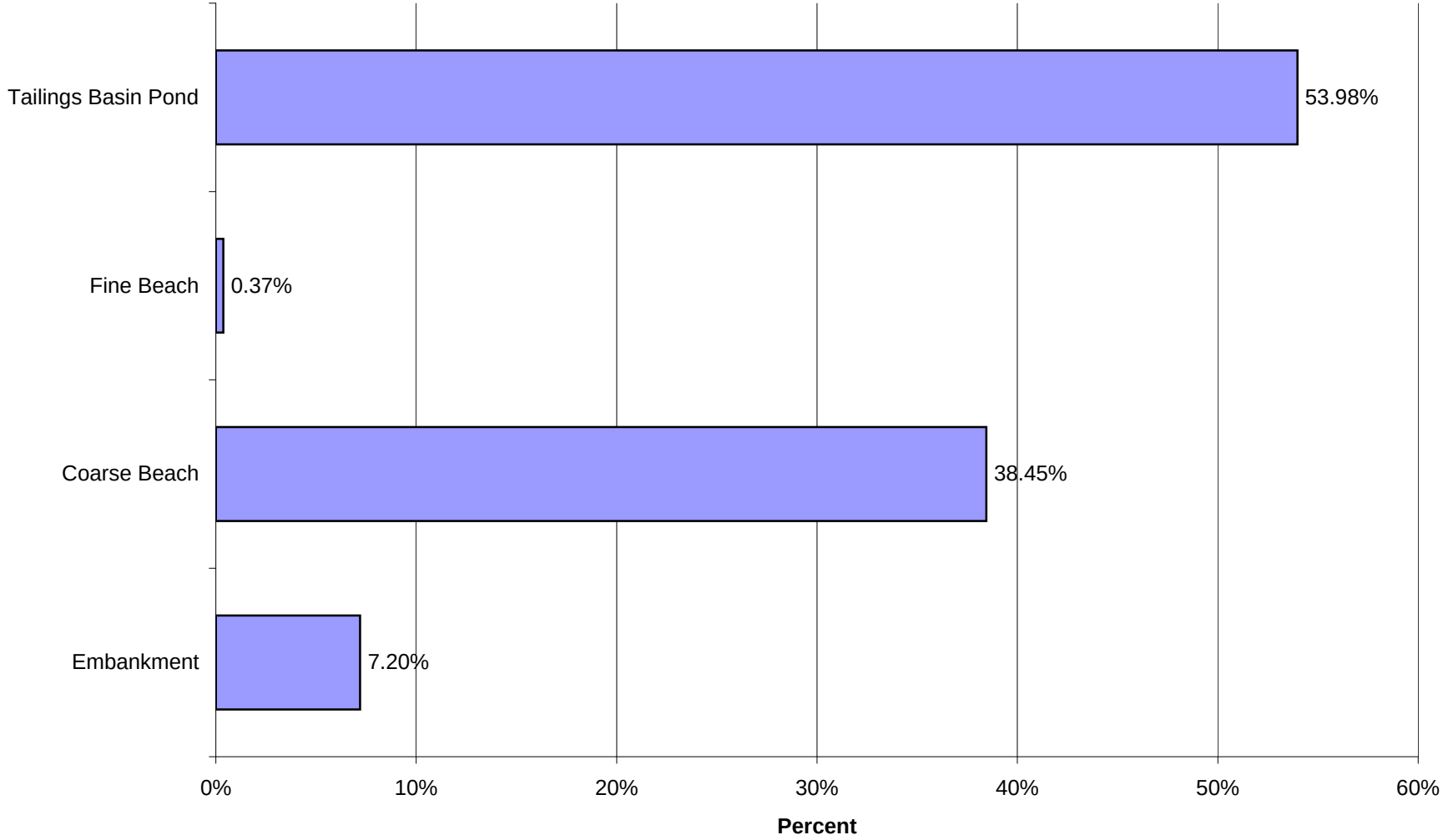
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 8 for Cobalt (Co)



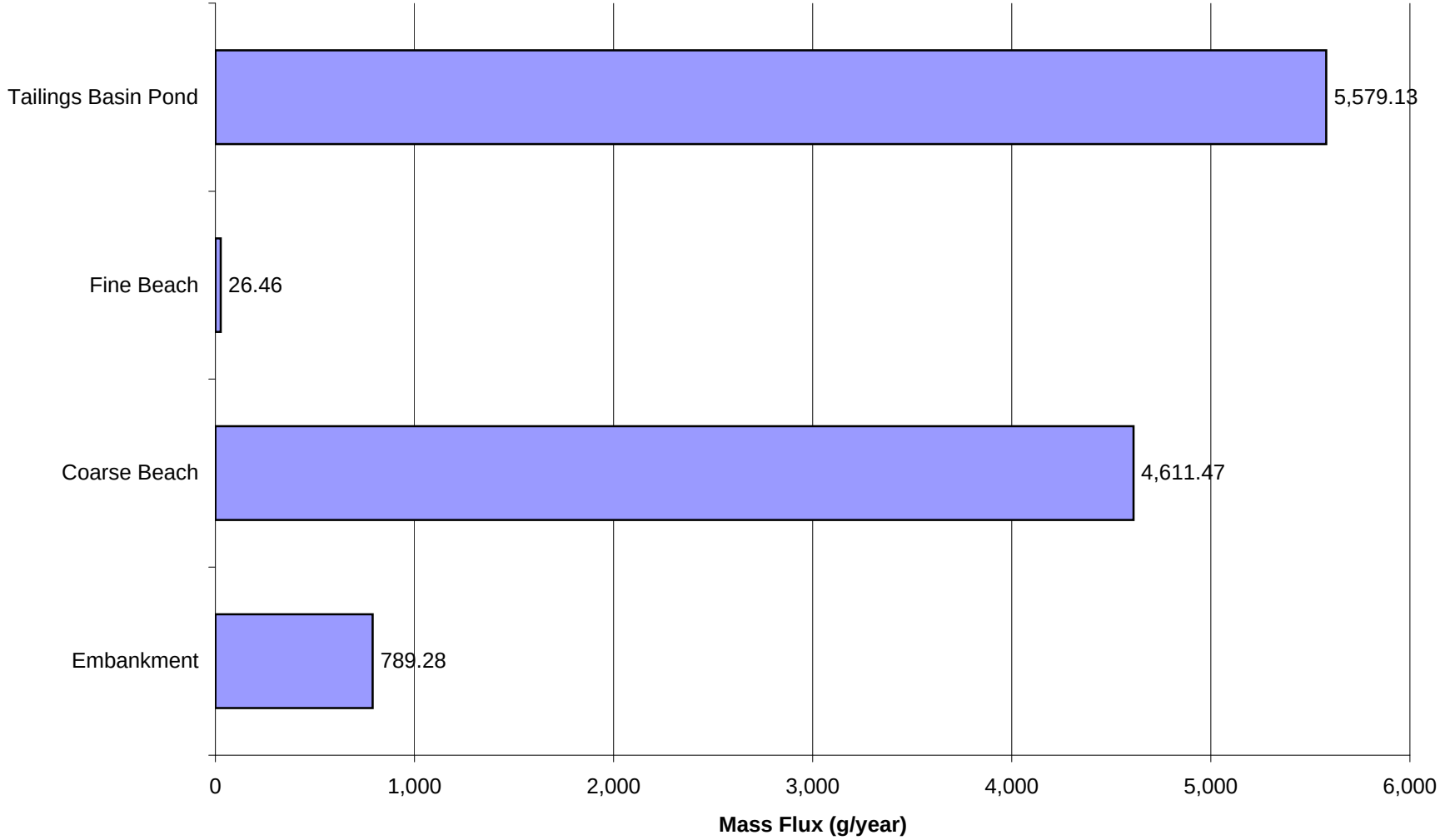
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 9 for Cobalt (Co)



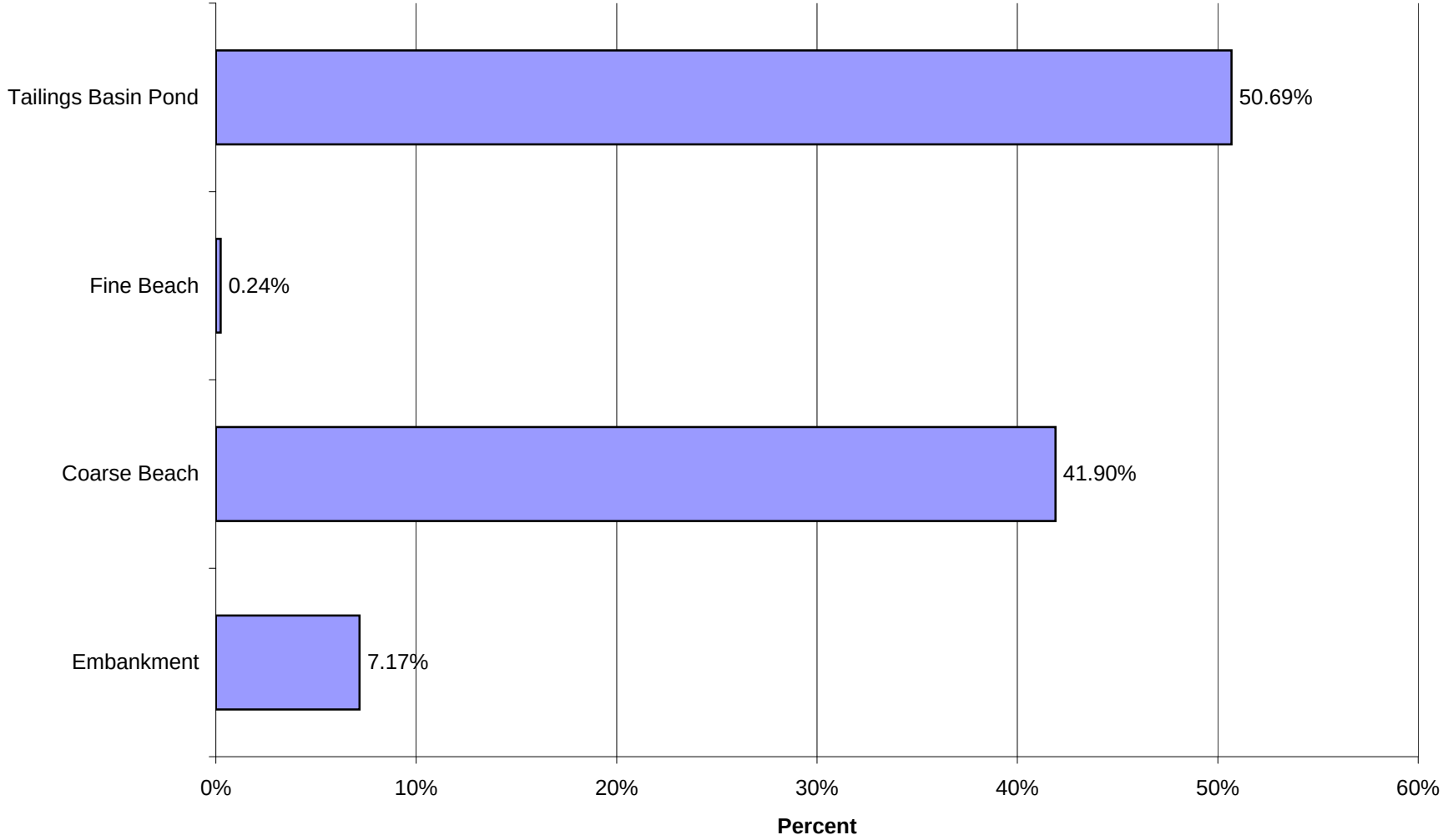
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 9 for Cobalt (Co)



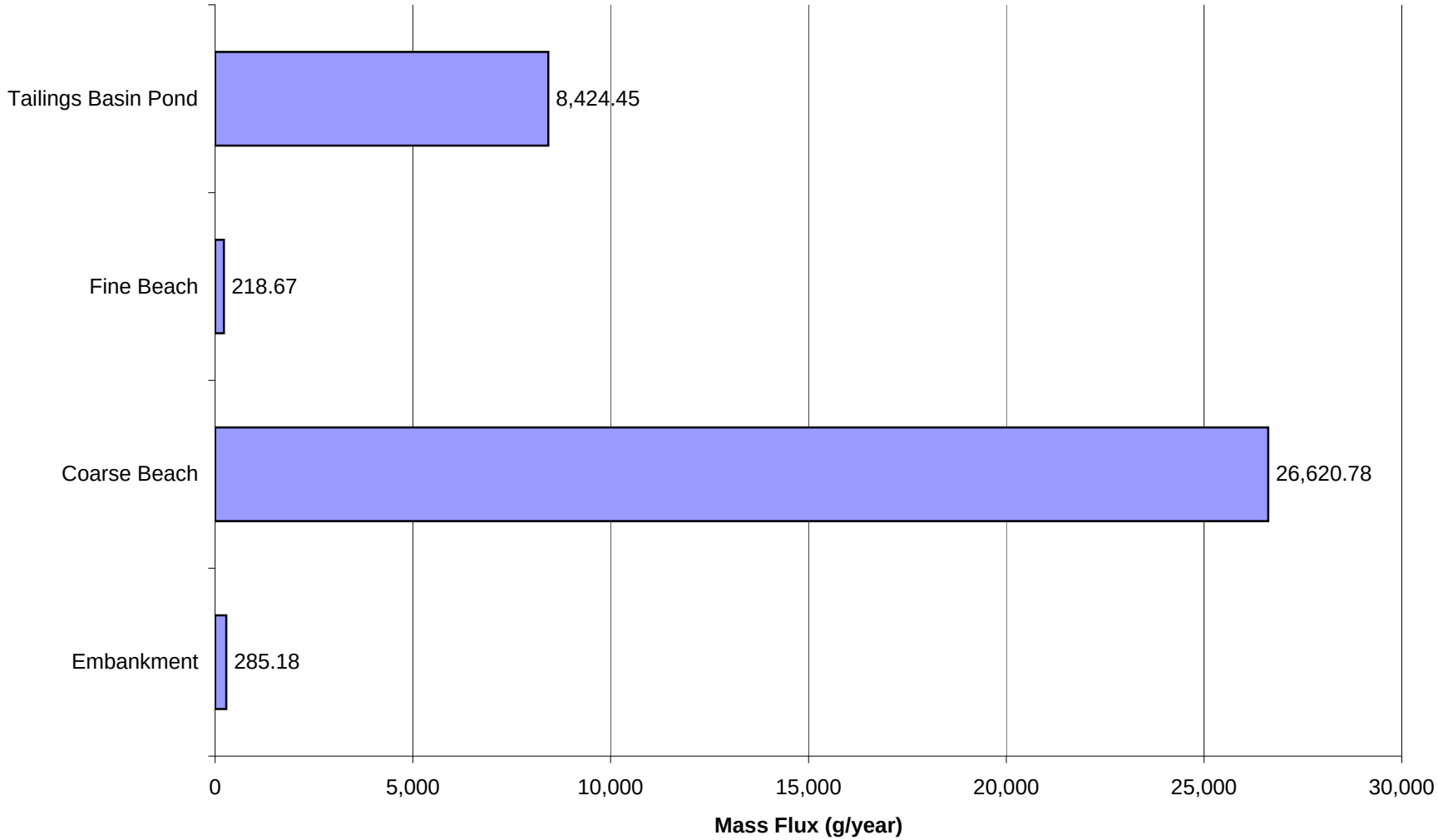
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 10 for Cobalt (Co)



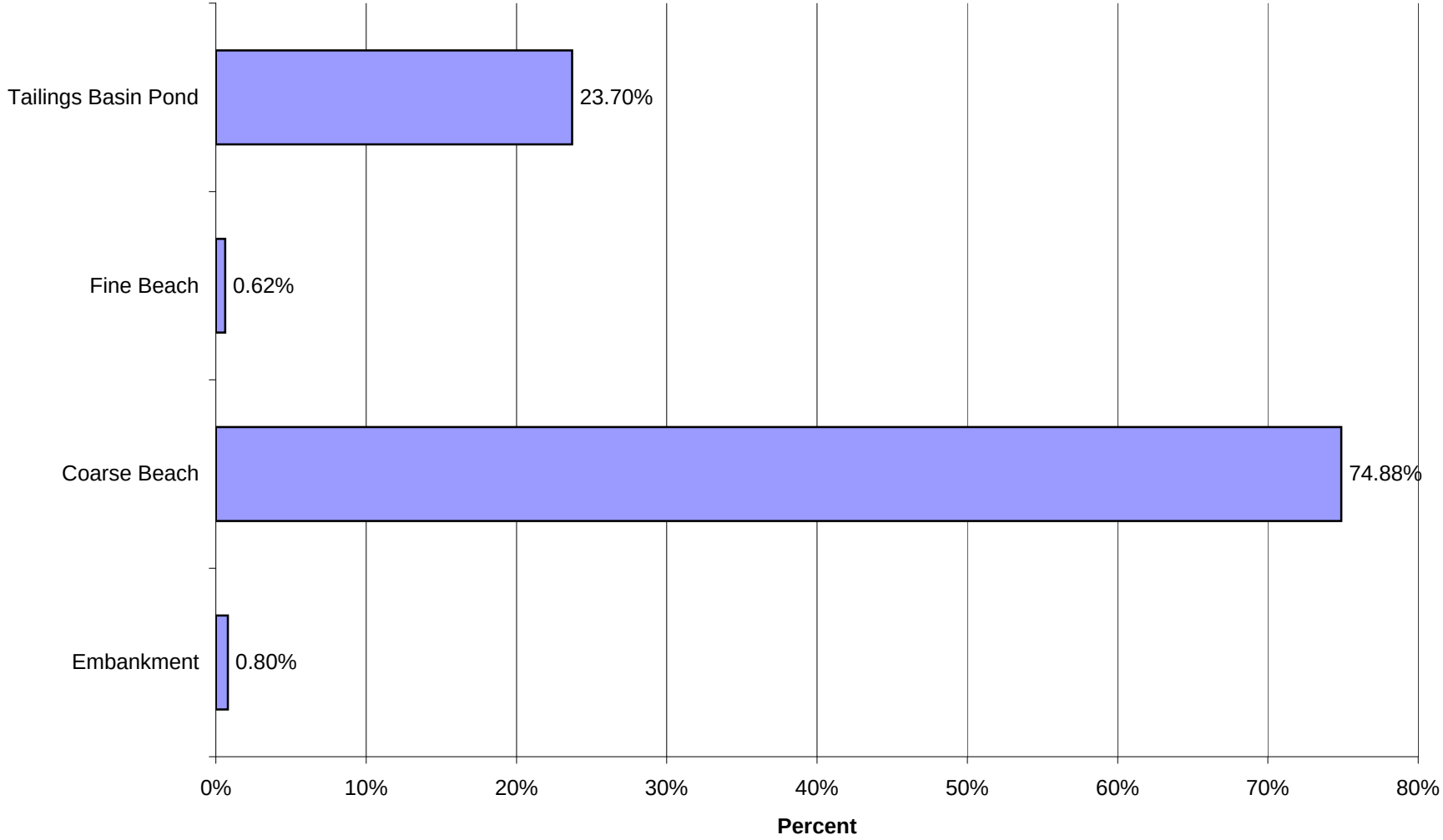
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 10 for Cobalt (Co)



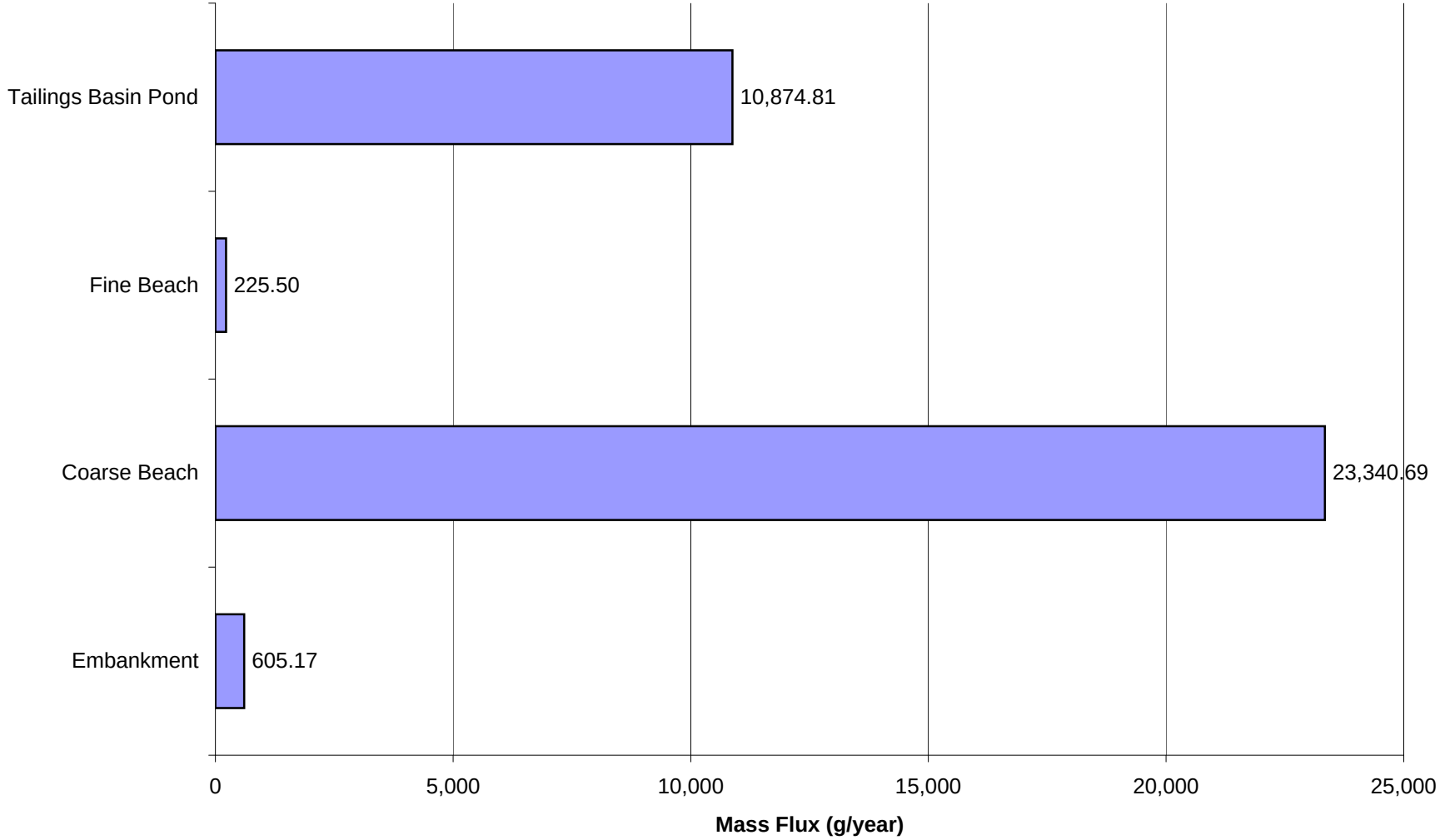
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 15 for Cobalt (Co)



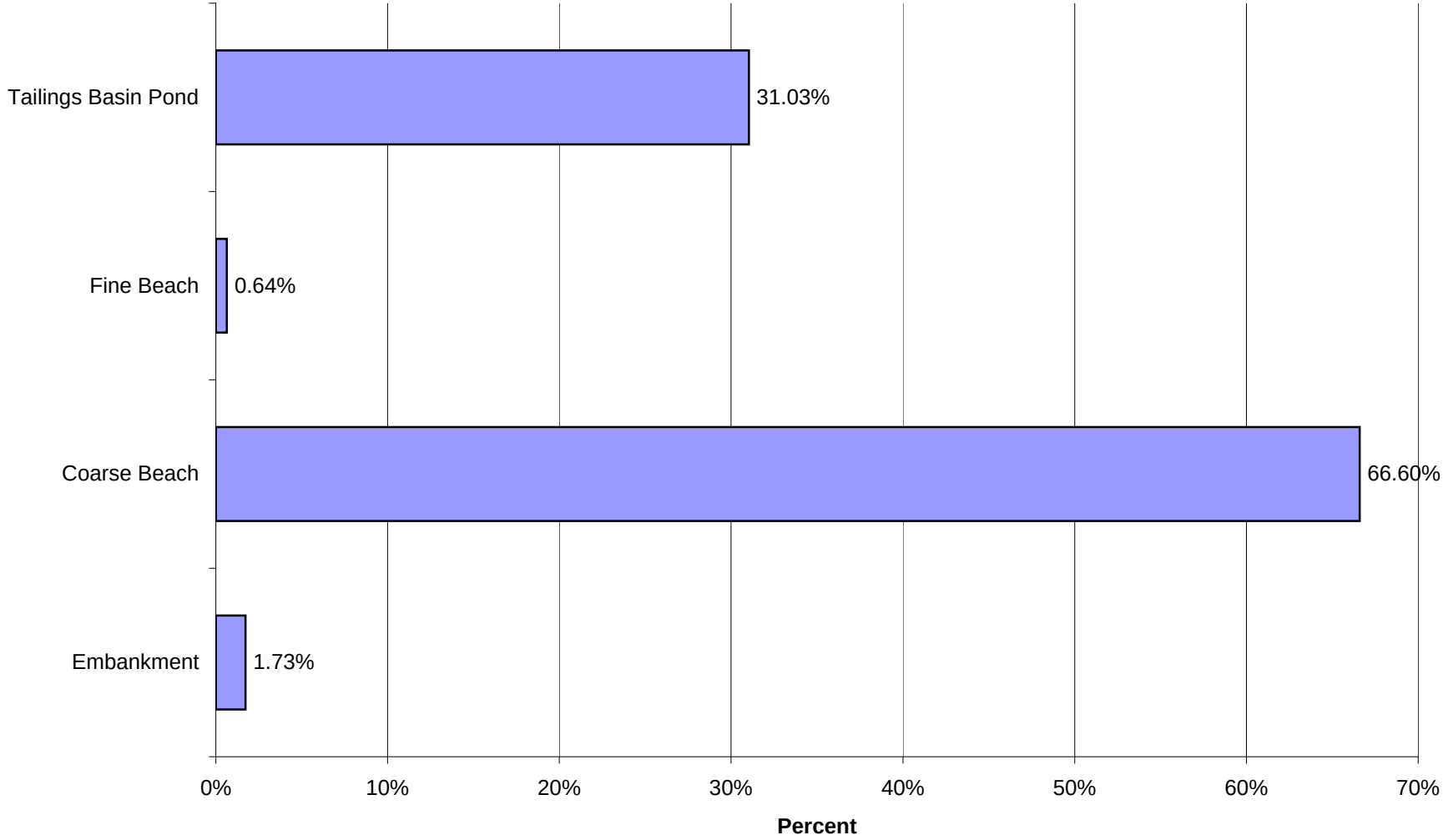
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 15 for Cobalt (Co)



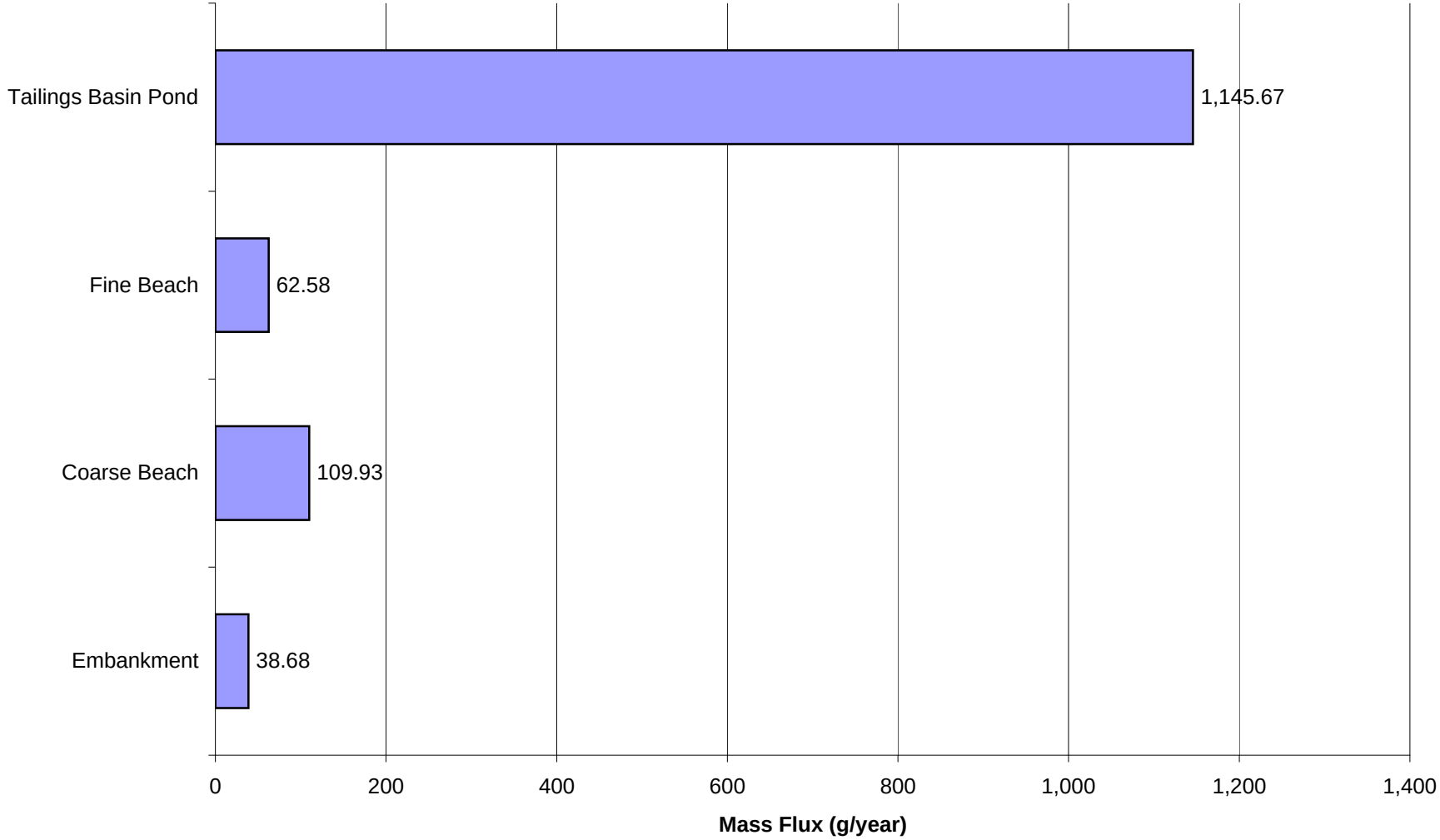
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 20 for Cobalt (Co)



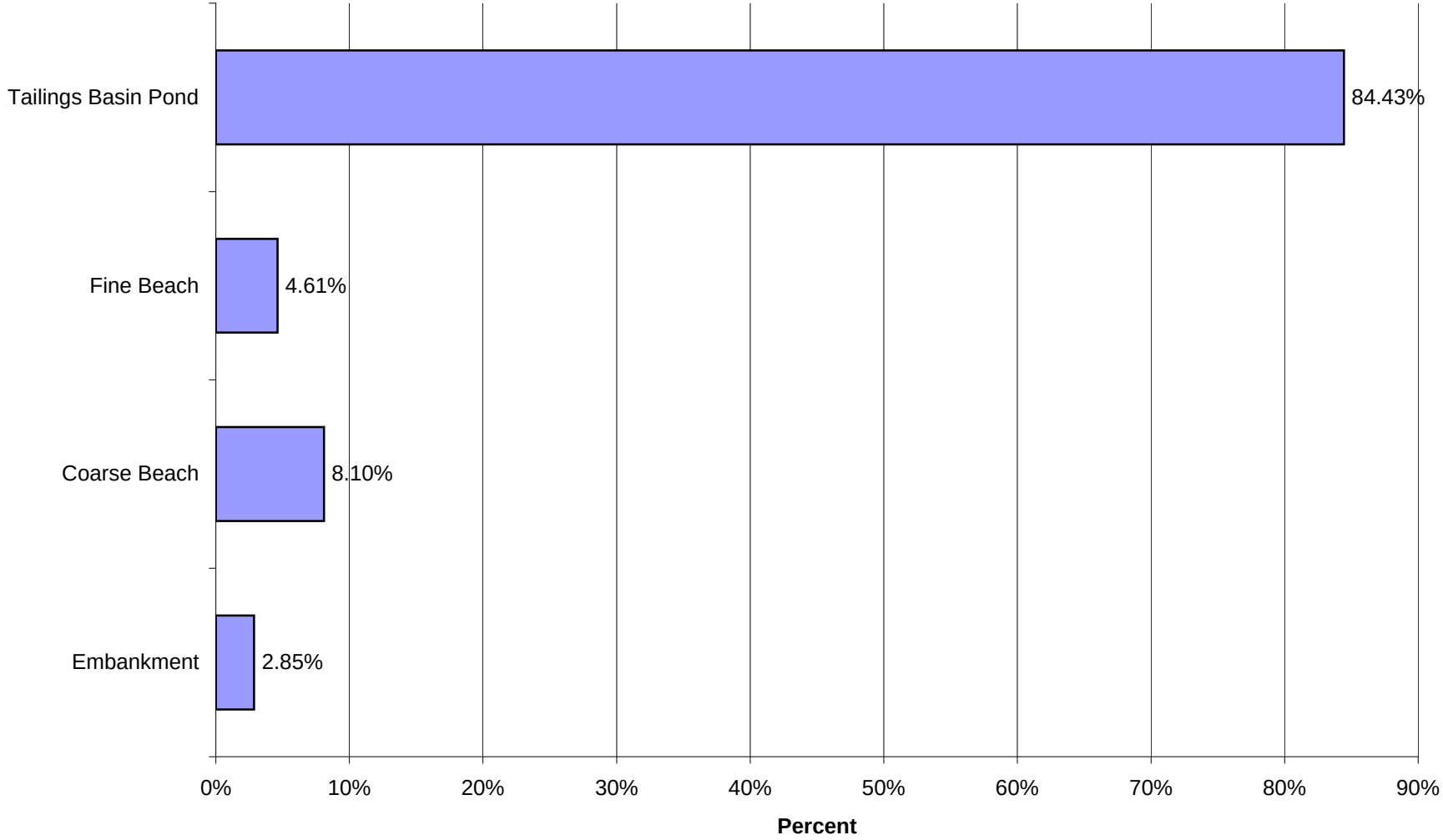
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 20 for Cobalt (Co)



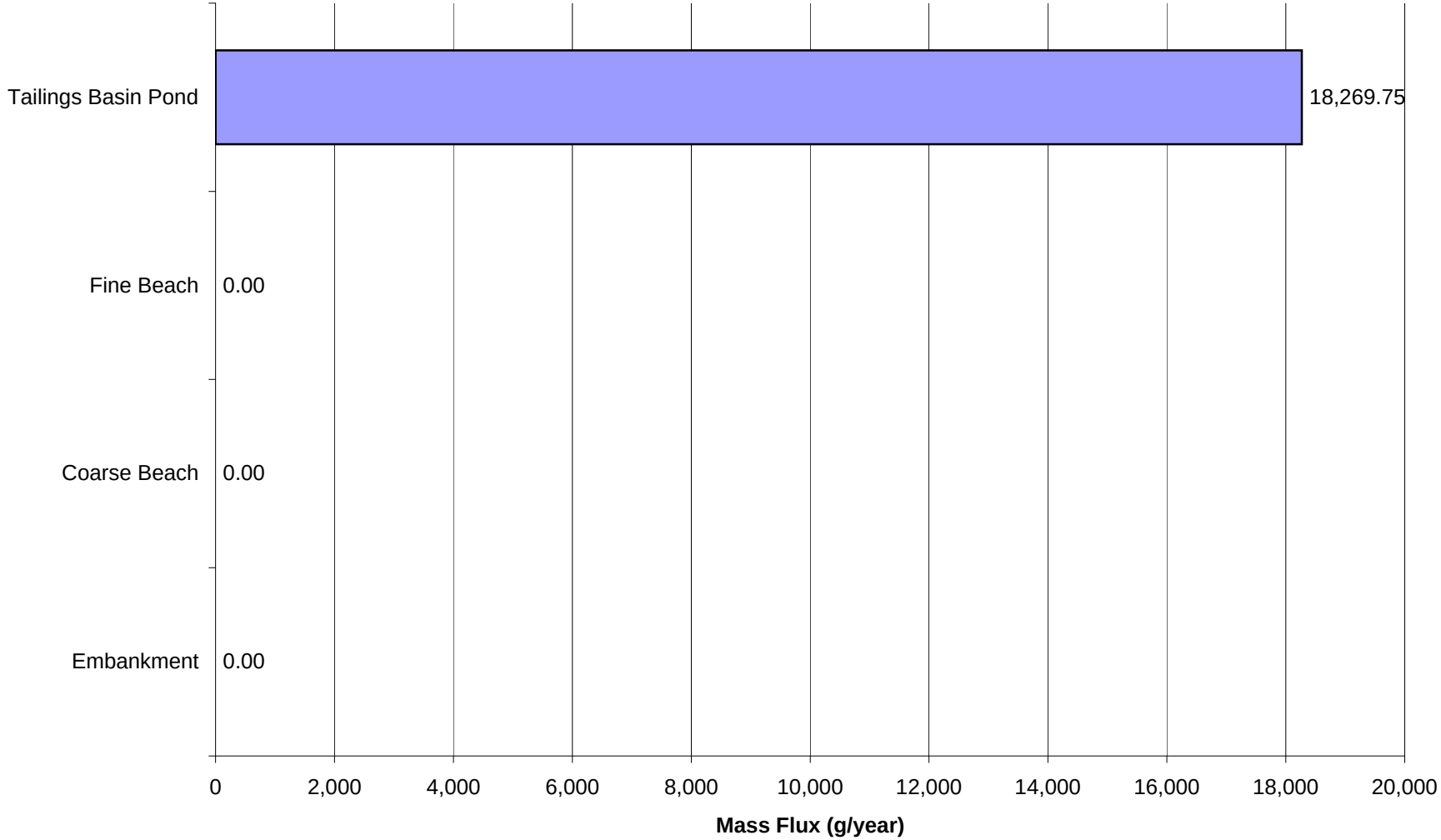
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Closure for Cobalt (Co)



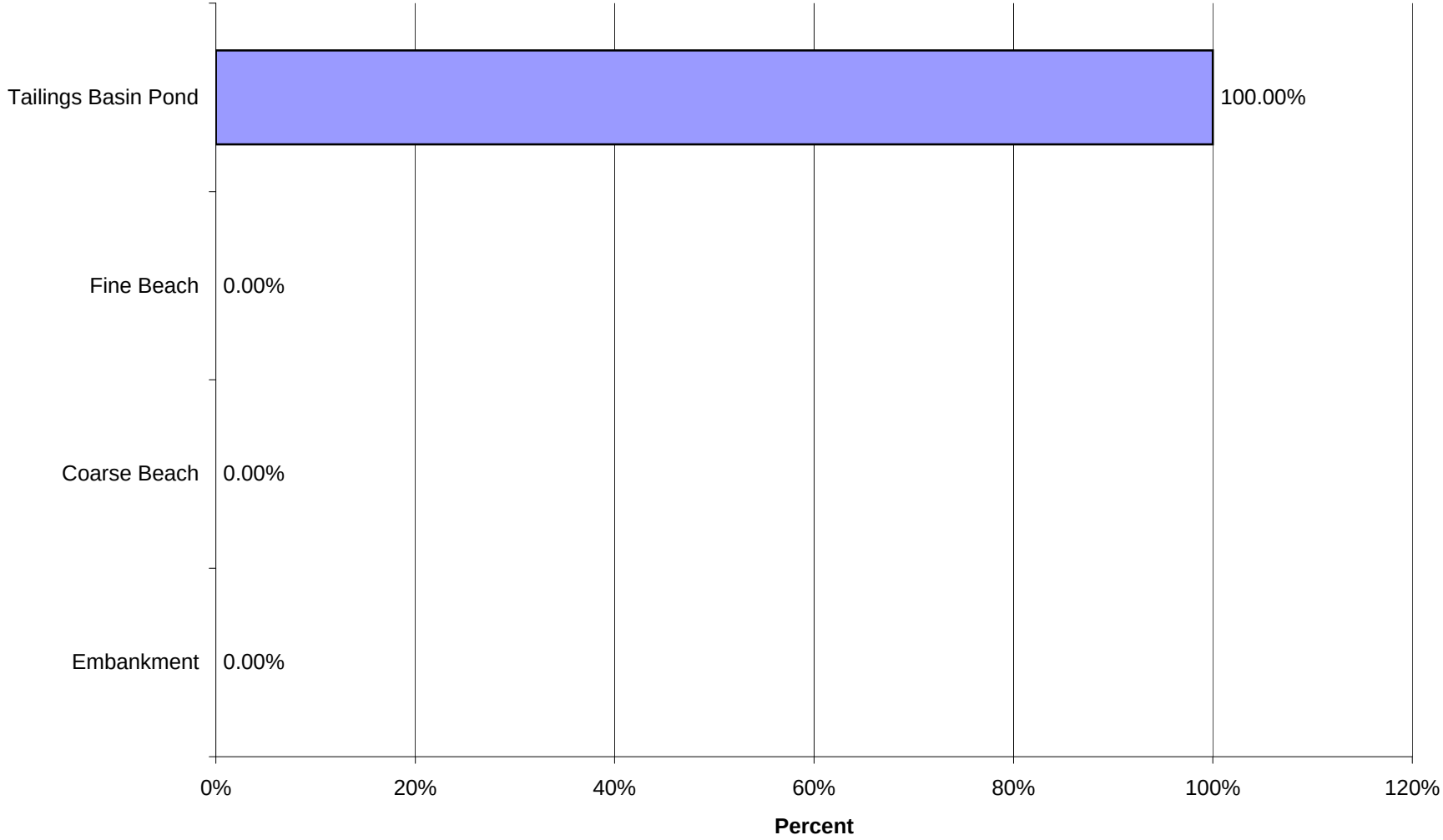
Proposed Action: Percent of Tailings Basin Features' Impacts in Closure for Cobalt (Co)



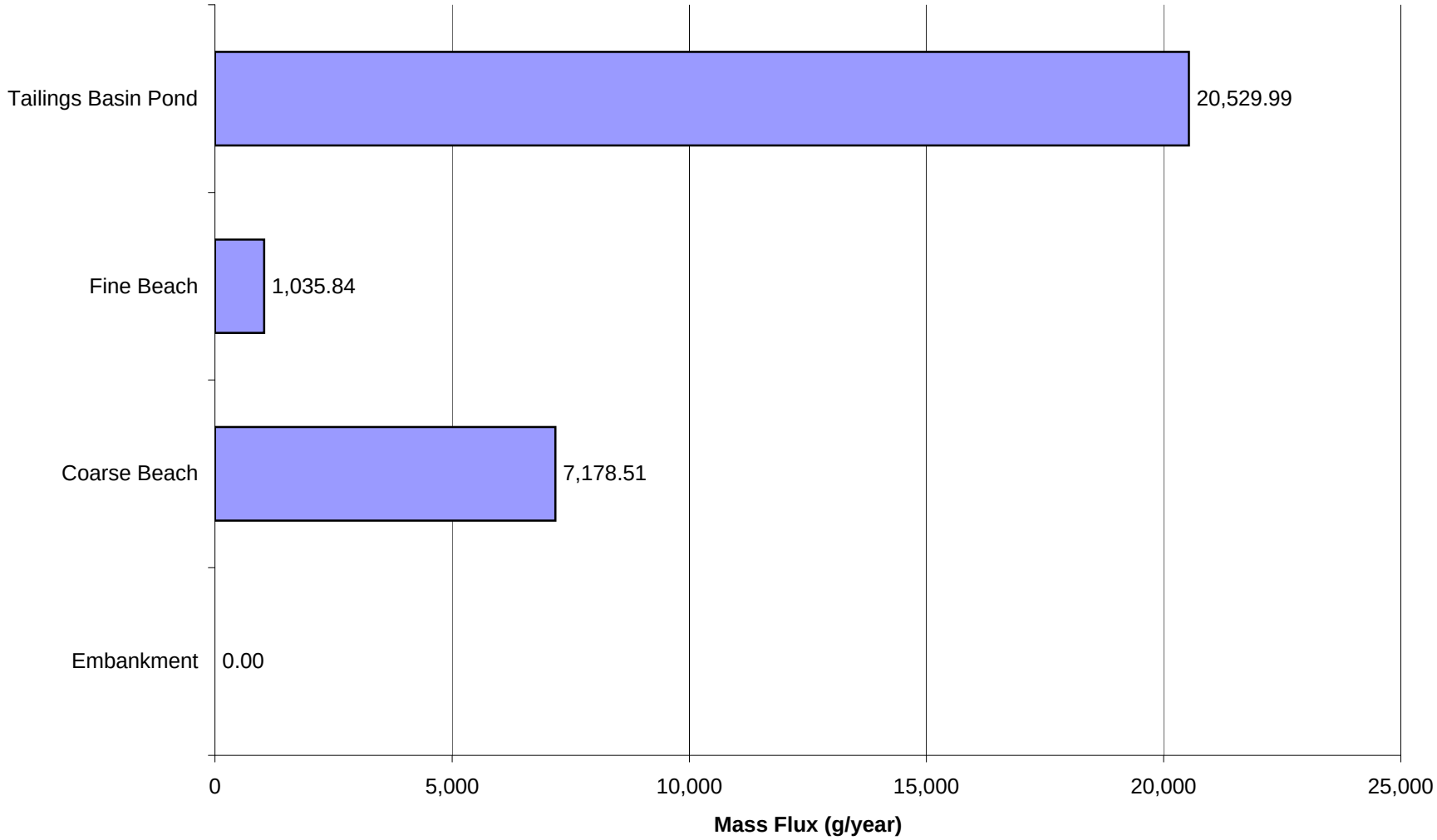
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 1 for Copper (Cu)



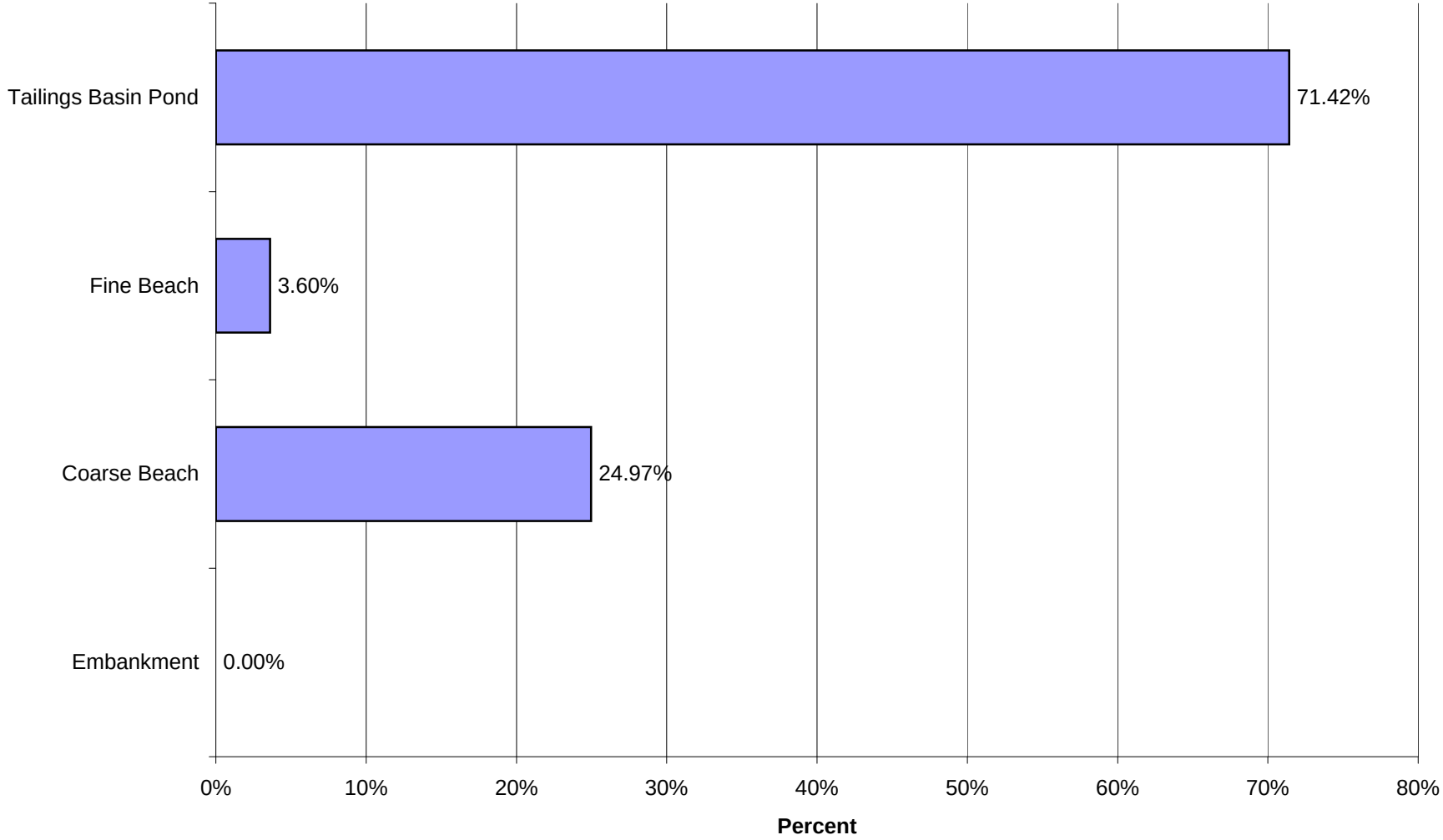
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 1 for Copper (Cu)



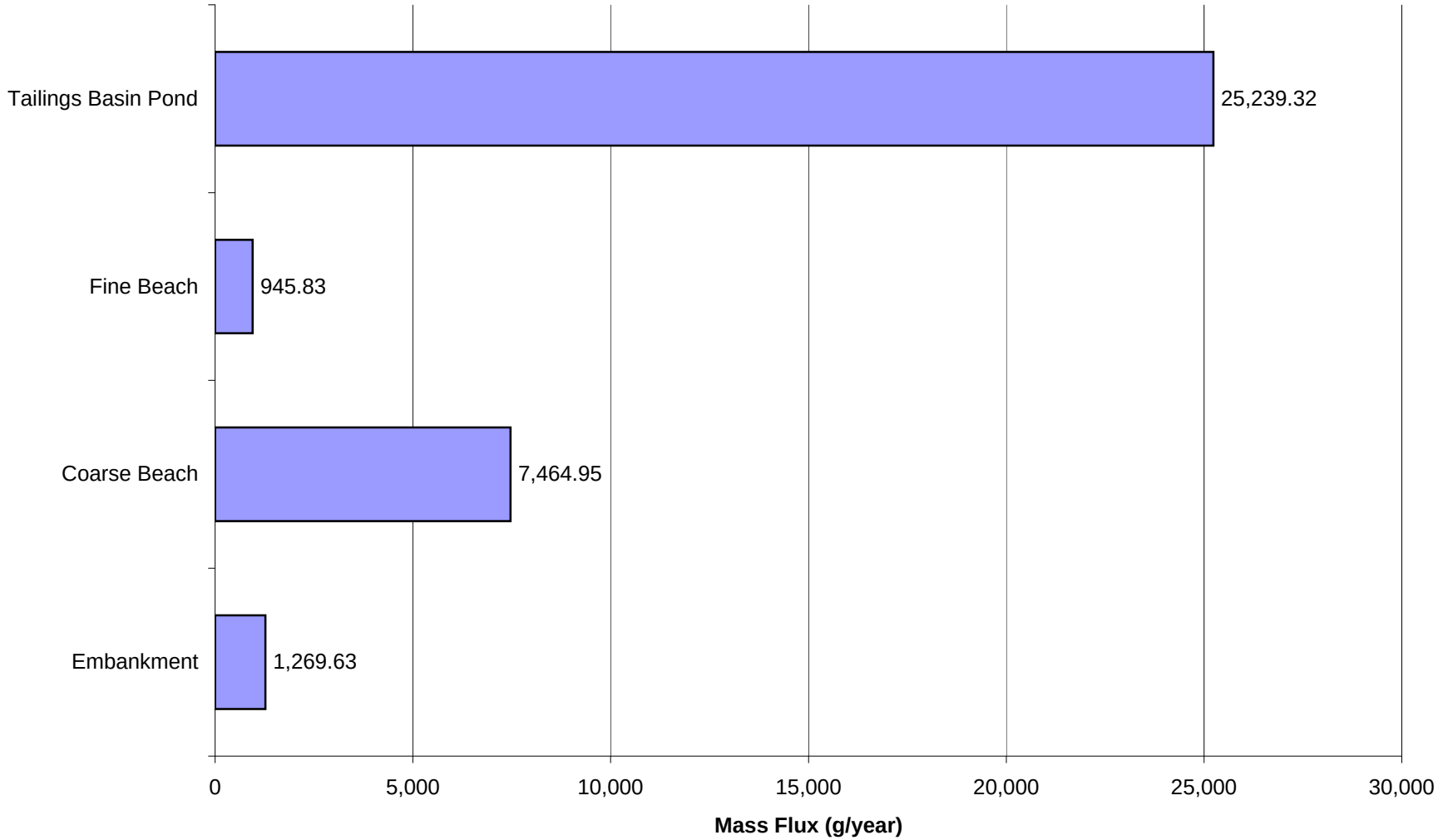
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 5 for Copper (Cu)



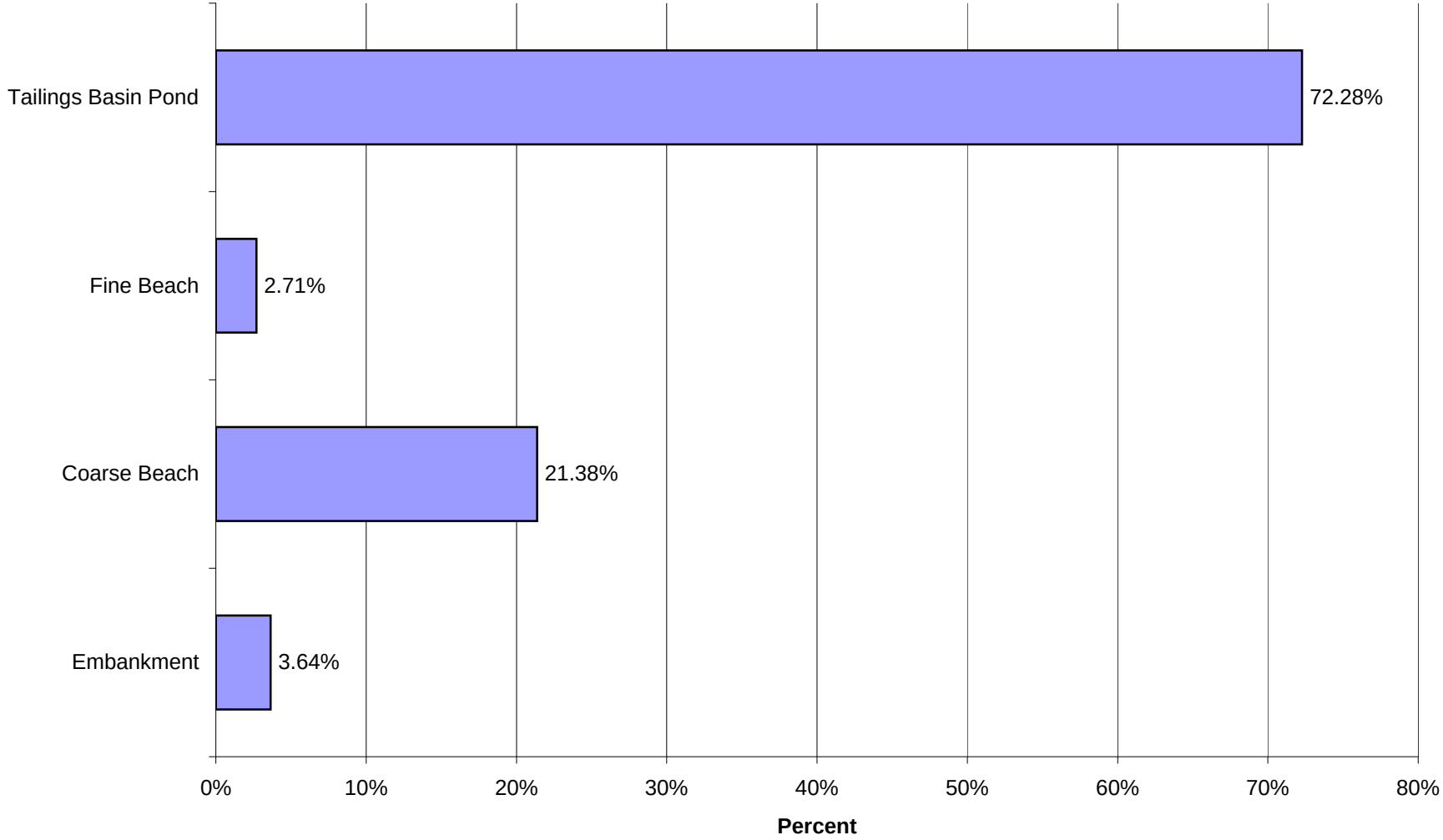
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 5 for Copper (Cu)



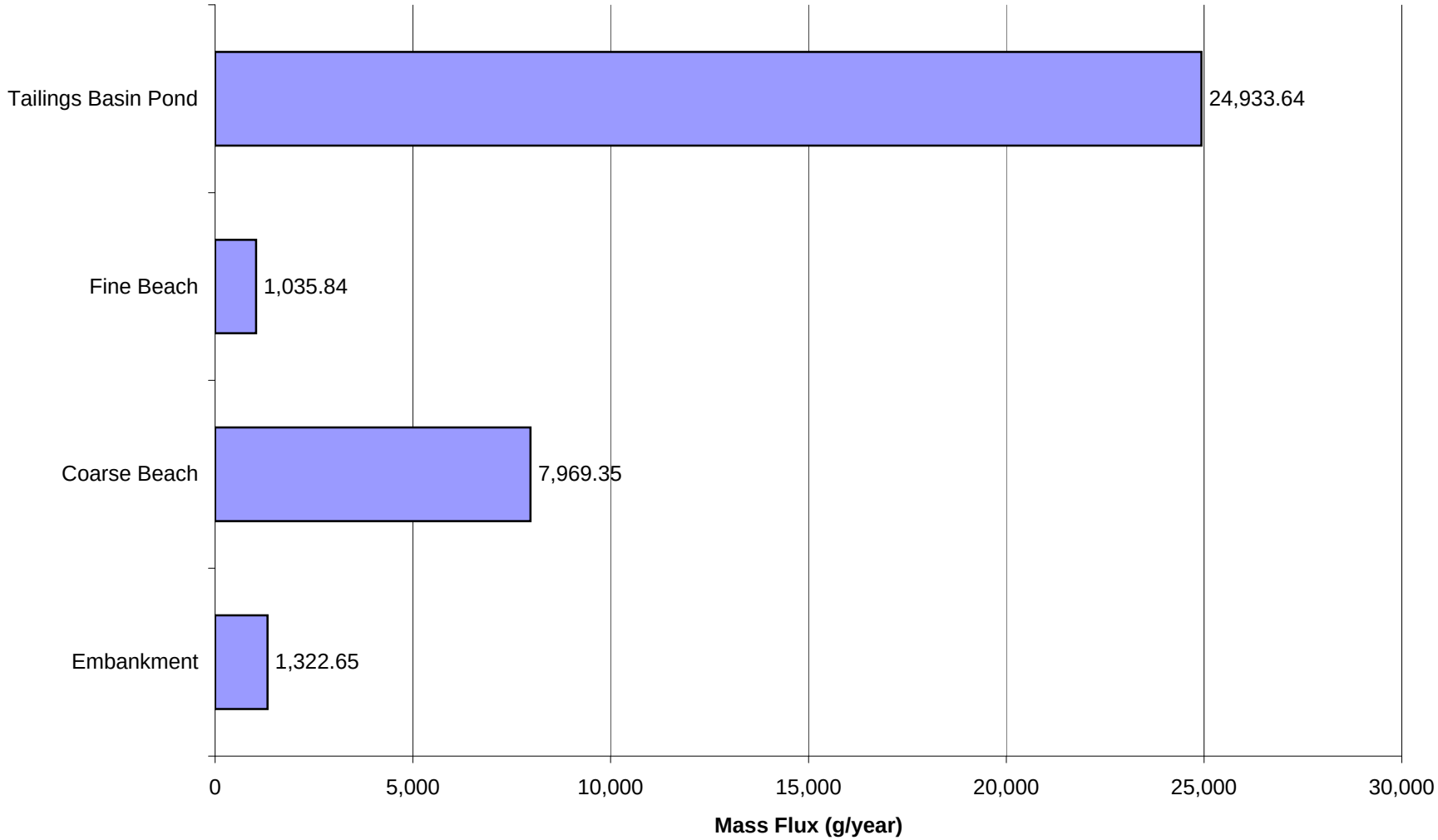
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 8 for Copper (Cu)



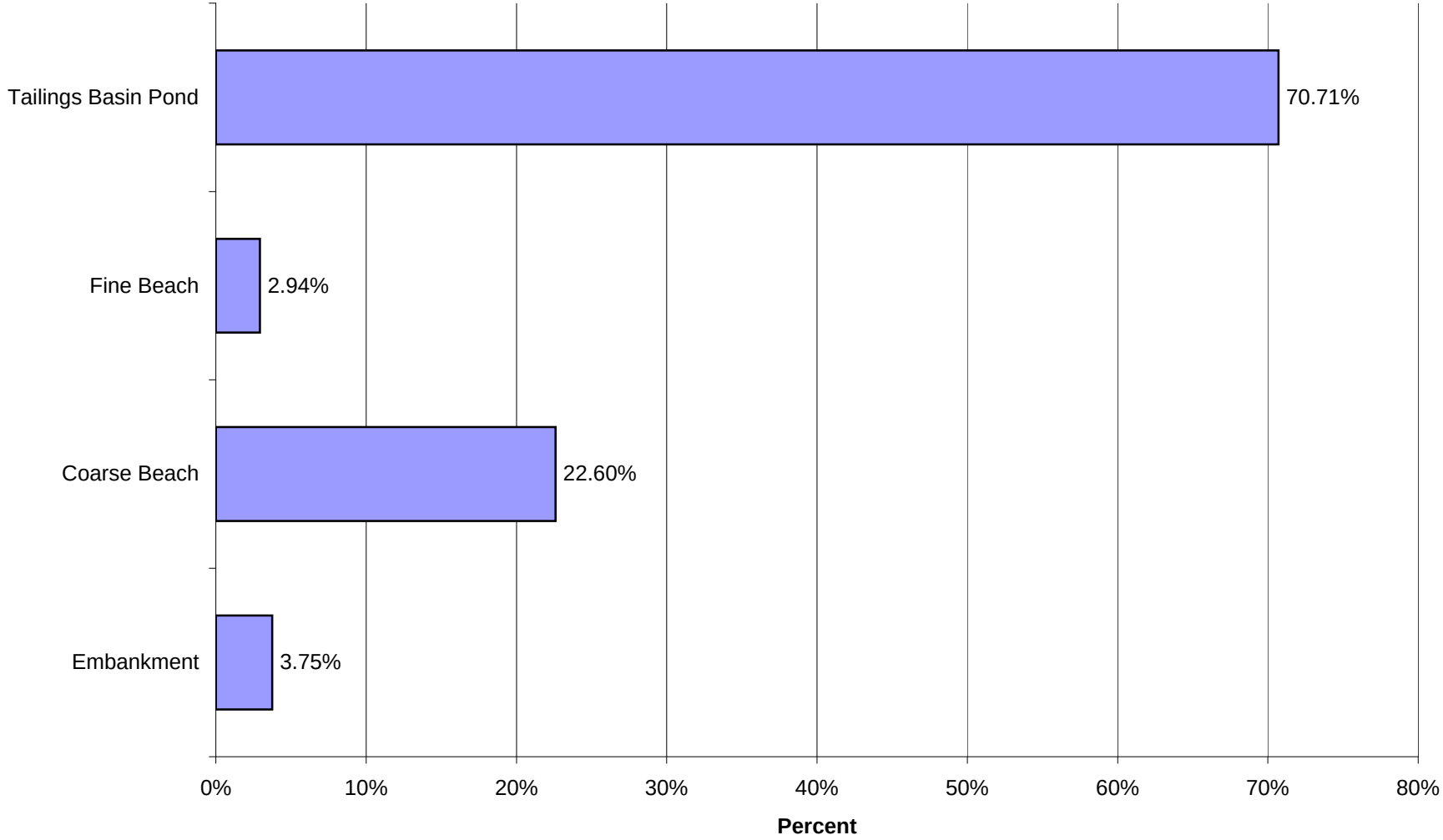
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 8 for Copper (Cu)



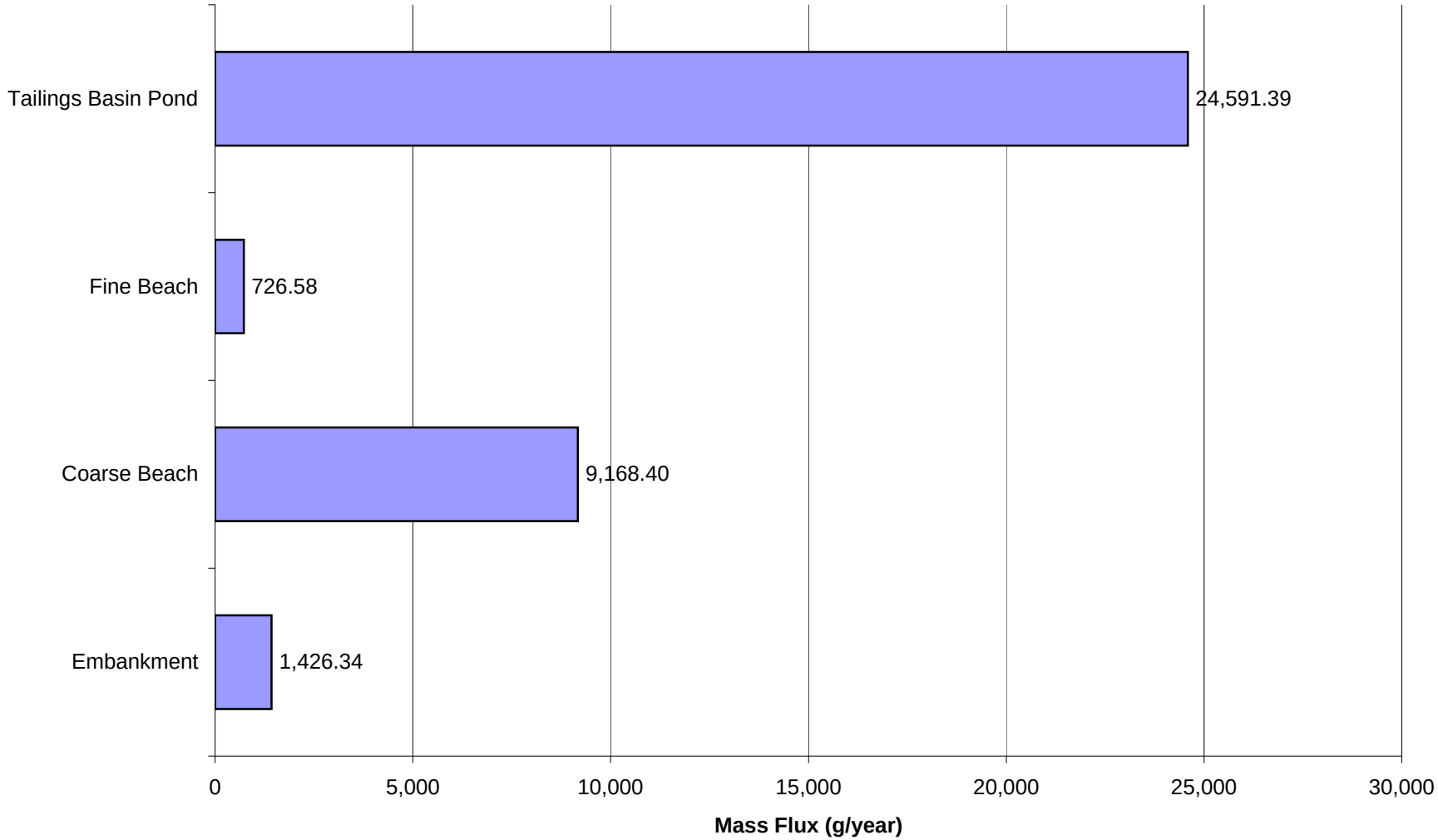
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 9 for Copper (Cu)



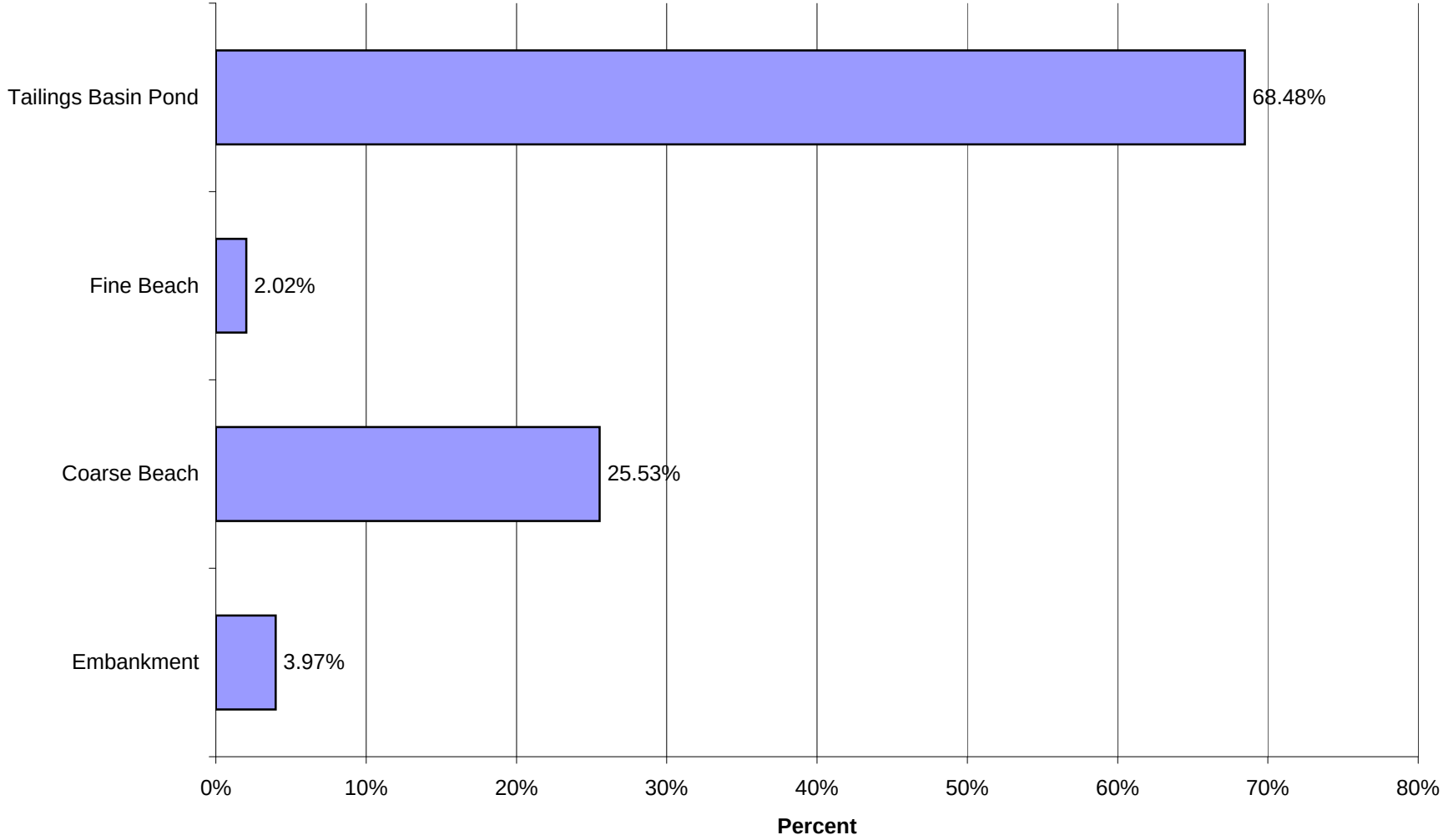
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 9 for Copper (Cu)



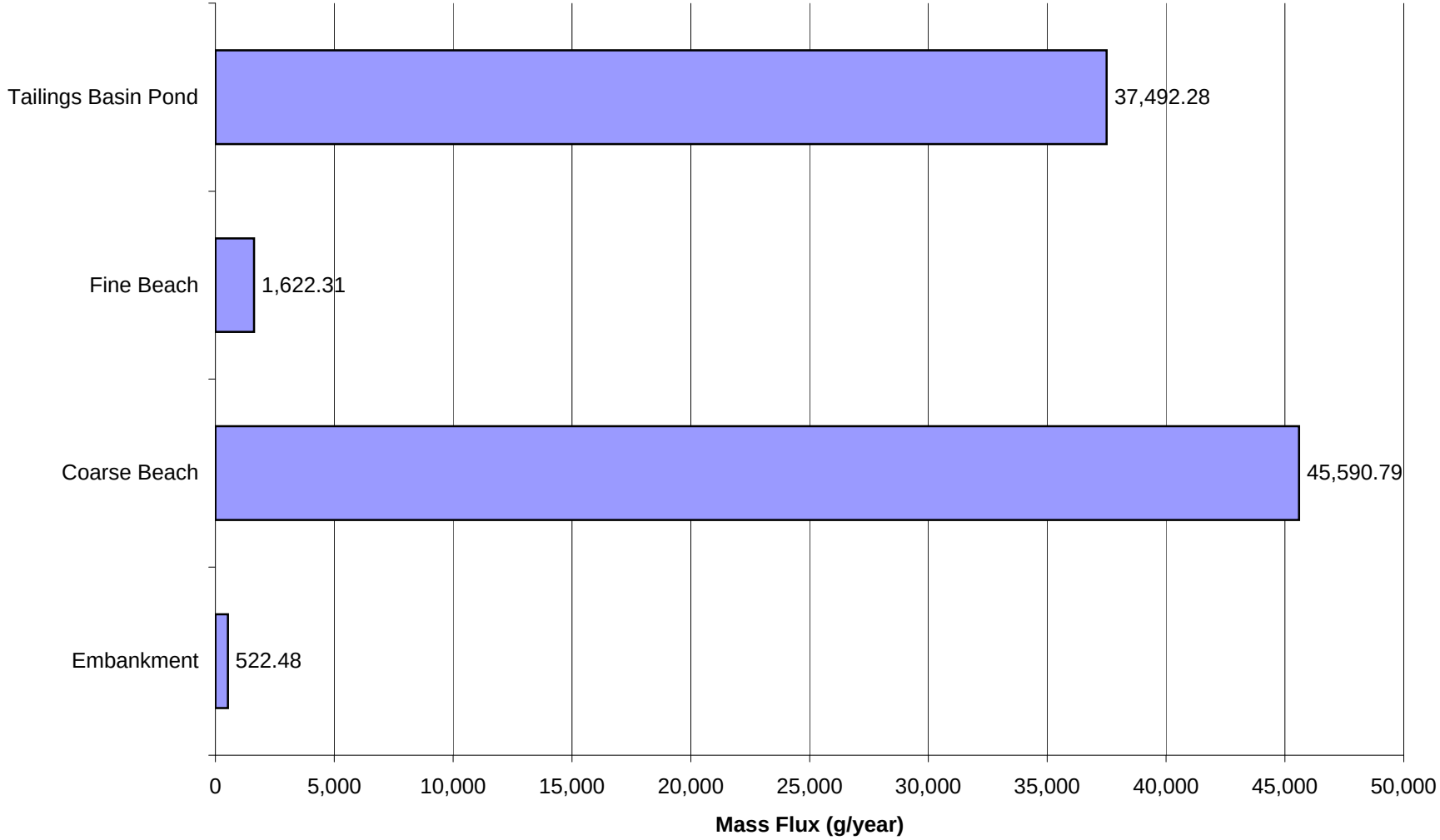
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 10 for Copper (Cu)



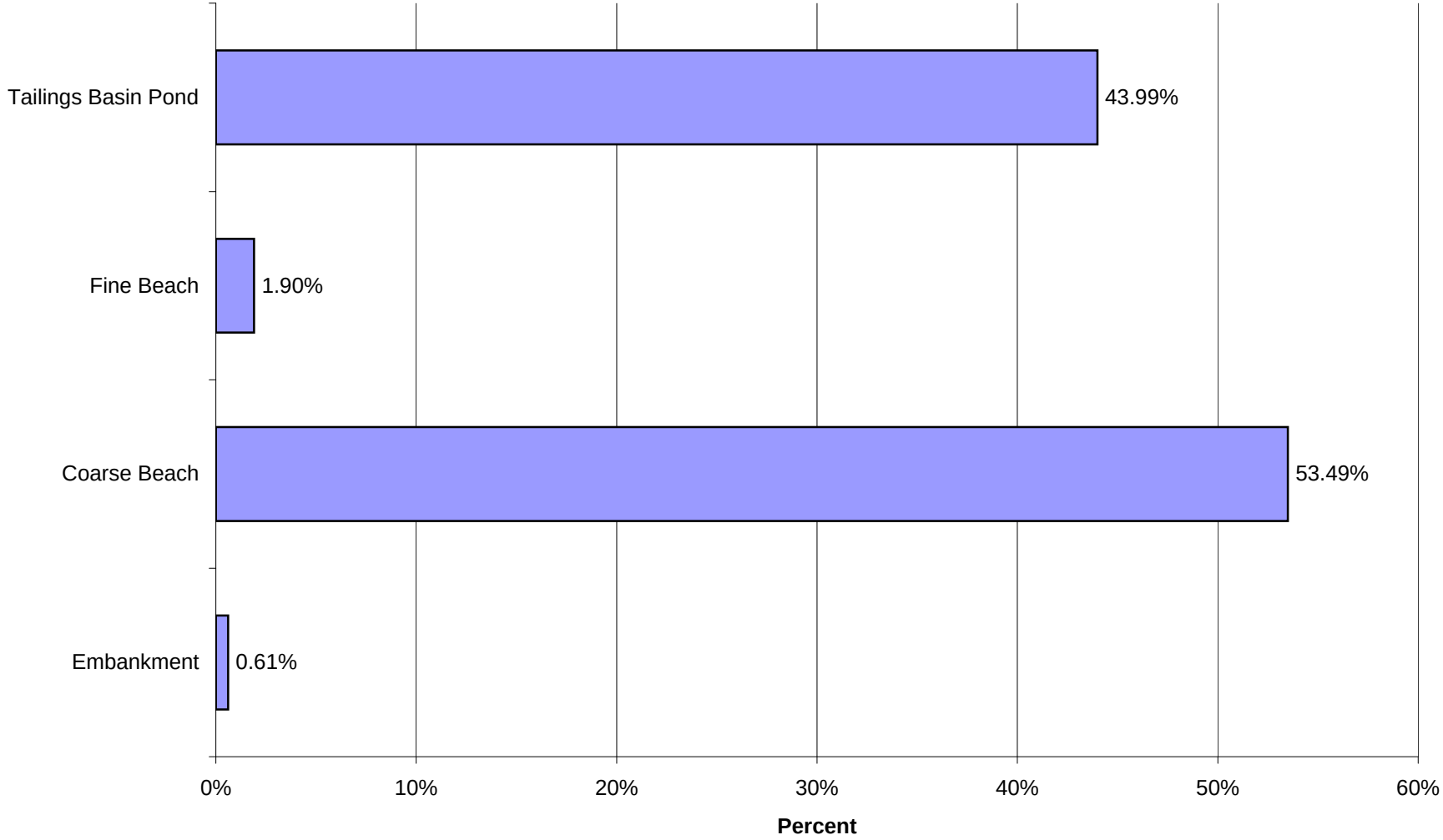
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 10 for Copper (Cu)



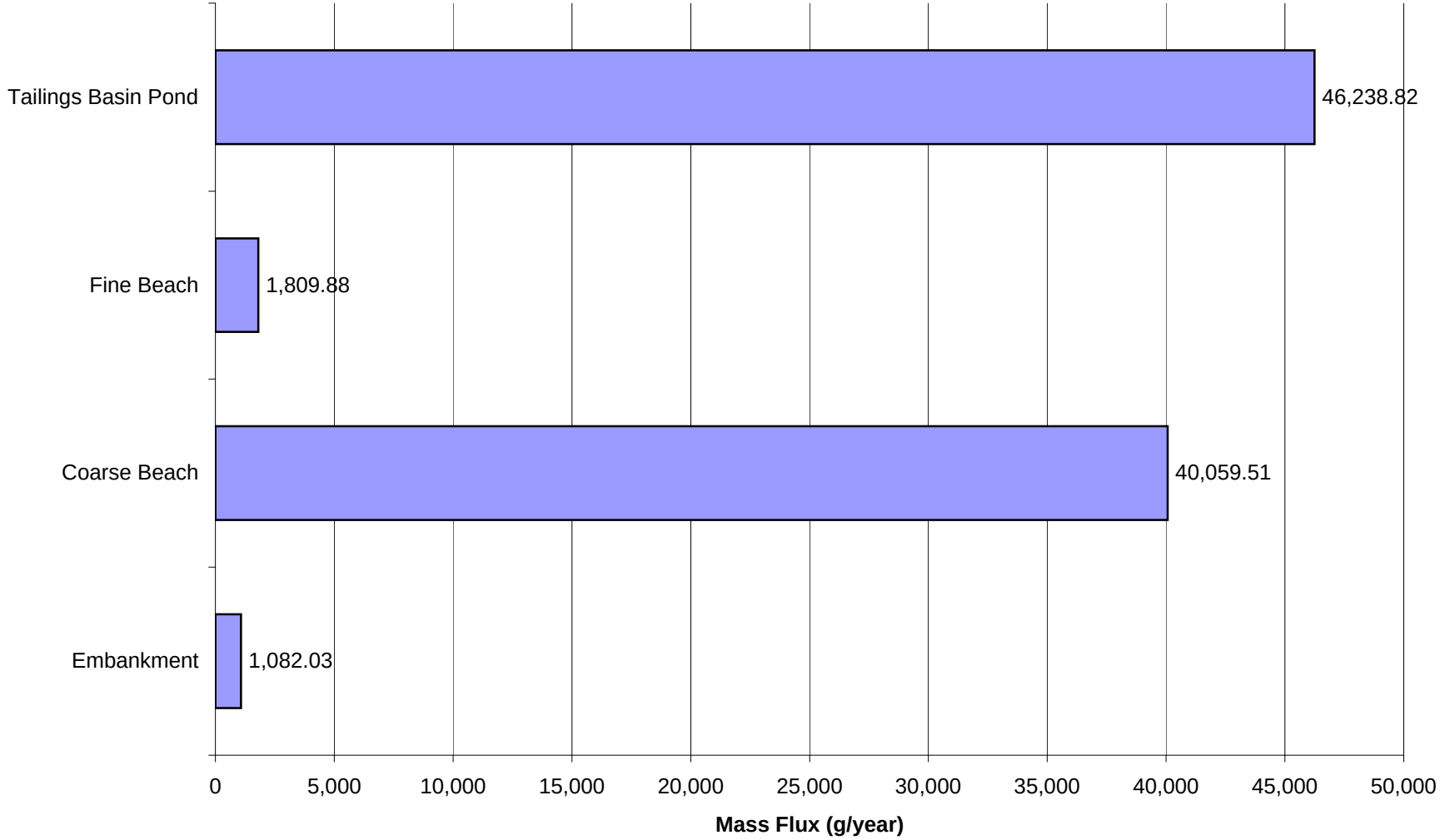
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 15 for Copper (Cu)



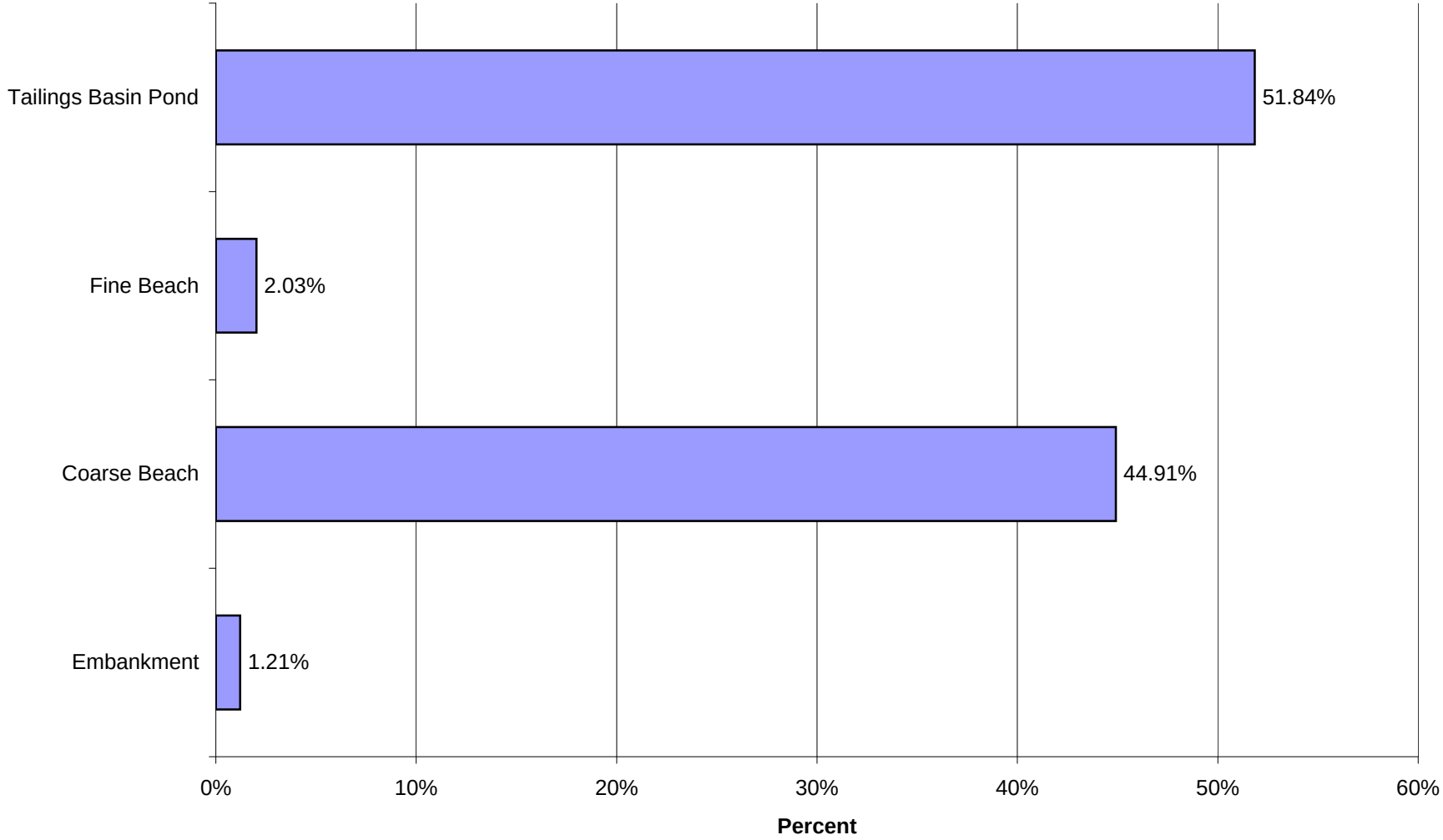
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 15 for Copper (Cu)

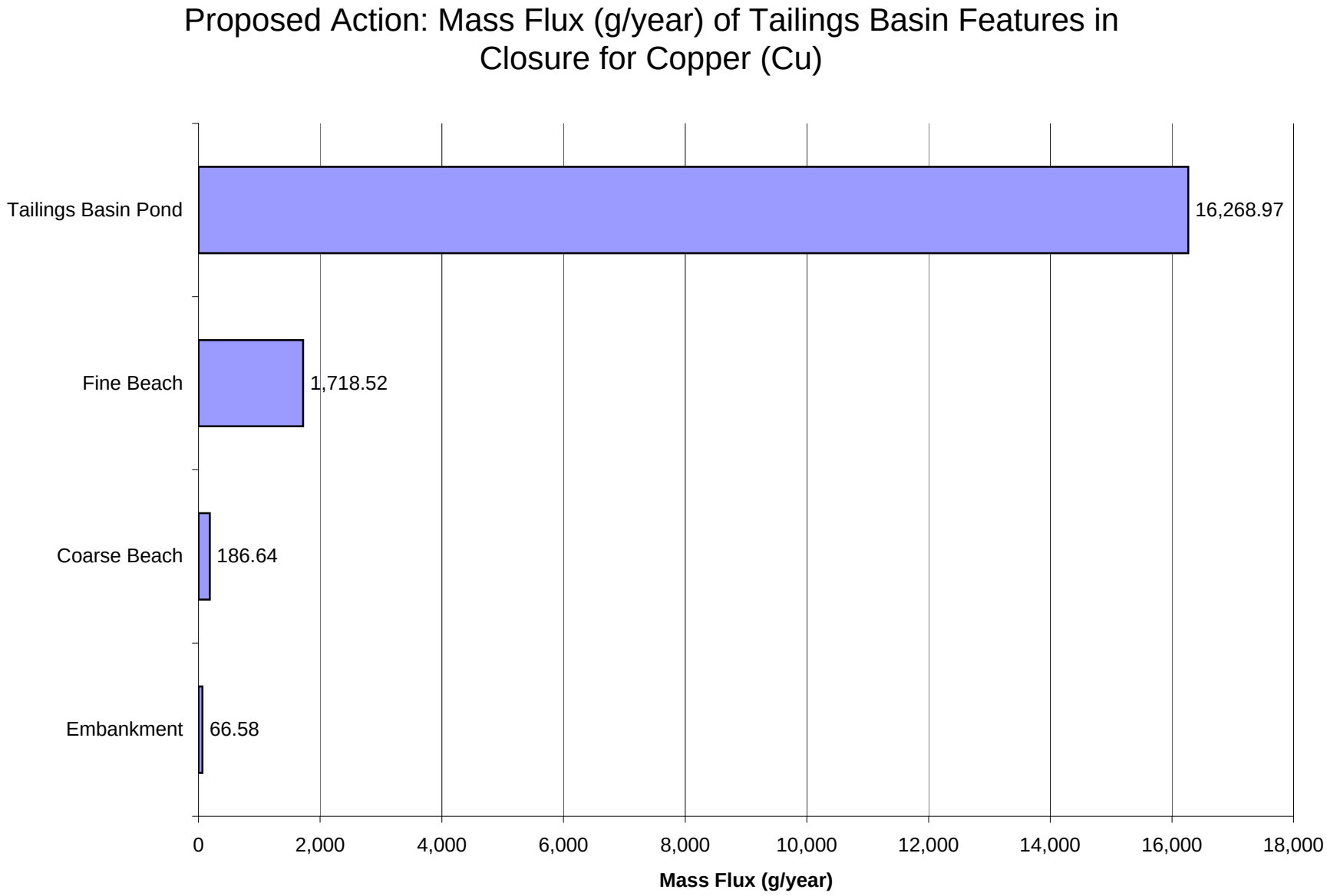


Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 20 for Copper (Cu)

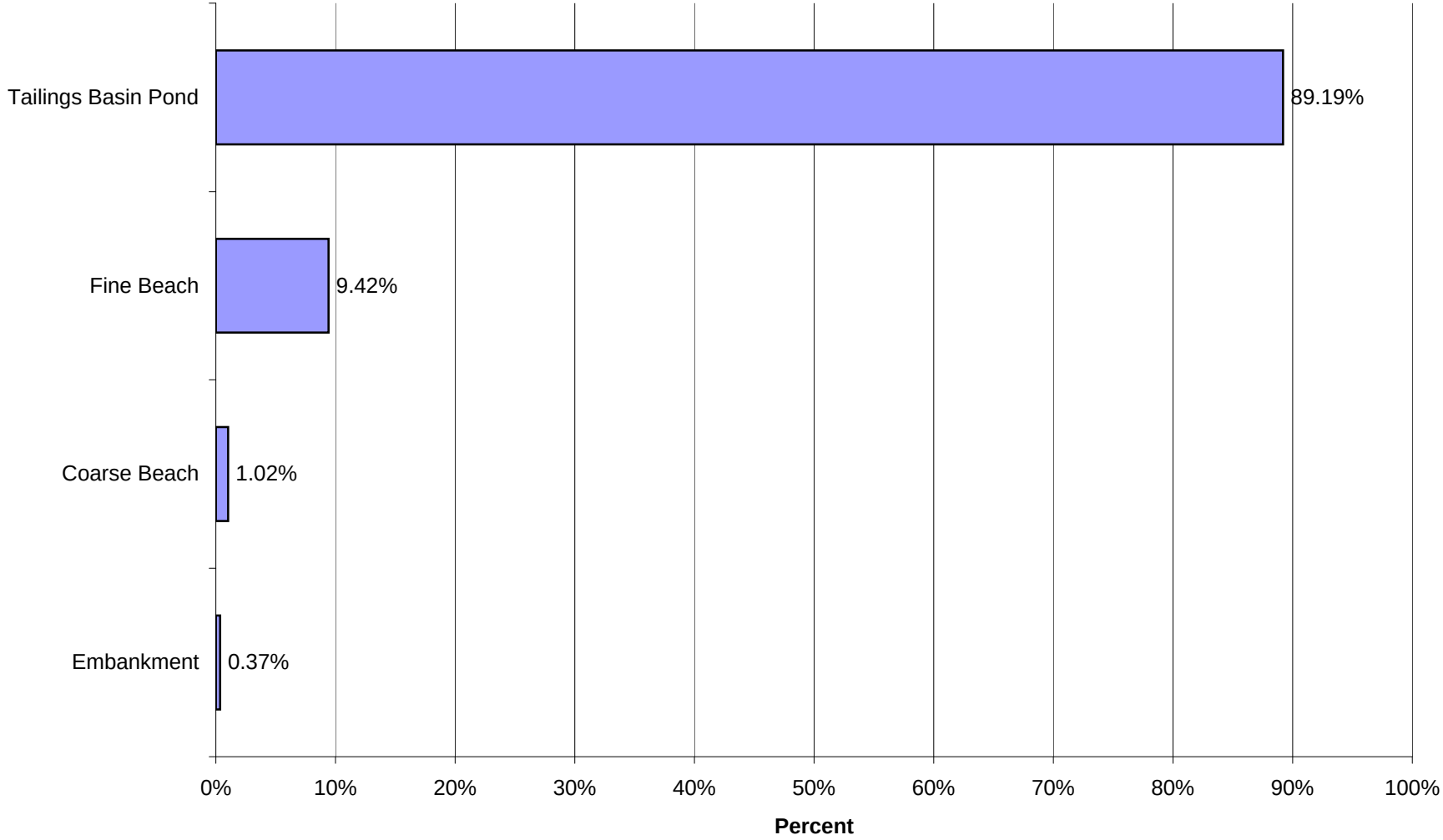


Proposed Action: Percent of Tailings Basin Features' Impacts in Year 20 for Copper (Cu)

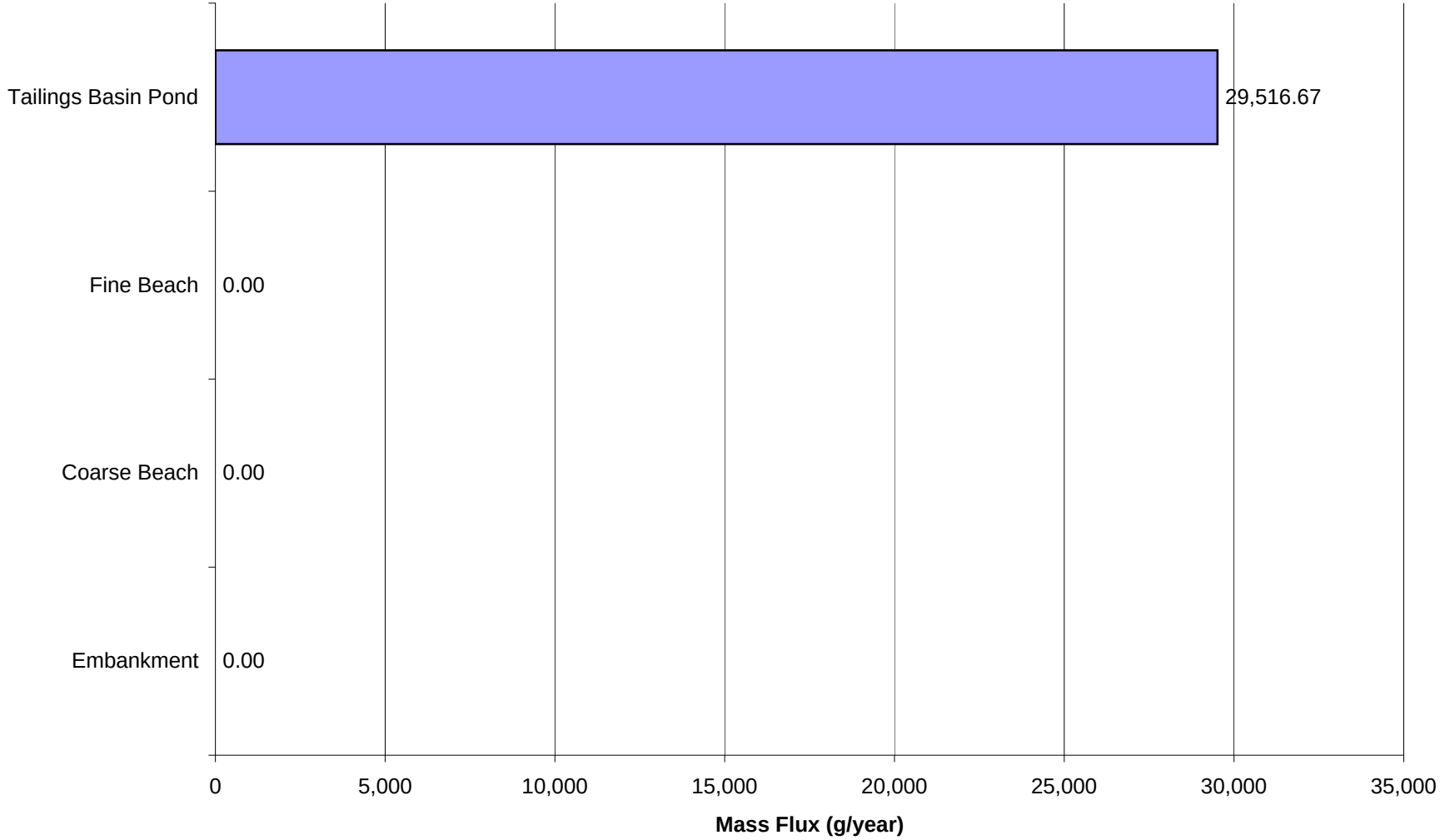



Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Closure for Copper (Cu)
Tailings Basin Pond
16,268.97
Fine Beach
1,718.52
Coarse Beach
186.64
Embankment
66.58
0
2,000
4,000
6,000
8,000
10,000
12,000
14,000
16,000
18,000
Mass Flux (g/year)

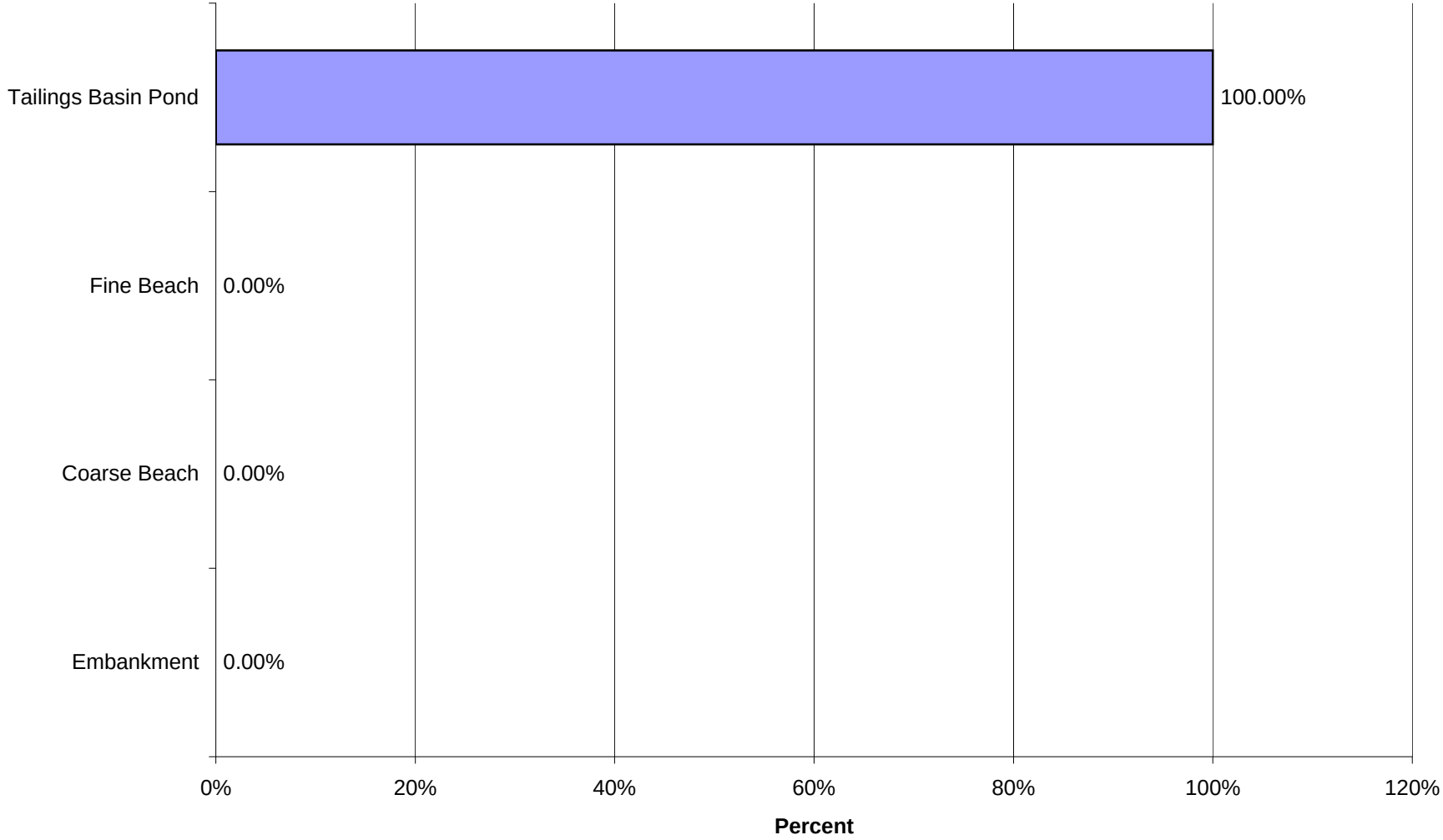
Proposed Action: Percent of Tailings Basin Features' Impacts in Closure for Copper (Cu)



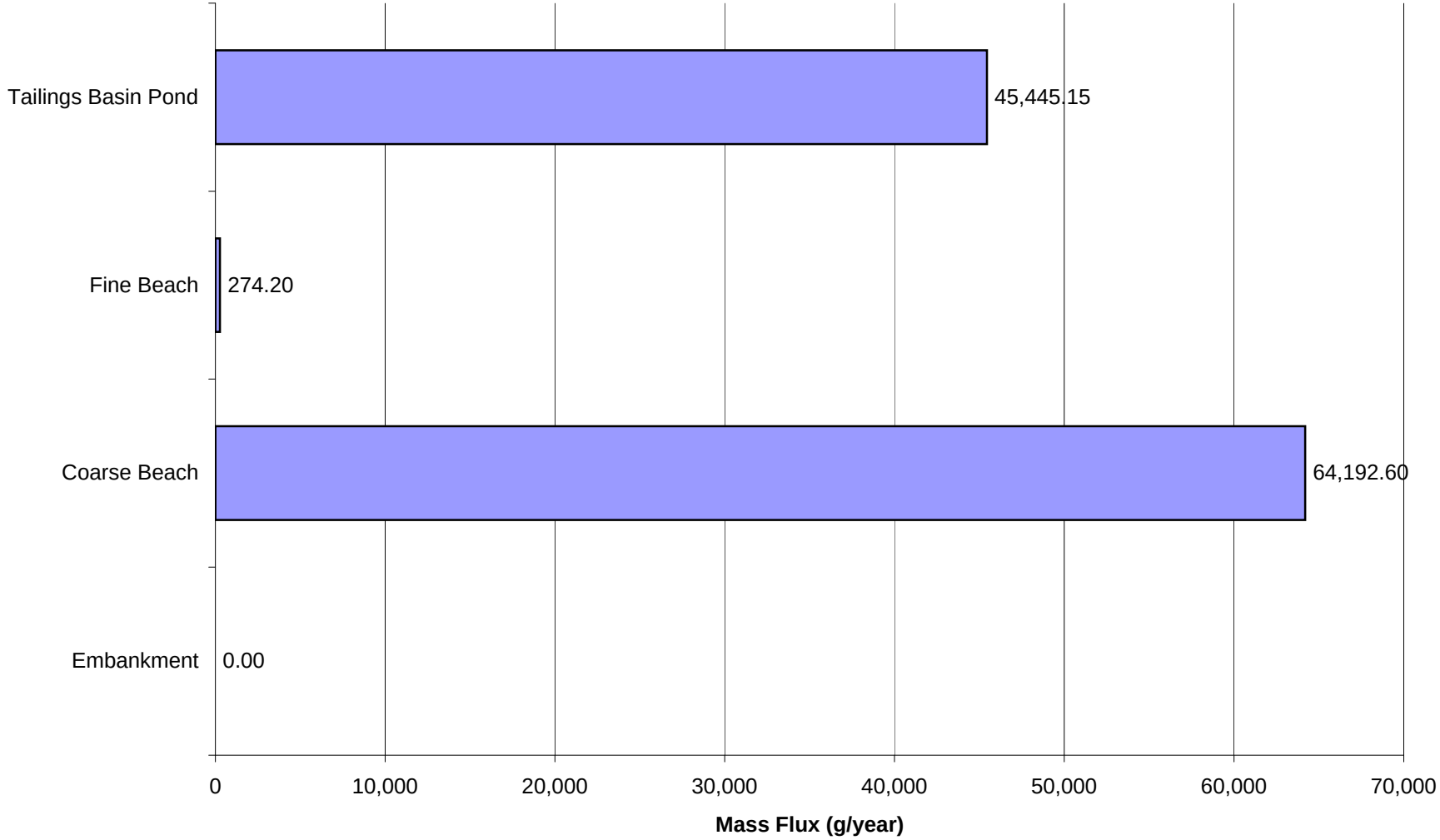
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 1 for Nickel (Ni)



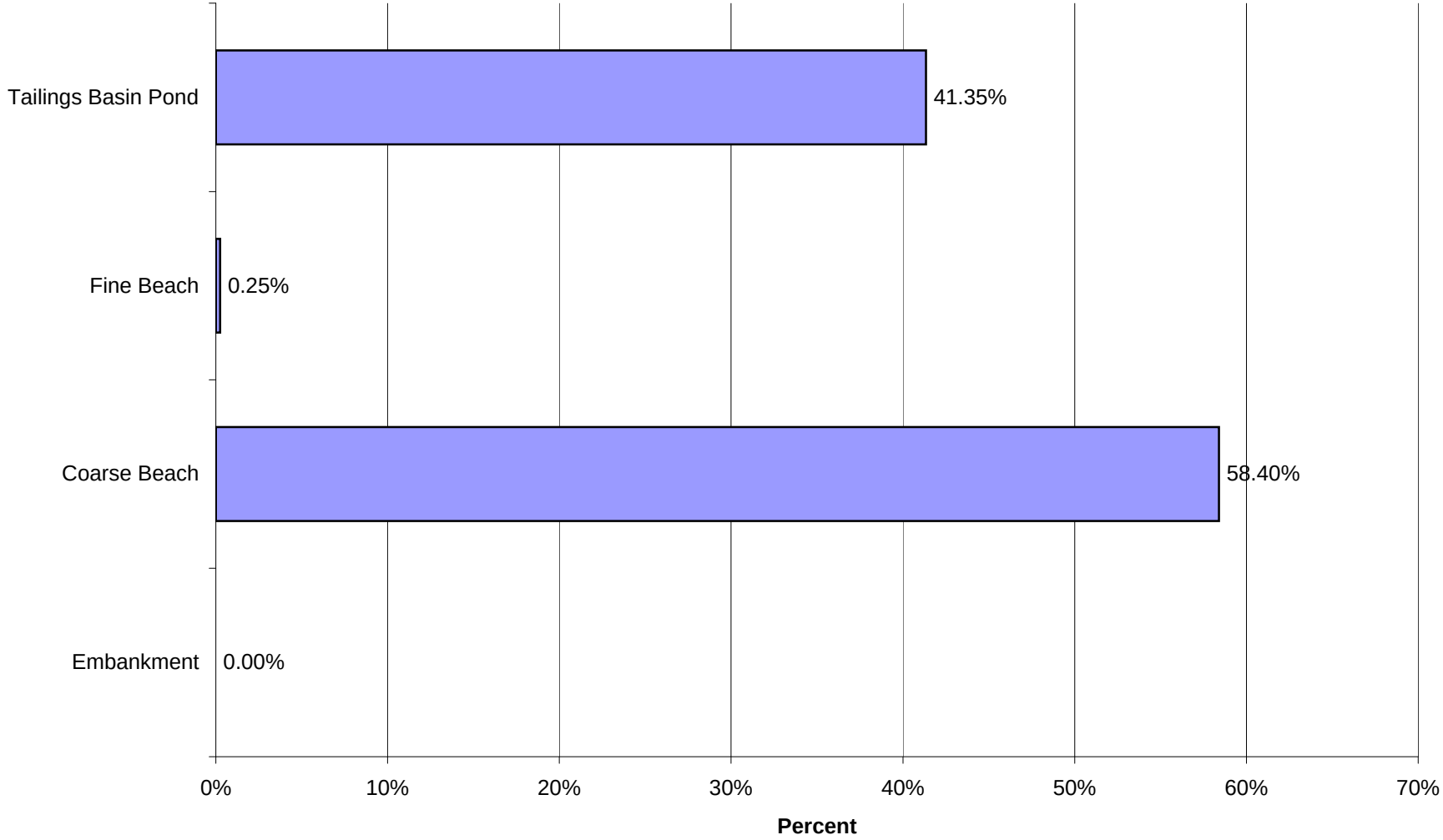
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 1 for Nickel (Ni)



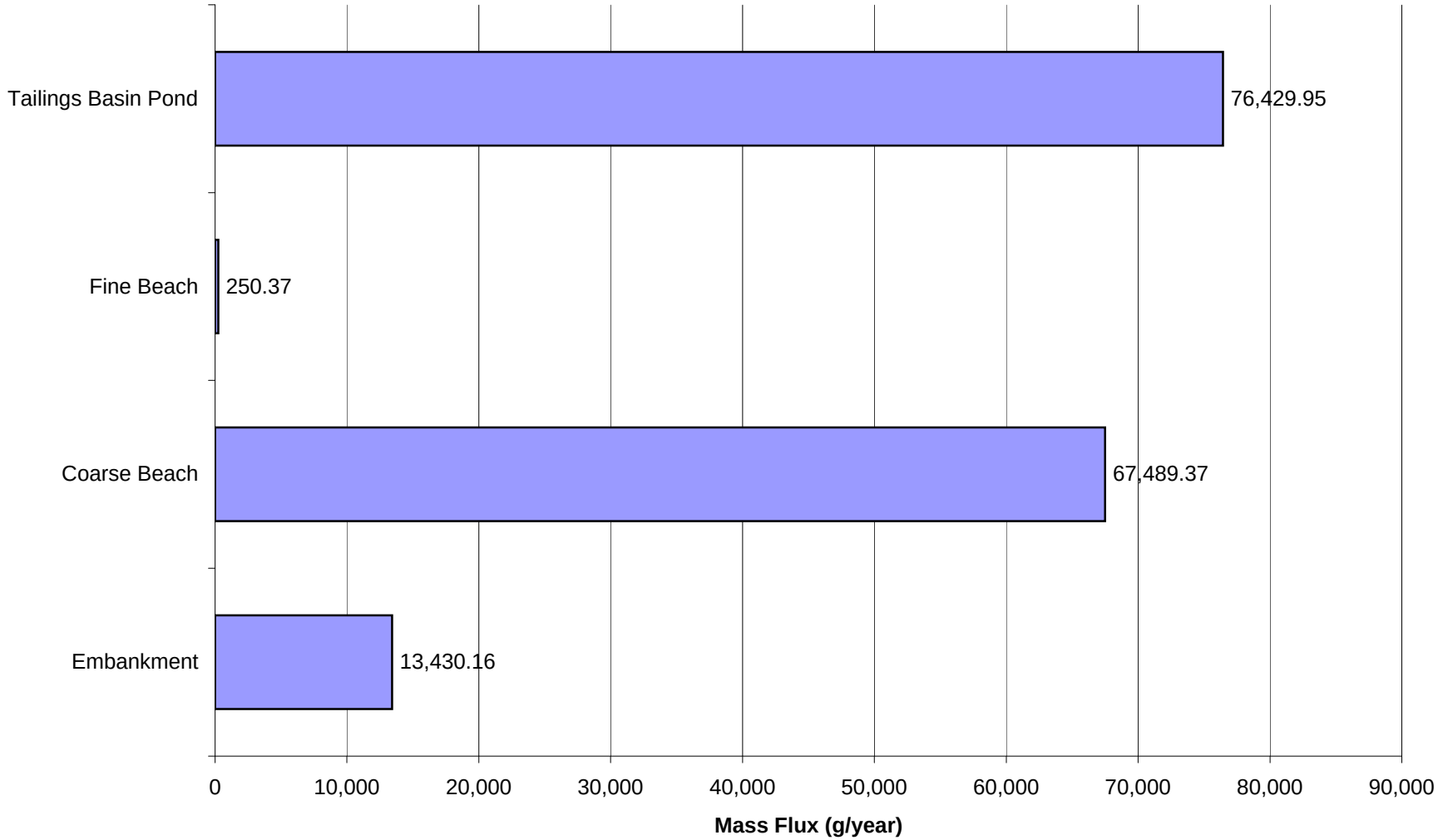
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 5 for Nickel (Ni)



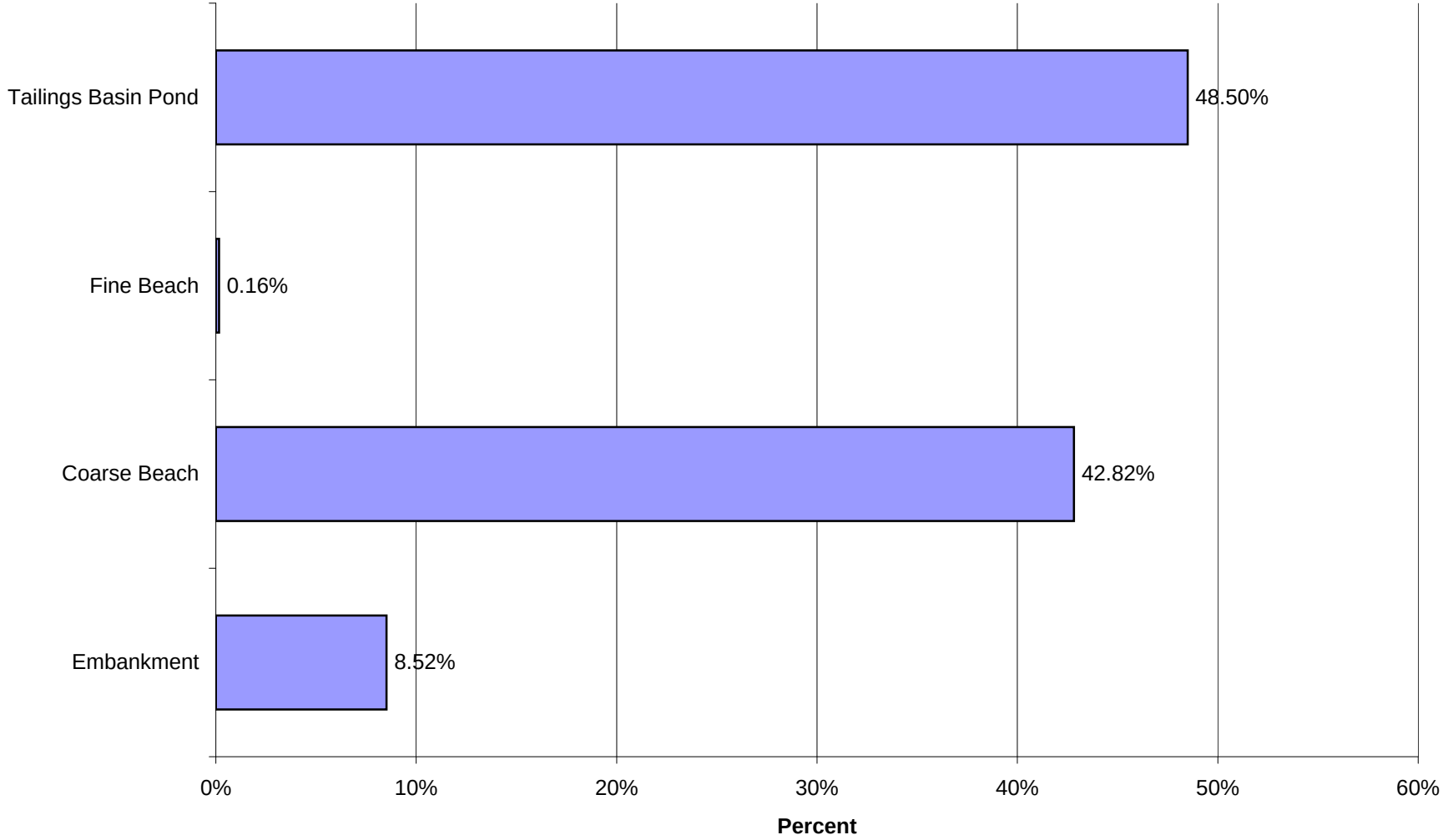
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 5 for Nickel (Ni)



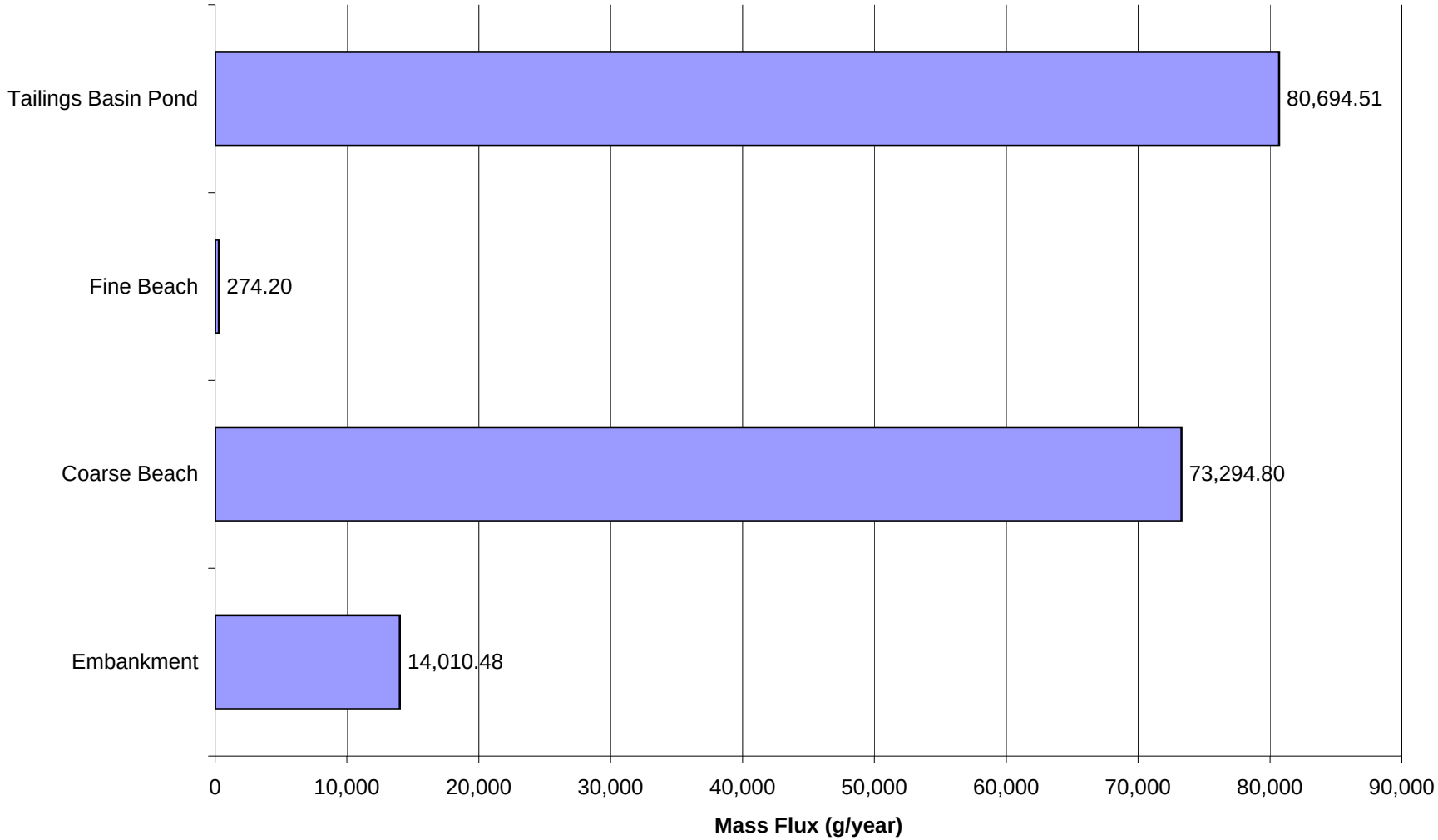
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 8 for Nickel (Ni)



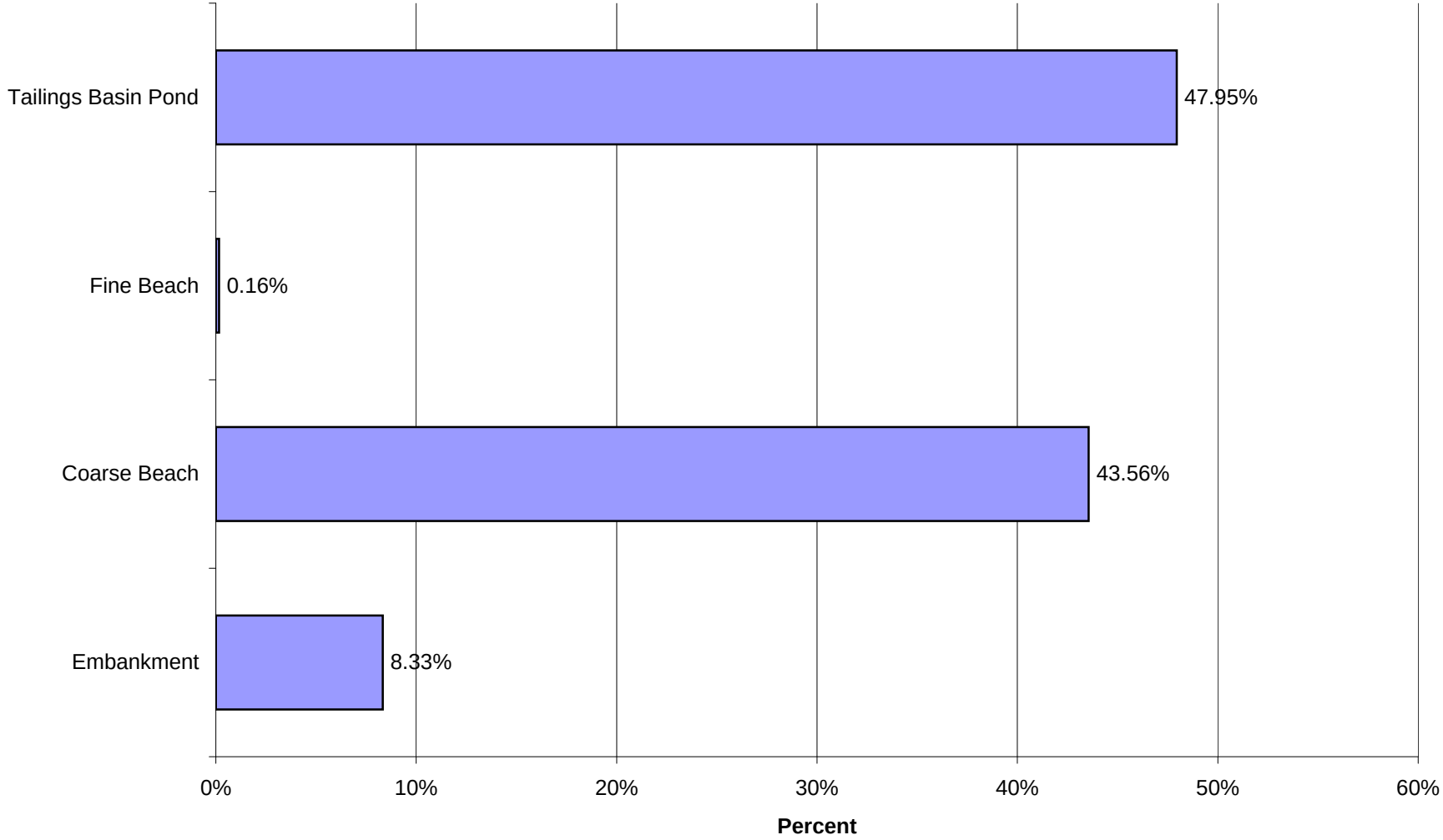
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 8 for Nickel (Ni)



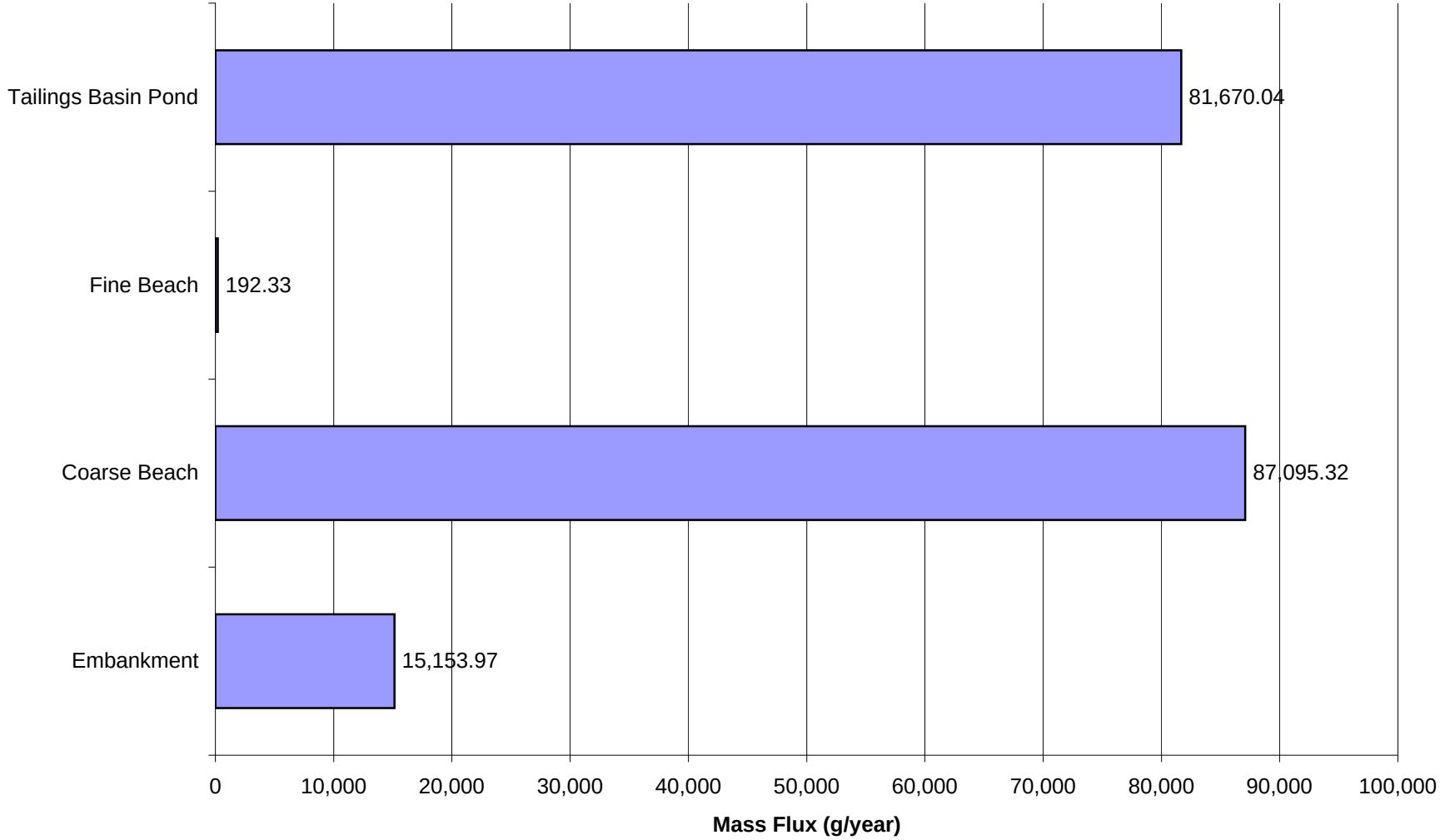
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 9 for Nickel (Ni)



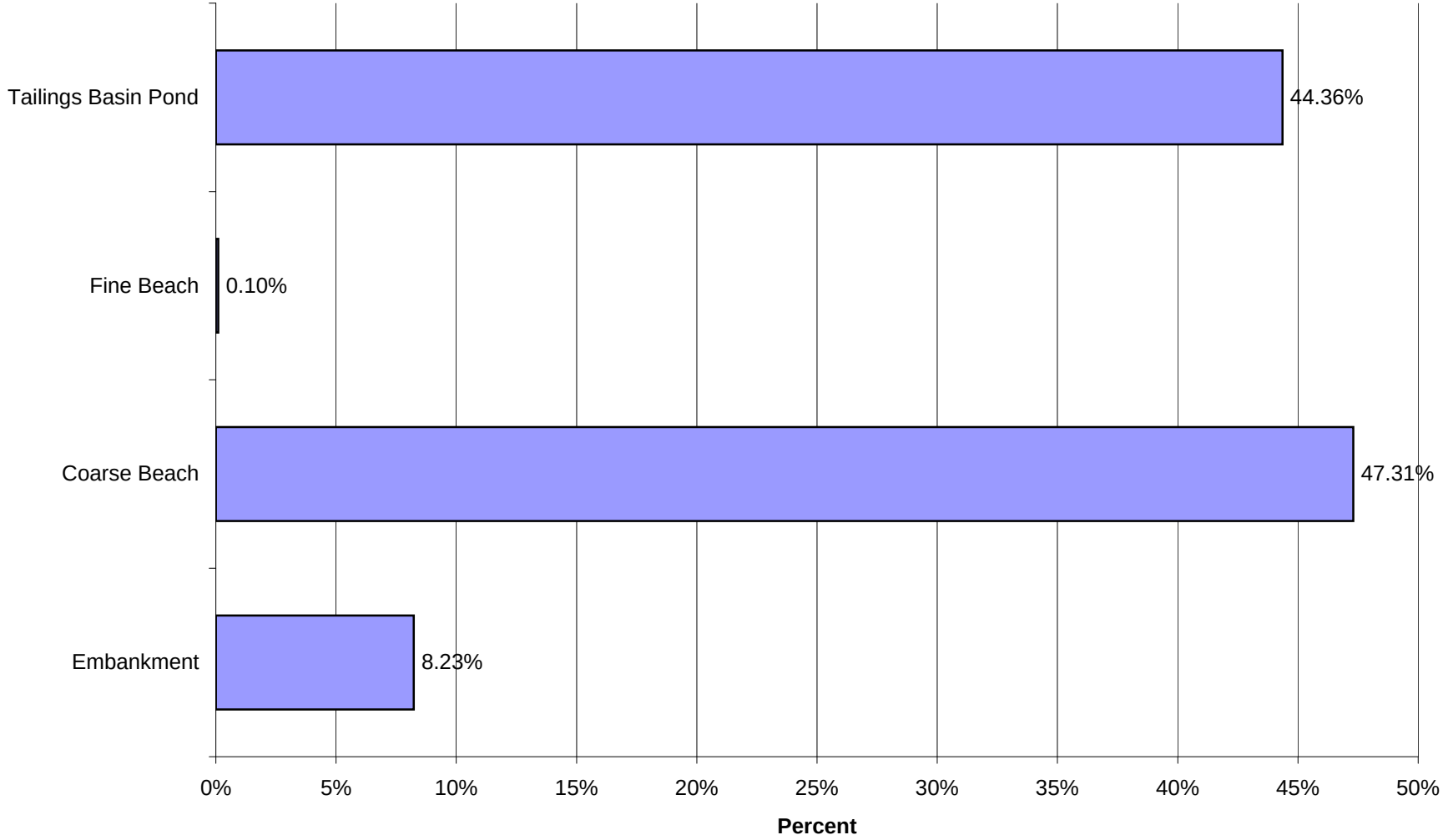
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 9 for Nickel (Ni)



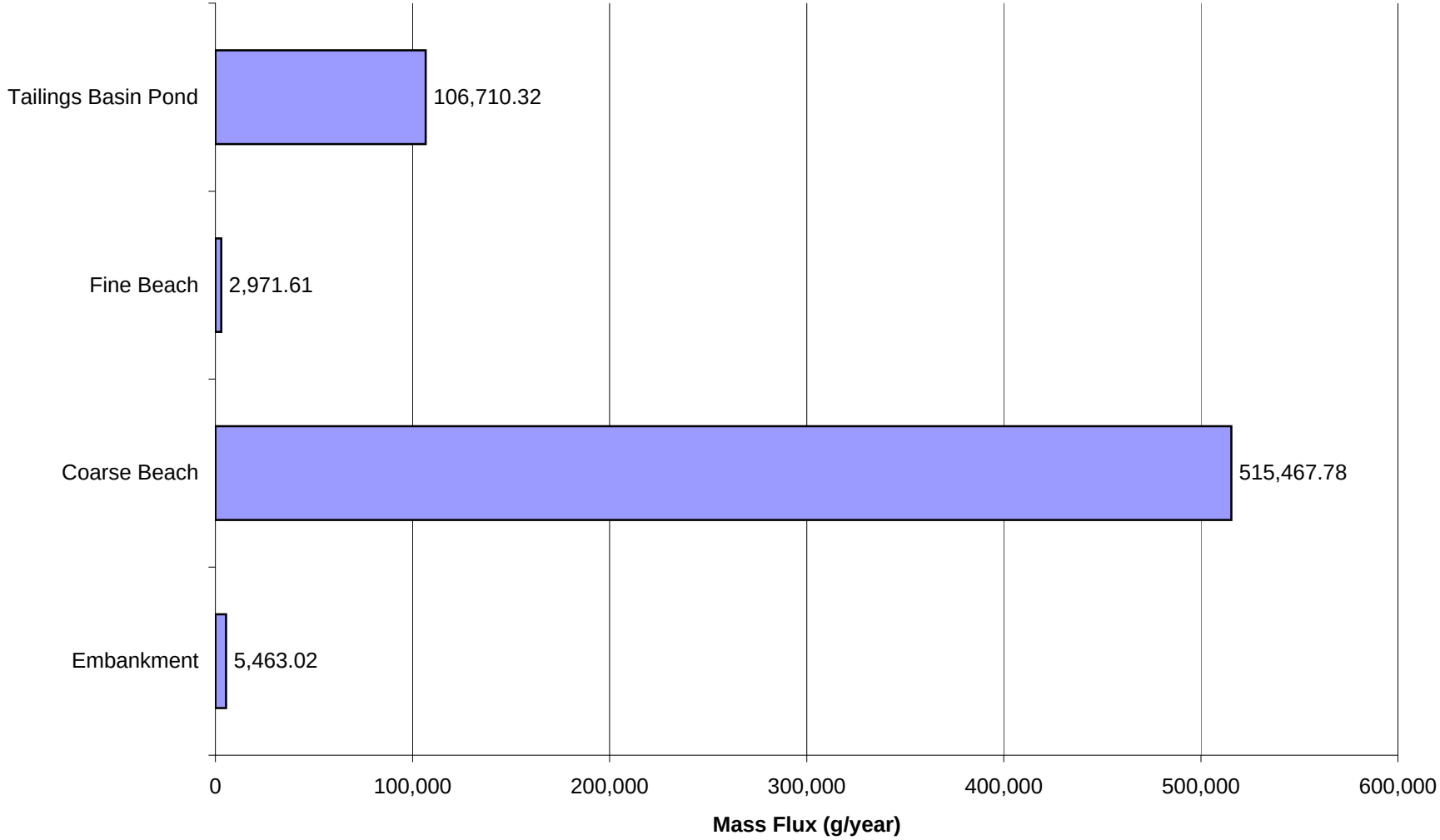
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 10 for Nickel (Ni)



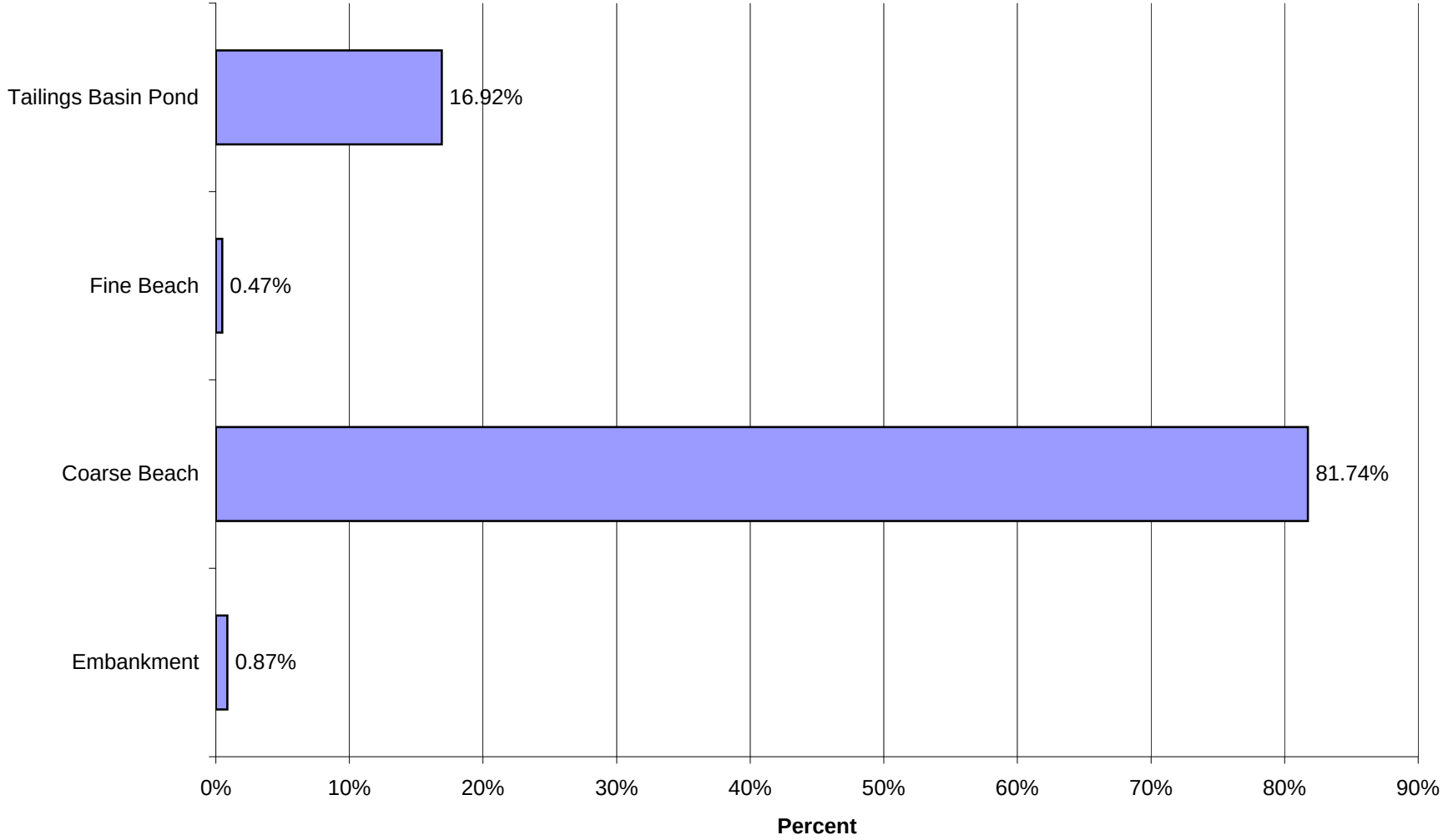
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 10 for Nickel (Ni)



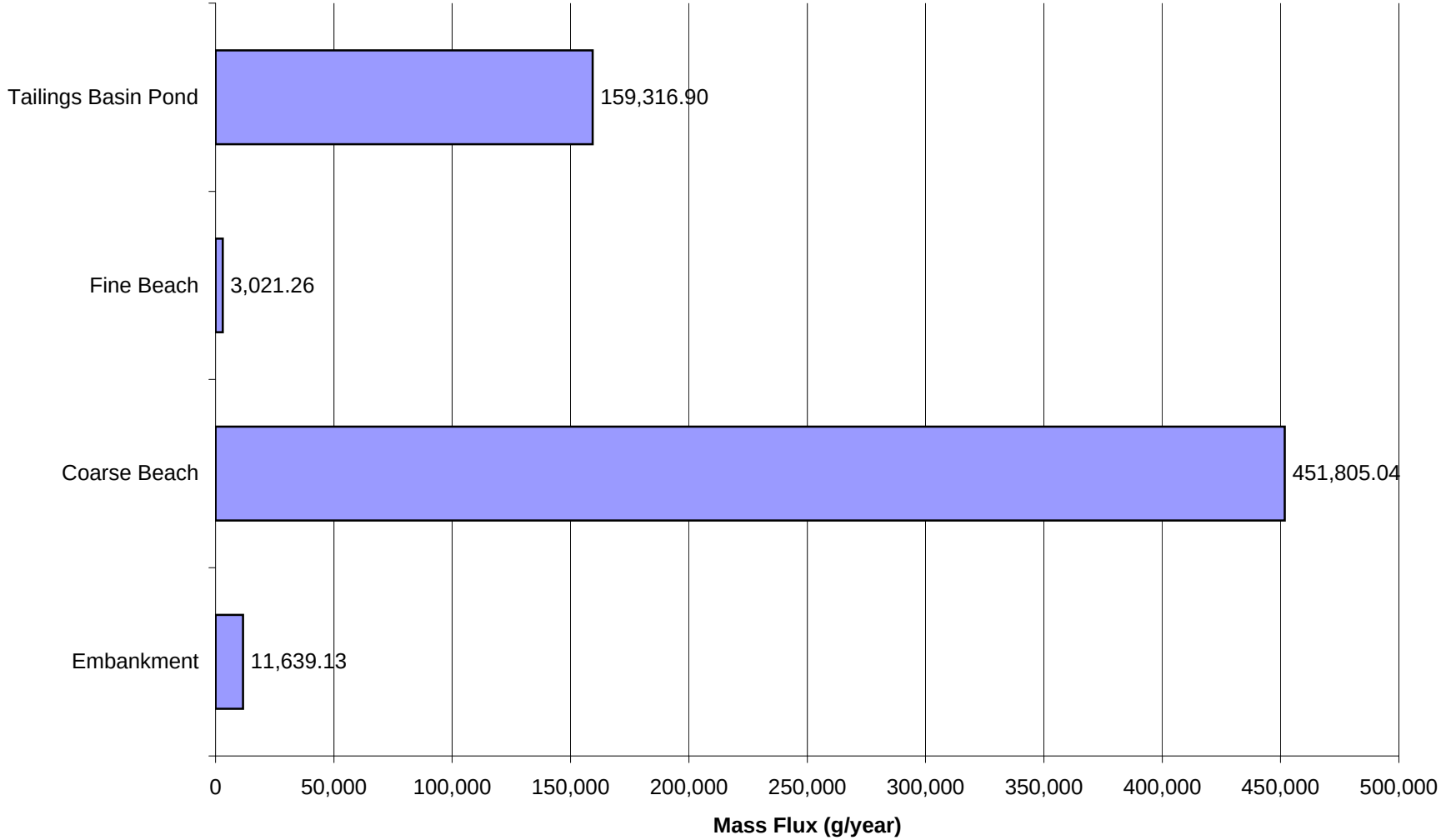
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 15 for Nickel (Ni)



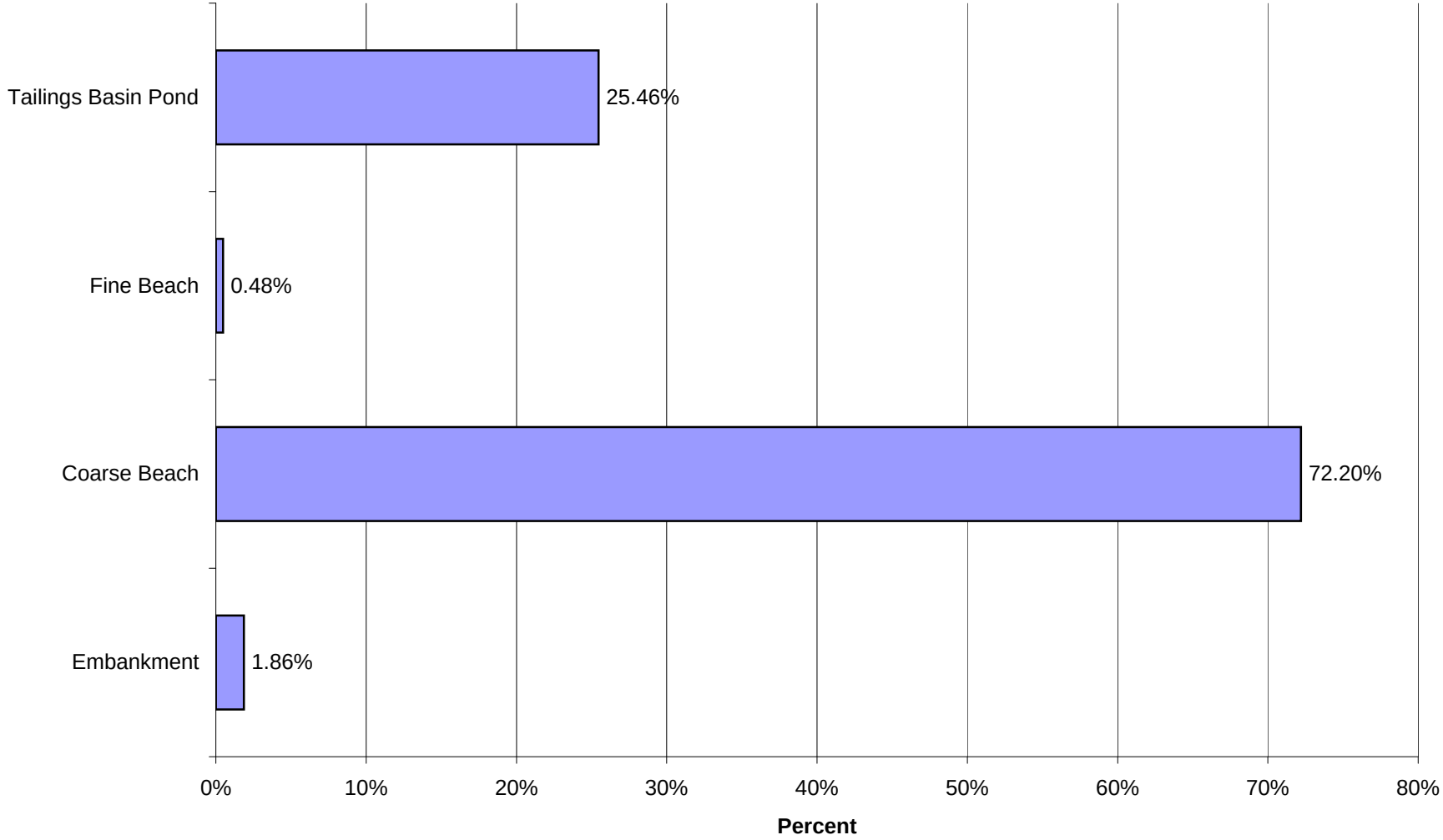
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 15 for Nickel (Ni)



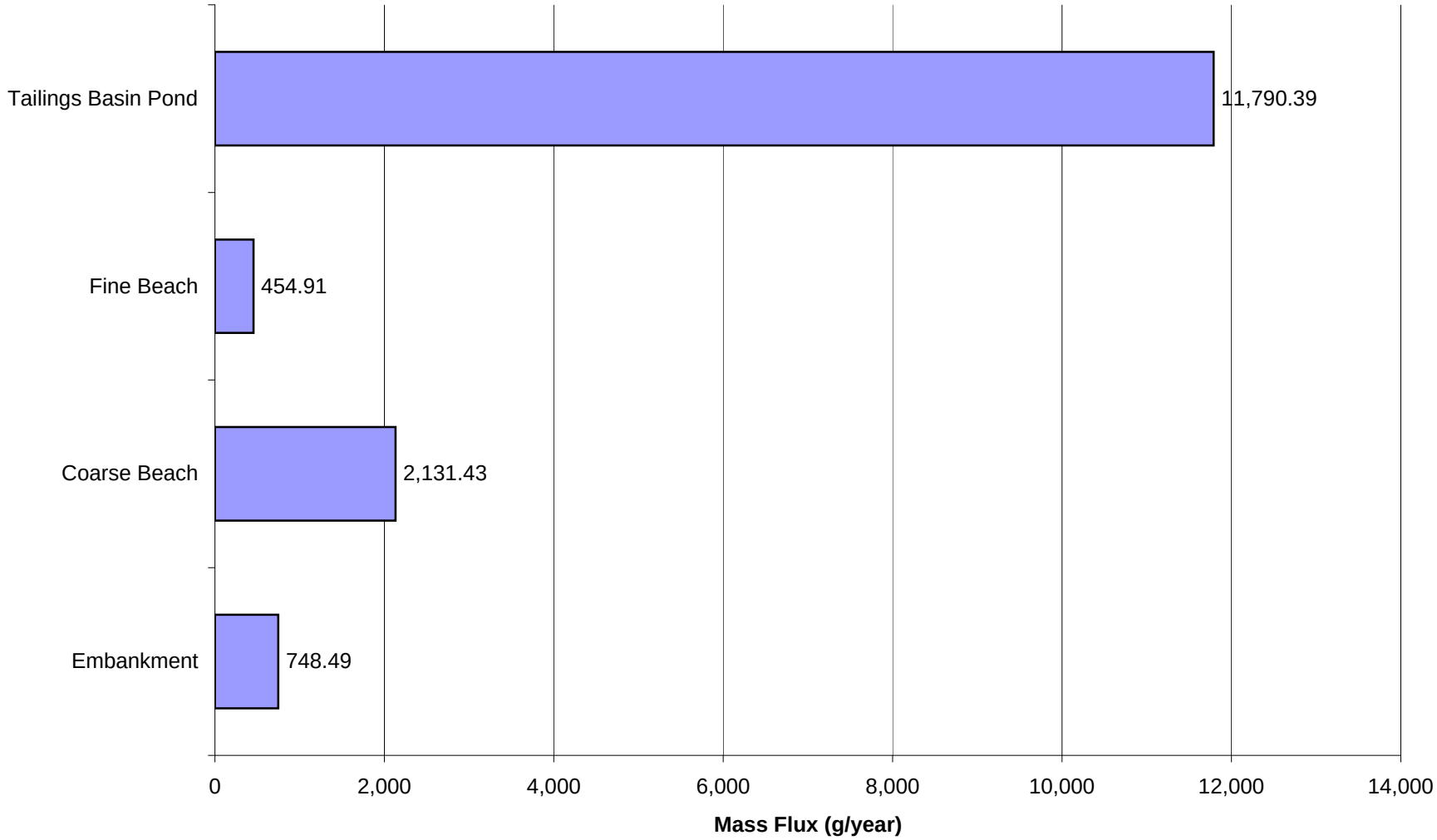
Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Year 20 for Nickel (Ni)



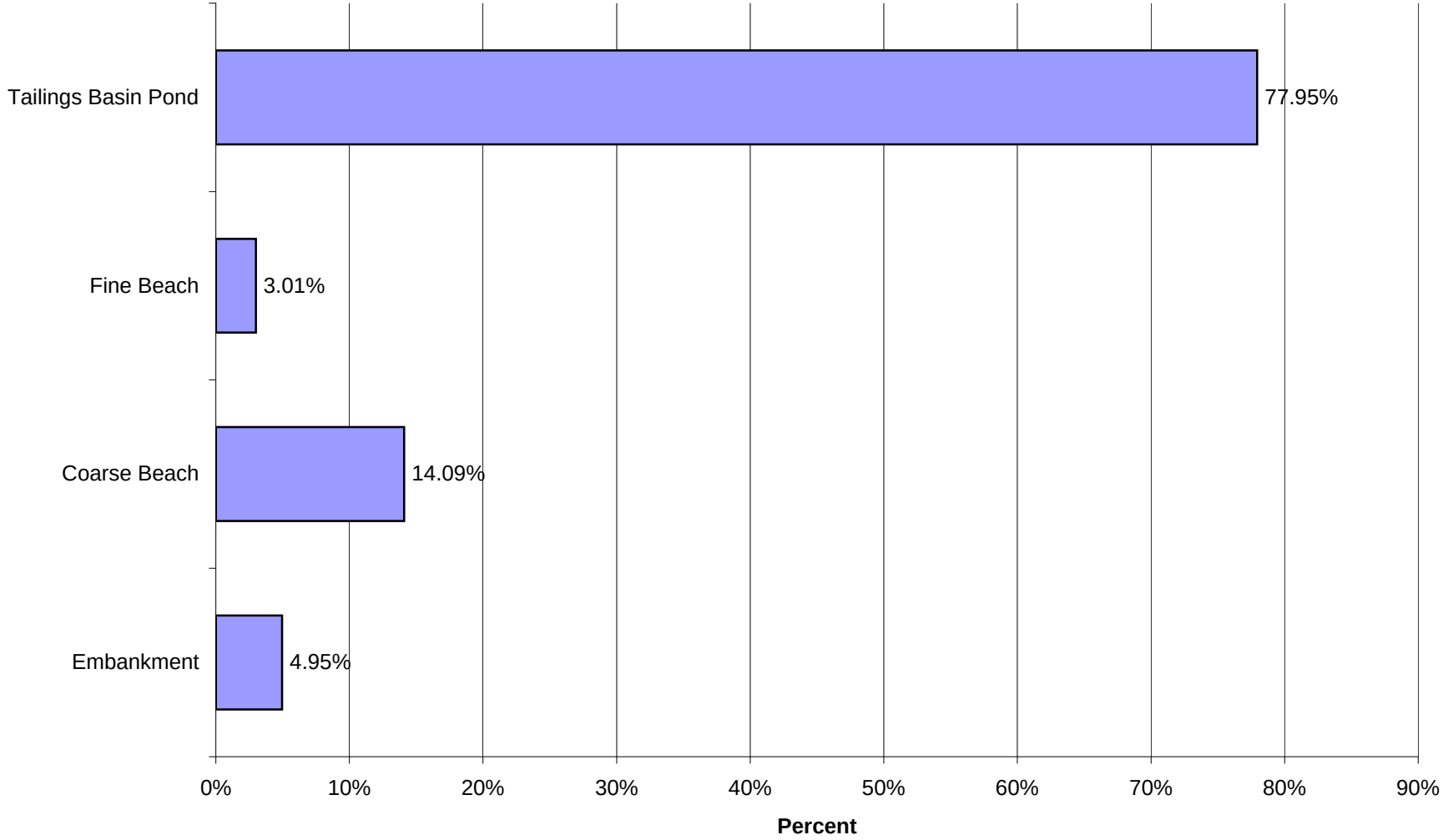
Proposed Action: Percent of Tailings Basin Features' Impacts in Year 20 for Nickel (Ni)



Proposed Action: Mass Flux (g/year) of Tailings Basin Features in Closure for Nickel (Ni)

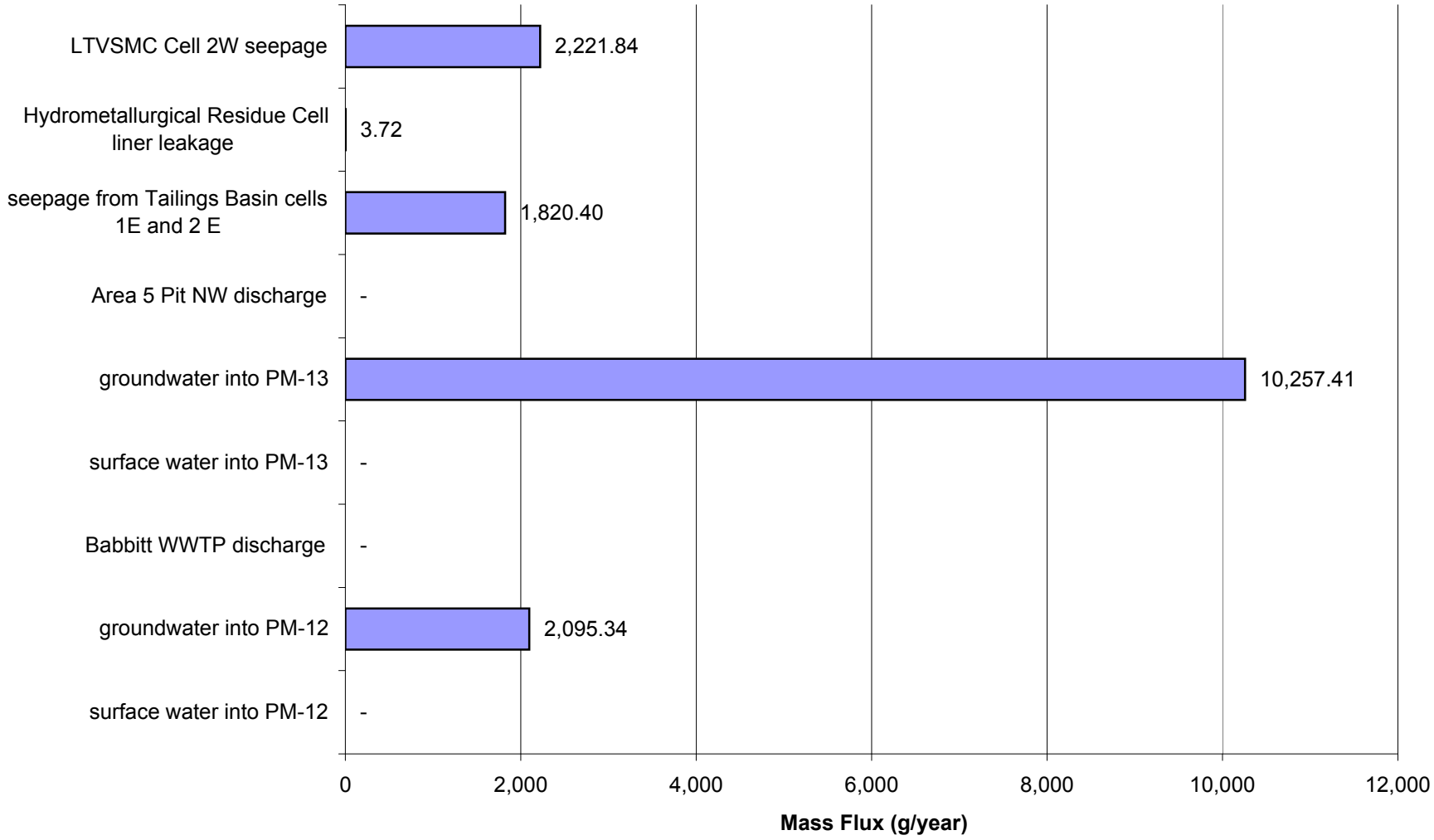


Proposed Action: Percent of Tailings Basin Features' Impacts in Closure for Nickel (Ni)

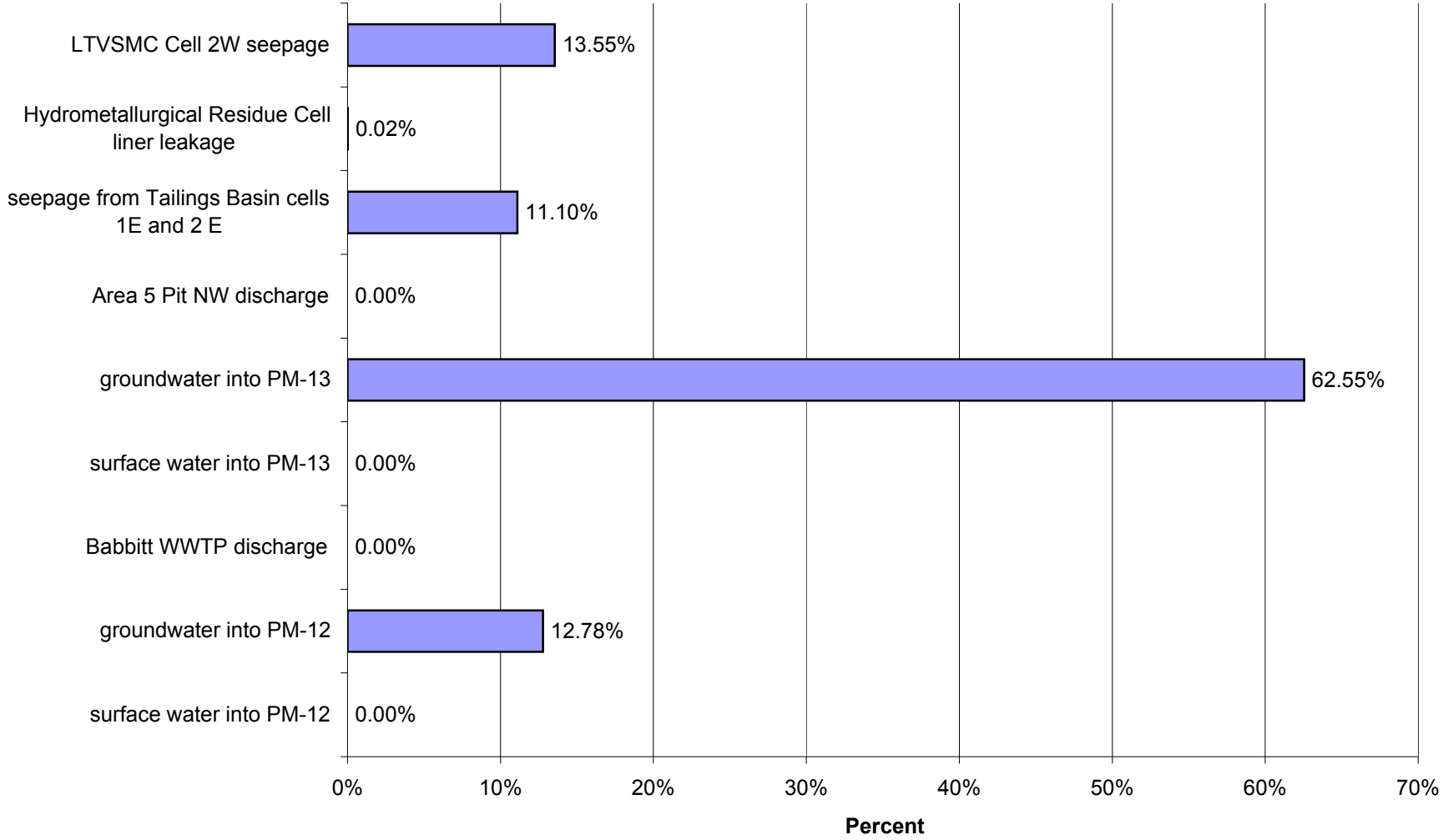


Appendix G.2
Embarrass River Watershed
Proposed Action

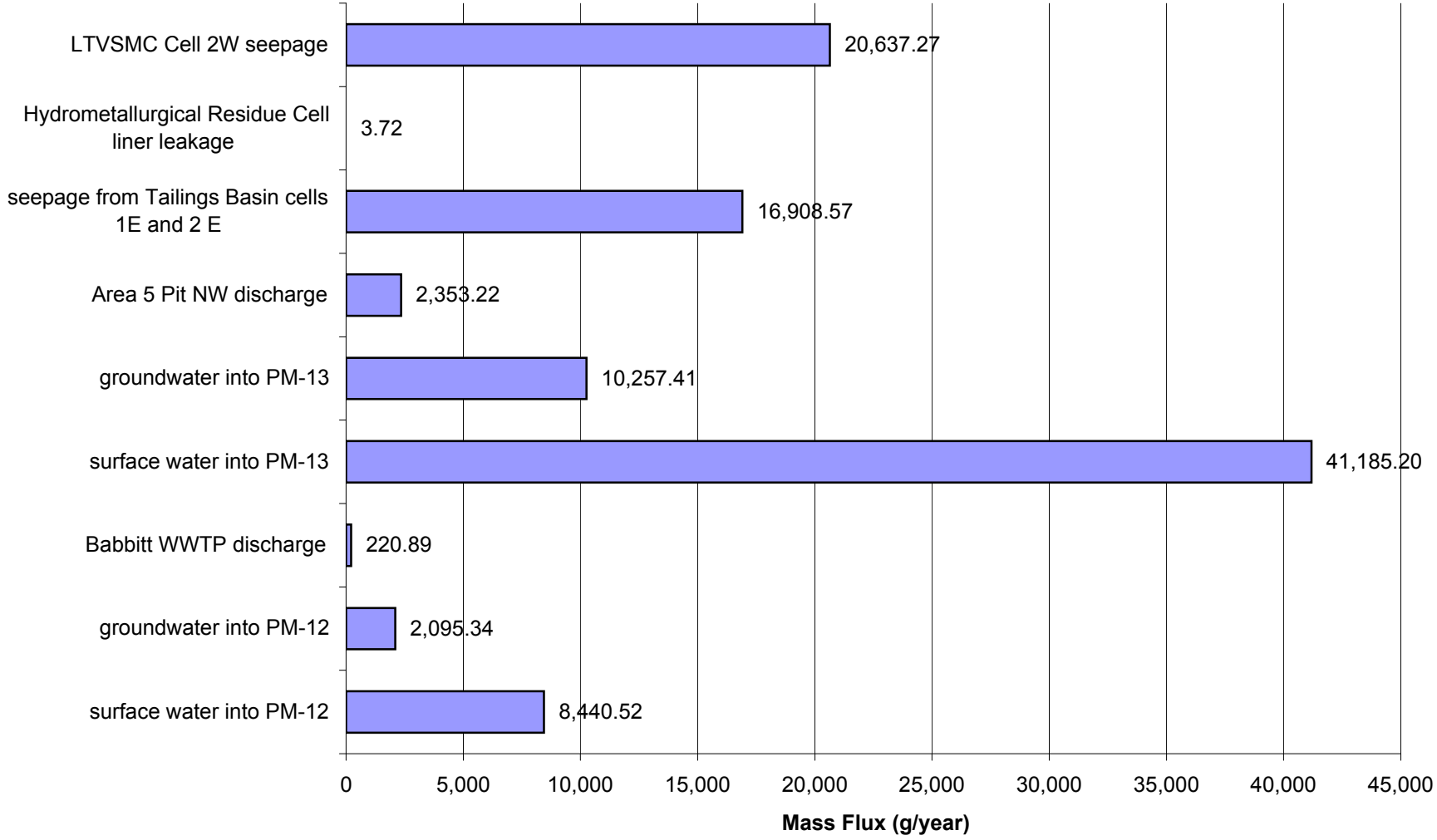
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for Low Flow for Arsenic (As)



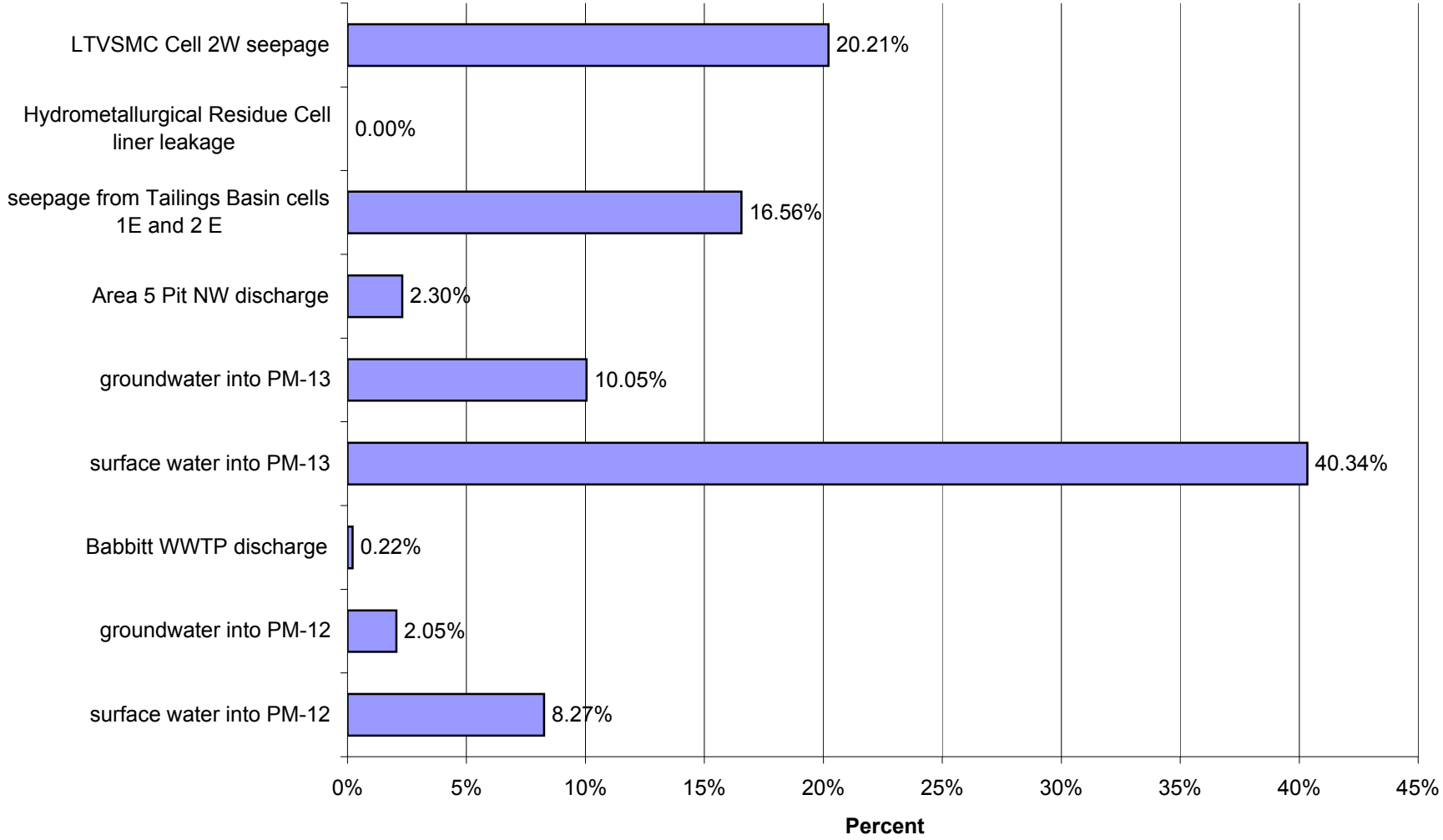
Proposed Action: Percent of Impacts at PM-13 in Year 1 for Low Flow for Arsenic (As)



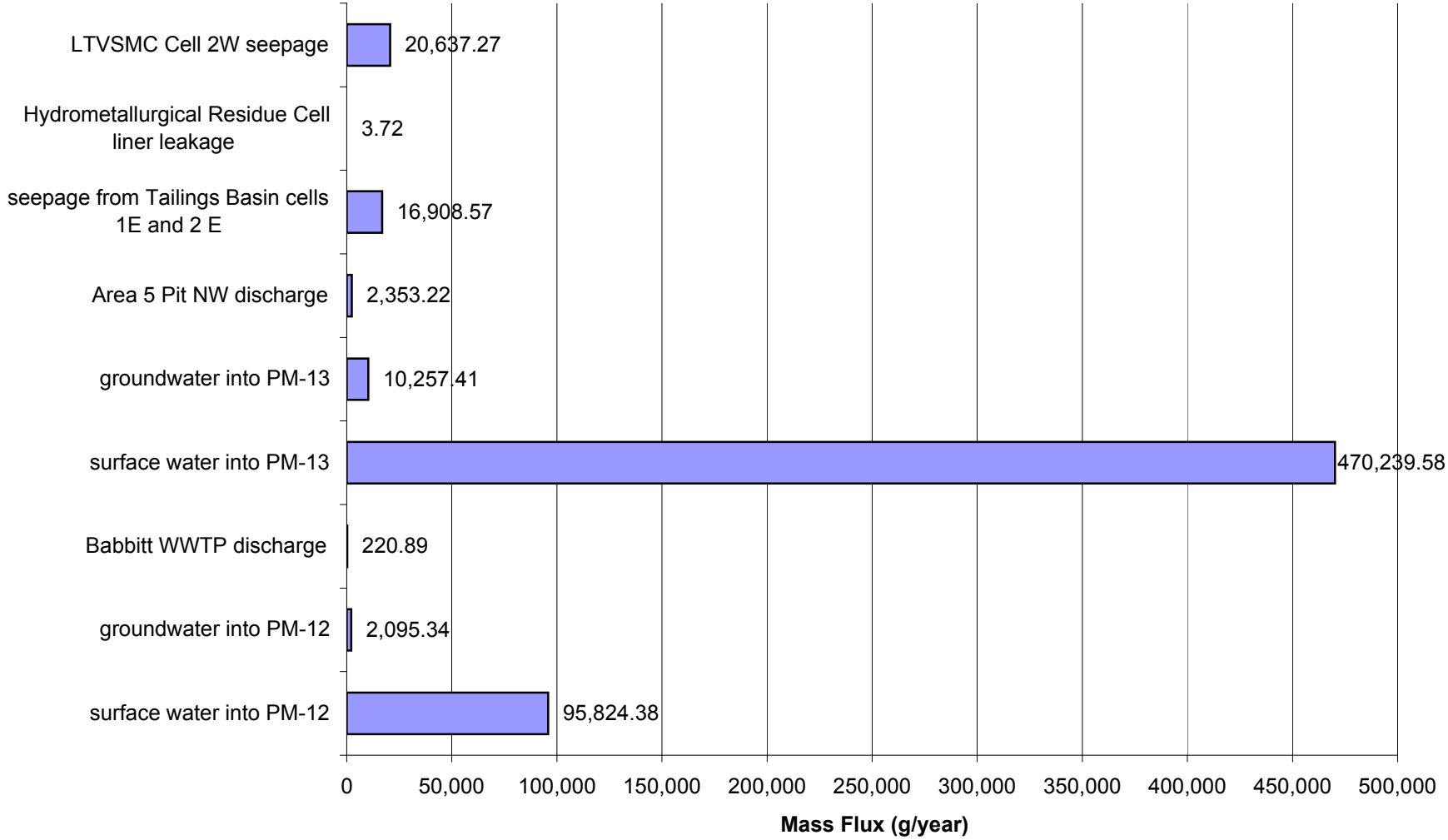
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for Average Flow for Arsenic (As)



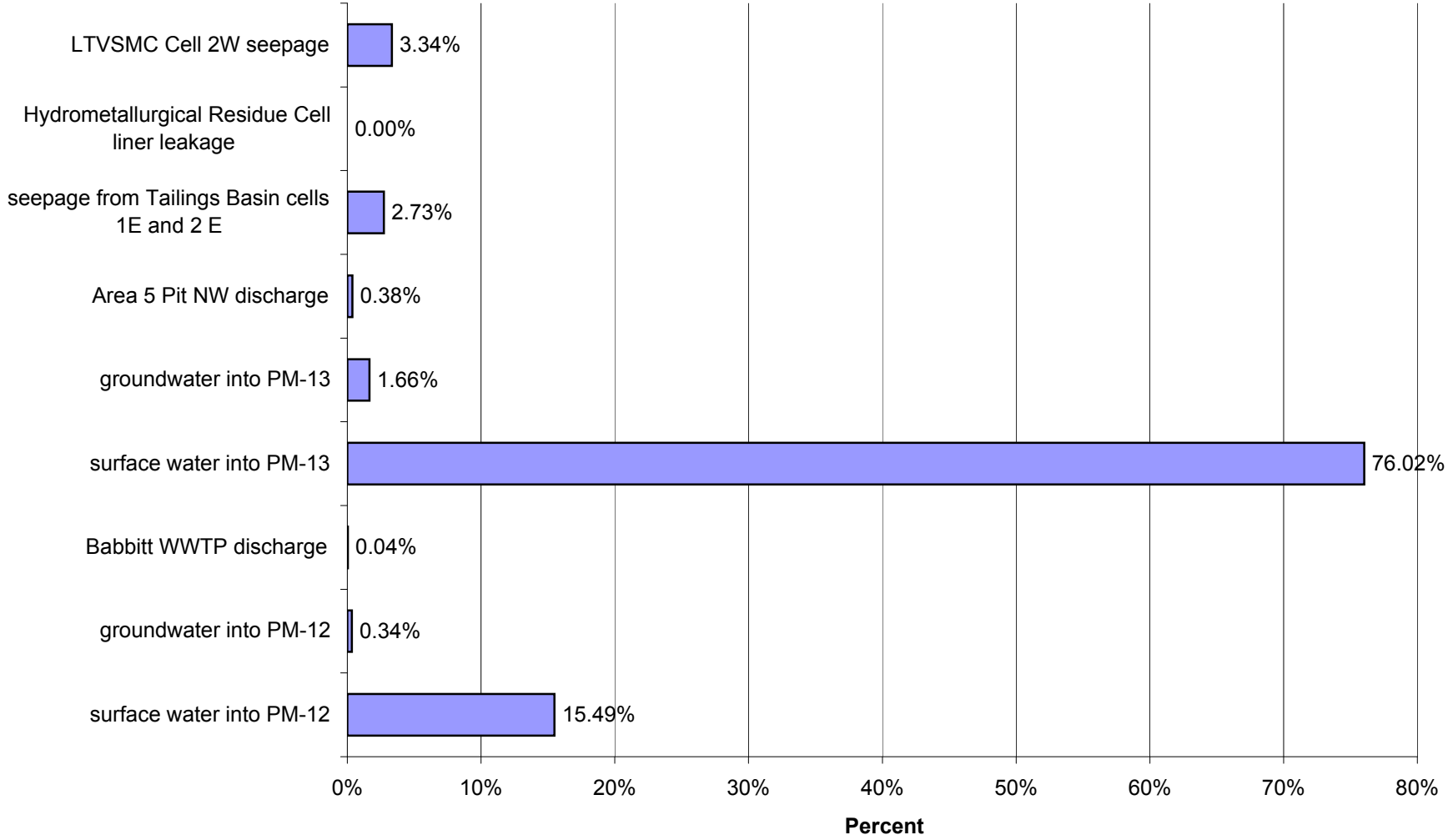
Proposed Action: Percent of Impacts at PM-13 in Year 1 for Average Flow for Arsenic (As)



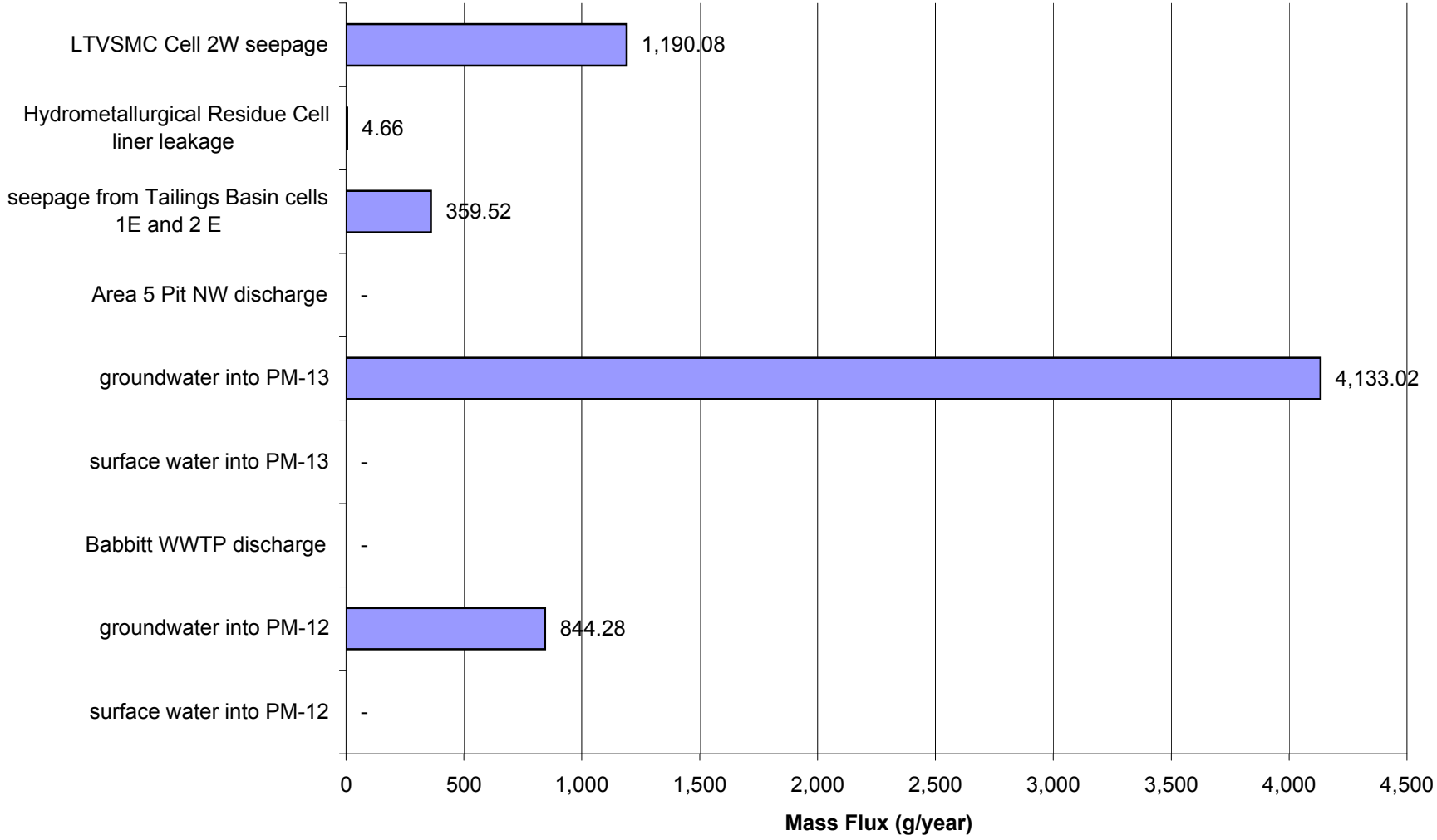
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for High Flow for Arsenic (As)



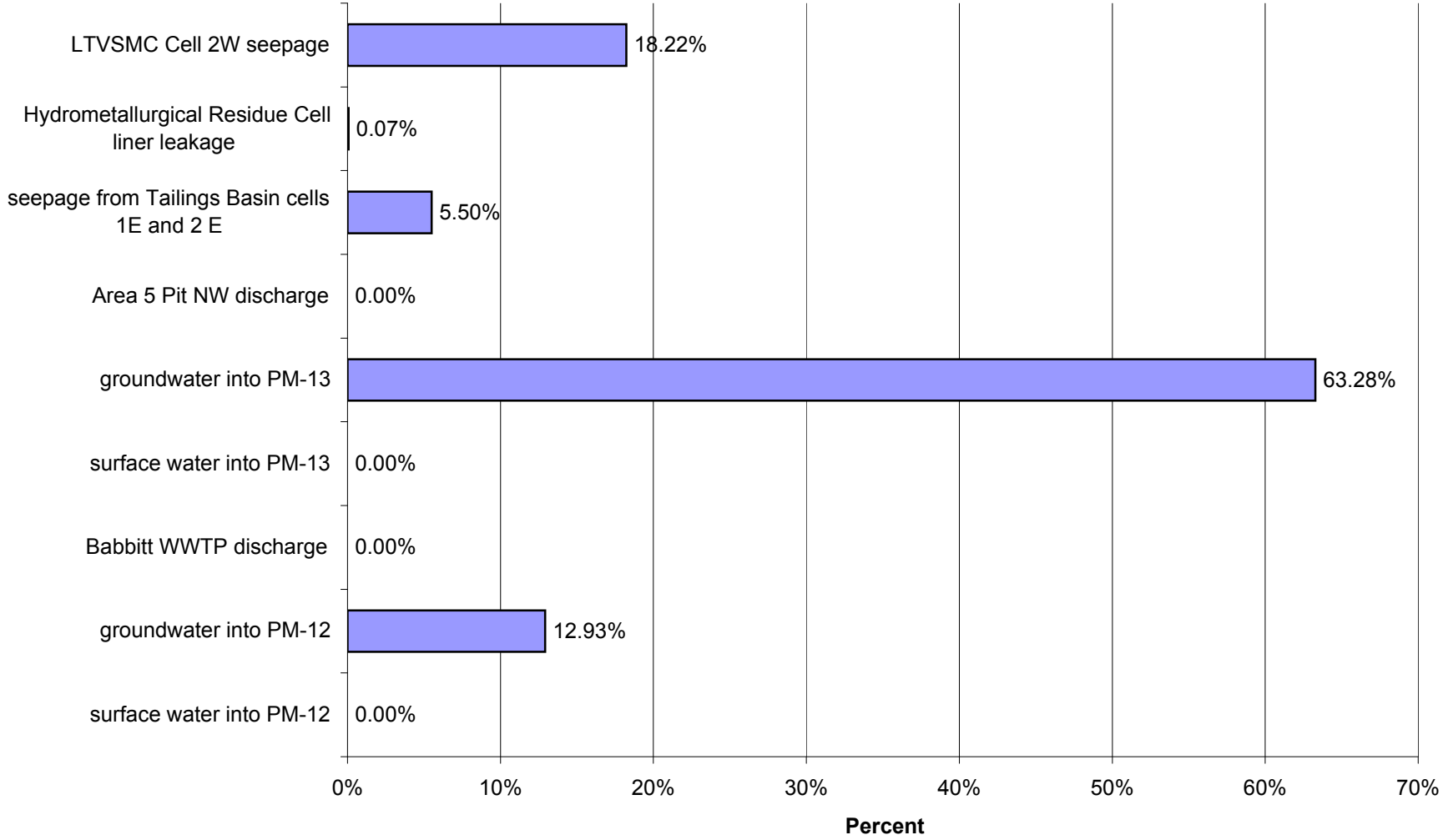
Proposed Action: Percent of Impacts at PM-13 in Year 1 for High Flow for Arsenic (As)



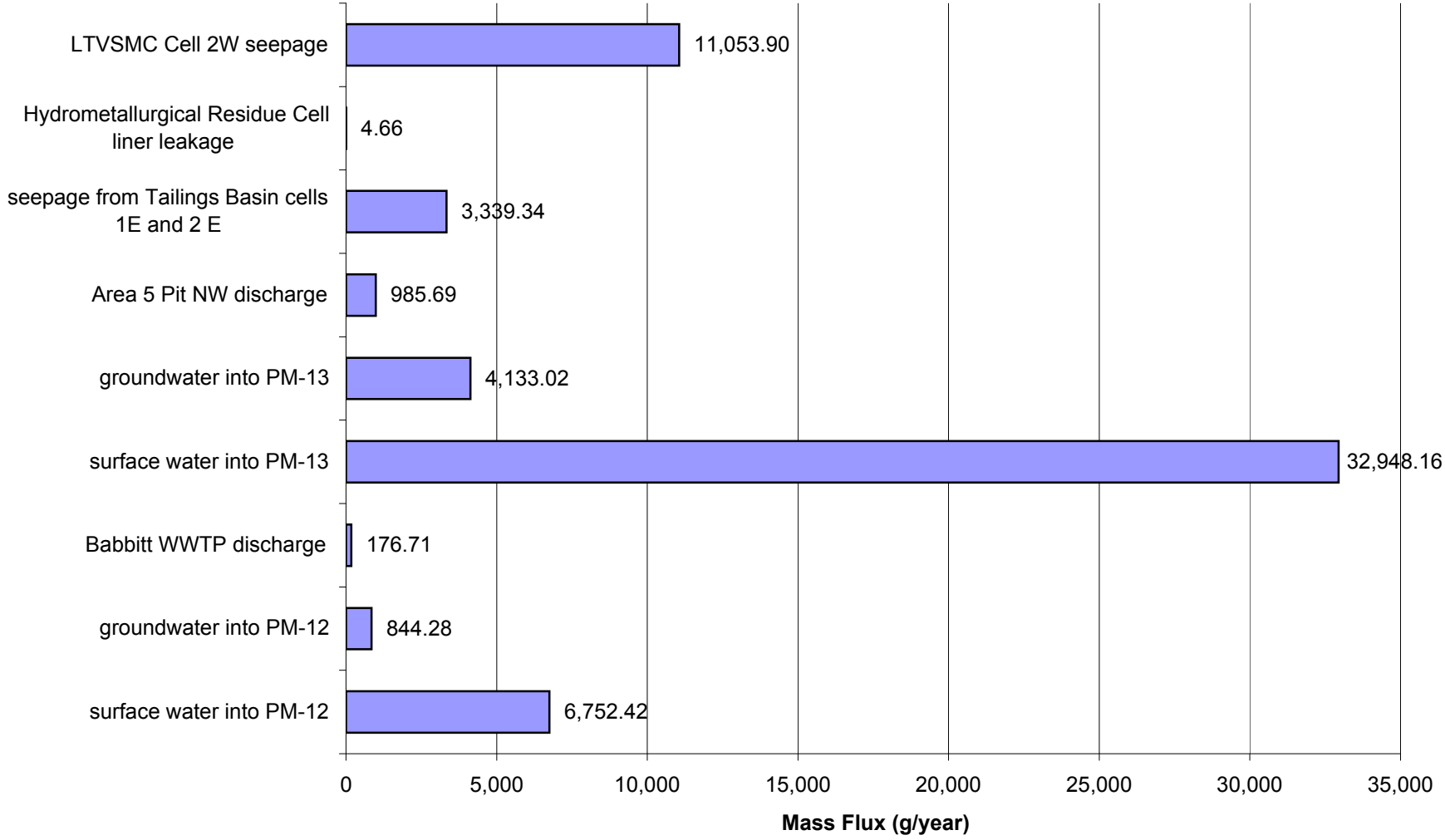
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for Low Flow for Cobalt (Co)



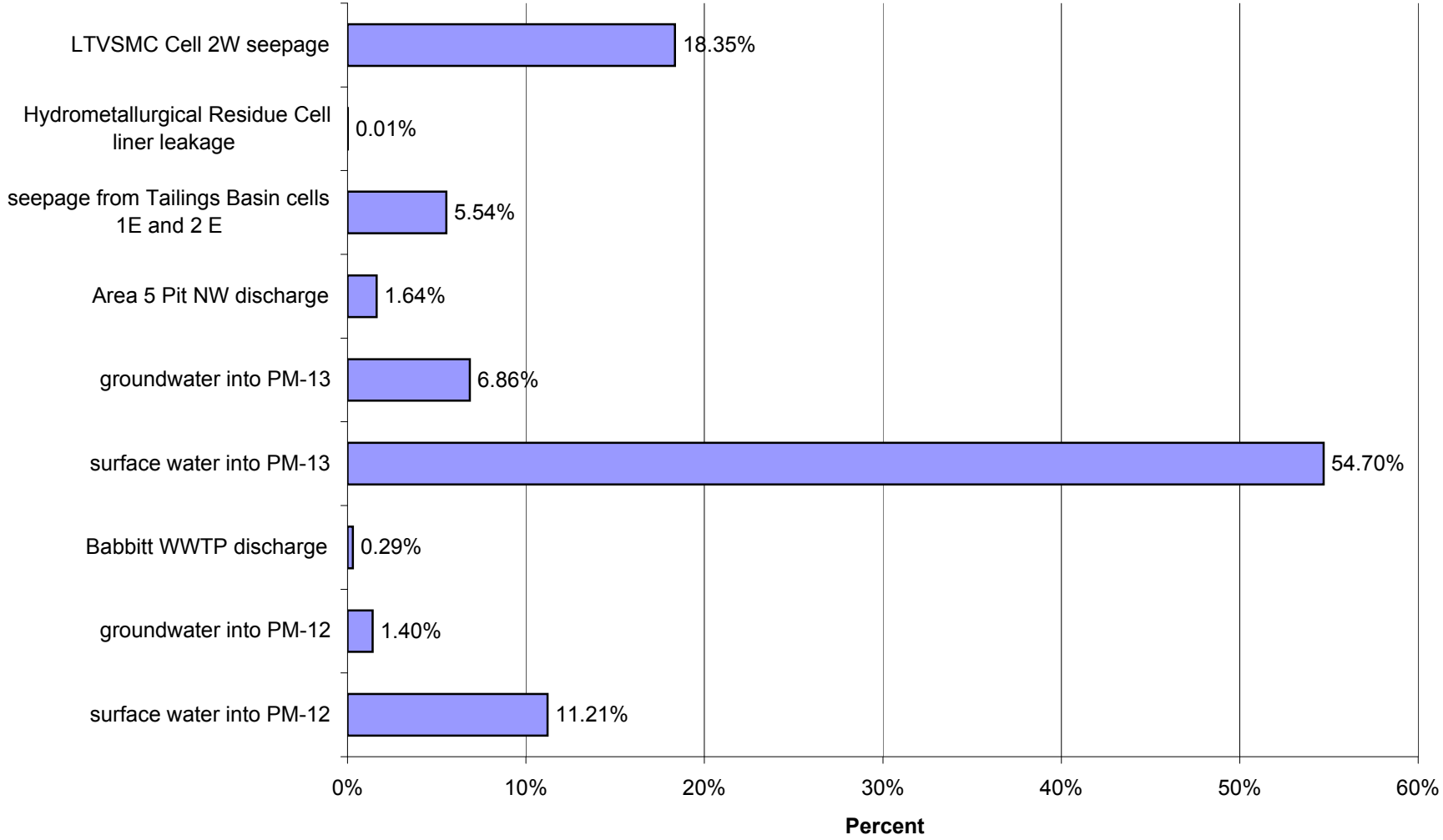
Proposed Action: Percent of Impacts at PM-13 in Year 1 for Low Flow for Cobalt (Co)



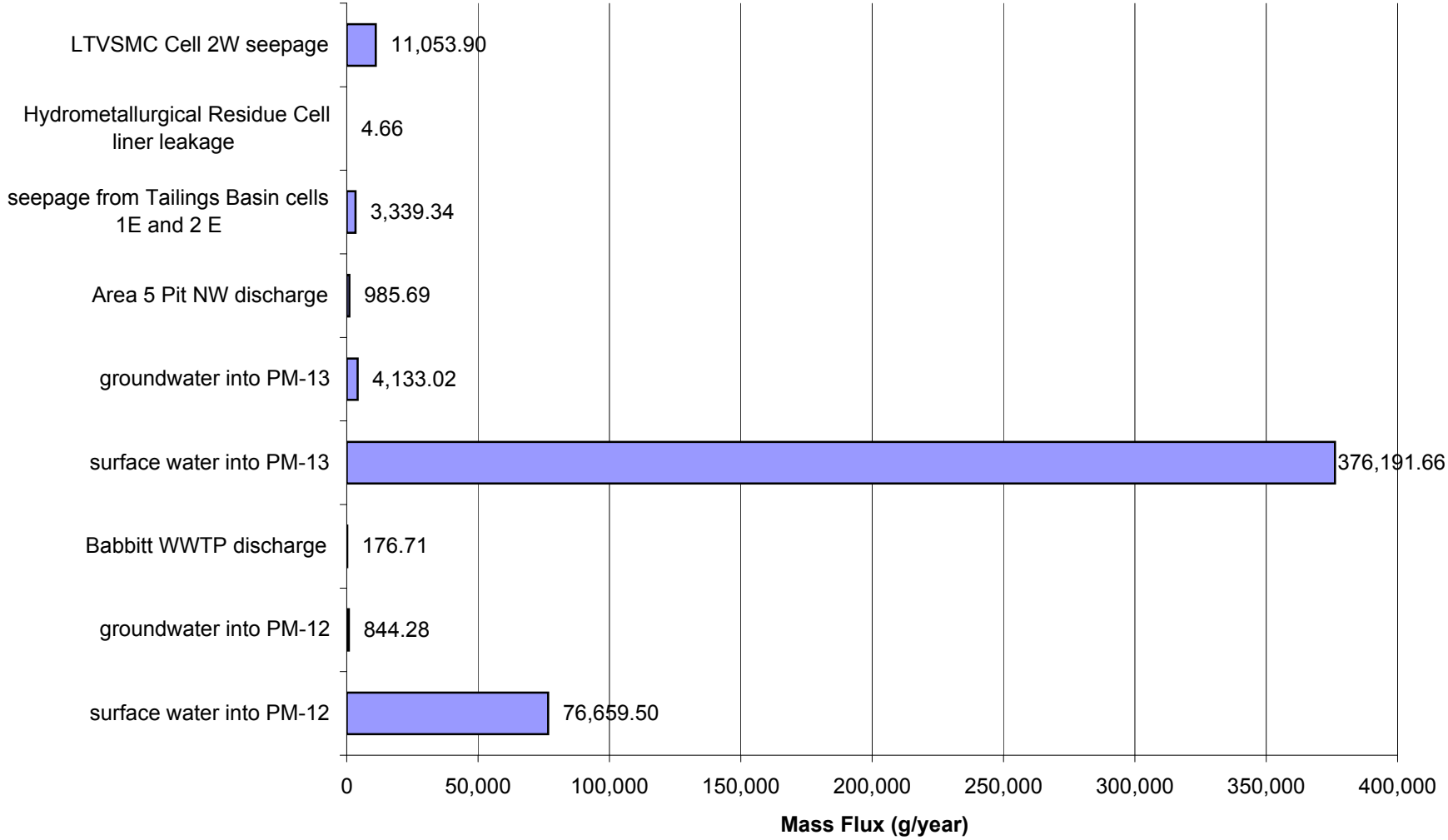
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for Average Flow for Cobalt (Co)



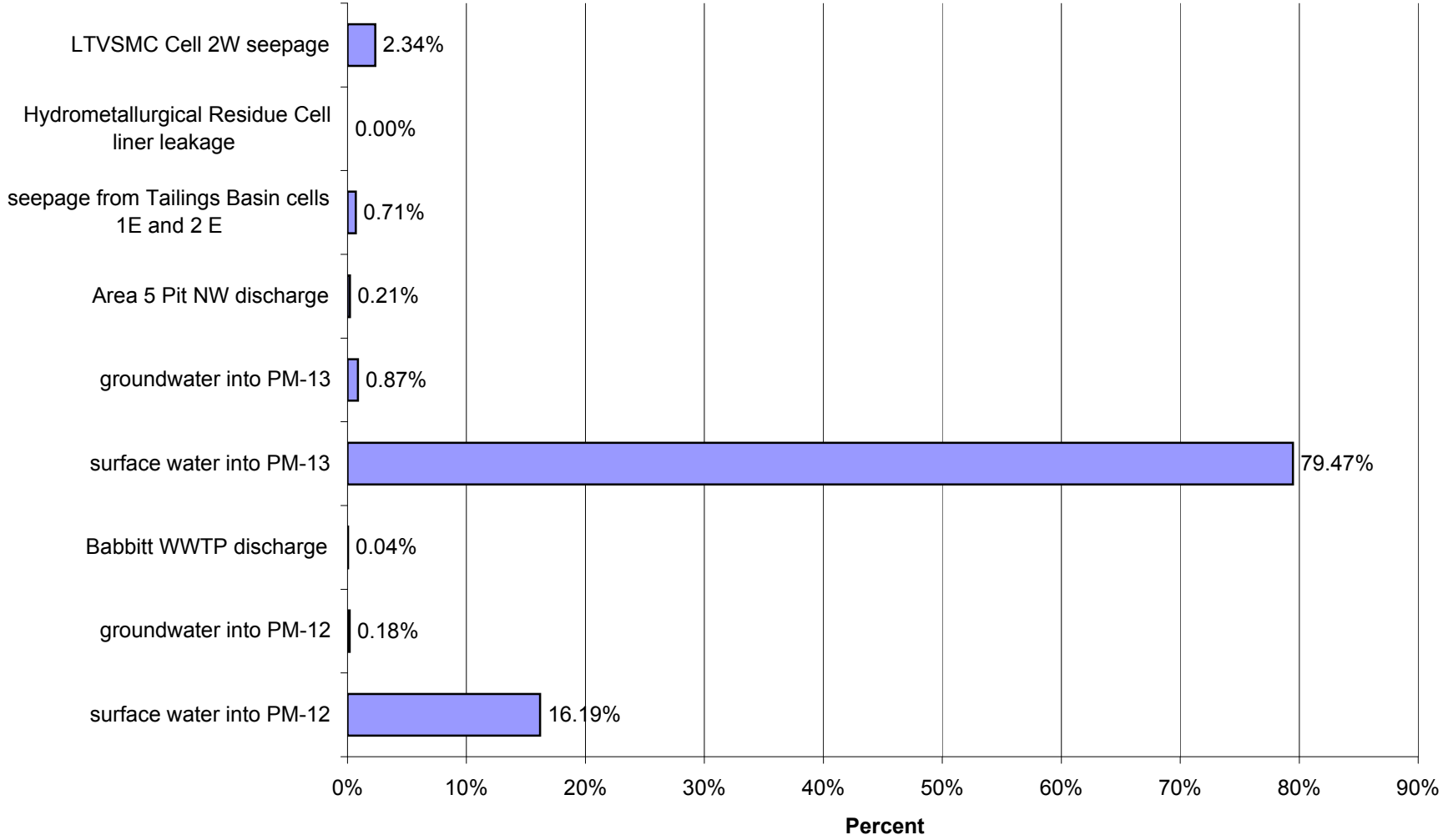
Proposed Action: Percent of Impacts at PM-13 in Year 1 for Average Flow for Cobalt (Co)



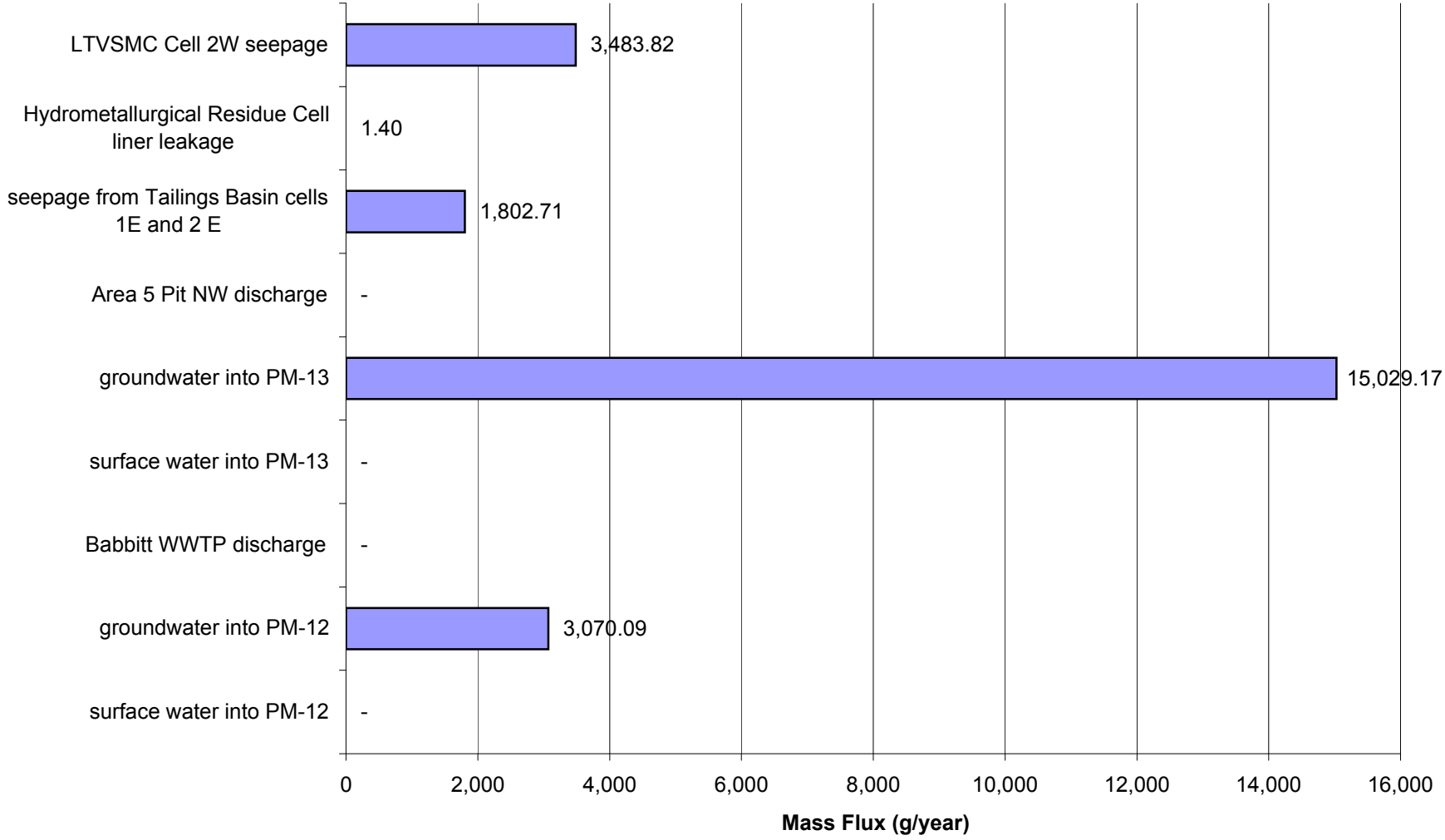
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for High Flow for Cobalt (Co)



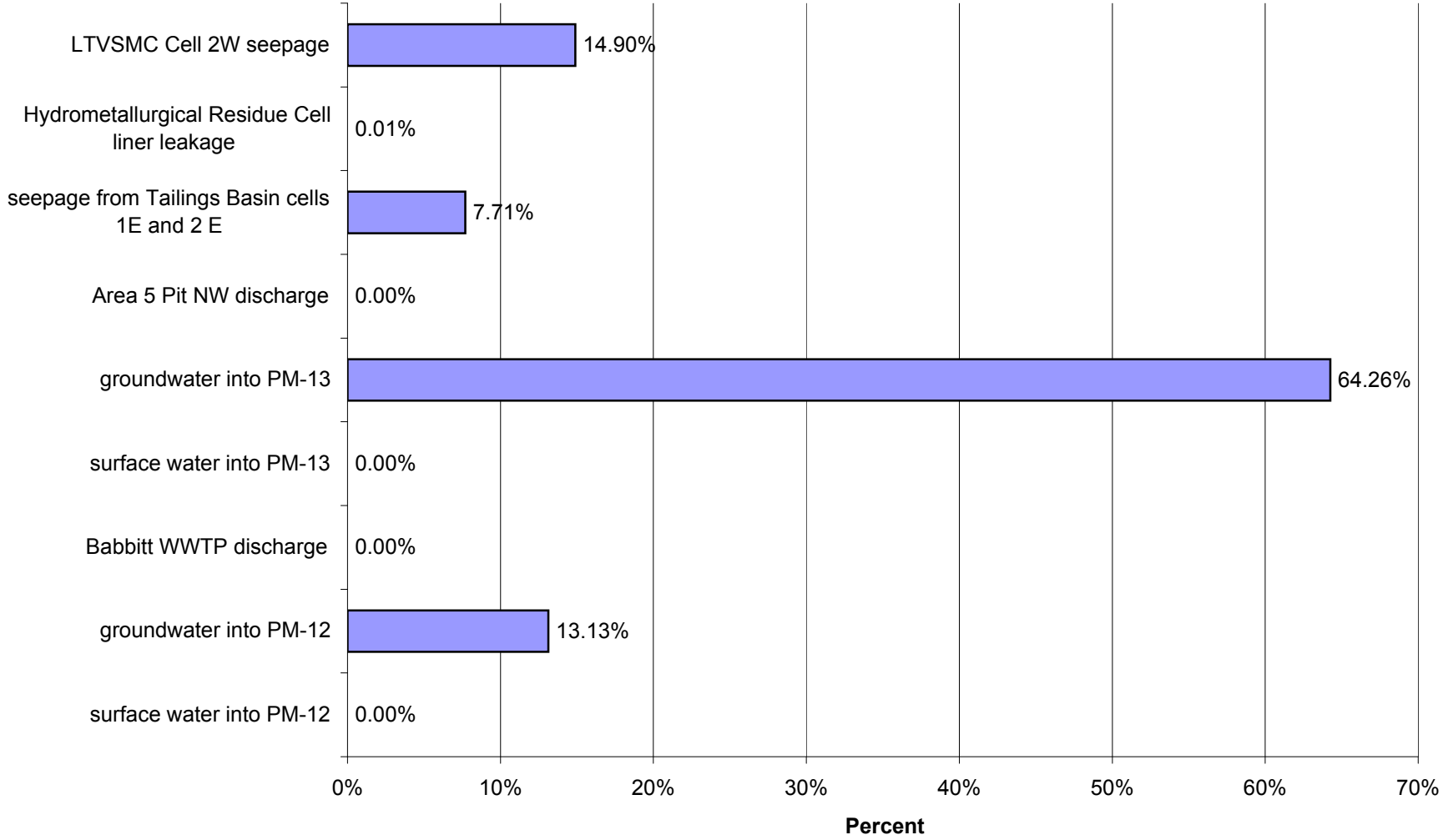
Proposed Action: Percent of Impacts at PM-13 in Year 1 for High Flow for Cobalt (Co)



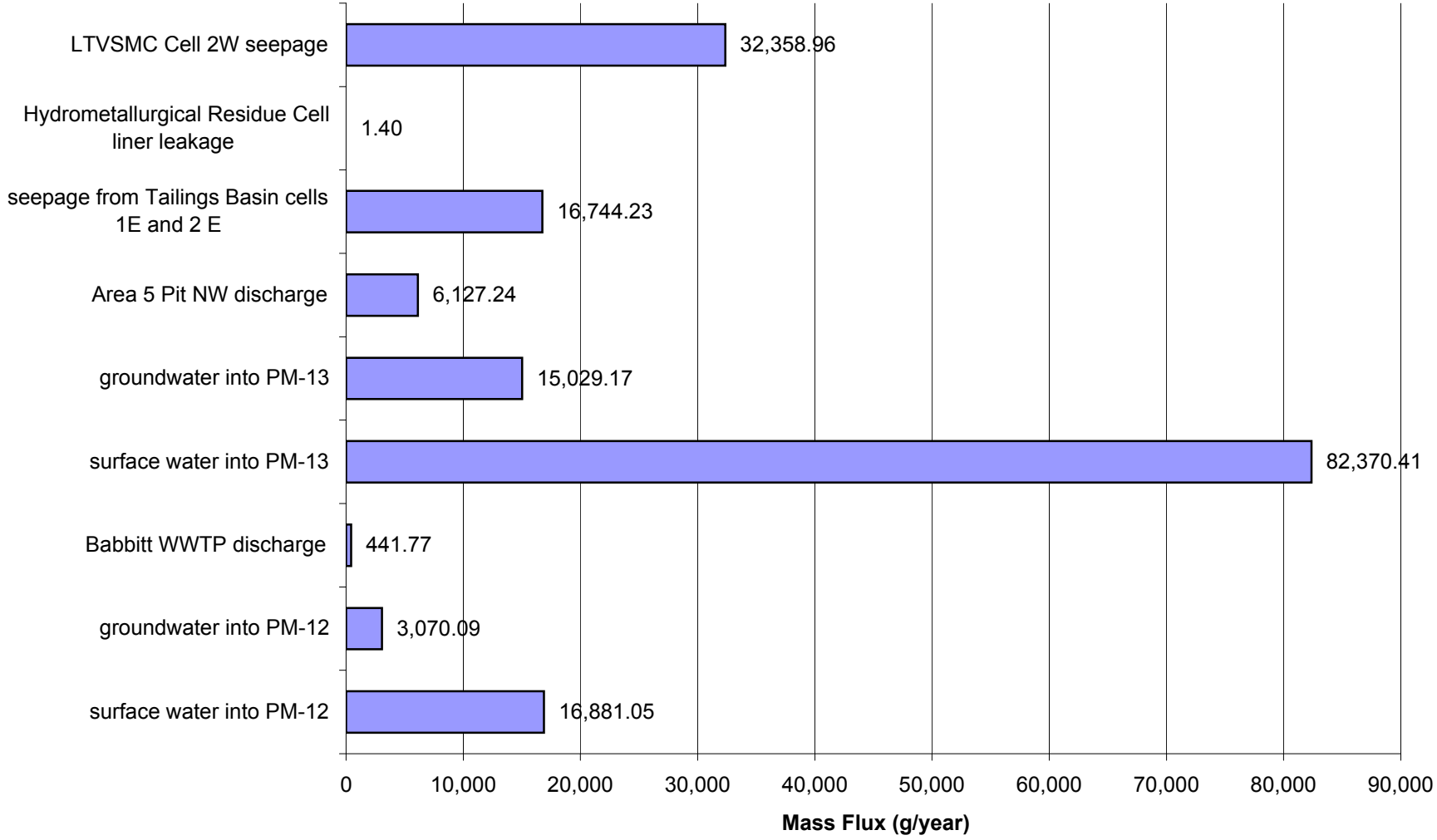
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for Low Flow for Copper (Cu)



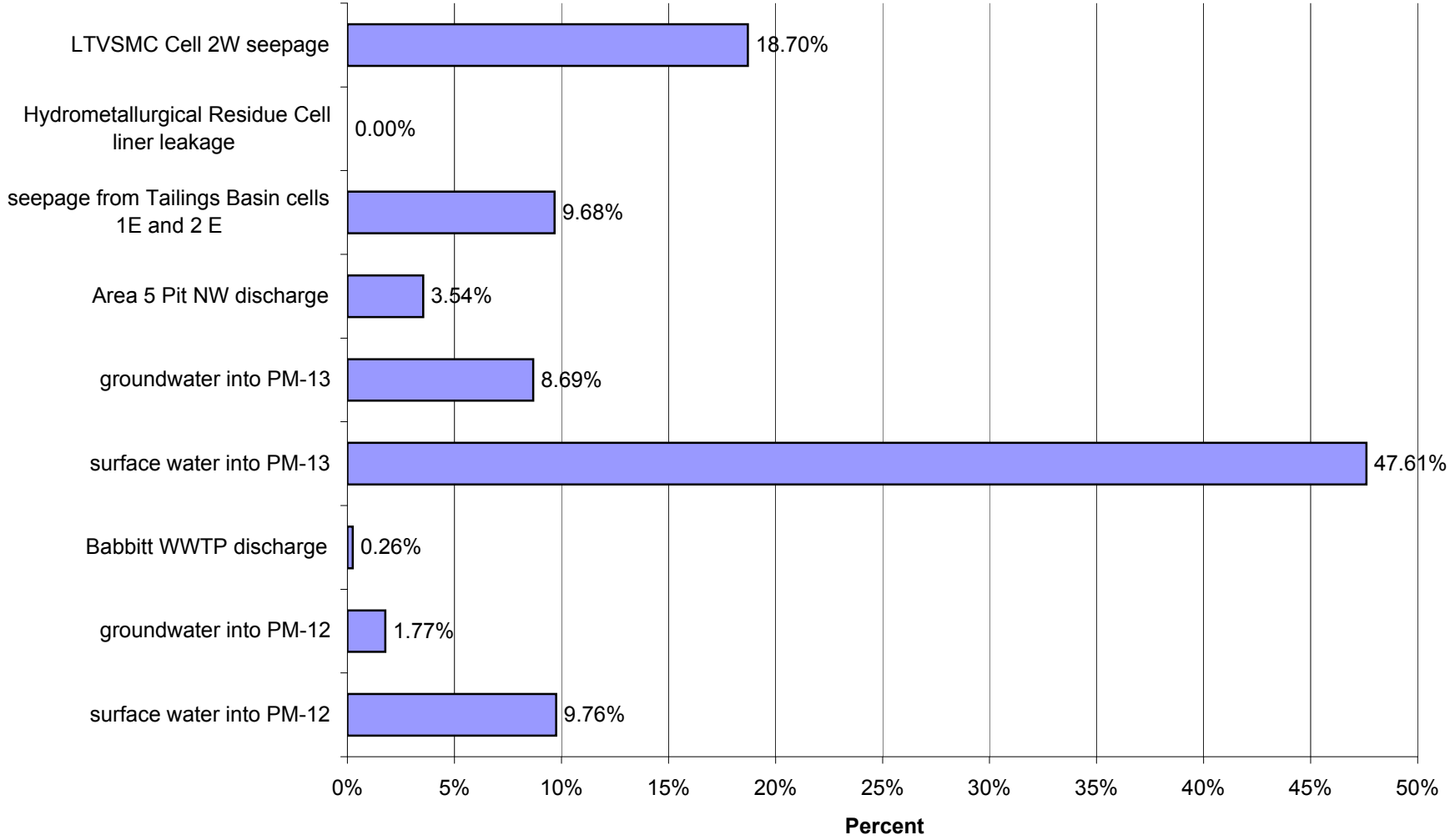
Proposed Action: Percent of Impacts at PM-13 in Year 1 for Low Flow for Copper (Cu)



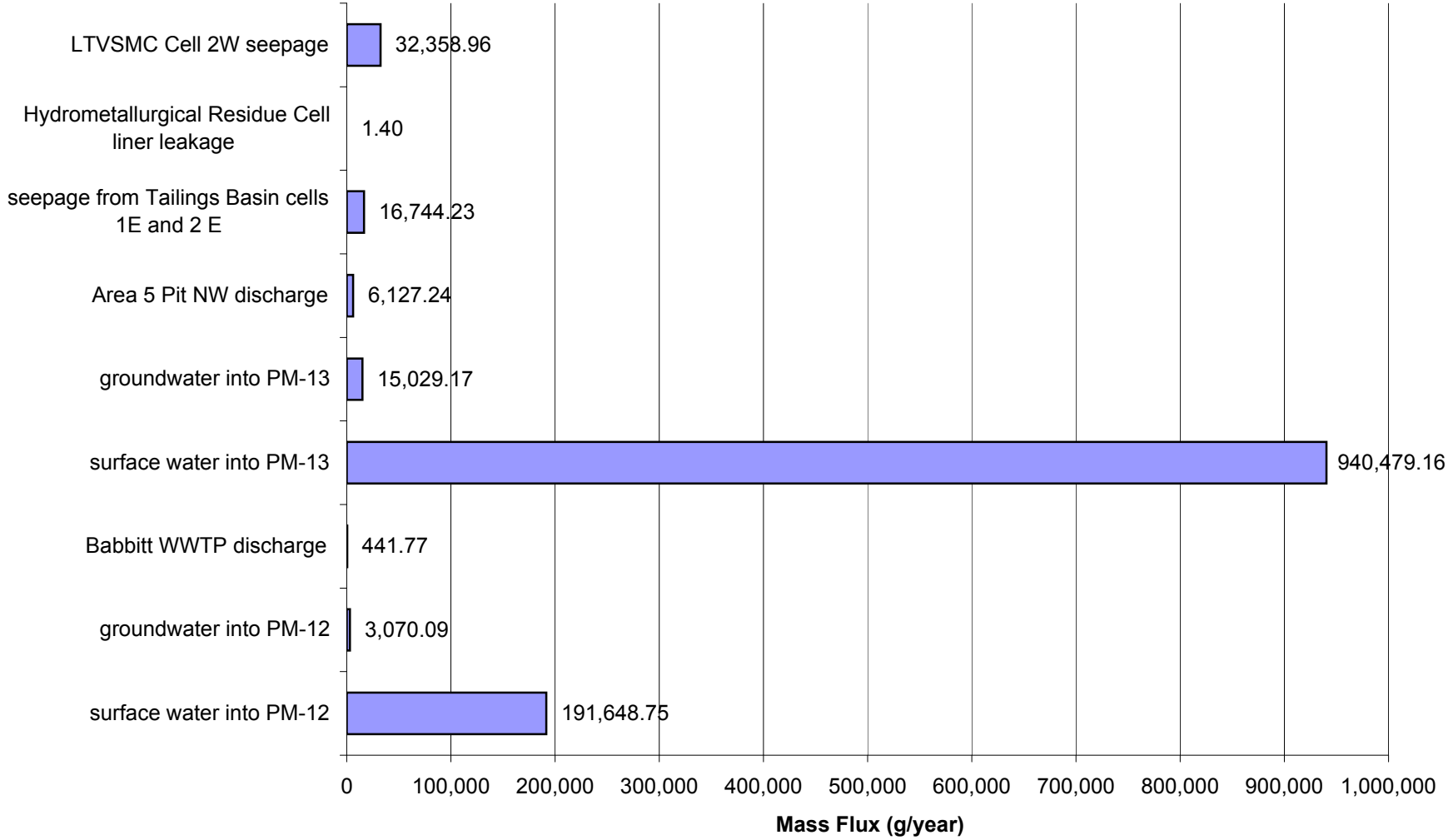
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for Average Flow for Copper (Cu)



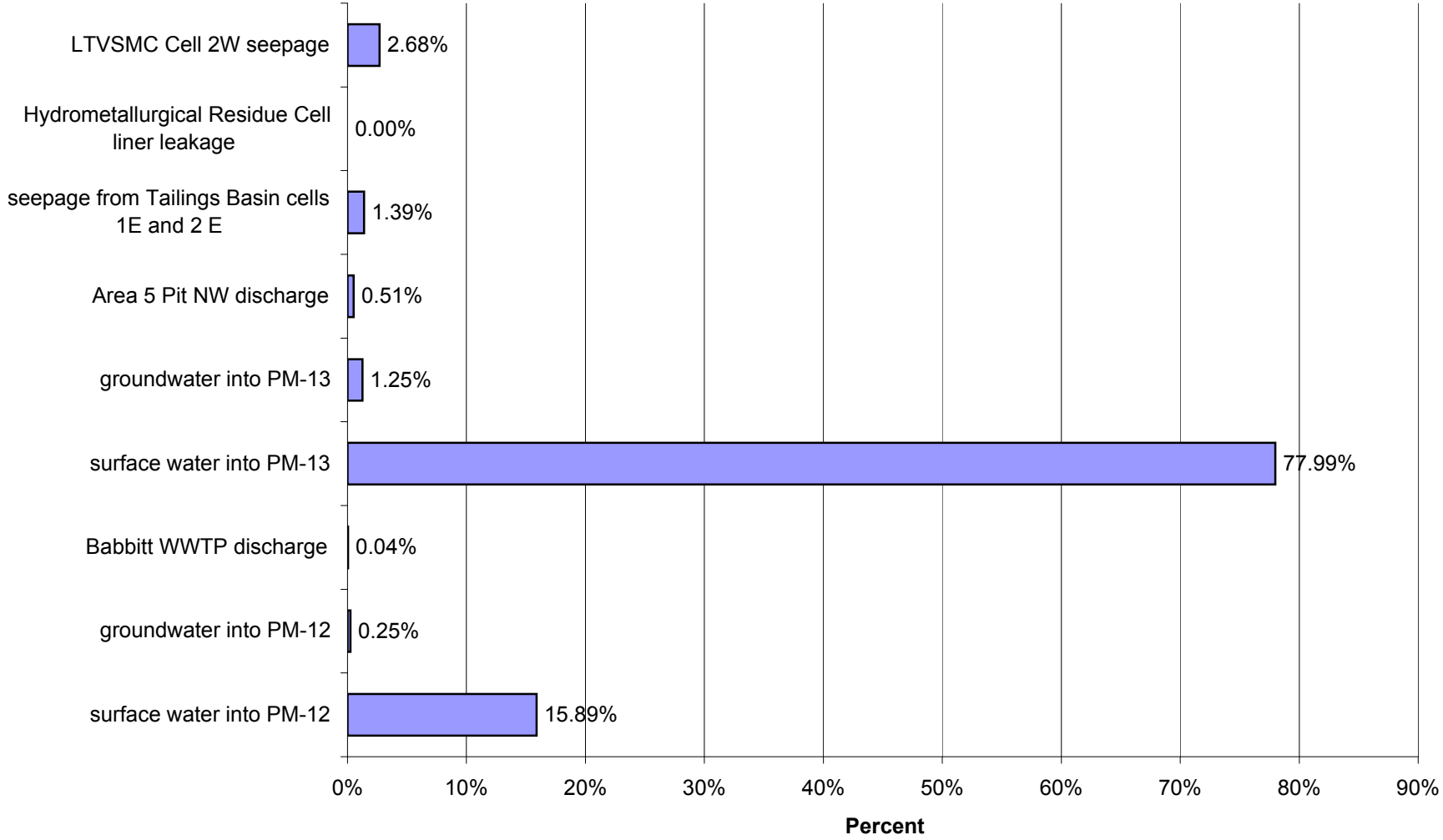
Proposed Action: Percent of Impacts at PM-13 in Year 1 for Average Flow for Copper (Cu)



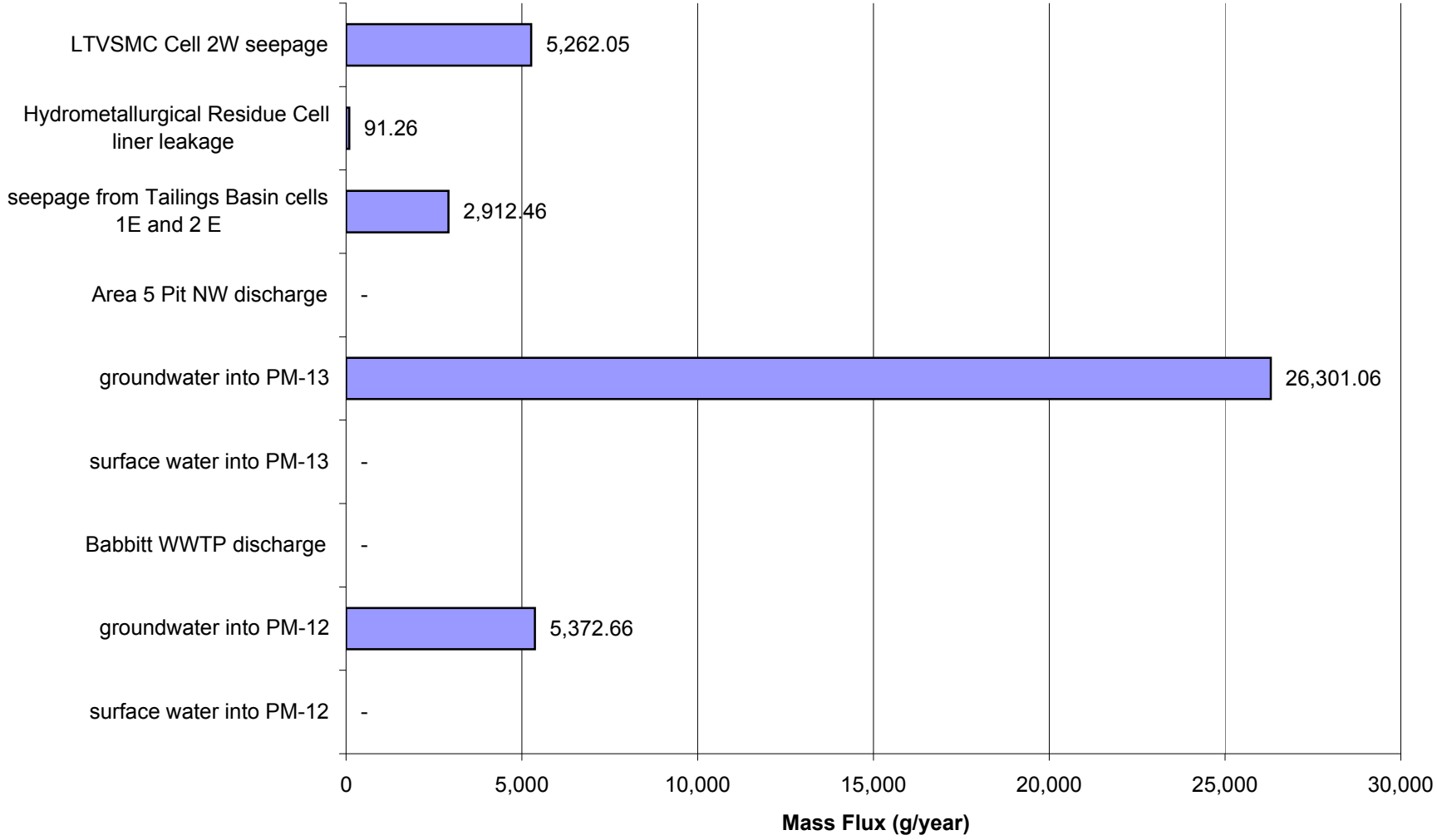
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for High Flow for Copper (Cu)



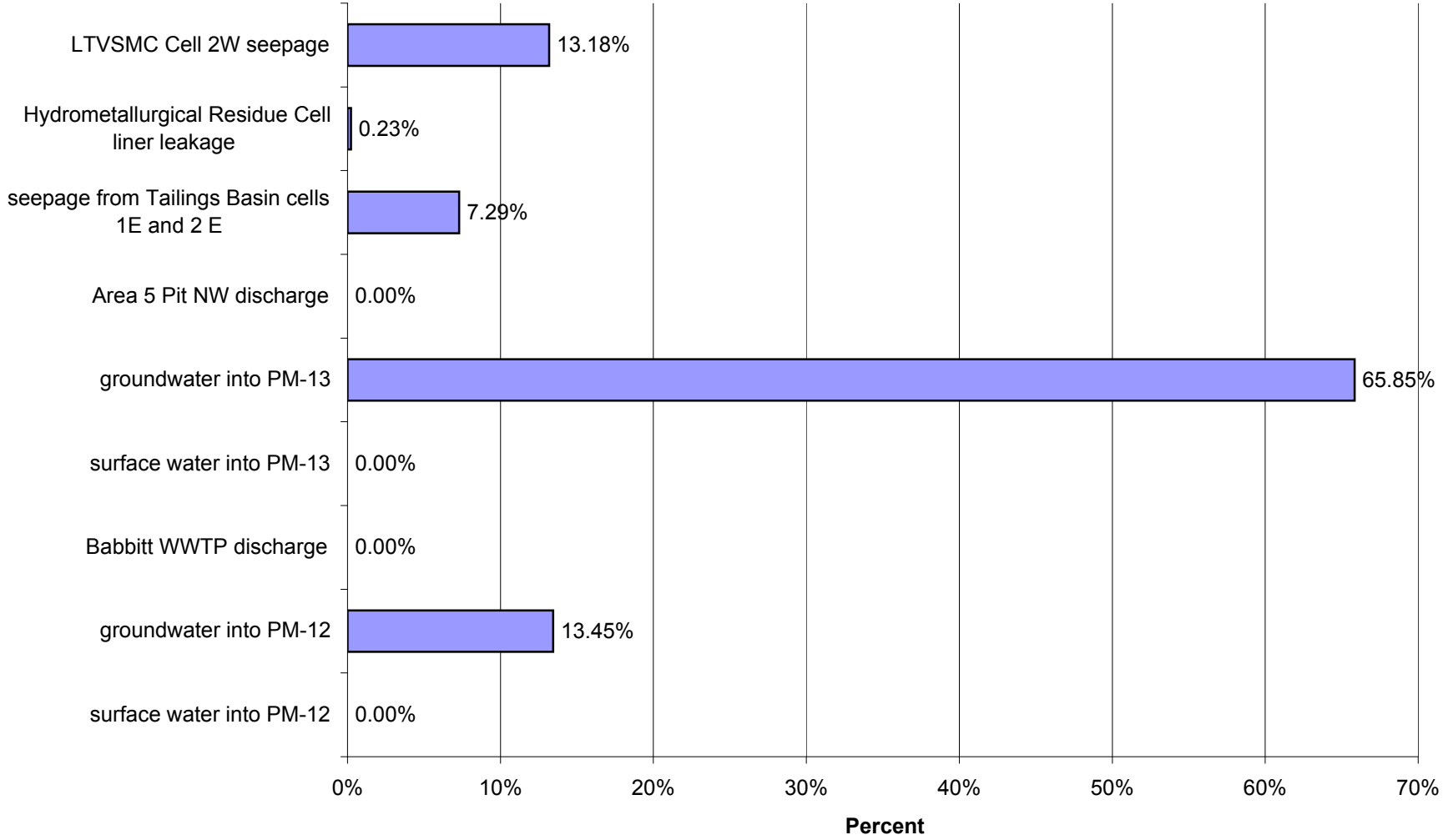
Proposed Action: Percent of Impacts at PM-13 in Year 1 for High Flow for Copper (Cu)



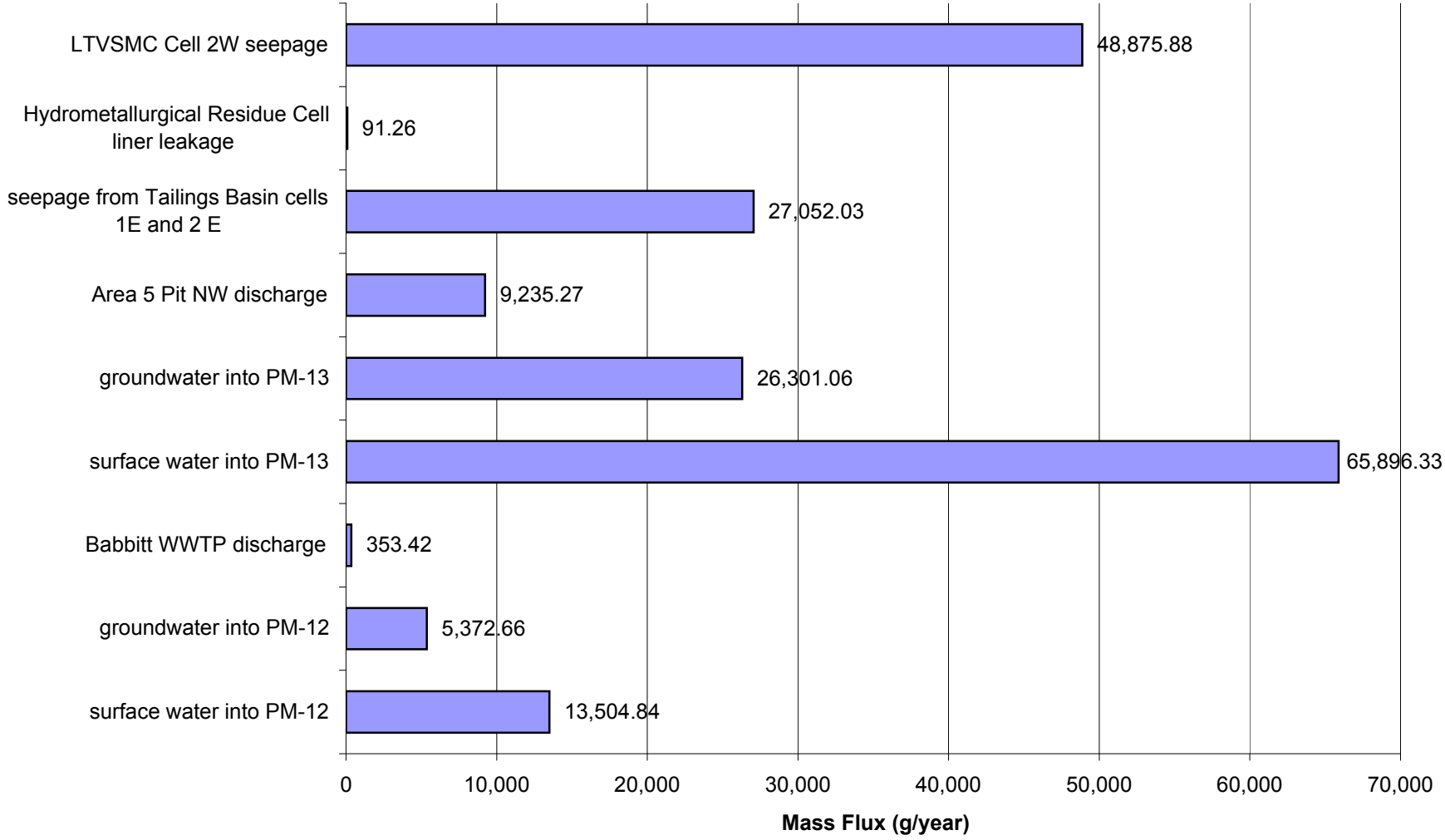
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for Low Flow for Nickel (Ni)



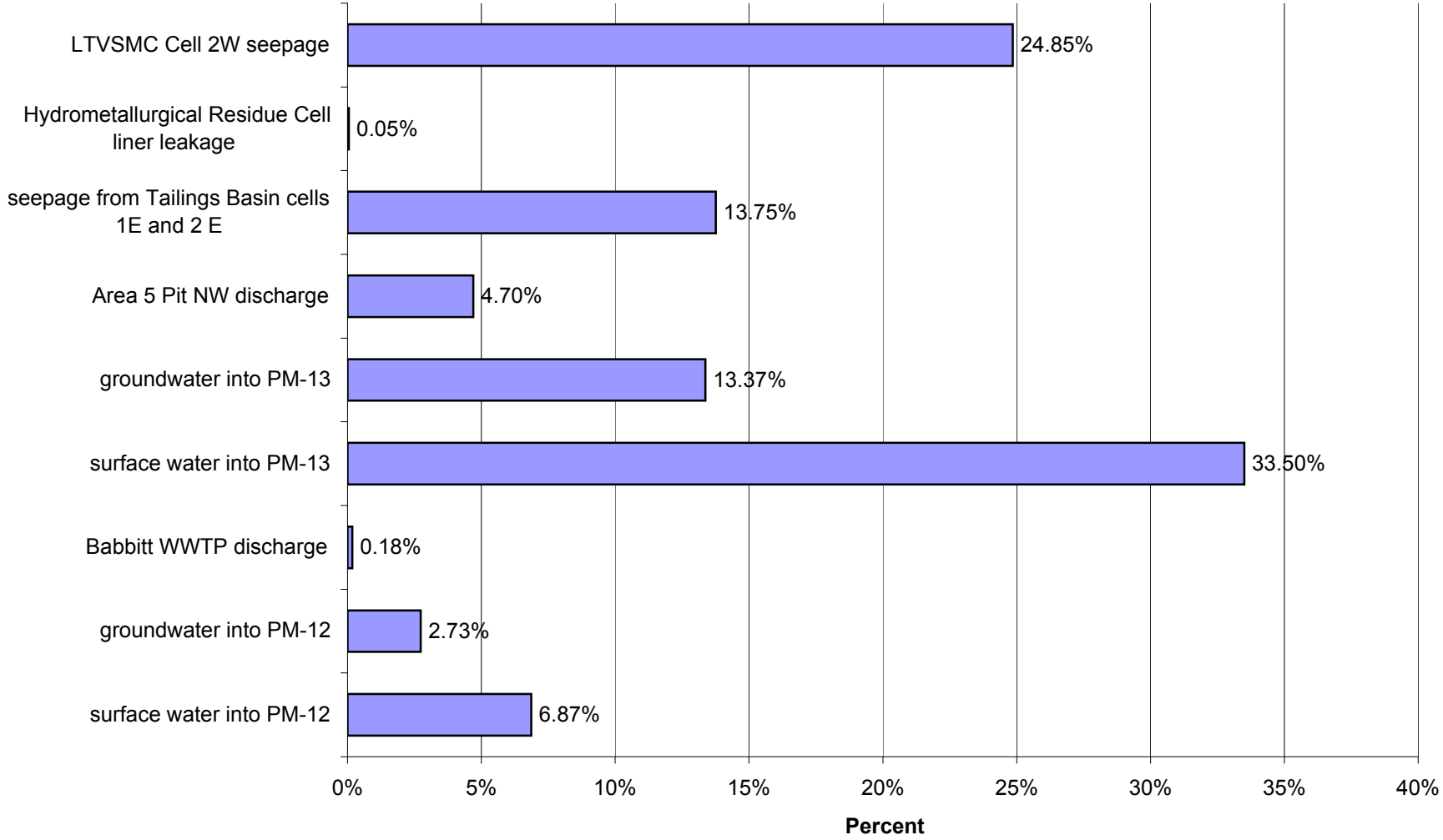
Proposed Action: Percent of Impacts at PM-13 in Year 1 for Low Flow for Nickel (Ni)



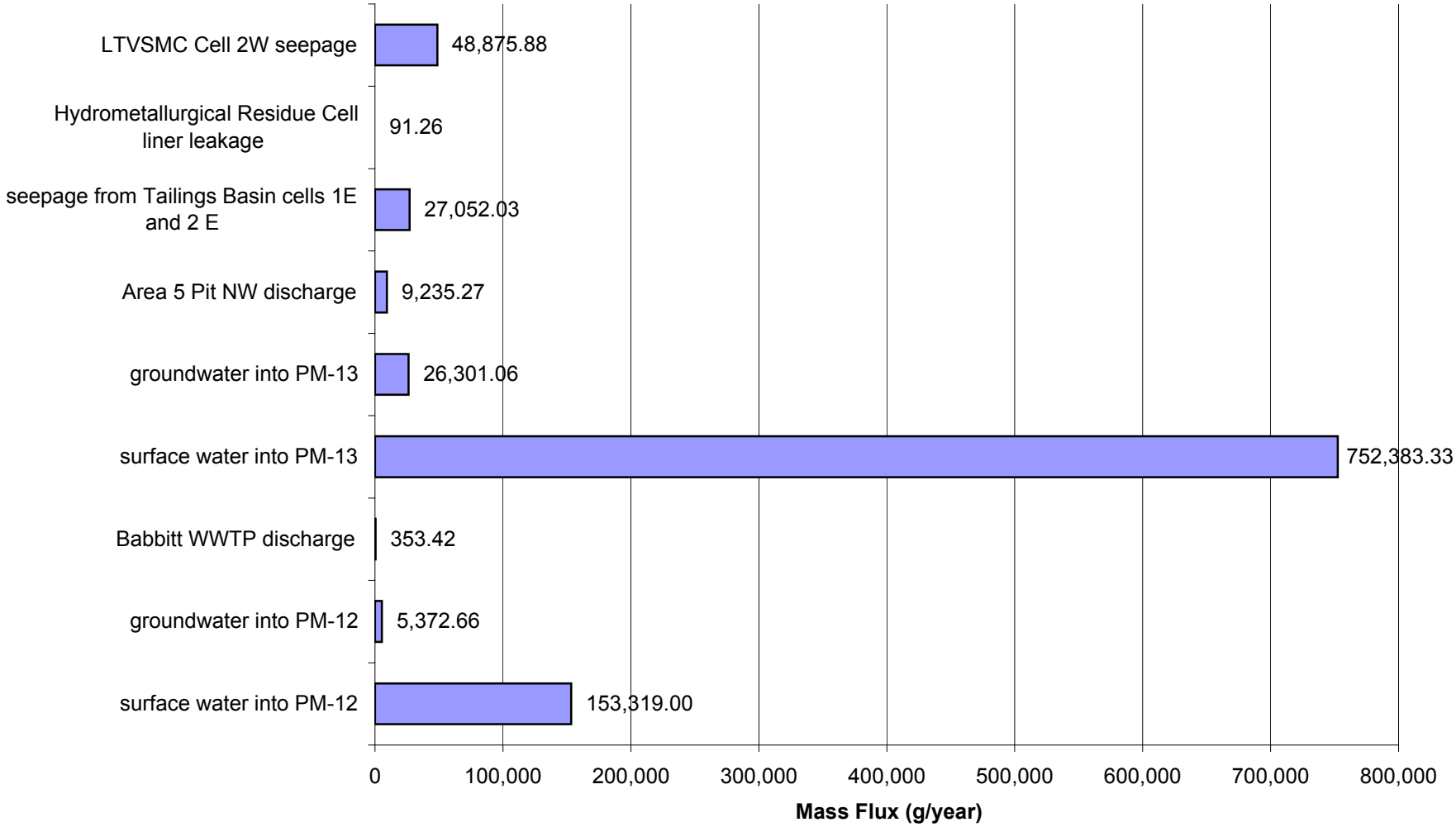
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for Average Flow for Nickel (Ni)



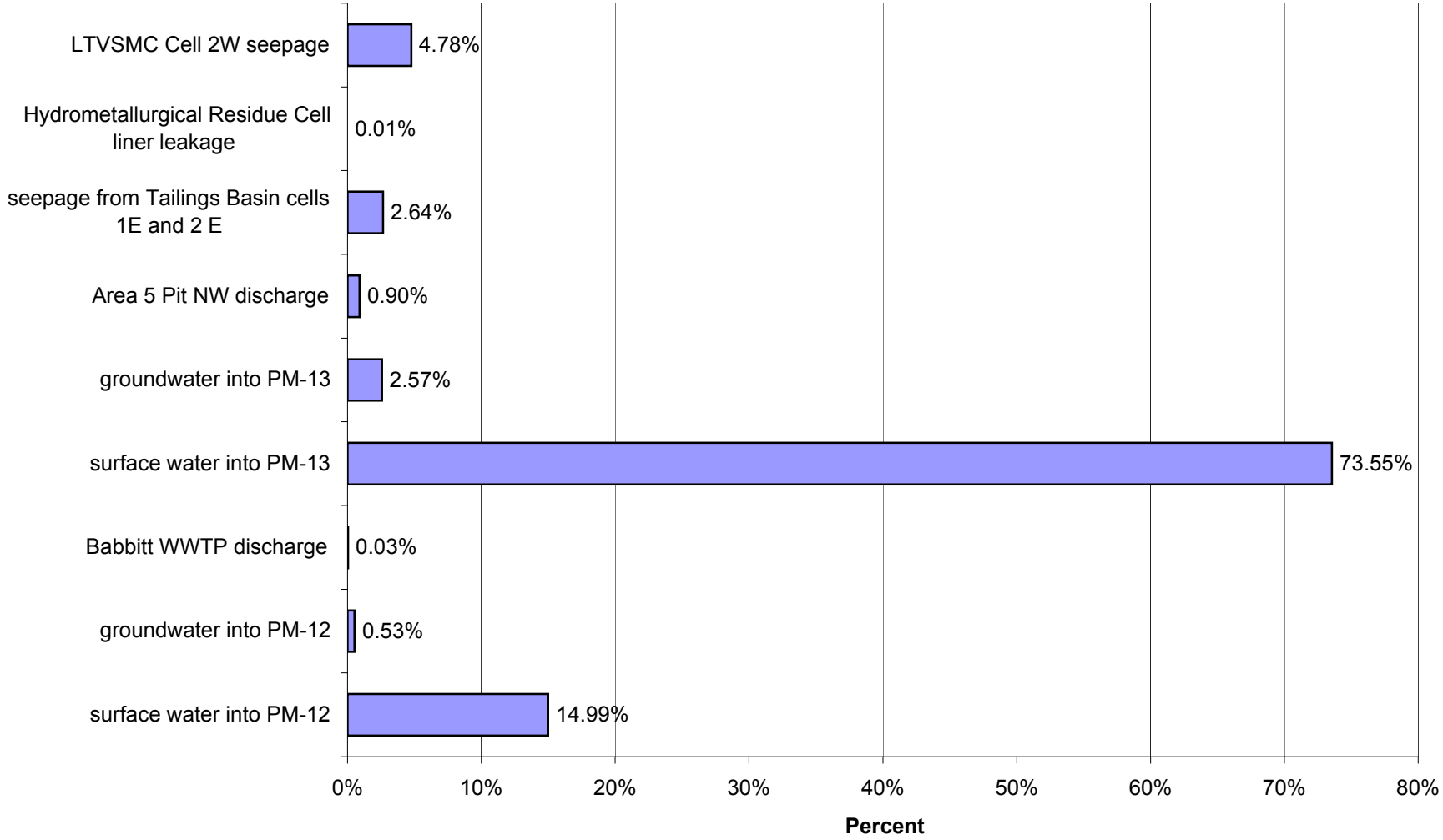
Proposed Action: Percent of Impacts at PM-13 in Year 1 for Average Flow for Nickel (Ni)



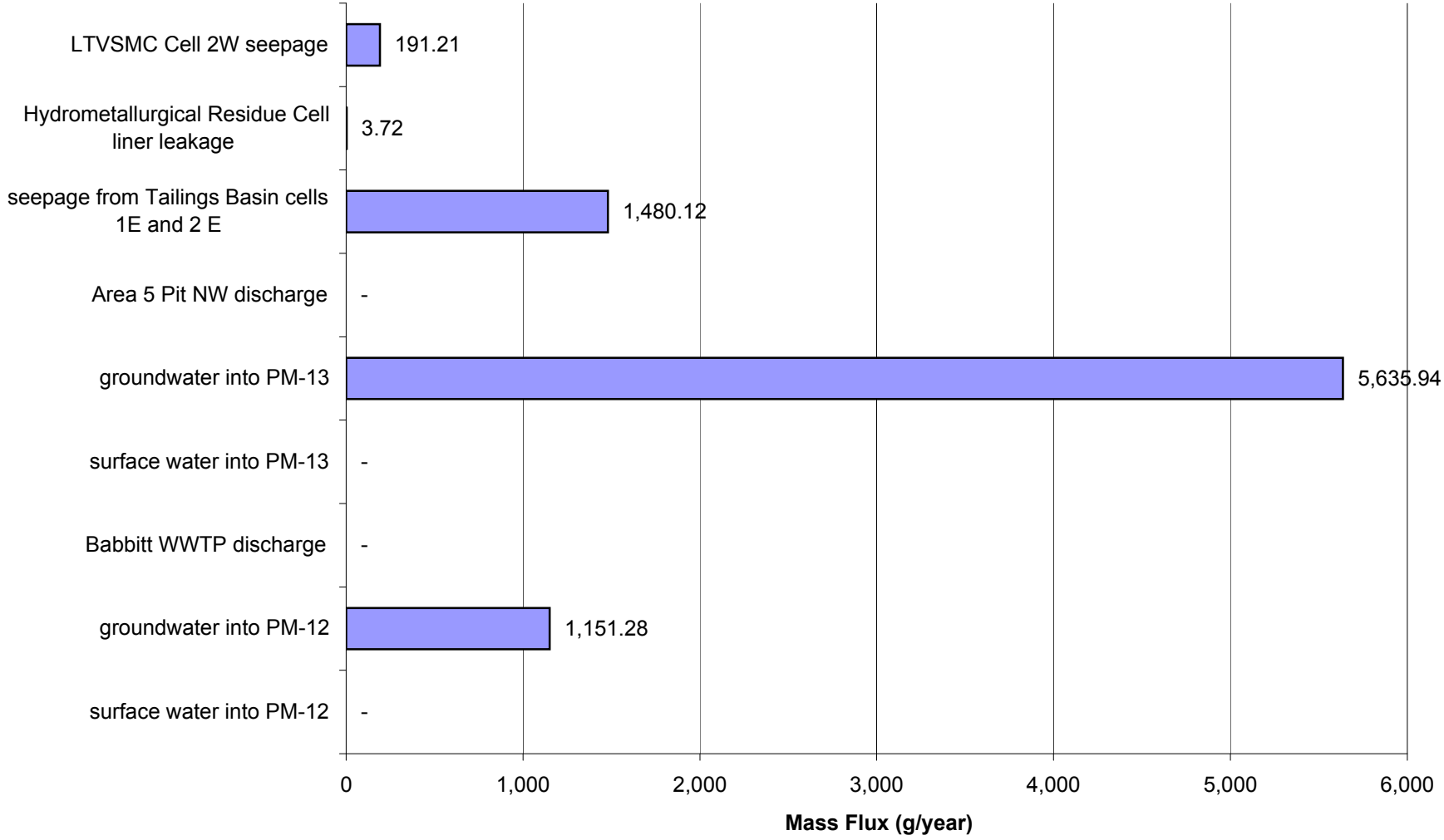
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for High Flow for Nickel (Ni)



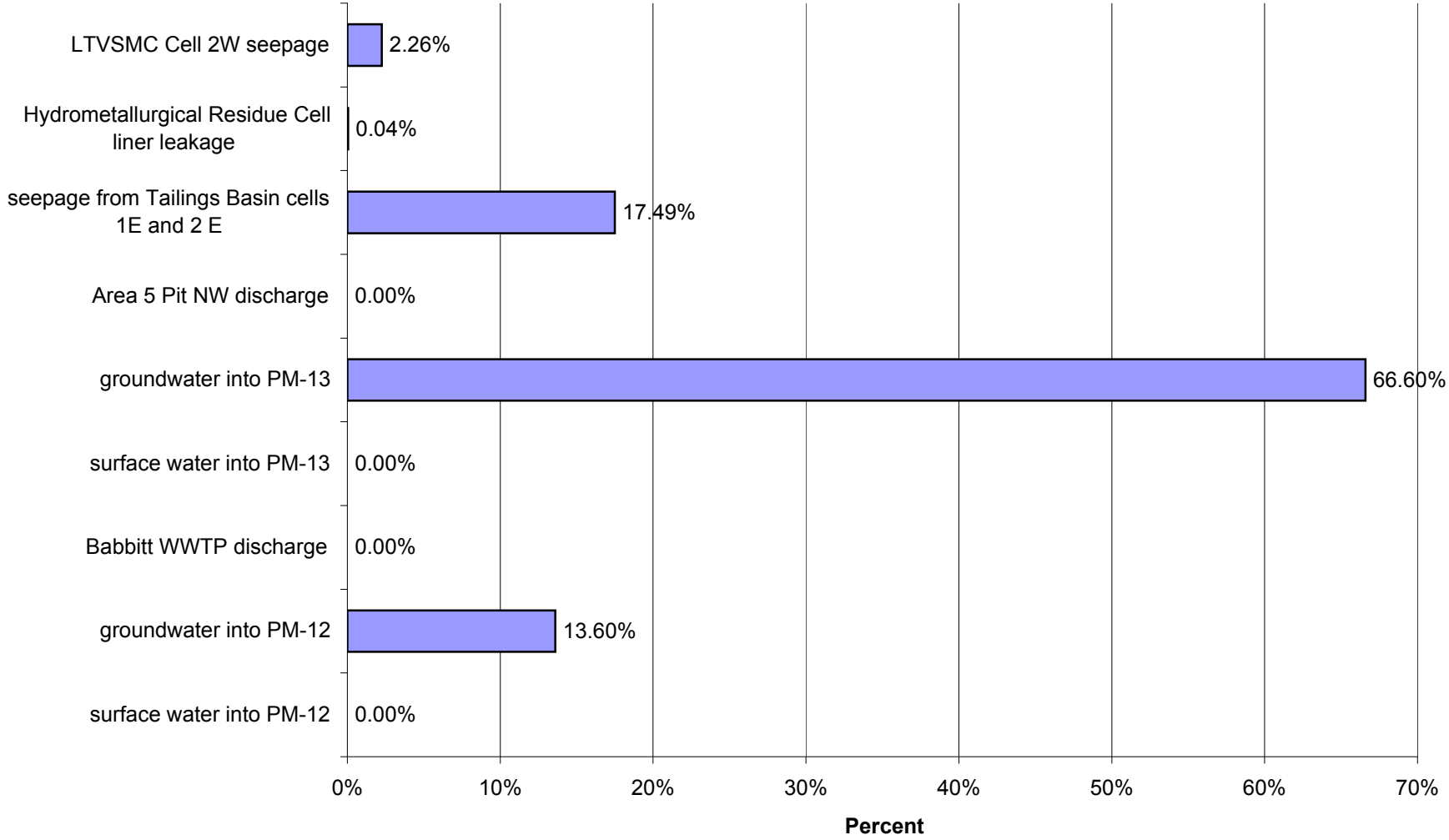
Proposed Action: Percent of Impacts at PM-13 in Year 1 for High Flow for Nickel (Ni)



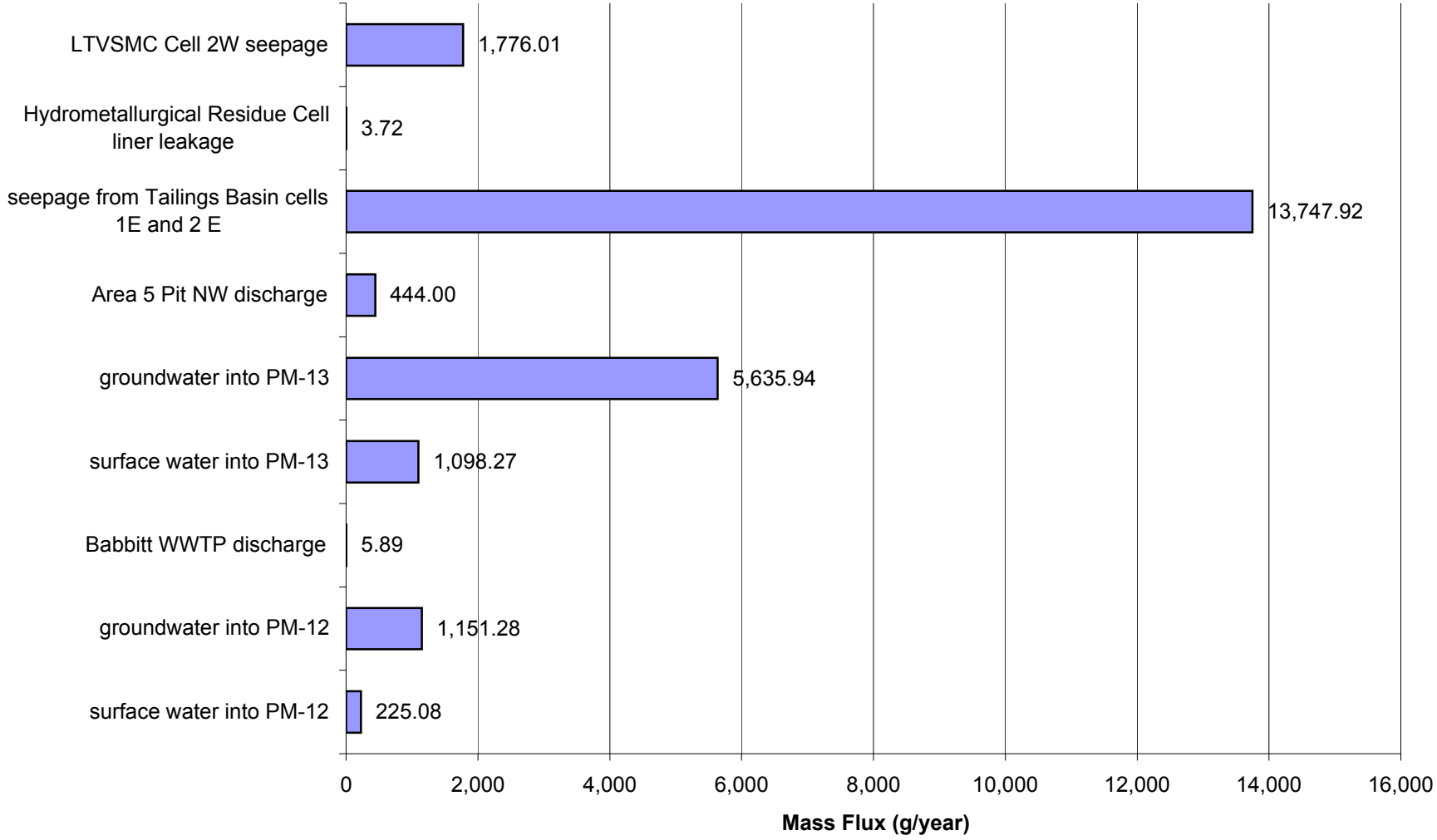
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for Low Flow for Antimony (Sb)



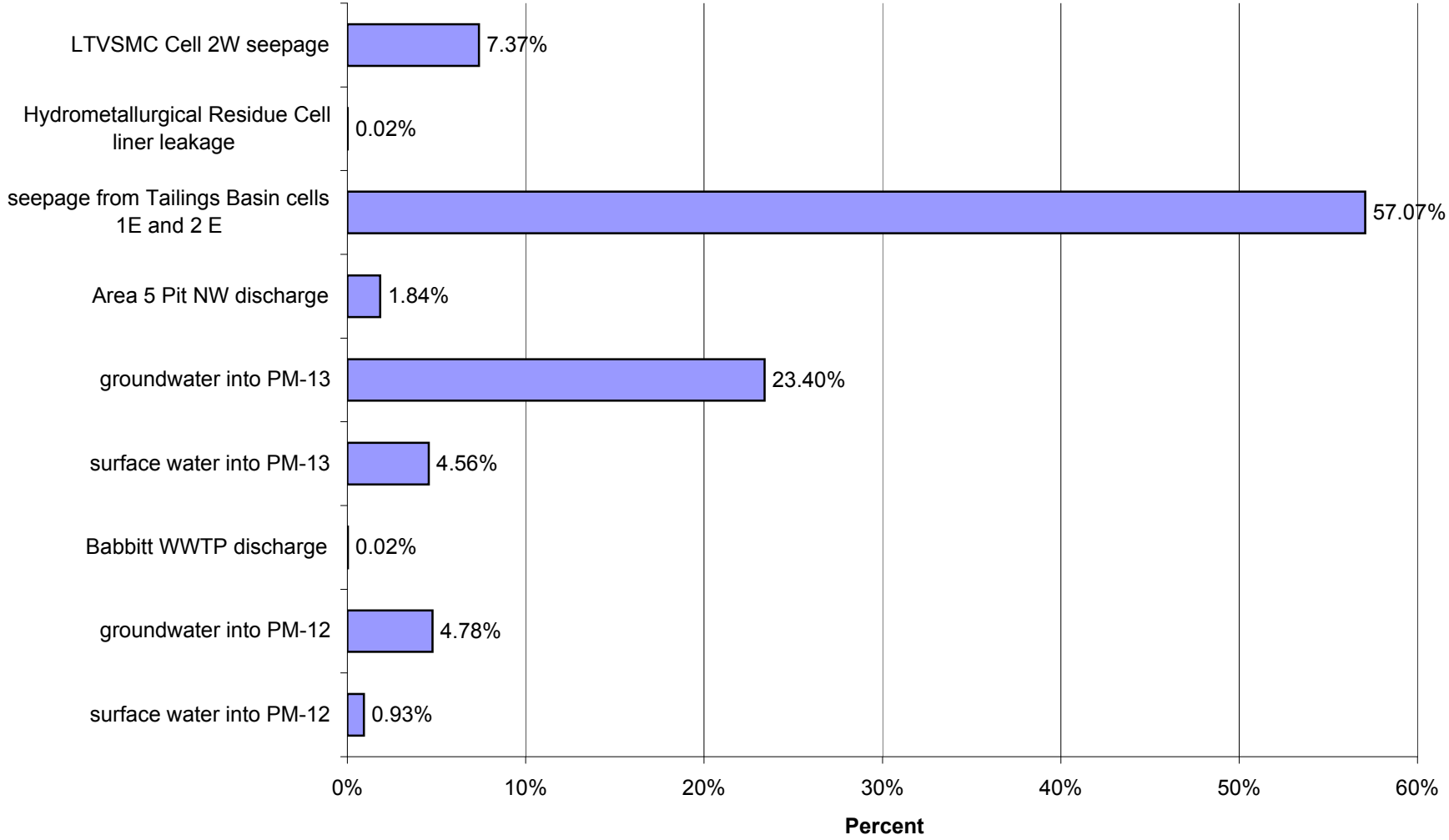
Proposed Action: Percent of Impacts at PM-13 in Year 1 for Low Flow for Antimony (Sb)



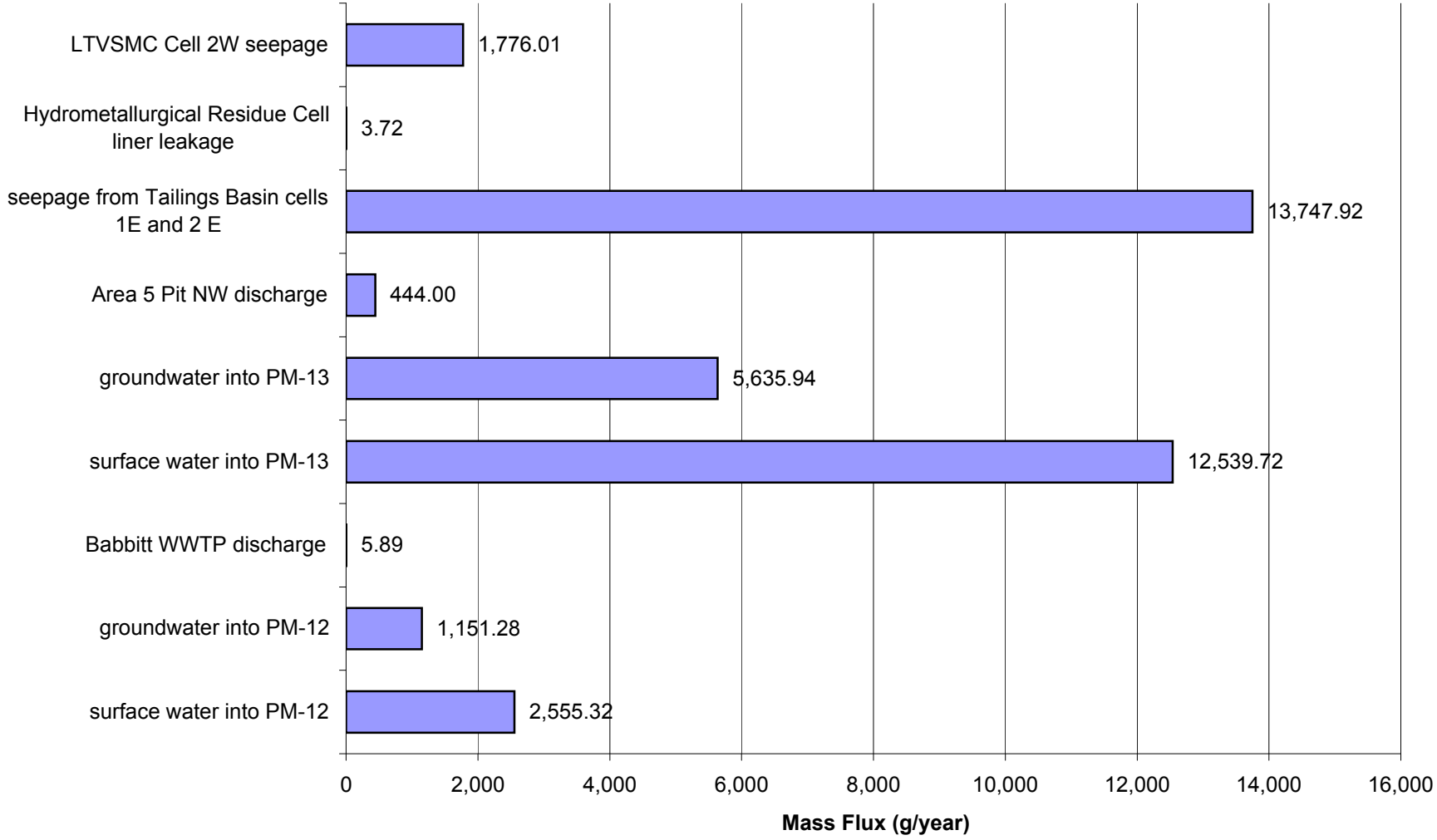
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for Average Flow for Antimony (Sb)



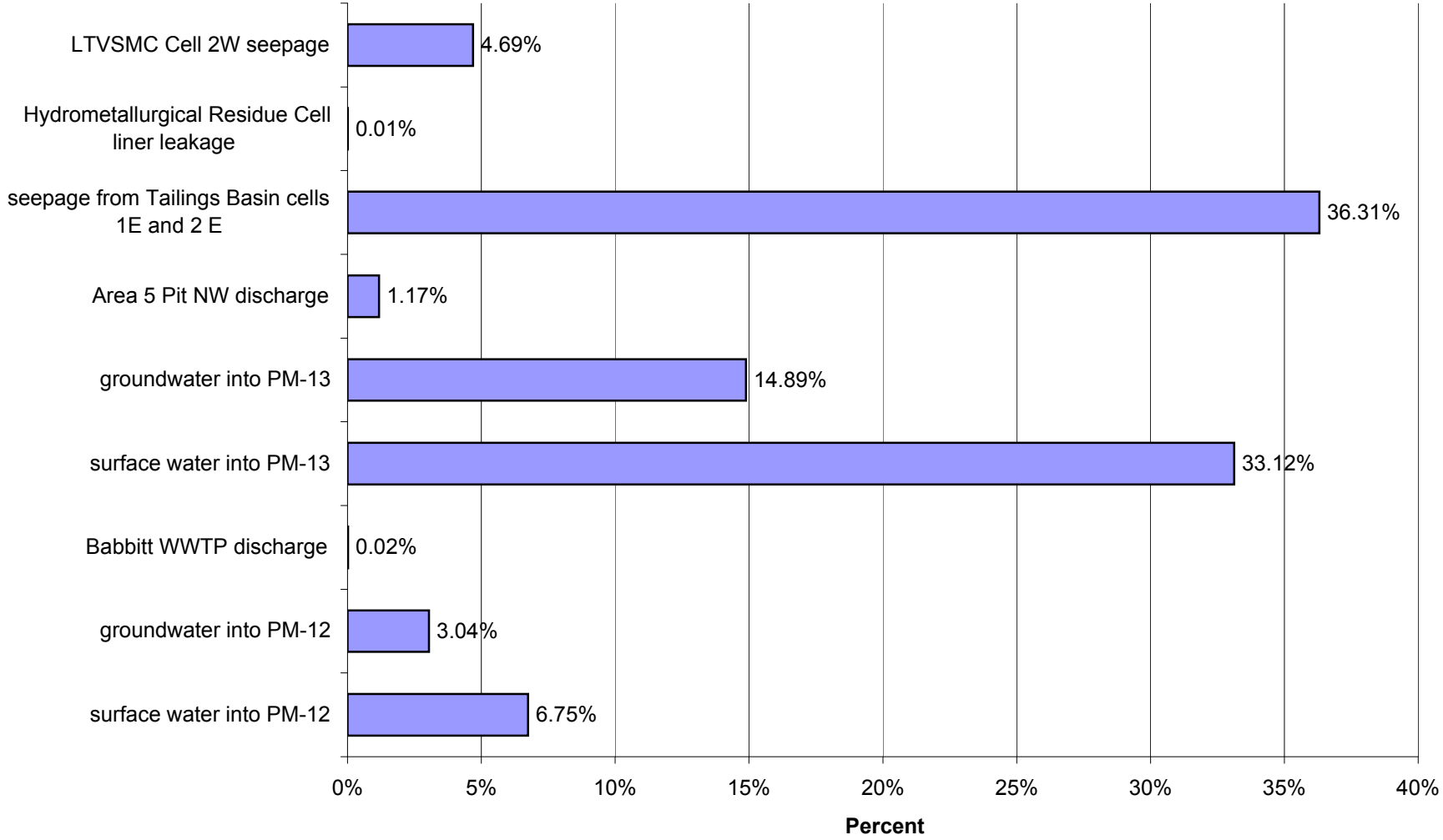
Proposed Action: Percent of Impacts at PM-13 in Year 1 for Average Flow for Antimony (Sb)



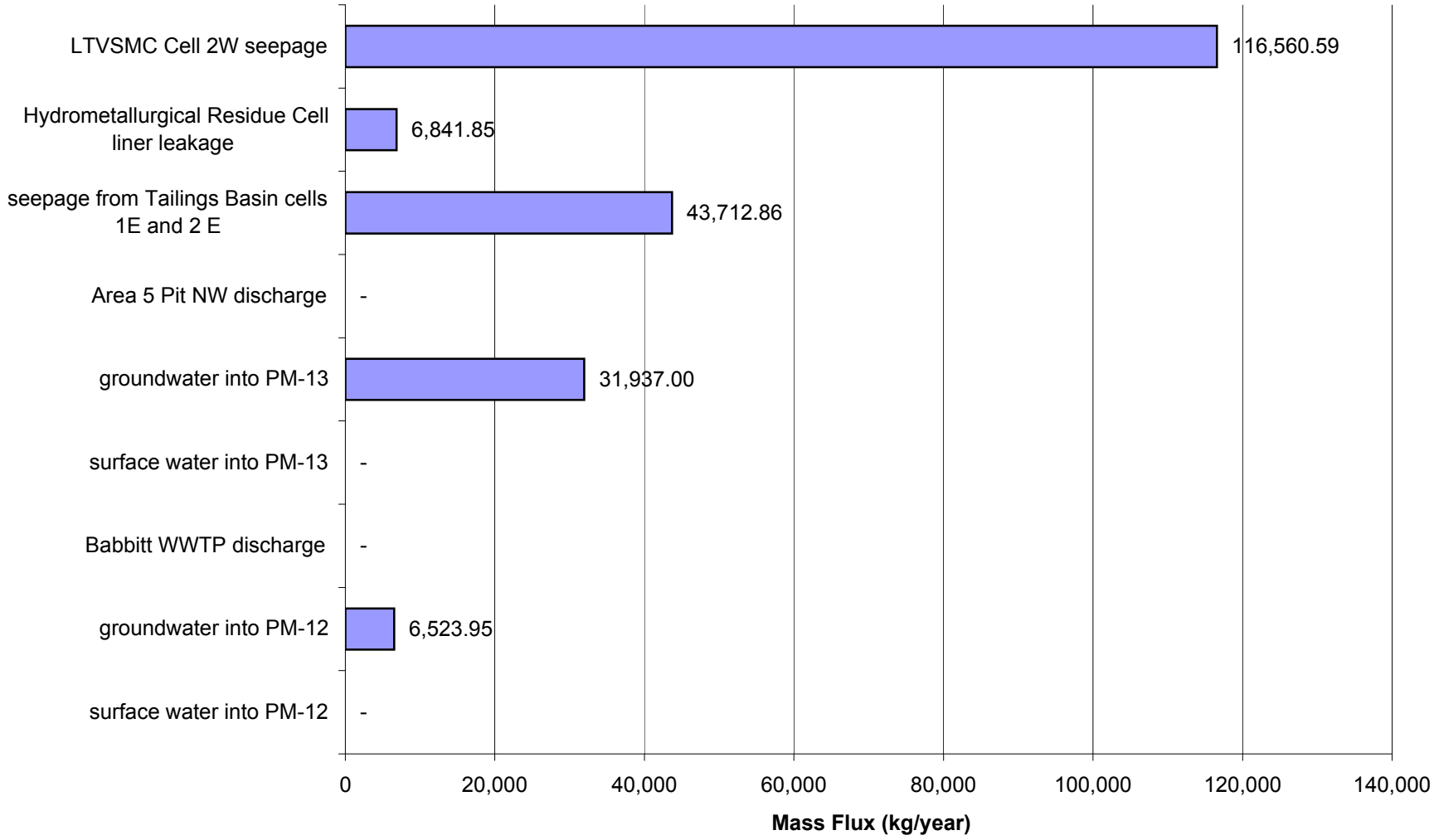
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for High Flow for Antimony (Sb)



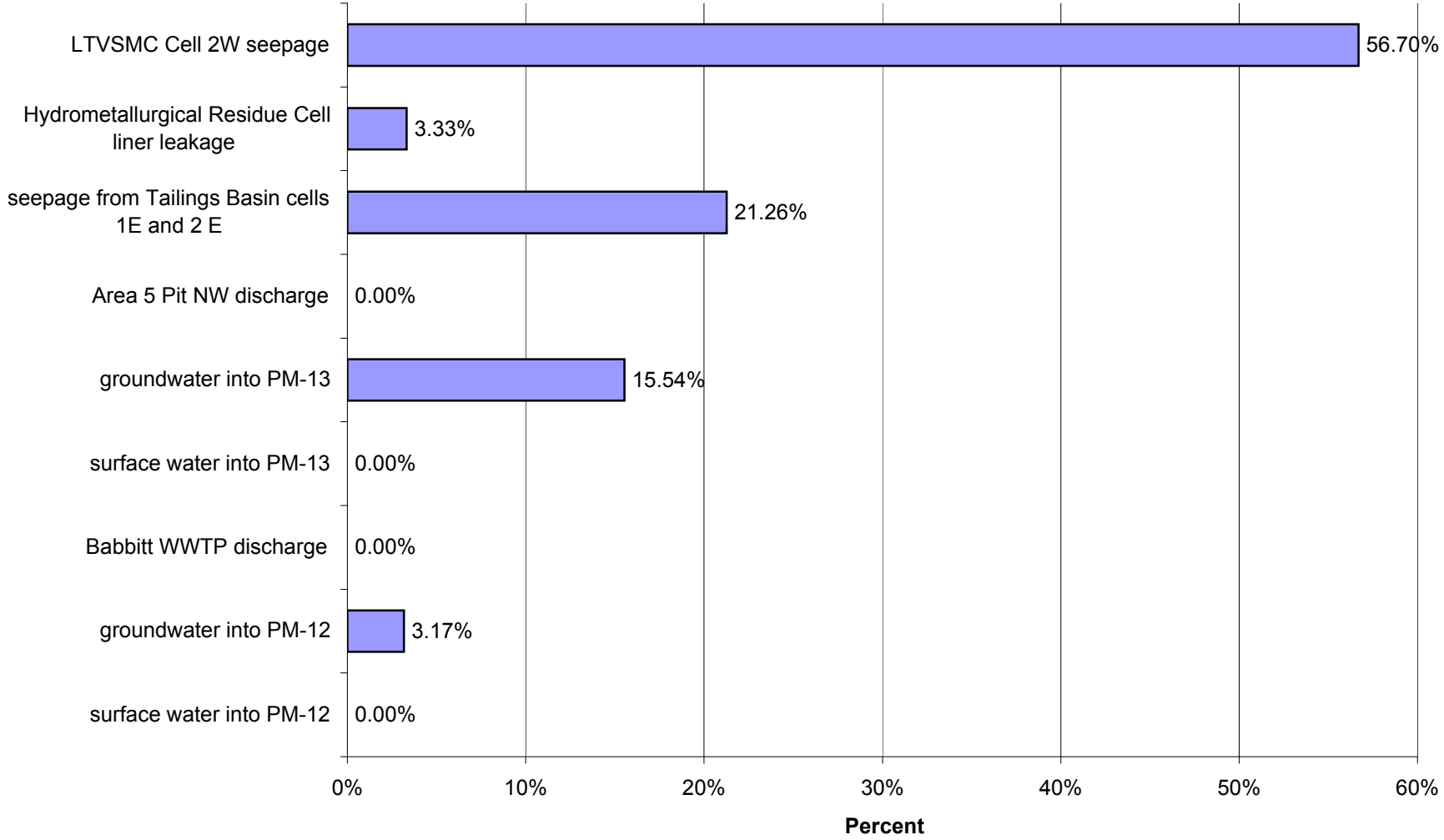
Proposed Action: Percent of Impacts at PM-13 in Year 1 for High Flow for Antimony (Sb)



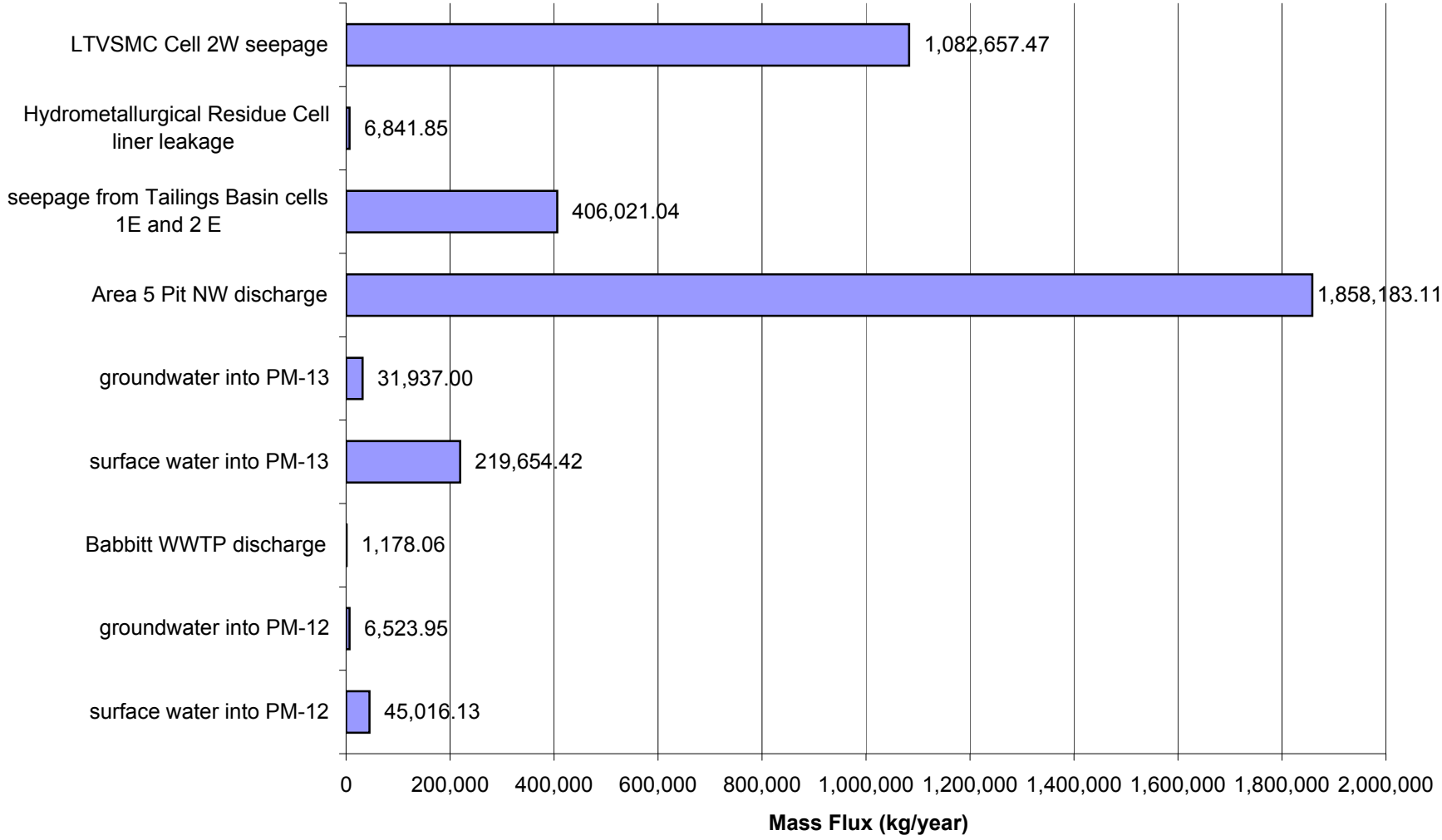
Proposed Action: Mass Flux (kg/year) of Impacts at PM-13 in Year 1 for Low Flow for Sulfate (SO_4)



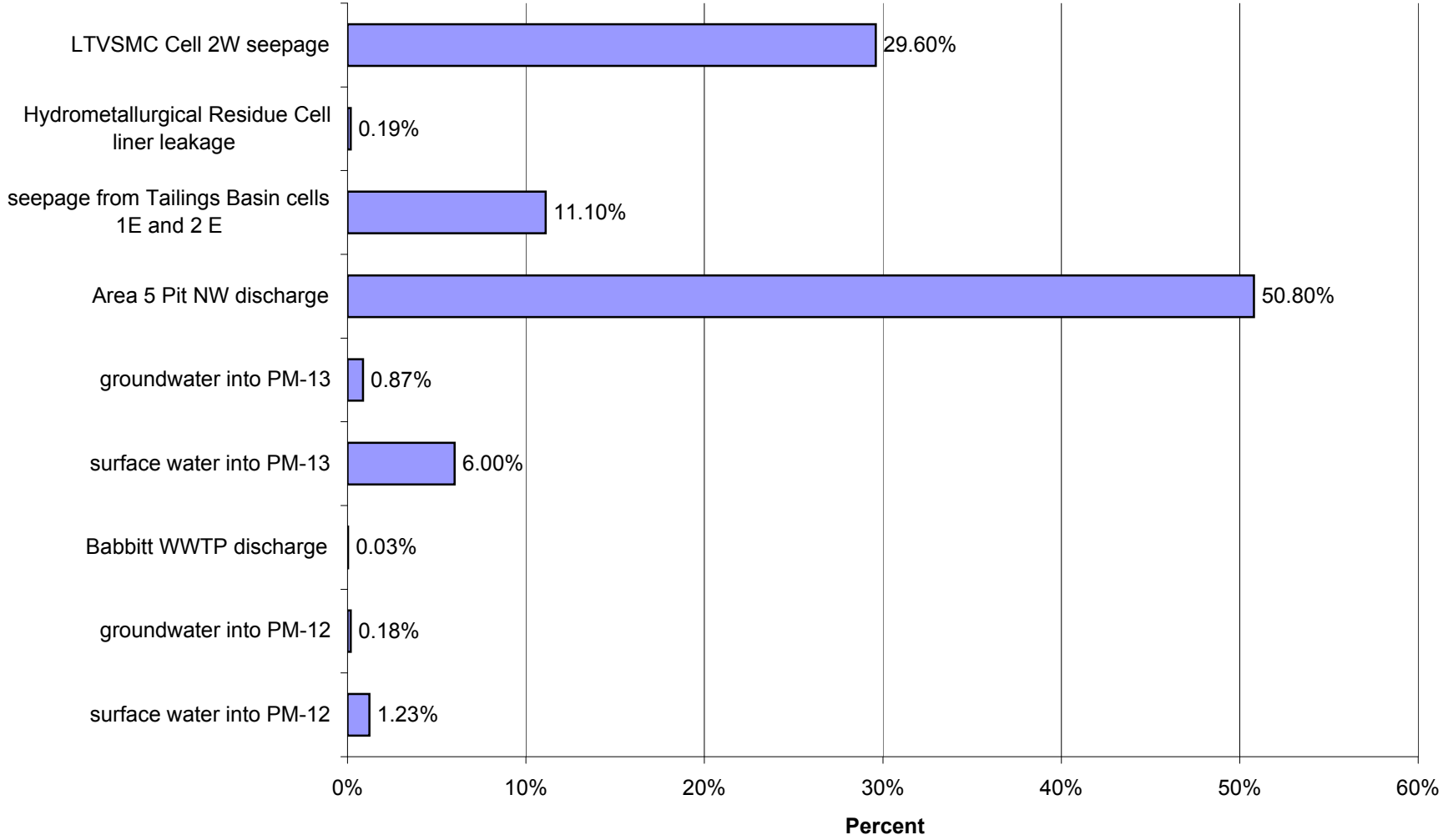
Proposed Action: Percent of Impacts at PM-13 in Year 1 for Low Flow for Sulfate (SO_4)



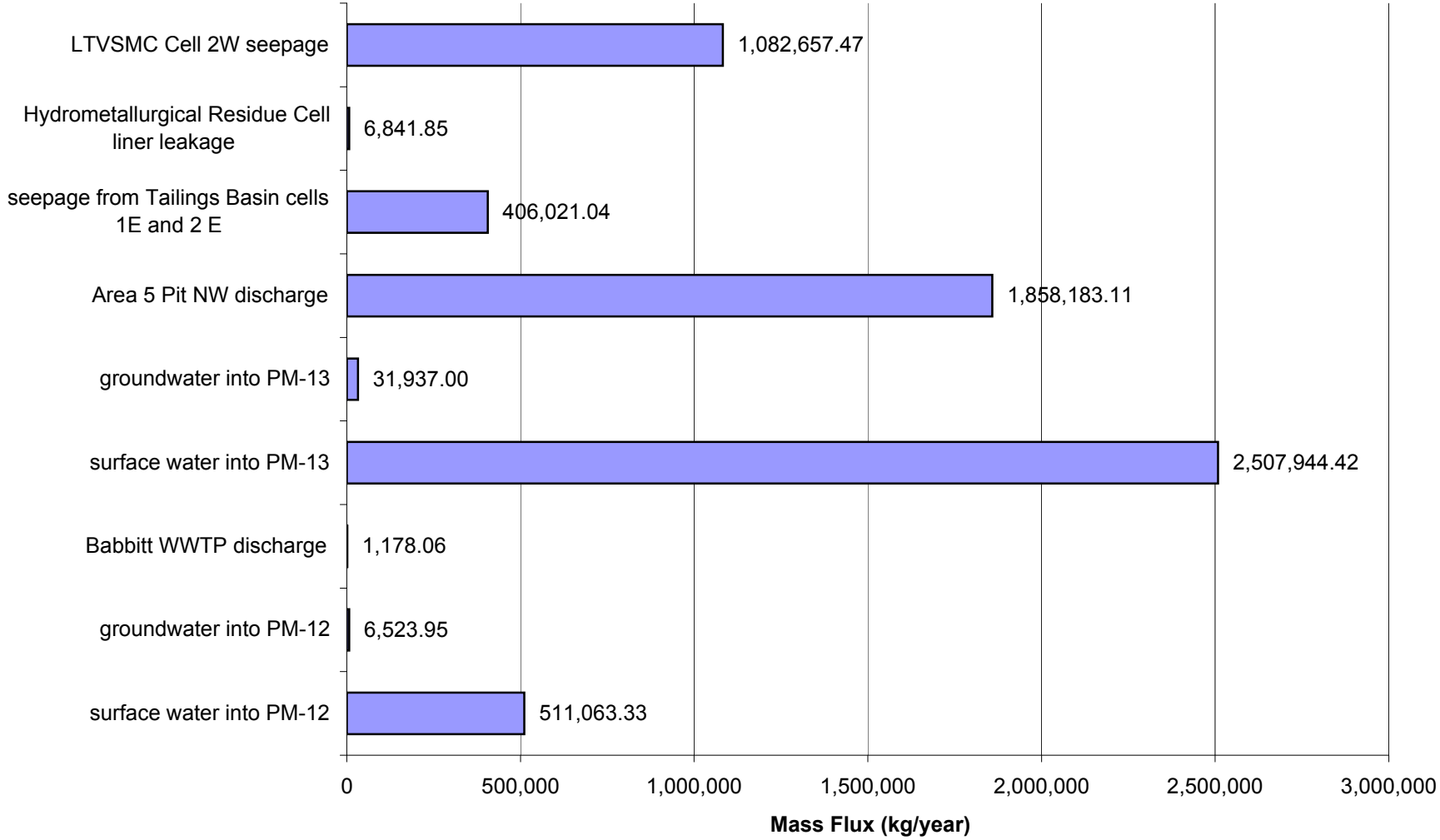
Proposed Action: Mass Flux (kg/year) of Impacts at PM-13 in Year 1 for Average Flow for Sulfate (SO_4)



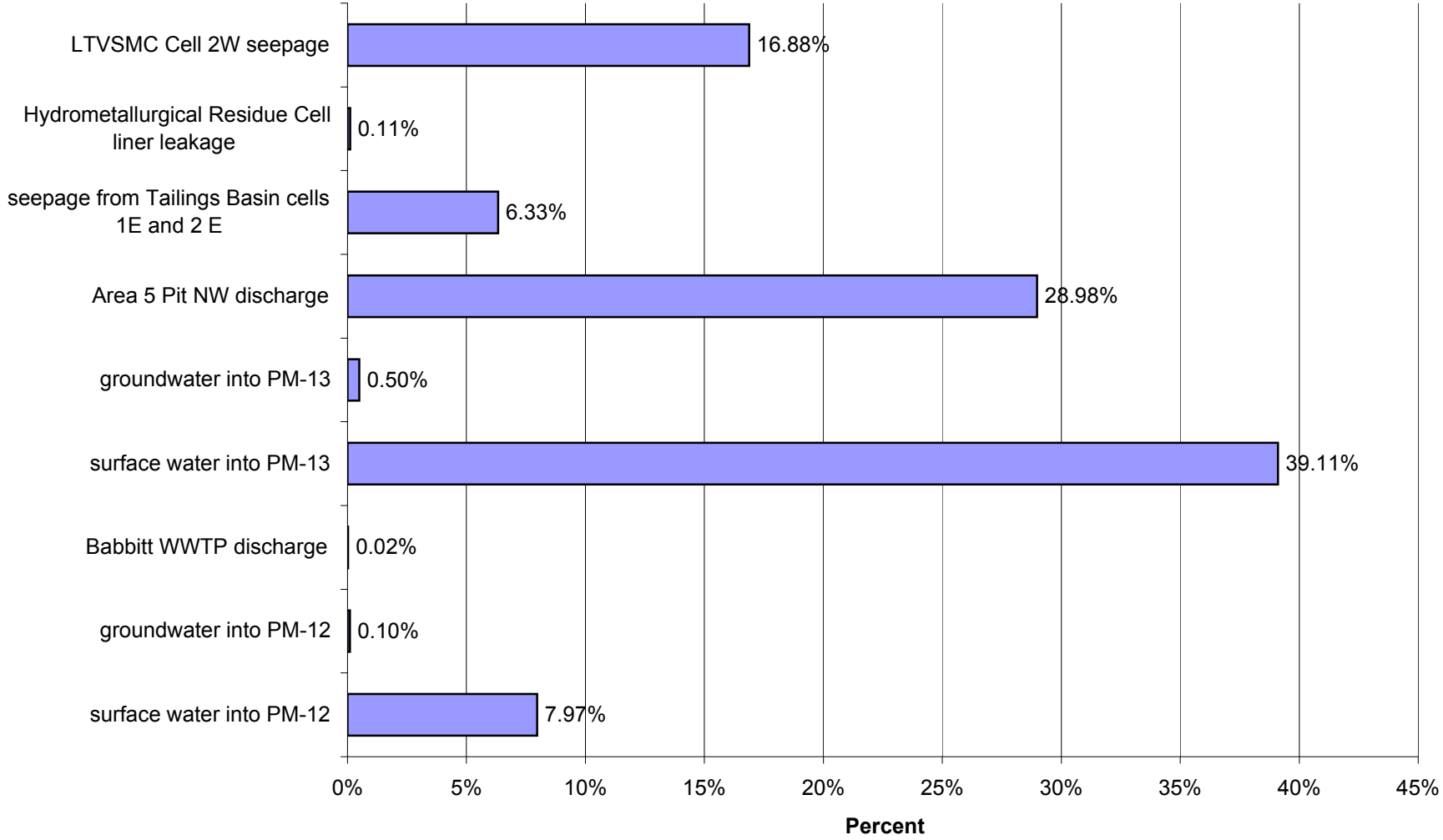
Proposed Action: Percent of Impacts at PM-13 in Year 1 for Average Flow for Sulfate (SO_4)



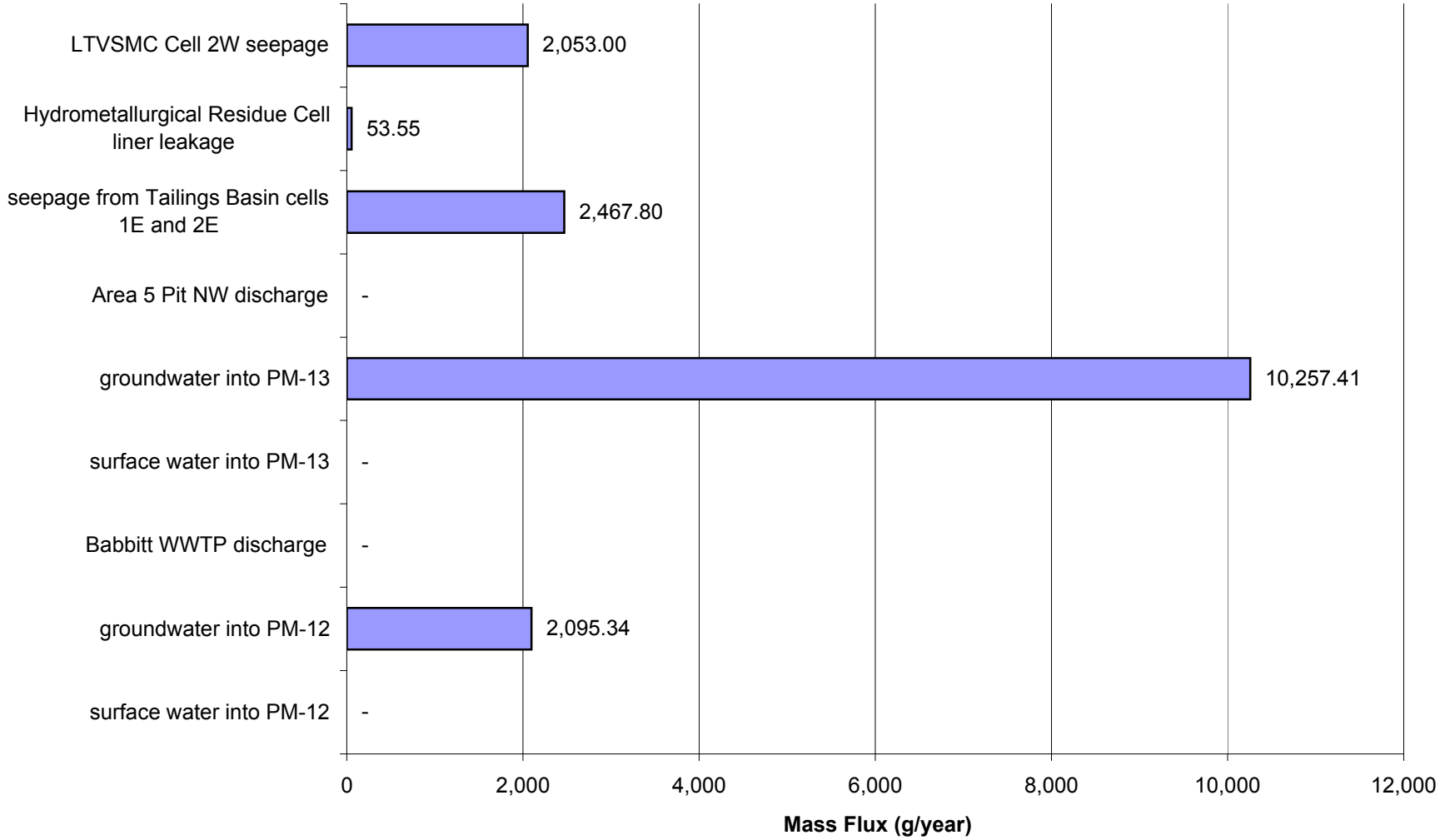
Proposed Action: Mass Flux (kg/year) of Impacts at PM-13 in Year 1 for High Flow for Sulfate (SO_4)



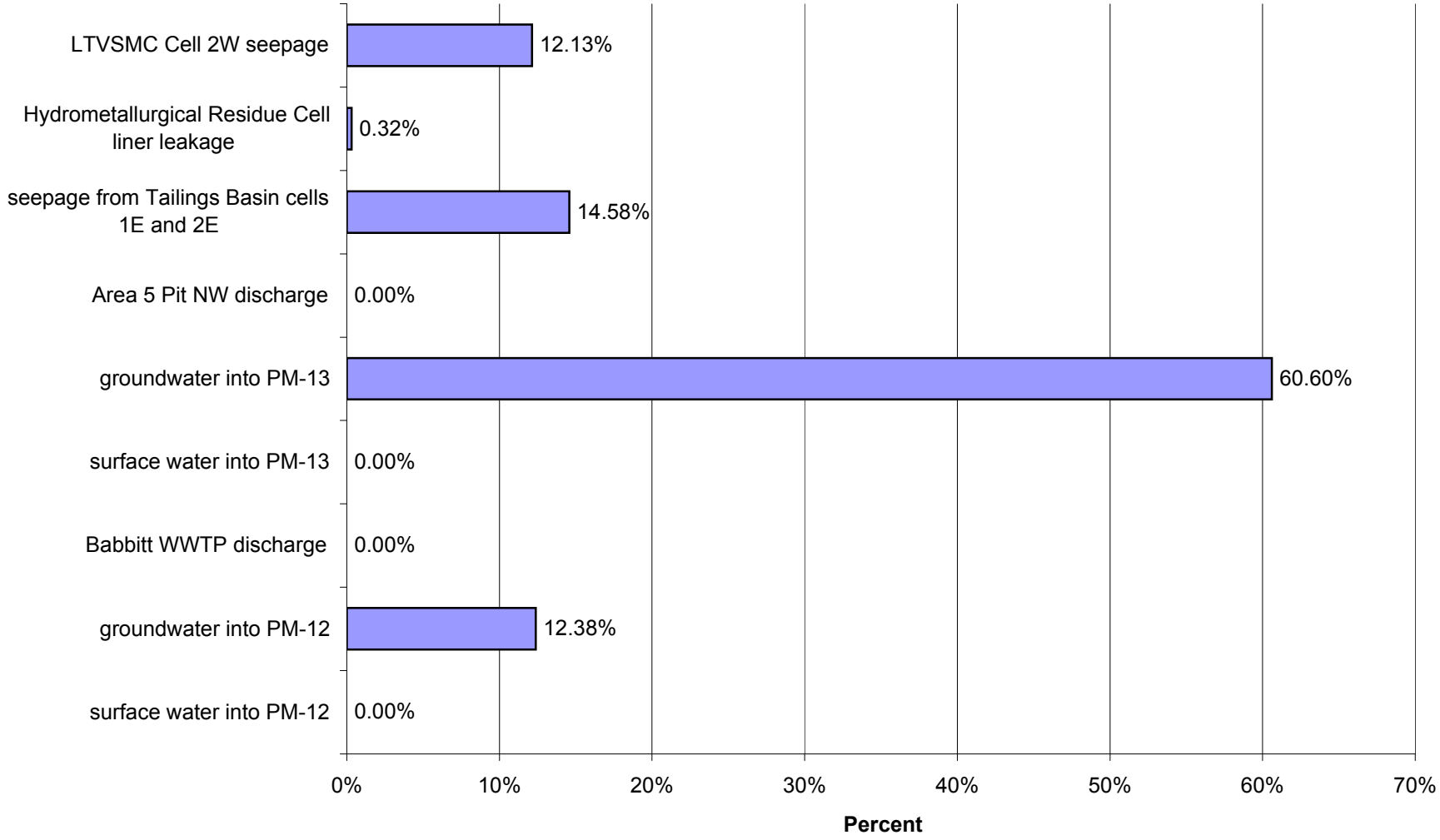
Proposed Action: Percent of Impacts at PM-13 in Year 1 for High Flow for Sulfate (SO_4)



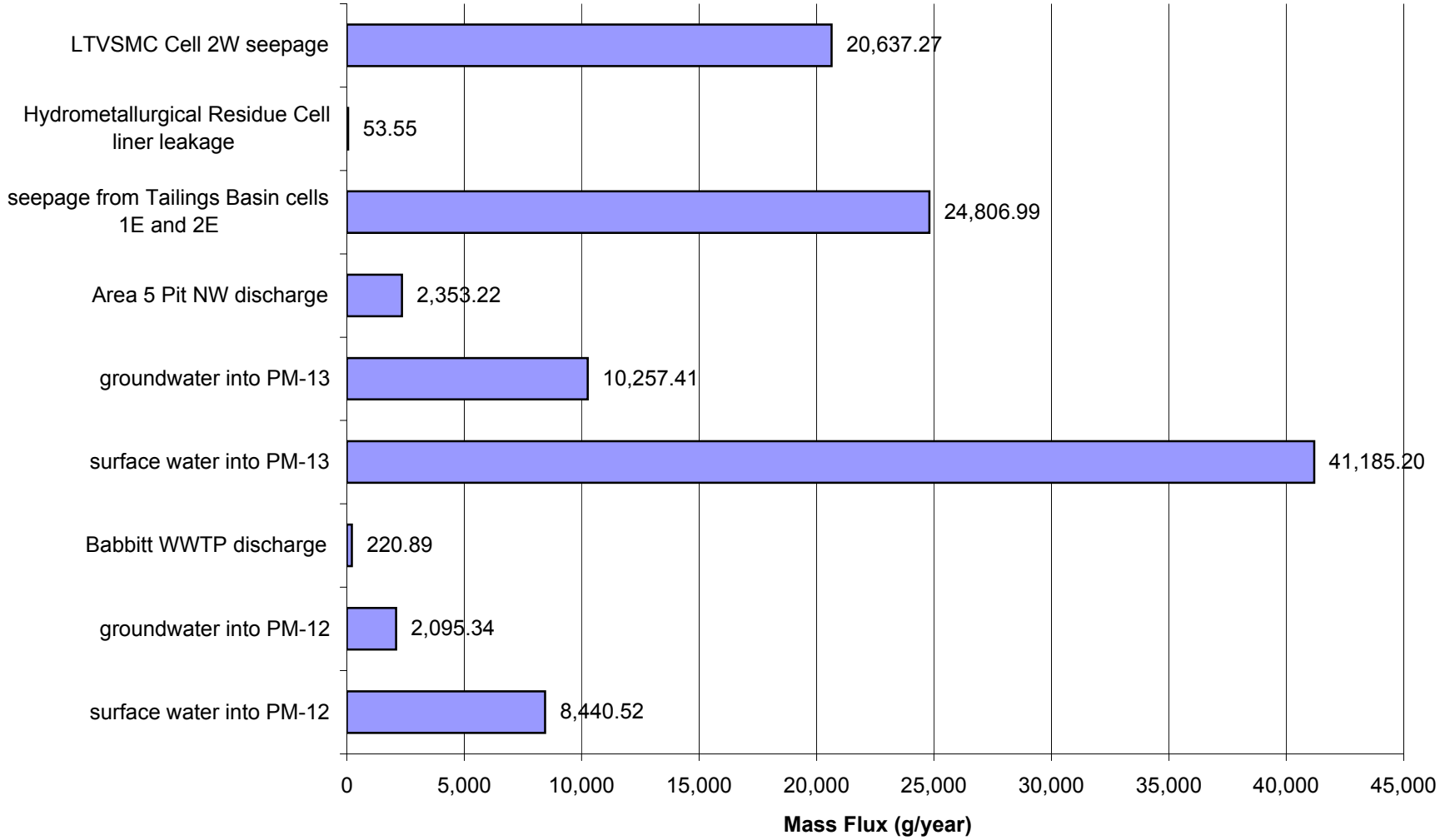
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for Low Flow for Arsenic (As)



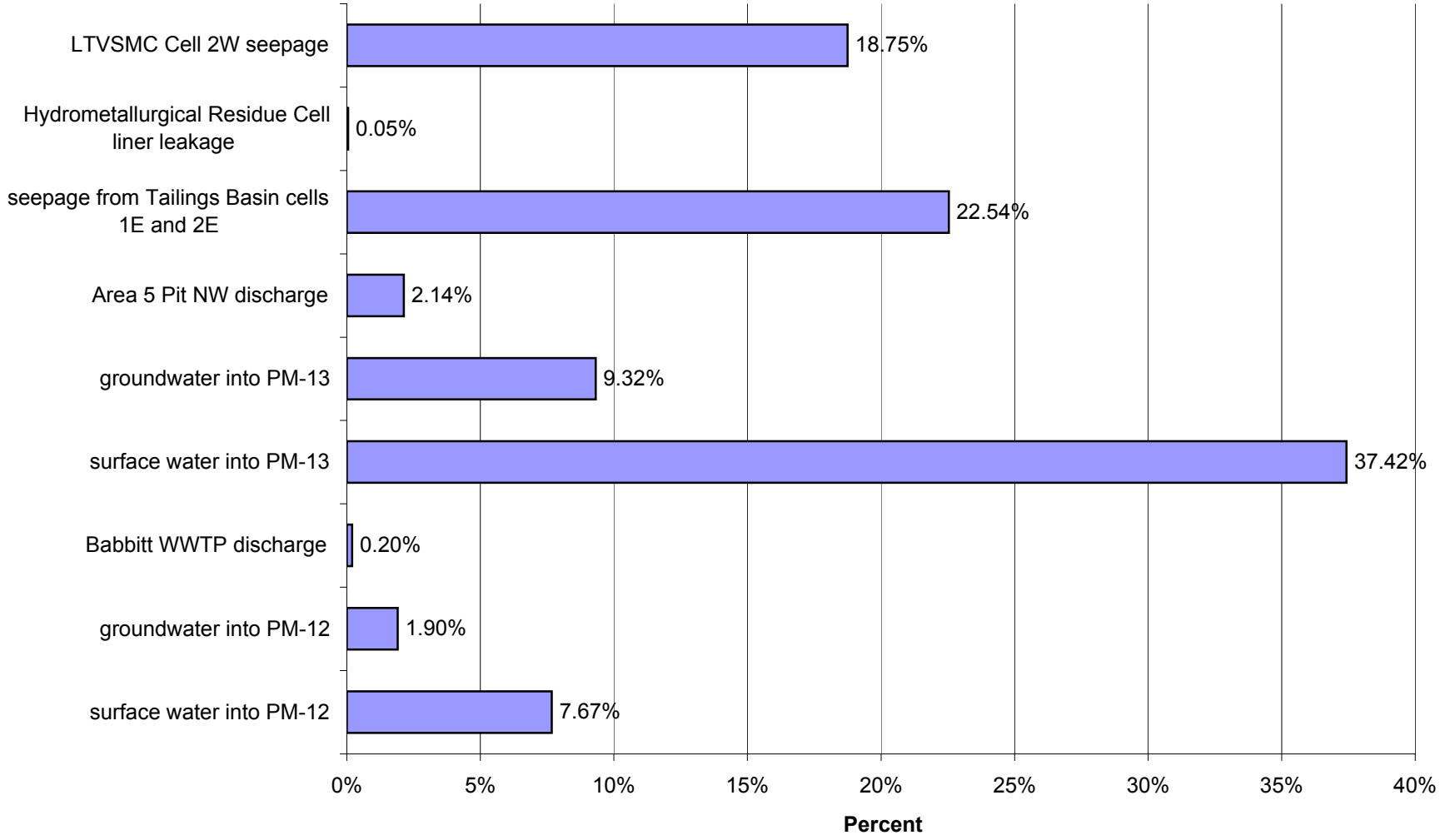
Proposed Action: Percent of Impacts at PM-13 in Year 5 for Low Flow for Arsenic (As)



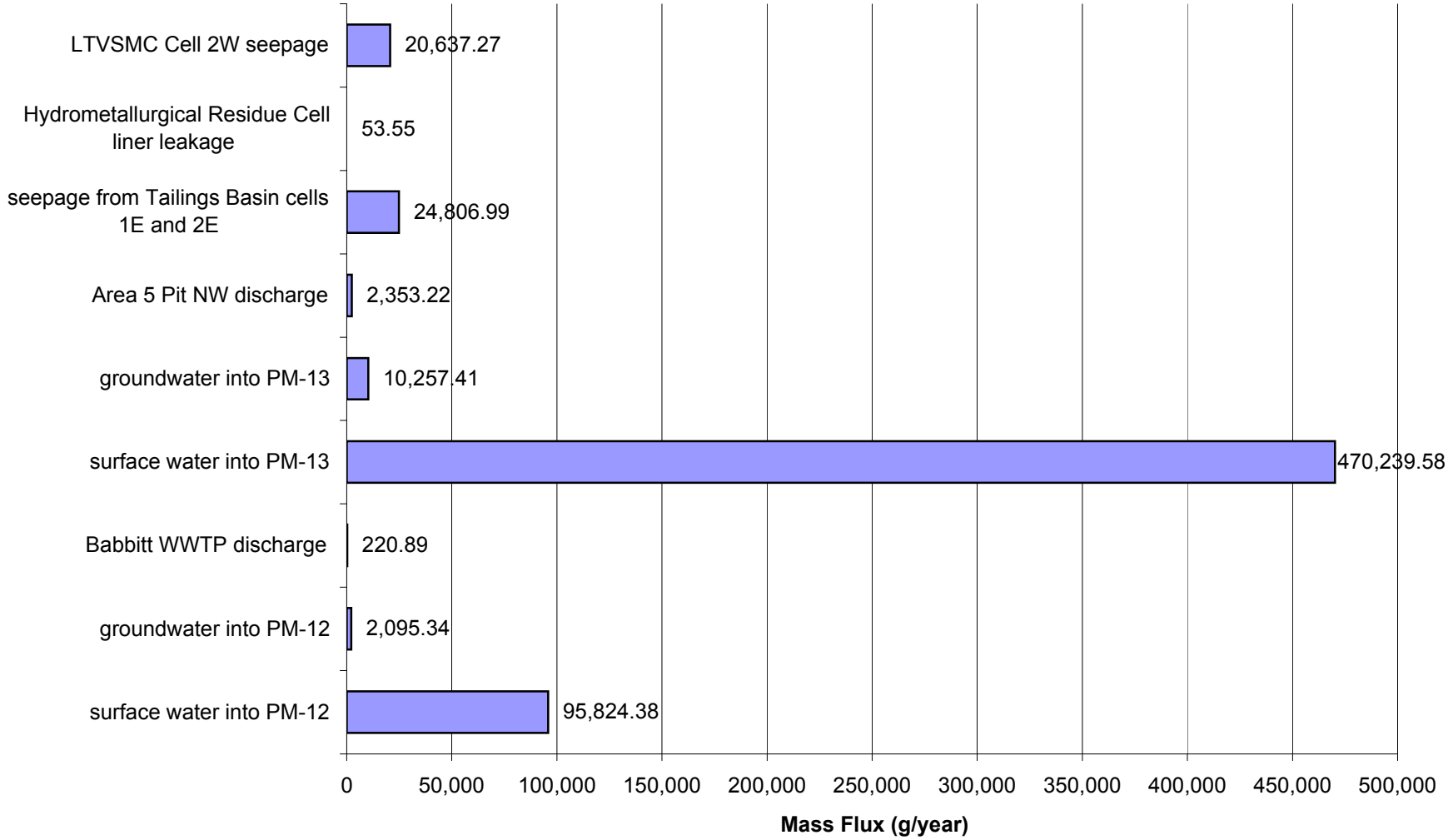
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for Average Flow for Arsenic (As)



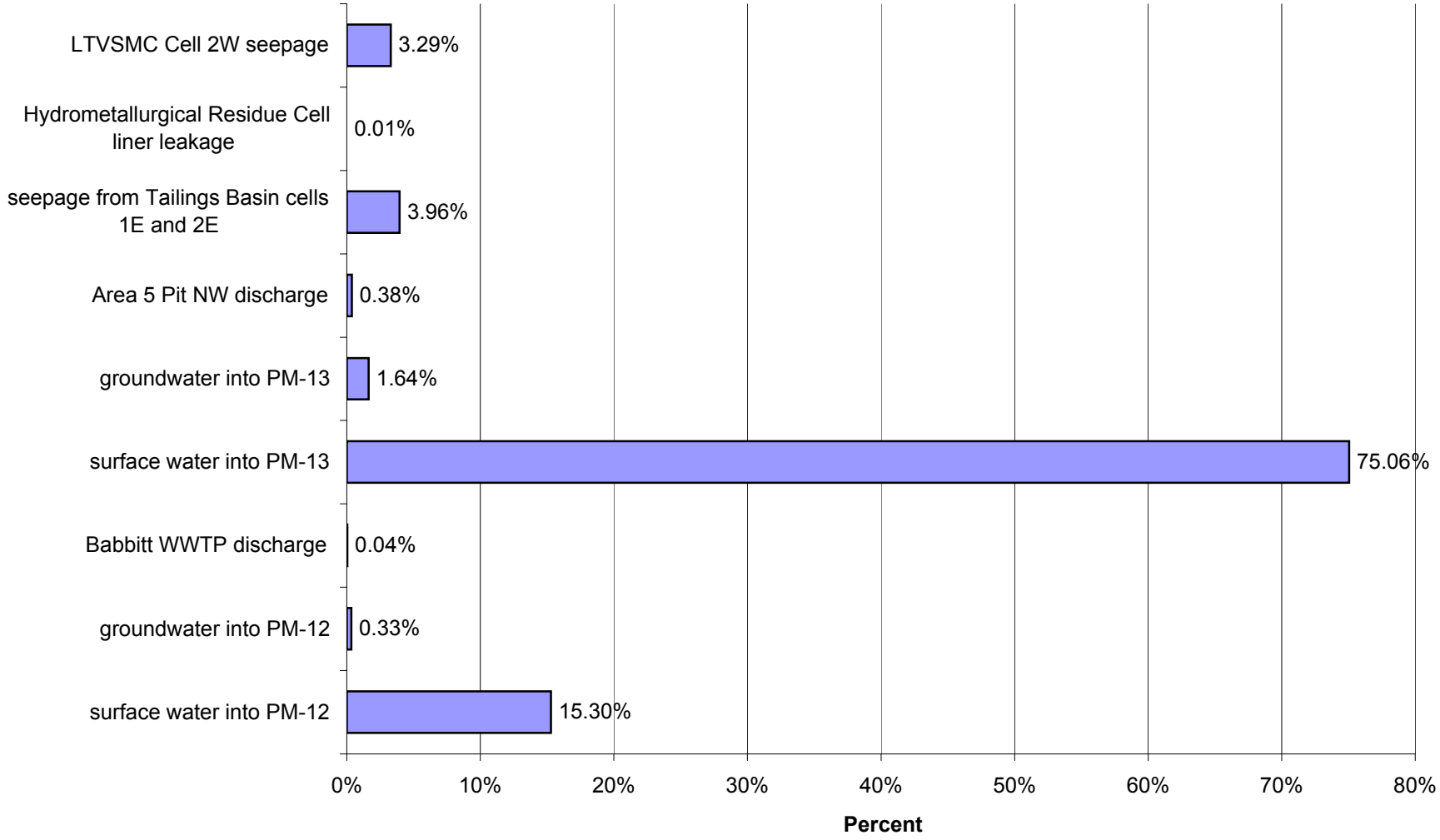
Proposed Action: Percent of Impacts at PM-13 in Year 5 for Average Flow for Arsenic (As)



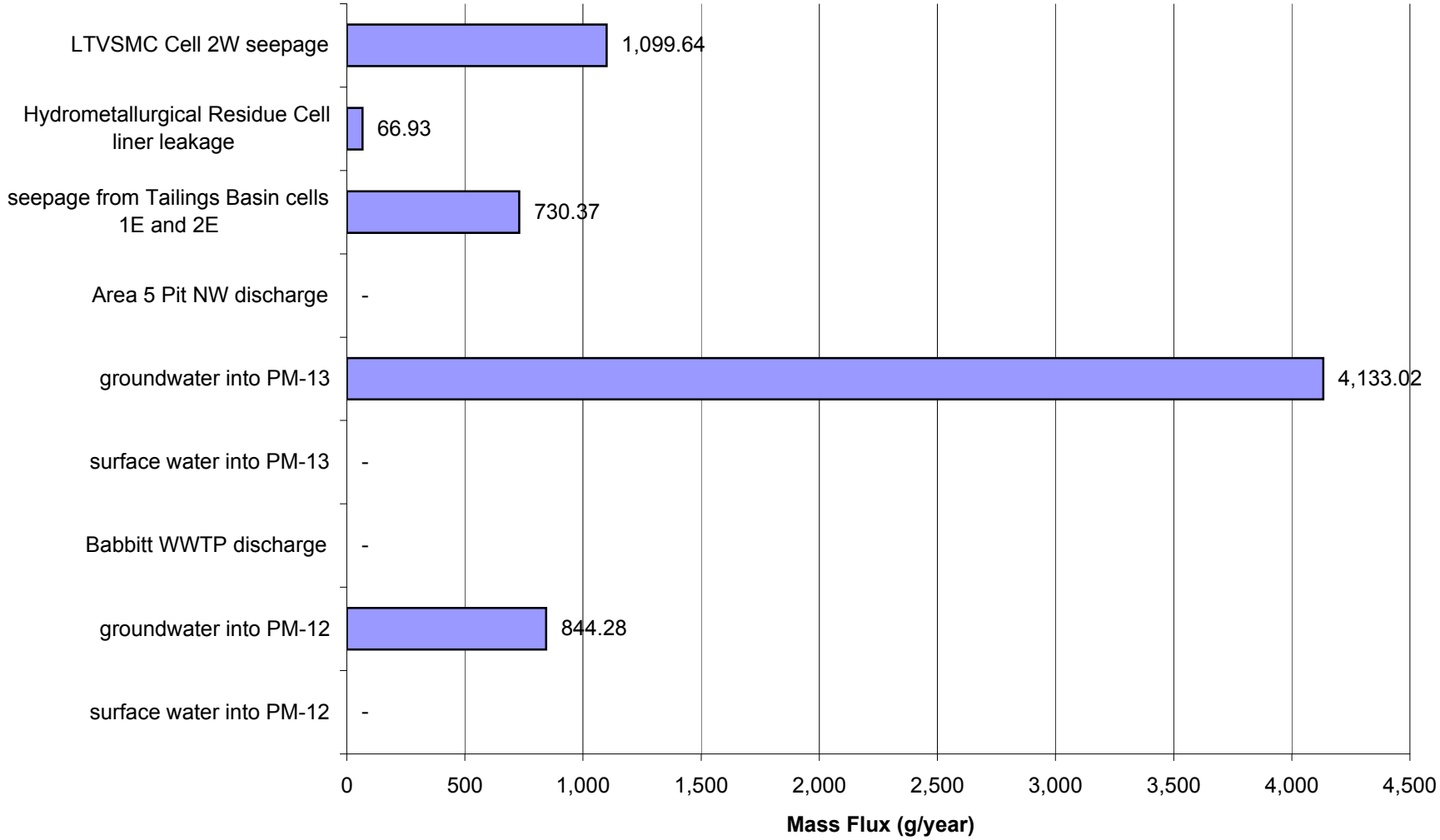
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for High Flow for Arsenic (As)



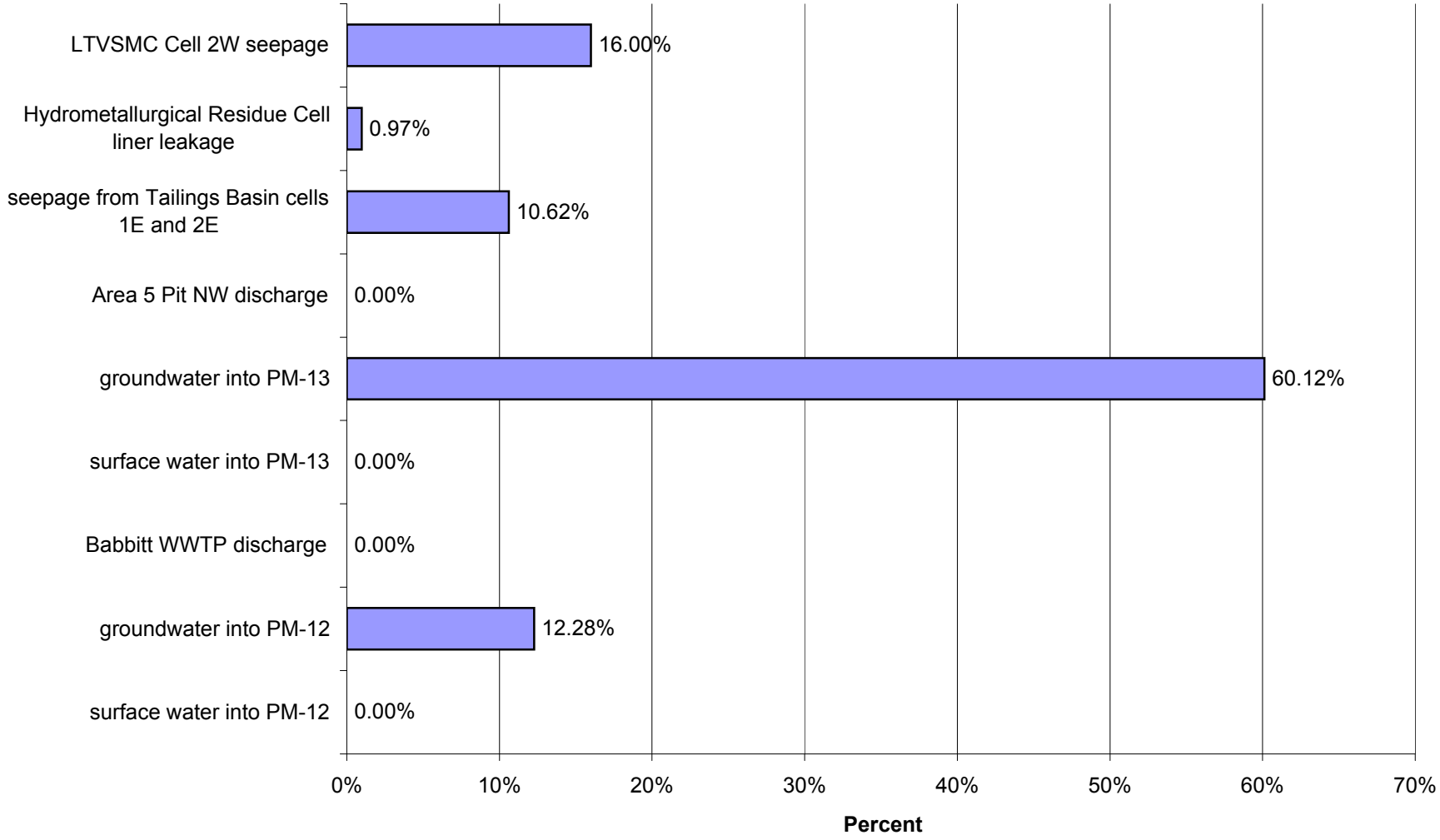
Proposed Action: Percent of Impacts at PM-13 in Year 5 for High Flow for Arsenic (As)



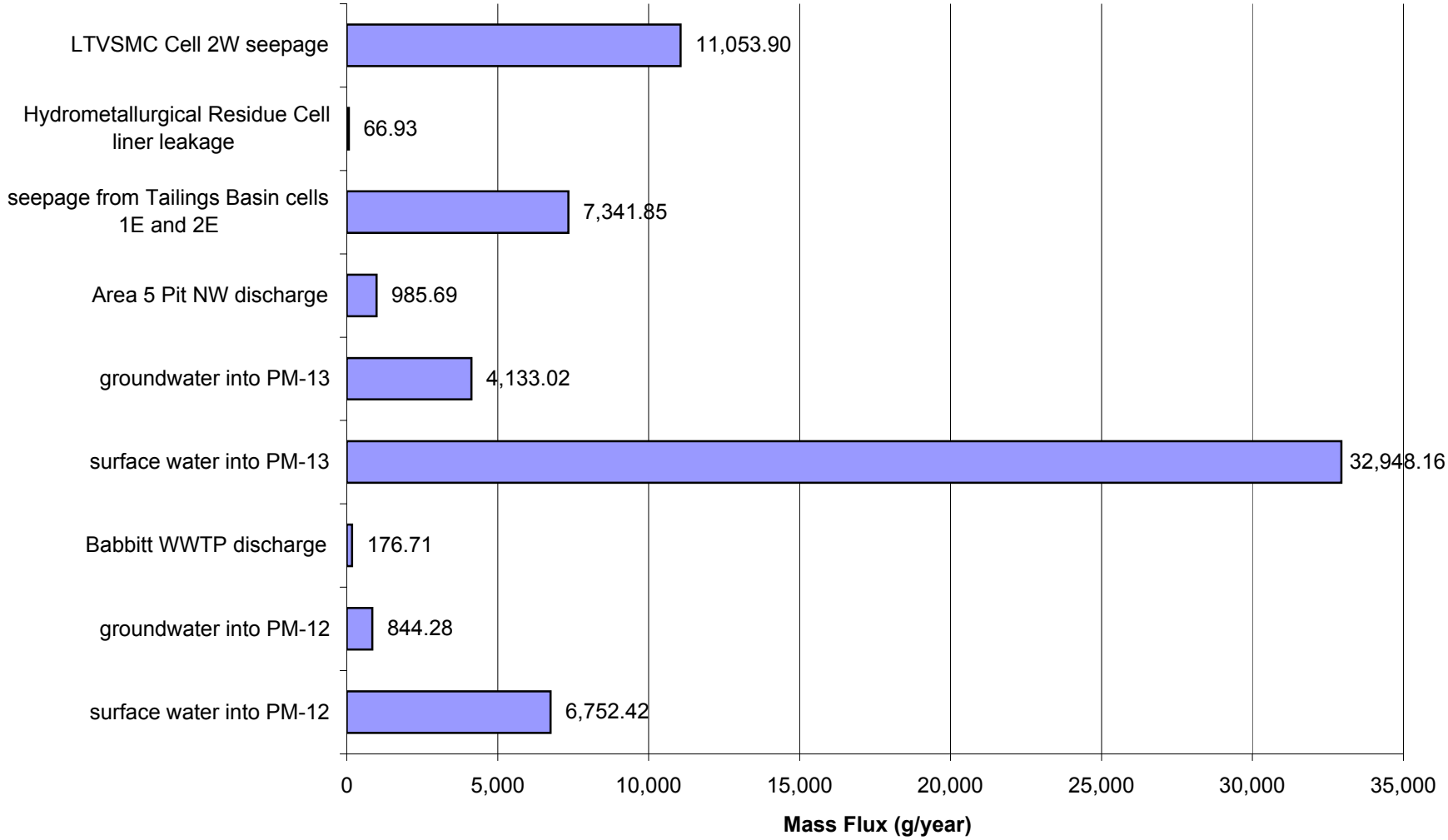
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for Low Flow for Cobalt (Co)



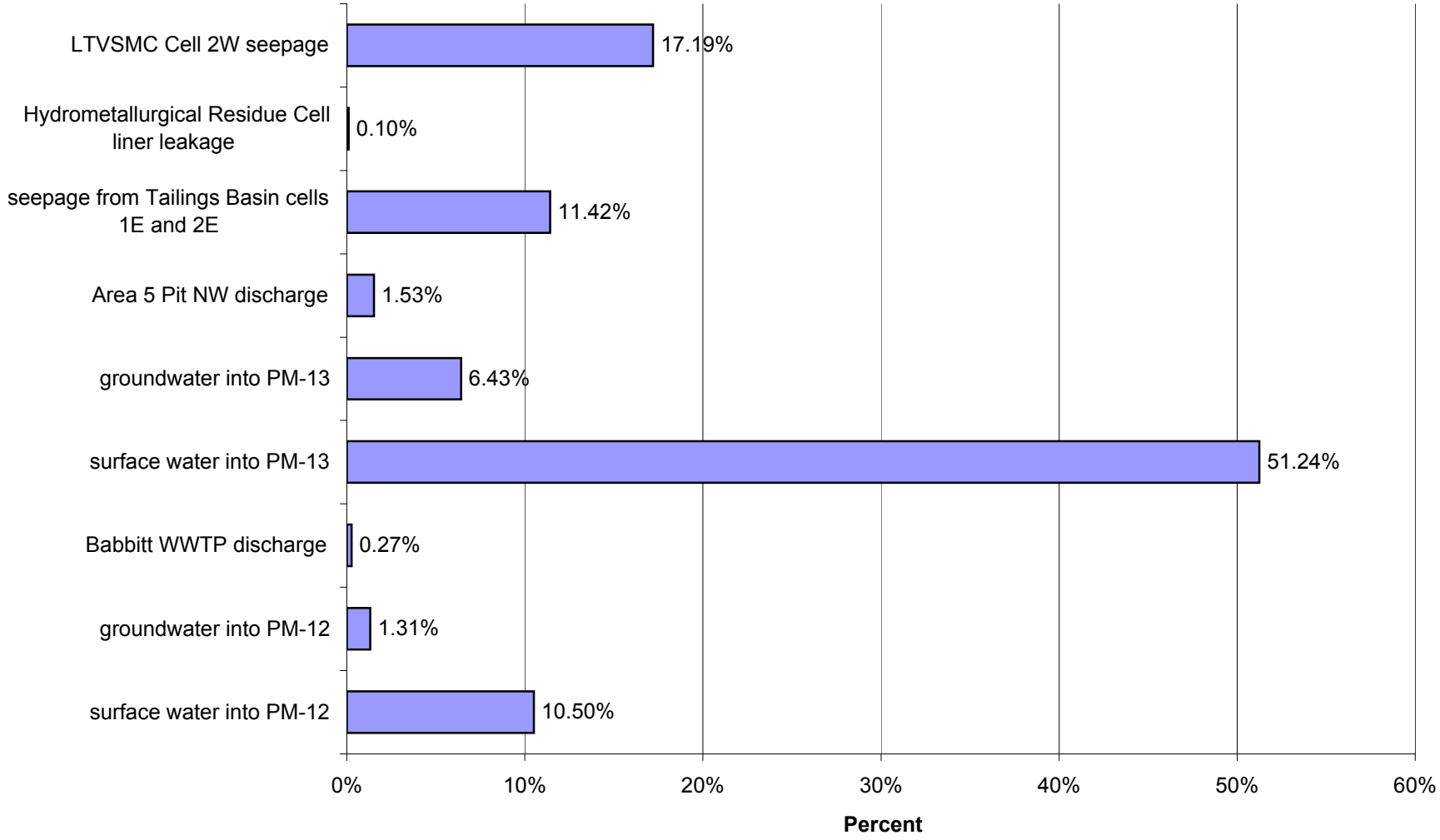
Proposed Action: Percent of Impacts at PM-13 in Year 5 for Low Flow for Cobalt (Co)



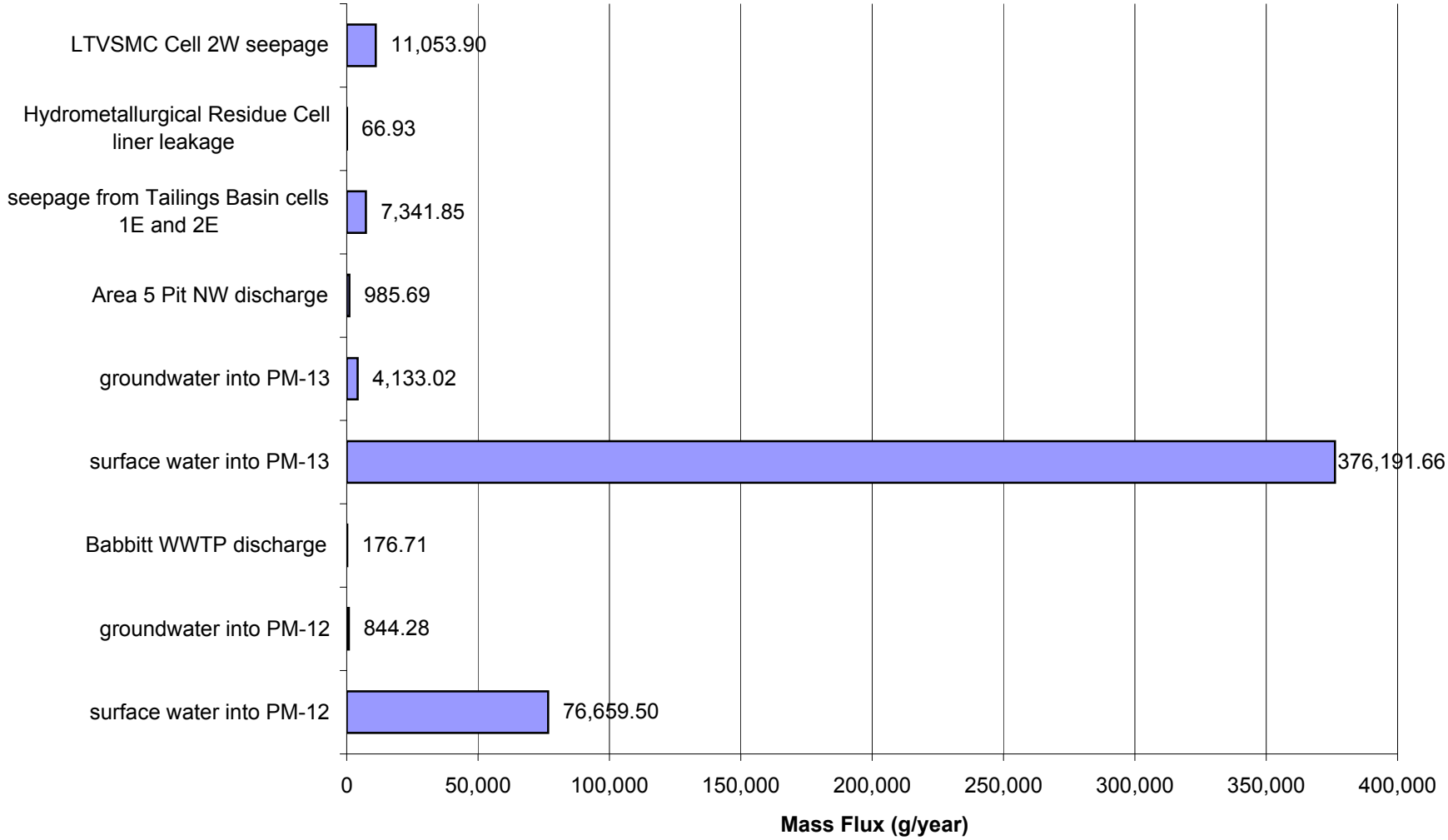
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for Average Flow for Cobalt (Co)



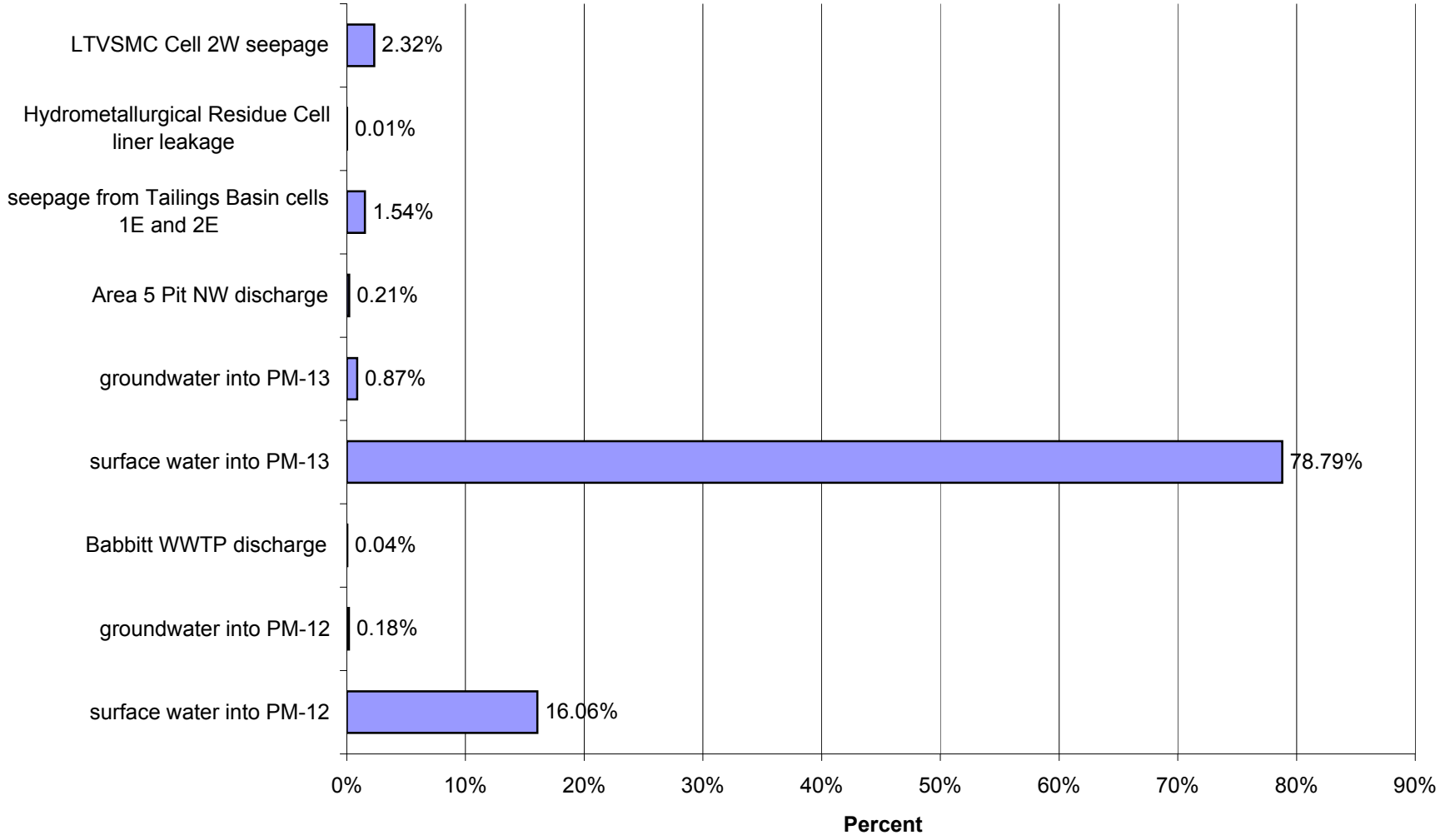
Proposed Action: Percent of Impacts at PM-13 in Year 5 for Average Flow for Cobalt (Co)



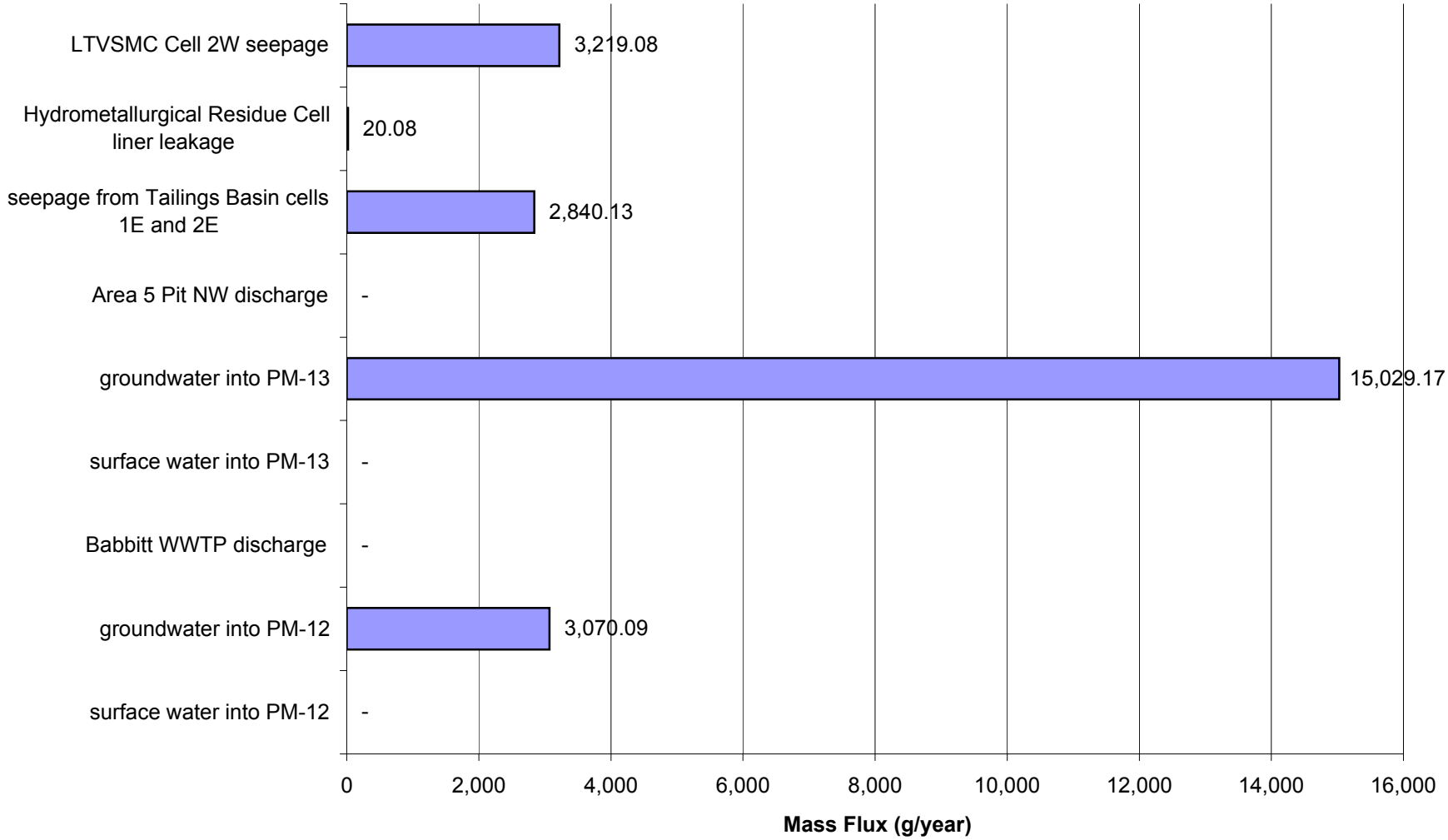
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for High Flow for Cobalt (Co)



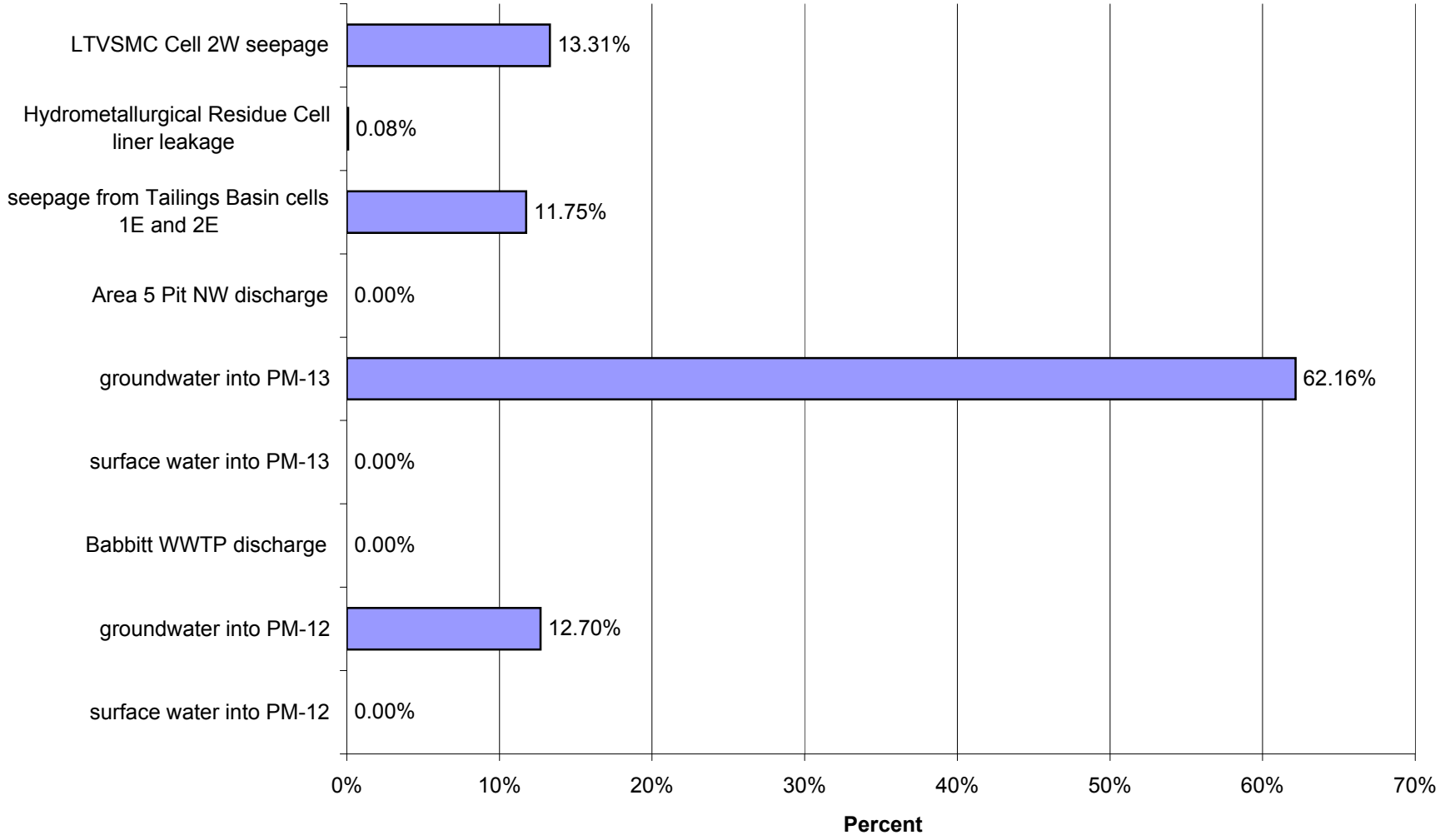
Proposed Action: Percent of Impacts at PM-13 in Year 5 for High Flow for Cobalt (Co)



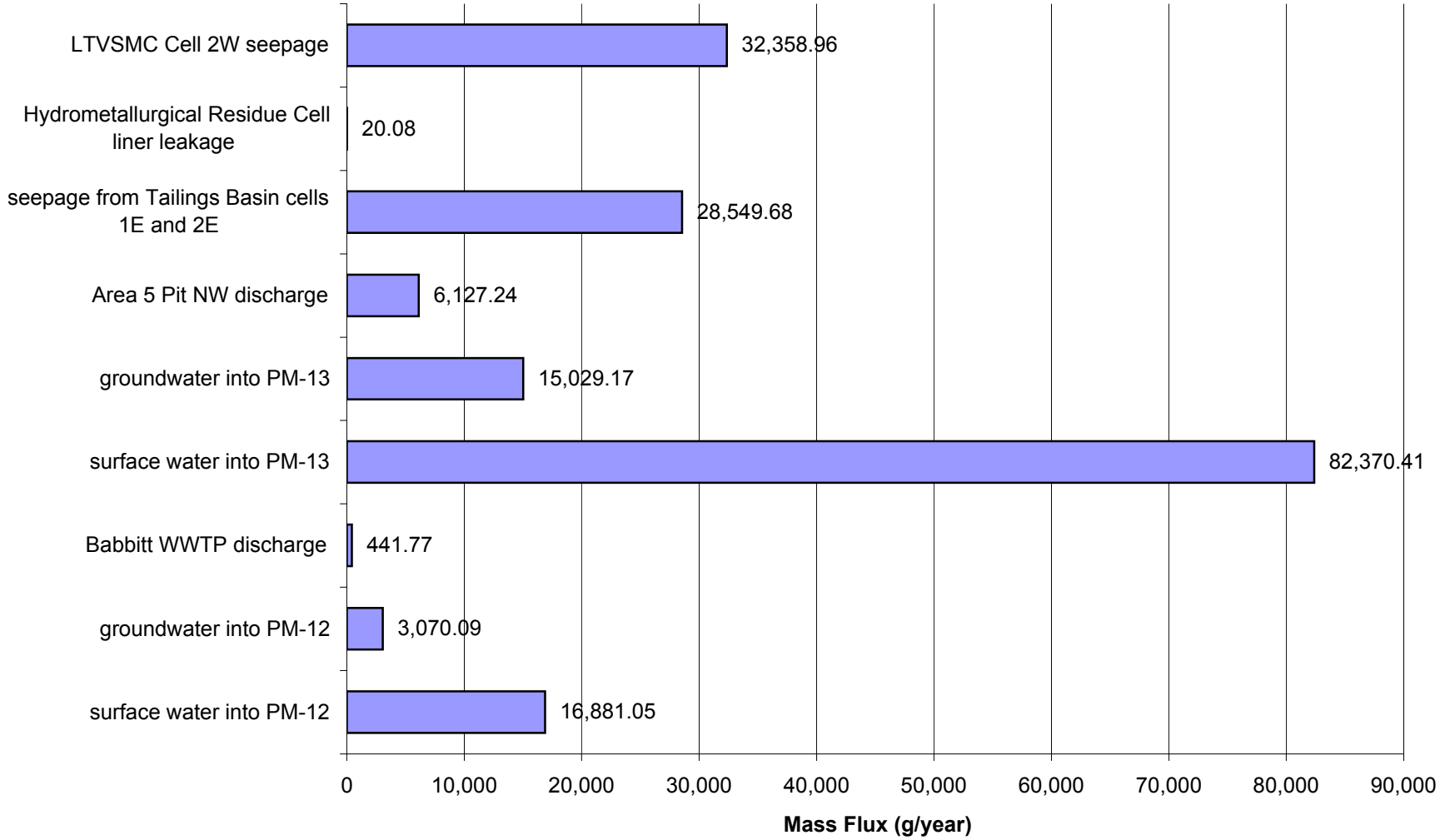
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for Low Flow for Copper (Cu)



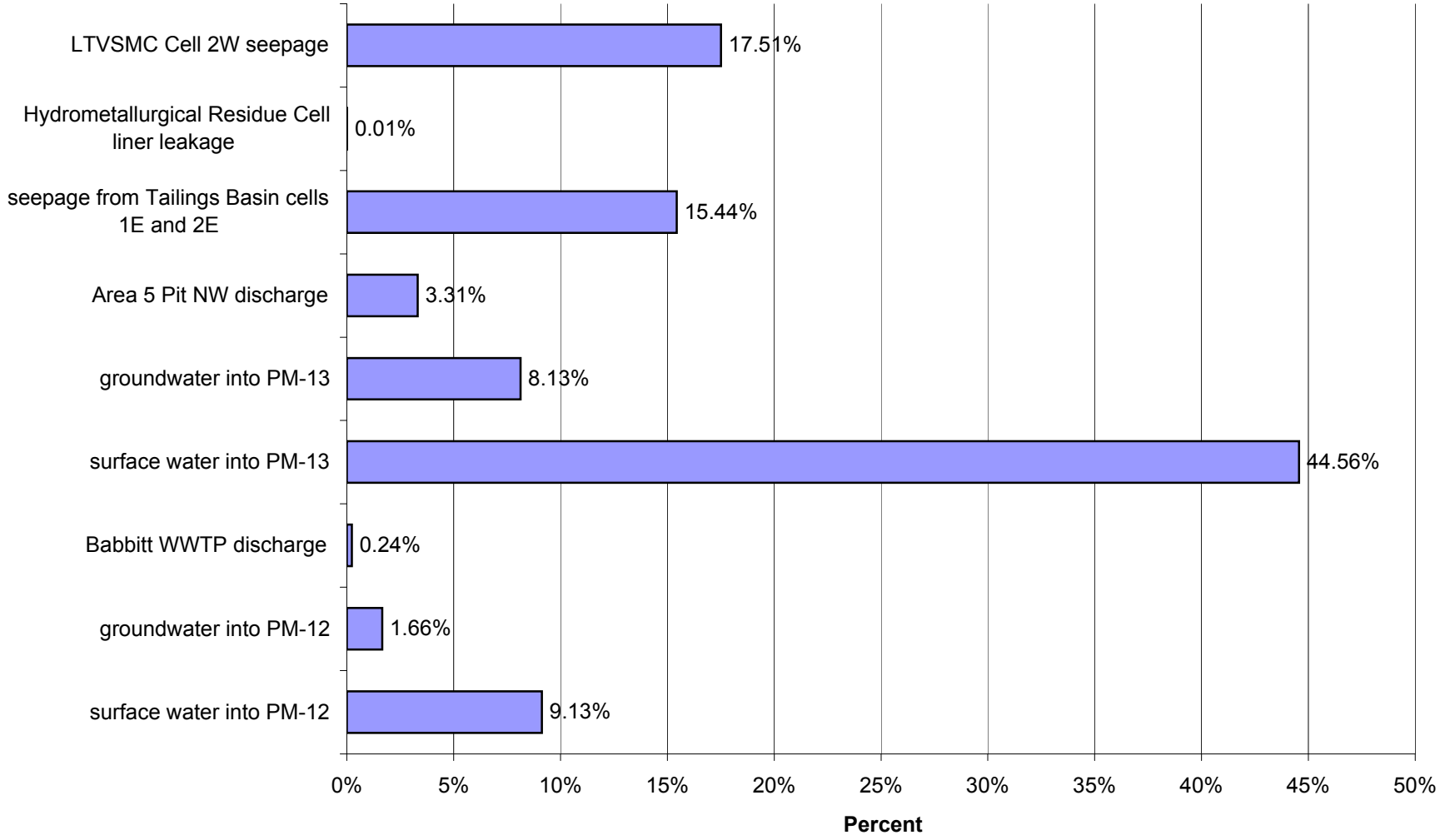
Proposed Action: Percent of Impacts at PM-13 in Year 5 for Low Flow for Copper (Cu)



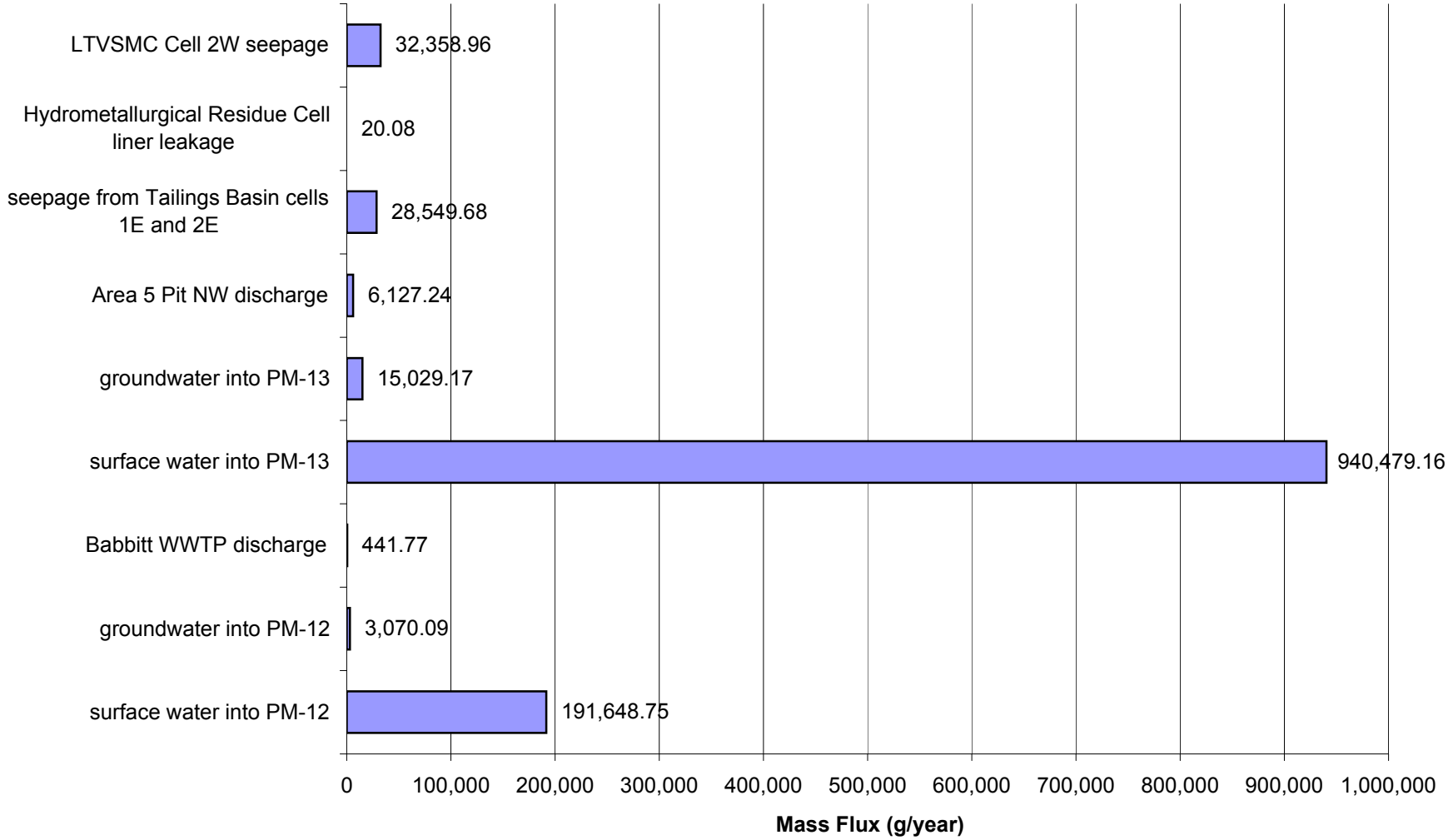
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for Average Flow for Copper (Cu)



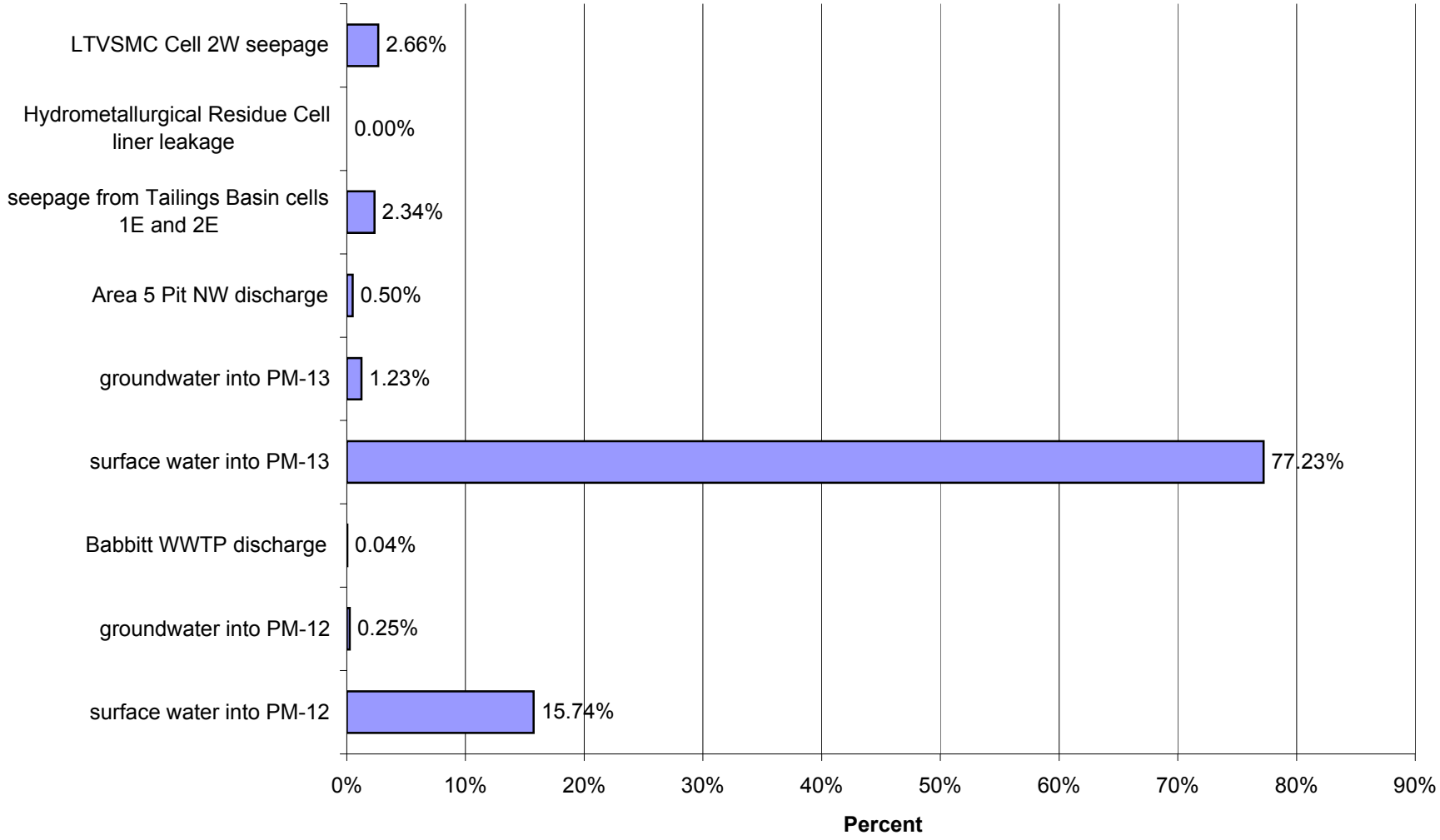
Proposed Action: Percent of Impacts at PM-13 in Closure for Year 5 Flow for Copper (Cu)



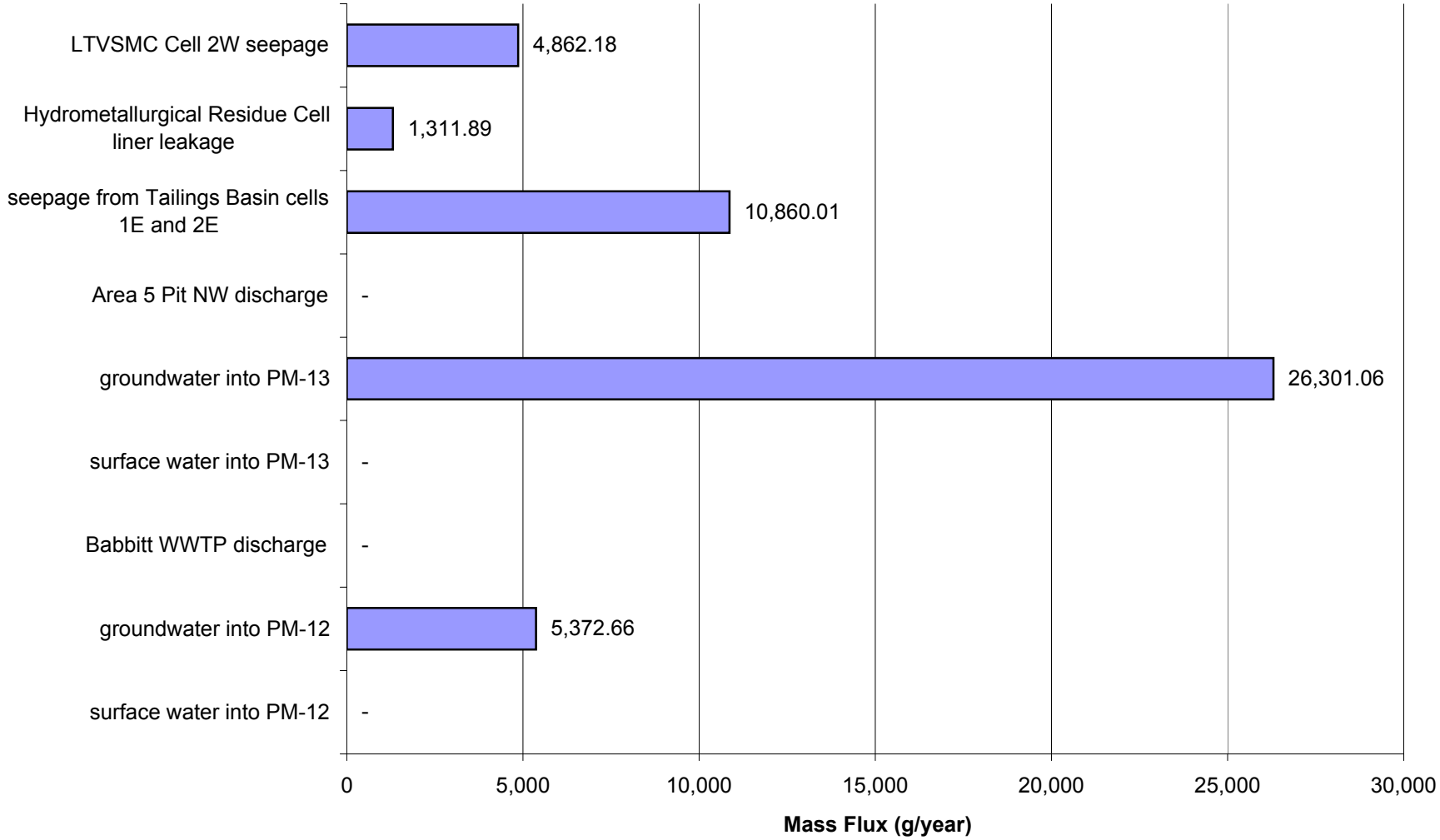
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for High Flow for Copper (Cu)



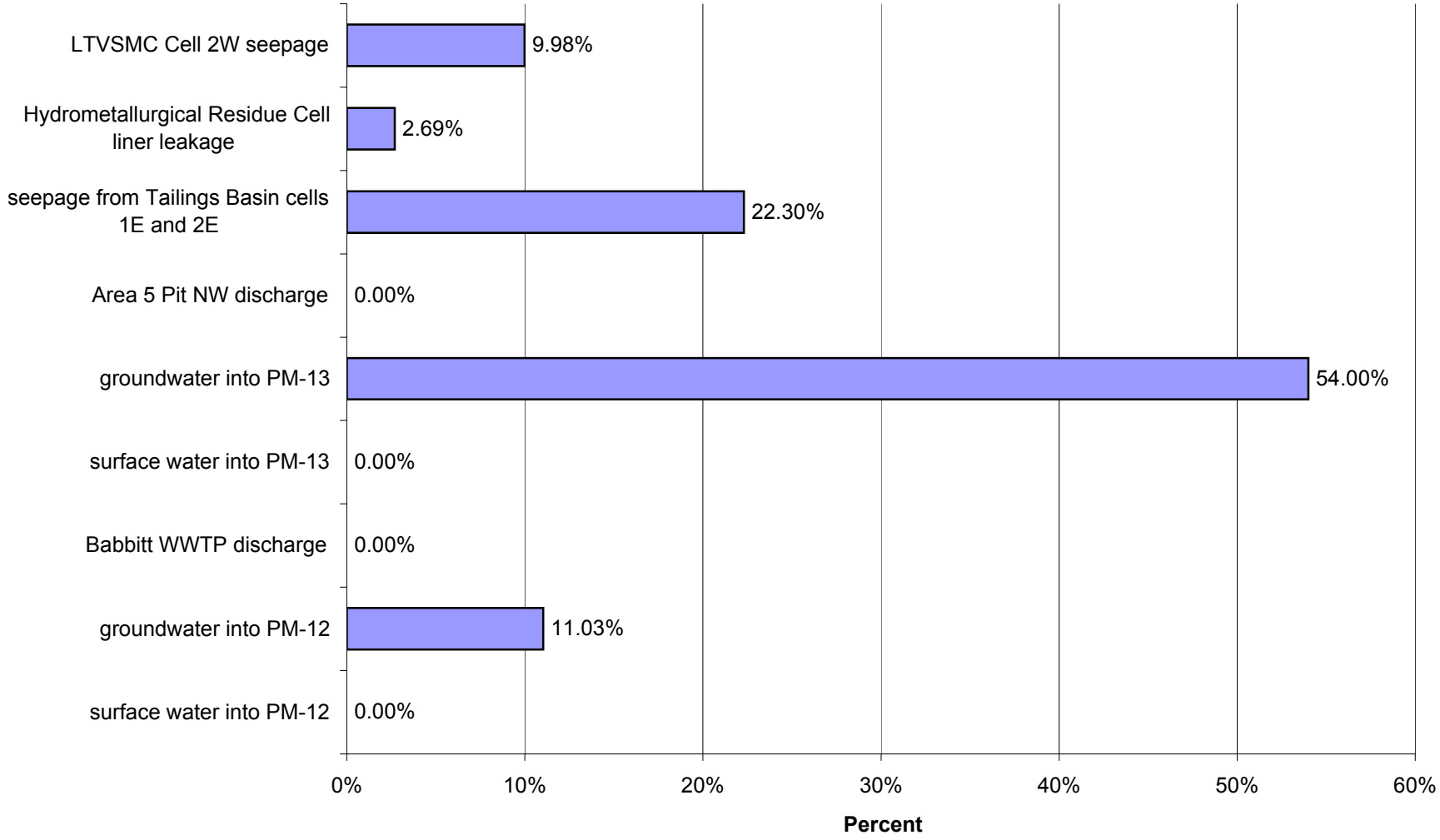
Proposed Action: Percent of Impacts at PM-13 in Year 5 for High Flow for Copper (Cu)



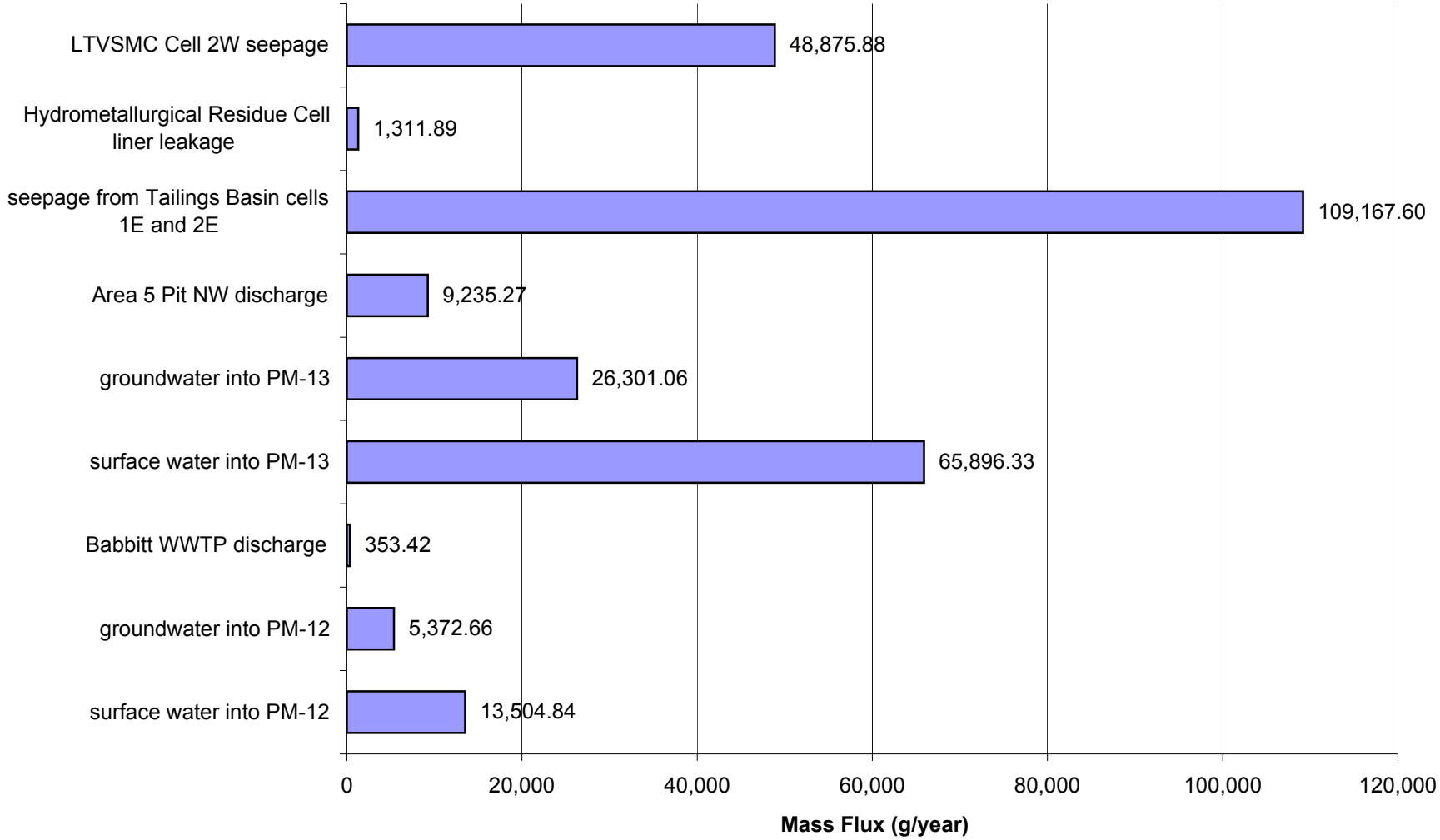
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for Low Flow for Nickel (Ni)



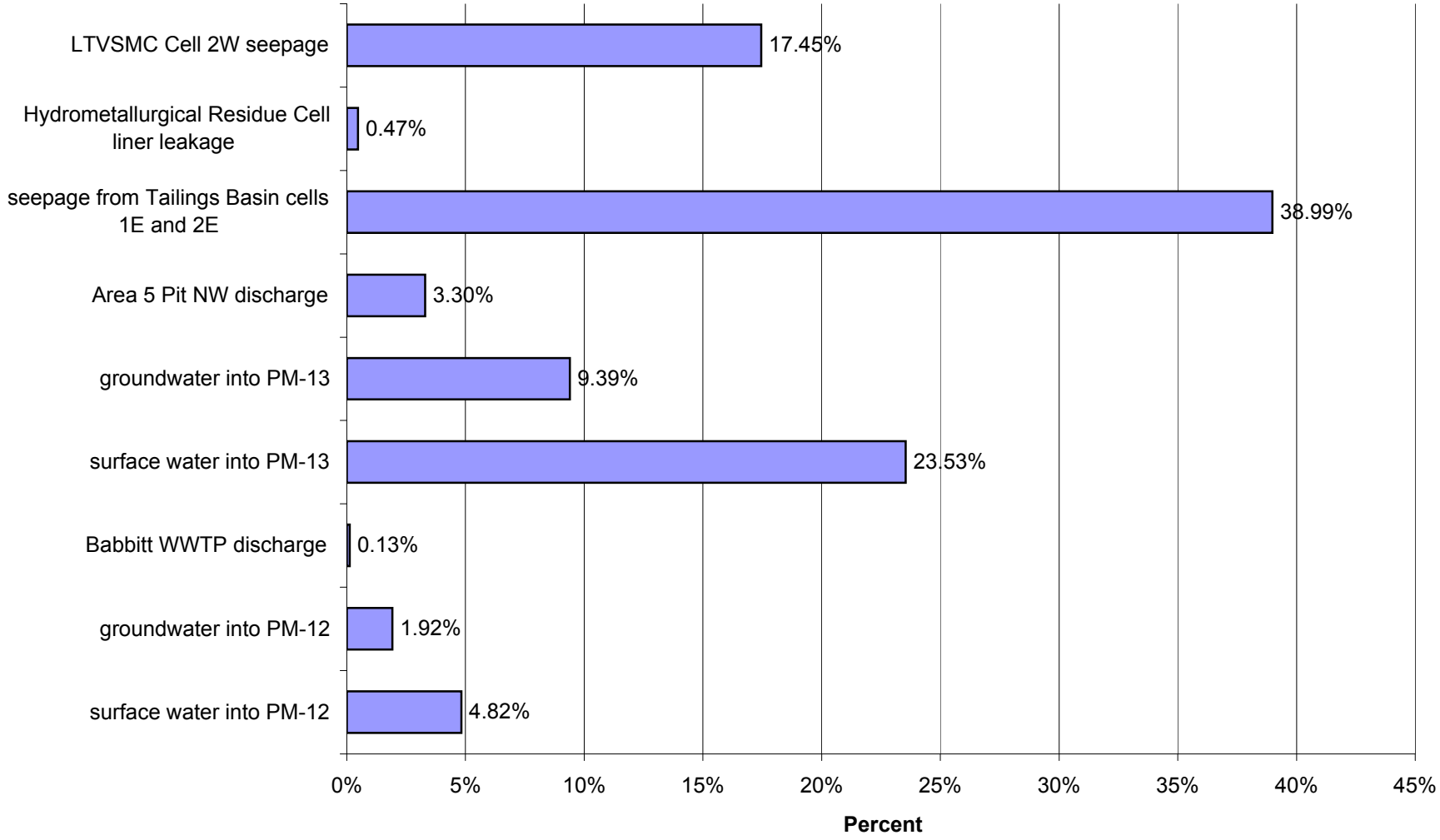
Proposed Action: Percent of Impacts at PM-13 in Year 5 for Low Flow for Nickel (Ni)



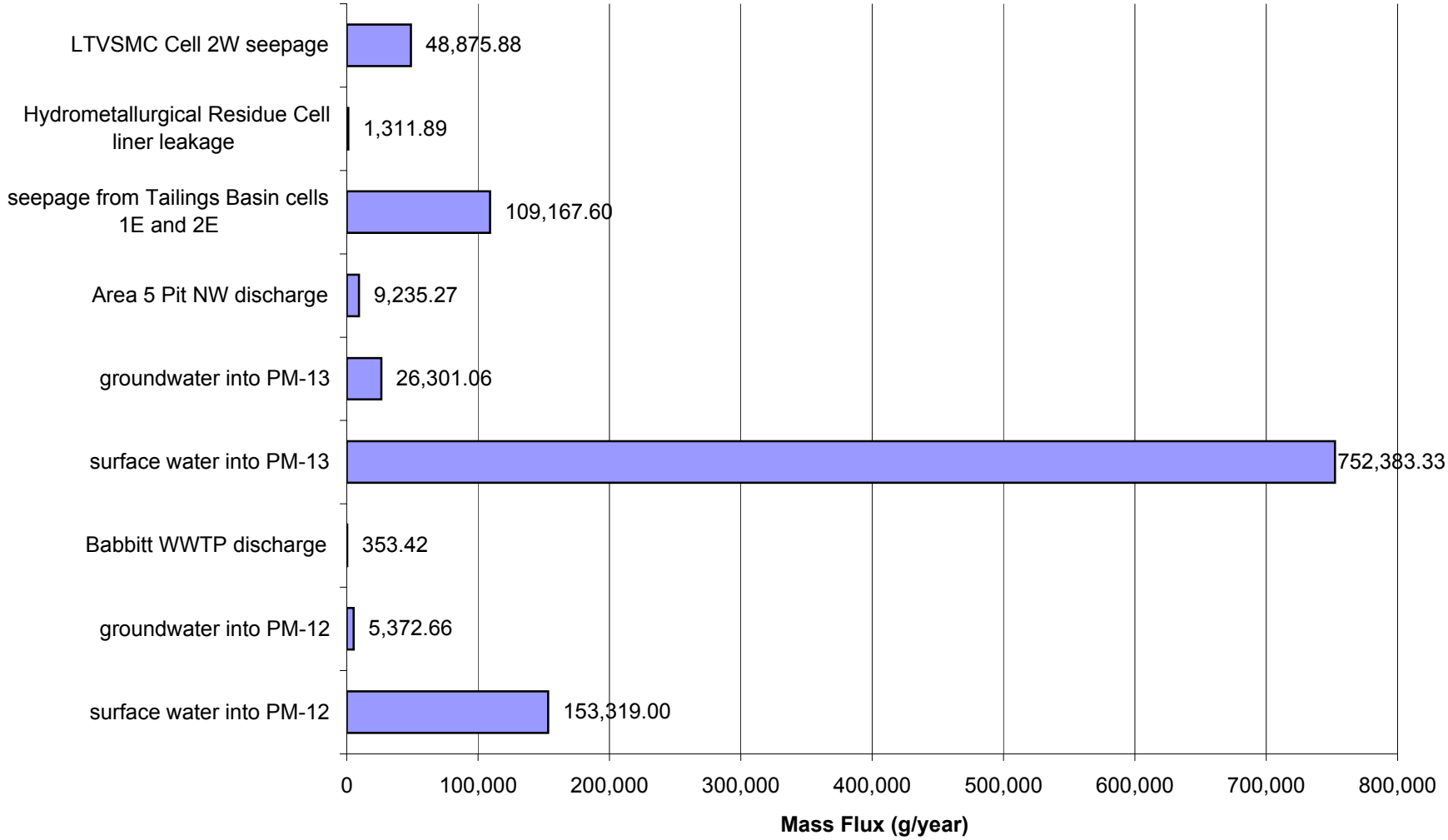
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for Average Flow for Nickel (Ni)



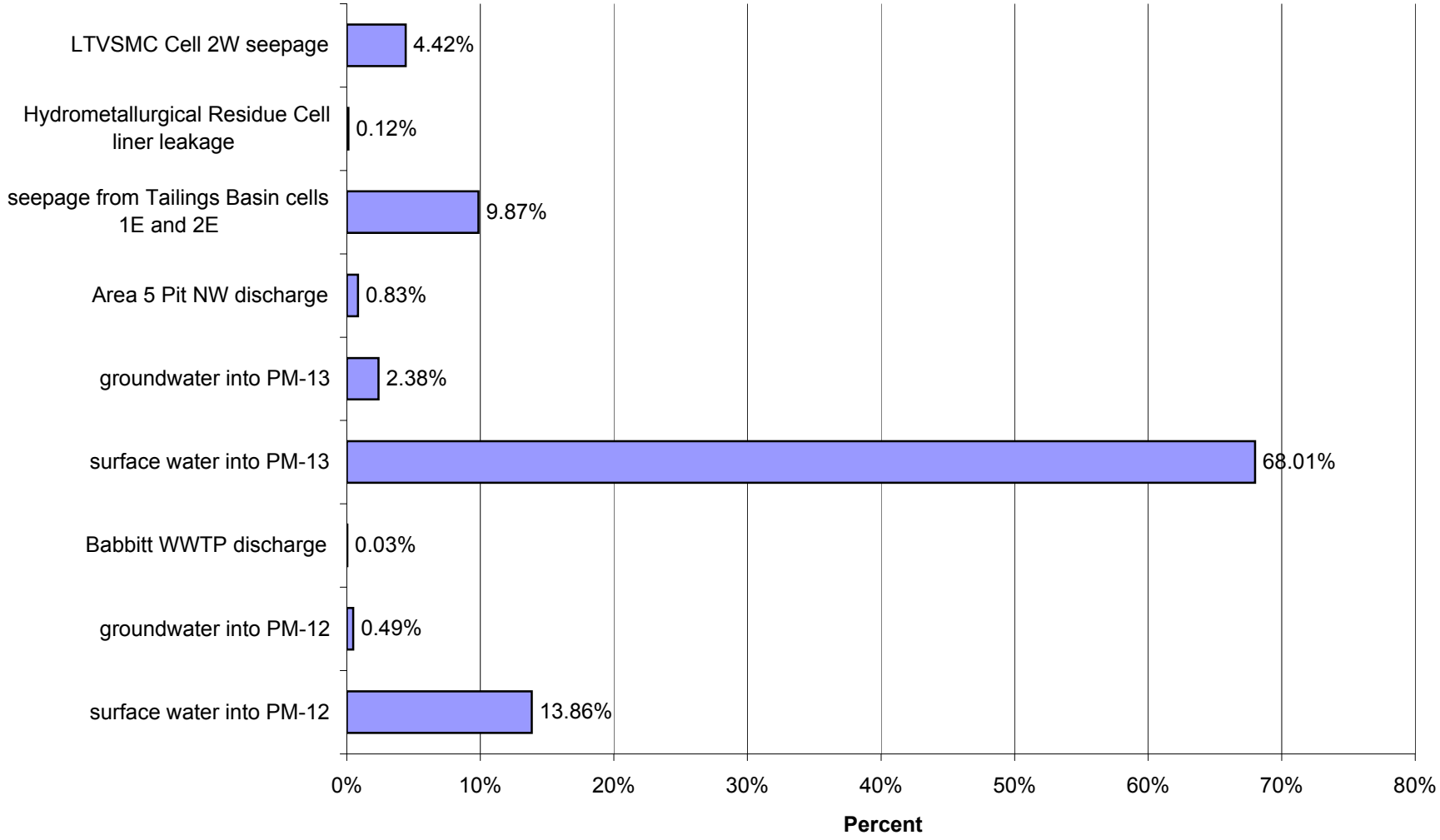
Proposed Action: Percent of Impacts at PM-13 in Year 5 for Average Flow for Nickel (Ni)



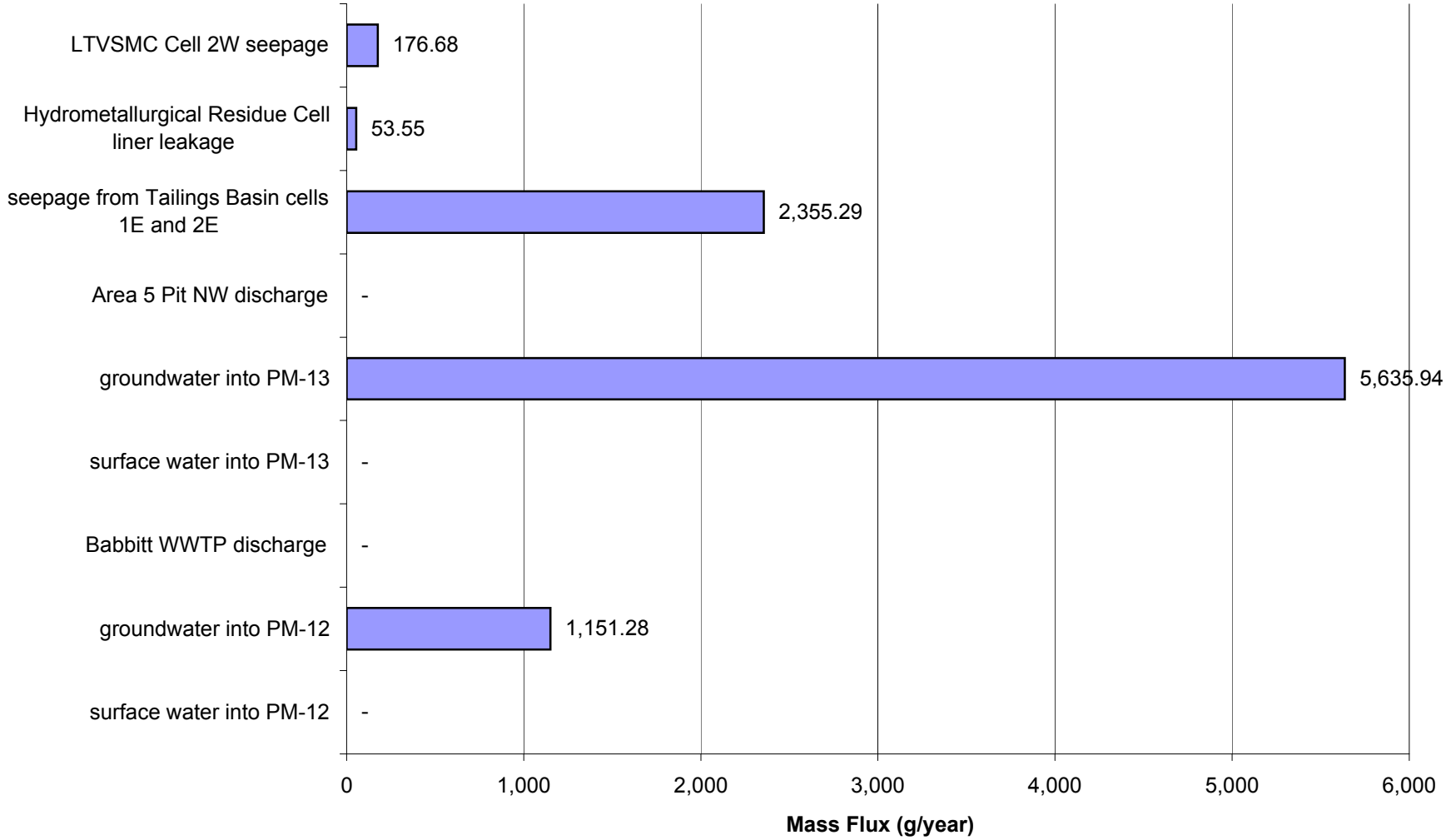
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for High Flow for Nickel (Ni)



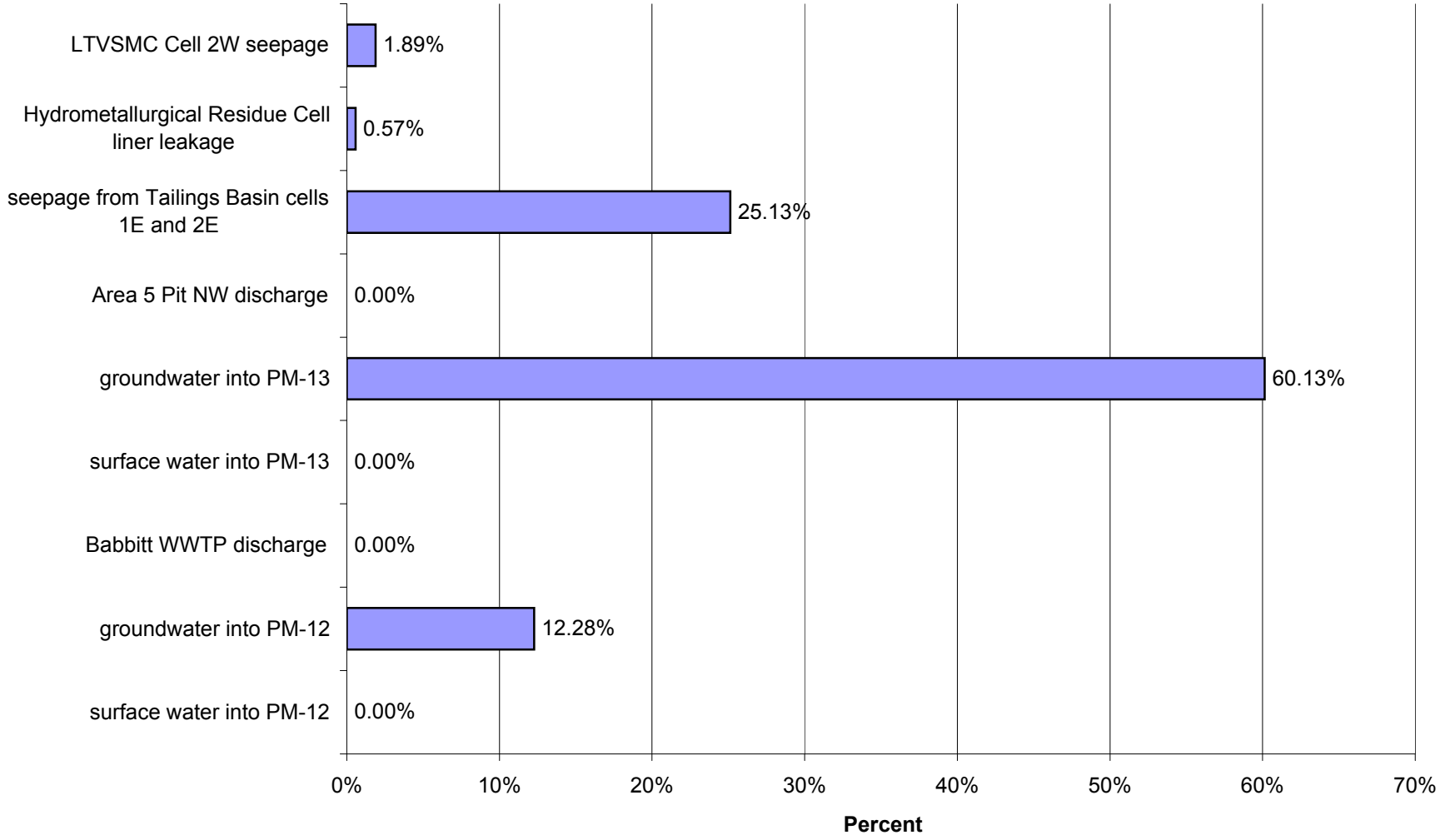
Proposed Action: Percent of Impacts at PM-13 in Year 5 for High Flow for Nickel (Ni)



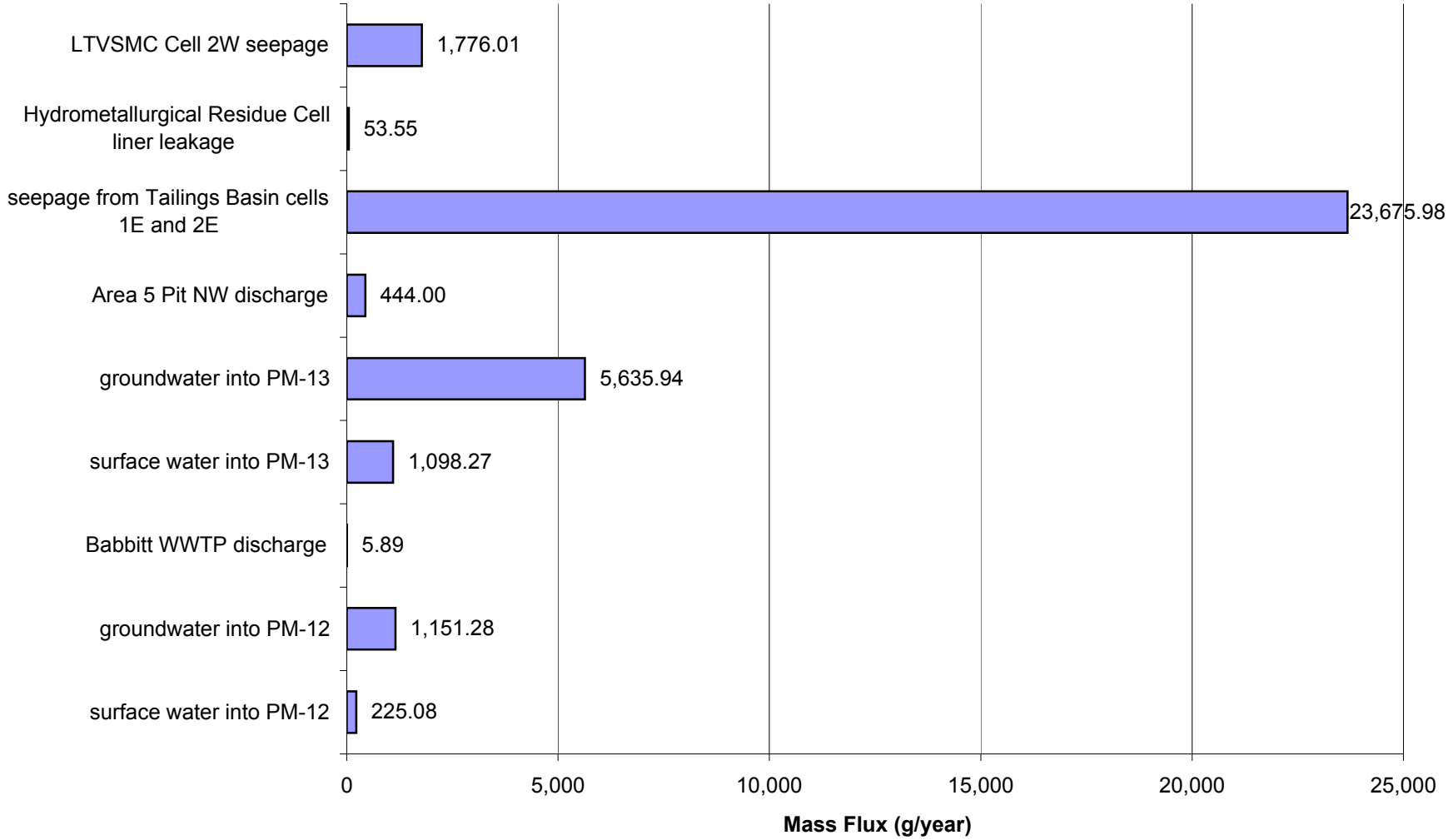
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for Low Flow for Antimony (Sb)



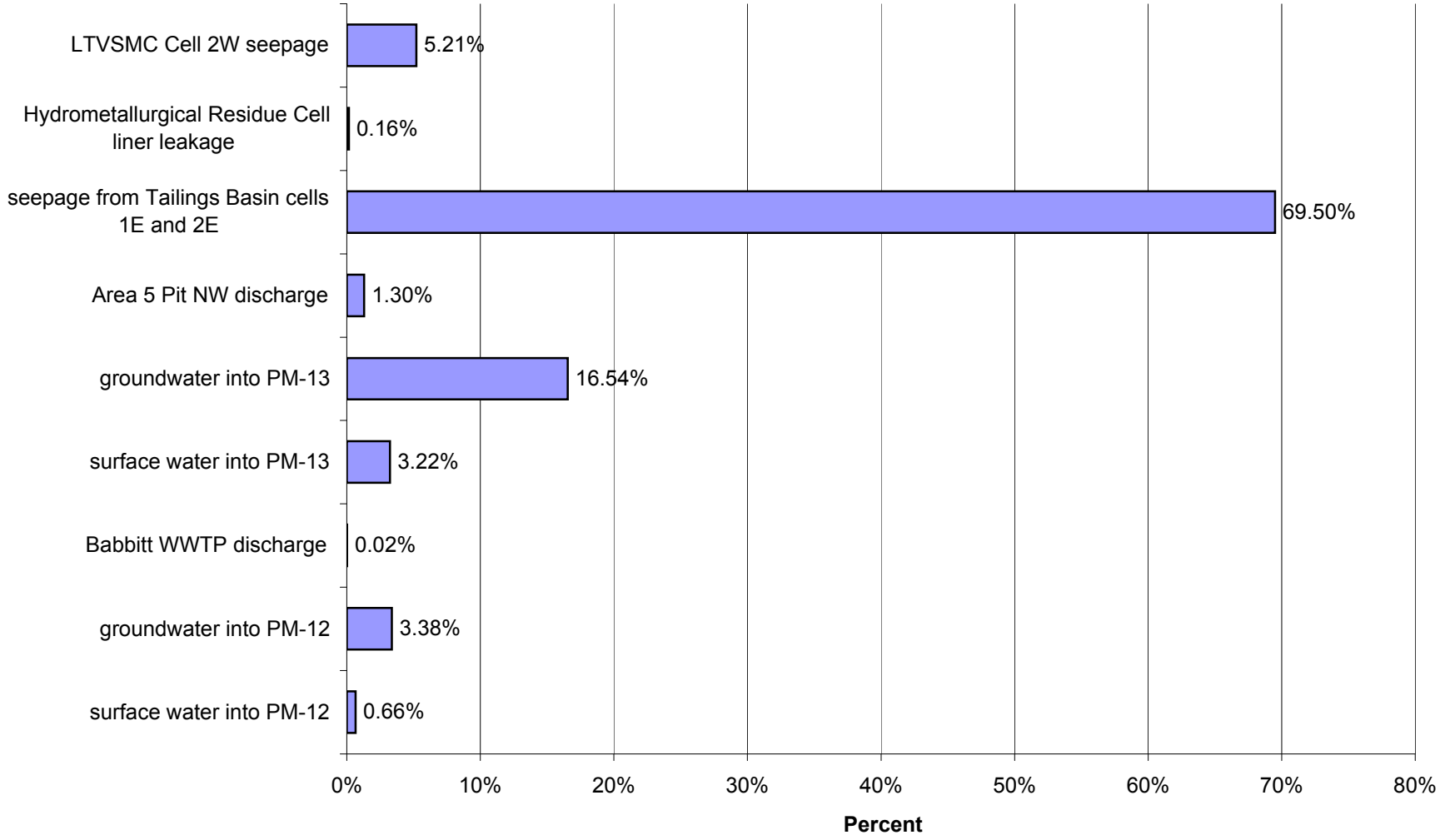
Proposed Action: Percent of Impacts at PM-13 in Year 5 for Low Flow for Antimony (Sb)



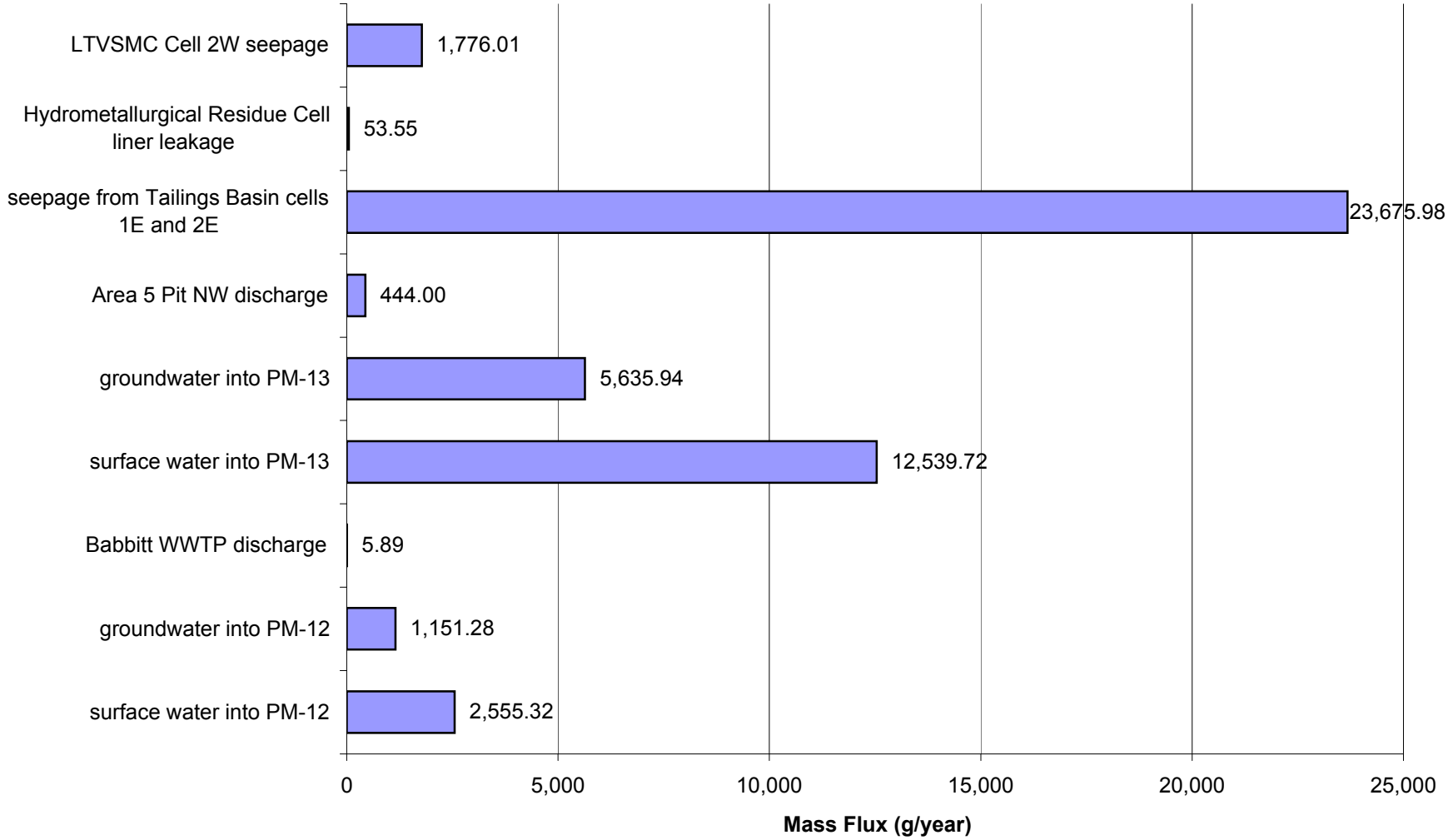
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for Average Flow for Antimony(Sb)



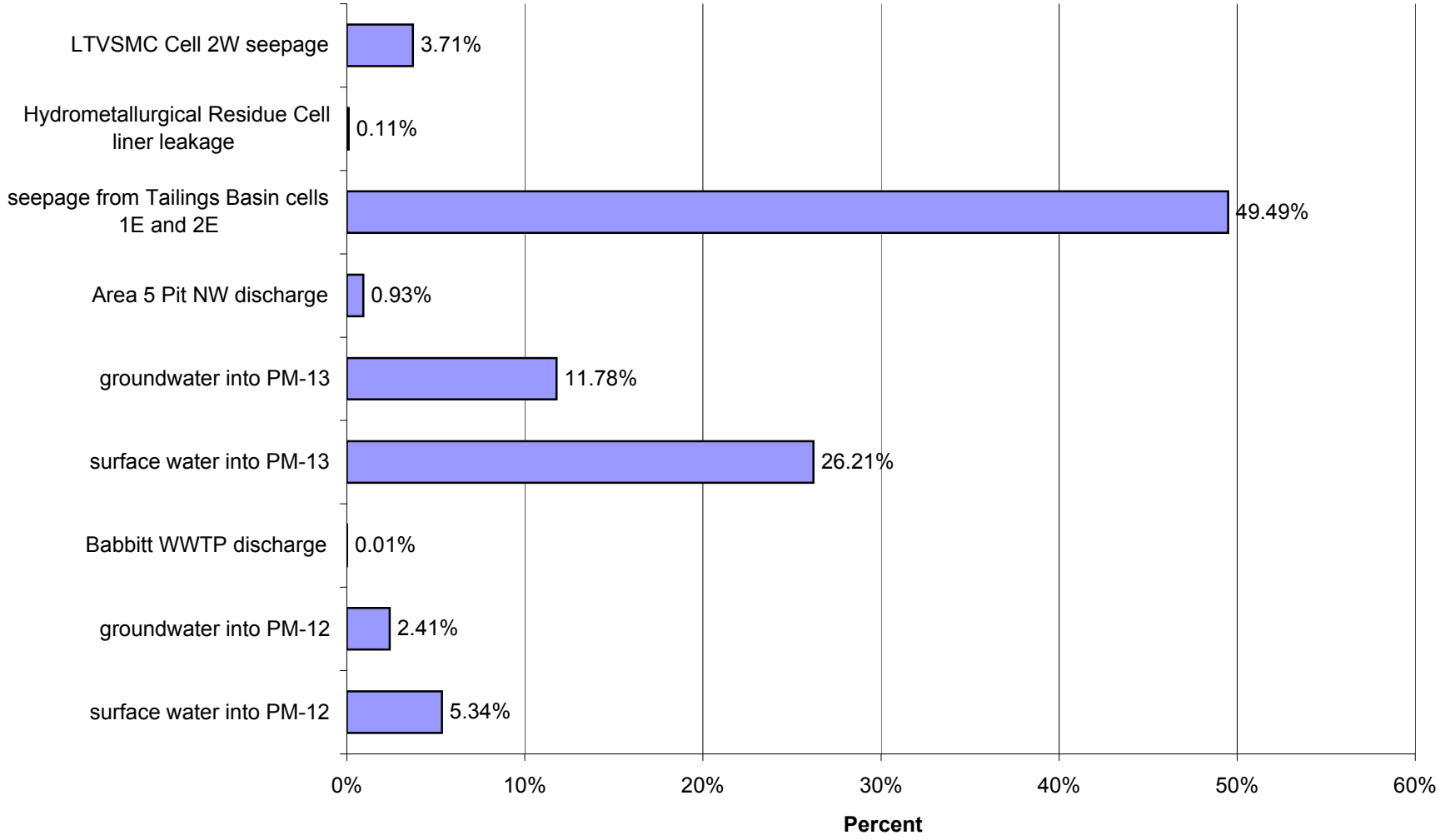
Proposed Action: Percent of Impacts at PM-13 in Year 5 for Average Flow for Antimony (Sb)



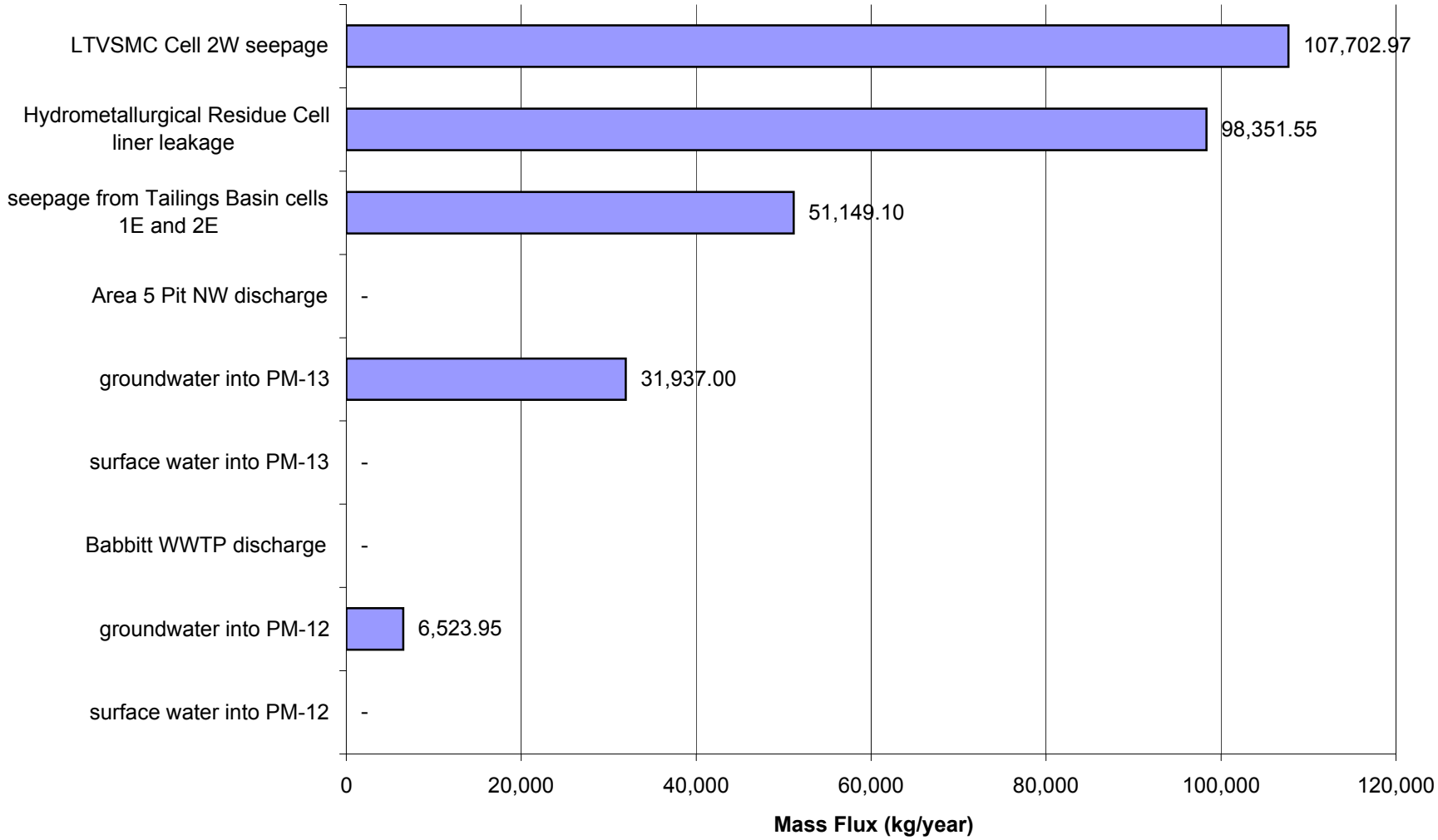
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for High Flow for Antimony (Sb)



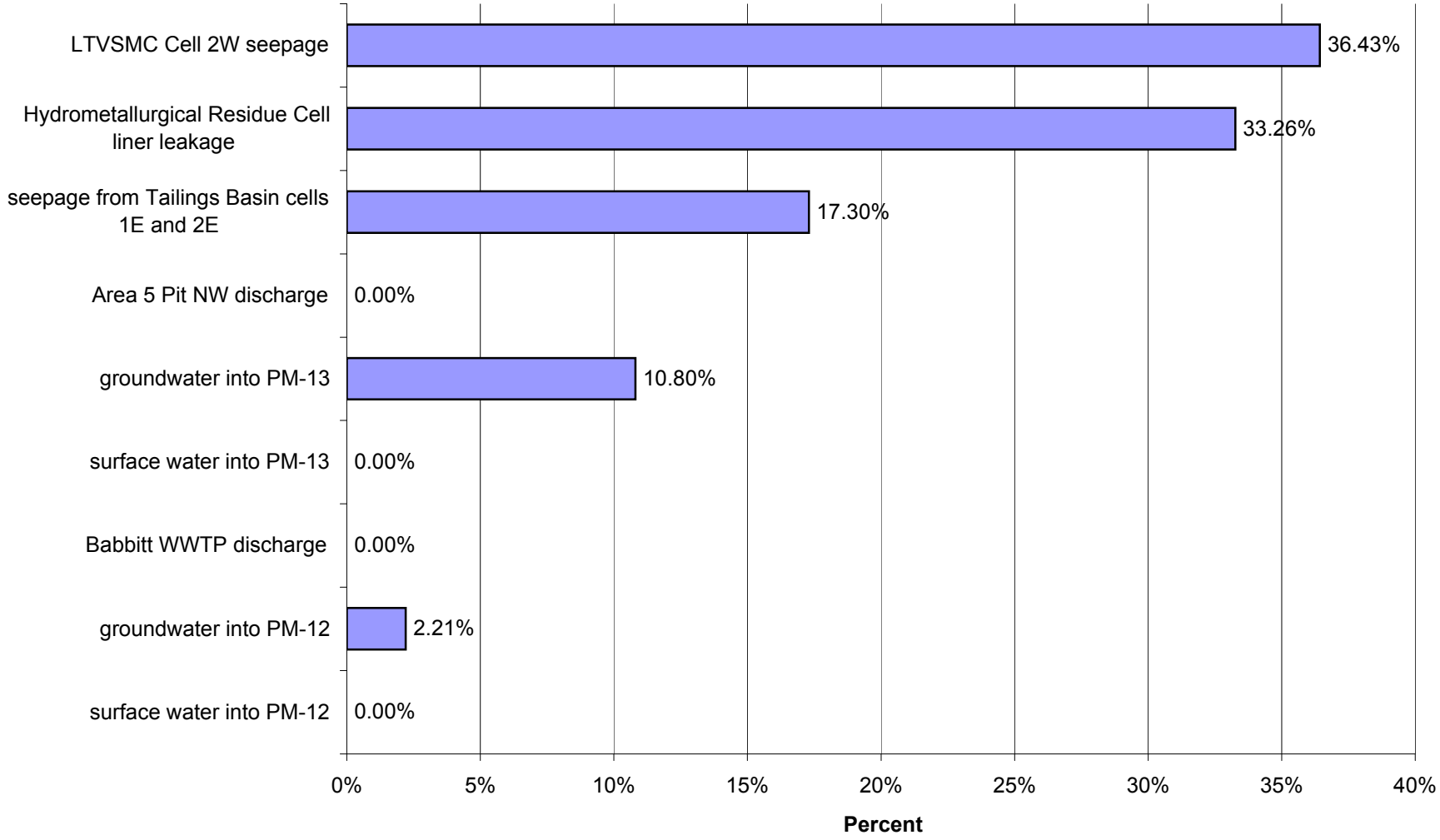
Proposed Action: Percent of Impacts at PM-13 in Year 5 for High Flow for Antimony (Sb)



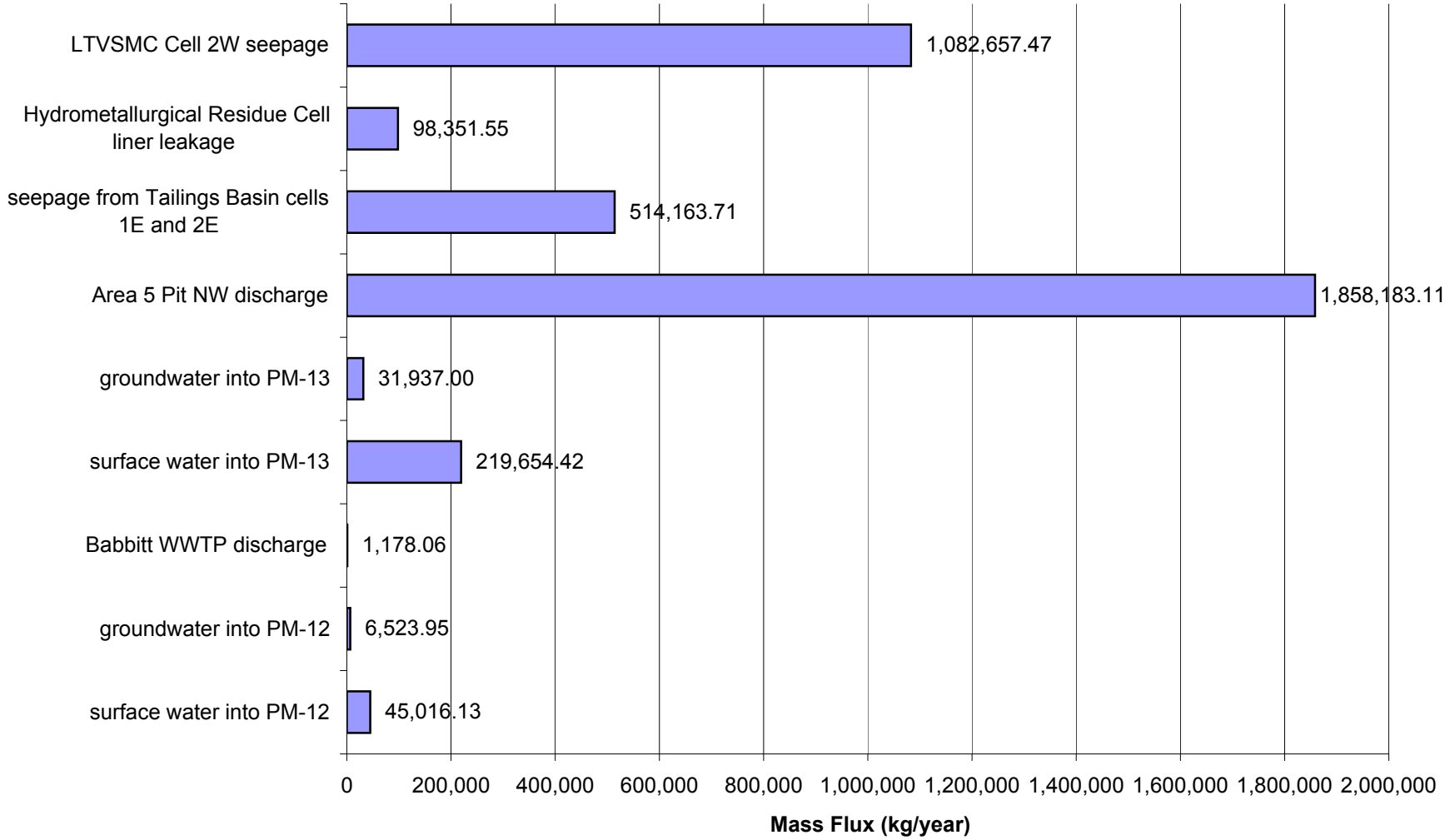
Proposed Action: Mass Flux (kg/year) of Impacts at PM-13 in Year 5 for Low Flow for Sulfate (SO_4)



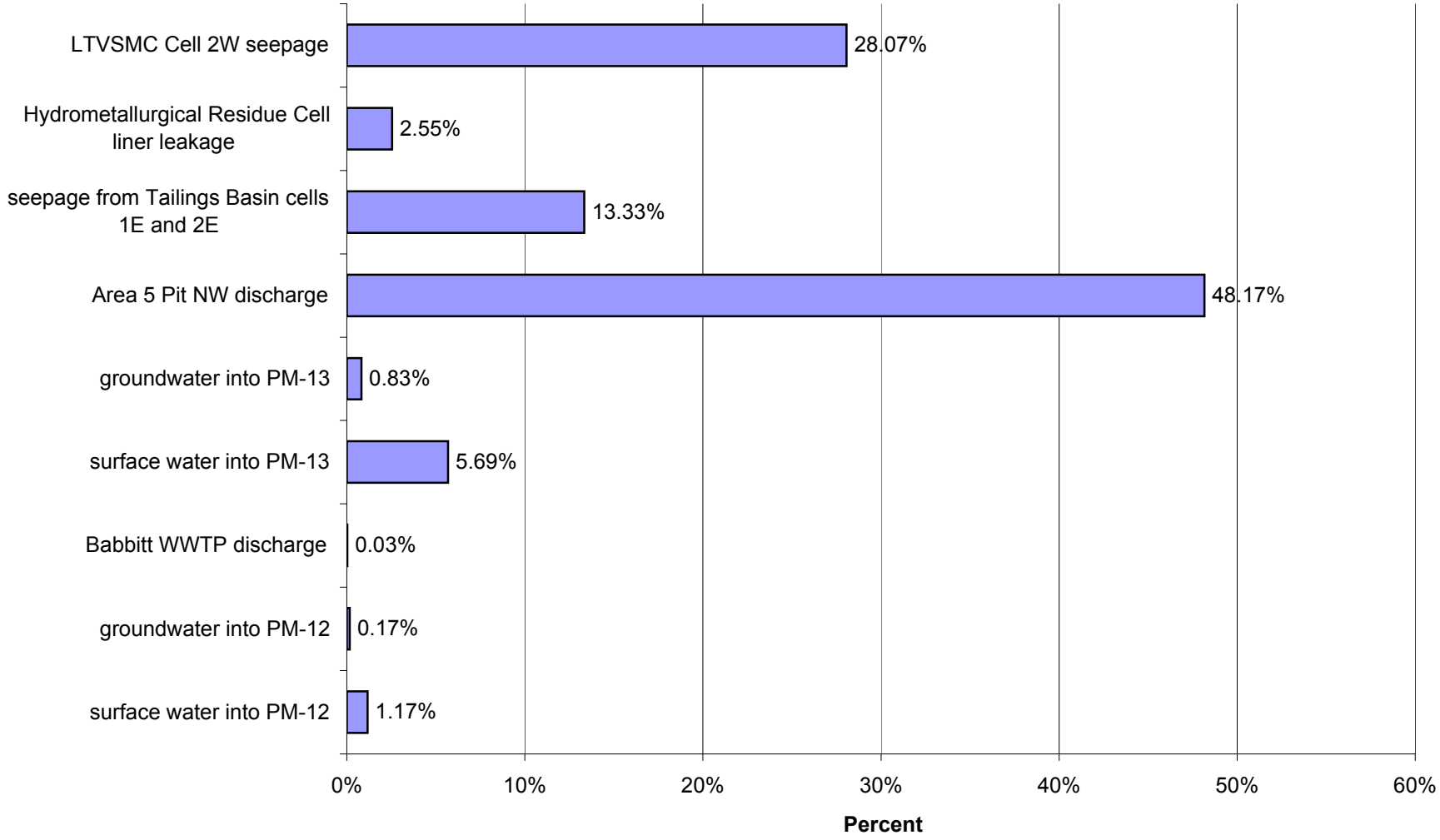
Proposed Action: Percent of Impacts at PM-13 in Year 5 for Low Flow for Sulfate (SO_4)



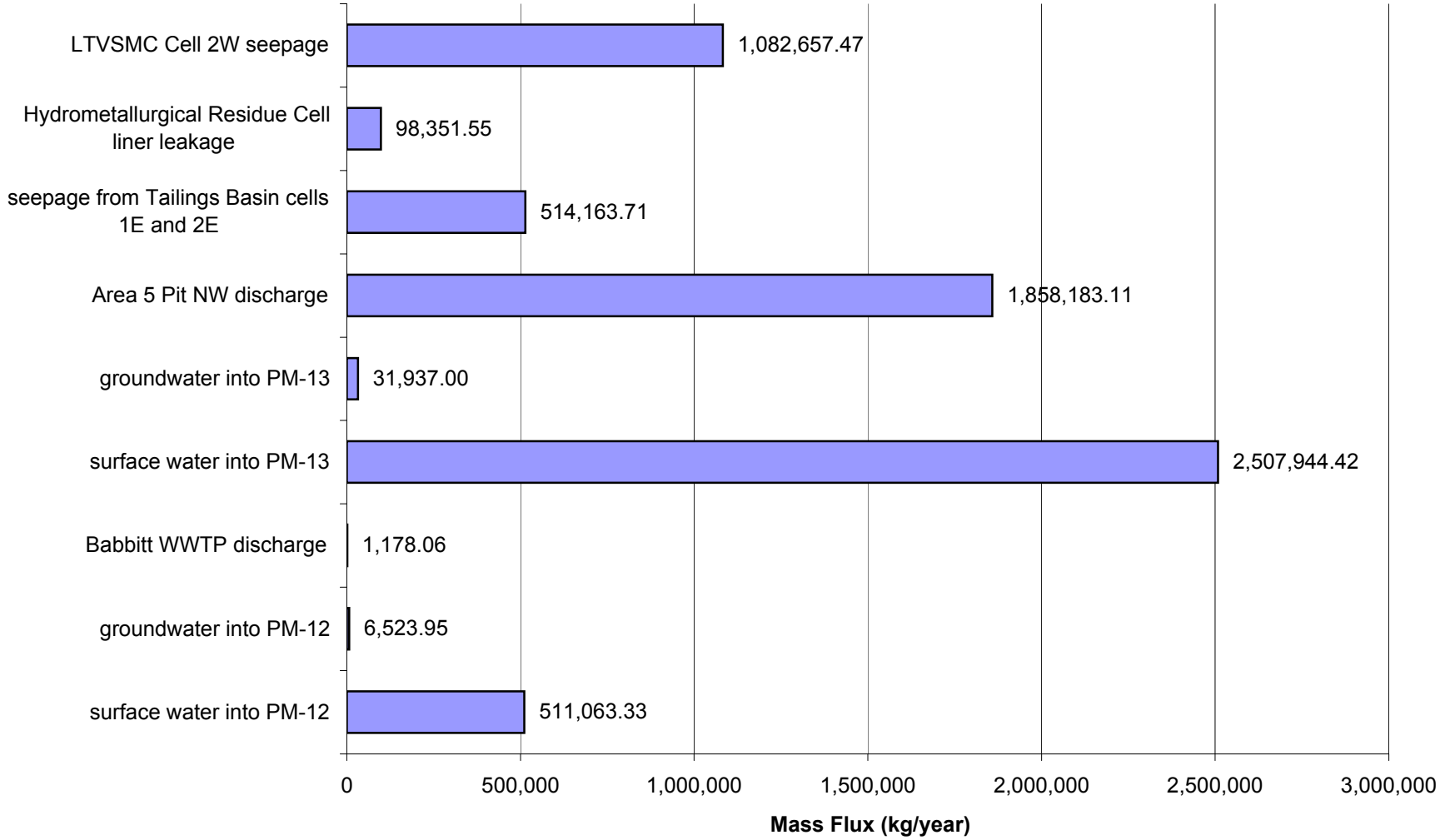
Proposed Action: Mass Flux (kg/year) of Impacts at PM-13 in Year 5 for Average Flow for Sulfate (SO_4)



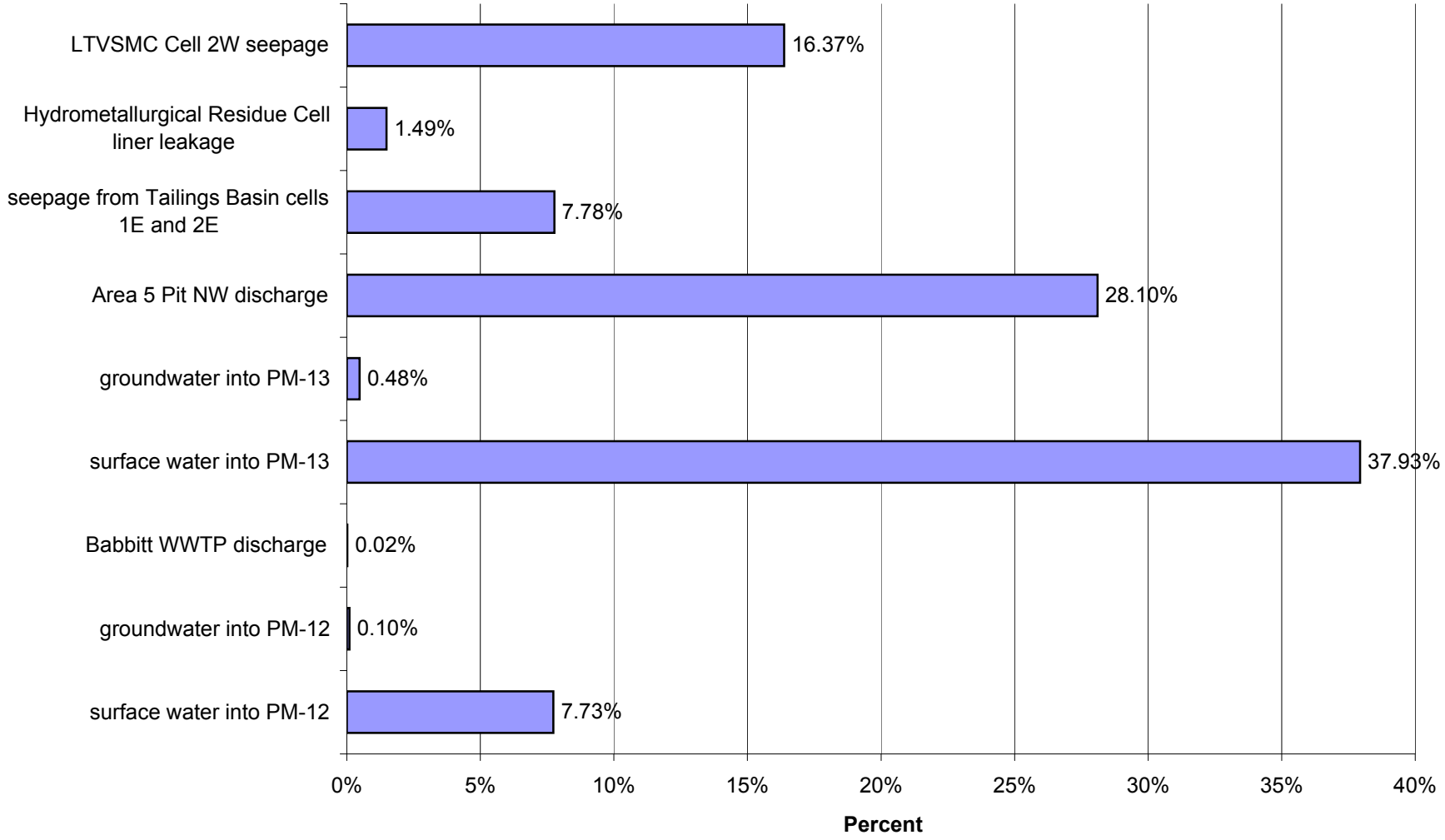
Proposed Action: Percent of Impacts at PM-13 in Year 5 for Average Flow for Sulfate (SO_4)



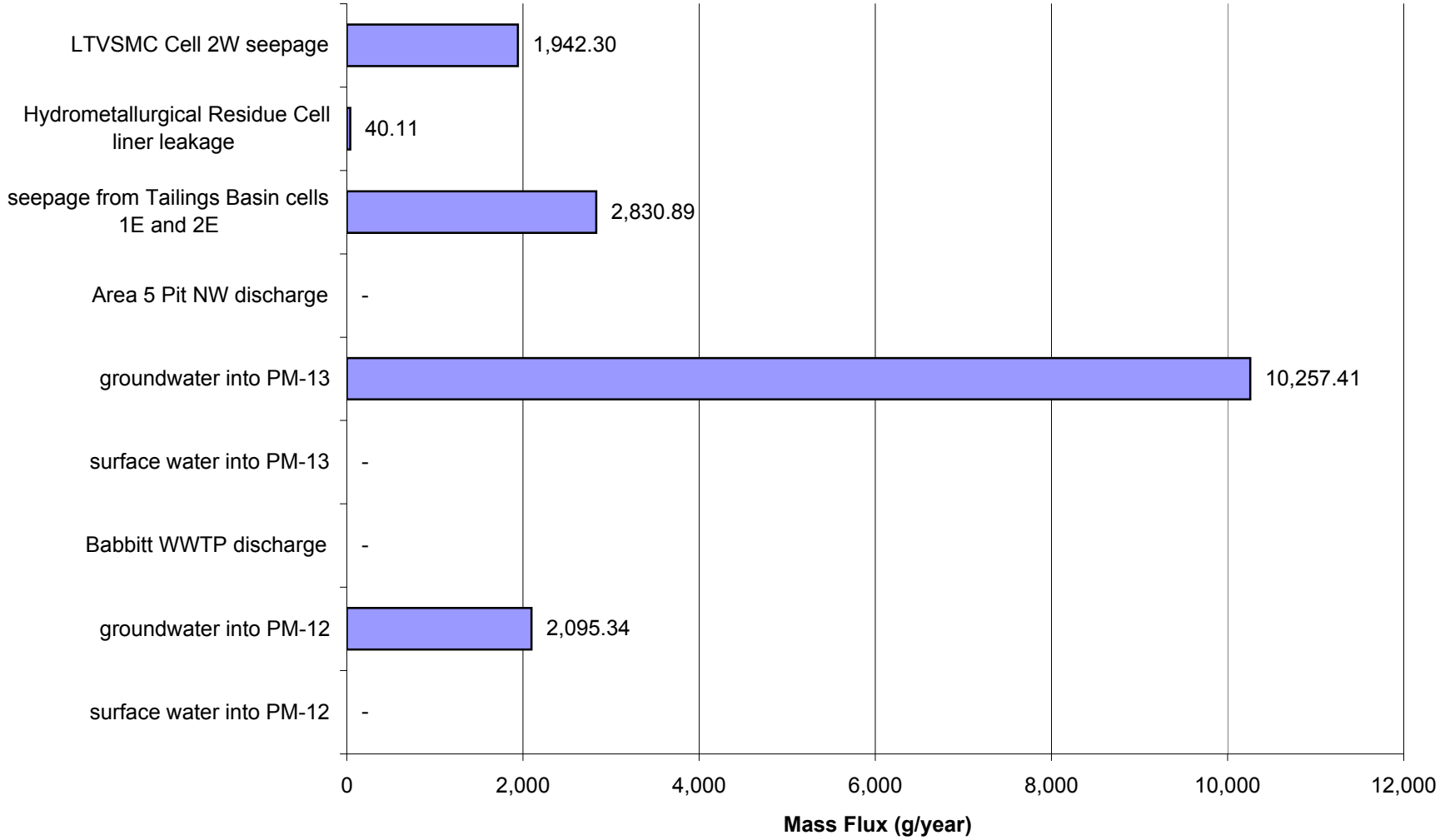
Proposed Action: Mass Flux (kg/year) of Impacts at PM-13 in Year 5 for High Flow for Sulfate (SO_4)



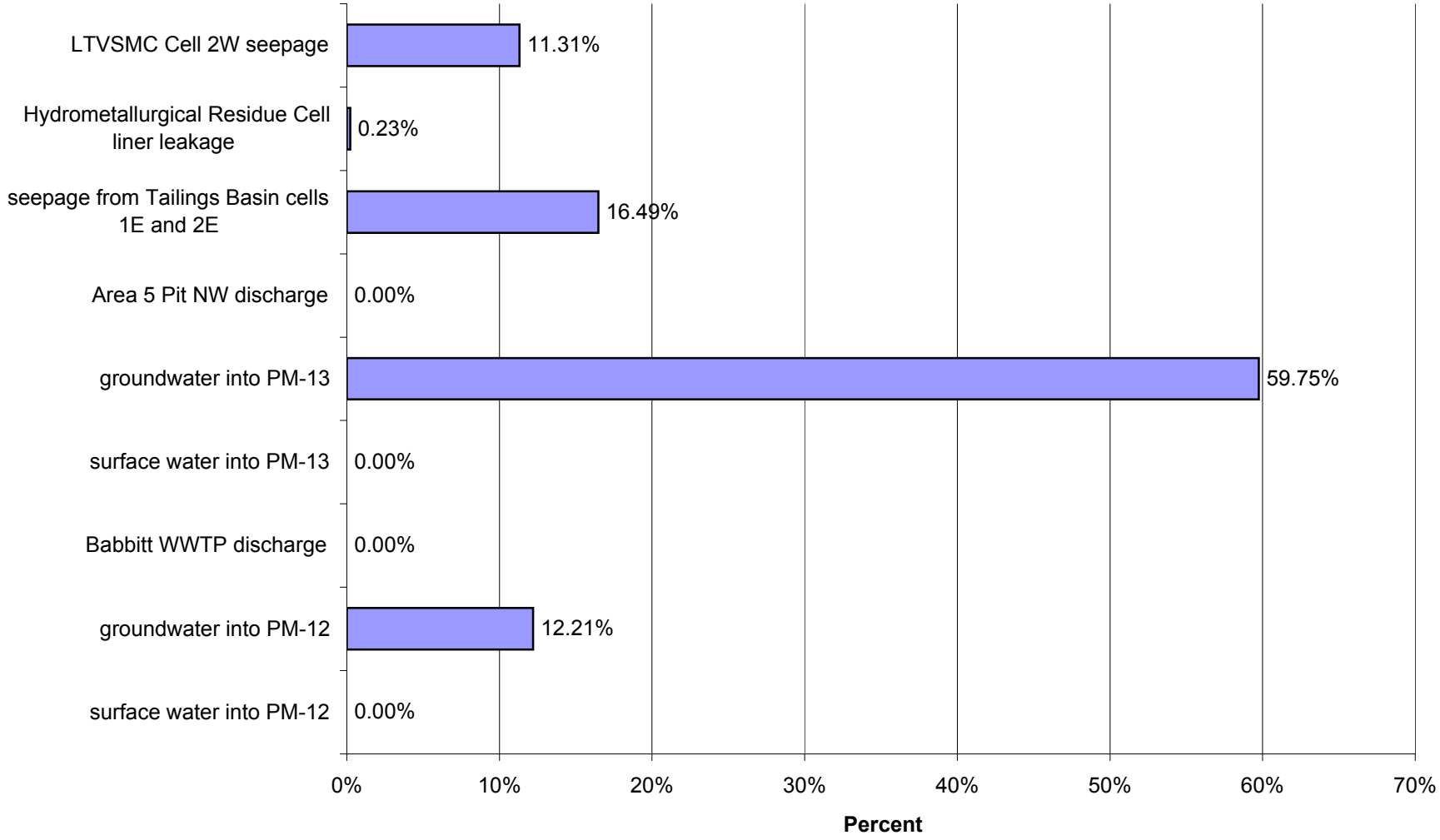
Proposed Action: Percent of Impacts at PM-13 in Year 5 for High Flow for Sulfate (SO_4)



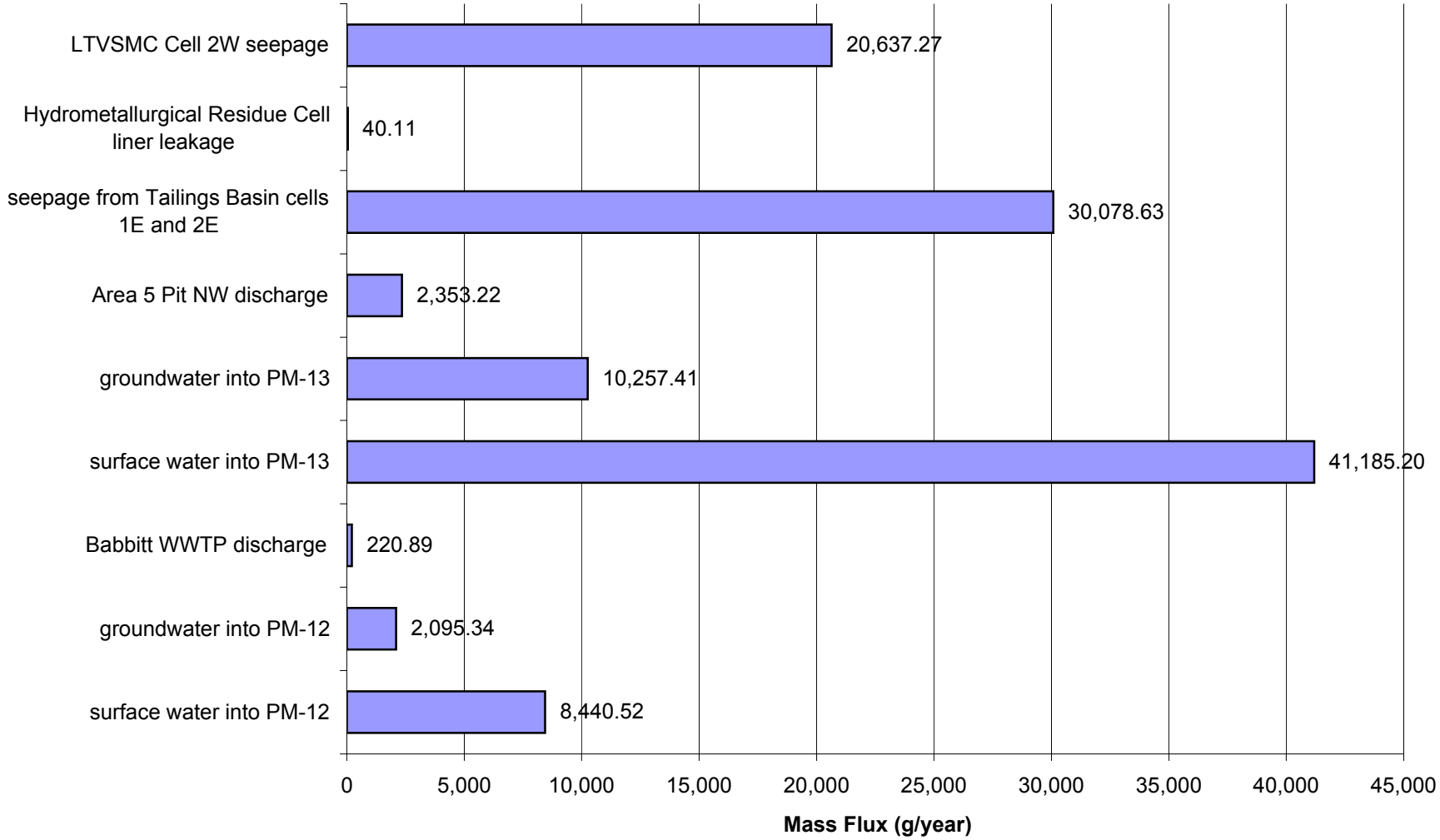
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 8 for Low Flow for Arsenic (As)



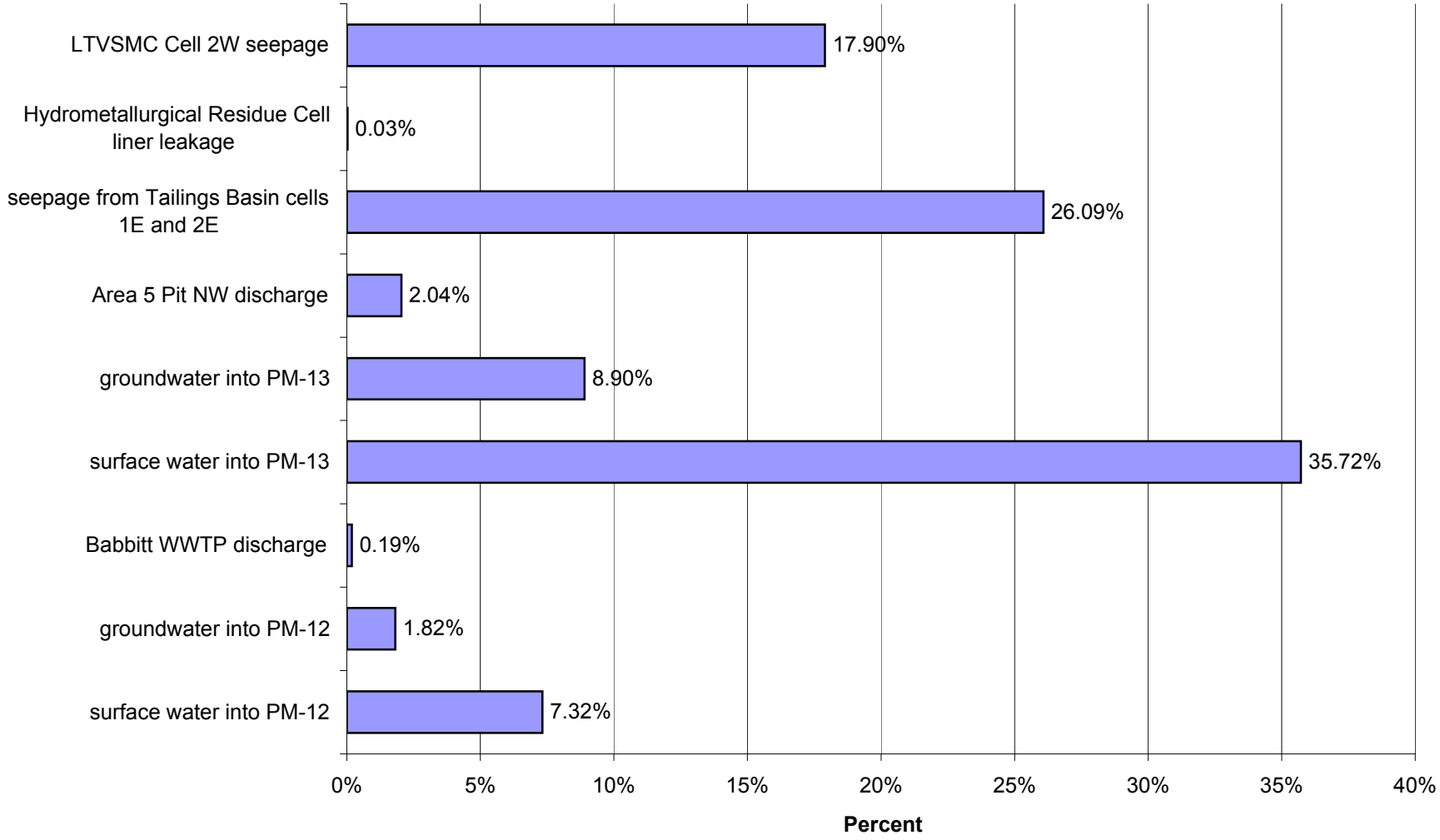
Proposed Action: Percent of Impacts at PM-13 in Year 8 for Low Flow for Arsenic (As)



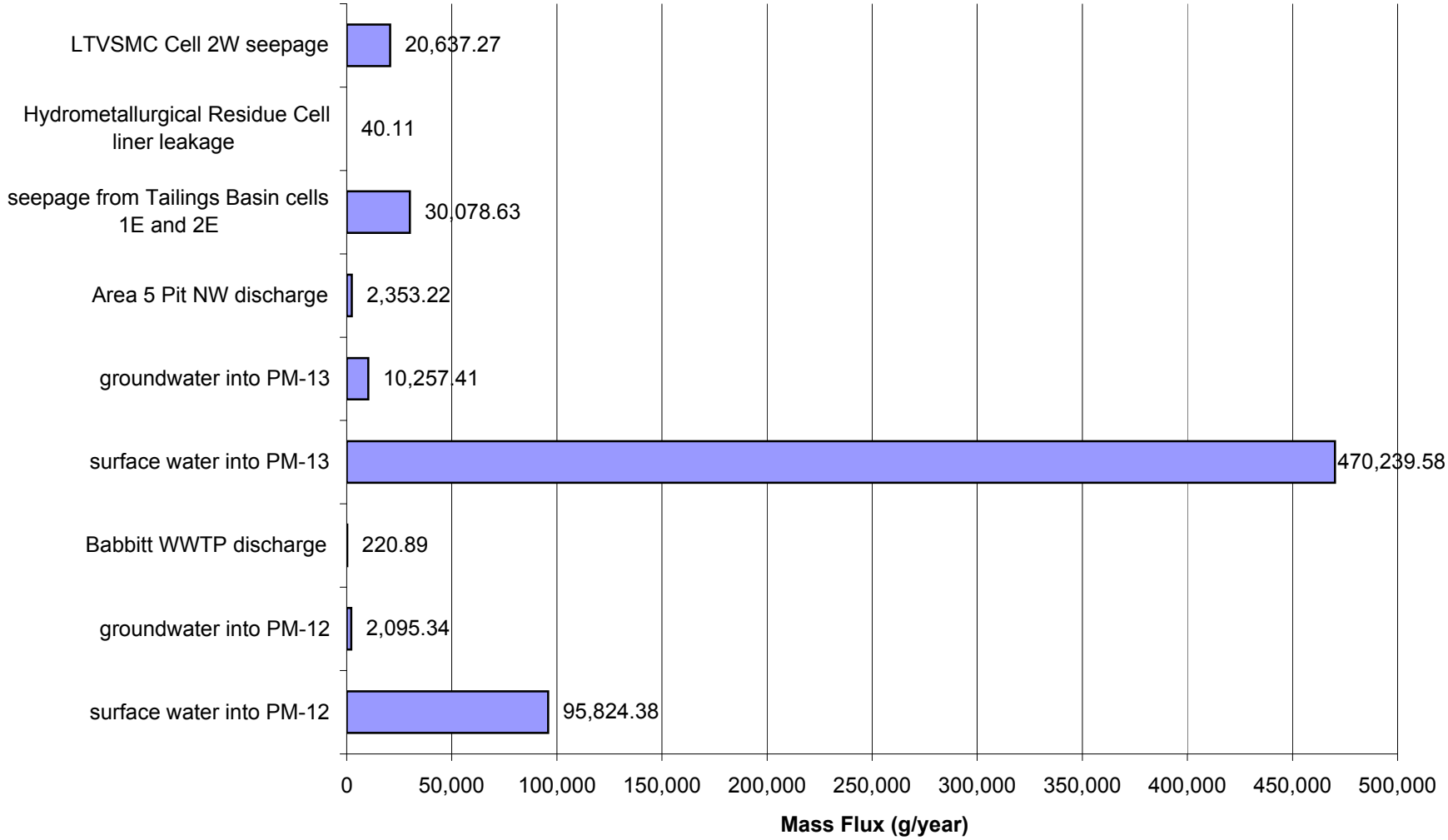
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 8 for Average Flow for Arsenic (As)



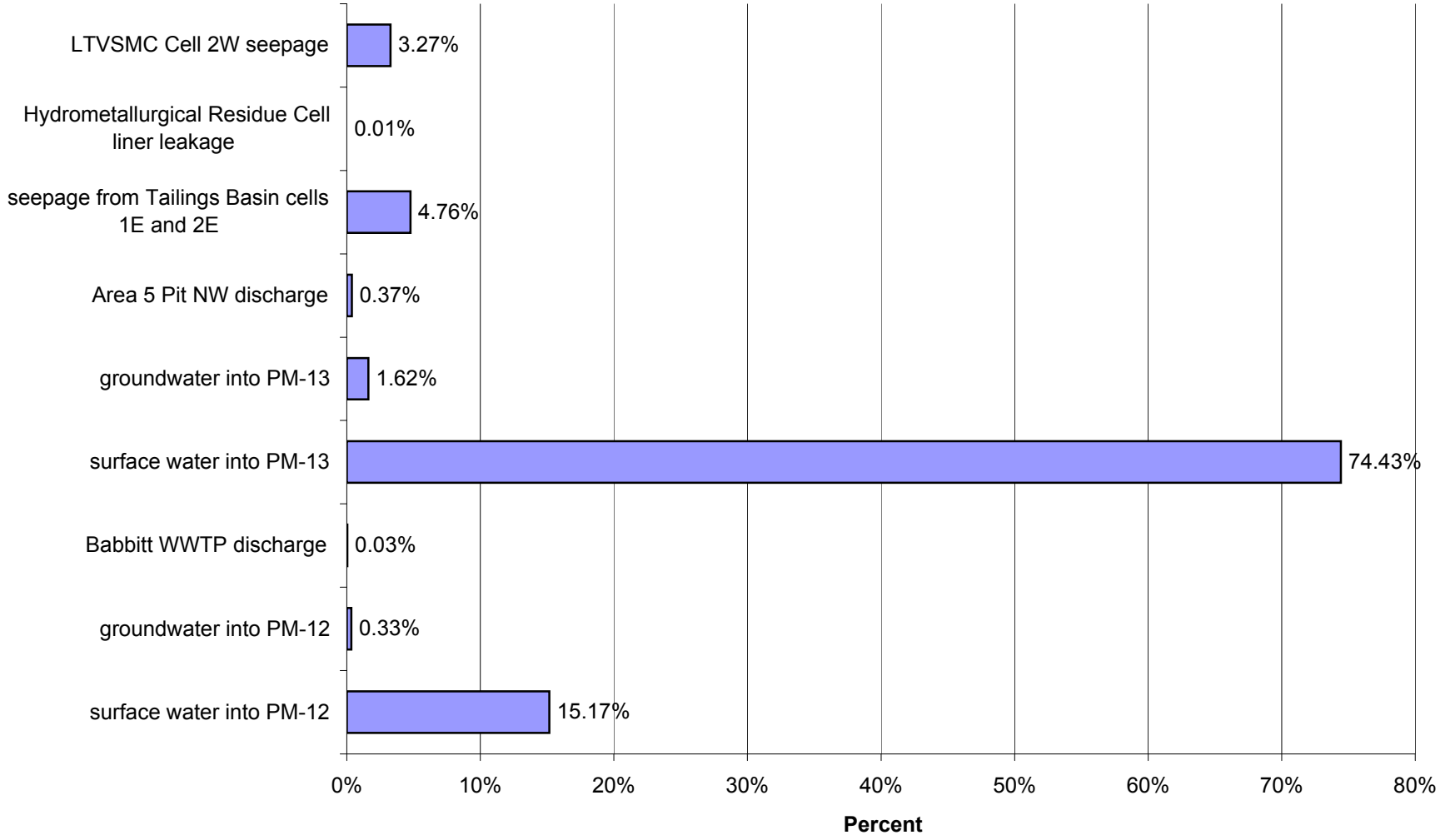
Proposed Action: Percent of Impacts at PM-13 in Year 8 for Average Flow for Arsenic (As)



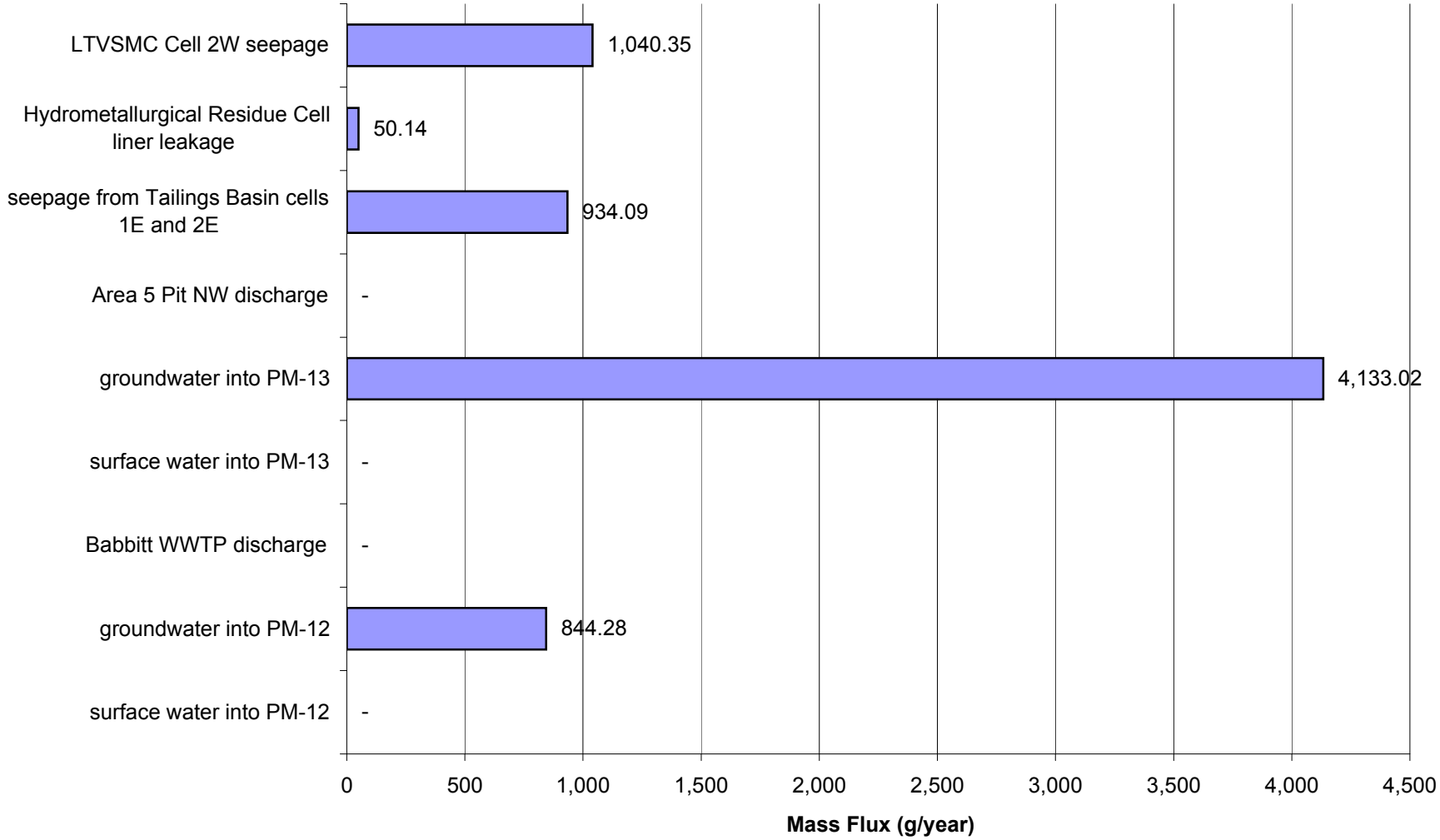
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 8 for High Flow for Arsenic (As)



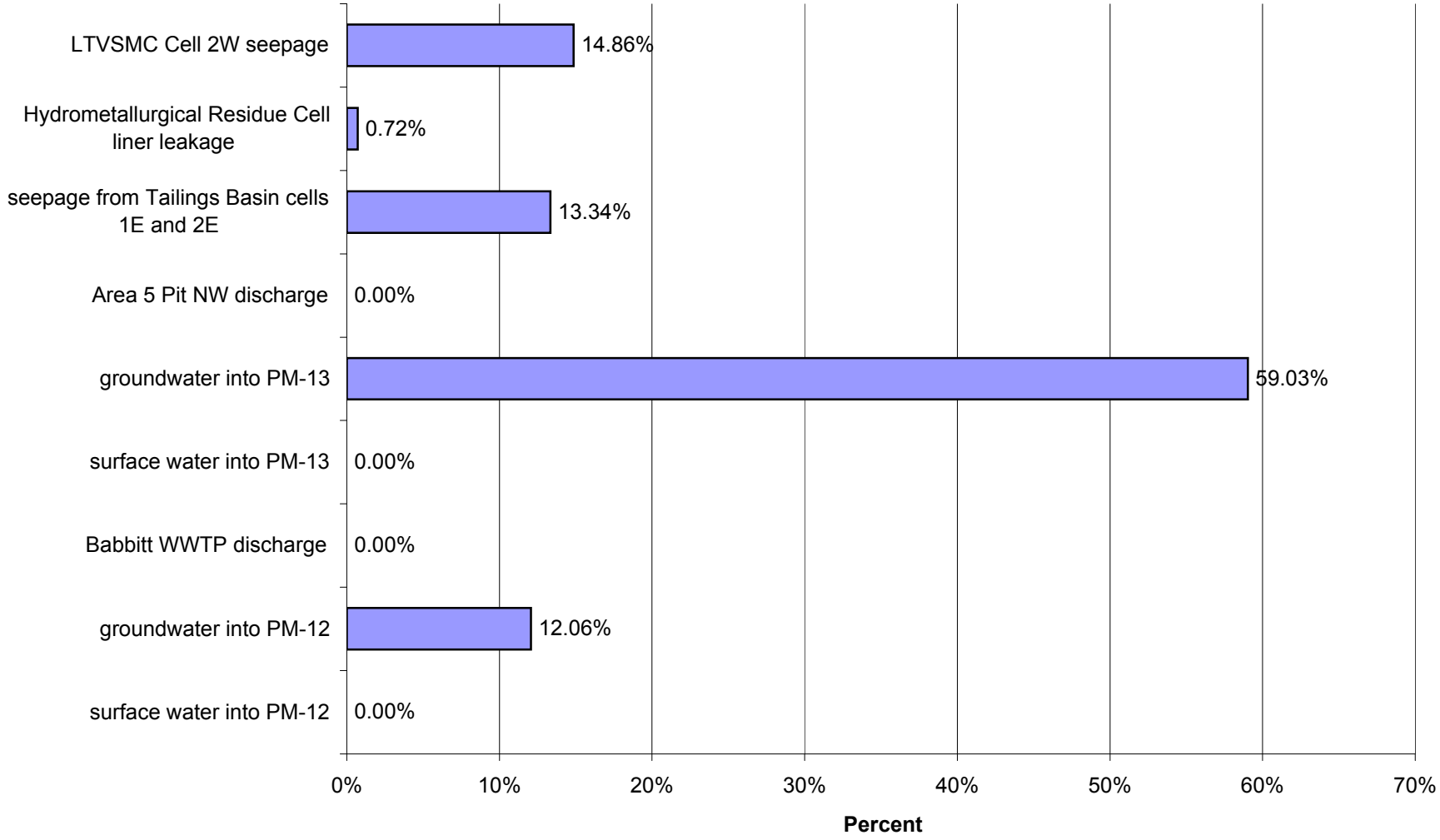
Proposed Action: Percent of Impacts at PM-13 in Year 8 for High Flow for Arsenic (As)



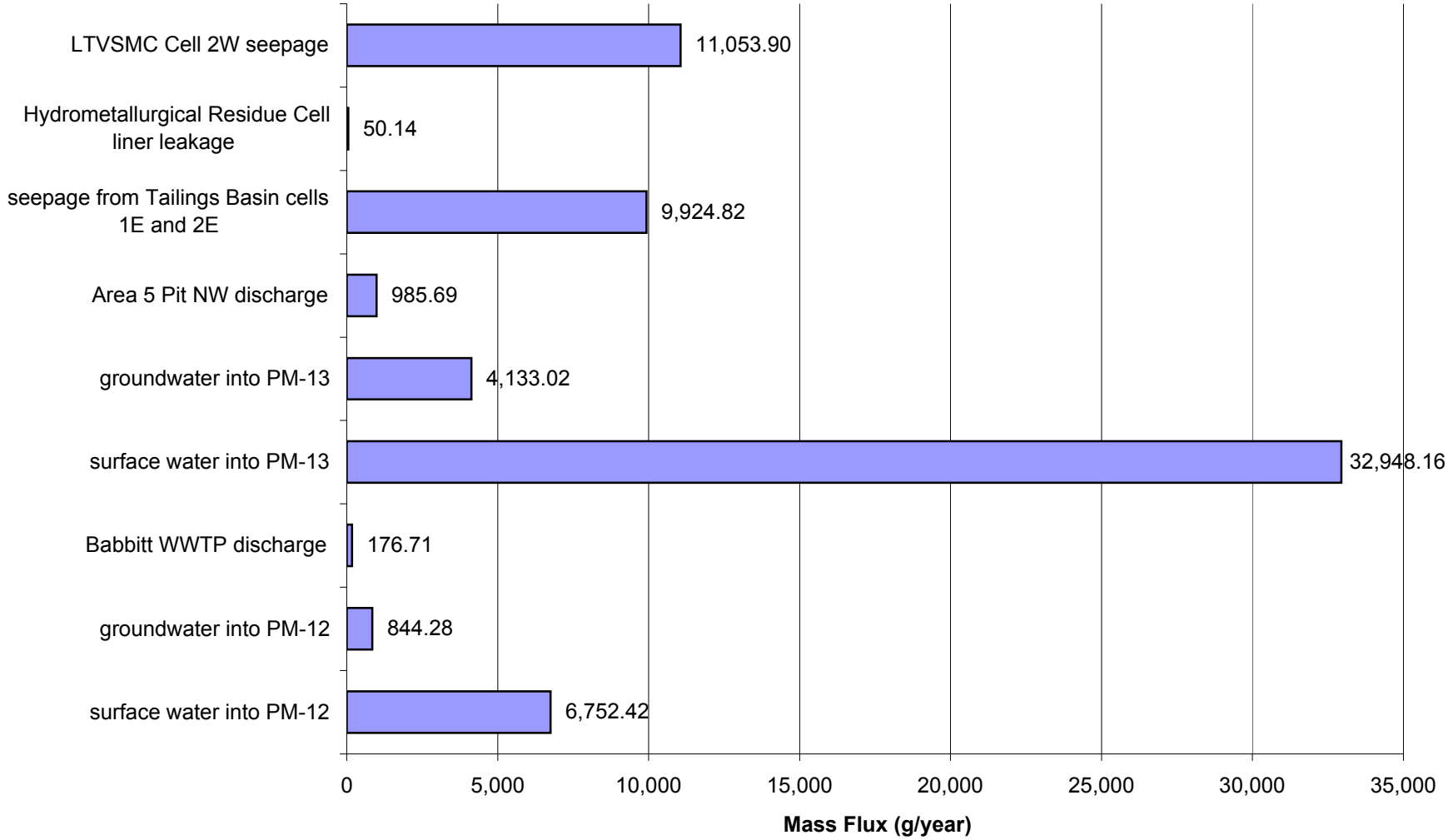
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 8 for Low Flow for Cobalt (Co)



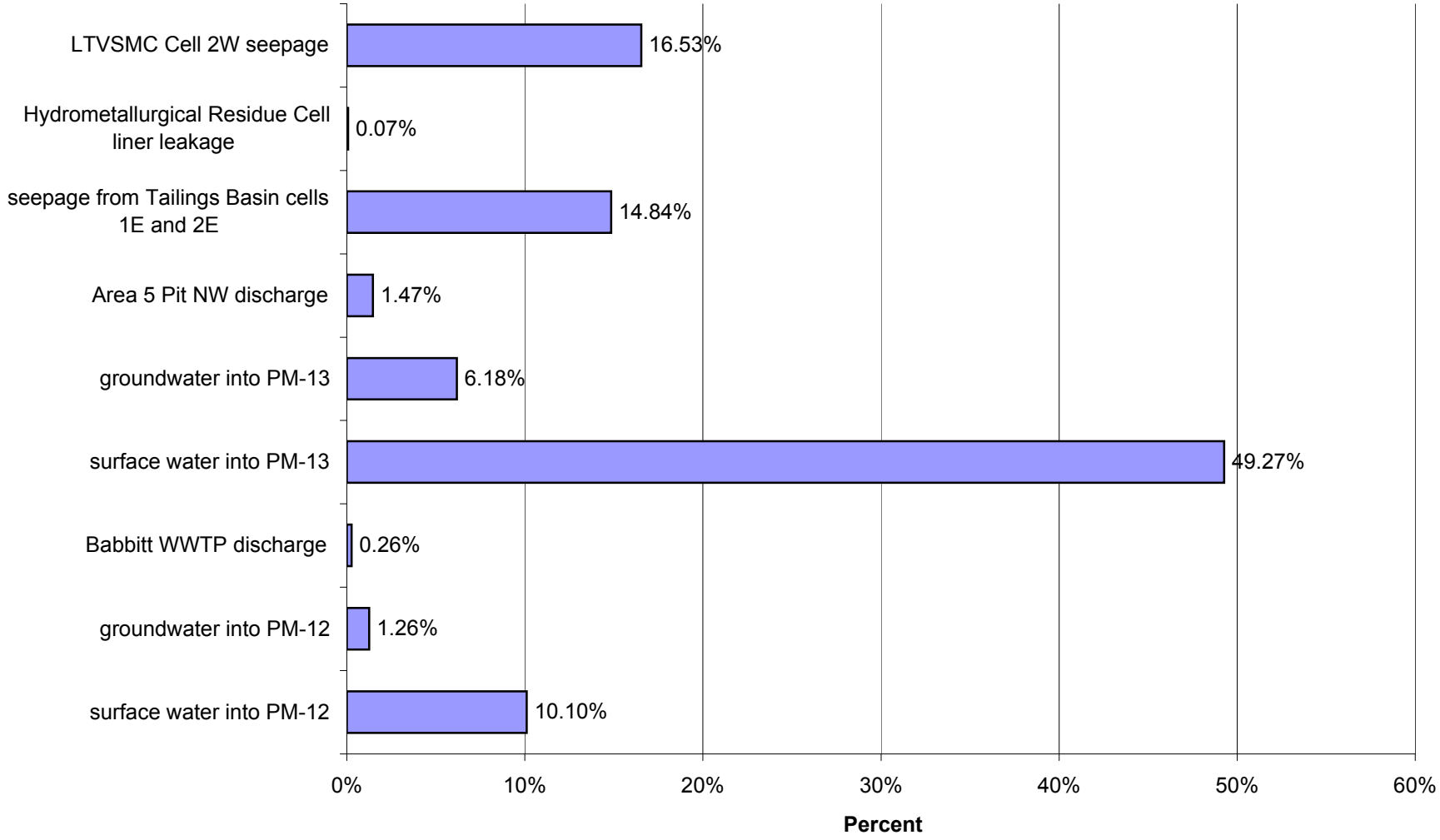
Proposed Action: Percent of Impacts at PM-13 in Year 8 for Low Flow for Cobalt (Co)



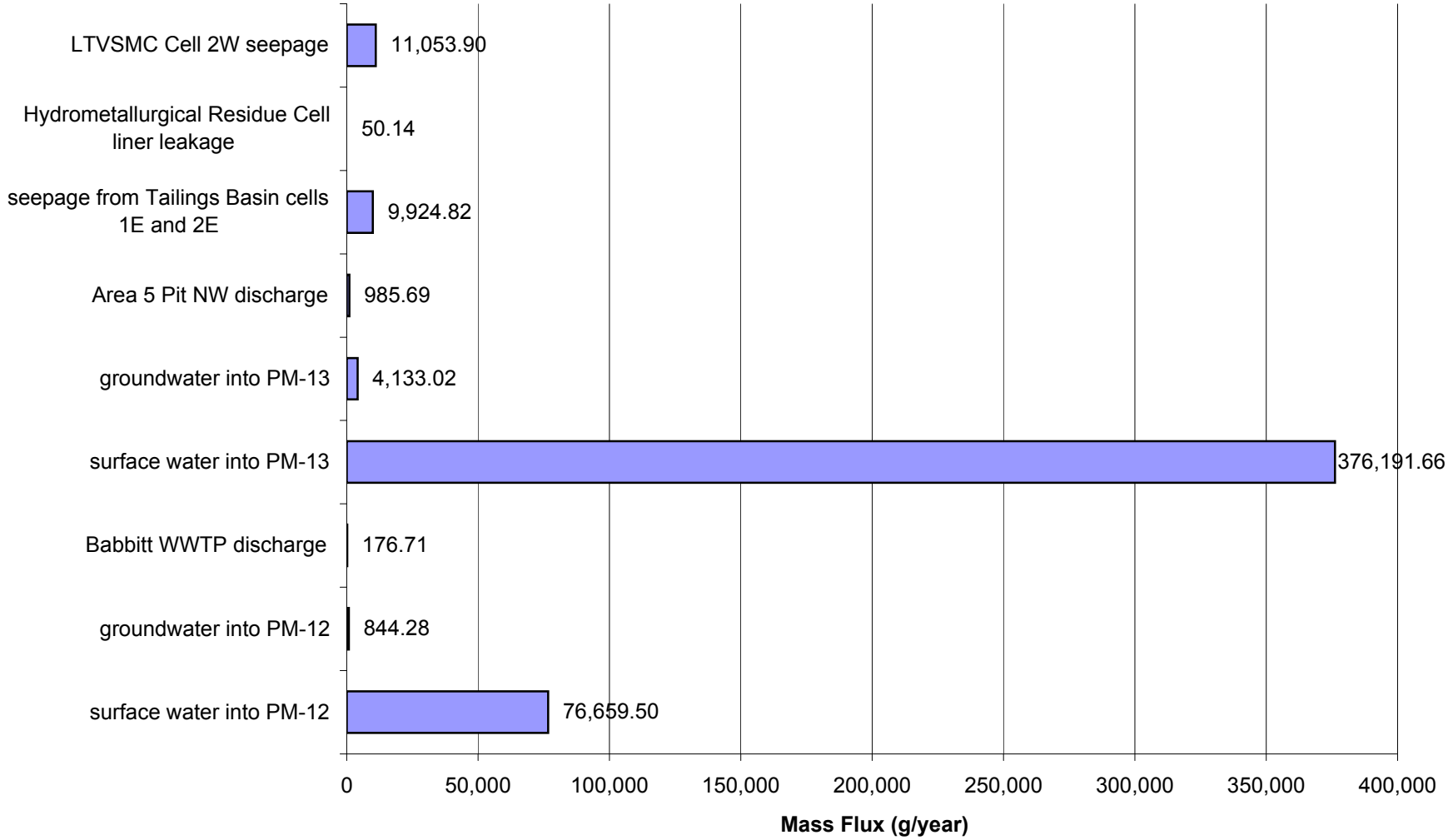
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 8 for Average Flow for Cobalt (Co)



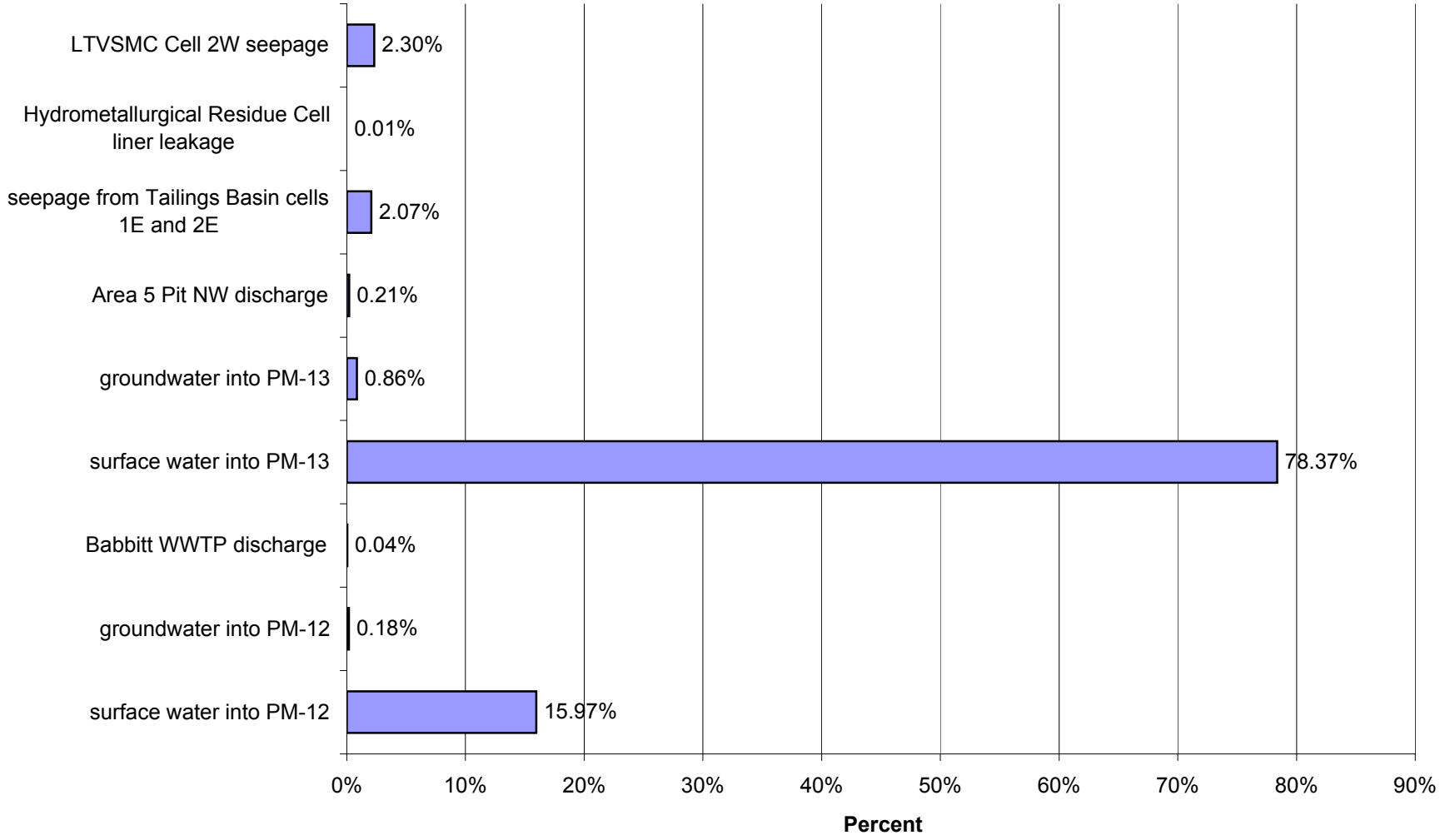
Proposed Action: Percent of Impacts at PM-13 in Year 8 for Average Flow for Cobalt (Co)



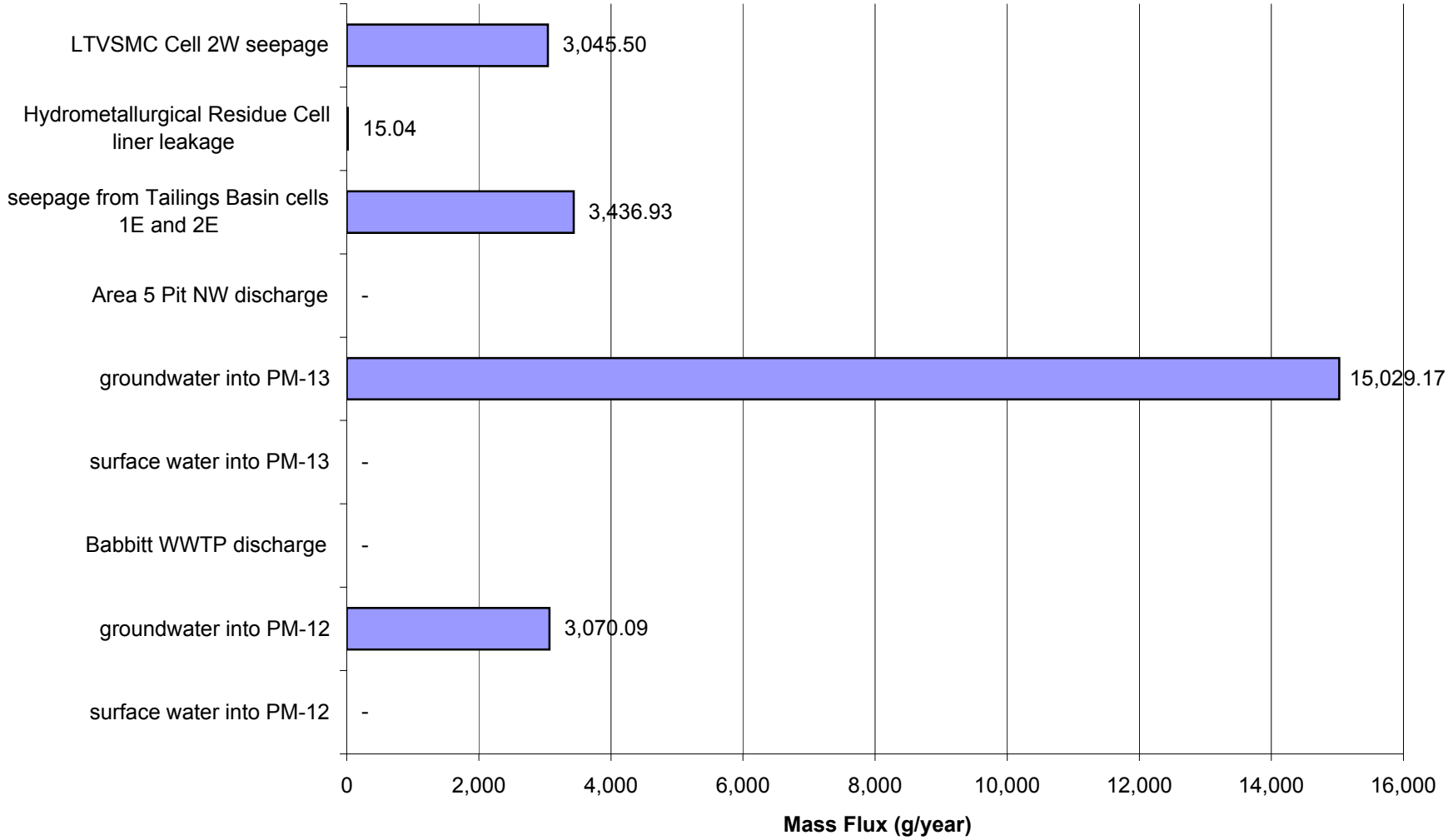
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 8 for High Flow for Cobalt (Co)



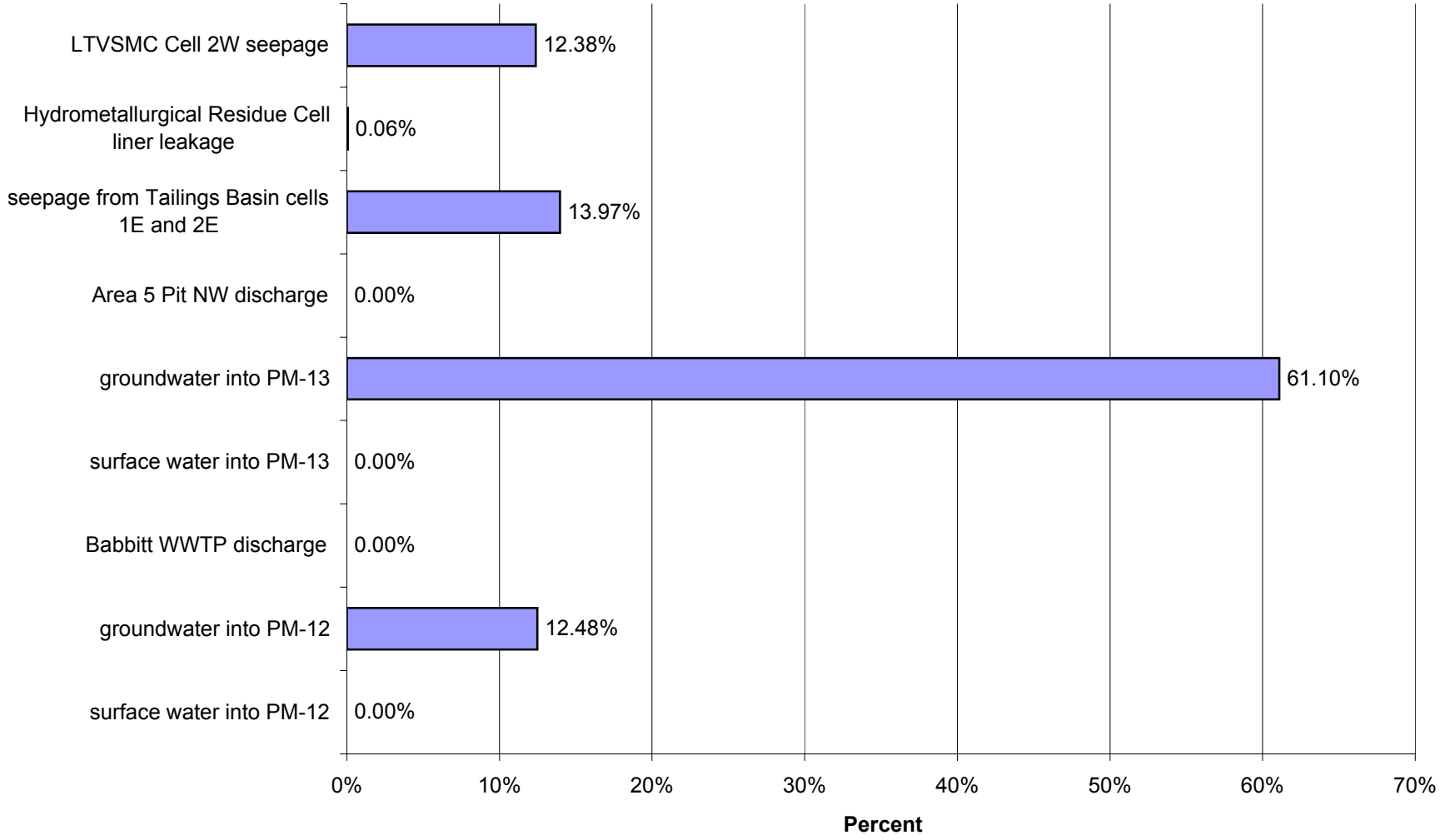
Proposed Action: Percent of Impacts at PM-13 in Year 8 for High Flow for Cobalt (Co)



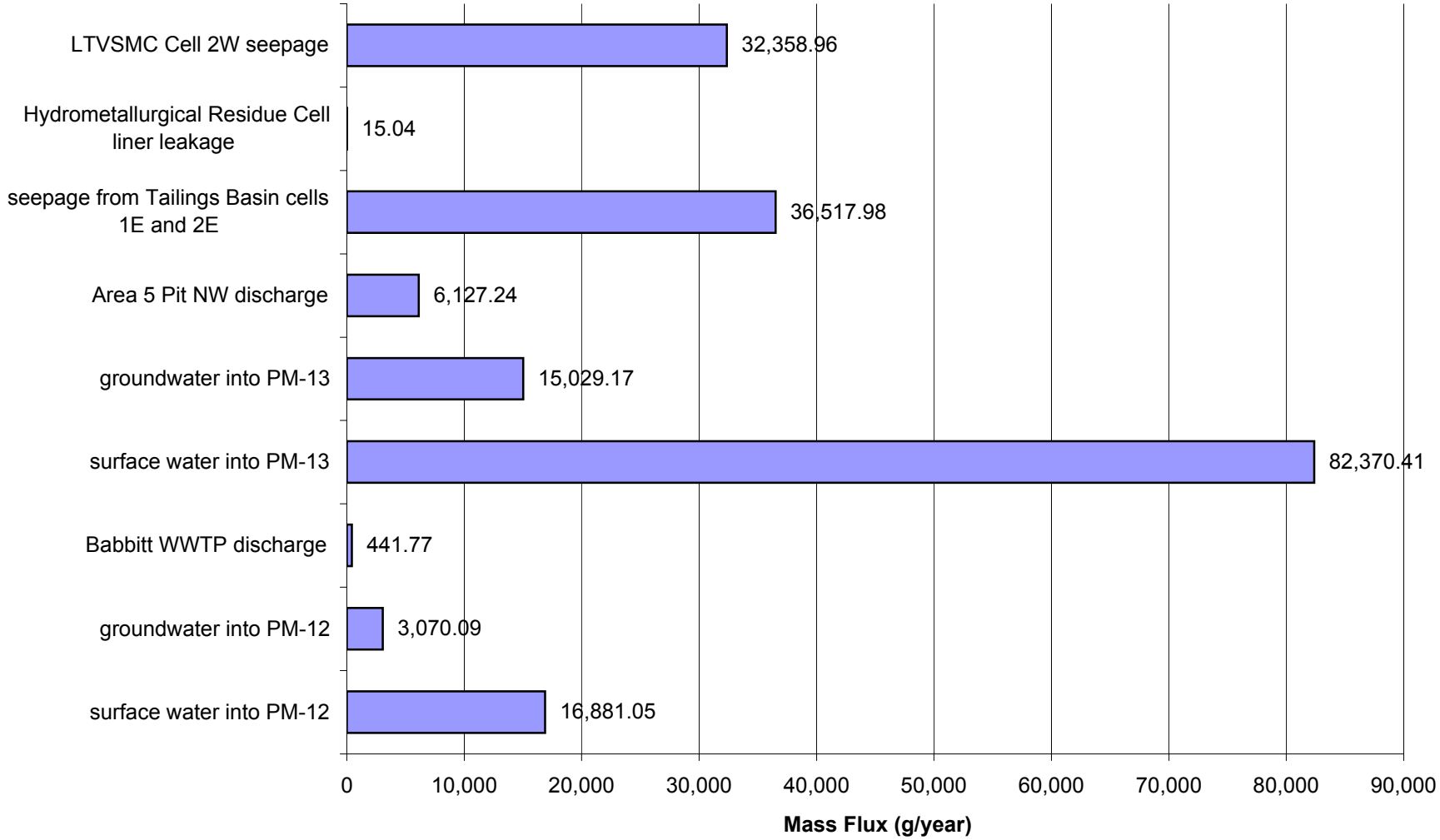
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 8 for Low Flow for Copper (Cu)



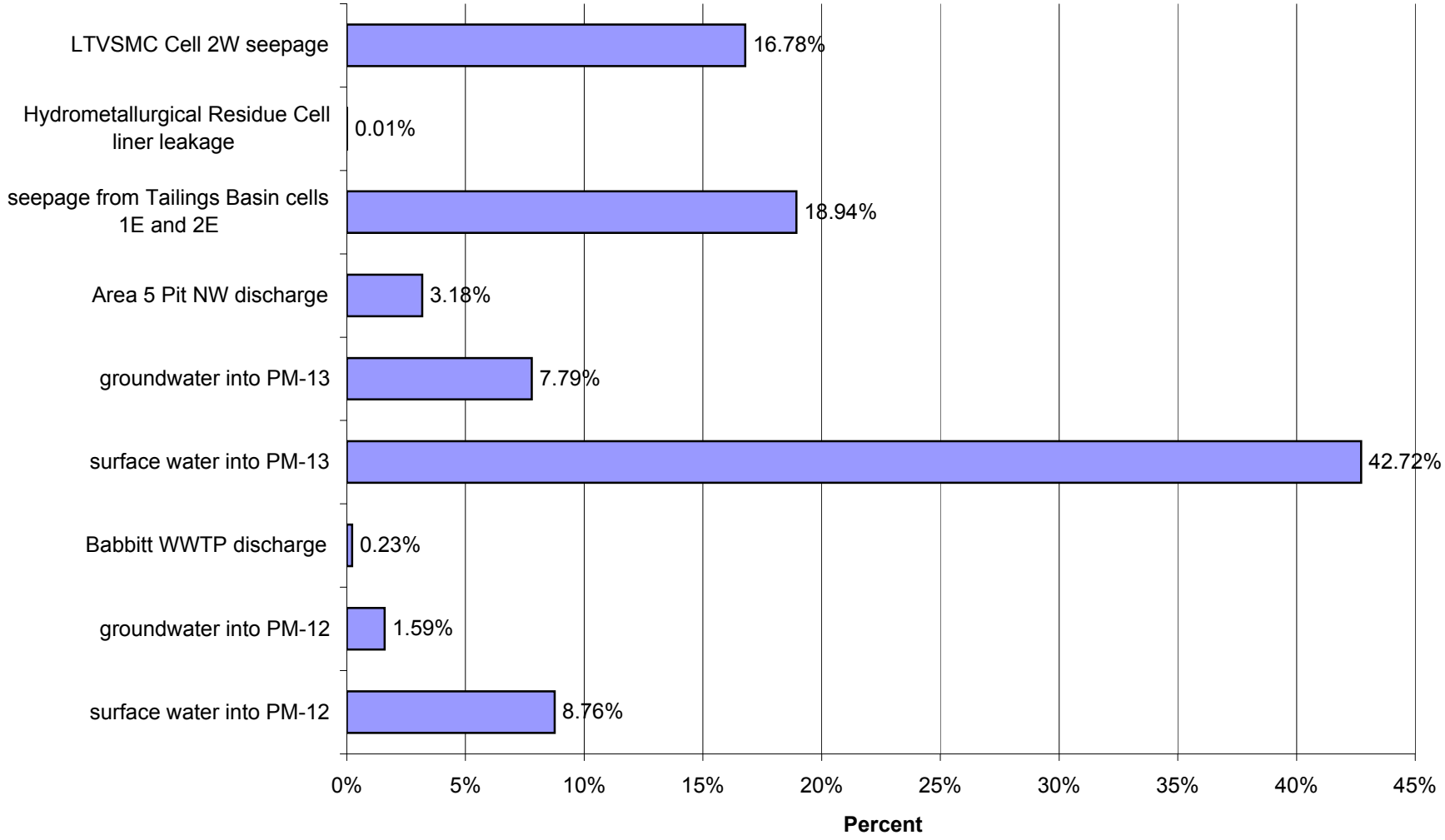
Proposed Action: Percent of Impacts at PM-13 in Year 8 for Low Flow for Copper (Cu)



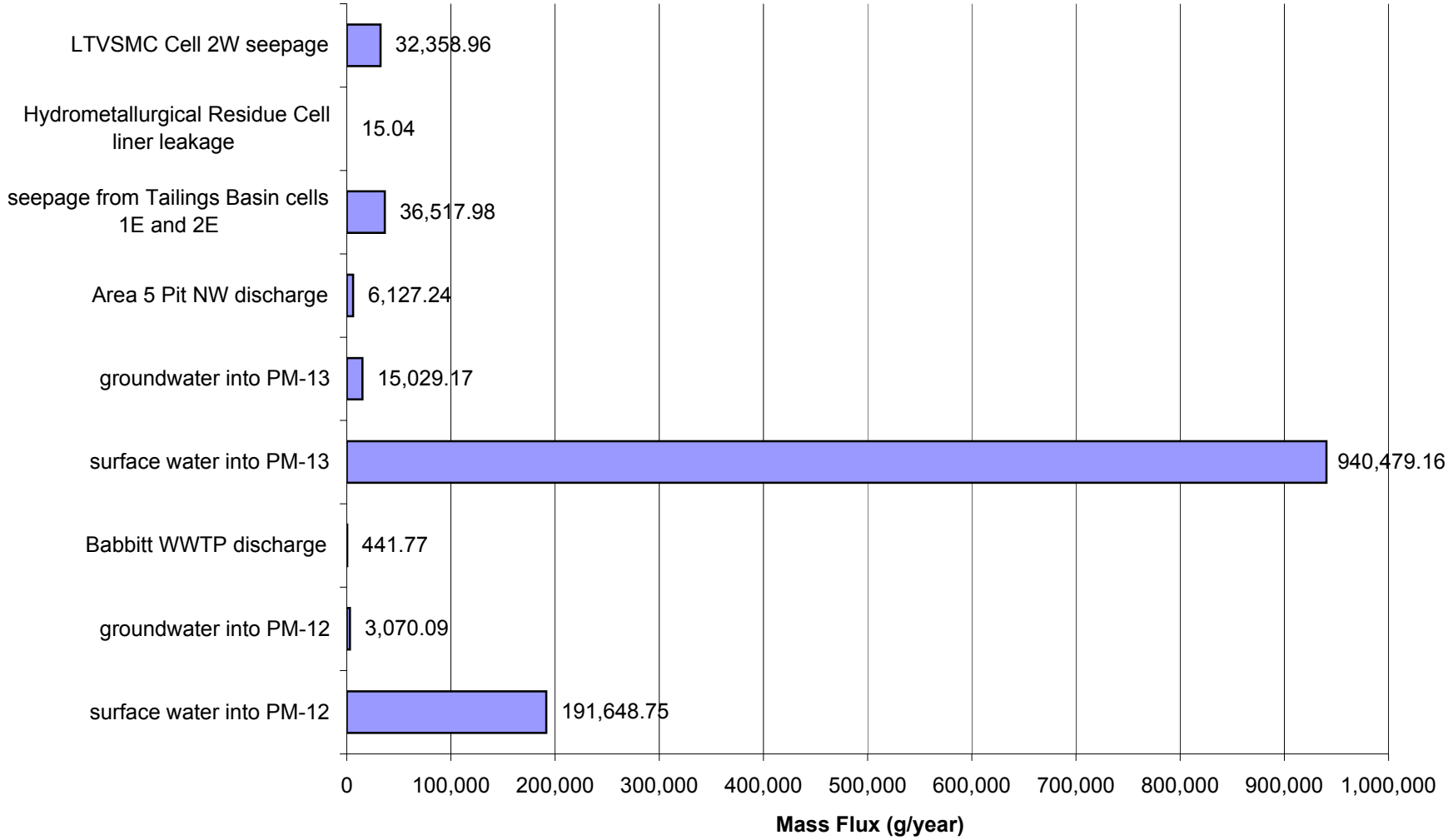
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 8 for Average Flow for Copper (Cu)



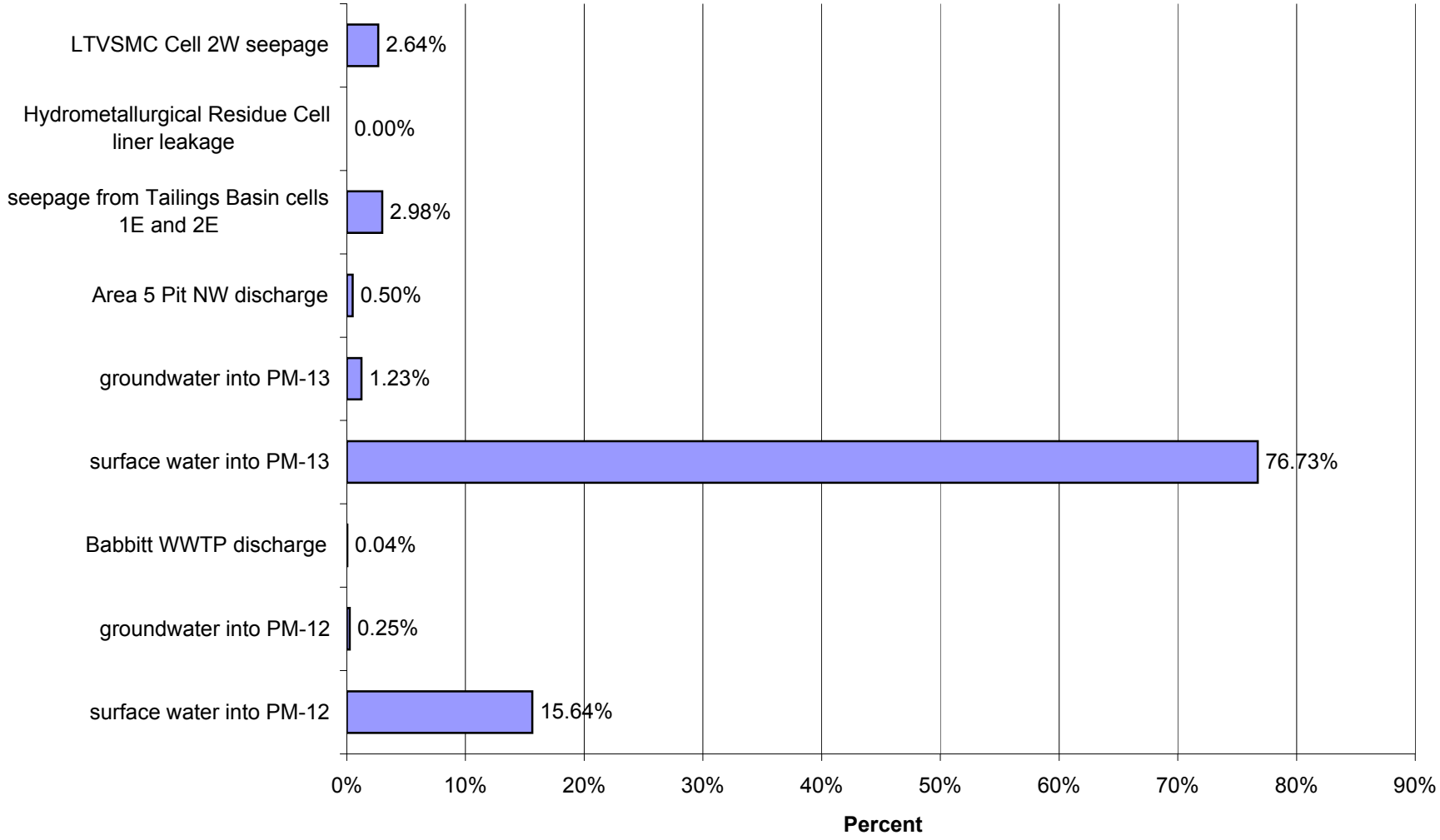
Proposed Action: Percent of Impacts at PM-13 in Year 8 for Average Flow for Copper (Cu)



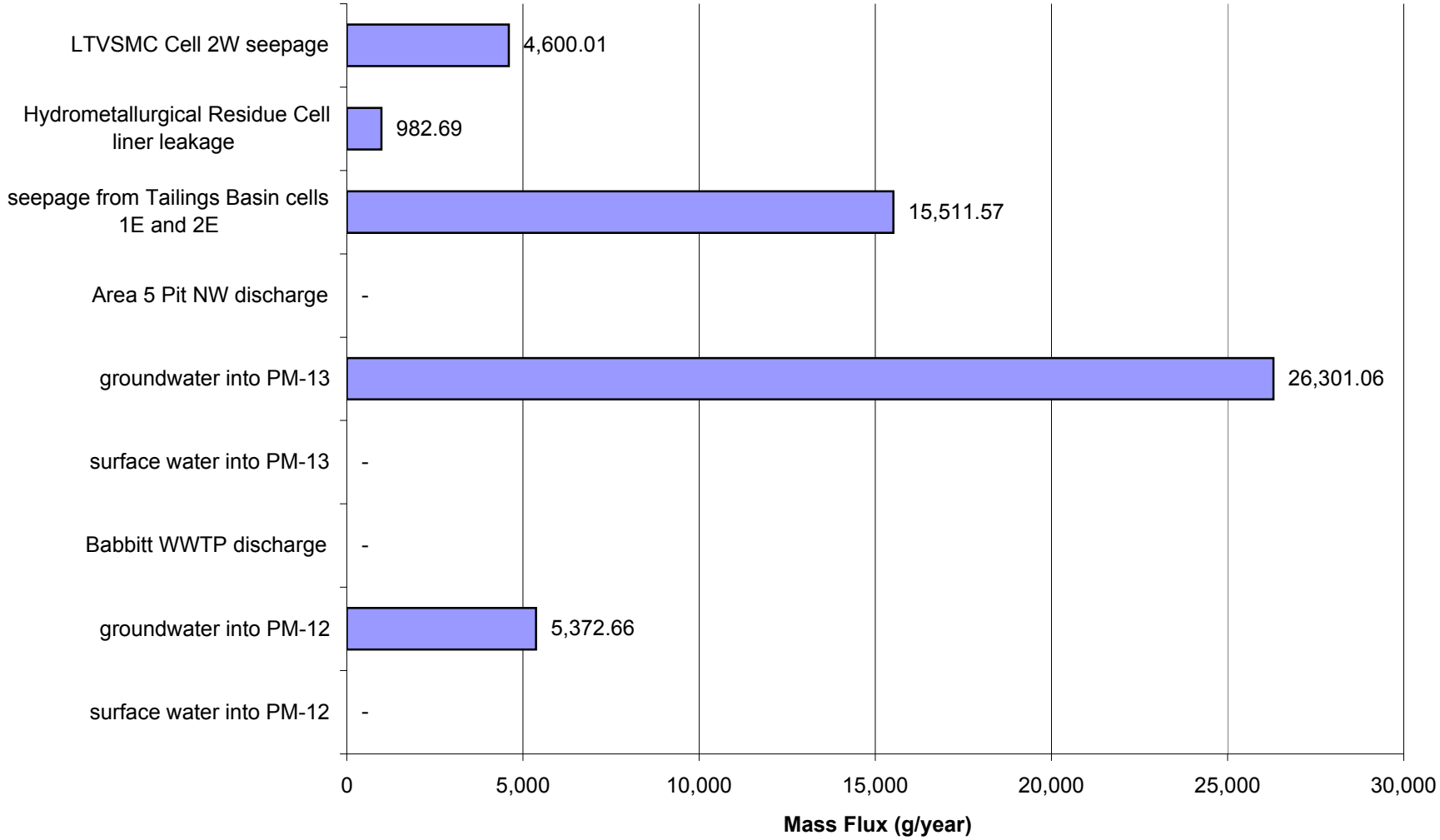
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 8 for High Flow for Copper (Cu)



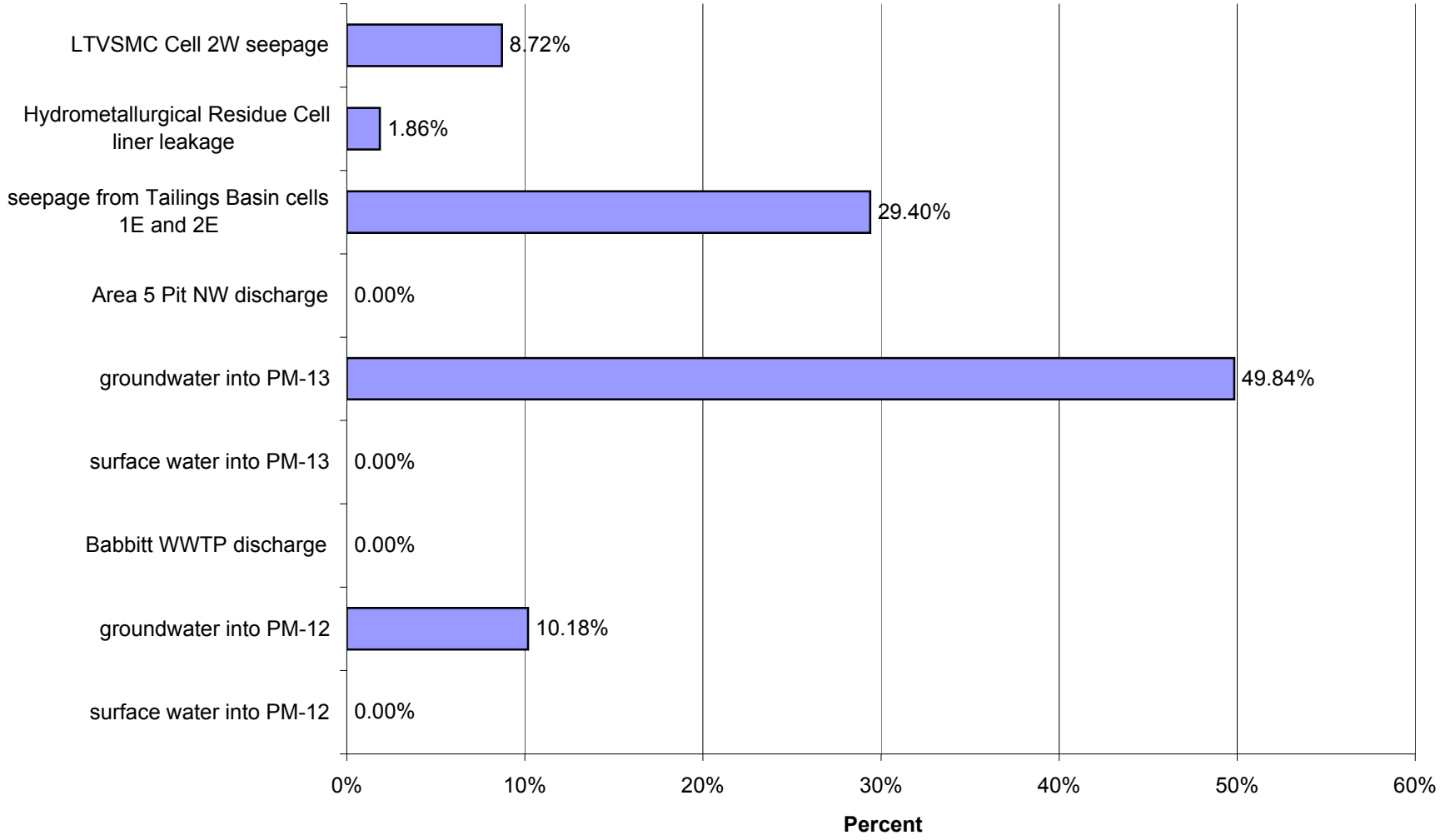
Proposed Action: Percent of Impacts at PM-13 in Year 8 for High Flow for Copper (Cu)



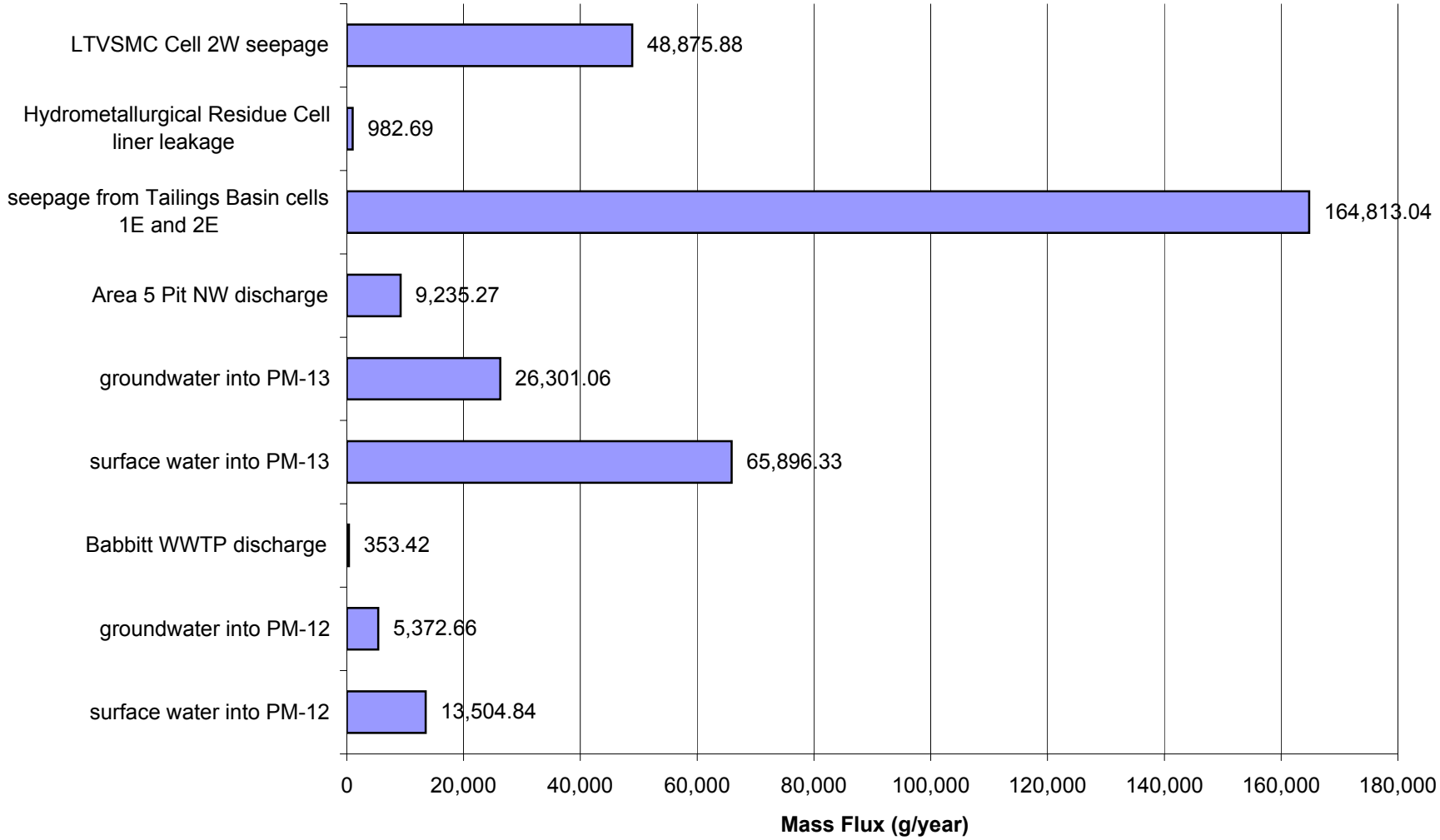
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 8 for Low Flow for Nickel (Ni)



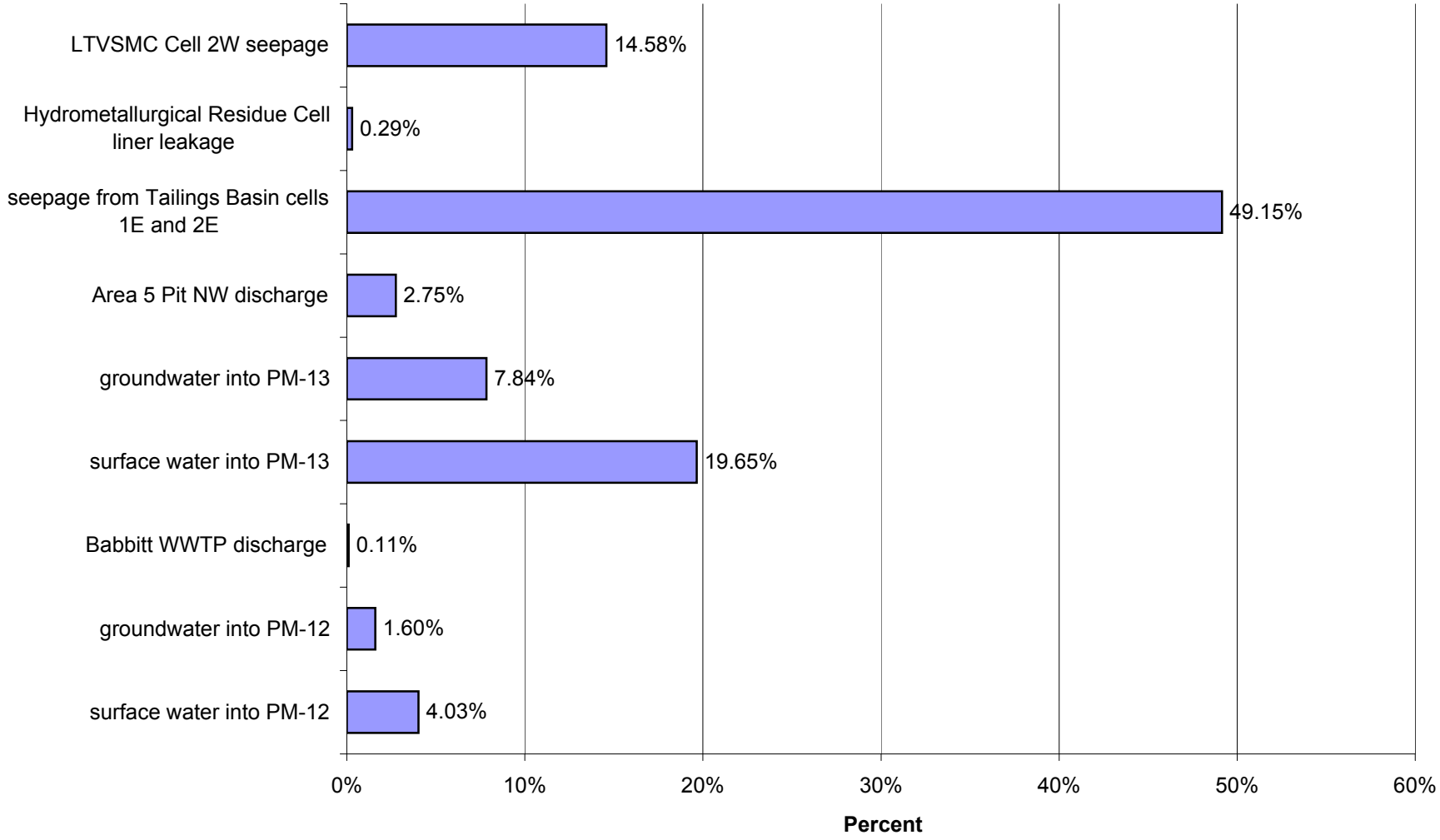
Proposed Action: Percent of Impacts at PM-13 in Year 8 for Low Flow for Nickel (Ni)



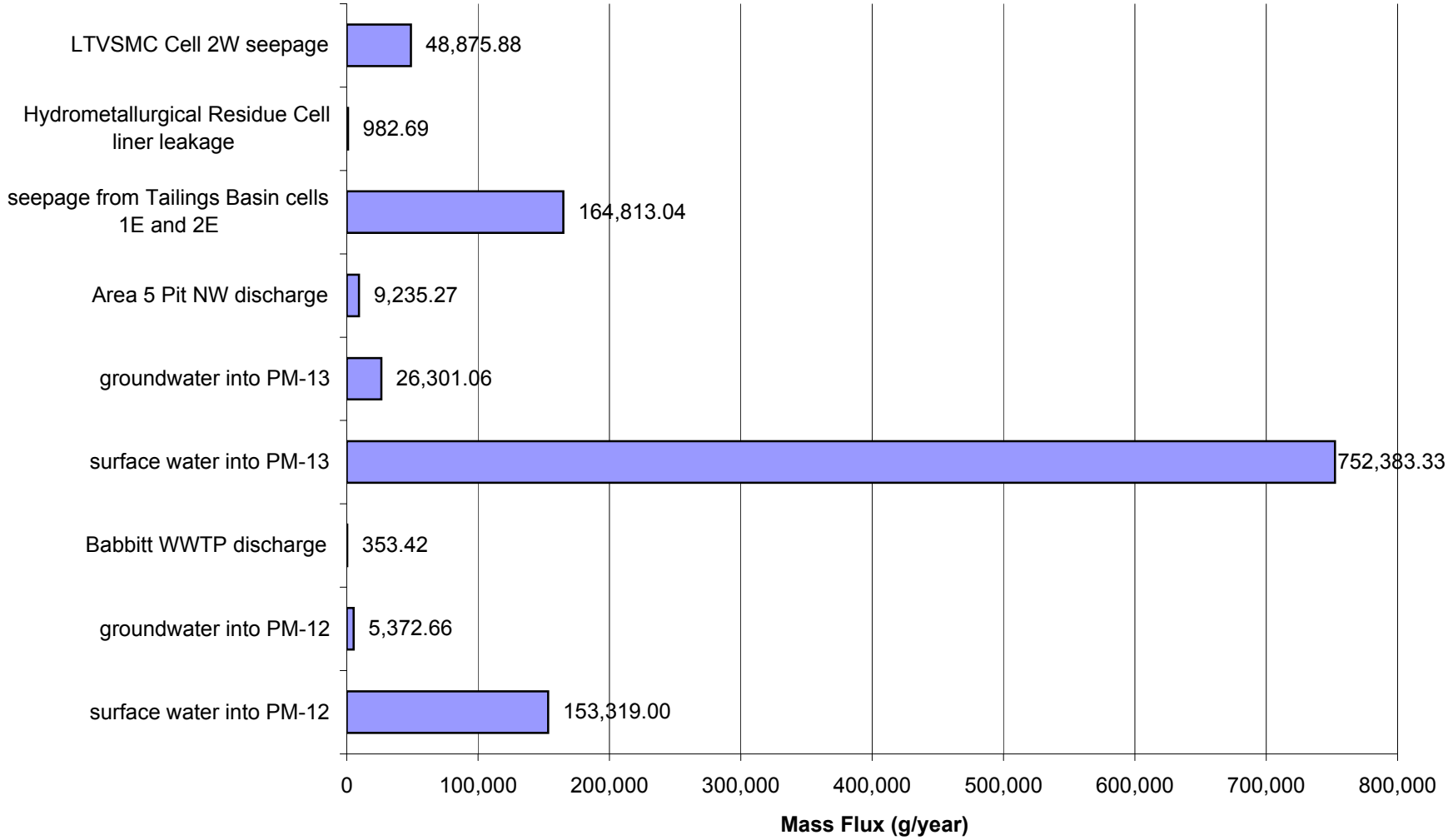
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 8 for Average Flow for Nickel (Ni)



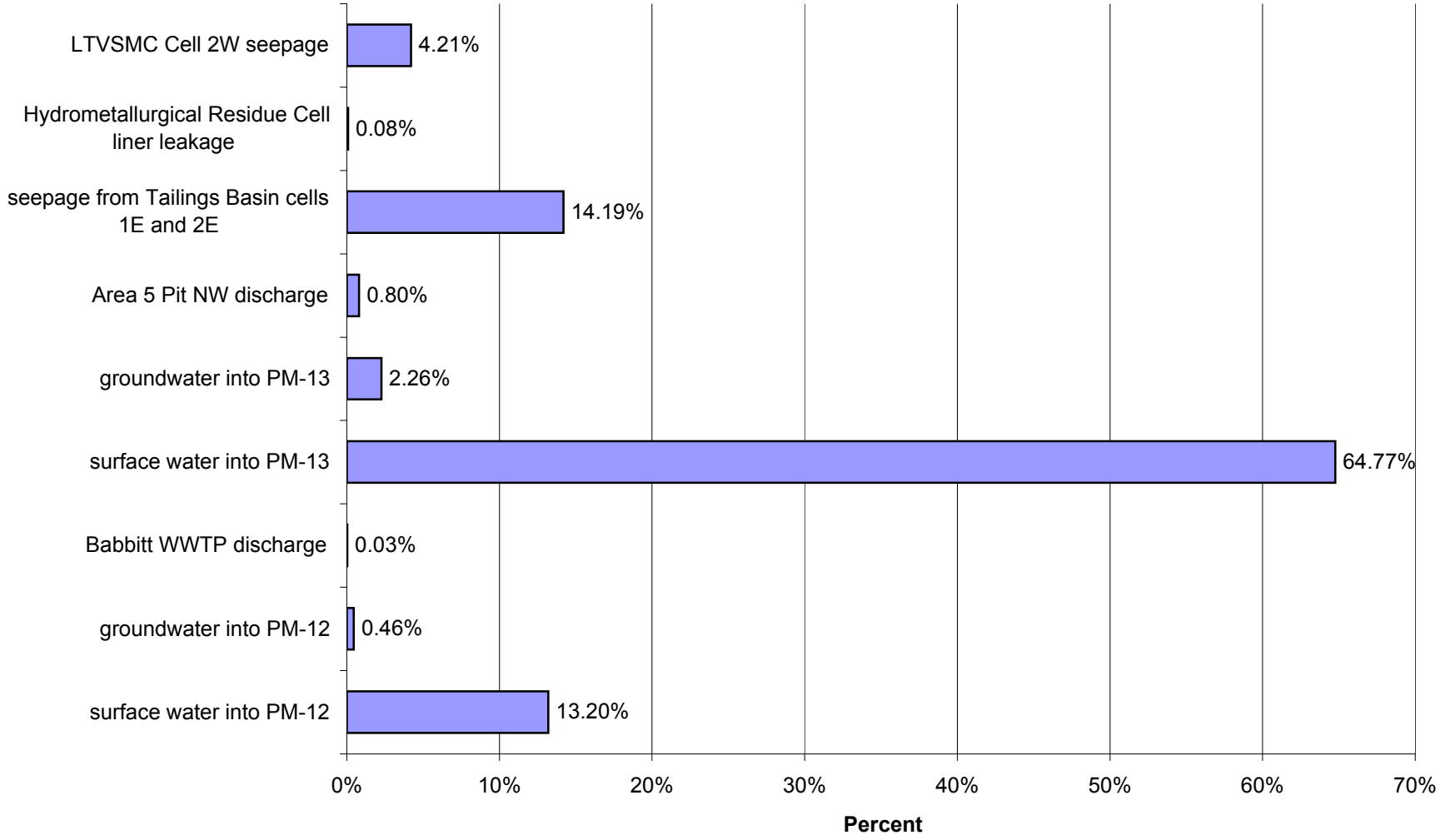
Proposed Action: Percent of Impacts at PM-13 in Year 8 for Average Flow for Nickel (Ni)



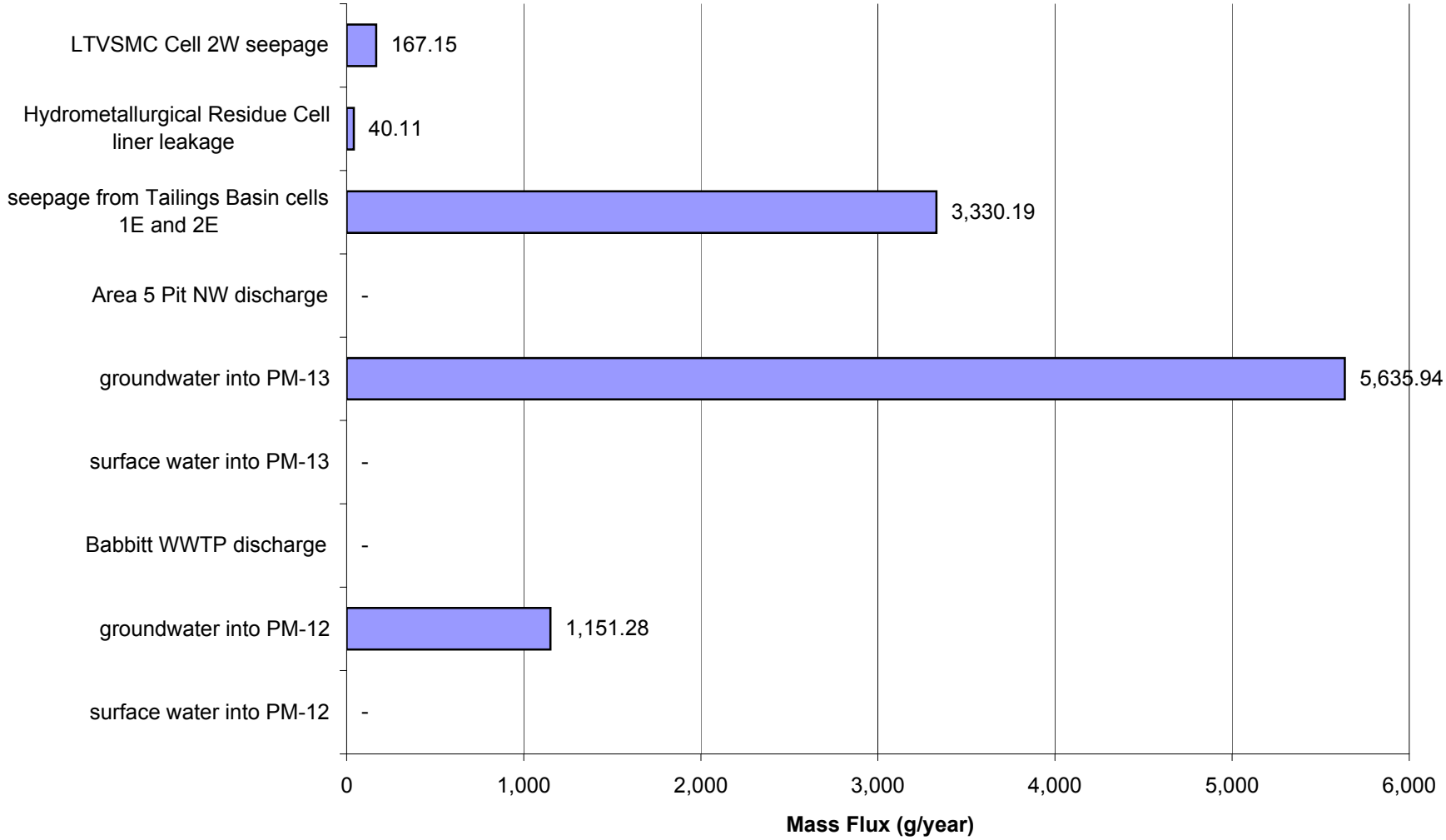
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 8 for High Flow for Nickel (Ni)



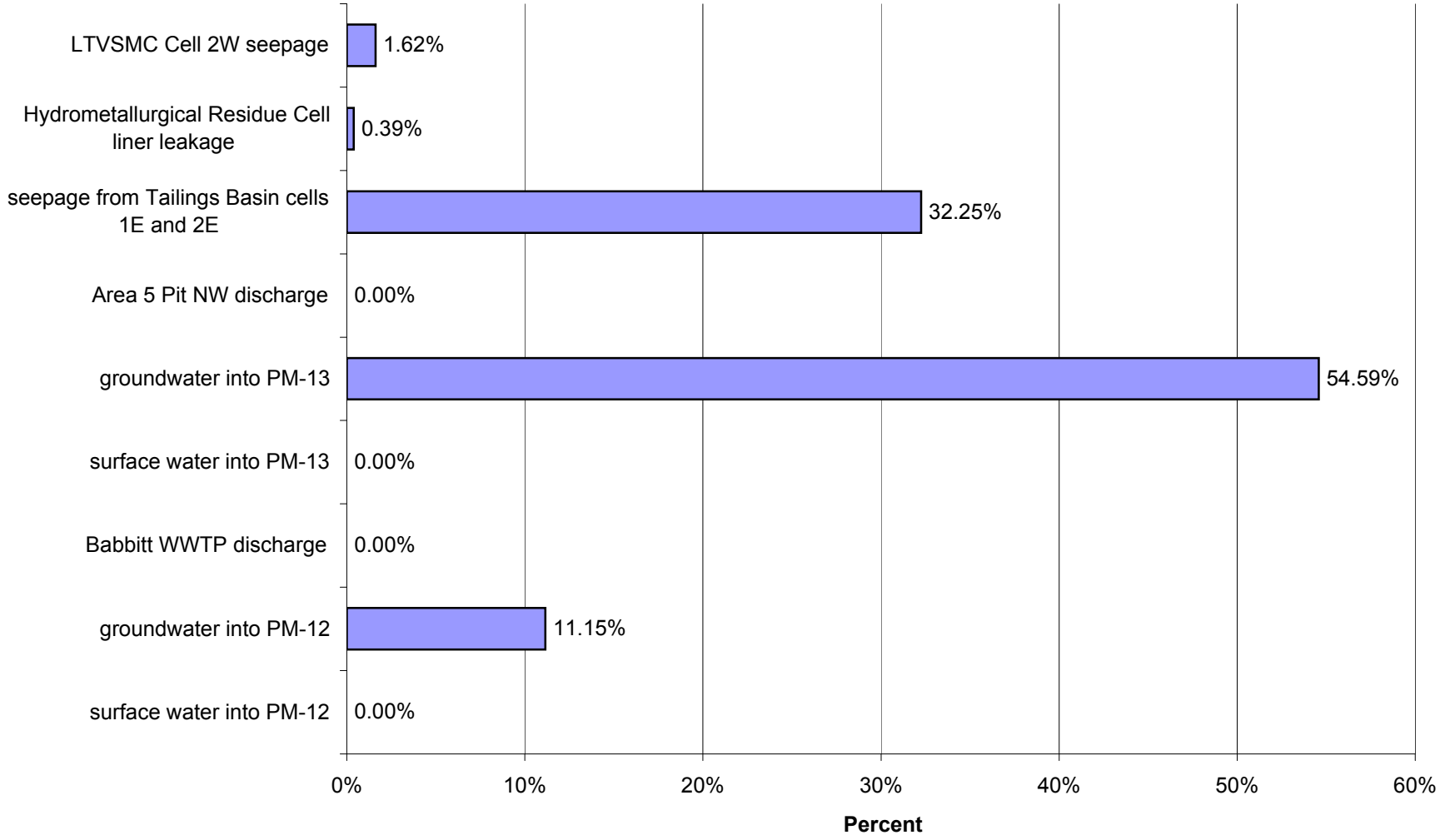
Proposed Action: Percent of Impacts at PM-13 in Year 8 for High Flow for Nickel (Ni)



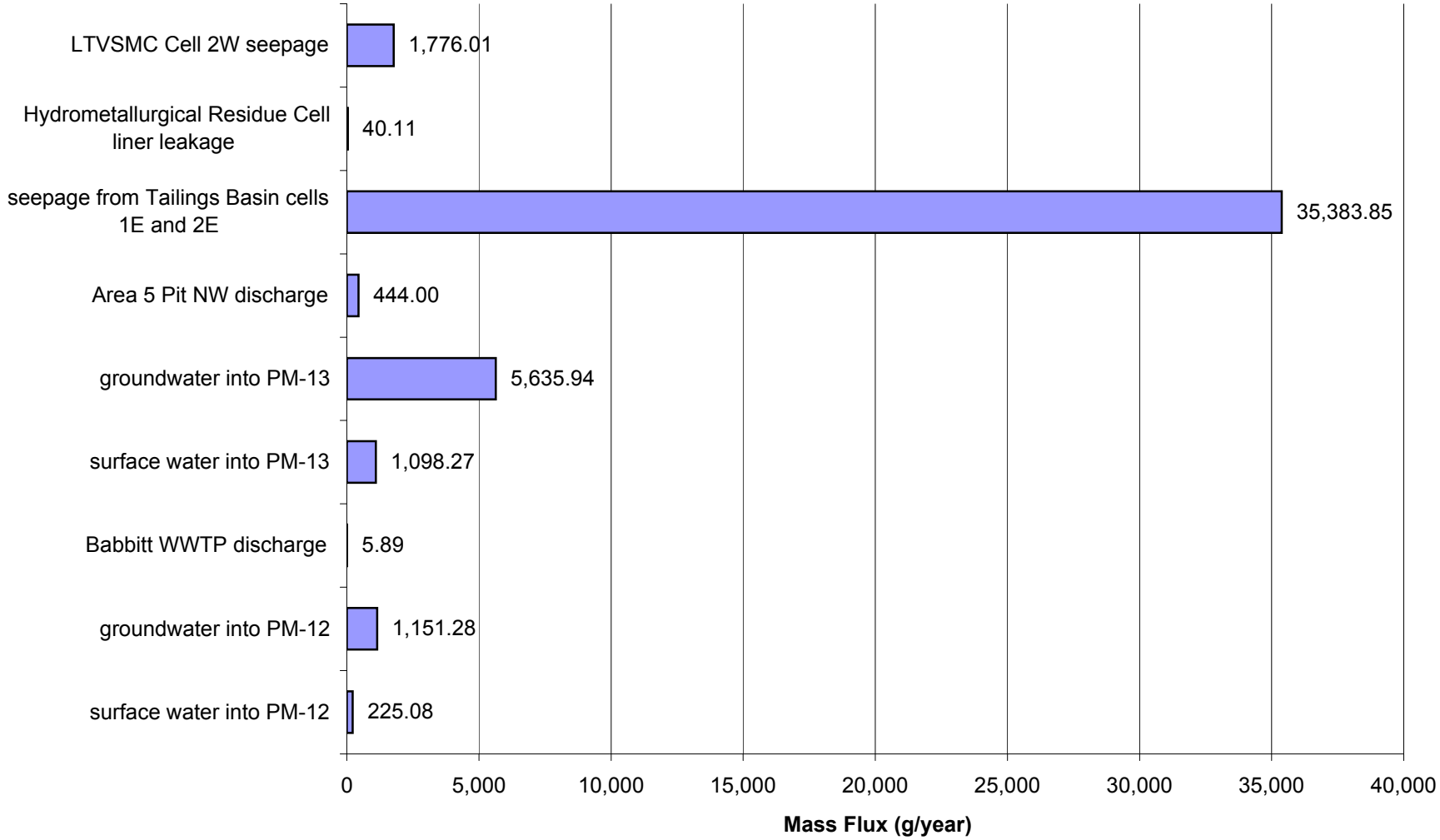
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 8 for Low Flow for Antimony (Sb)



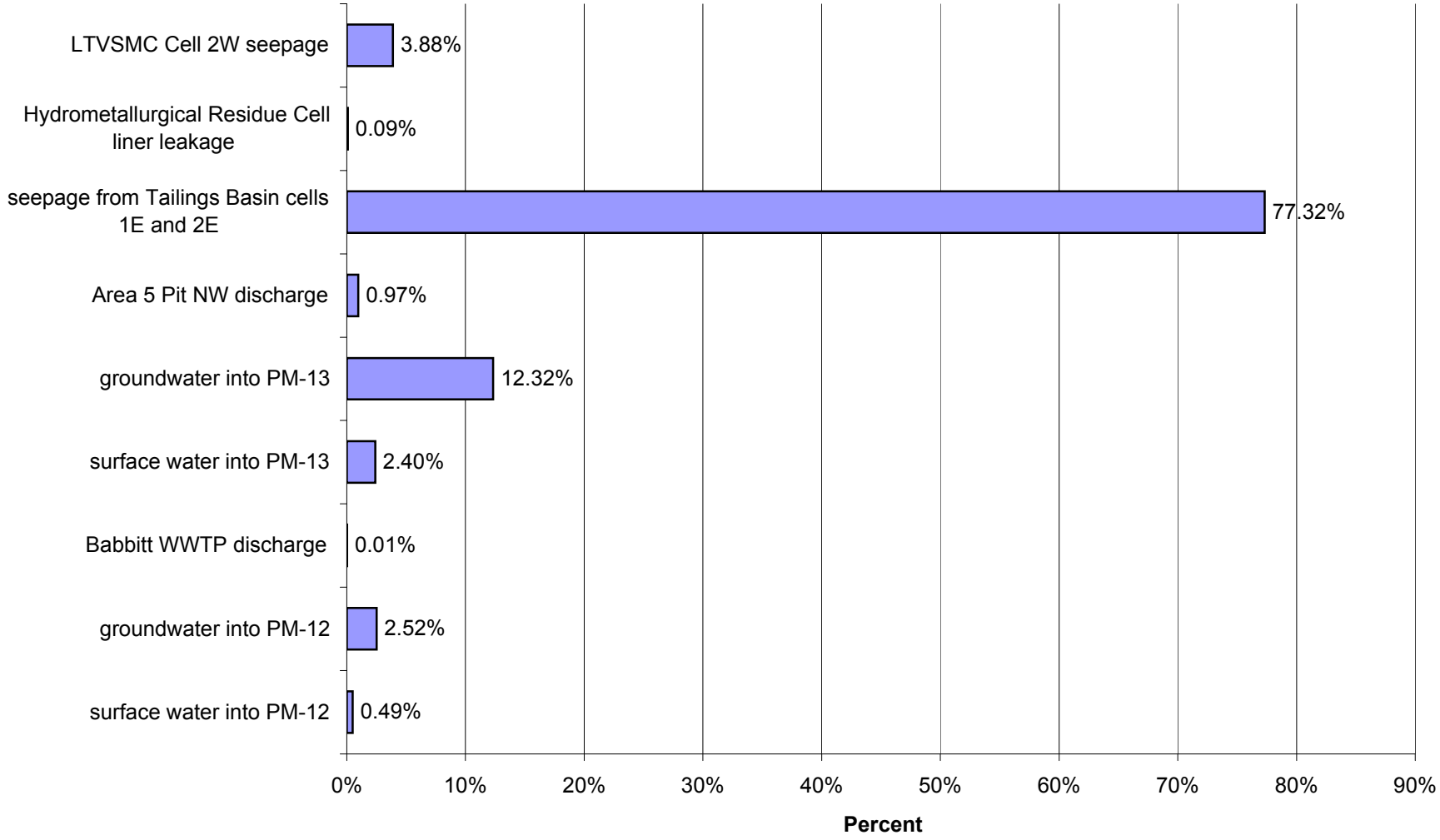
Proposed Action: Percent of Impacts at PM-13 in Year 8 for Low Flow for Antimony (Sb)



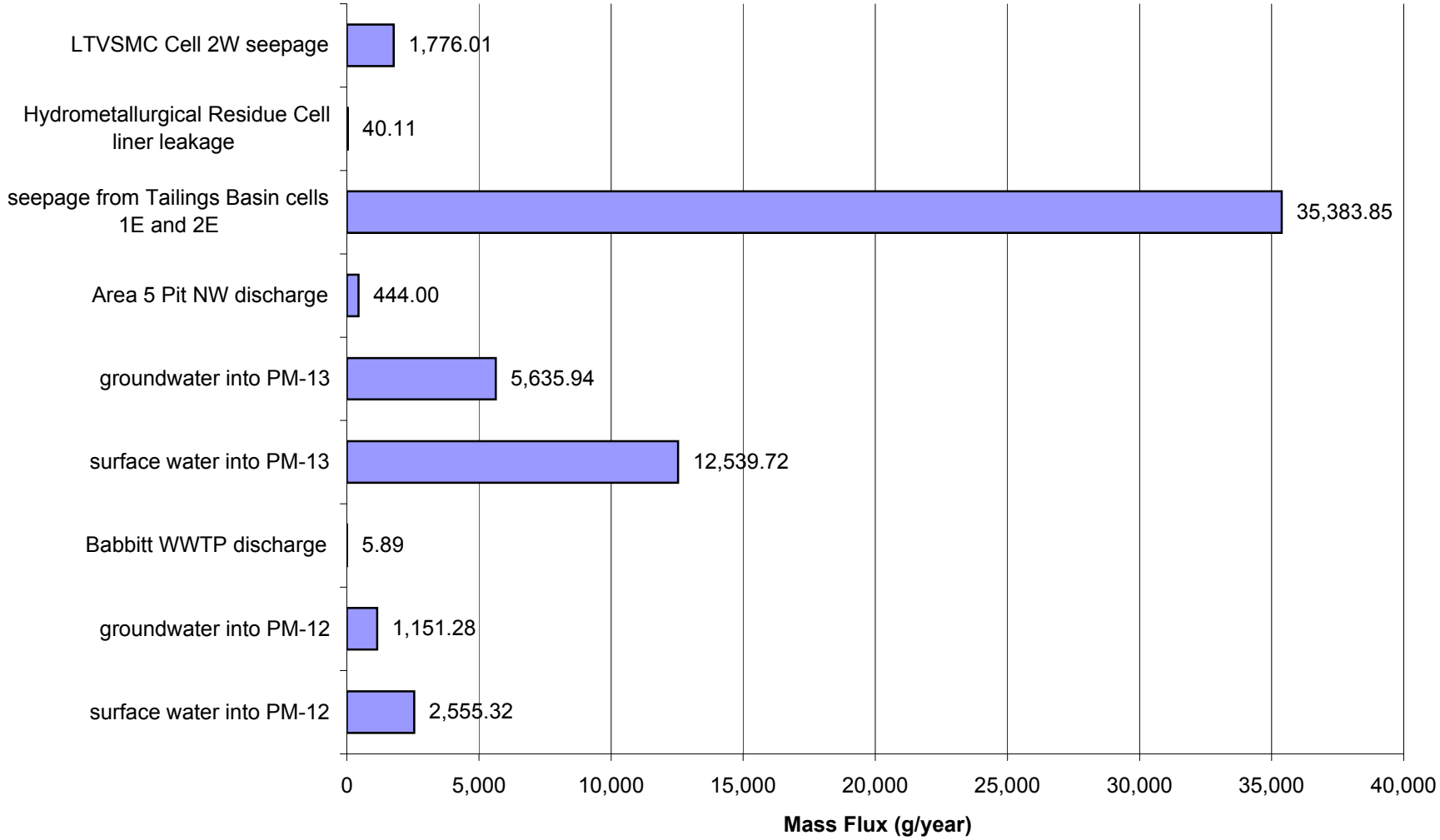
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 8 for Average Flow for Antimony (Sb)



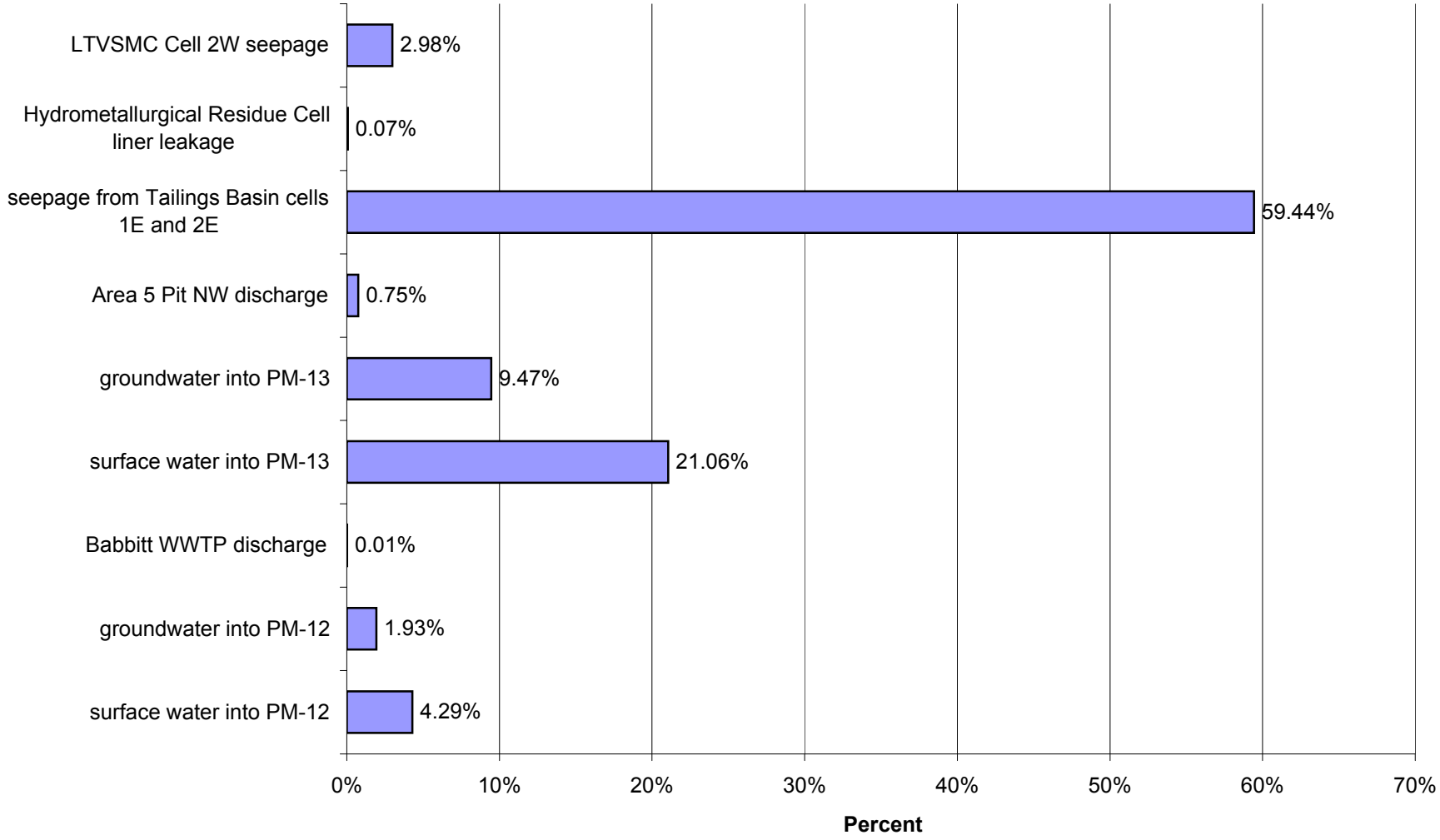
Proposed Action: Percent of Impacts at PM-13 in Year 8 for Average Flow for Antimony (Sb)



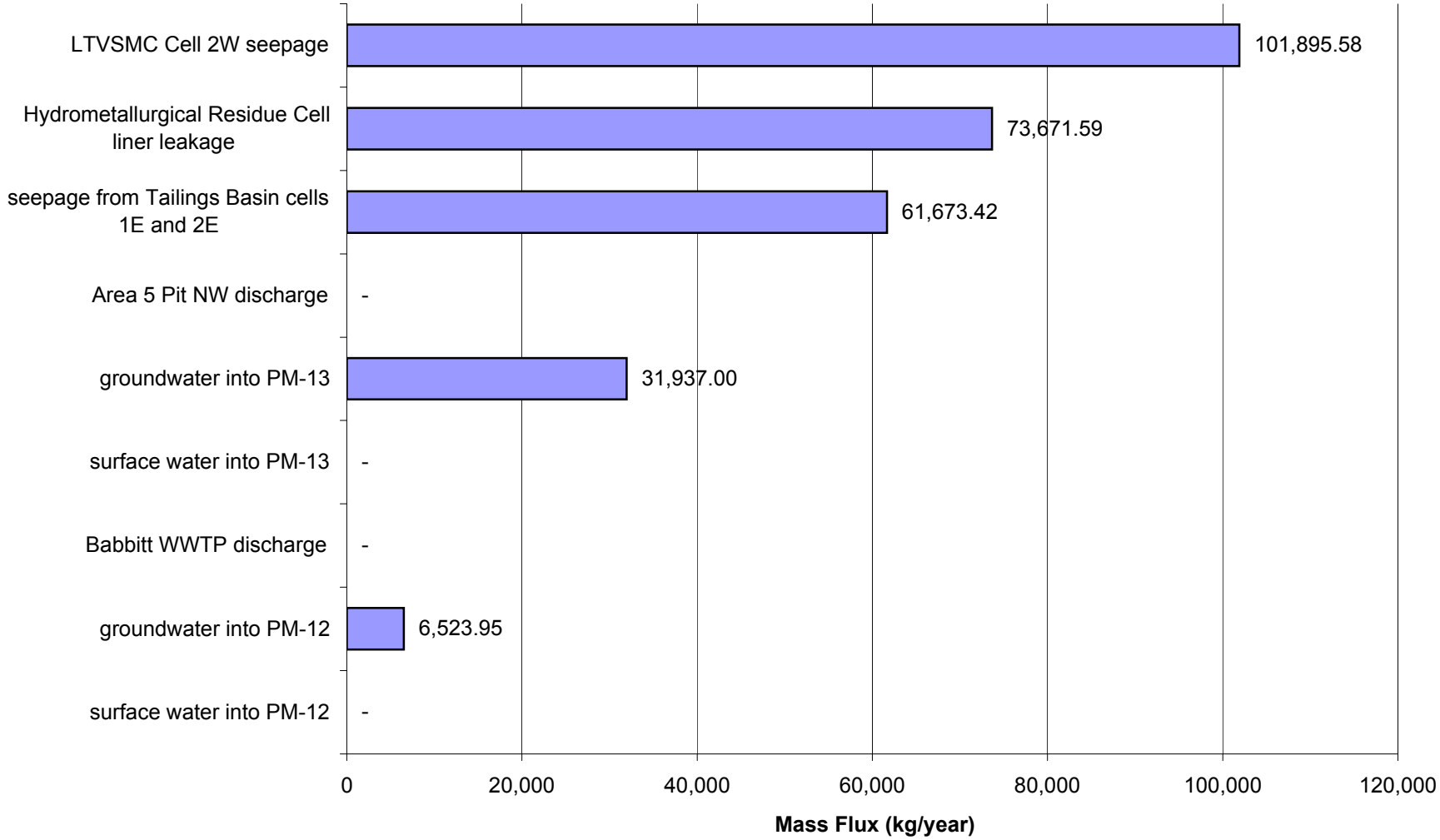
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 8 for High Flow for Antimony (Sb)



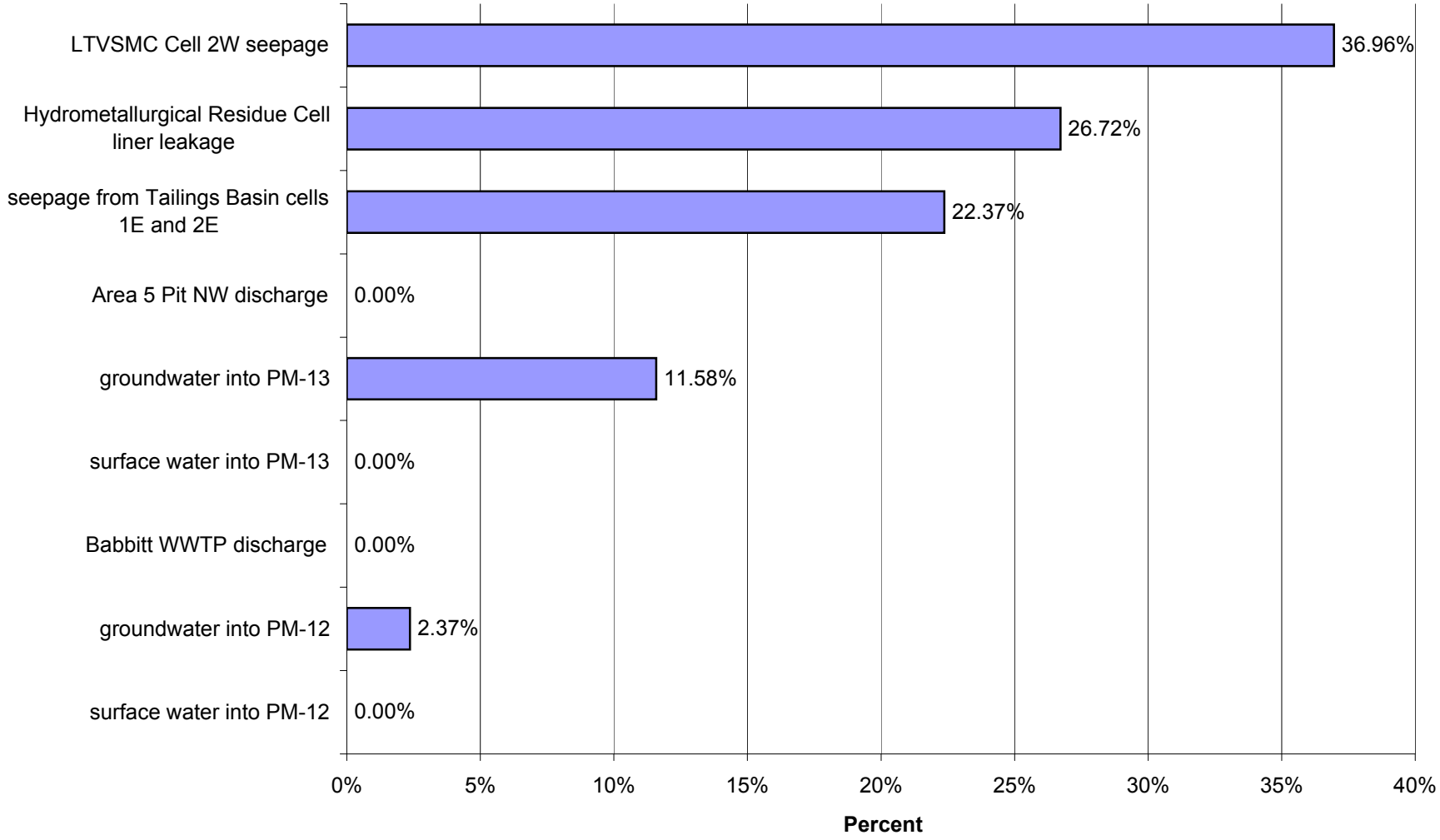
Proposed Action: Percent of Impacts at PM-13 in Year 8 for High Flow for Antimony (Sb)



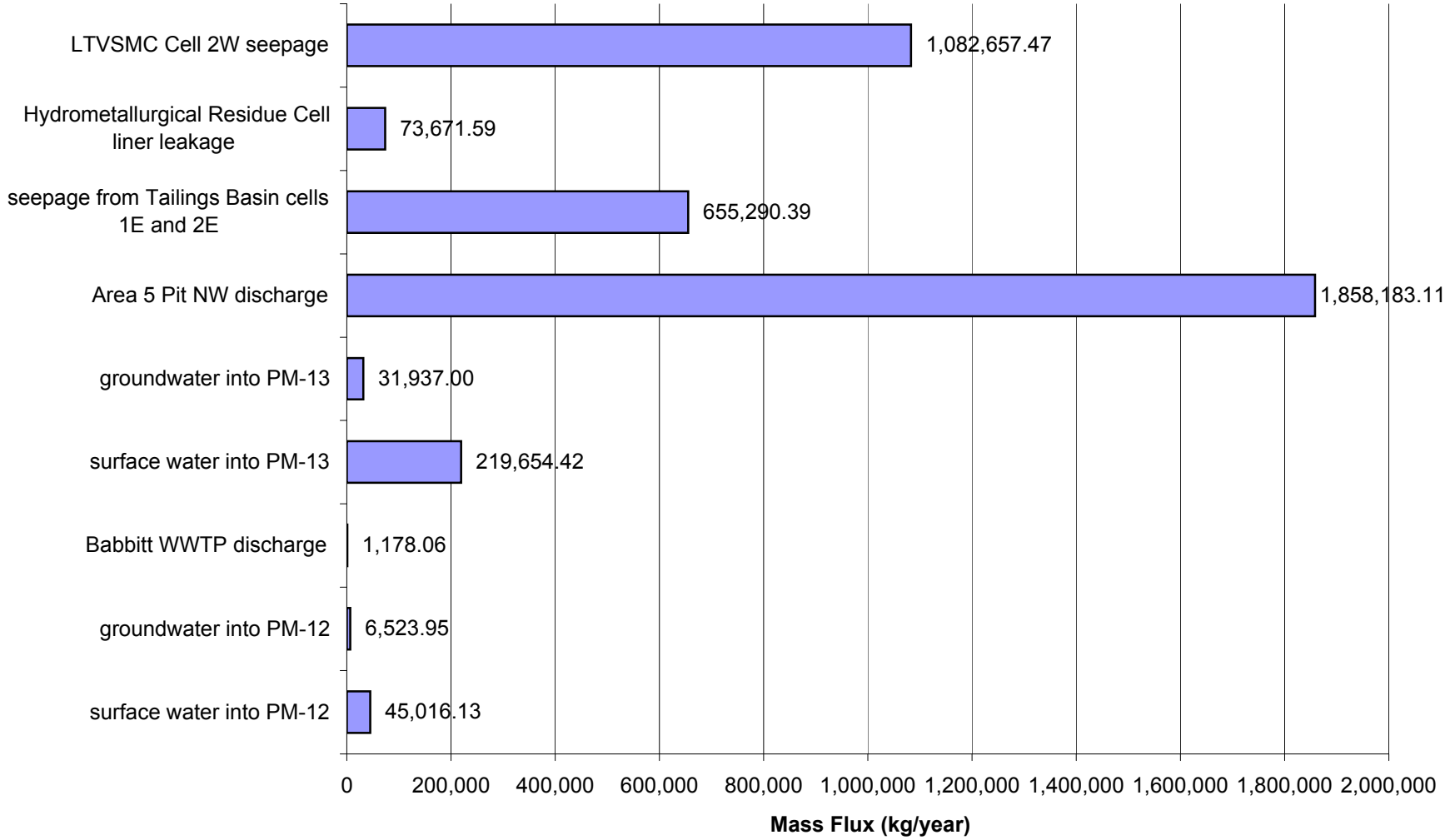
Proposed Action: Mass Flux (kg/year) of Impacts at PM-13 in Year 8 for Low Flow for Sulfate (SO_4)



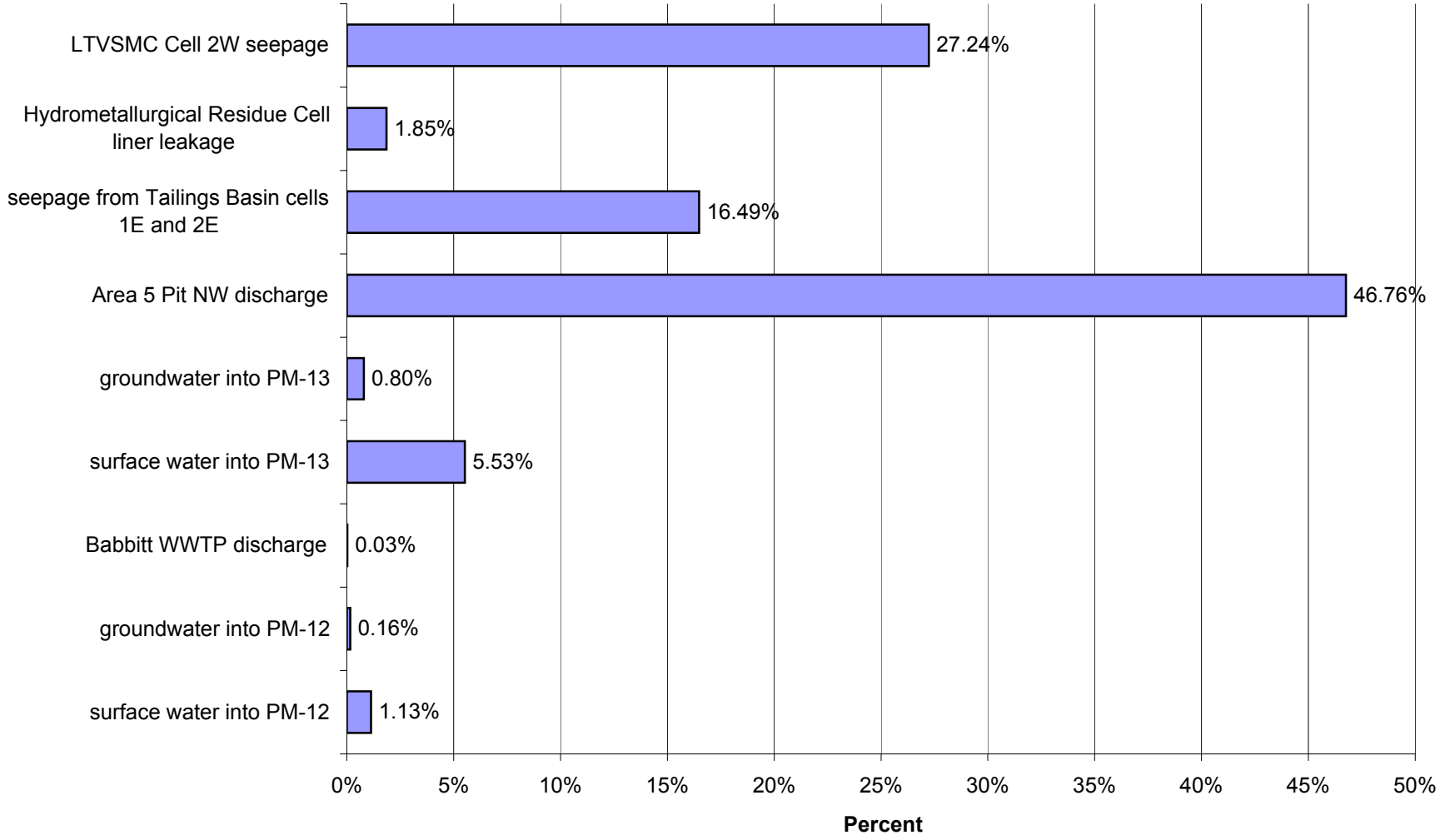
Proposed Action: Percent of Impacts at PM-13 in Year 8 for Low Flow for Sulfate (SO_4)



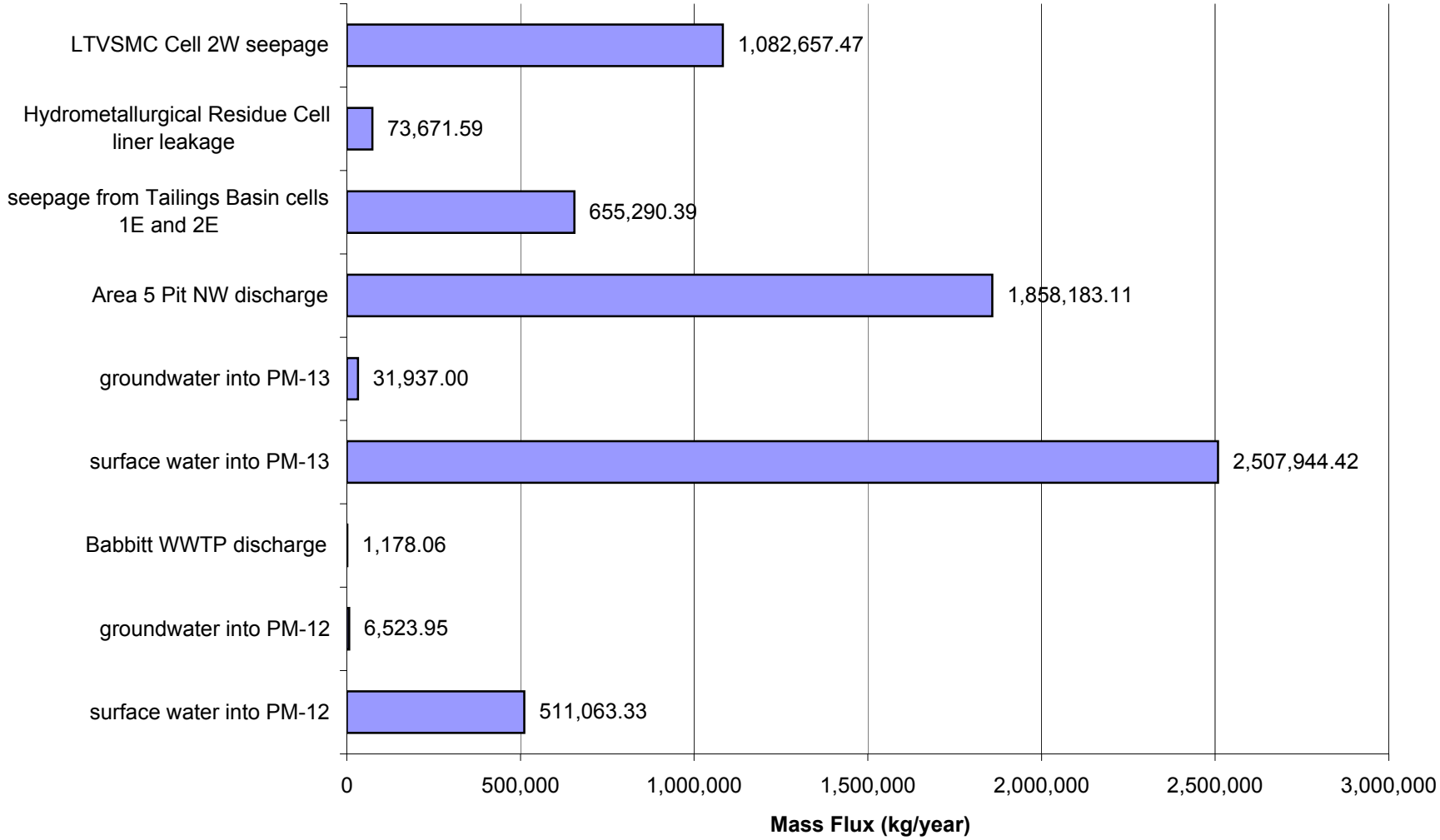
Proposed Action: Mass Flux (kg/year) of Impacts at PM-13 in Year 8 for Average Flow for Sulfate (SO_4)



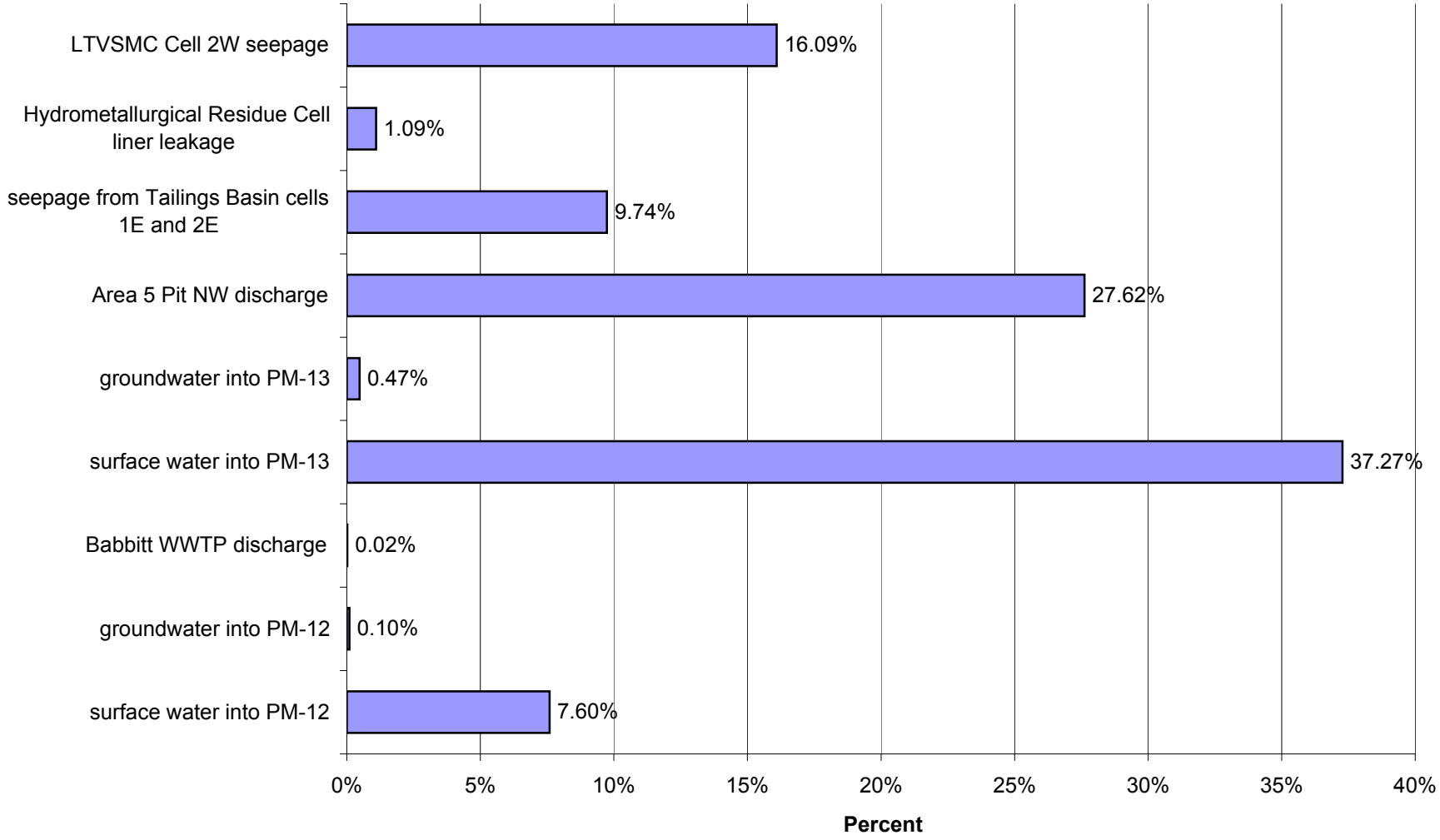
Proposed Action: Percent of Impacts at PM-13 in Year 8 for Average Flow for Sulfate (SO_4)



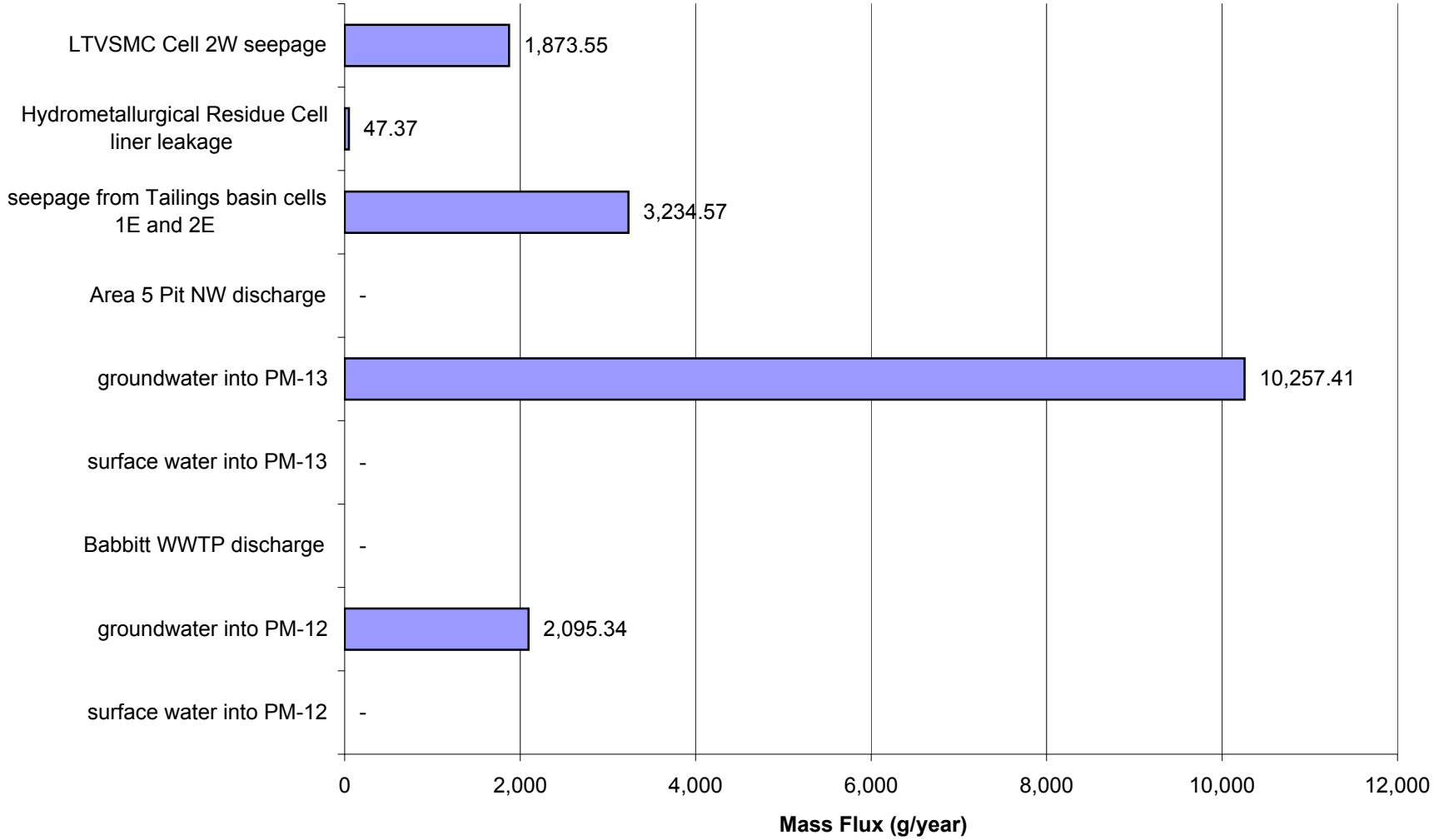
Proposed Action: Mass Flux (kg/year) of Impacts at PM-13 in Year 8 for High Flow for Sulfate (SO_4)



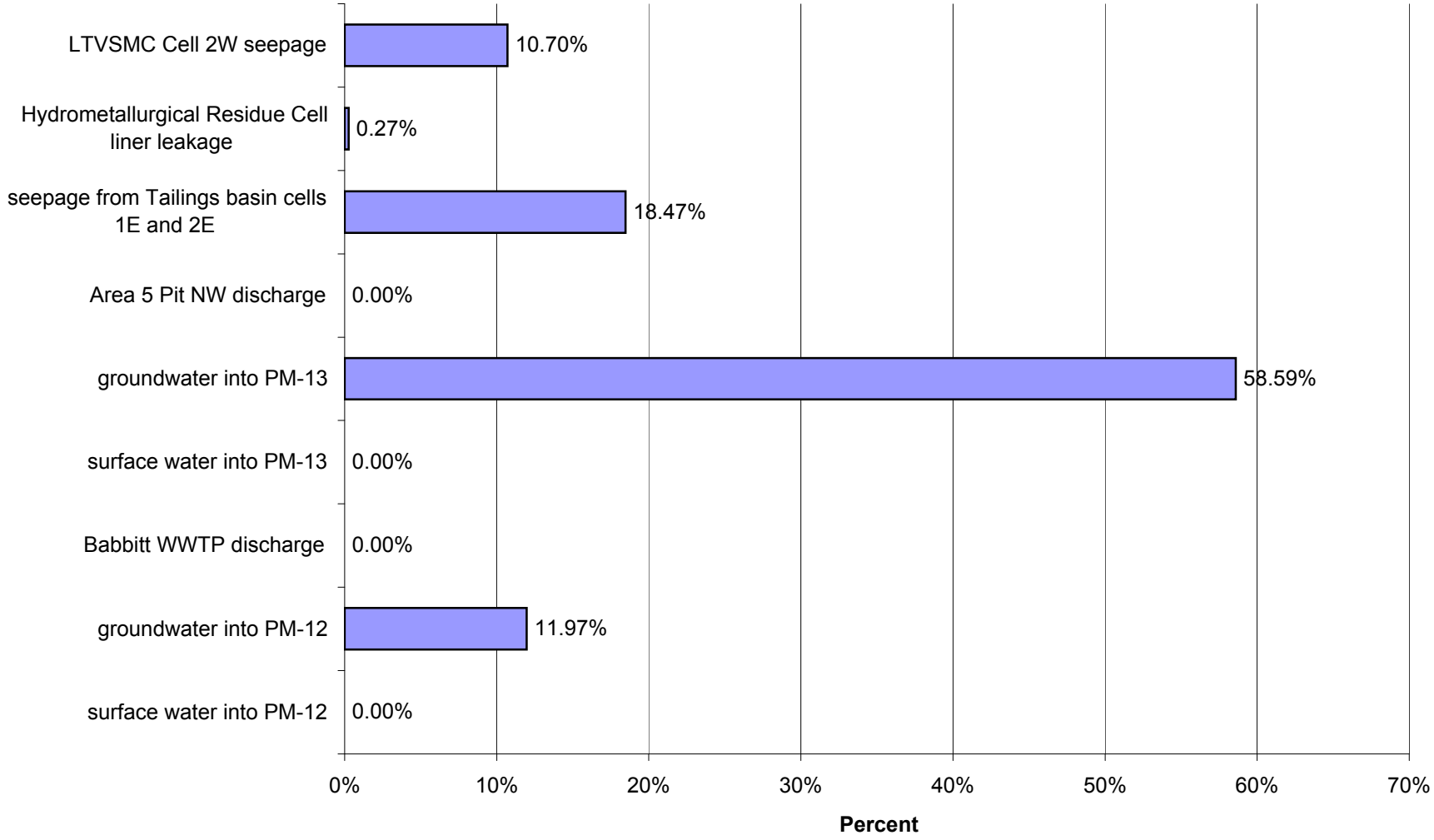
Proposed Action: Percent of Impacts at PM-13 in Year 8 for High Flow for Sulfate (SO_4)



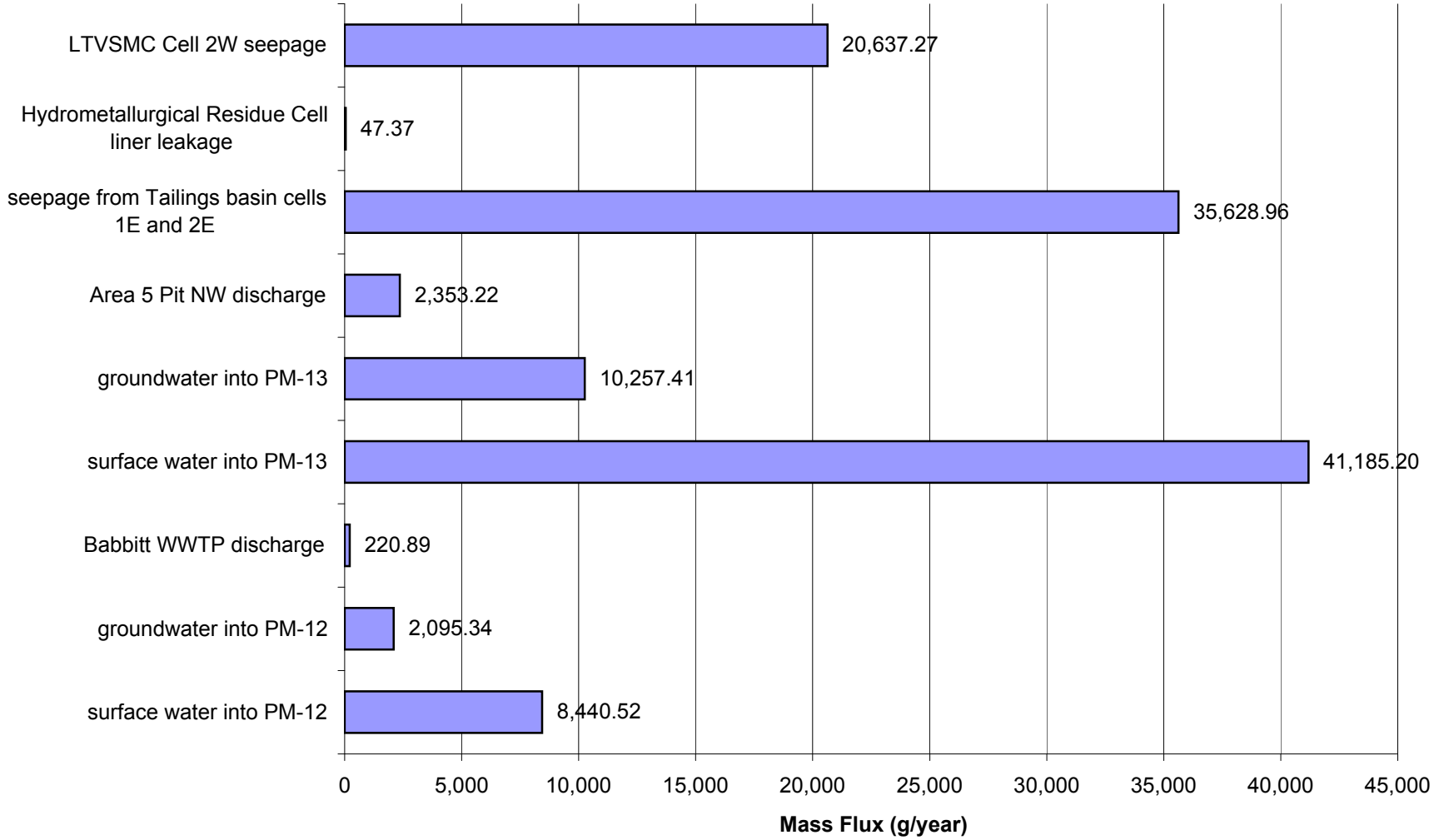
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 9 for Low Flow for Arsenic (As)



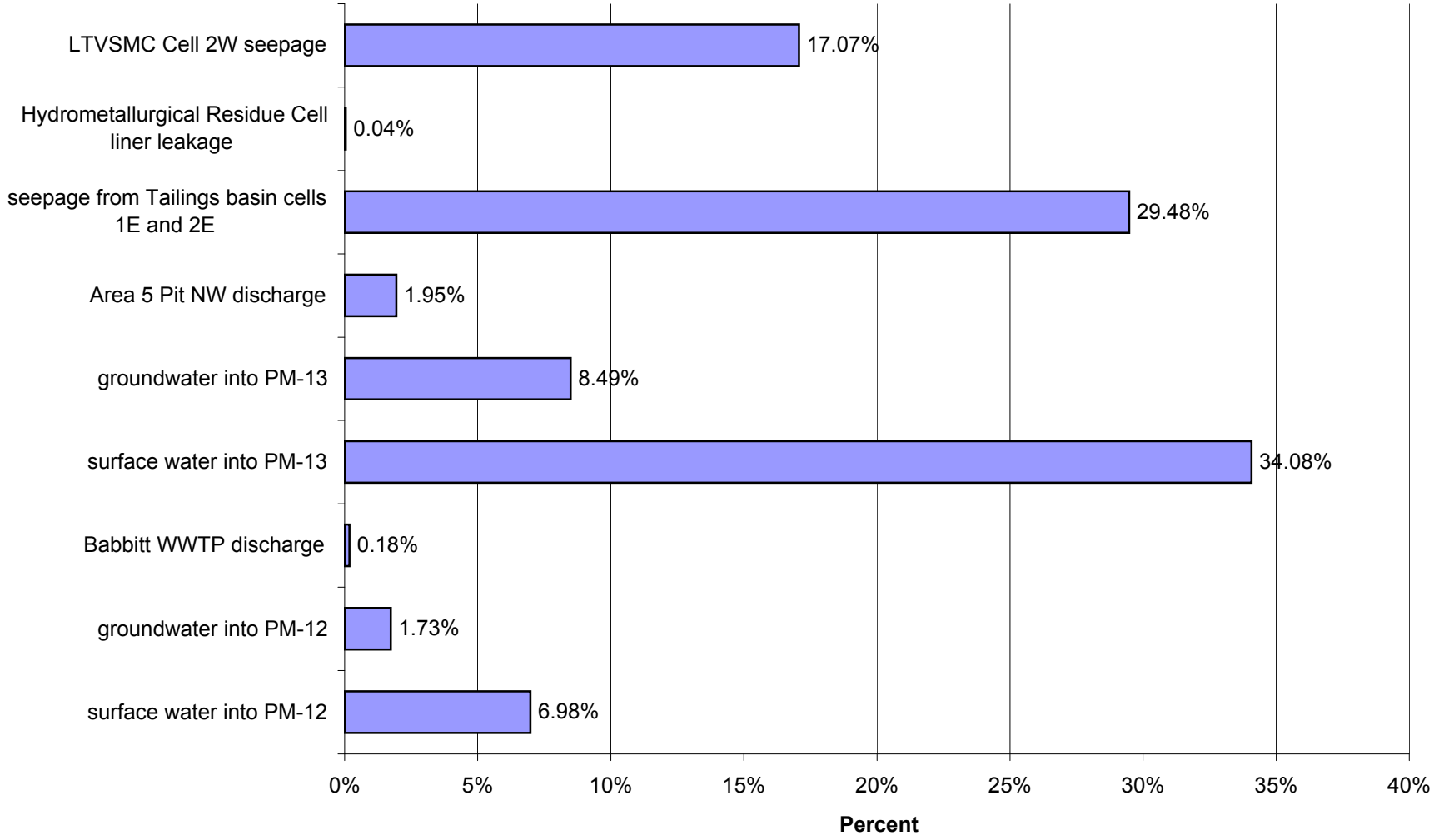
Proposed Action: Percent of Impacts at PM-13 in Year 9 for Low Flow for Arsenic (As)



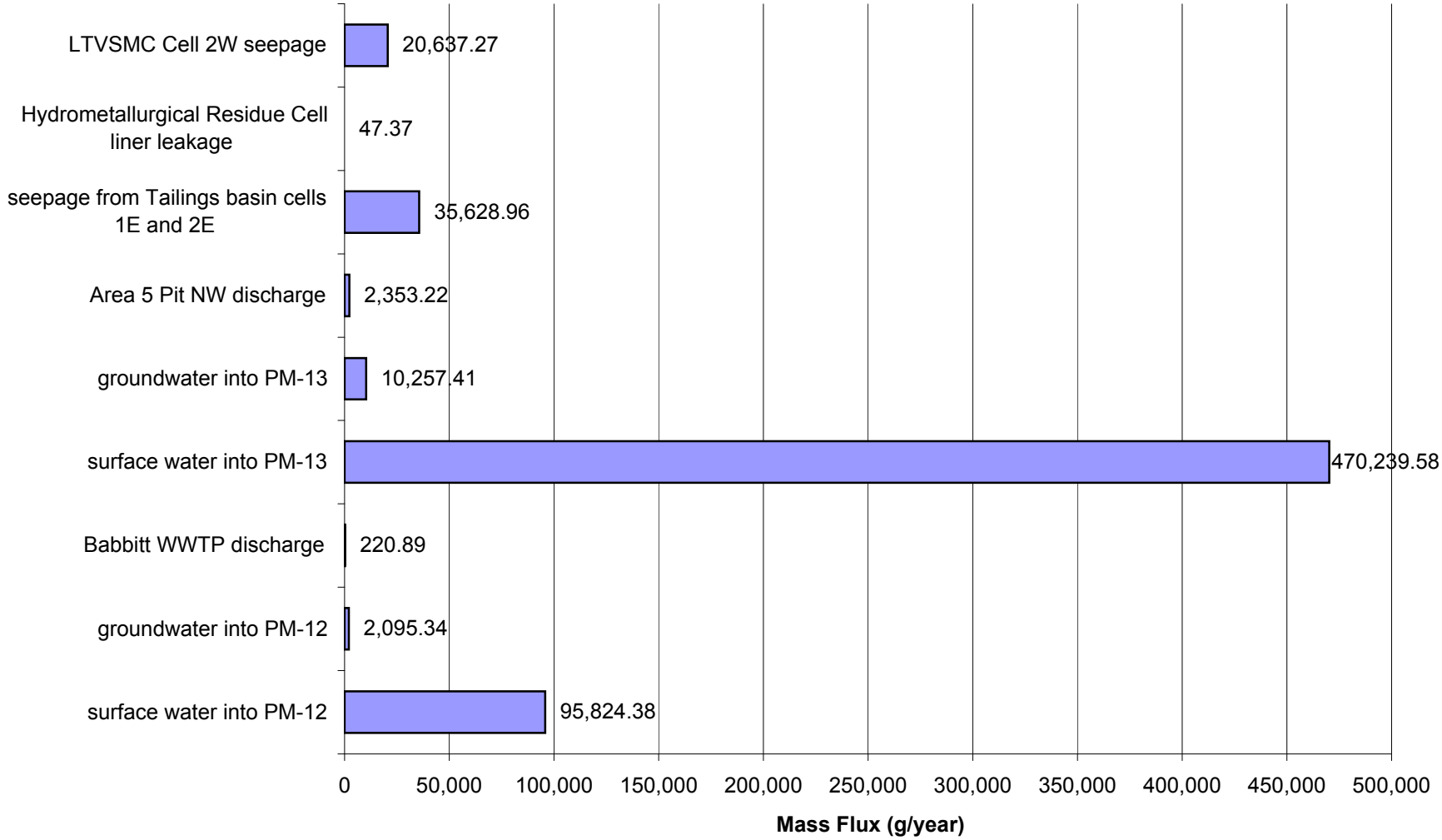
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 9 for Average Flow for Arsenic (As)



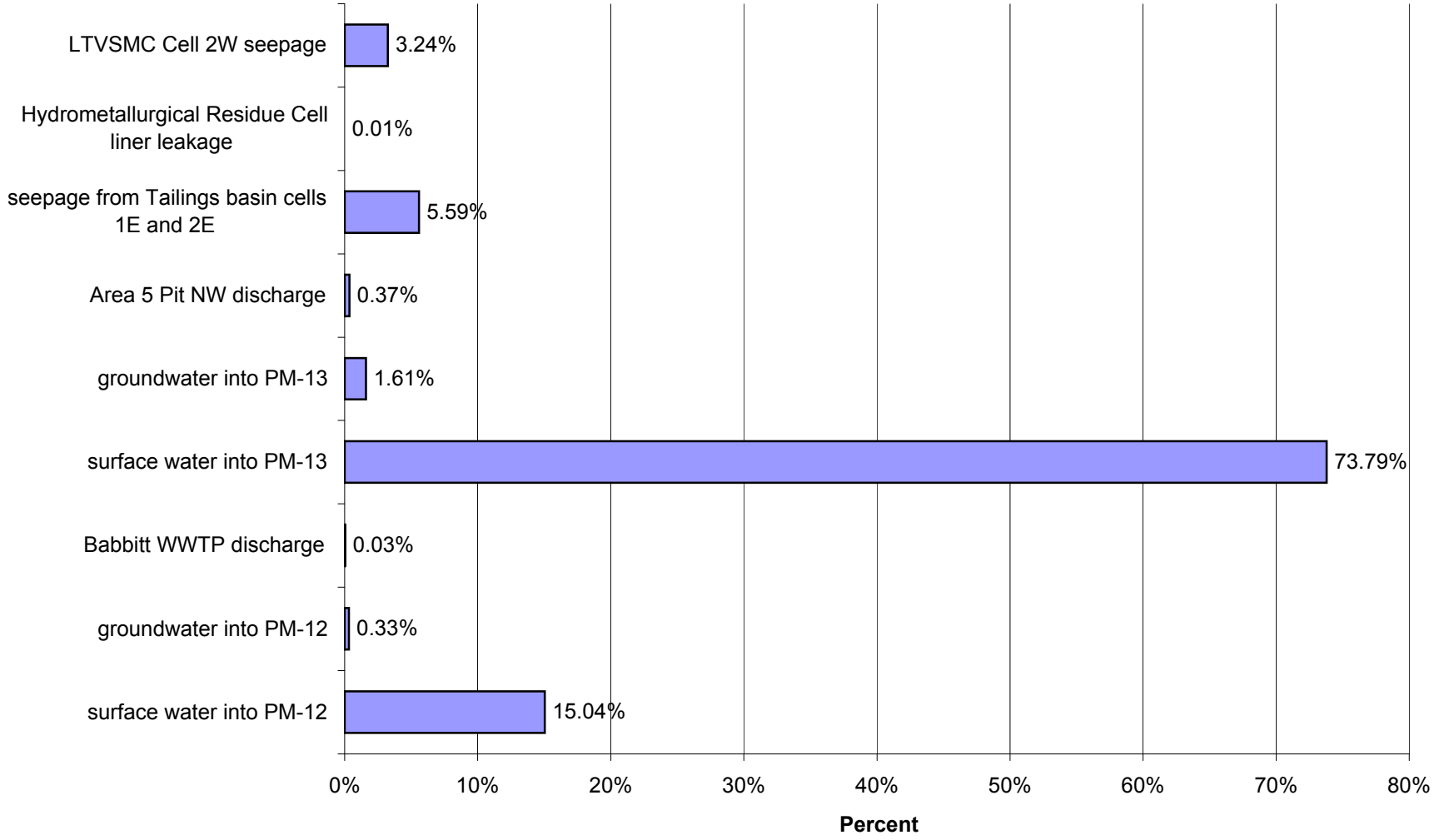
Proposed Action: Percent of Impacts at PM-13 in Year 9 for Average Flow for Arsenic (As)



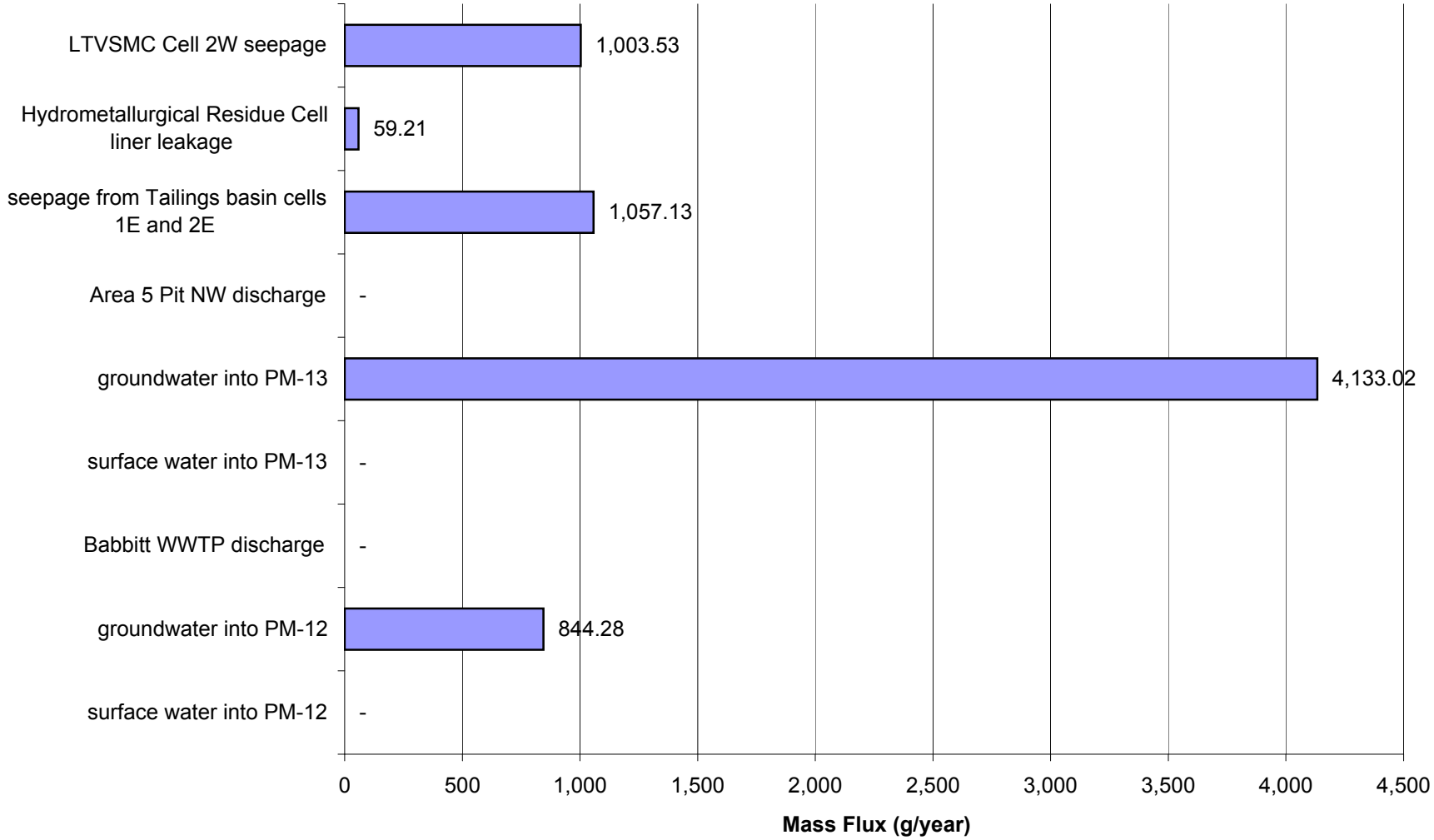
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 9 for High Flow for Arsenic (As)



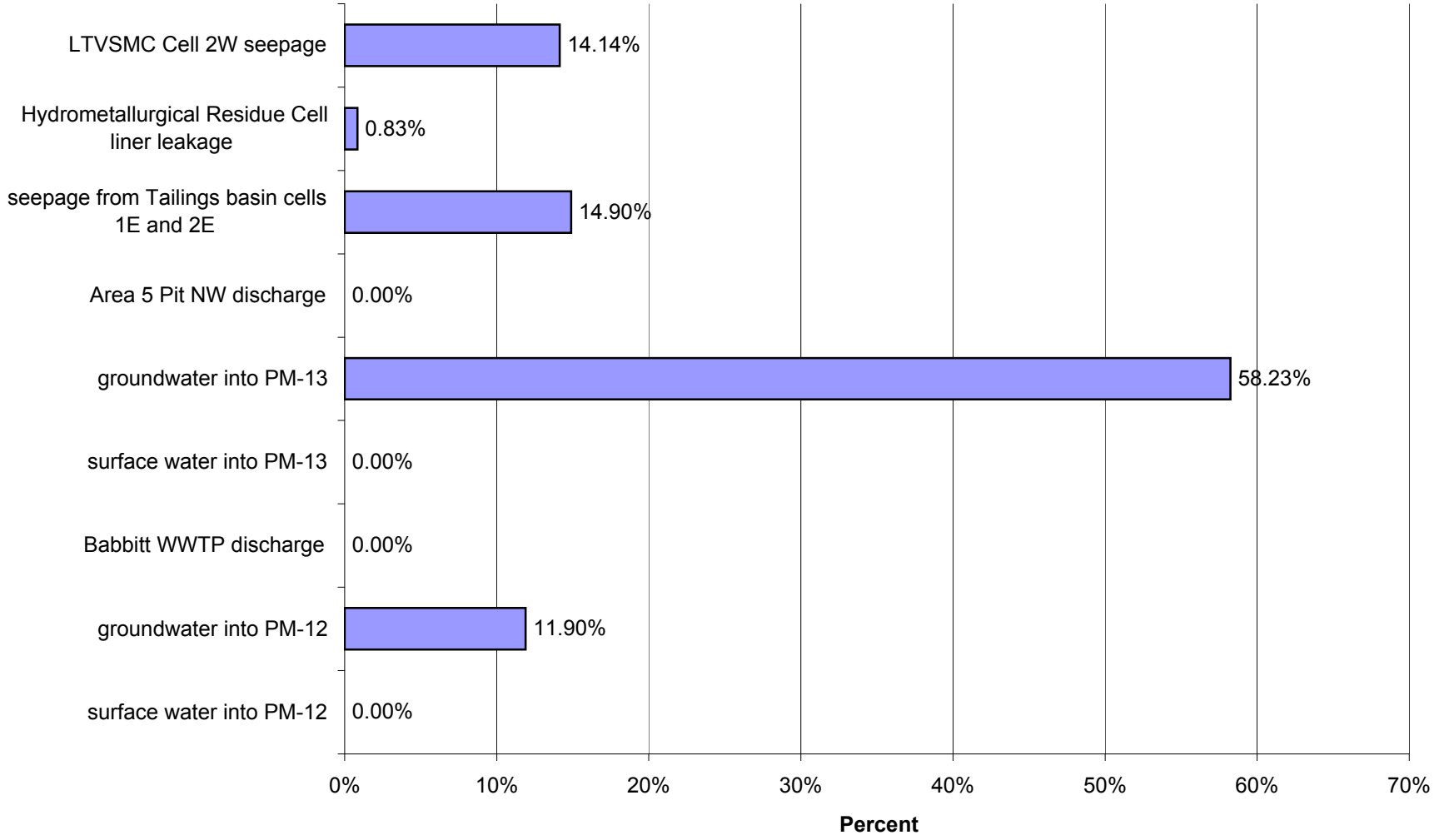
Proposed Action: Percent of Impacts at PM-13 in Year 9 for High Flow for Arsenic (As)



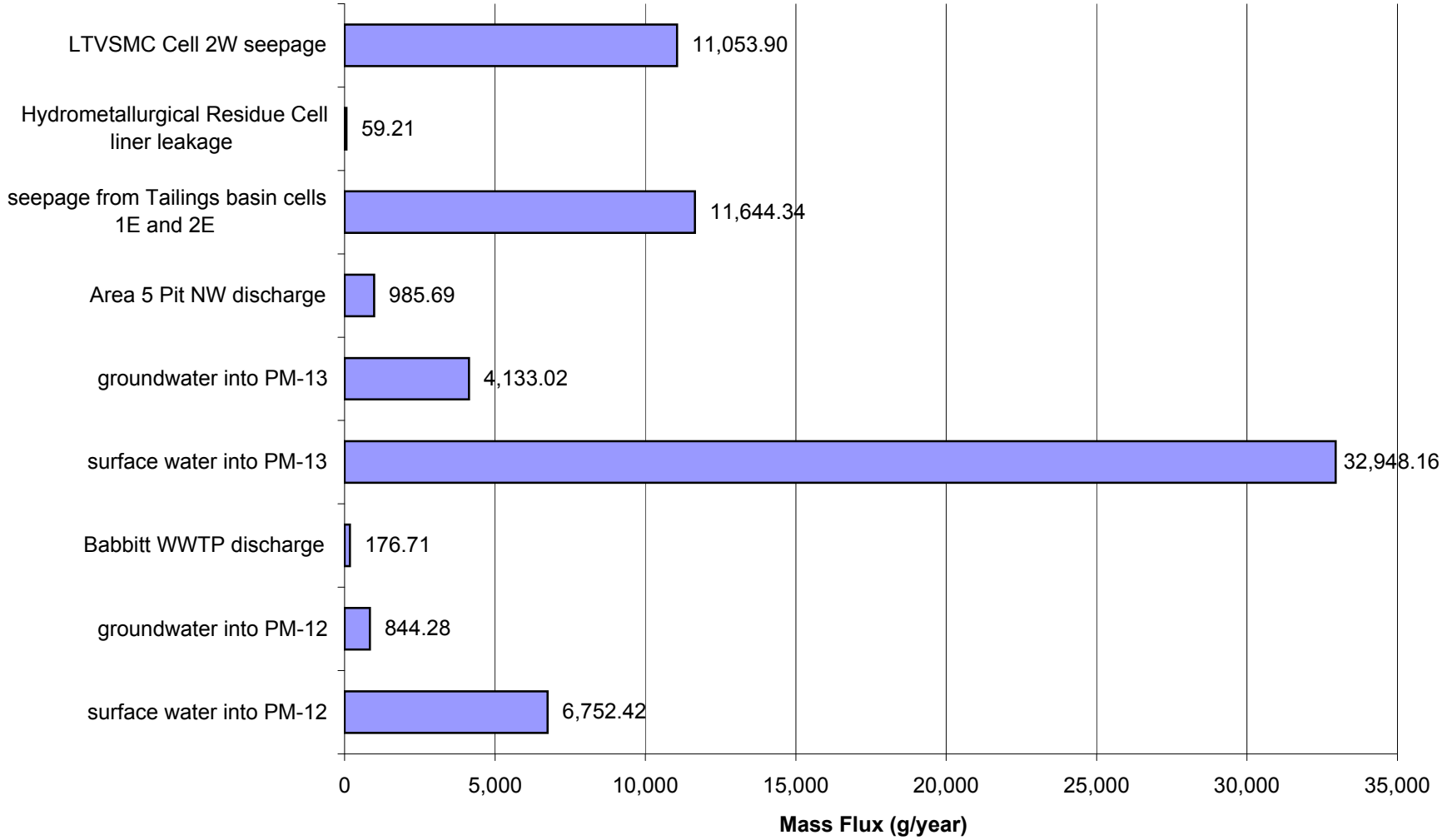
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 9 for Low Flow for Cobalt (Co)



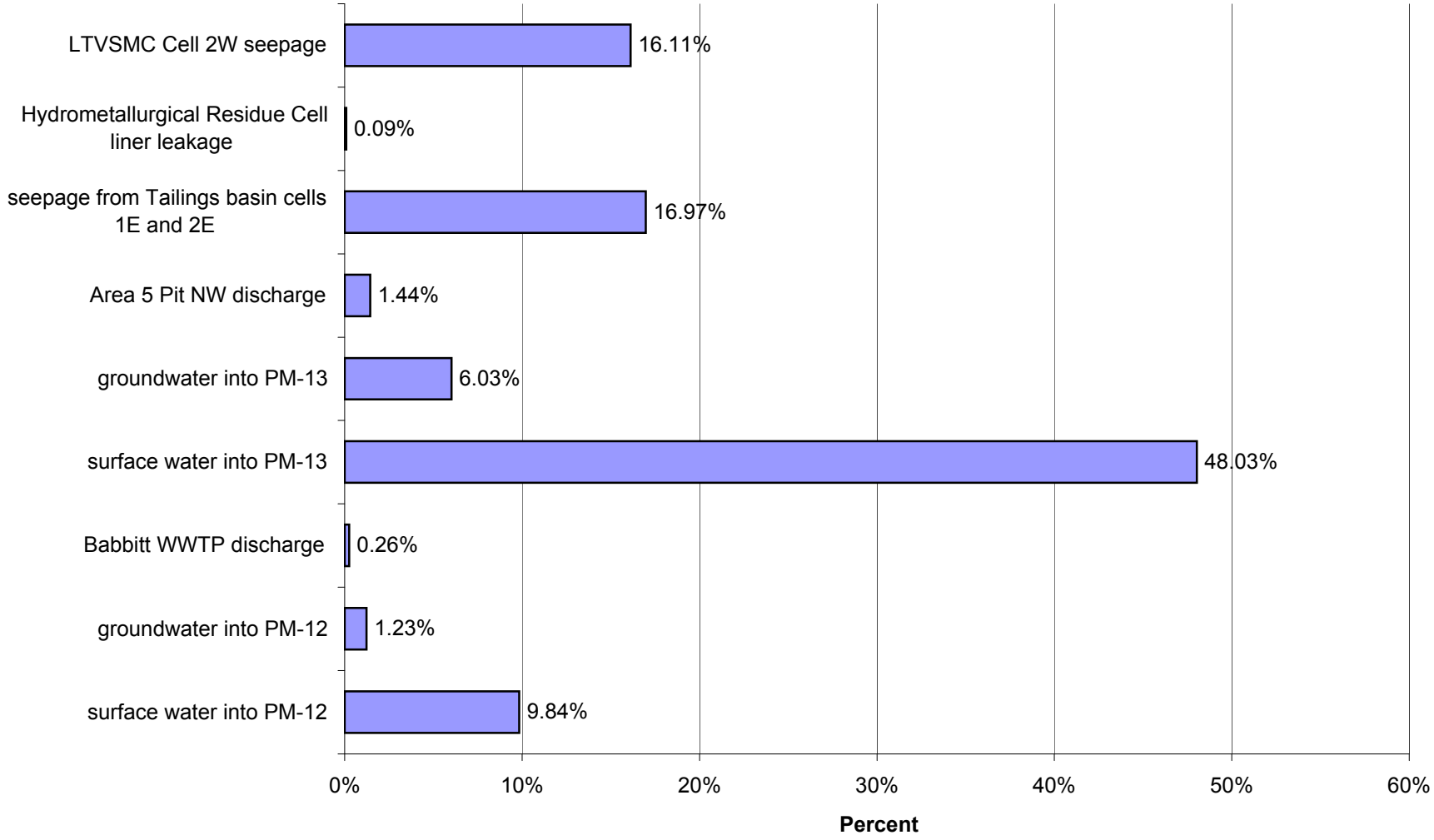
Proposed Action: Percent of Impacts at PM-13 in Year 9 for Low Flow for Cobalt (Co)



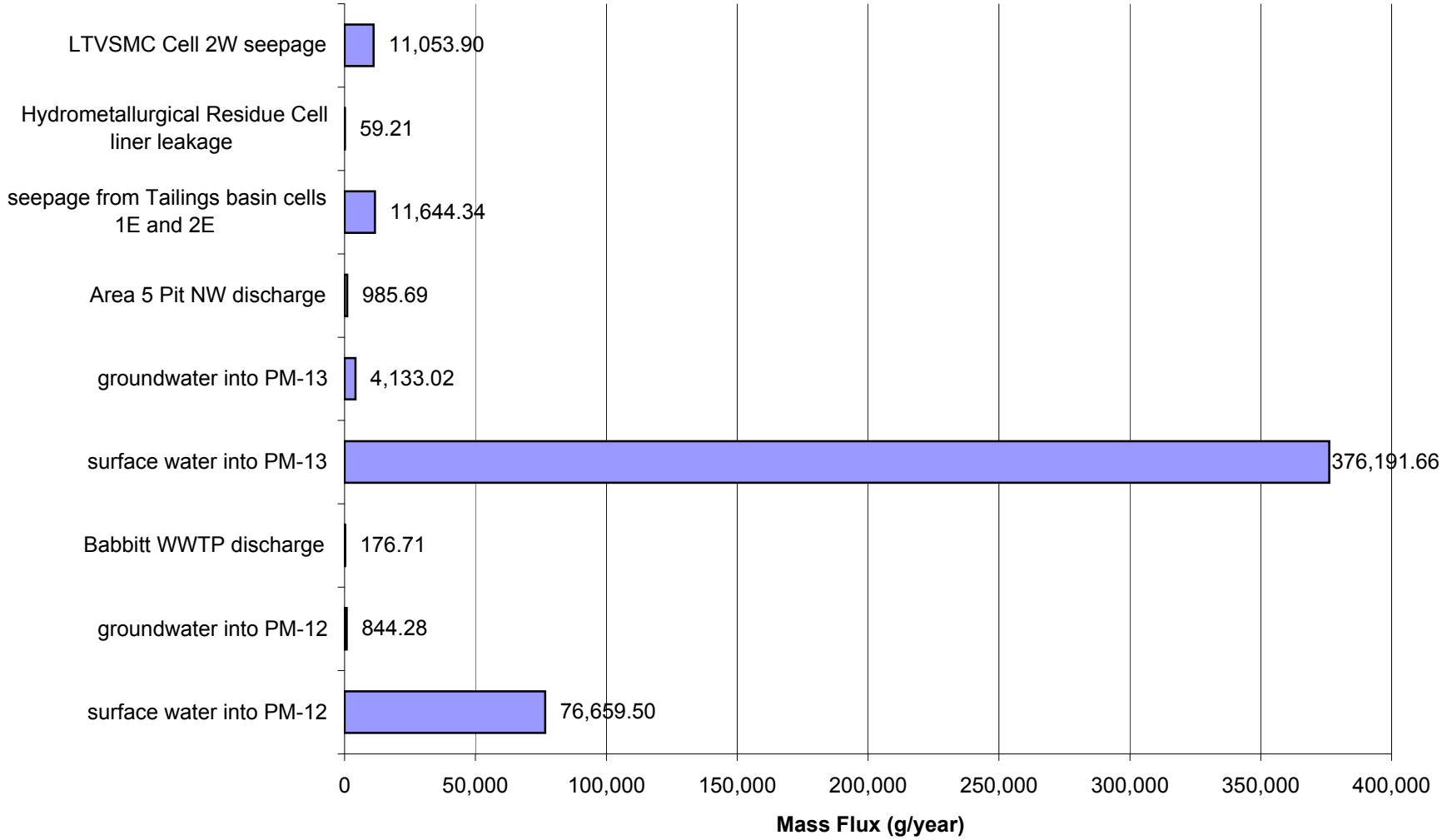
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 9 for Average Flow for Cobalt (Co)



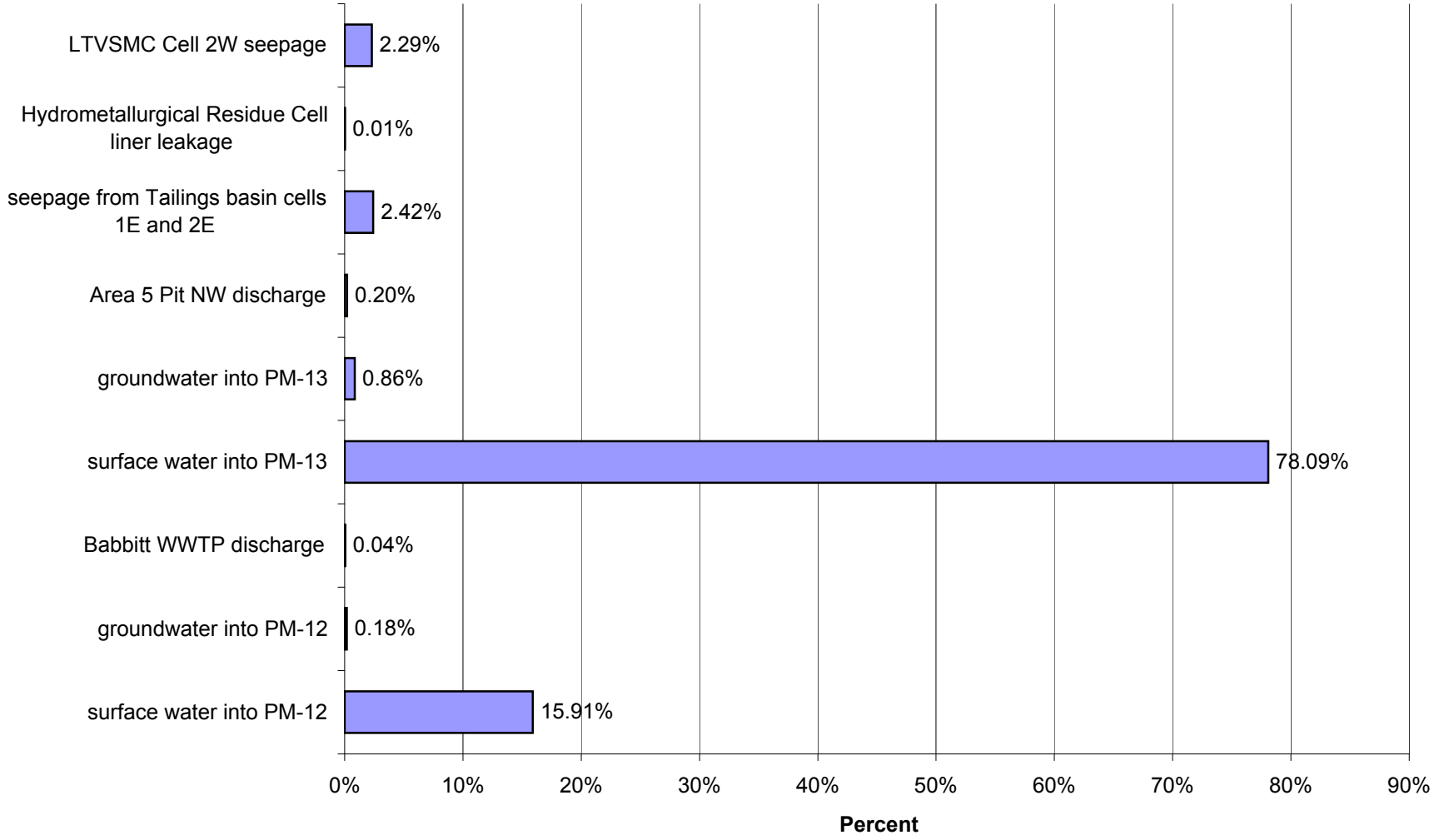
Proposed Action: Percent of Impacts at PM-13 in Year 9 for Average Flow for Cobalt (Co)



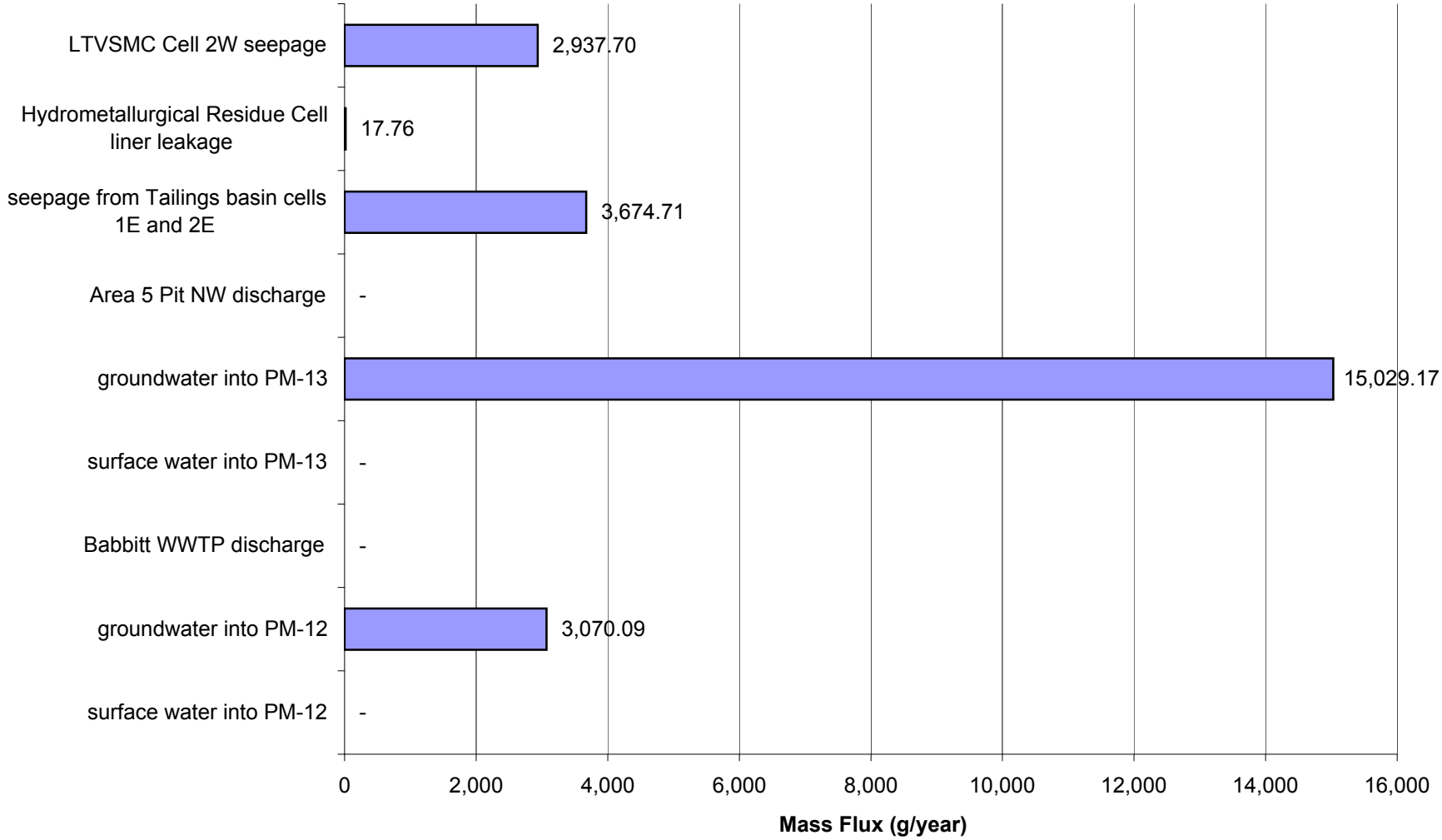
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 9 for High Flow for Cobalt (Co)



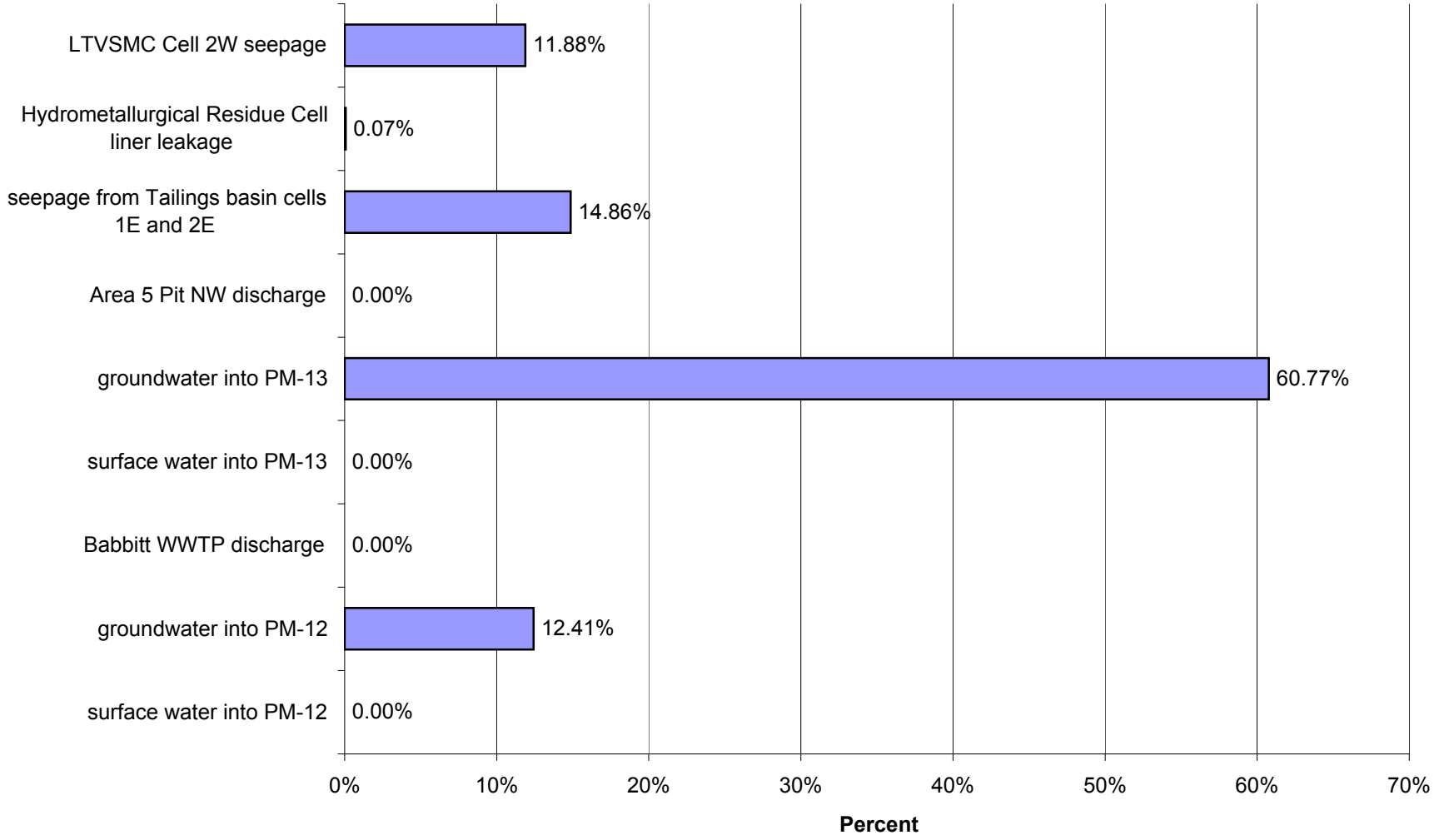
Proposed Action: Percent of Impacts at PM-13 in Year 9 for High Flow for Cobalt (Co)



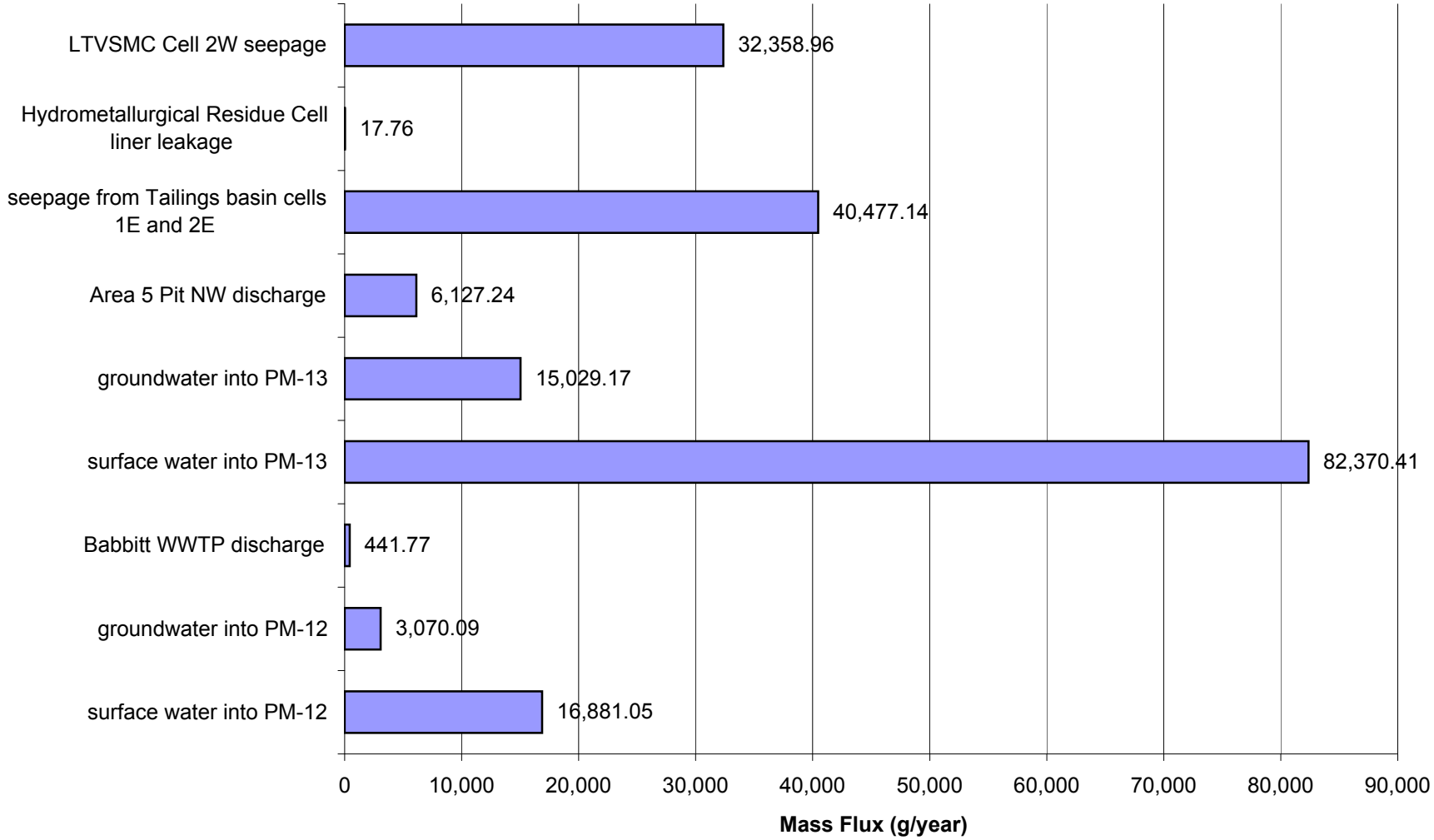
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 9 for Low Flow for Copper (Cu)



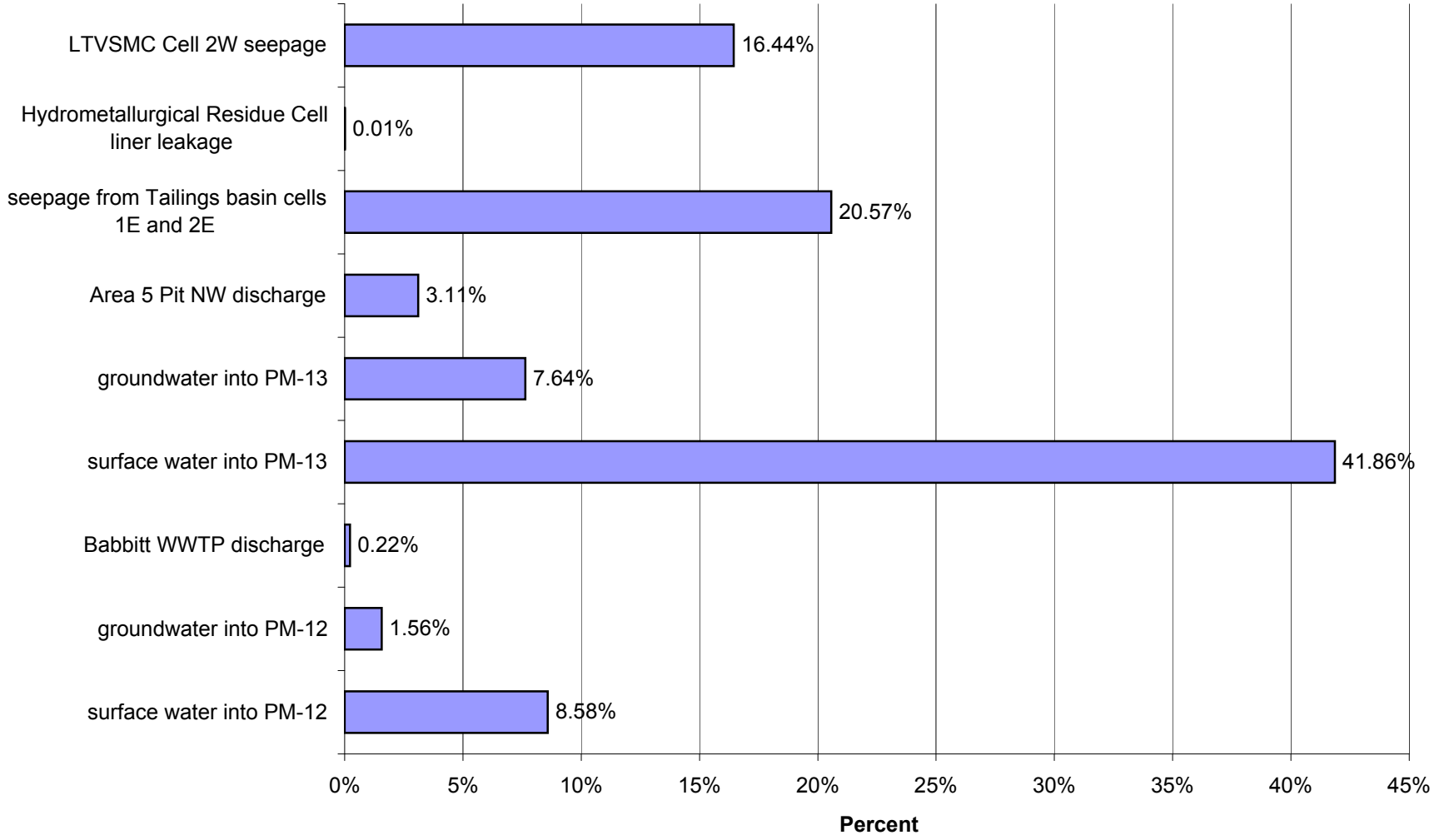
Proposed Action: Percent of Impacts at PM-13 in Year 9 for Low Flow for Copper (Cu)



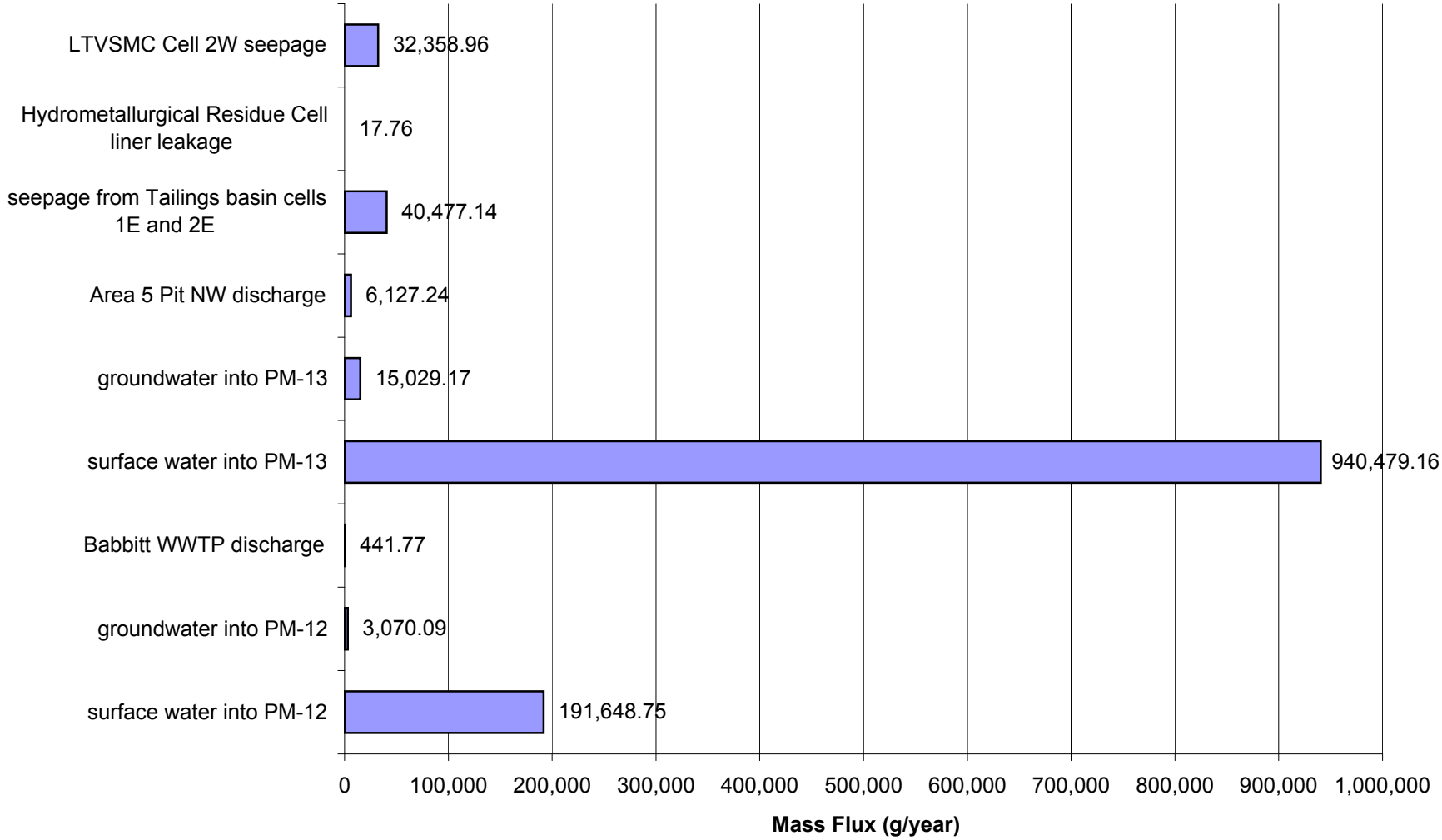
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 9 for Average Flow for Copper (Cu)



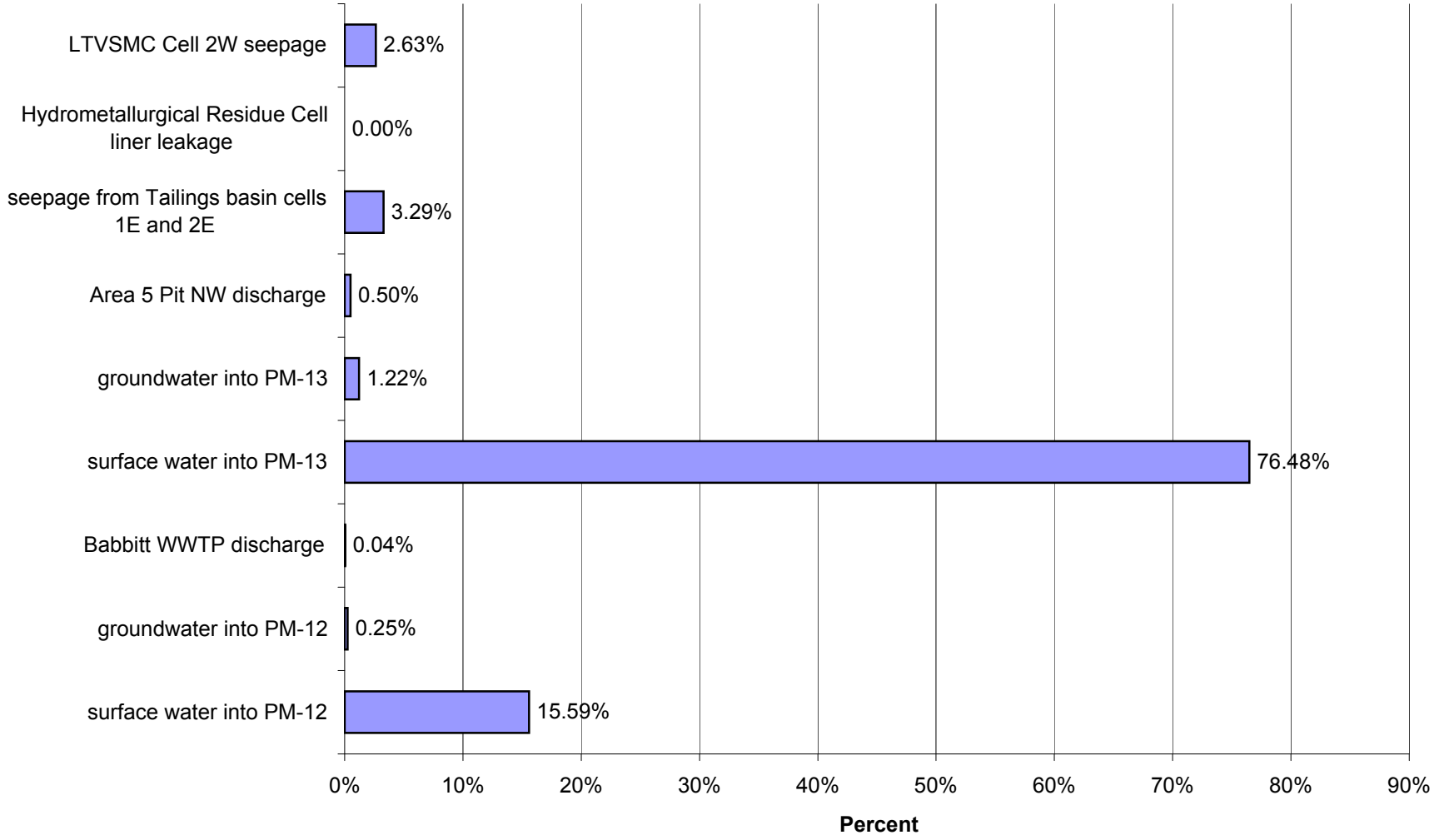
Proposed Action: Percent of Impacts at PM-13 in Year 9 for Average Flow for Copper (Cu)



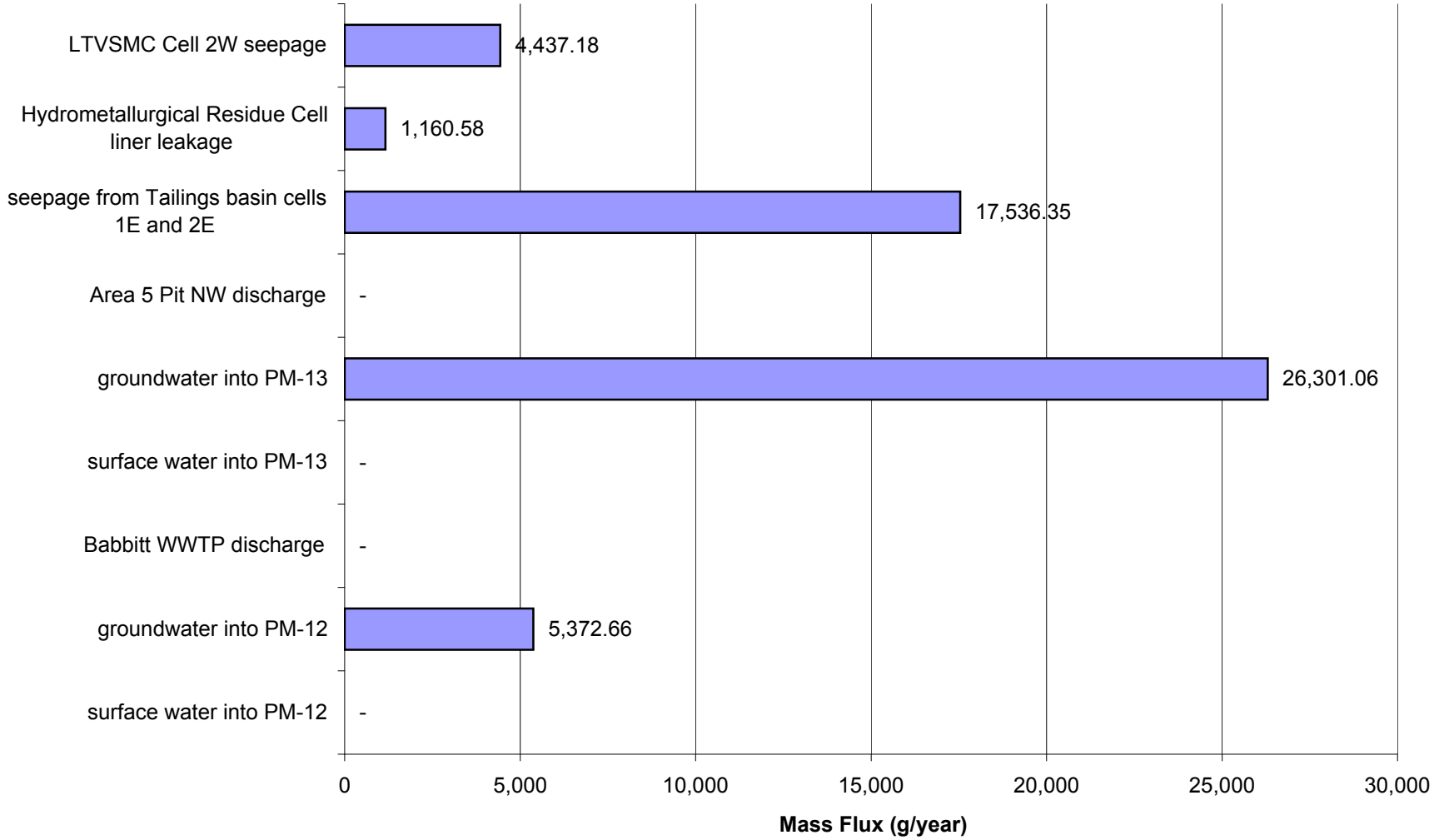
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 9 for High Flow for Copper (Cu)



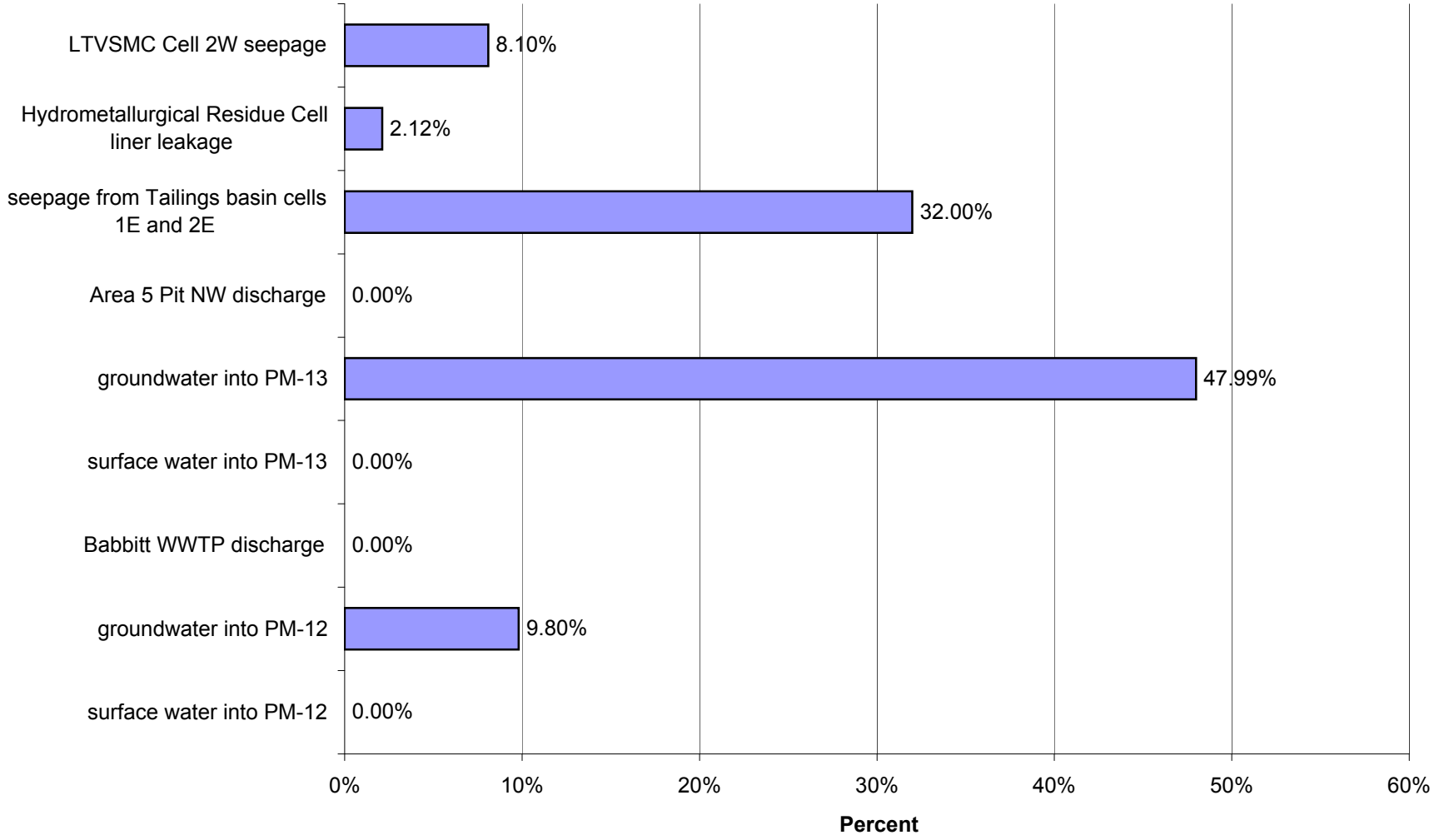
Proposed Action: Percent of Impacts at PM-13 in Year 9 for High Flow for Copper (Cu)



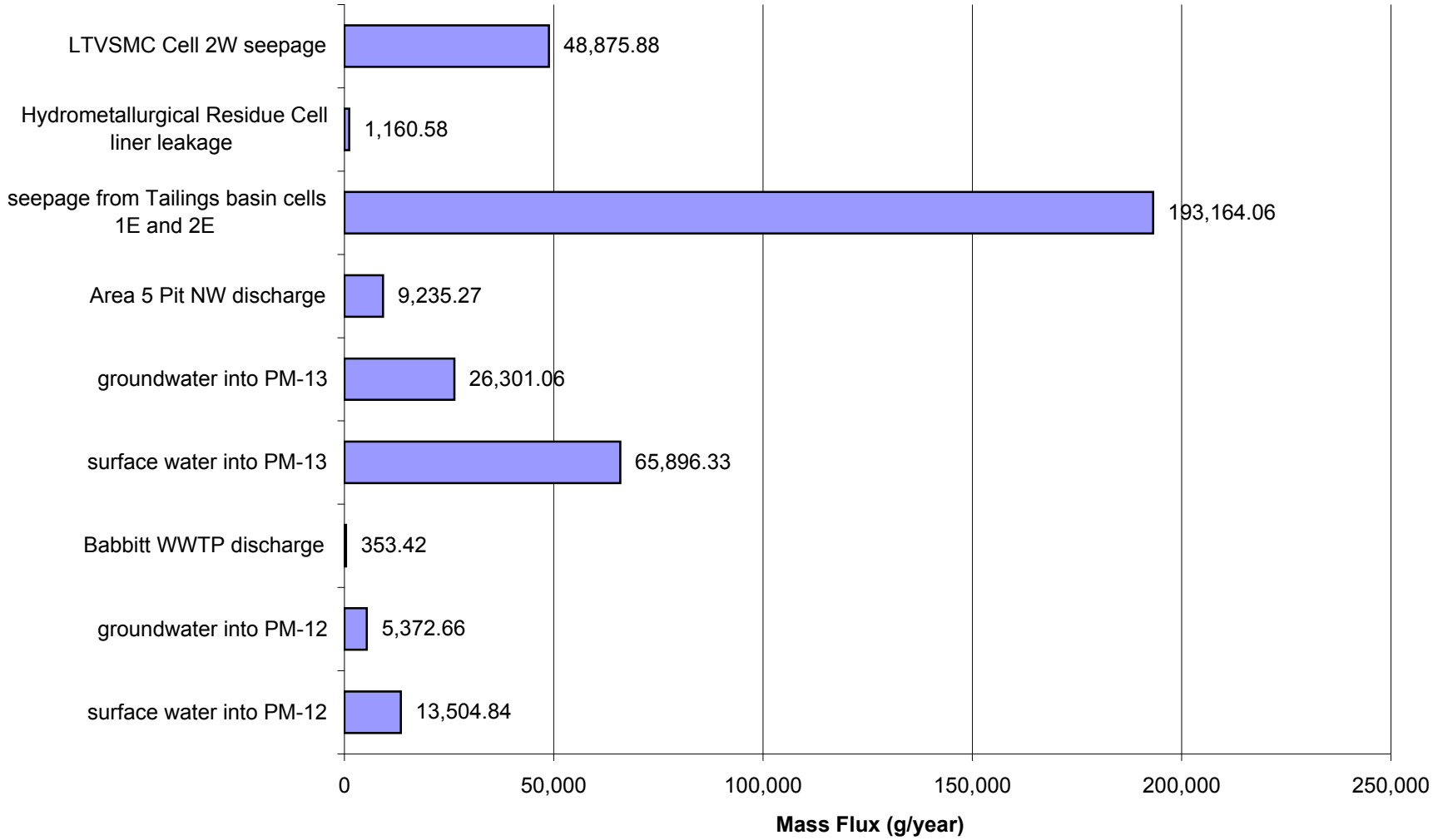
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 9 for Low Flow for Nickel (Ni)



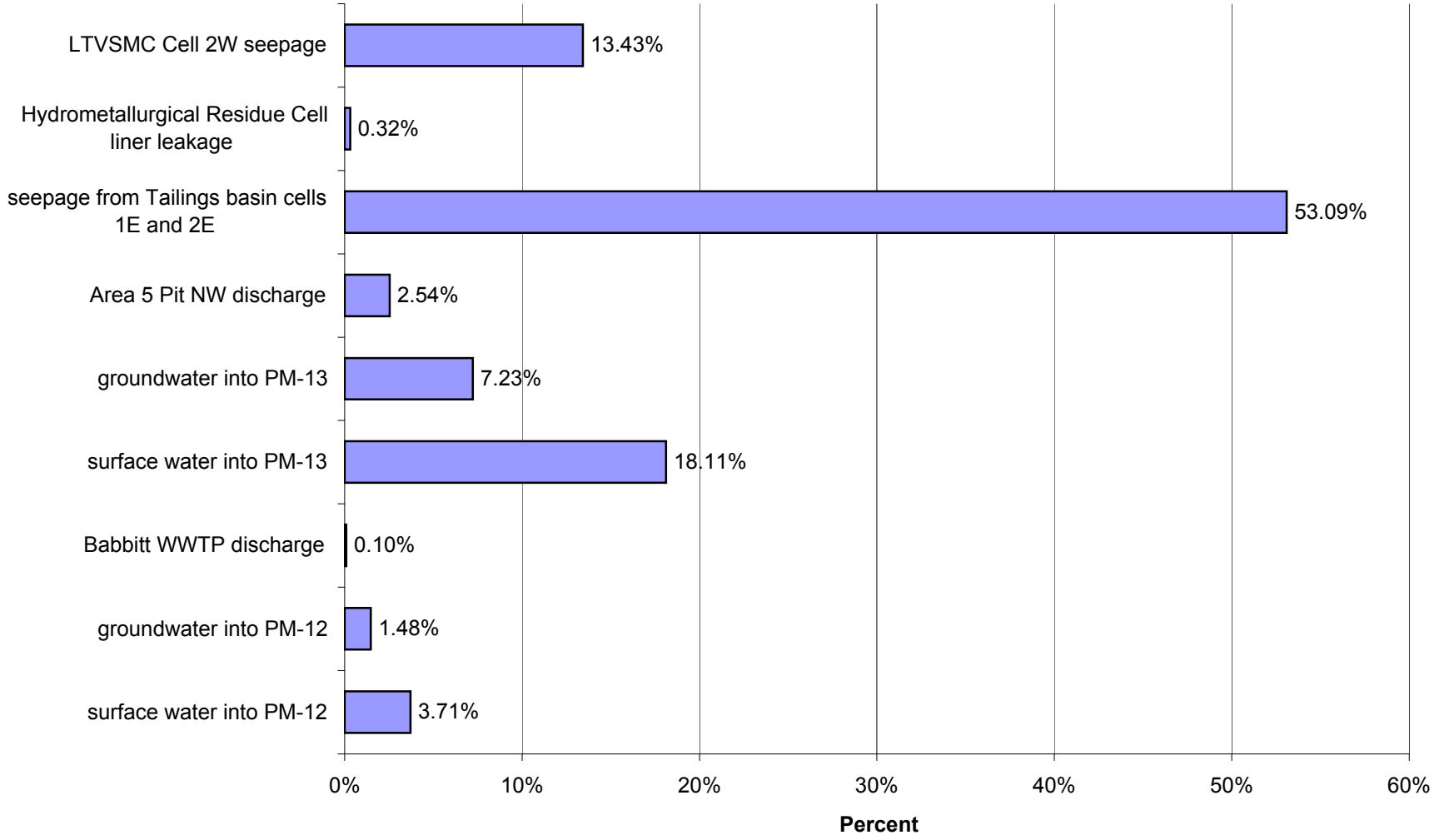
Proposed Action: Percent of Impacts at PM-13 in Year 9 for Low Flow for Nickel (Ni)



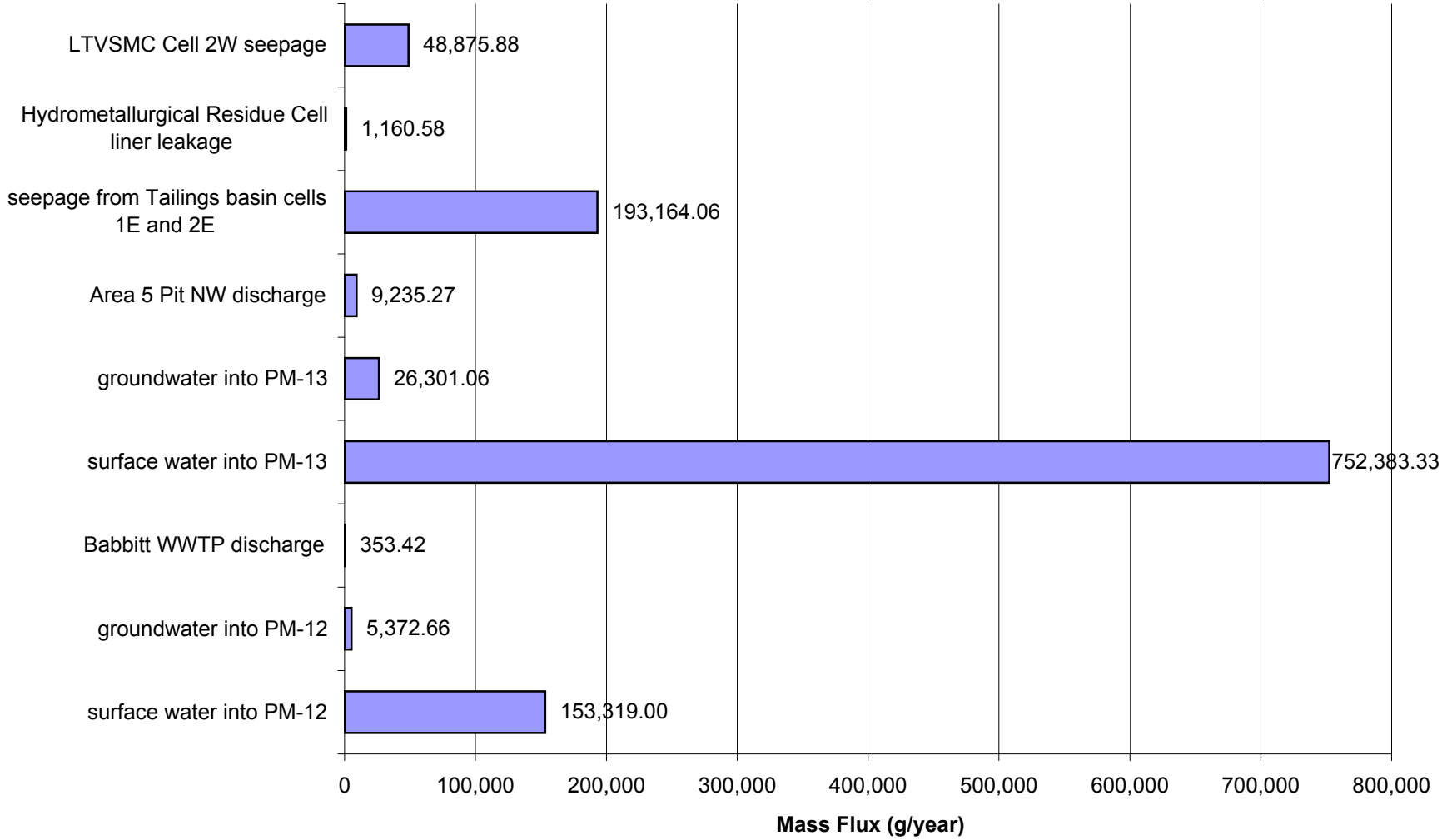
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 9 for Average Flow for Nickel (Ni)



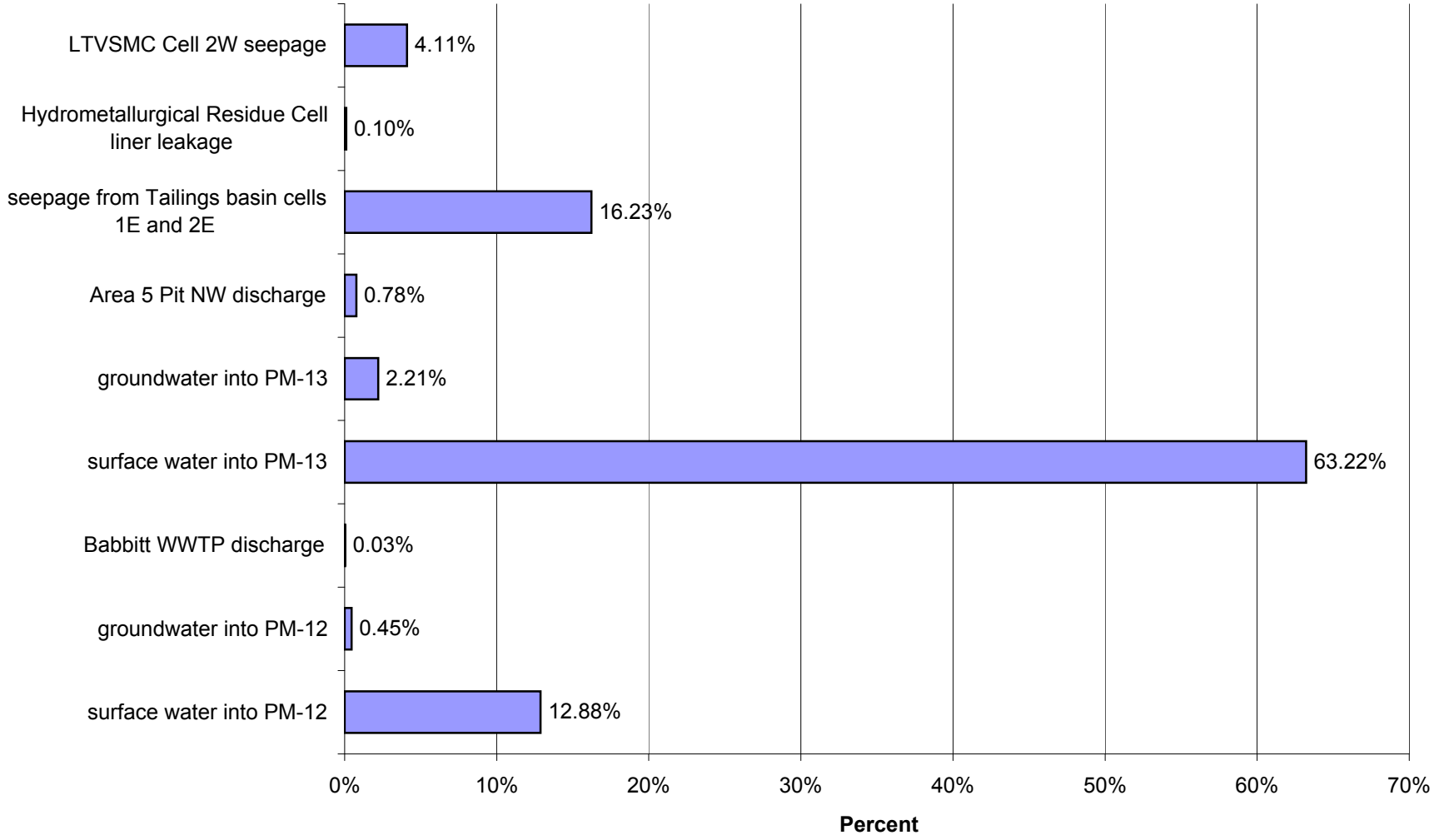
Proposed Action: Percent of Impacts at PM-13 in Year 9 for Average Flow for Nickel (Ni)



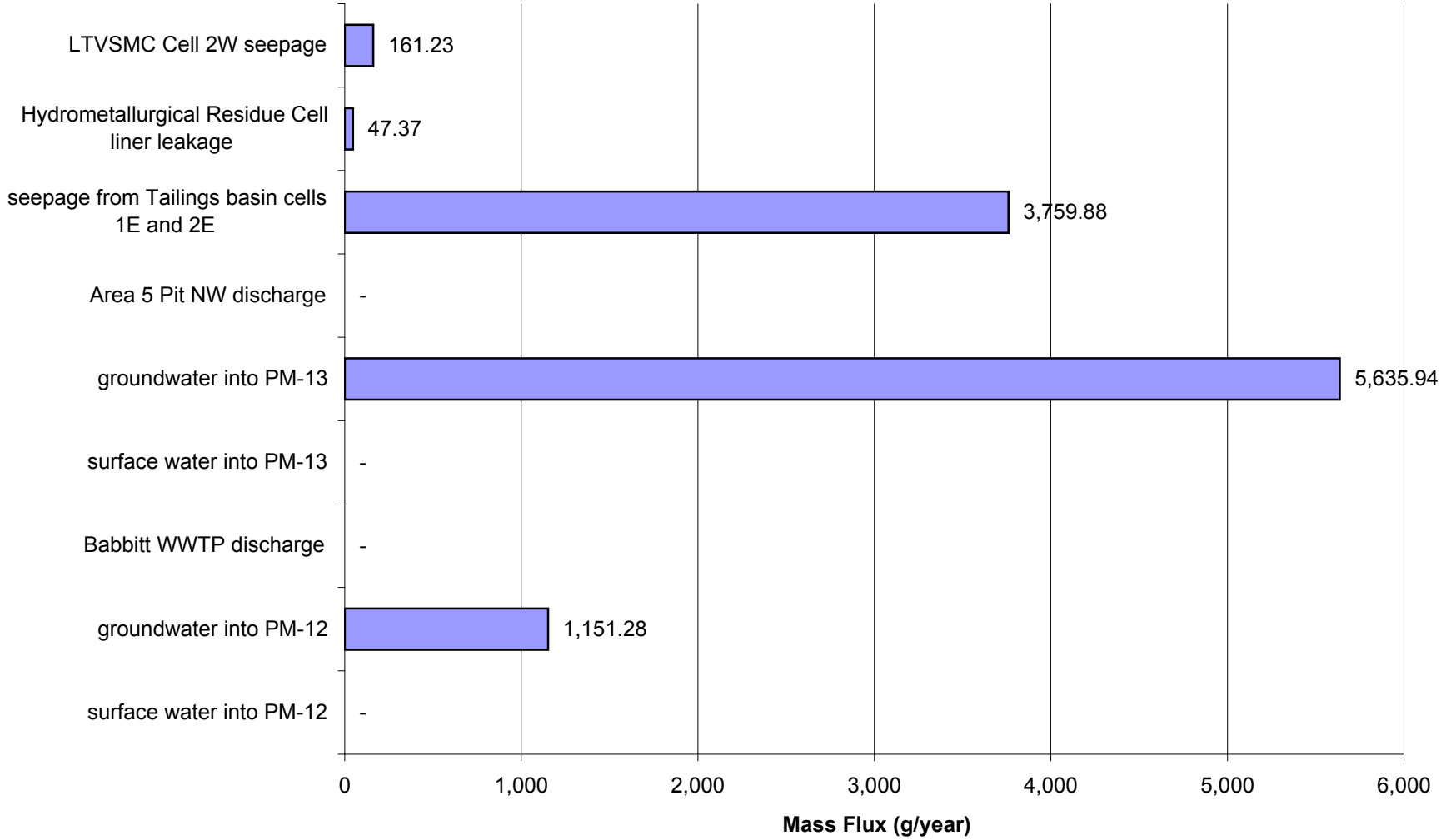
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 9 for High Flow for Nickel (Ni)



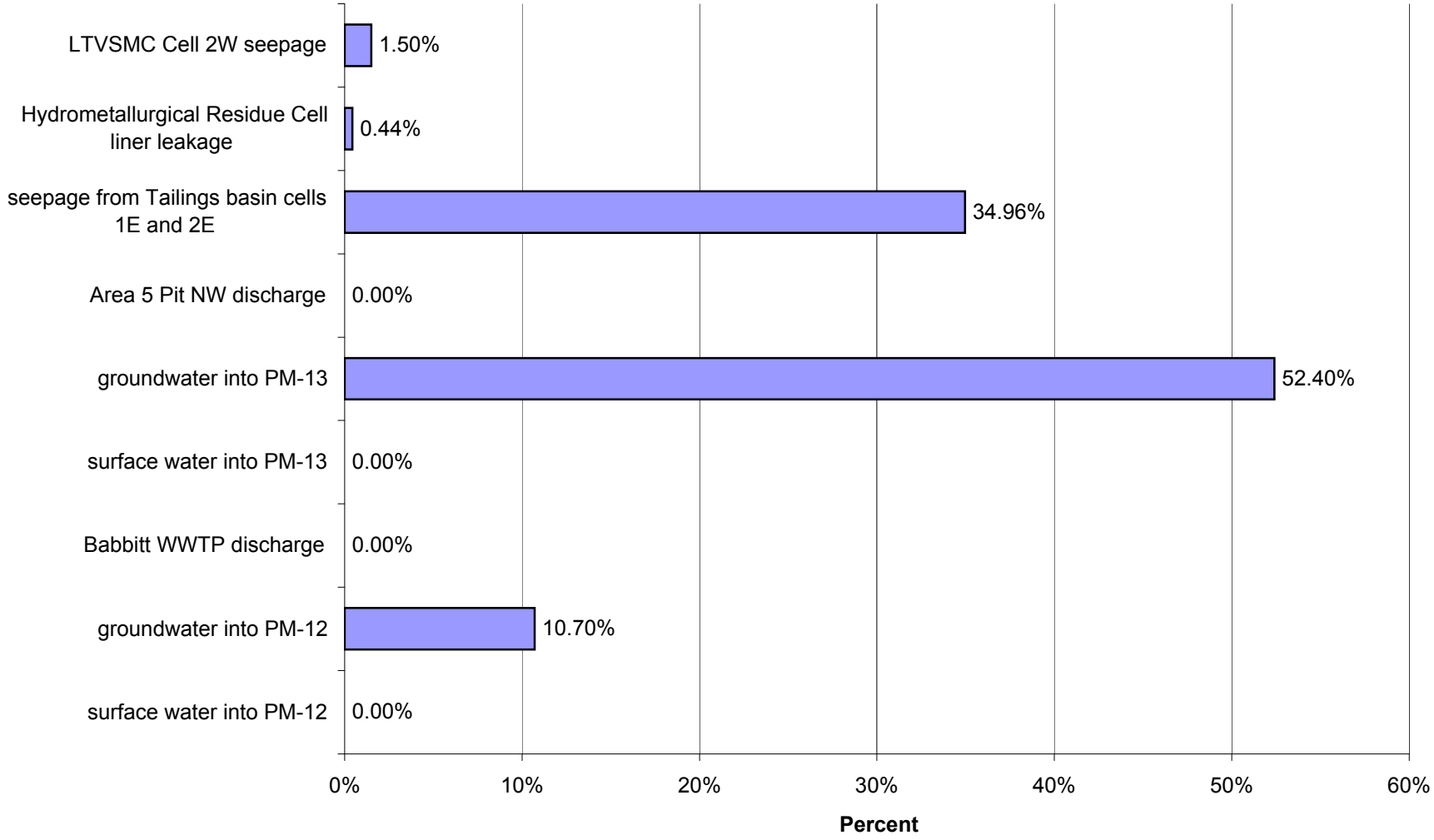
Proposed Action: Percent of Impacts at PM-13 in Year 9 for High Flow for Nickel (Ni)



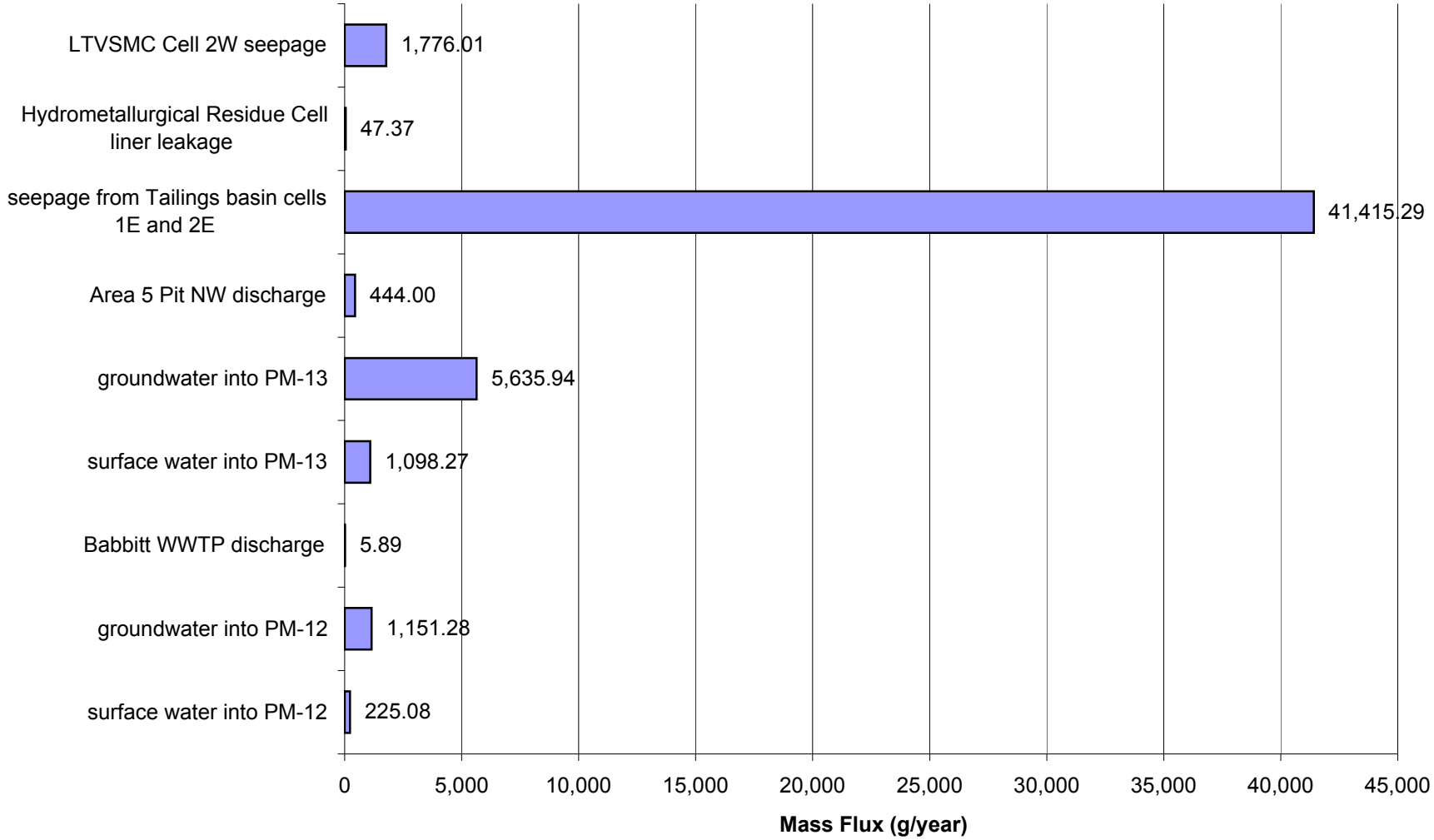
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 9 for Low Flow for Antimony (Sb)



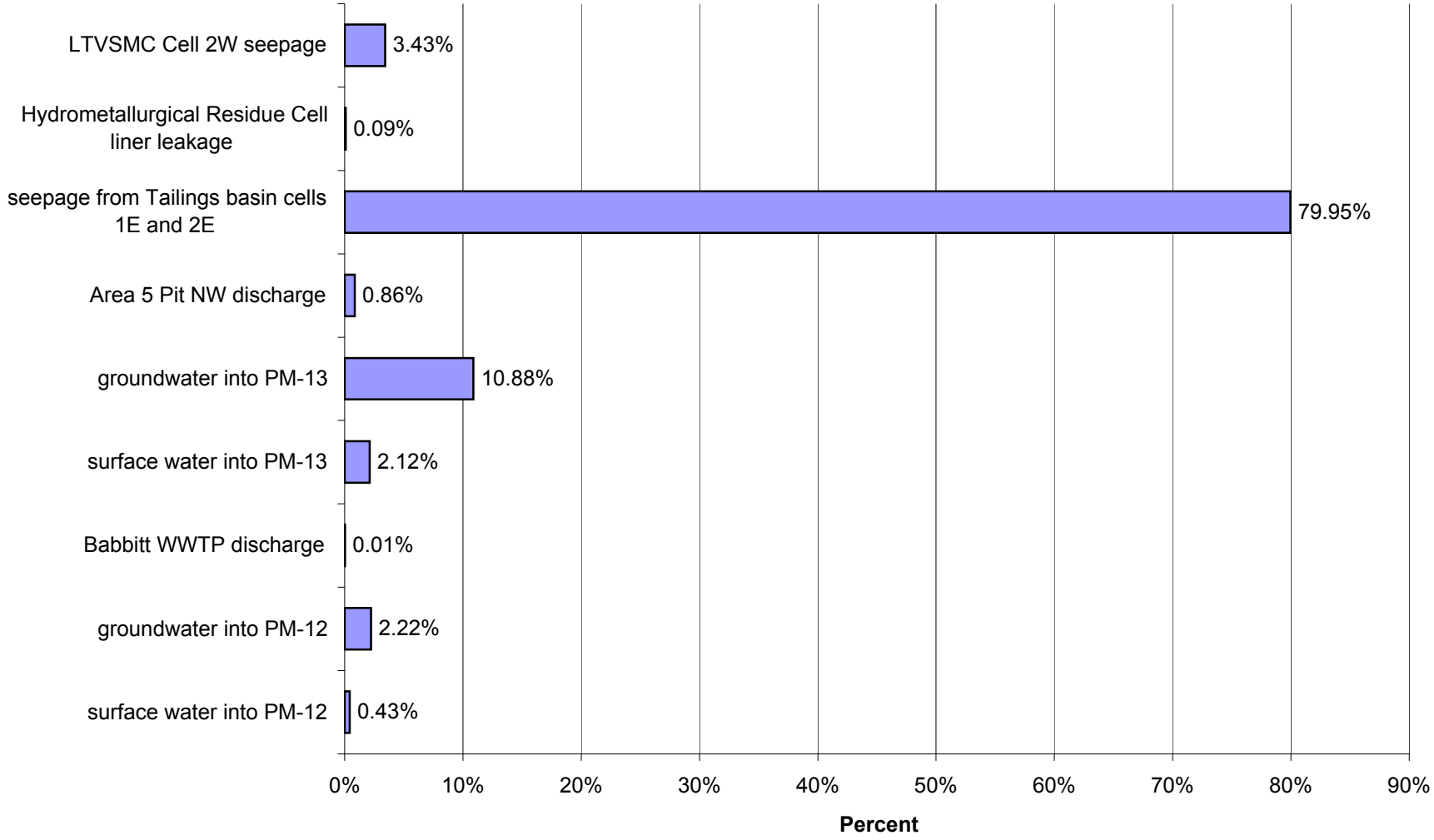
Proposed Action: Percent of Impacts at PM-13 in Year 9 for Low Flow for Antimony (Sb)



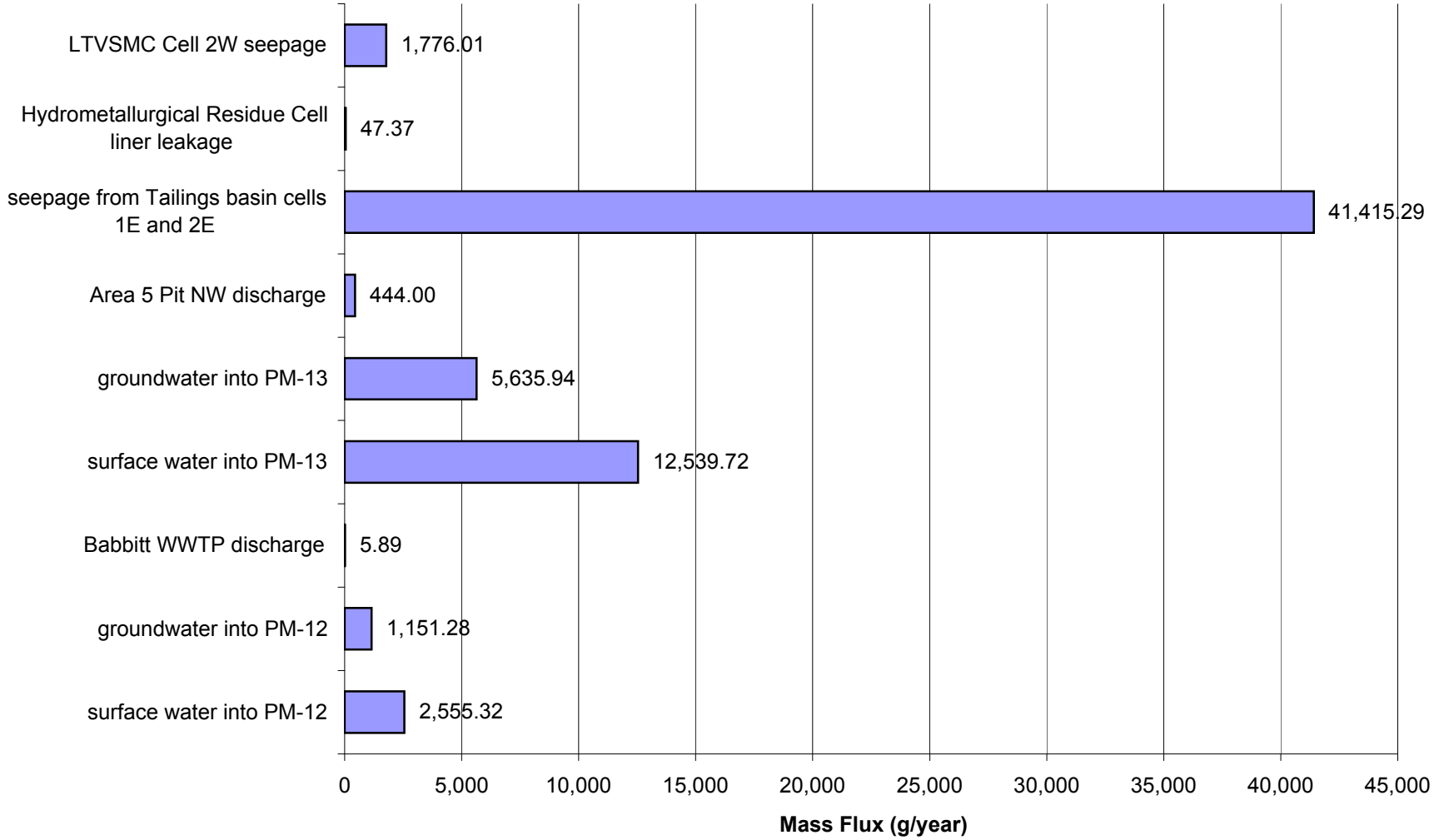
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 9 for Average Flow for Antimony (Sb)



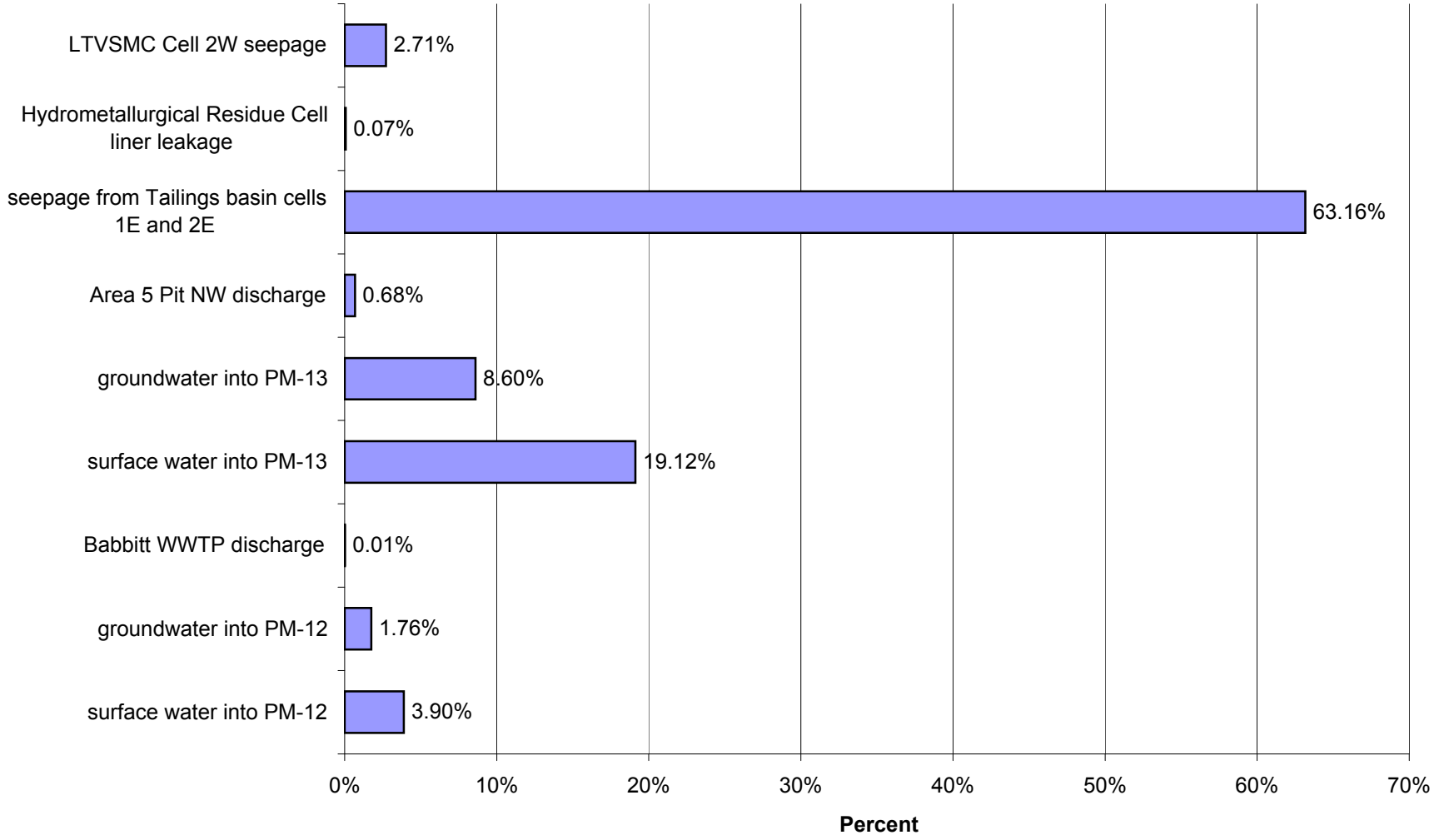
Proposed Action: Percent of Impacts at PM-13 in Year 9 for Average Flow for Antimony (Sb)



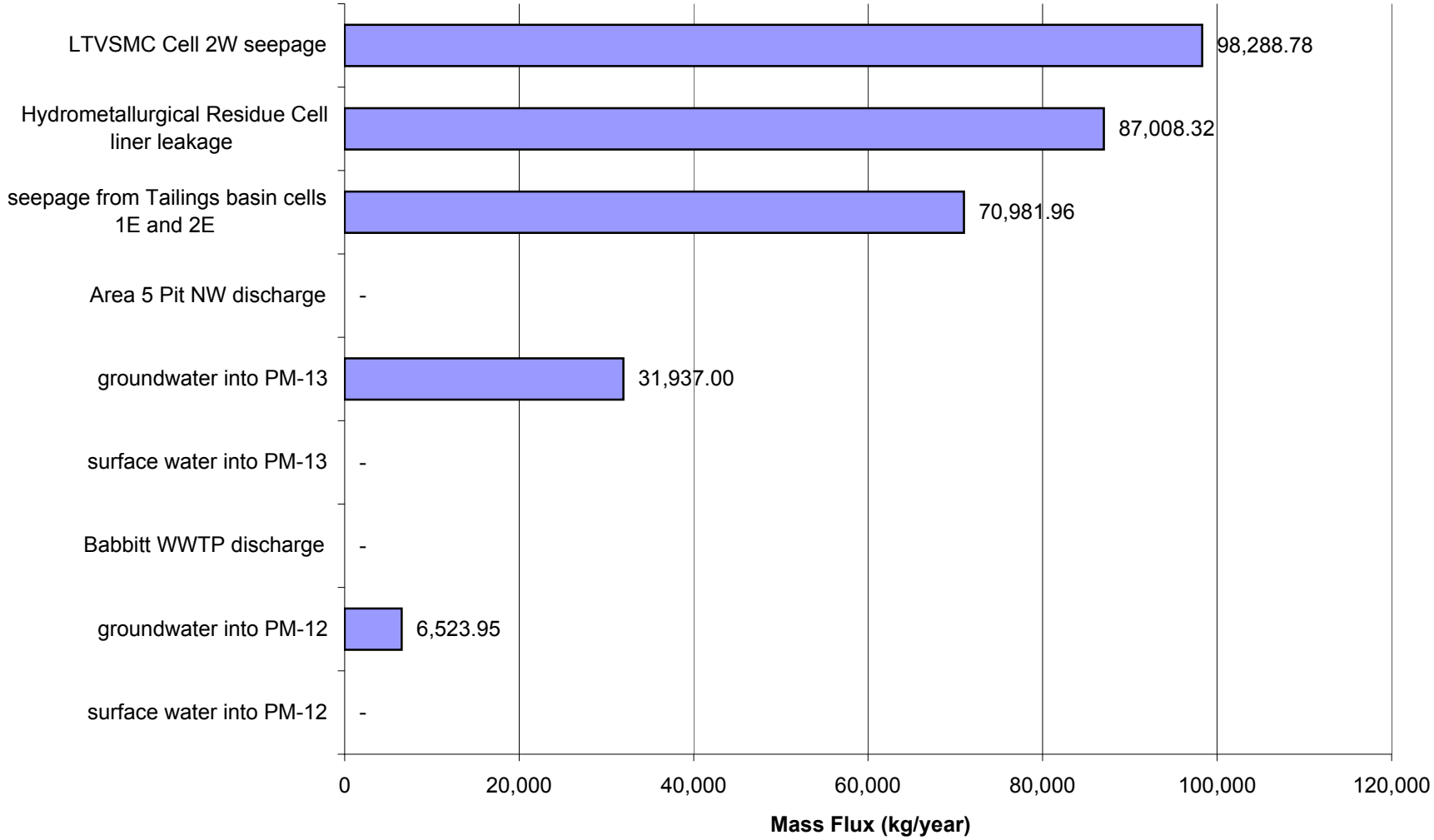
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 9 for High Flow for Antimony (Sb)



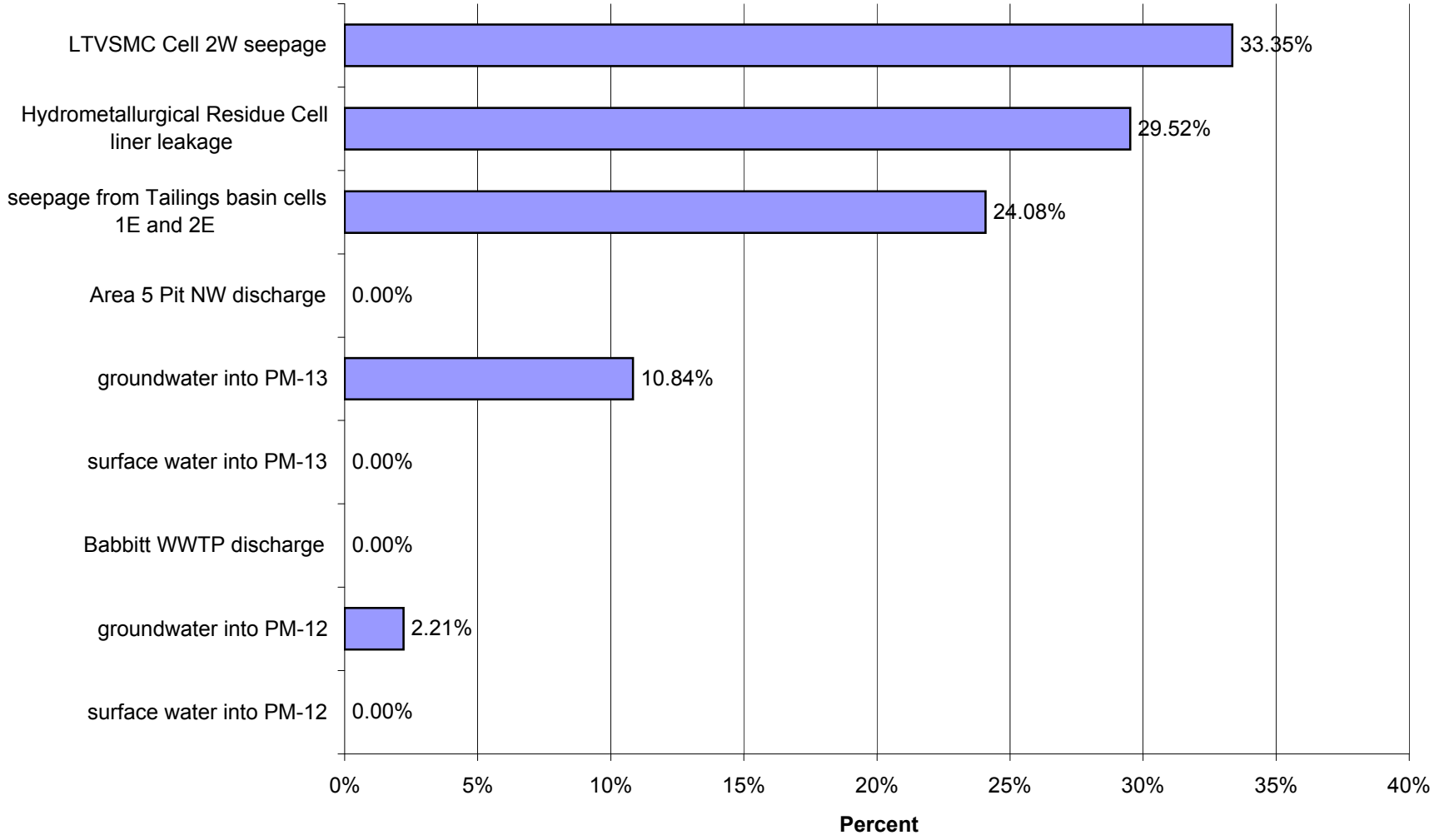
Proposed Action: Percent of Impacts at PM-13 in Year 9 for High Flow for Antimony (Sb)



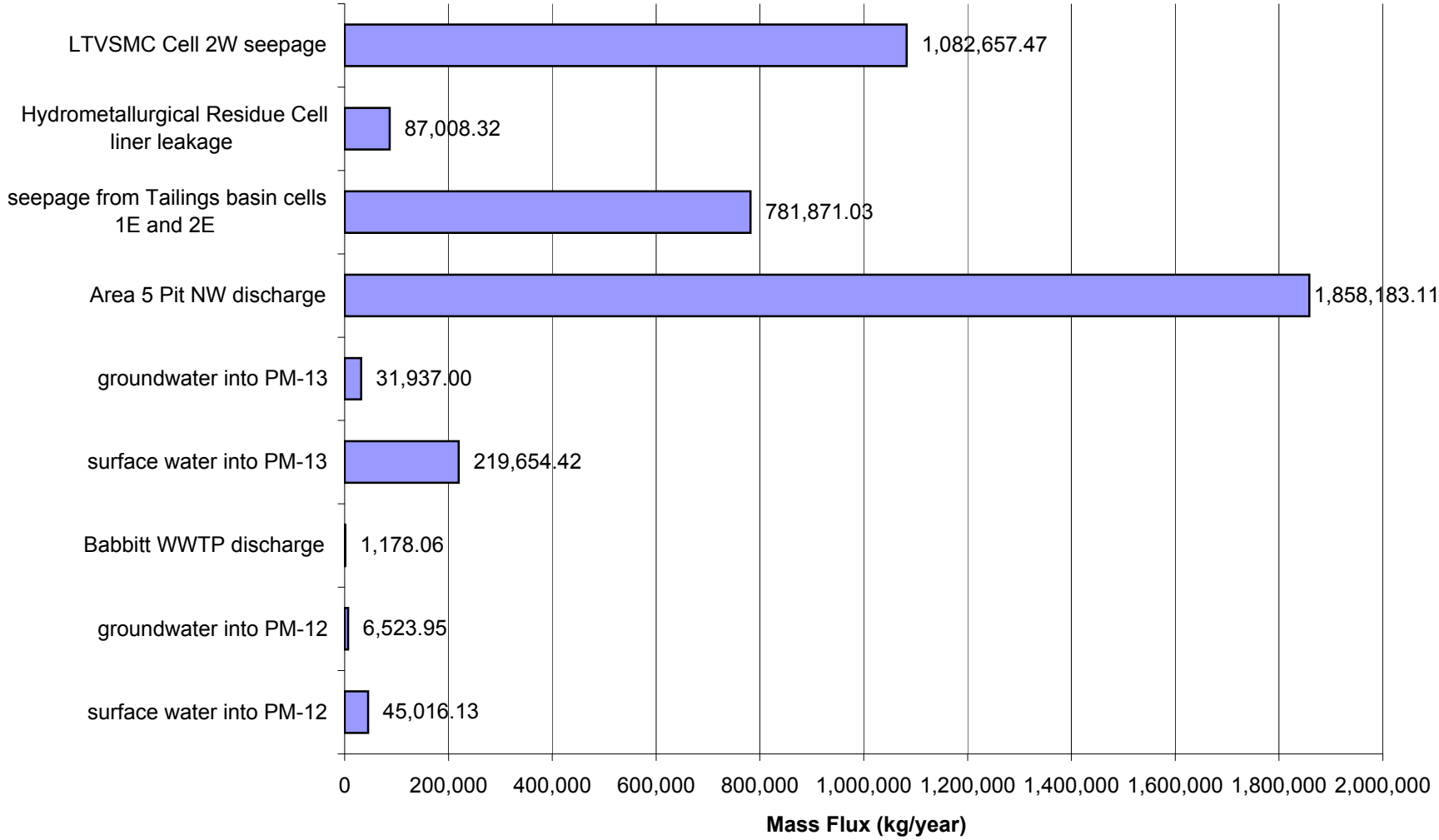
Proposed Action: Mass Flux (kg/year) of Impacts at PM-13 in Year 9 for Low Flow for Sulfate (SO_4)



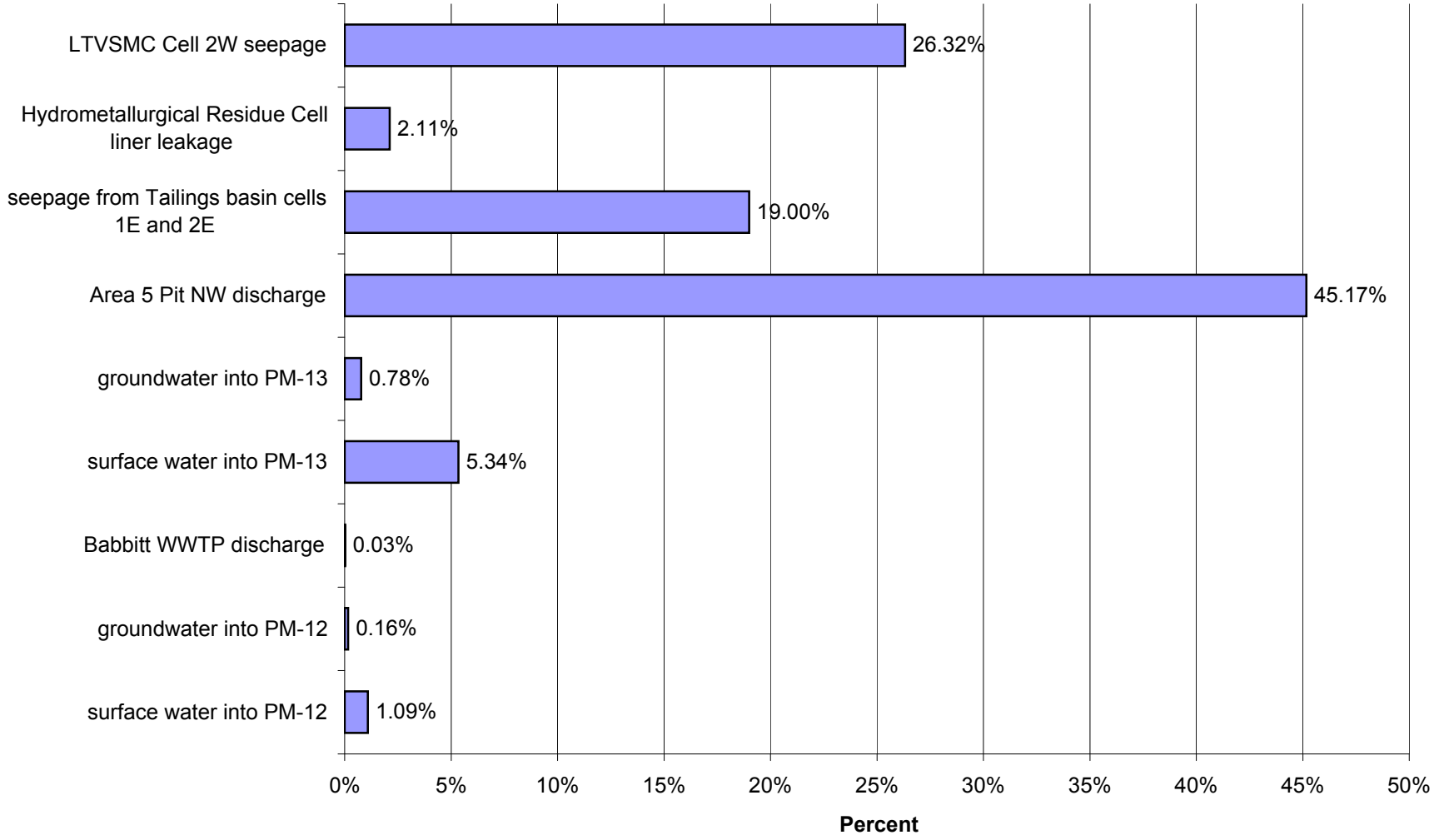
Proposed Action: Percent of Impacts at PM-13 in Year 9 for Low Flow for Sulfate (SO_4)



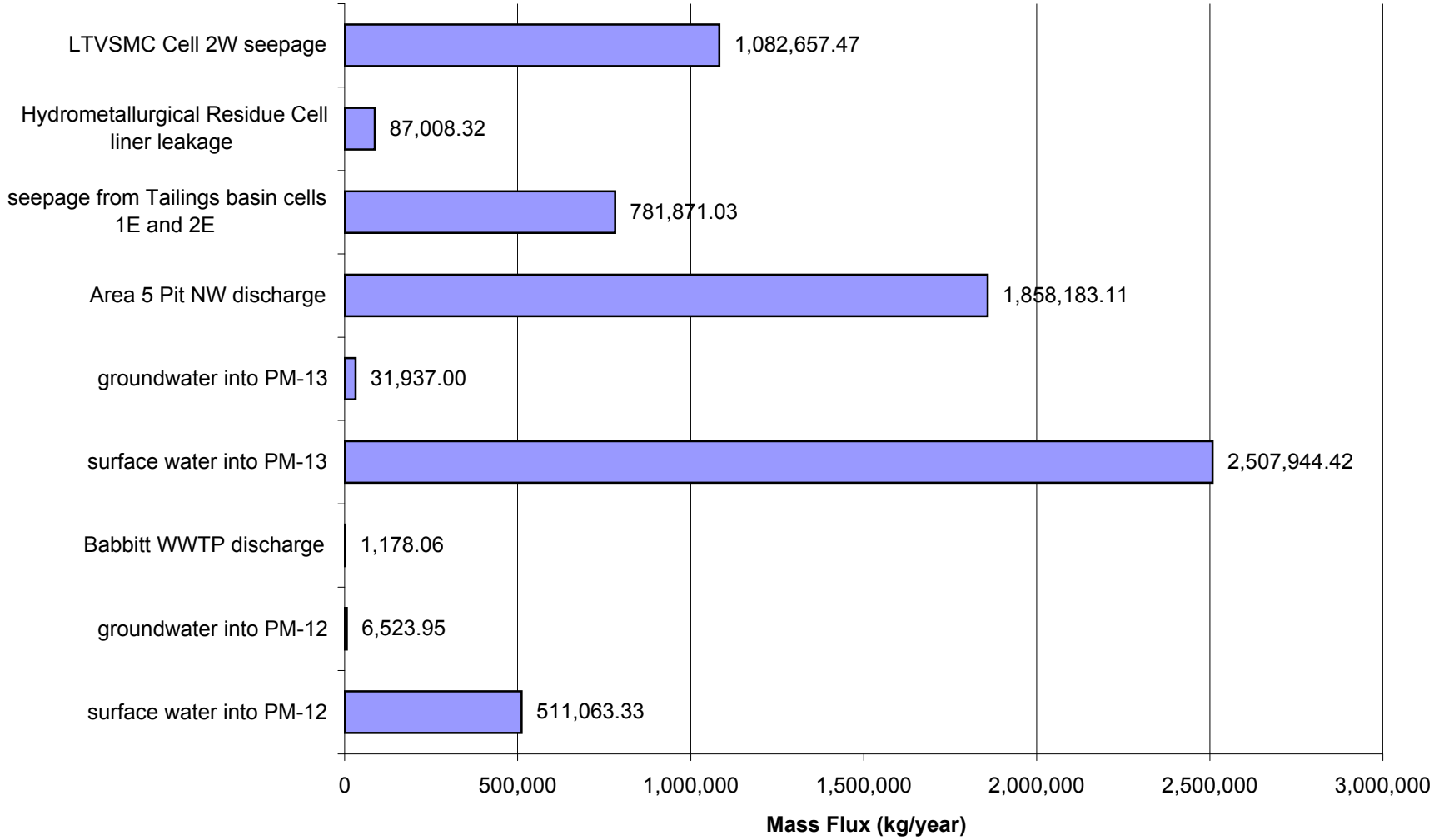
Proposed Action: Mass Flux (kg/year) of Impacts at PM-13 in Year 9 for Average Flow for Sulfate (SO_4)



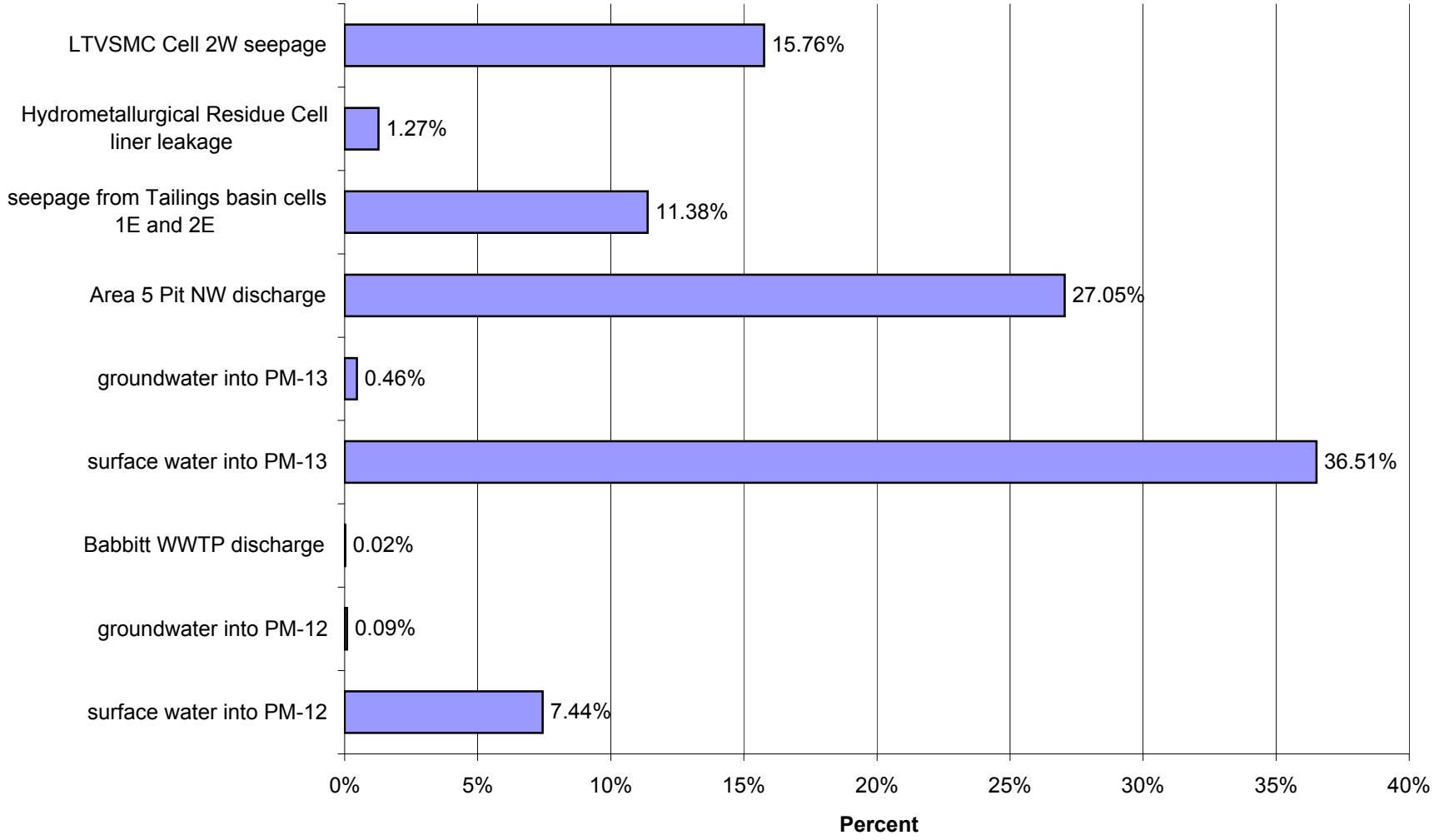
Proposed Action: Percent of Impacts at PM-13 in Year 9 for Average Flow for Sulfate (SO_4)



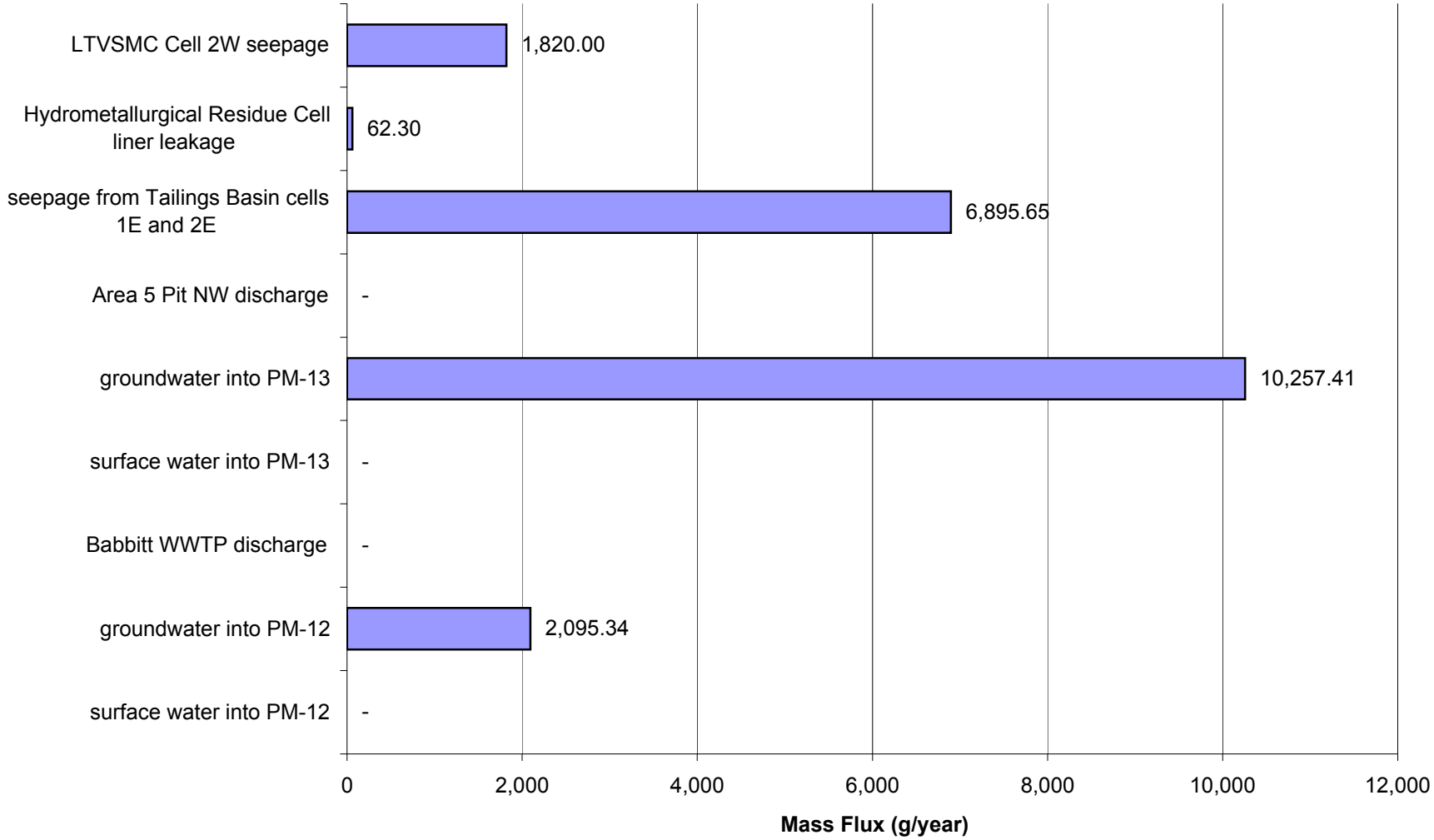
Proposed Action: Mass Flux (kg/year) of Impacts at PM-13 in Year 9 for High Flow for Sulfate (SO_4)



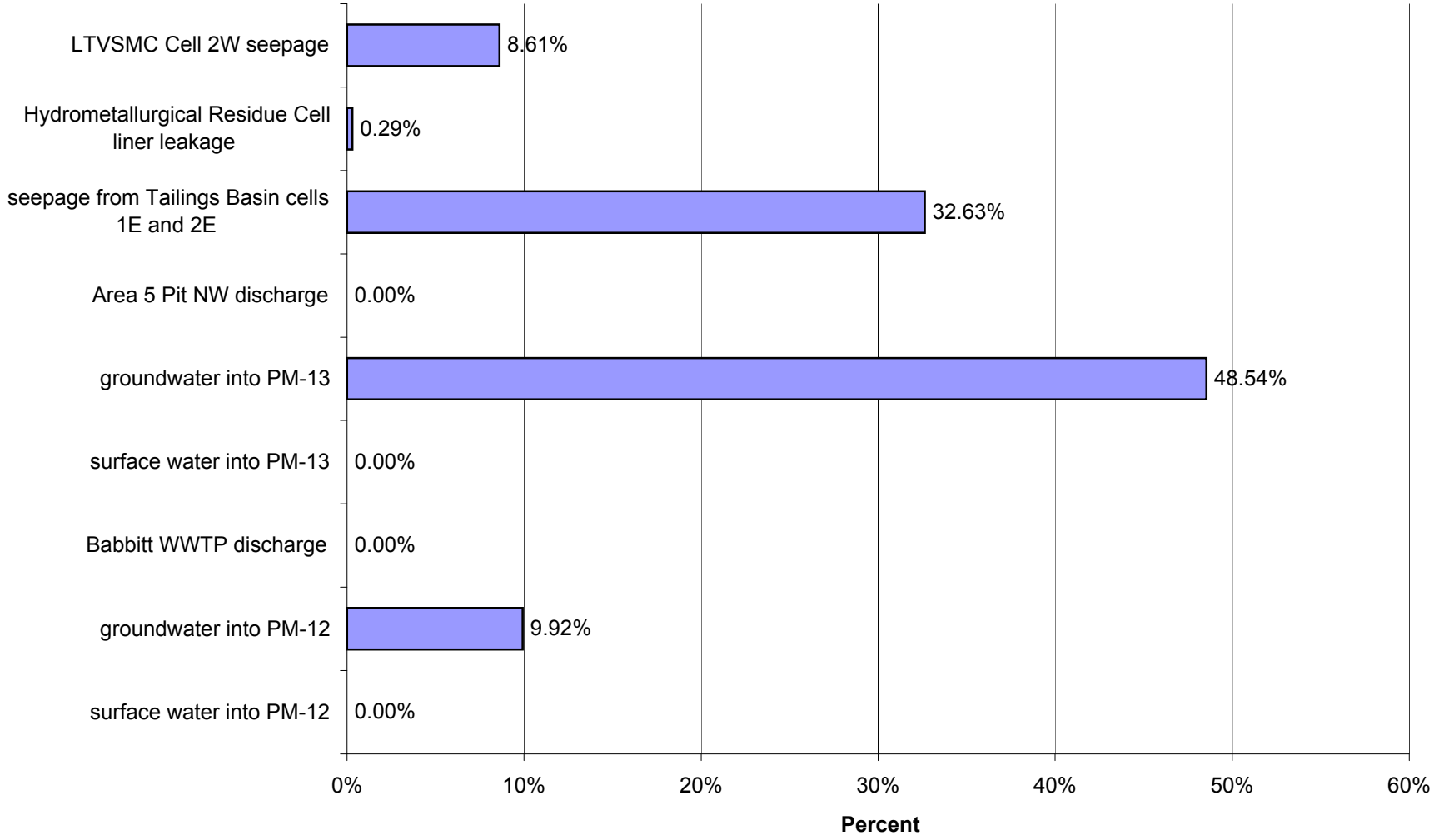
Proposed Action: Percent of Impacts at PM-13 in Year 9 for High Flow for Sulfate (SO_4)



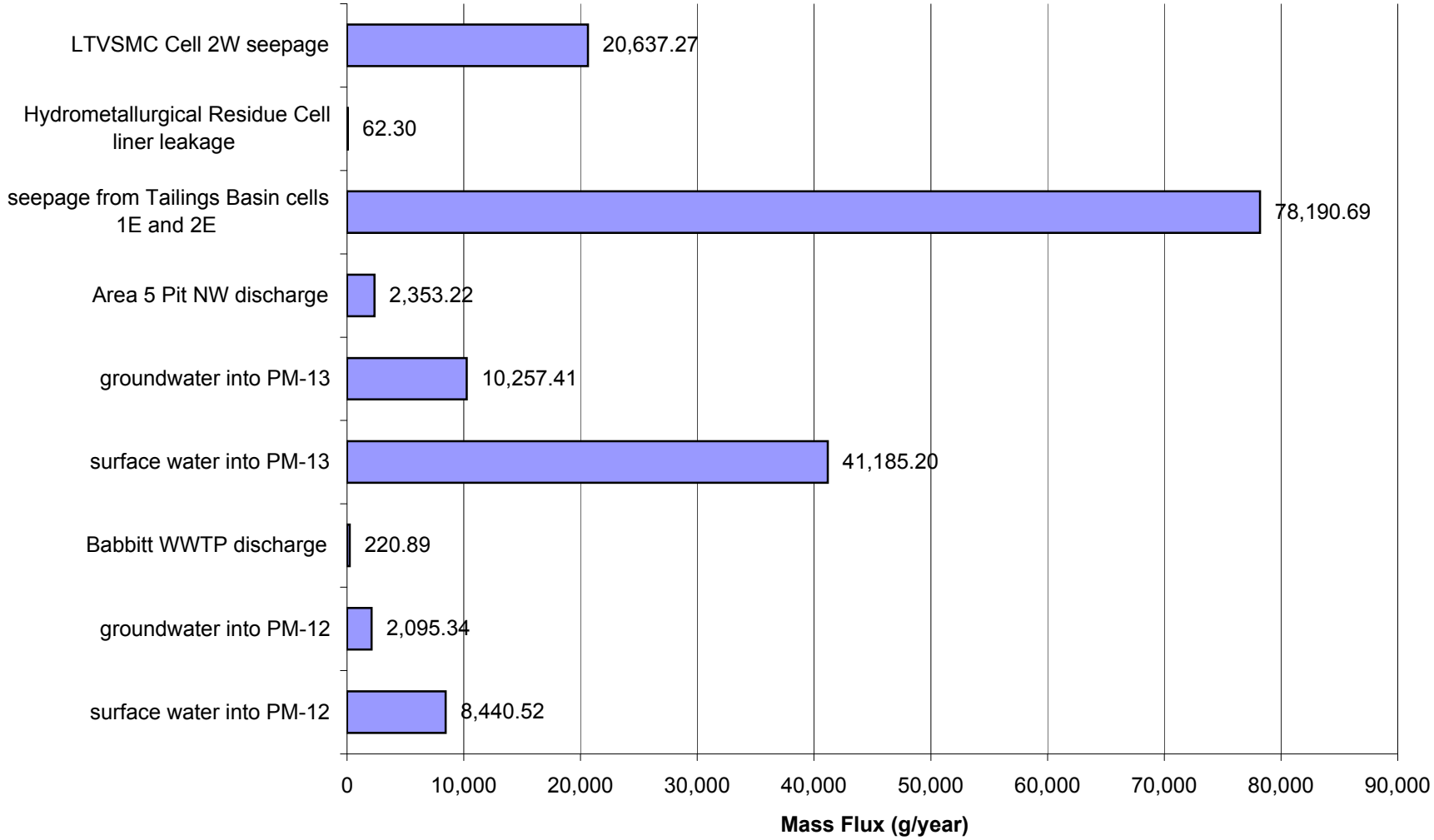
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for Low Flow for Arsenic (As)



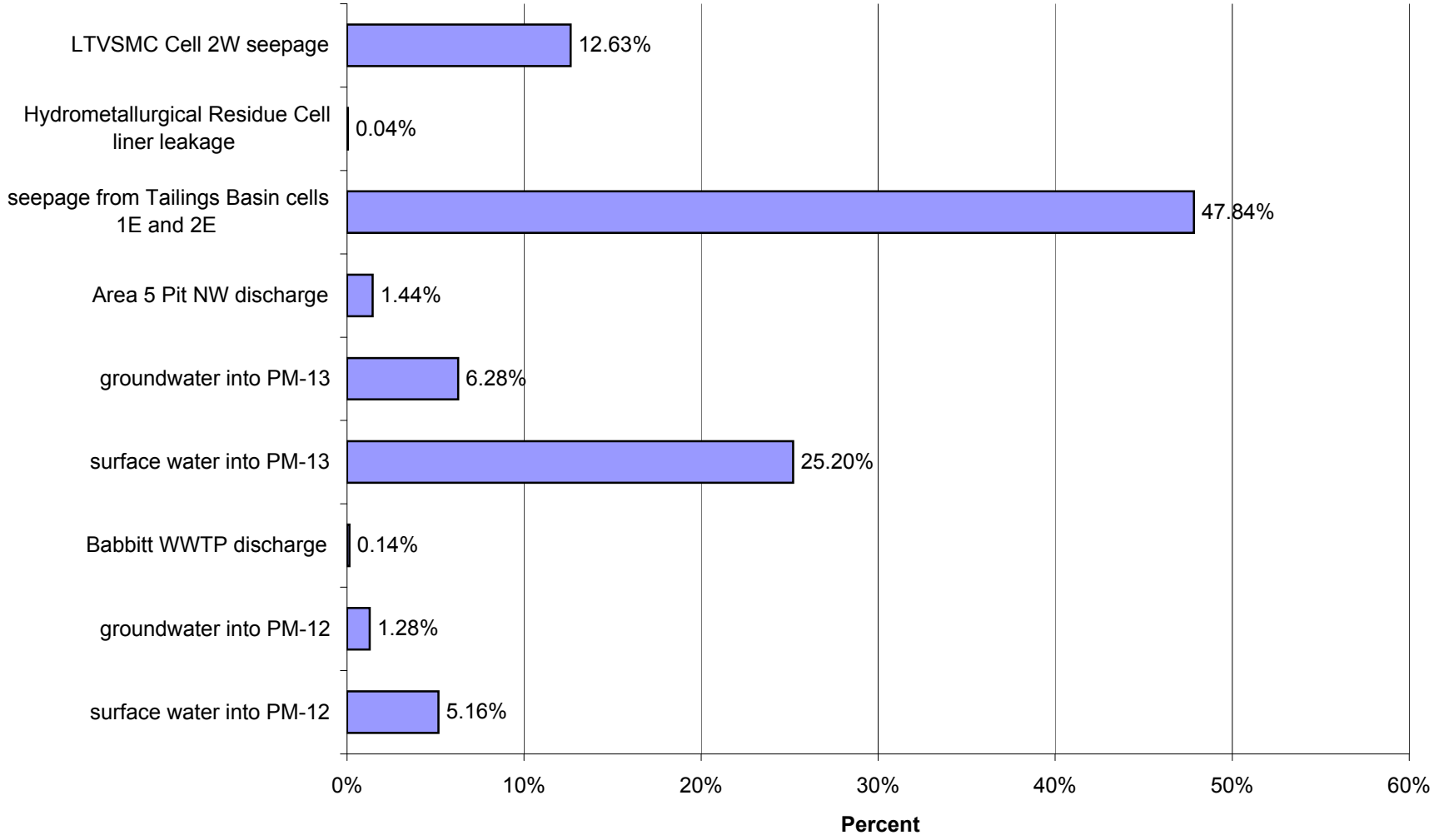
Proposed Action: Percent of Impacts at PM-13 in Year 15 for Low Flow for Arsenic (As)



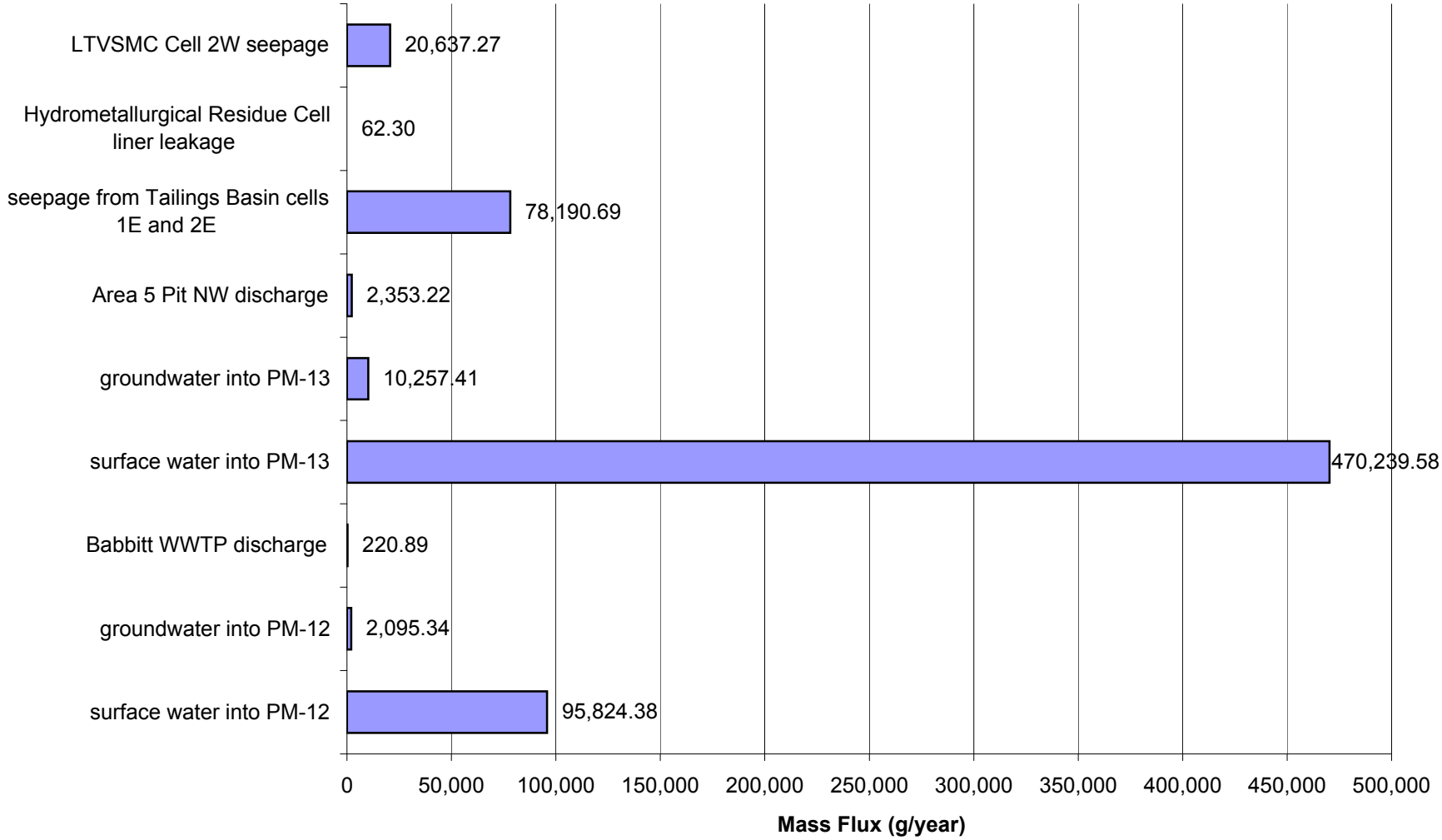
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for Average Flow for Arsenic (As)



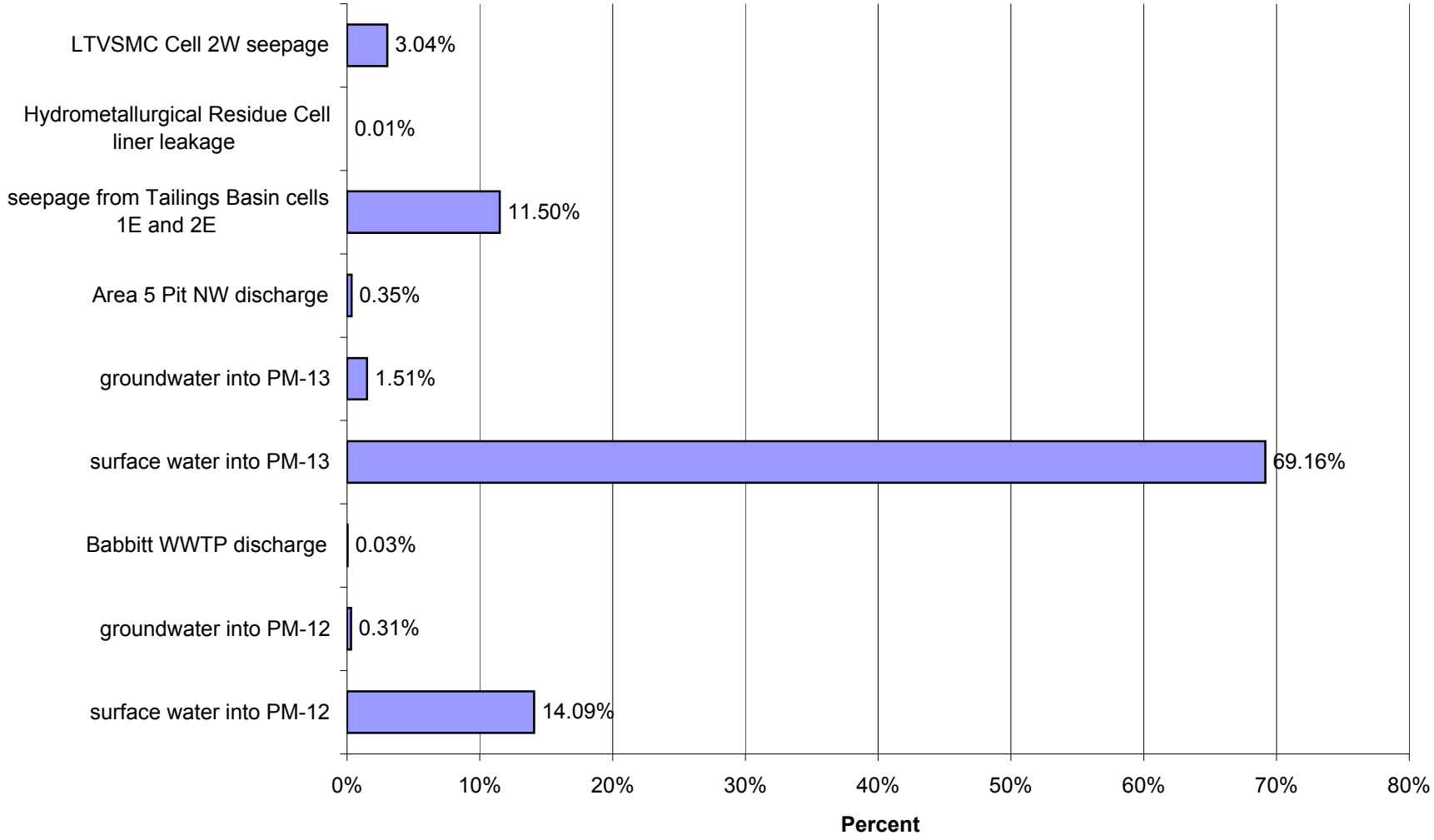
Proposed Action: Percent of Impacts at PM-13 in Year 15 for Average Flow for Arsenic (As)



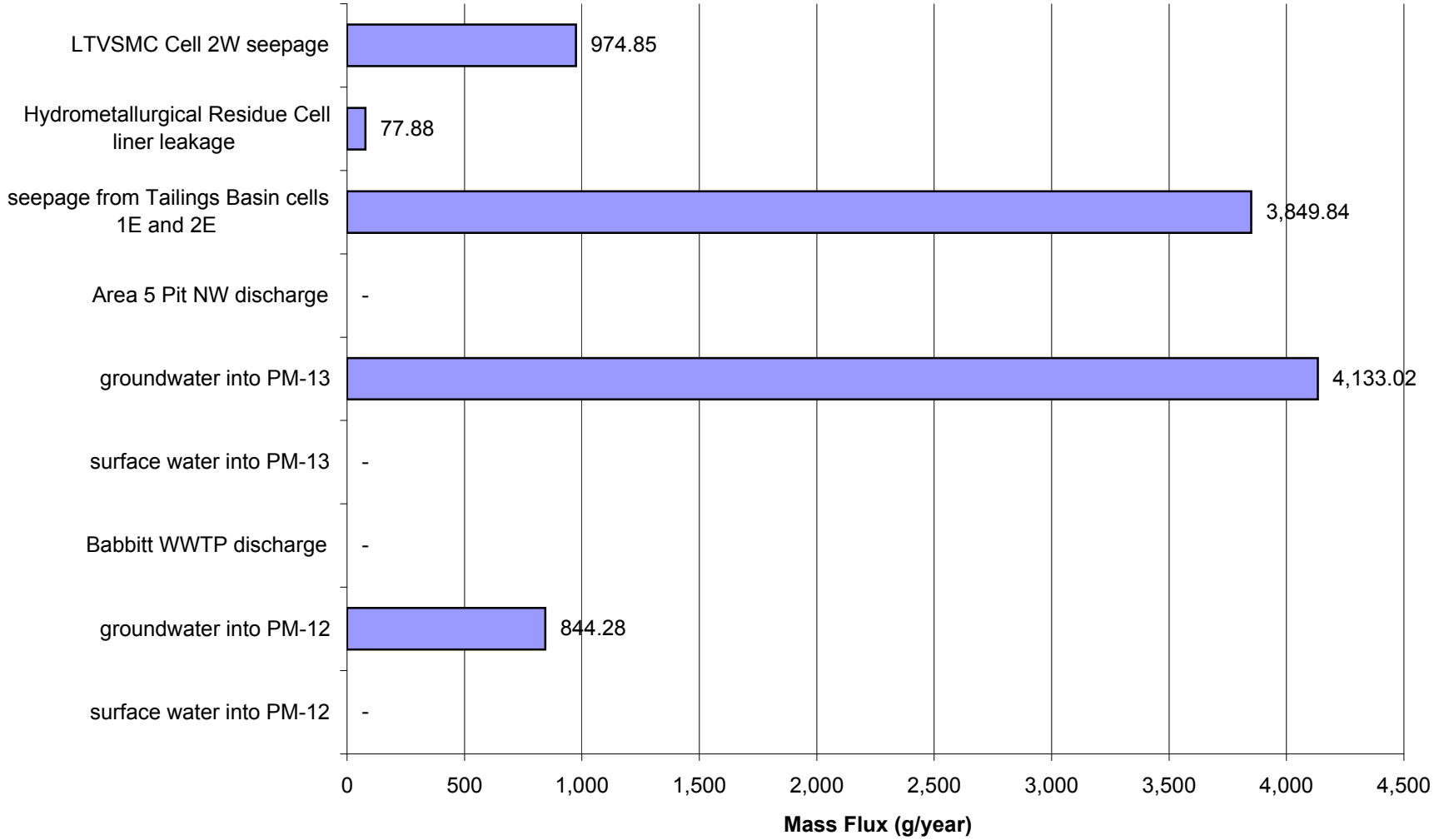
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for High Flow for Arsenic (As)



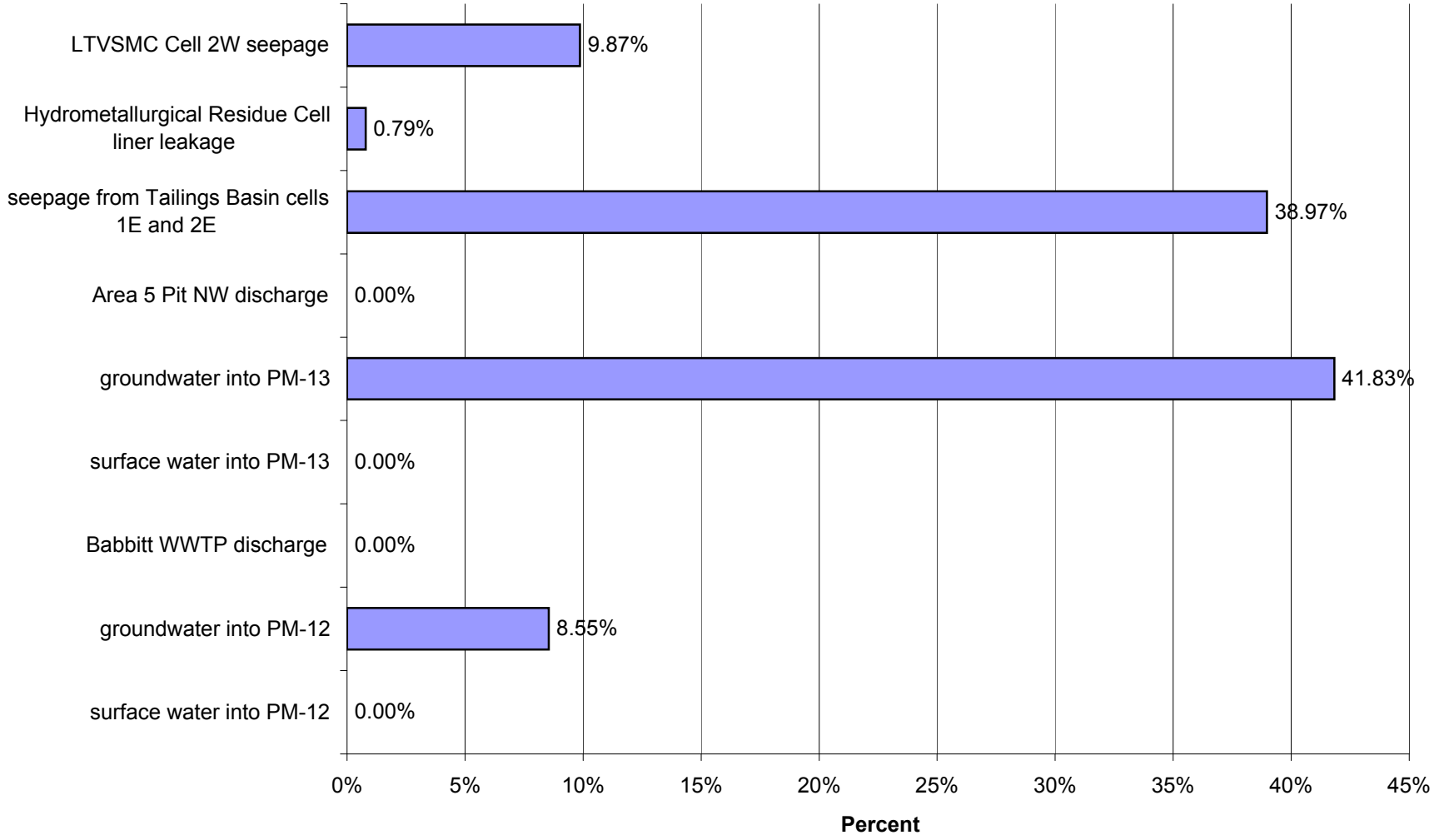
Proposed Action: Percent of Impacts at PM-13 in Year 15 for High Flow for Arsenic (As)



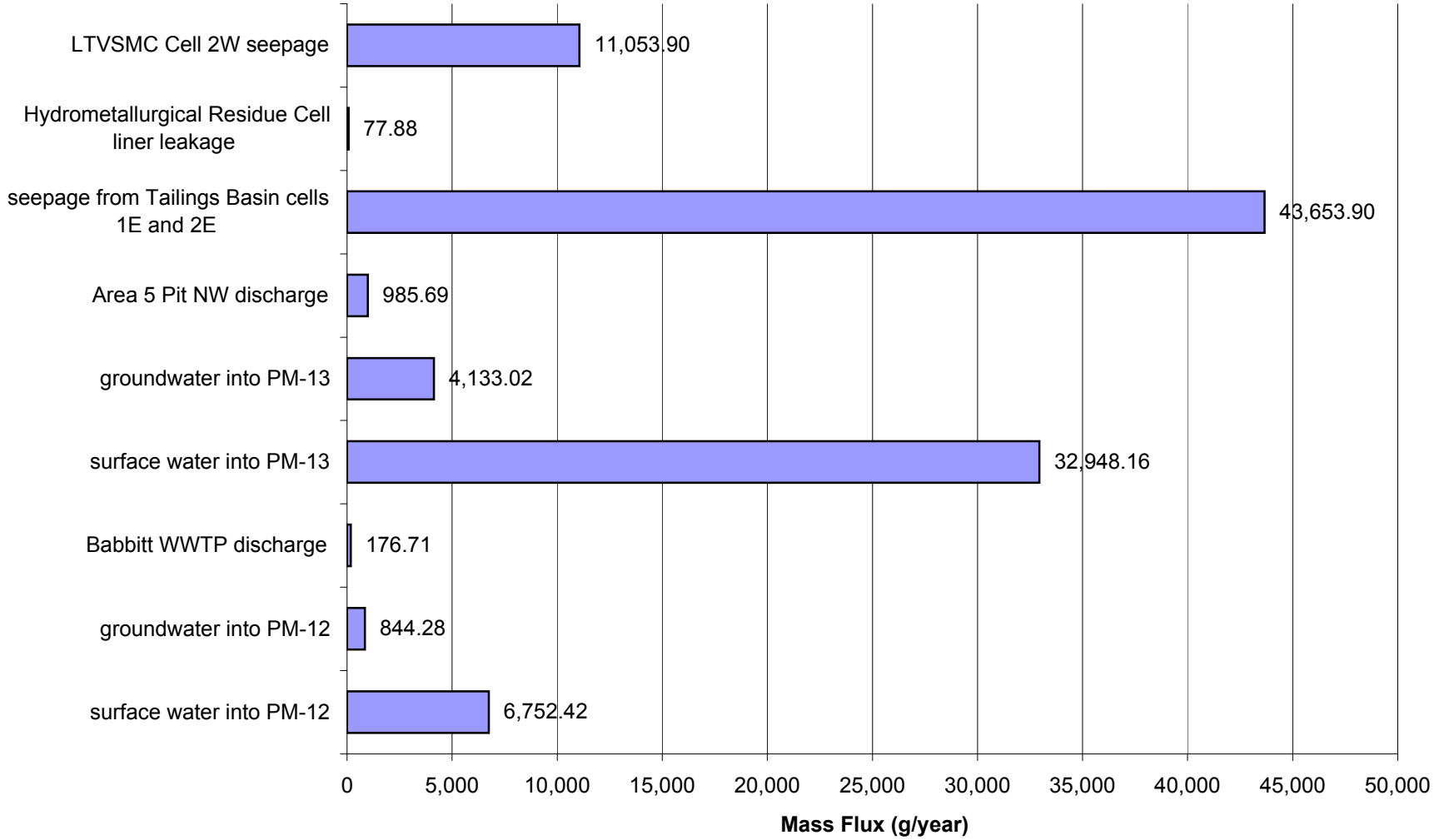
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for Low Flow for Cobalt (Co)



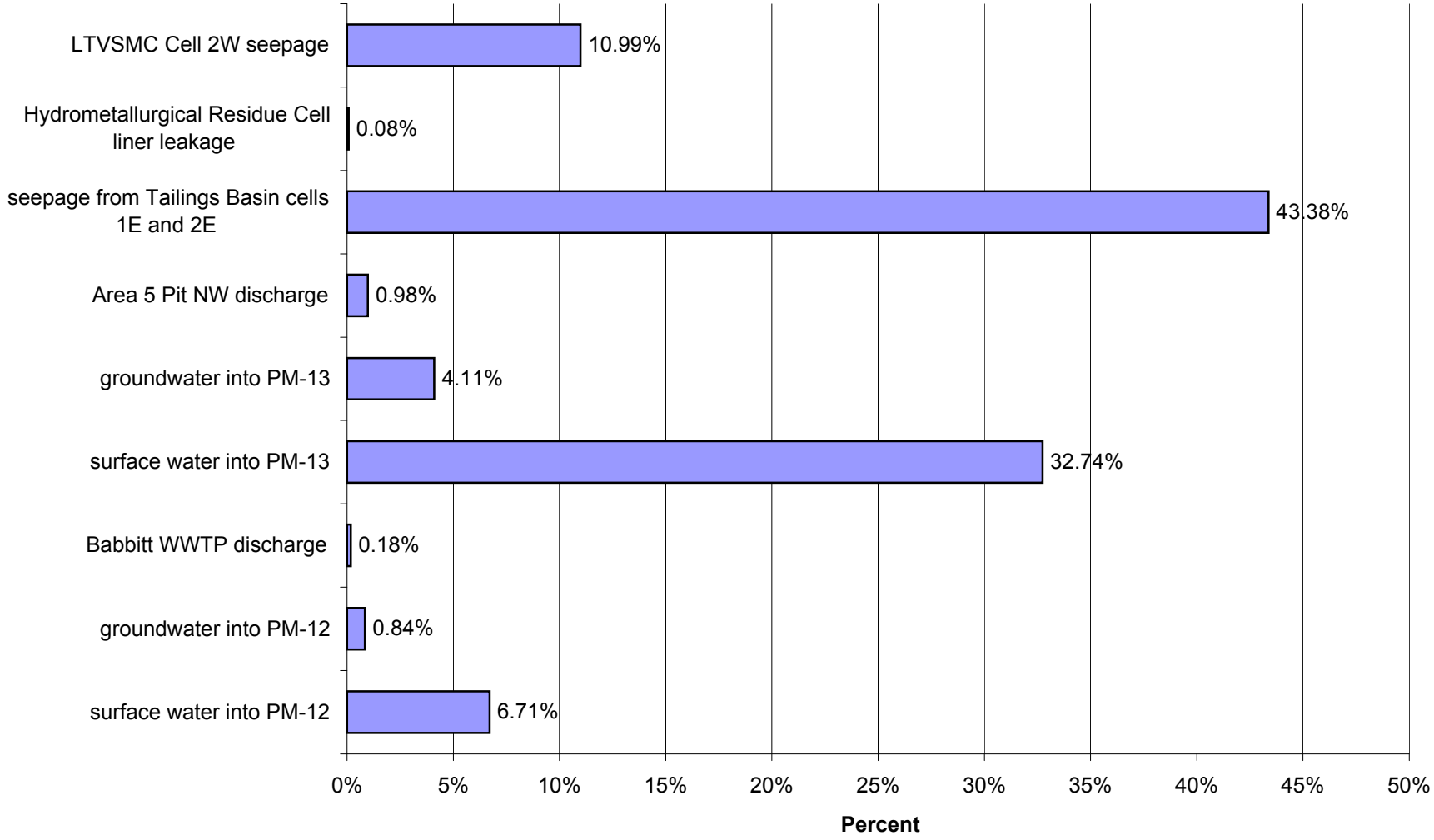
Proposed Action: Percent of Impacts at PM-13 in Year 15 for Low Flow for Cobalt (Co)



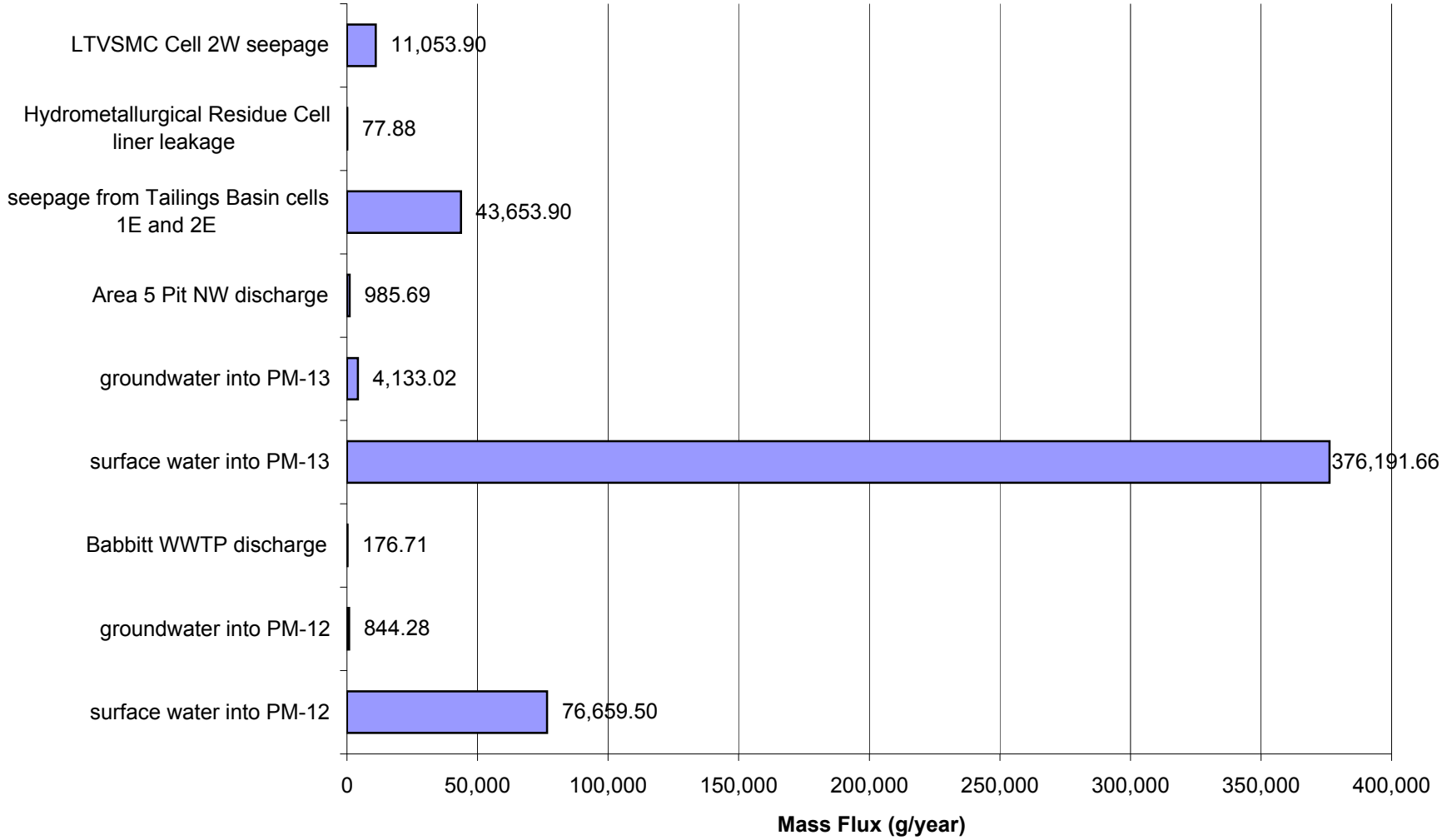
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for Average Flow for Cobalt (Co)



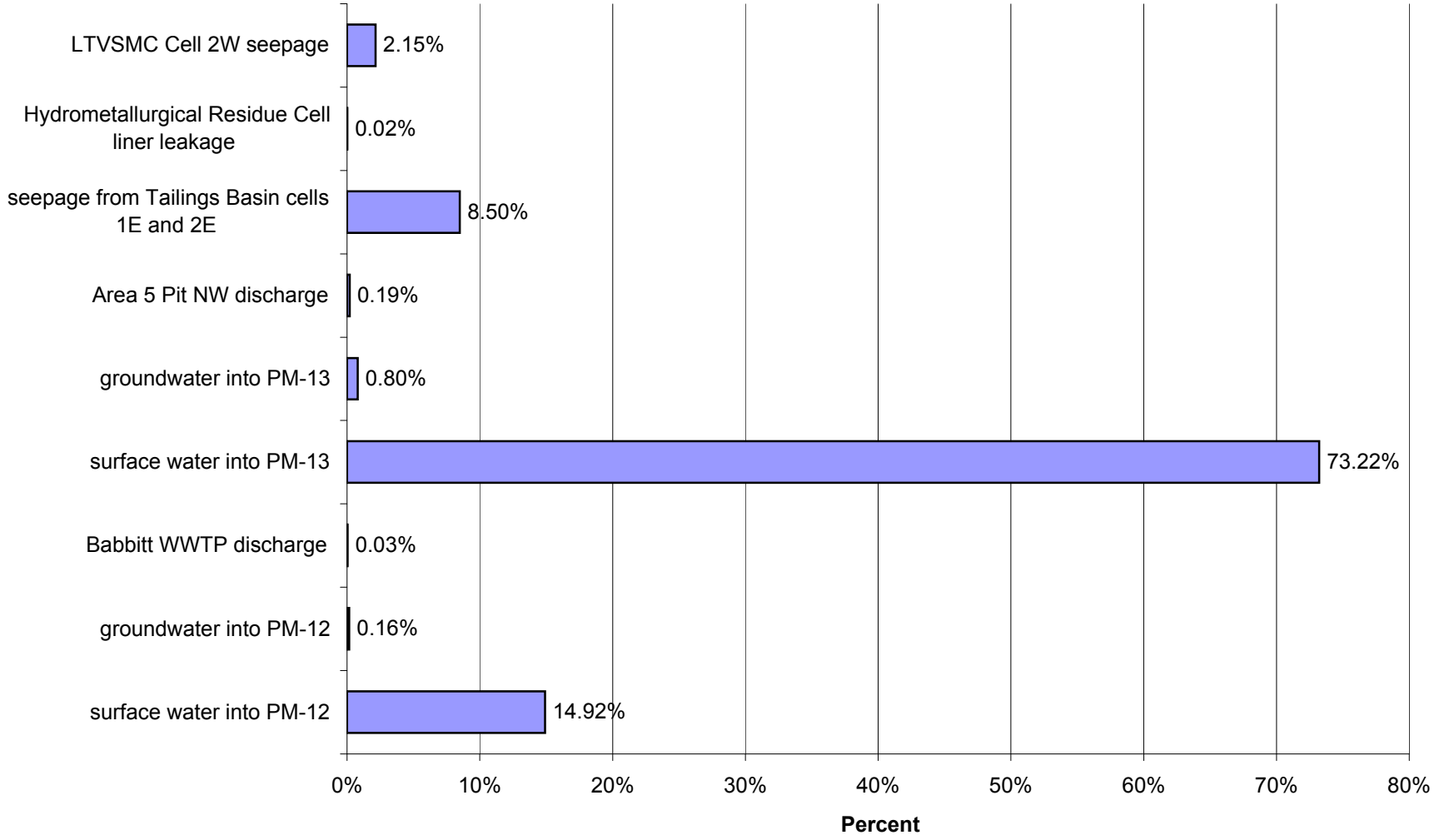
Proposed Action: Percent of Impacts at PM-13 in Year 15 for Average Flow for Cobalt (Co)



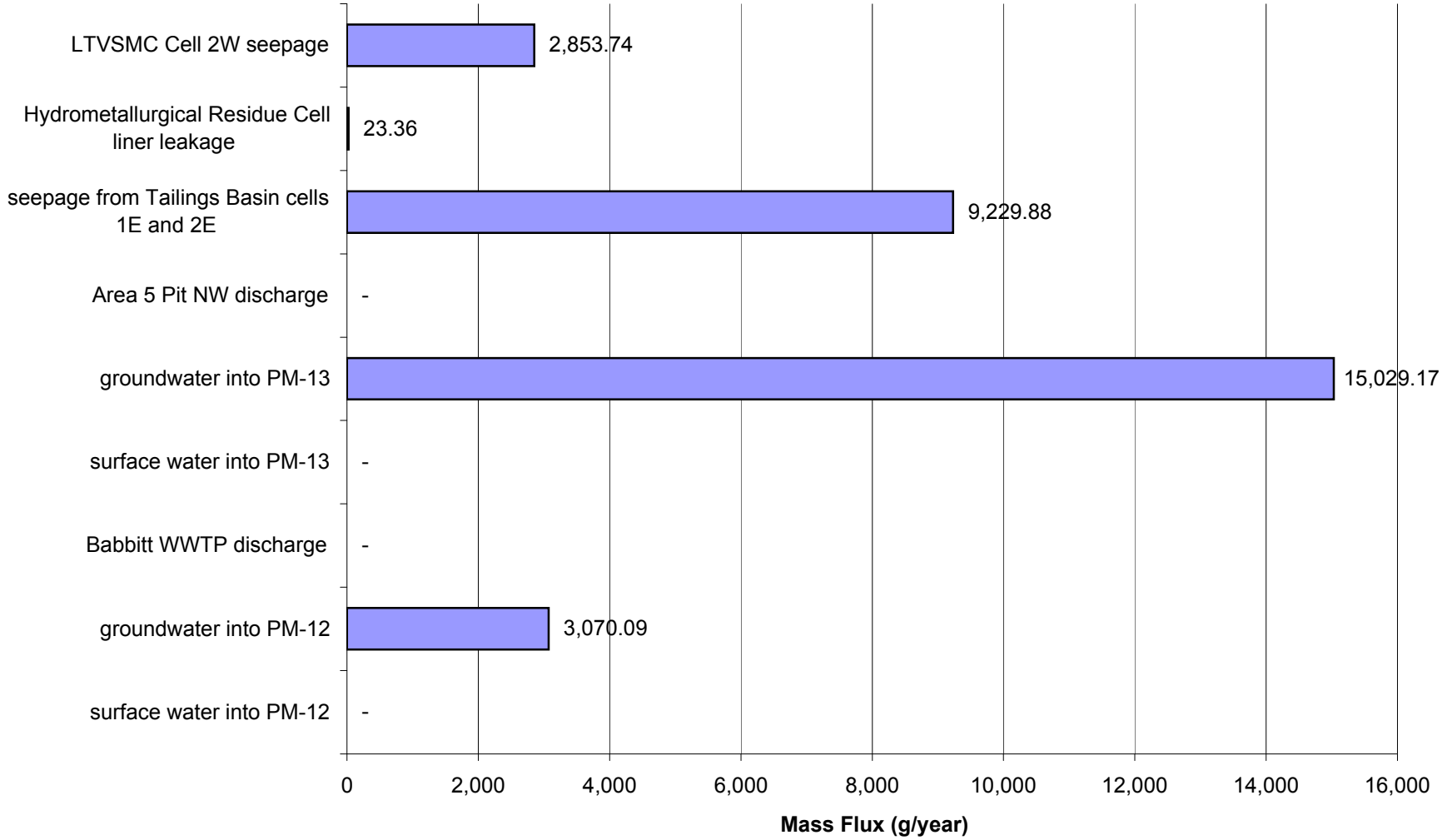
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for High Flow for Cobalt (Co)



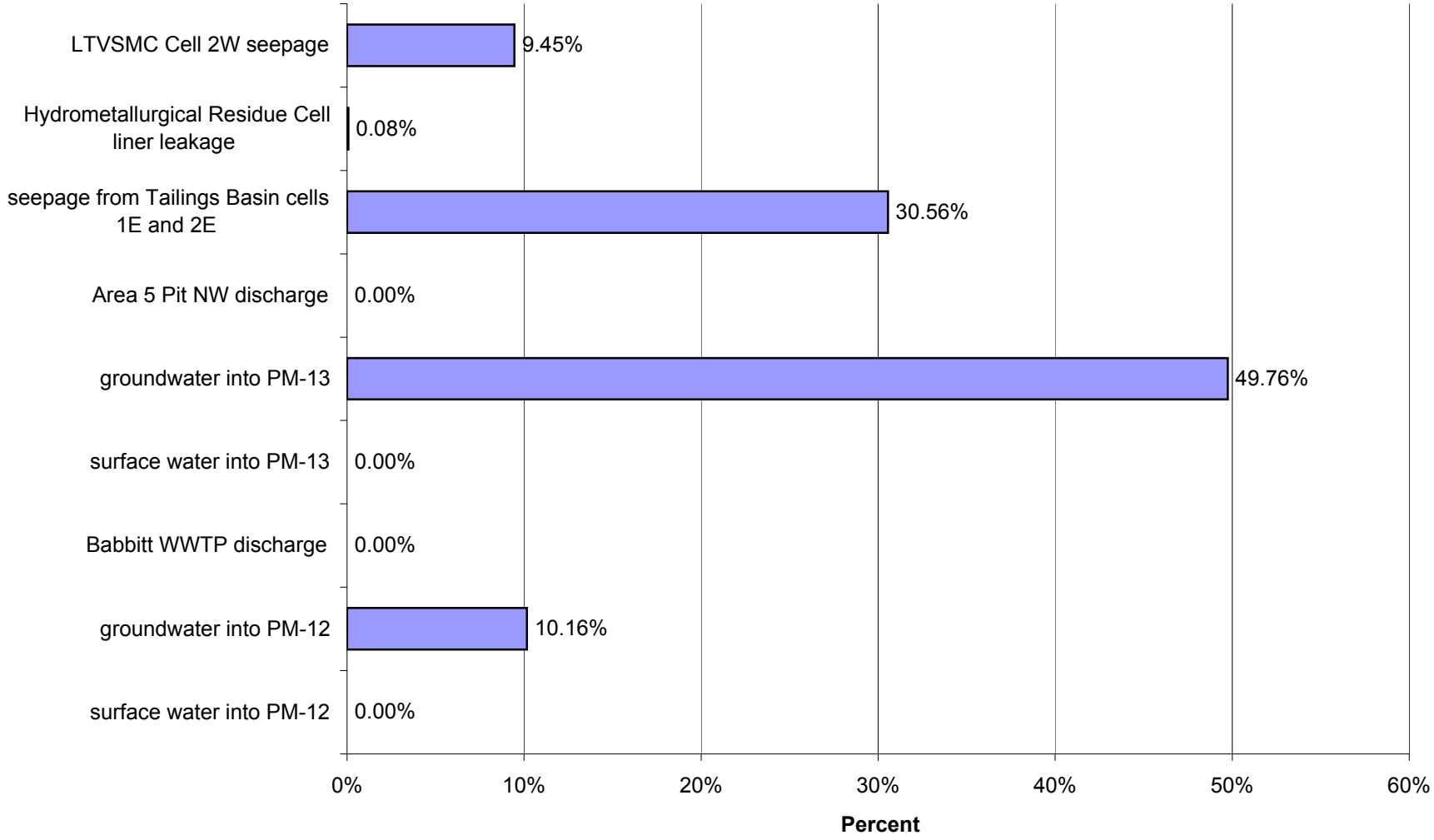
Proposed Action: Percent of Impacts at PM-13 in Year 15 for High Flow for Cobalt (Co)



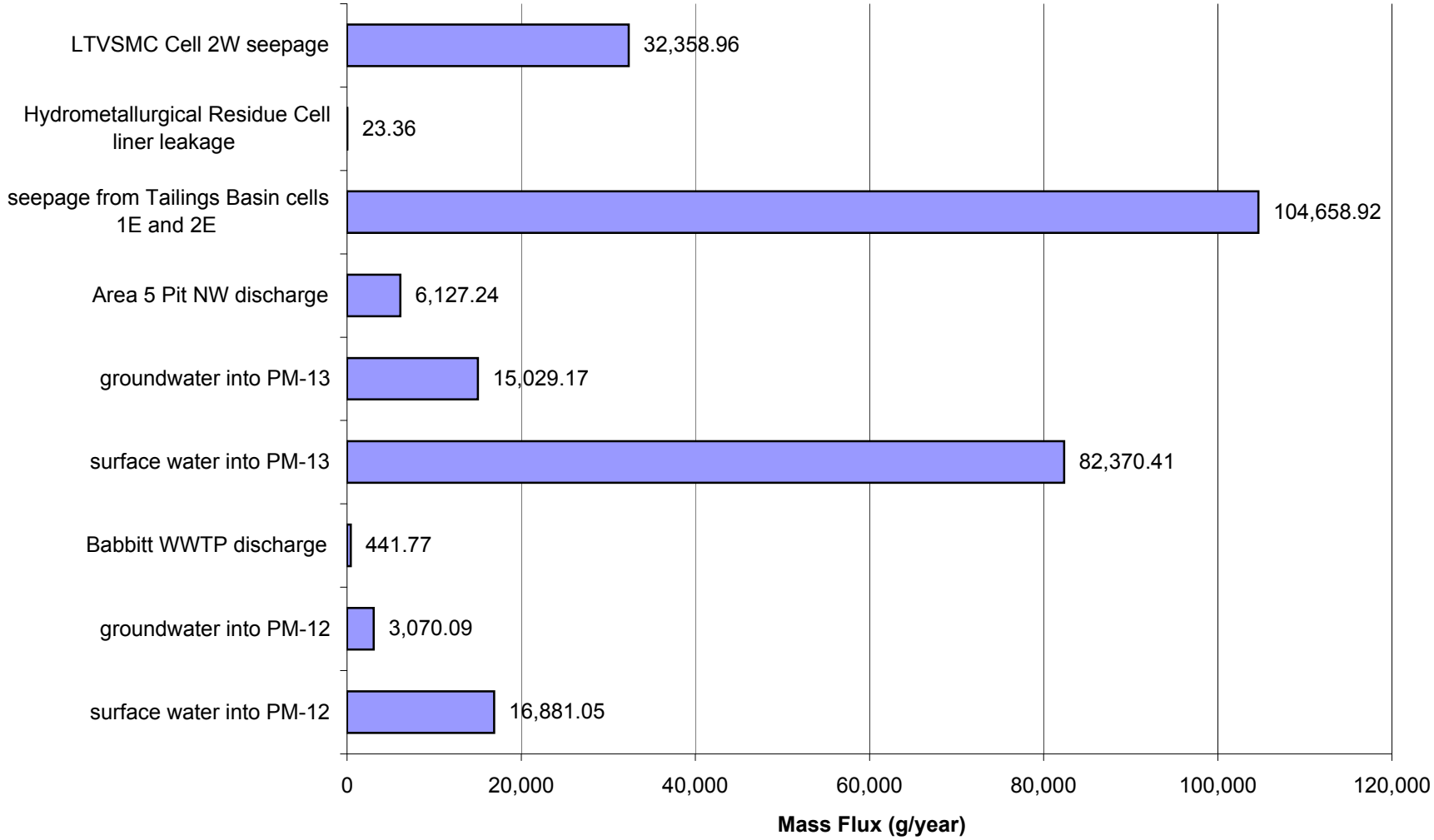
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for Low Flow for Copper (Cu)



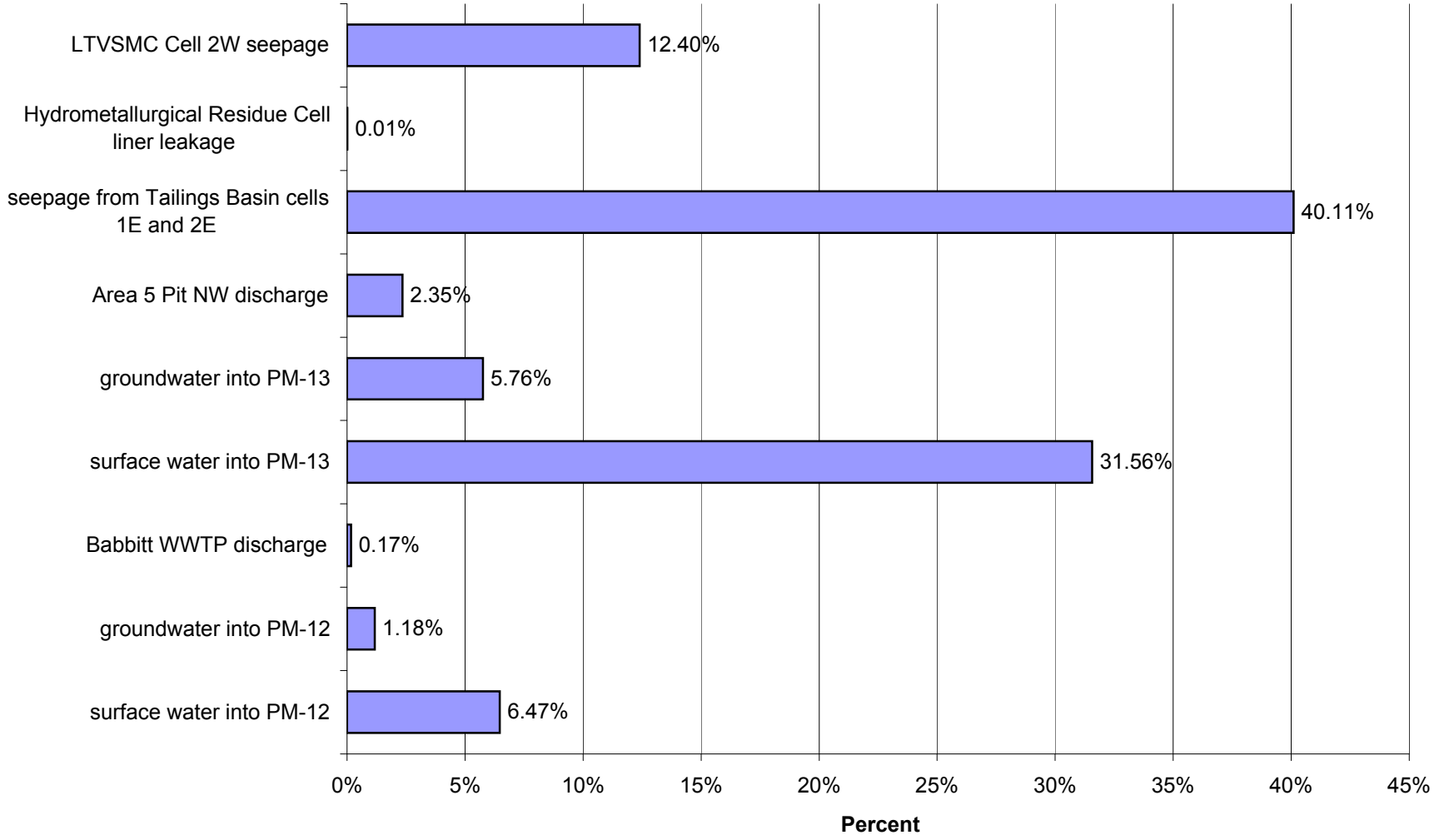
Proposed Action: Percent of Impacts at PM-13 in Year 15 for Low Flow for Copper (Cu)



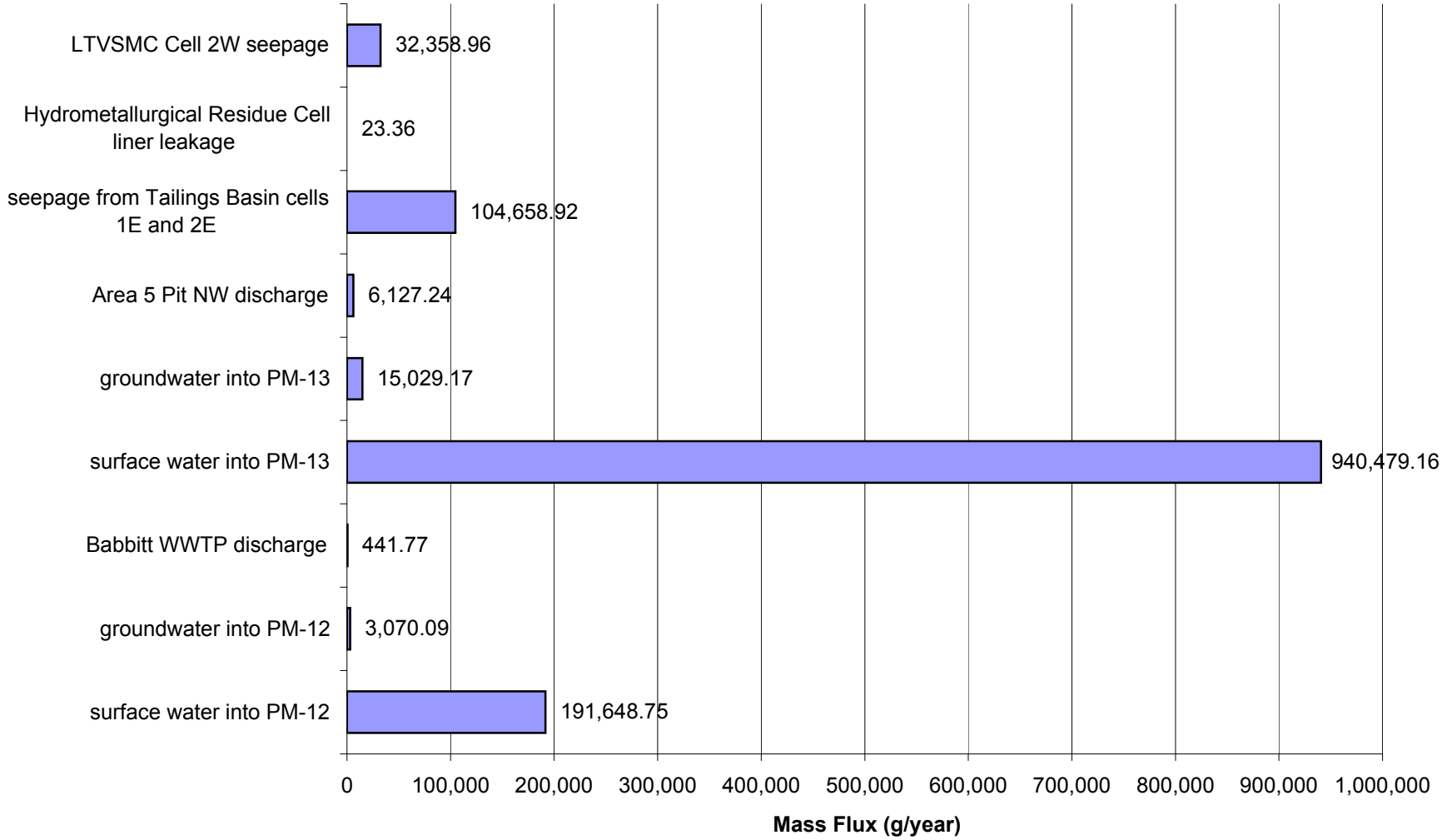
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for Average Flow for Copper (Cu)



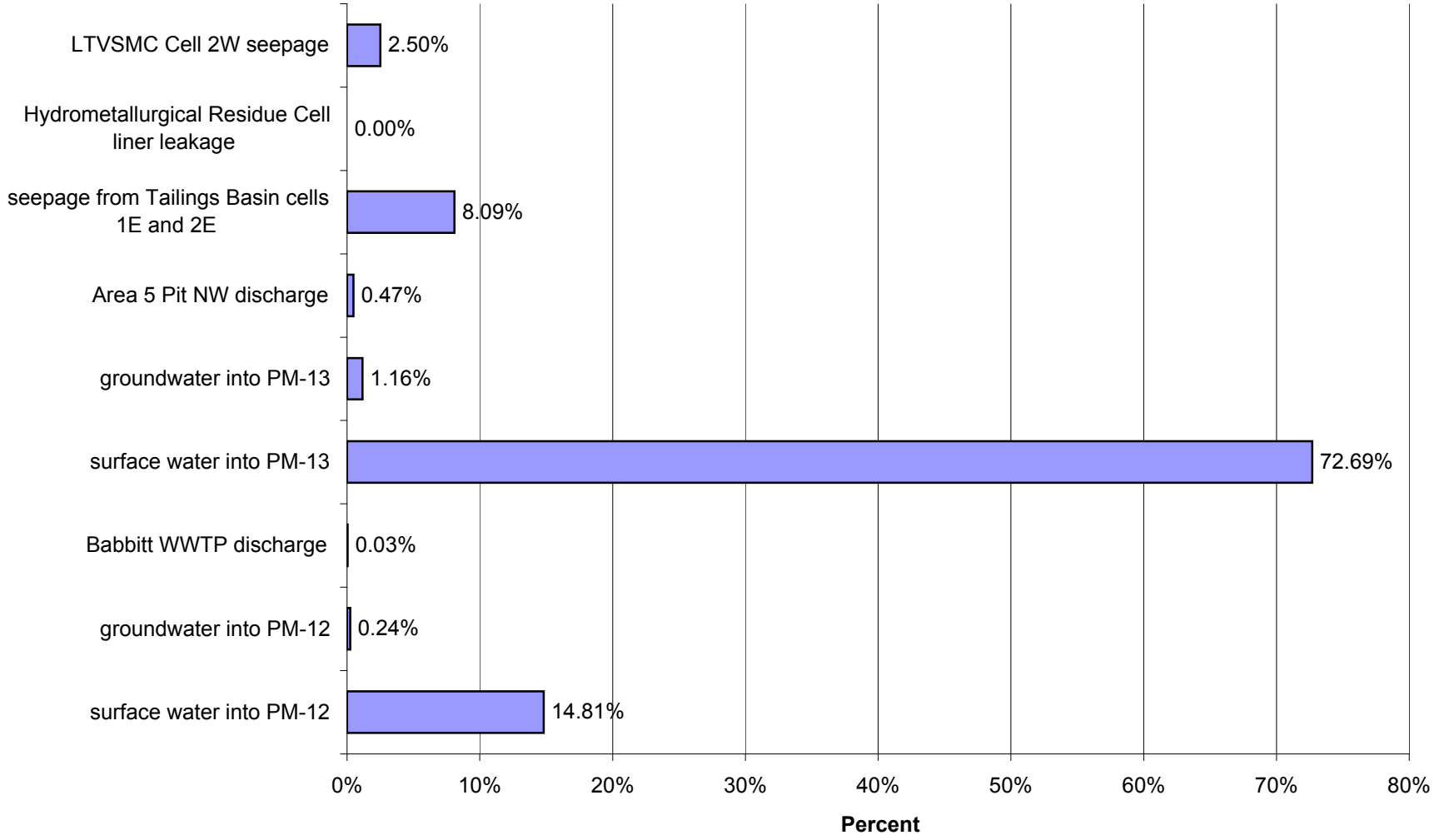
Proposed Action: Percent of Impacts at PM-13 in Year 15 for Average Flow for Copper (Cu)



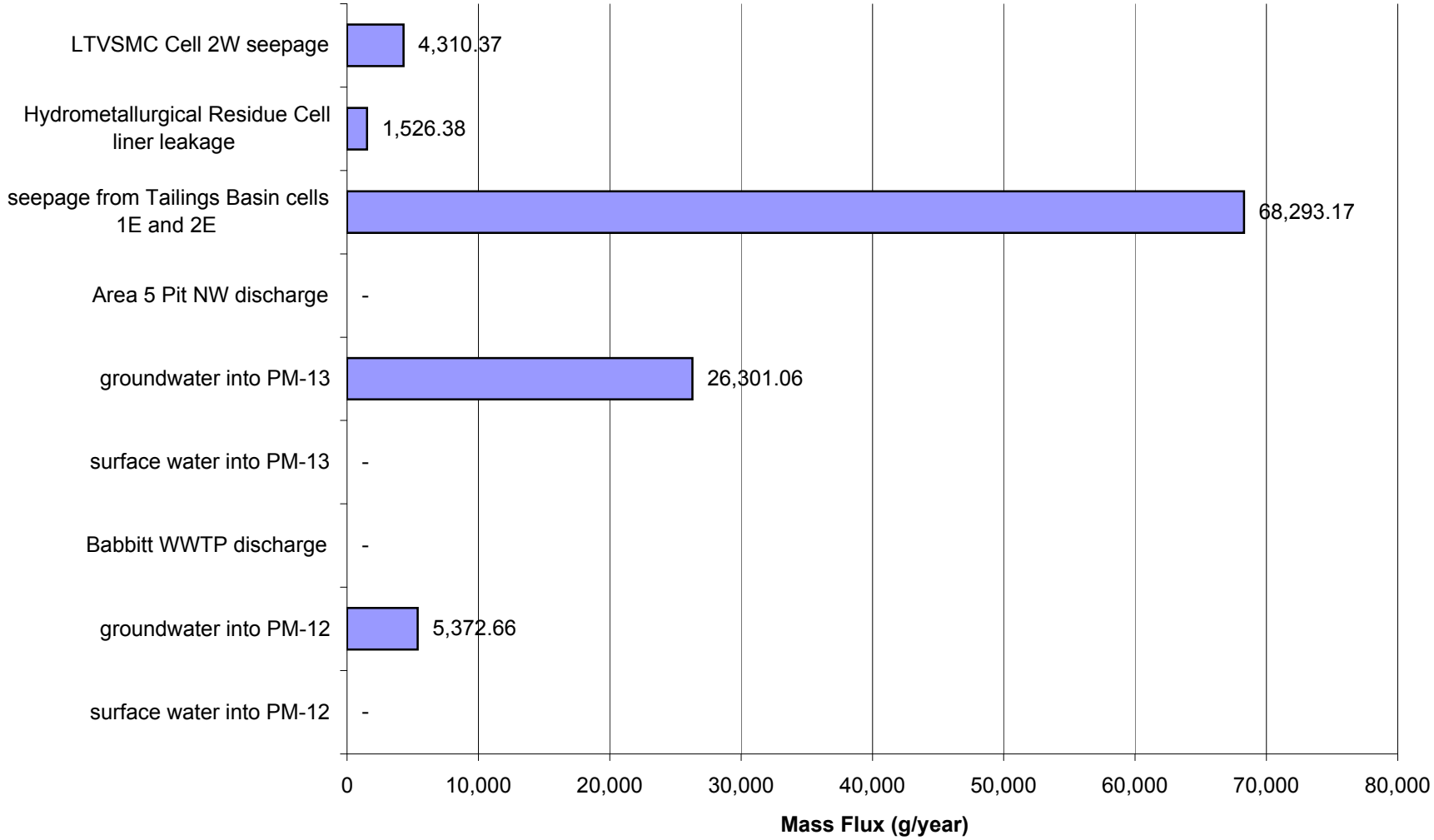
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for High Flow for Copper (Cu)



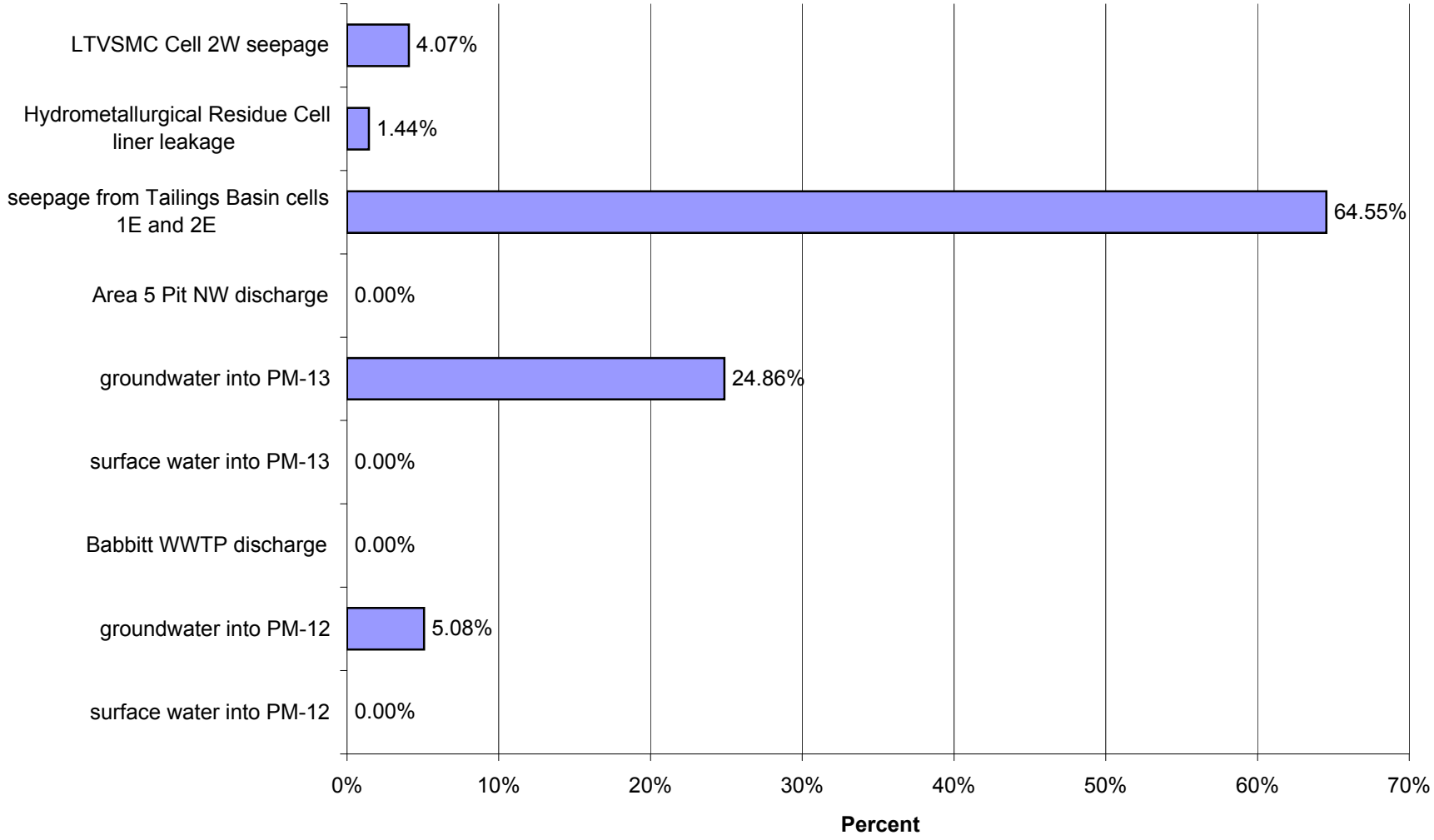
Proposed Action: Percent of Impacts at PM-13 in Year 15 for High Flow for Copper (Cu)



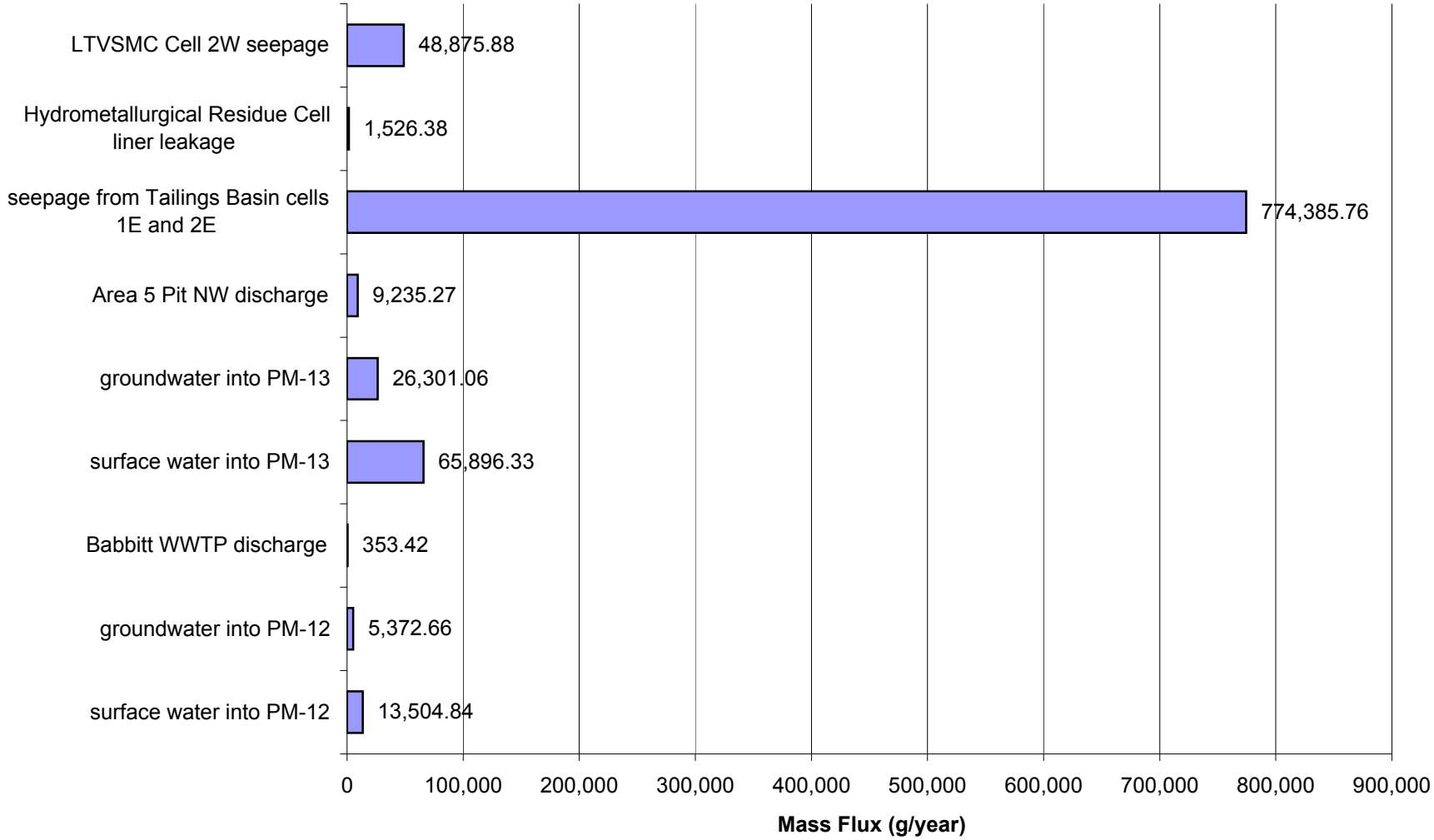
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for Low Flow for Nickel (Ni)



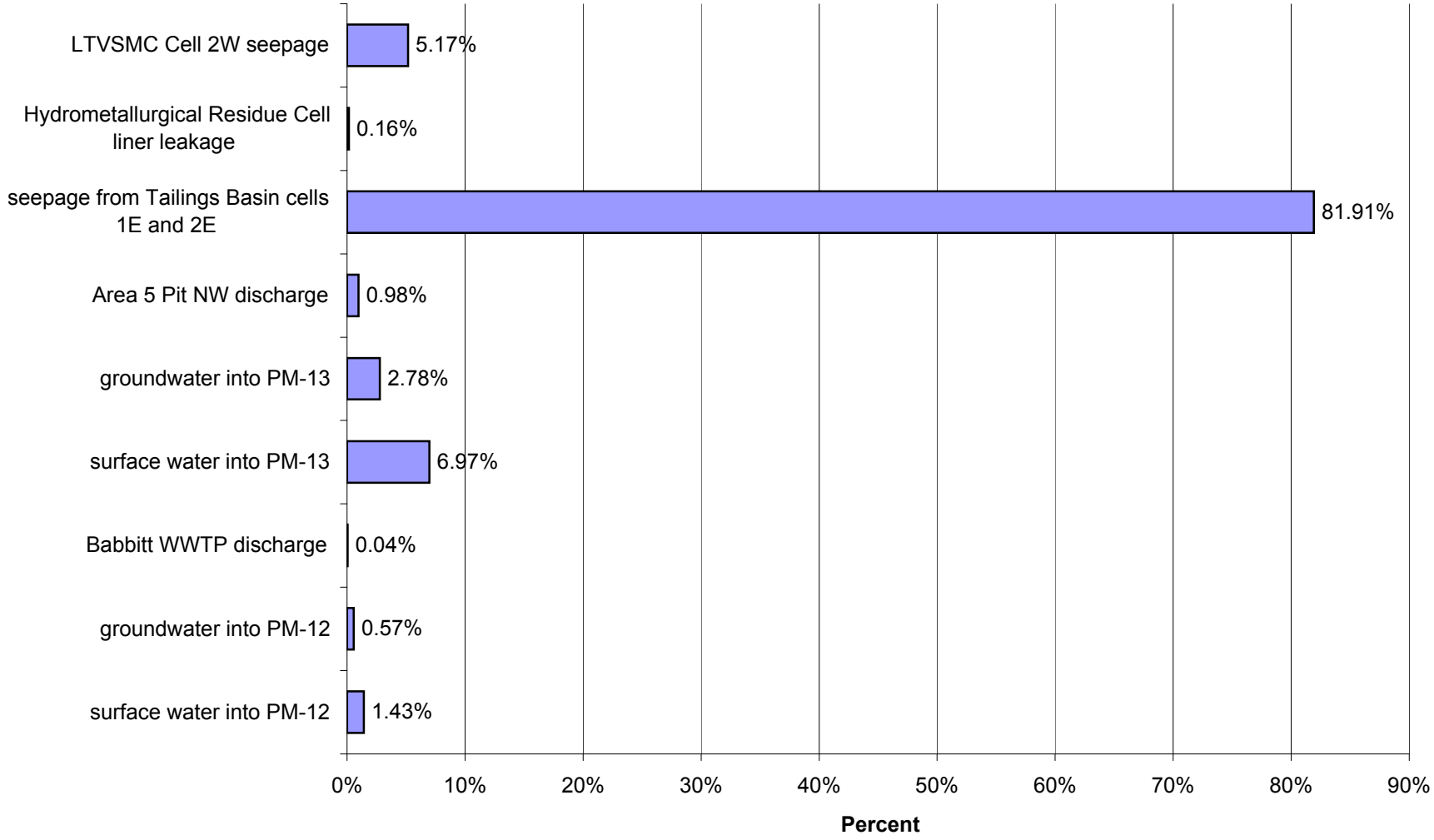
Proposed Action: Percent of Impacts at PM-13 in Year 15 for Low Flow for Nickel (Ni)



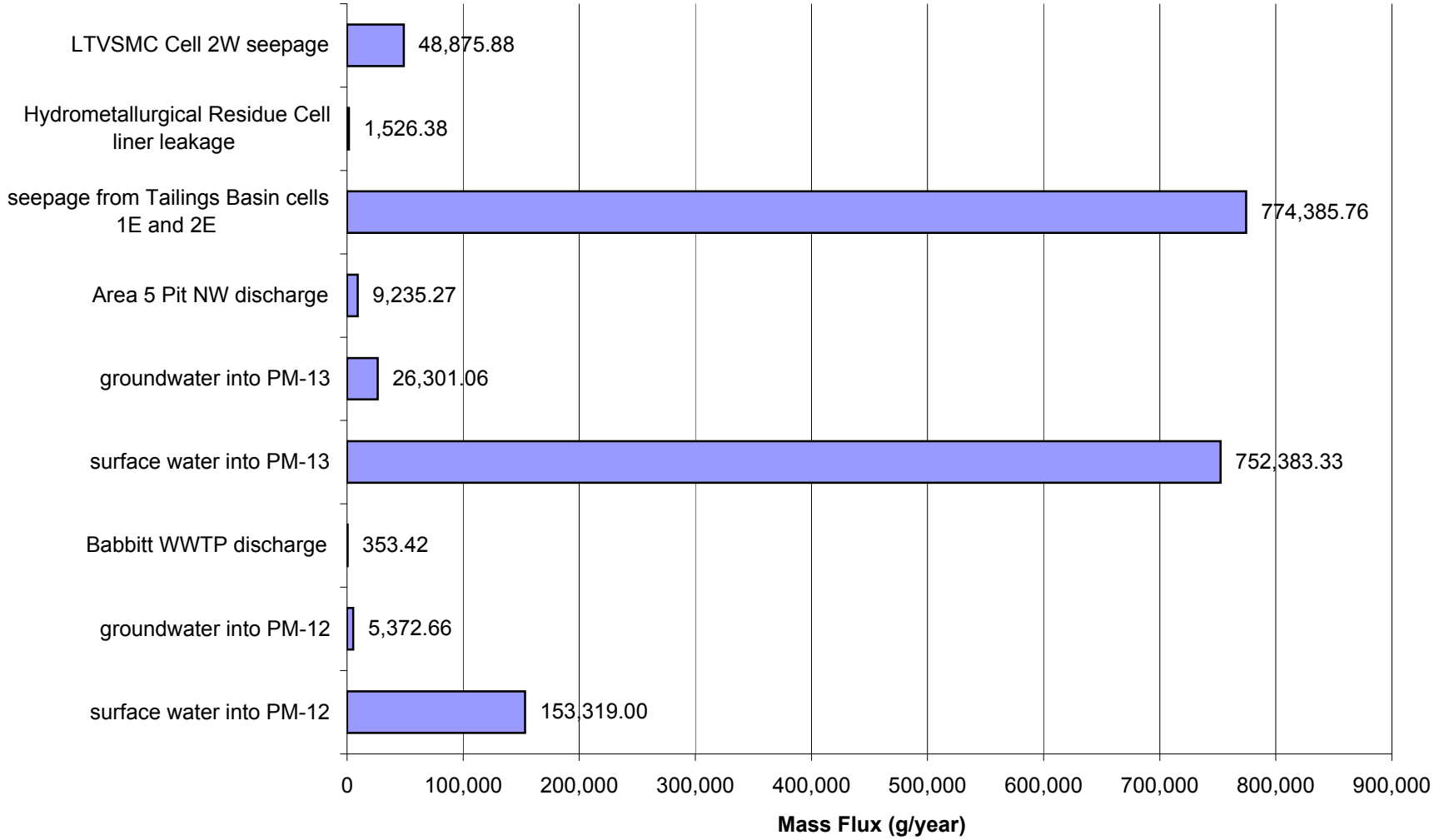
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for Average Flow for Nickel (Ni)



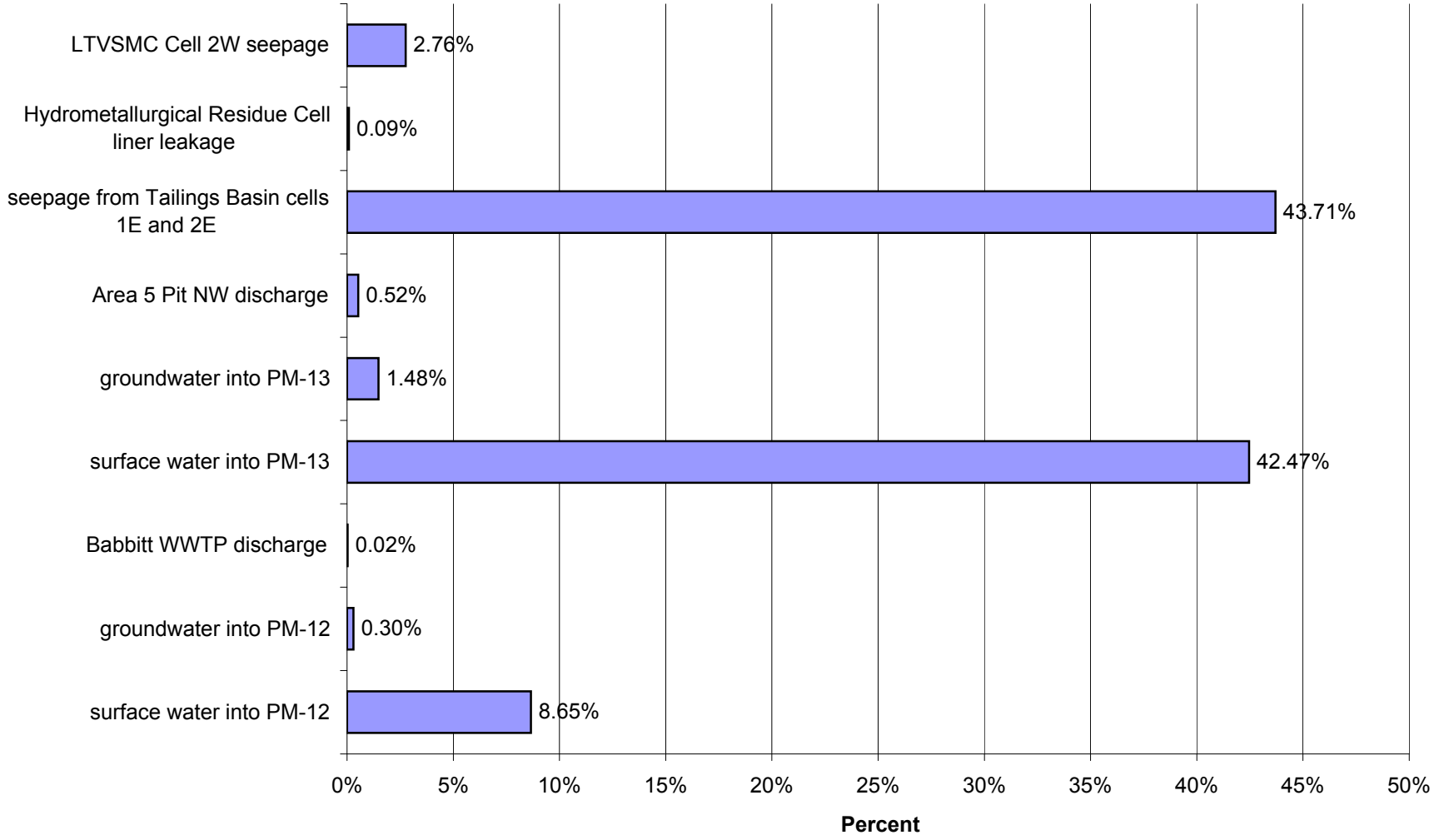
Proposed Action: Percent of Impacts at PM-13 in Year 15 for Average Flow for Nickel (Ni)



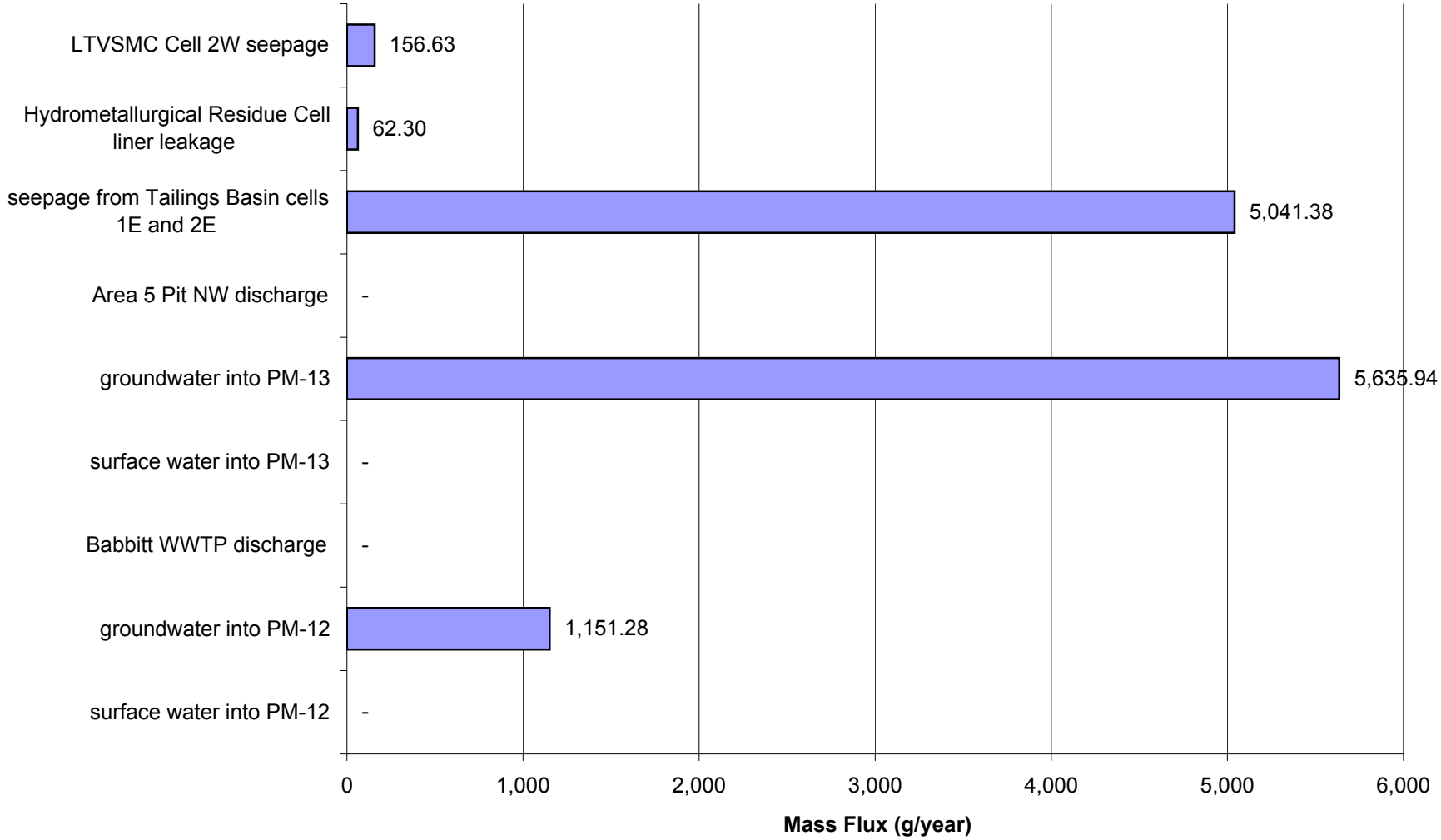
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for High Flow for Nickel (Ni)



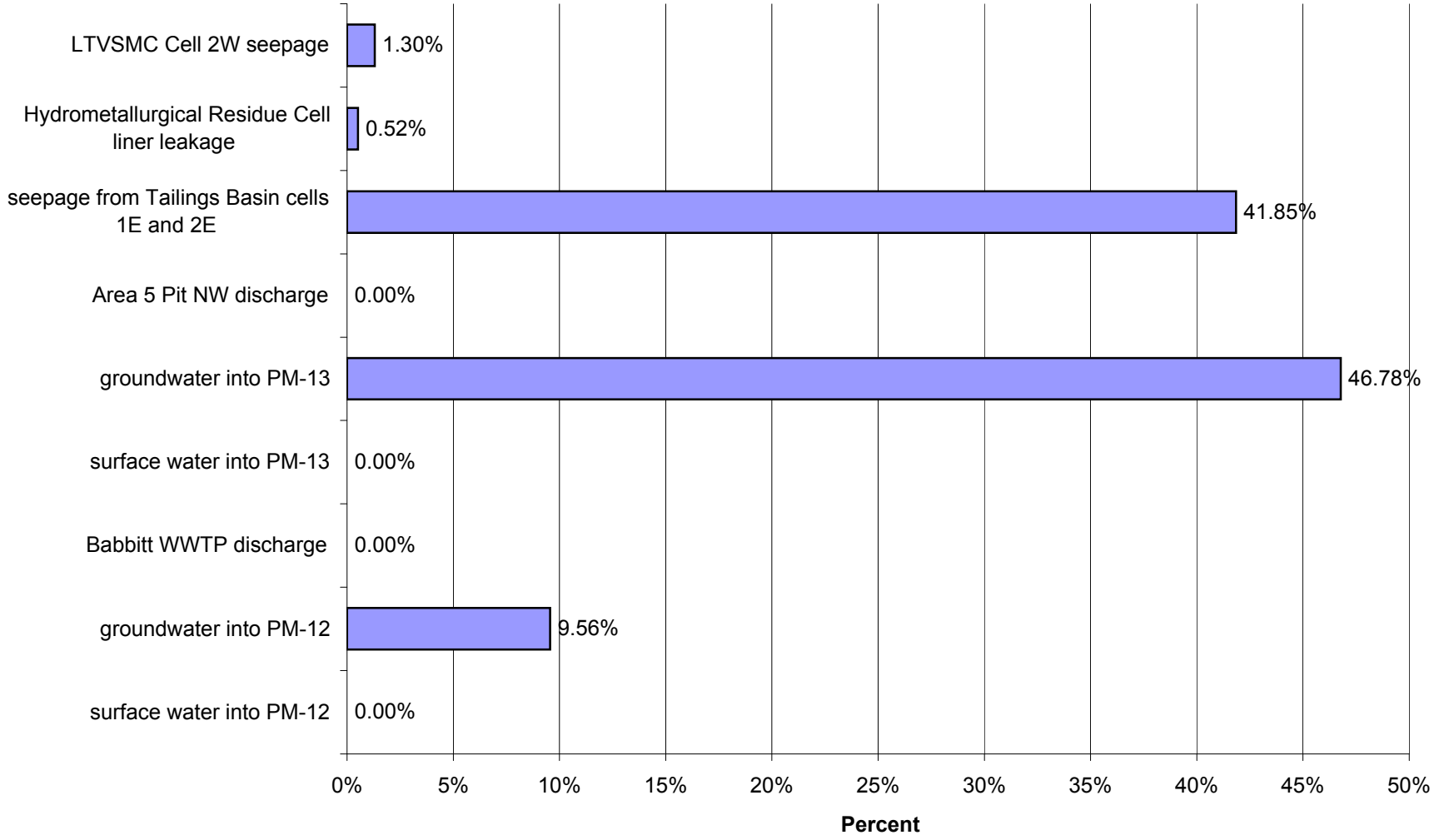
Proposed Action: Percent of Impacts at PM-13 in Year 15 for High Flow for Nickel (Ni)



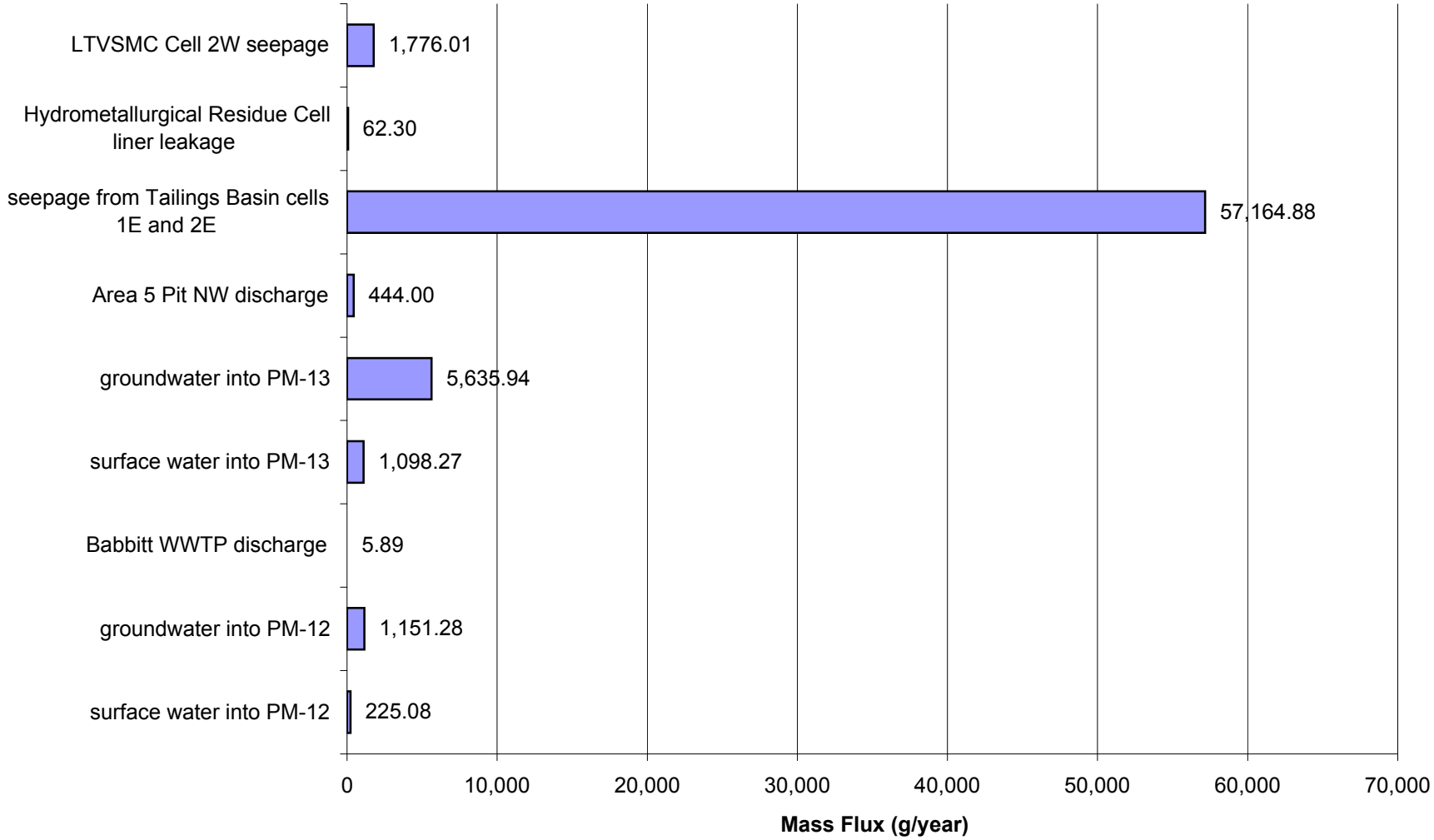
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for Low Flow for Antimony (Sb)



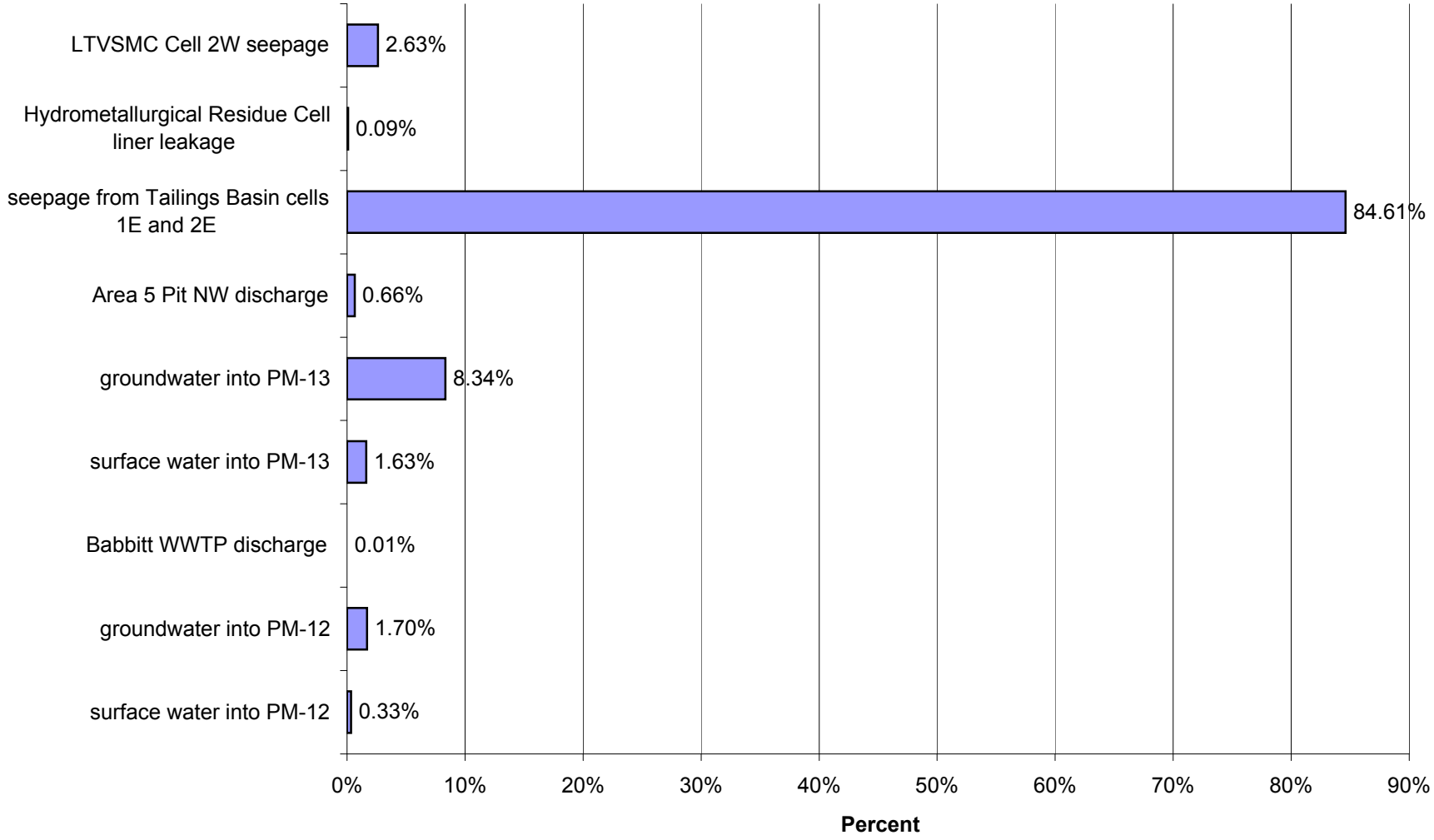
Proposed Action: Percent of Impacts at PM-13 in Year 15 for Low Flow for Antimony (Sb)



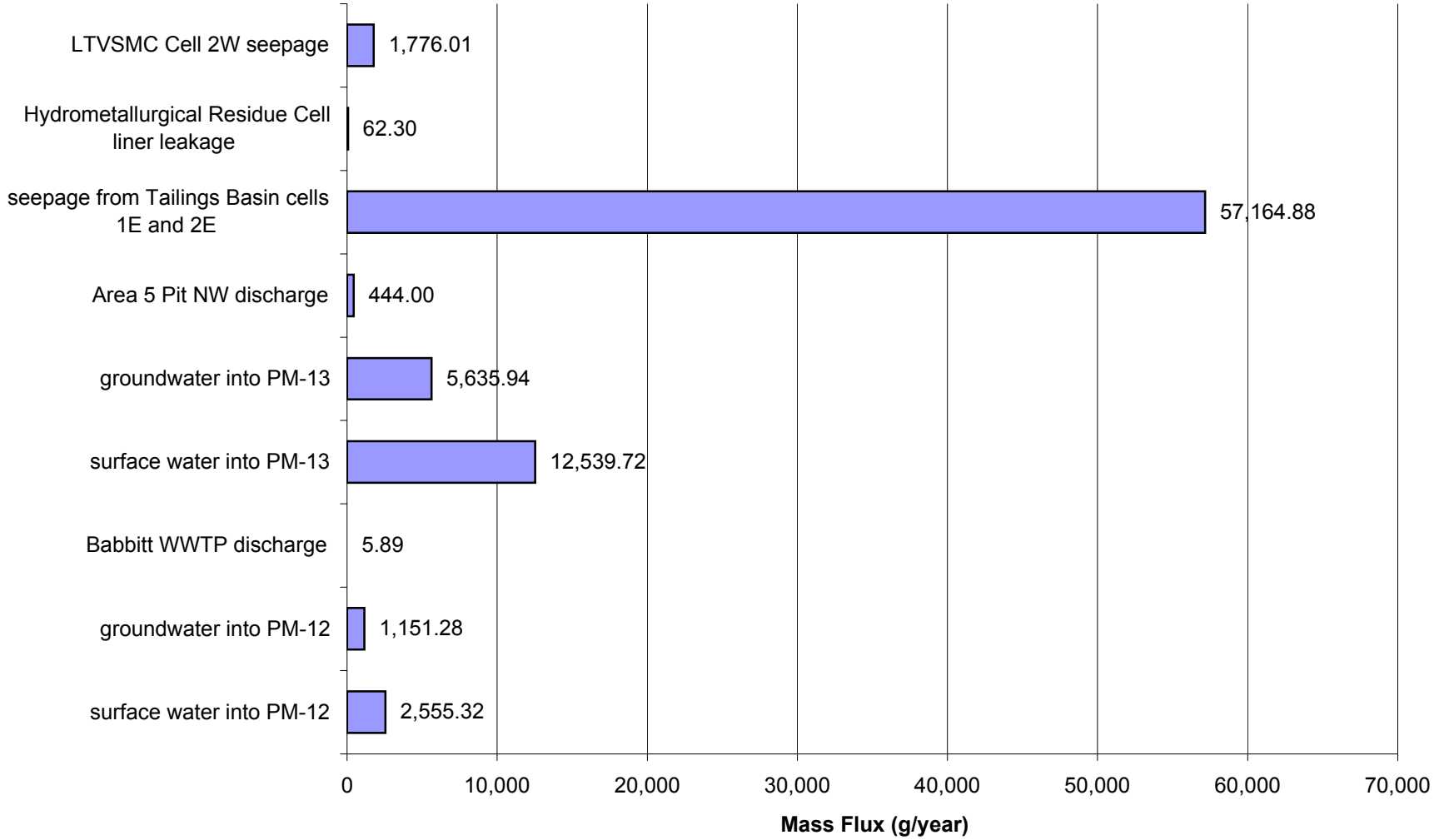
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for Average Flow for Antimony (Sb)



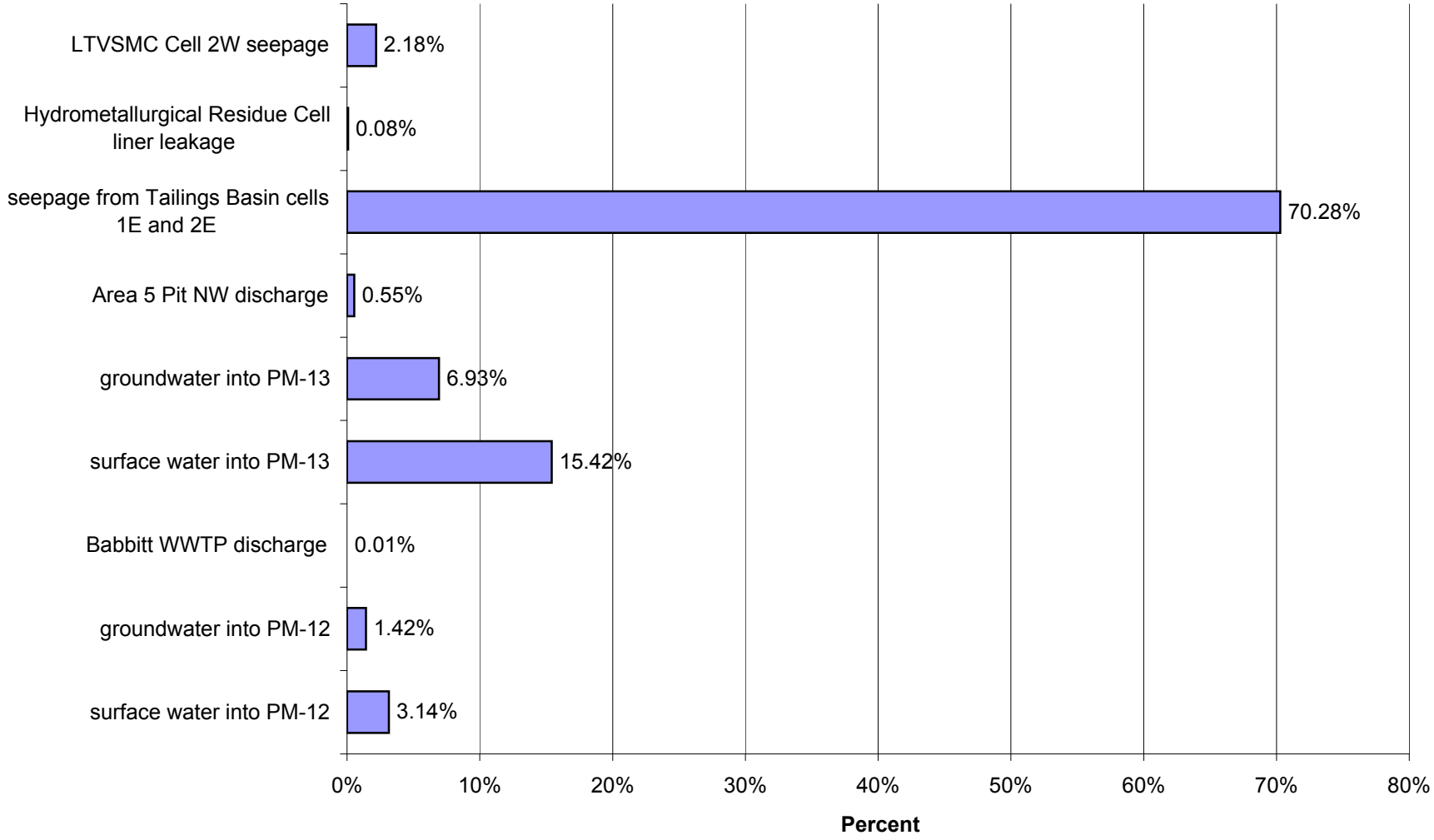
Proposed Action: Percent of Impacts at PM-13 in Year 15 for Average Flow for Antimony (Sb)



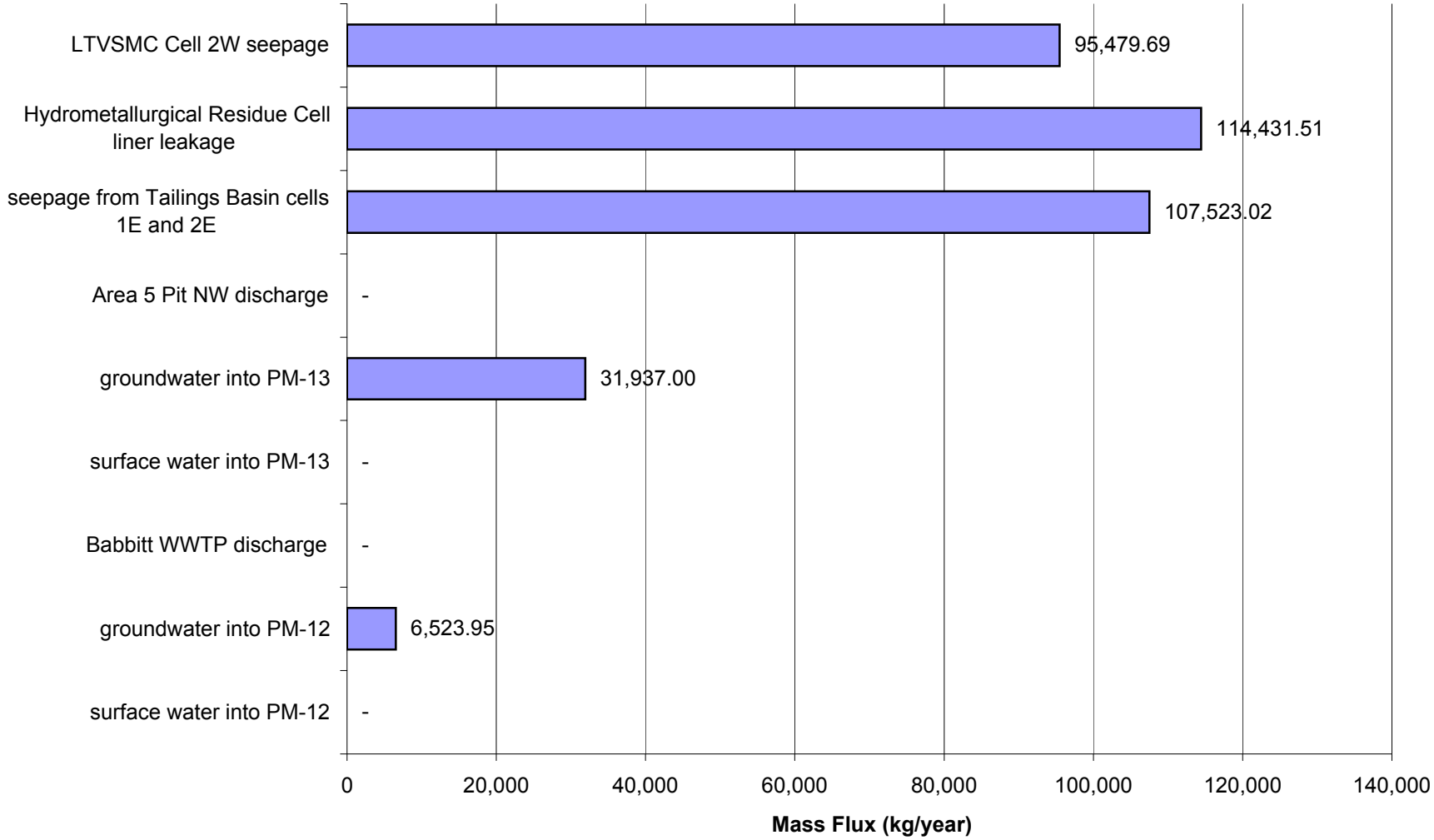
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for High Flow for Antimony (Sb)



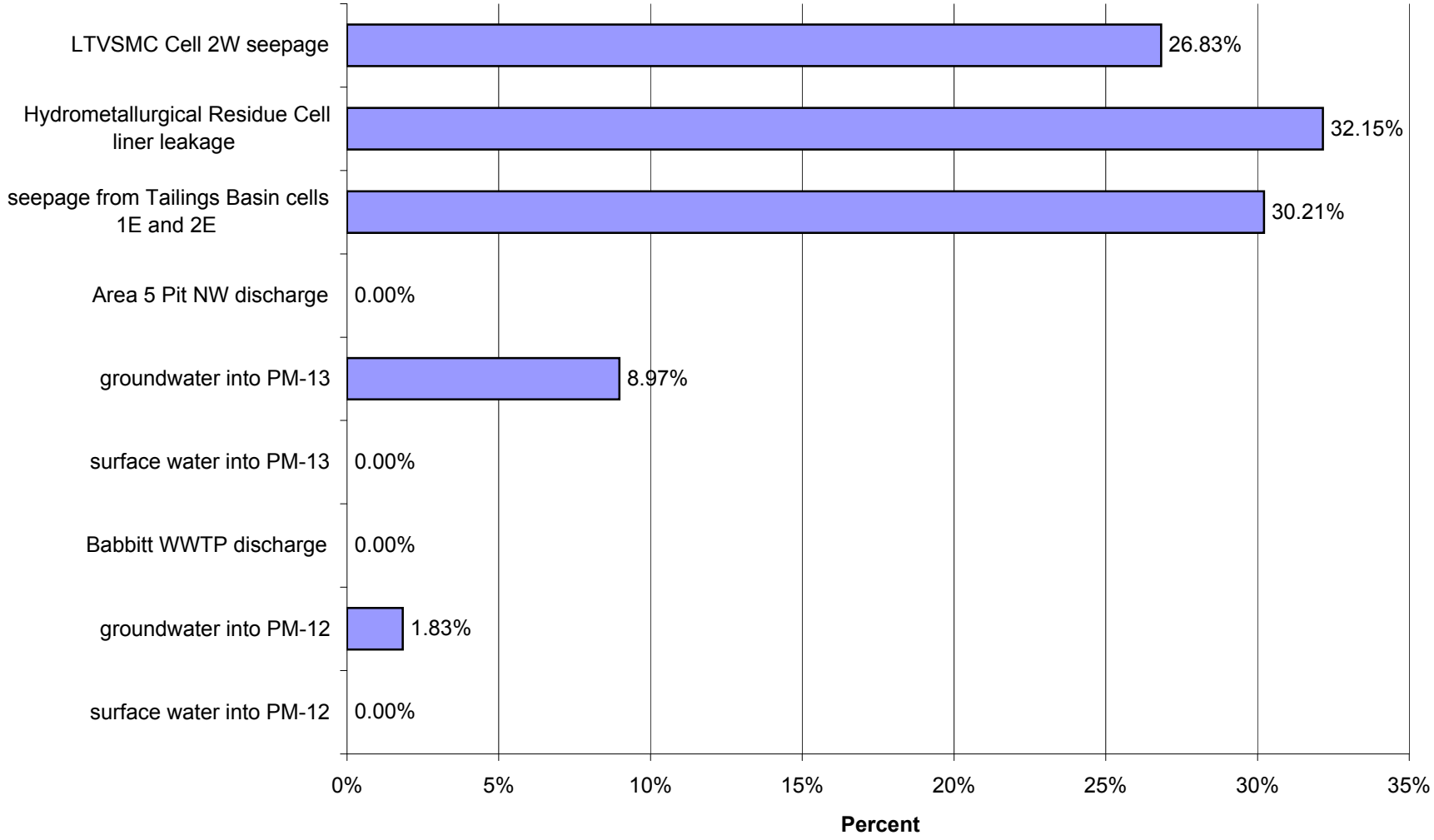
Proposed Action: Percent of Impacts at PM-13 in Year 15 for High Flow for Antimony (Sb)



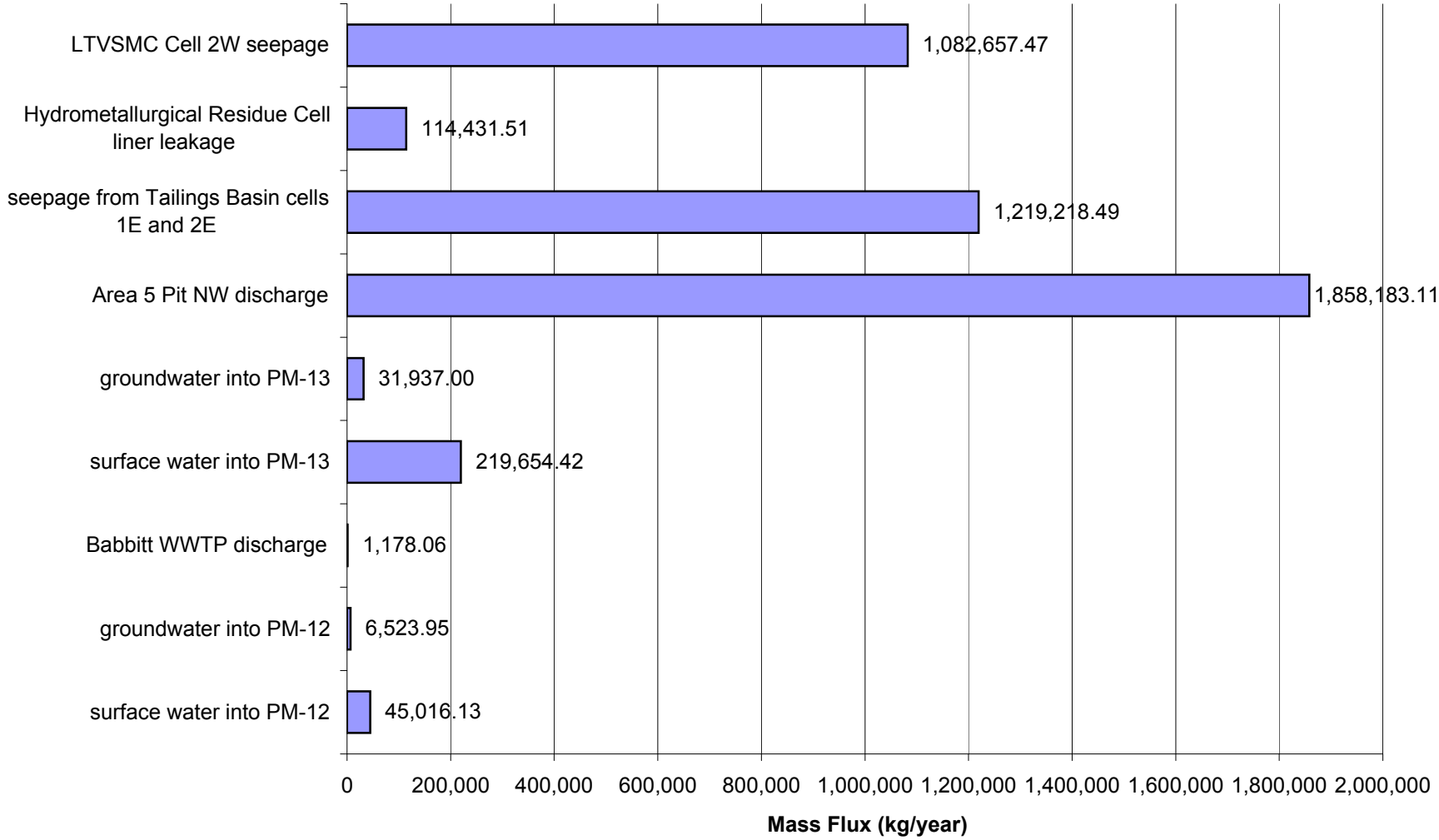
Proposed Action: Mass Flux (kg/year) of Impacts at PM-13 in Year 15 for Low Flow for Sulfate (SO_4)



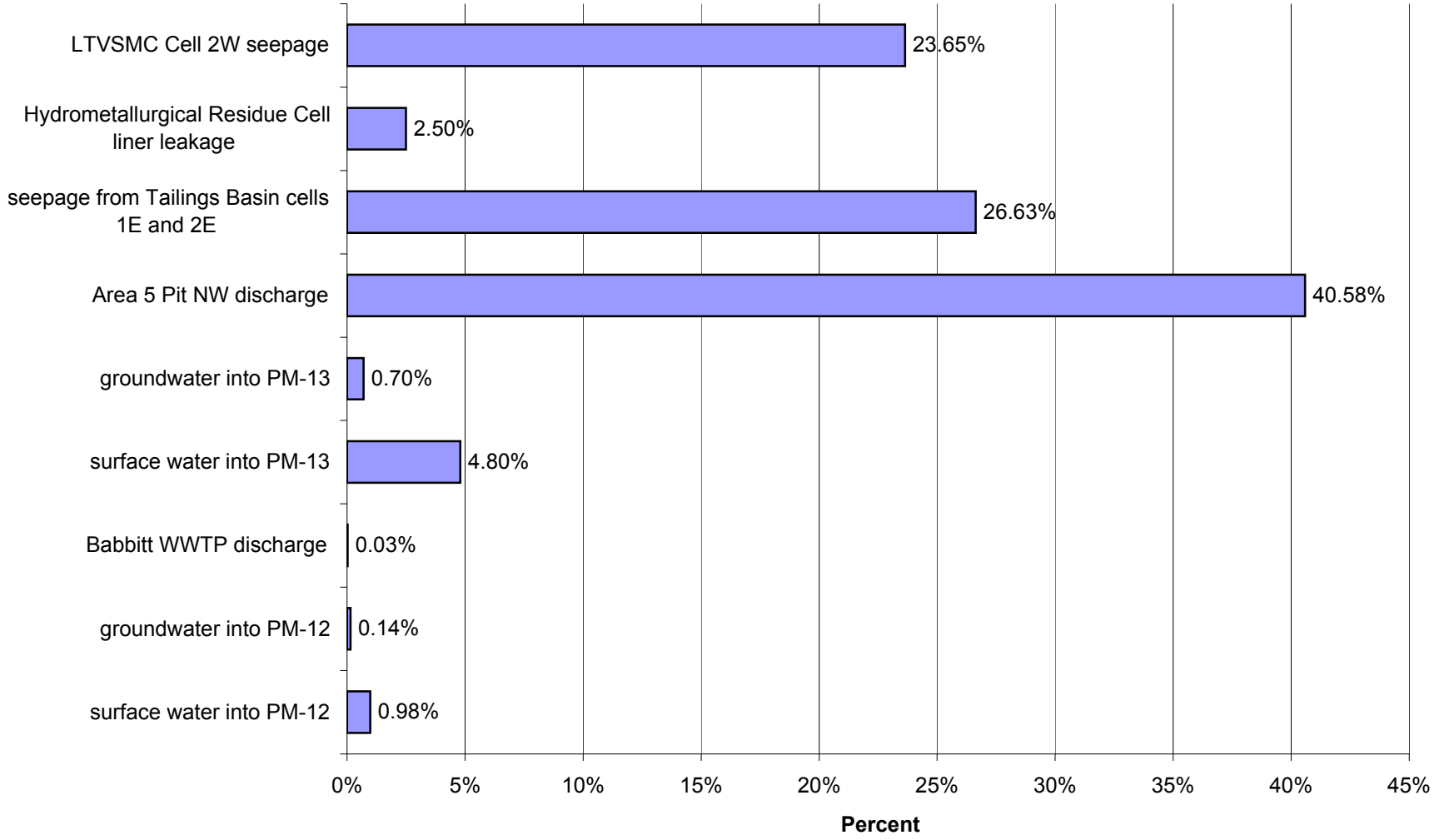
Proposed Action: Percent of Impacts at PM-13 in Year 15 for Low Flow for Sulfate (SO_4)



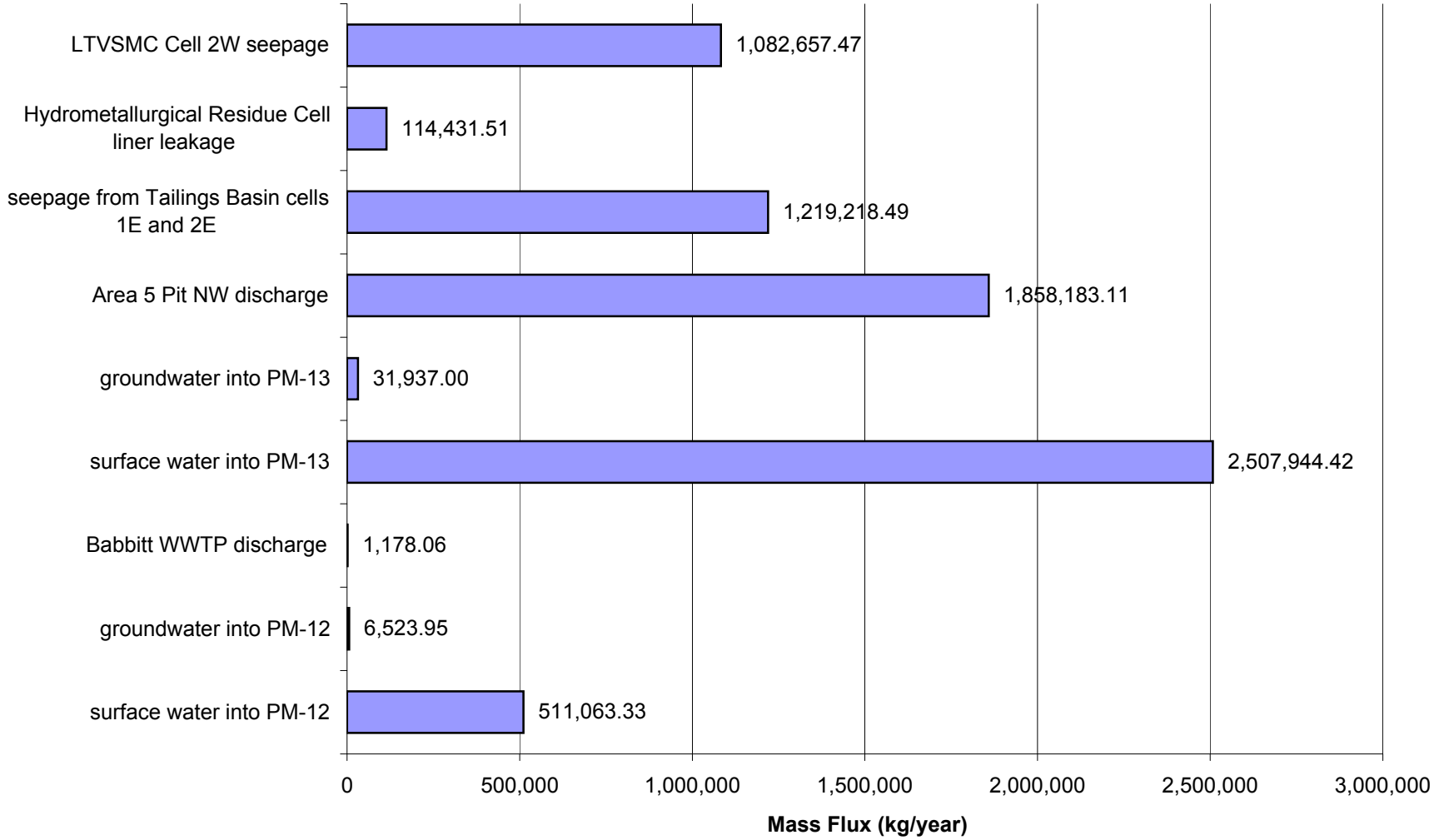
Proposed Action: Mass Flux (kg/year) of Impacts at PM-13 in Year 15 for Average Flow for Sulfate (SO_4)



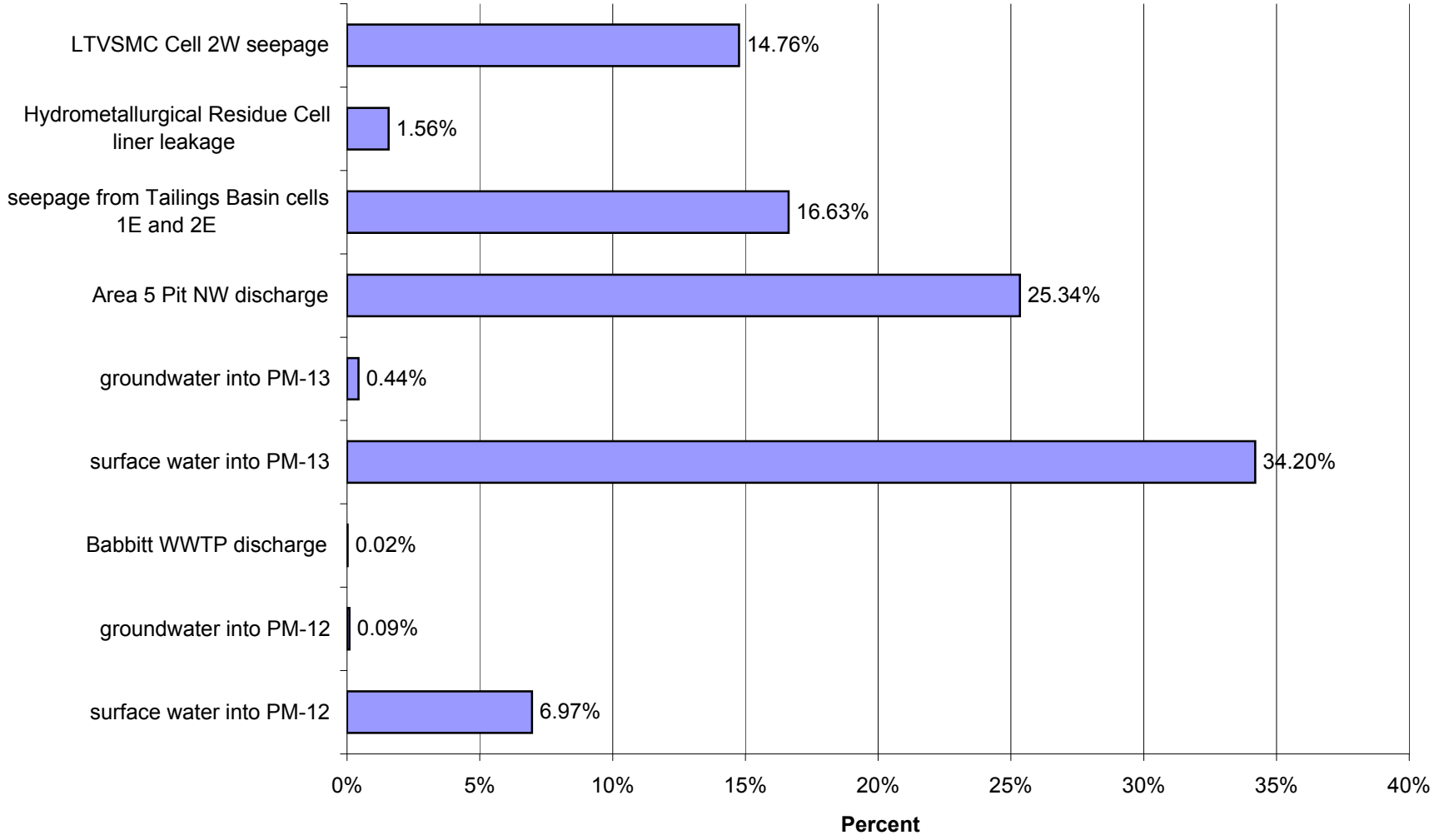
Proposed Action: Percent of Impacts at PM-13 in Year 15 for Average Flow for Sulfate (SO_4)



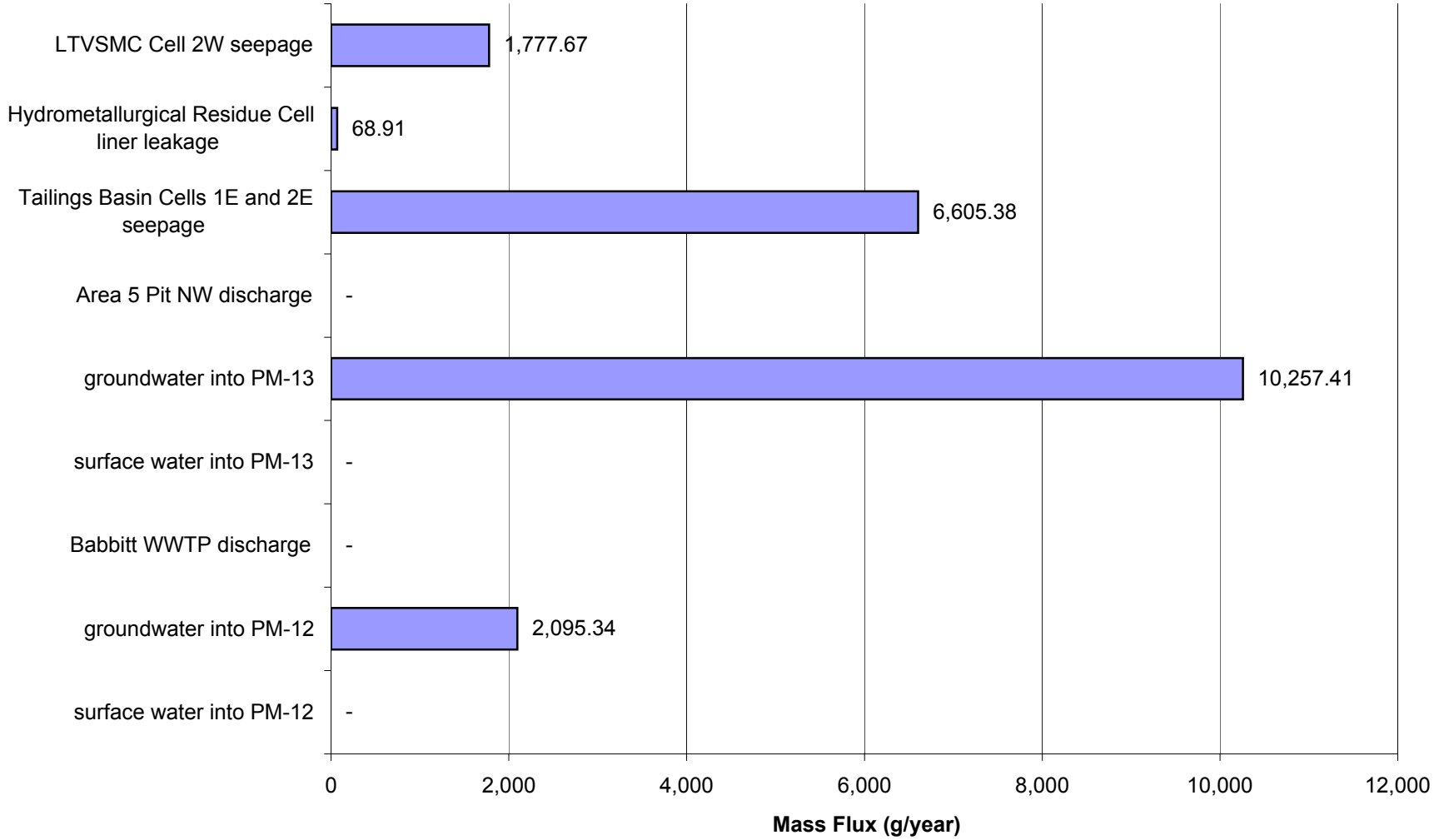
Proposed Action: Mass Flux (kg/year) of Impacts at PM-13 in Year 15 for High Flow for Sulfate (SO_4)



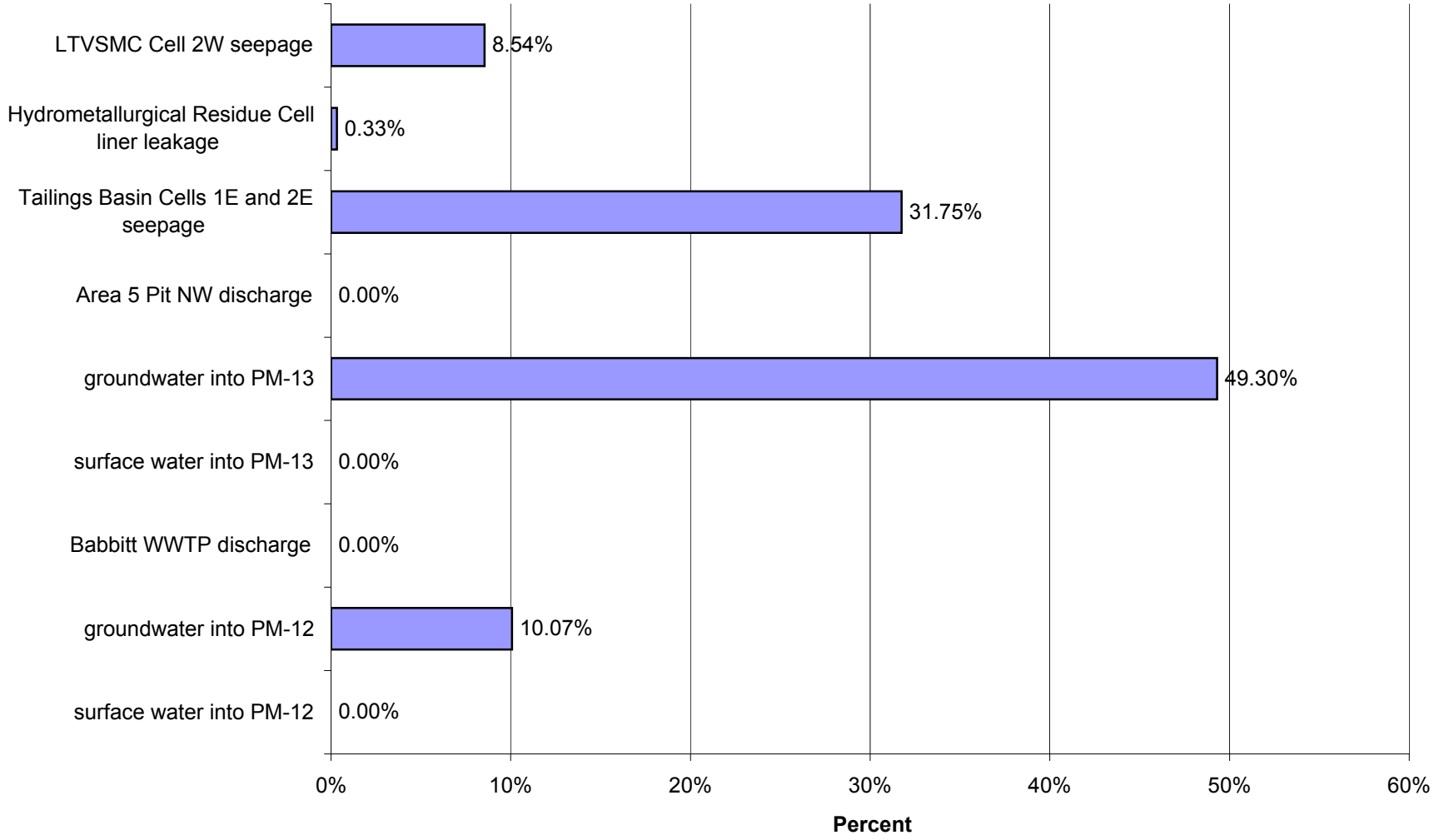
Proposed Action: Percent of Impacts at PM-13 in Year 15 for High Flow for Sulfate (SO_4)



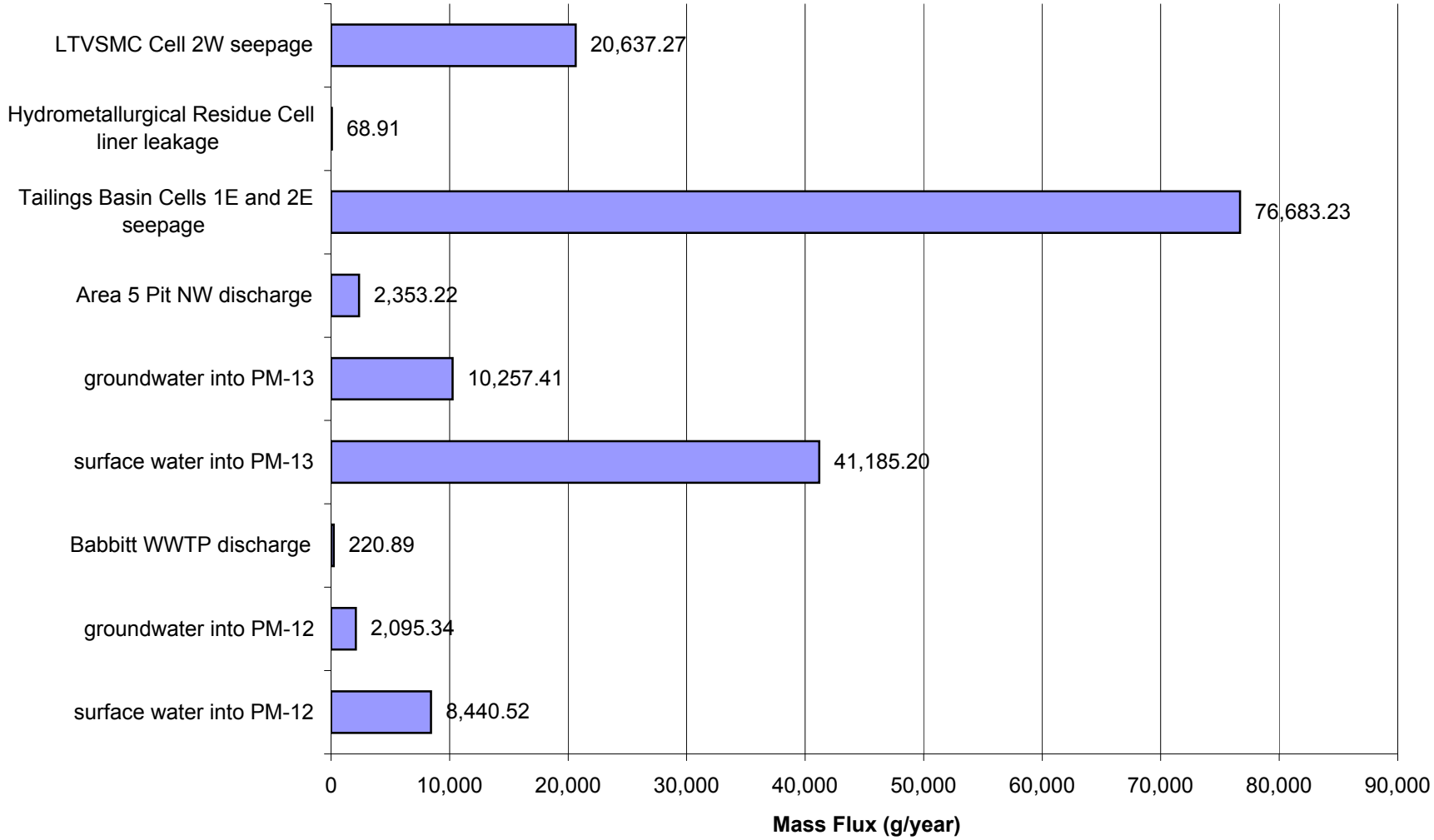
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for Low Flow for Arsenic (As)



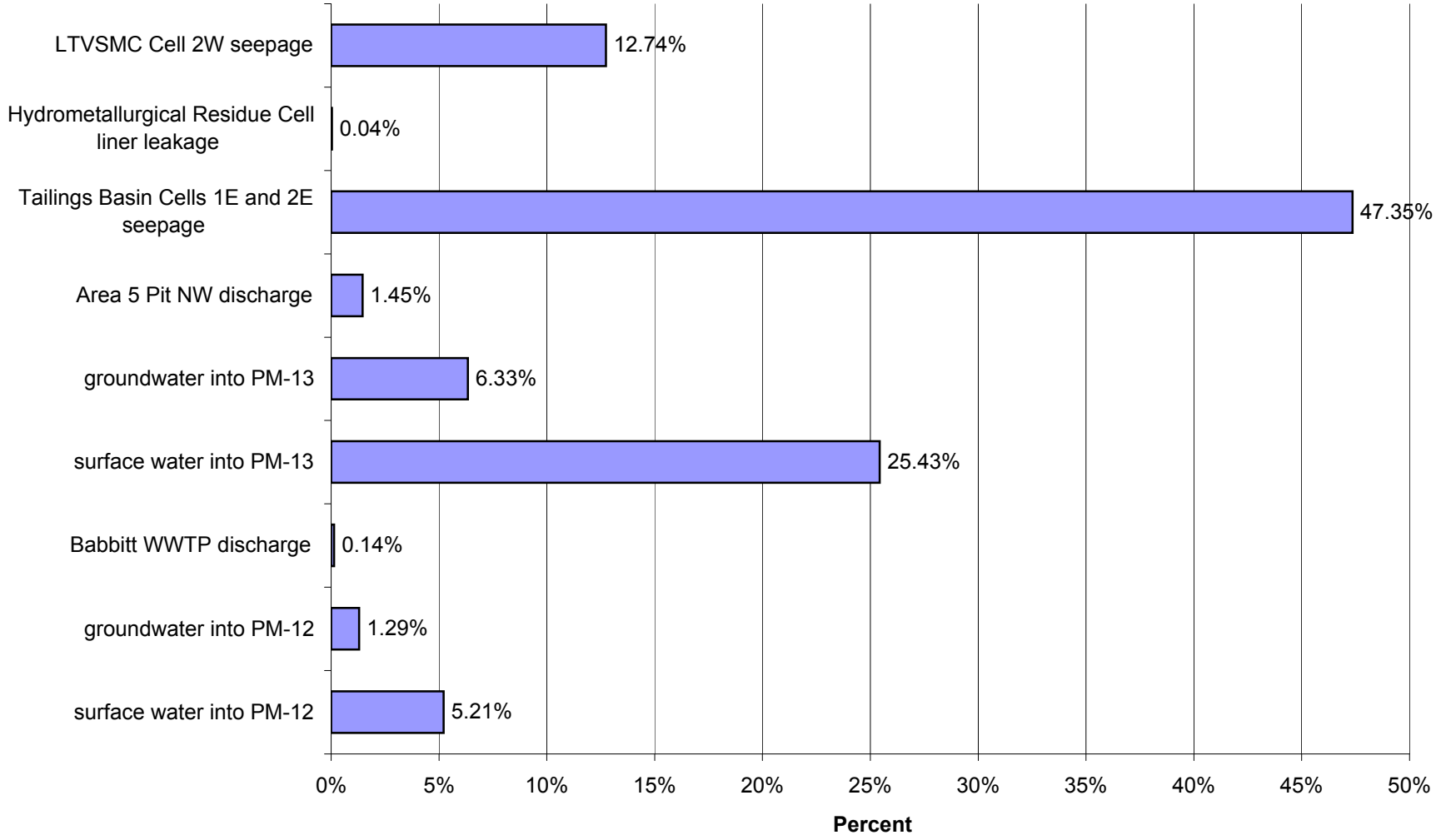
Proposed Action: Percent of Impacts at PM-13 in Year 20 for Low Flow for Arsenic (As)



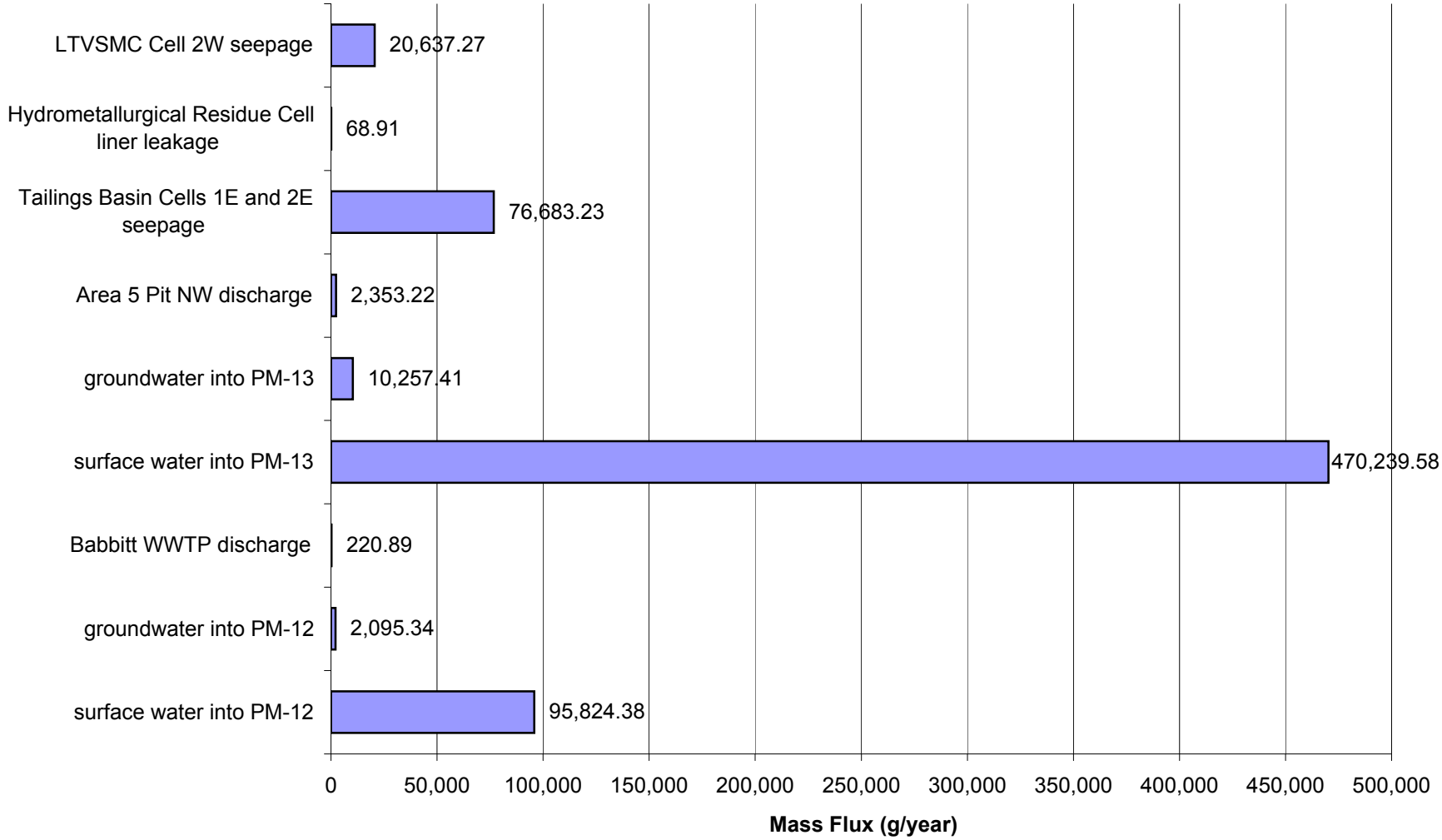
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for Average Flow for Arsenic (As)



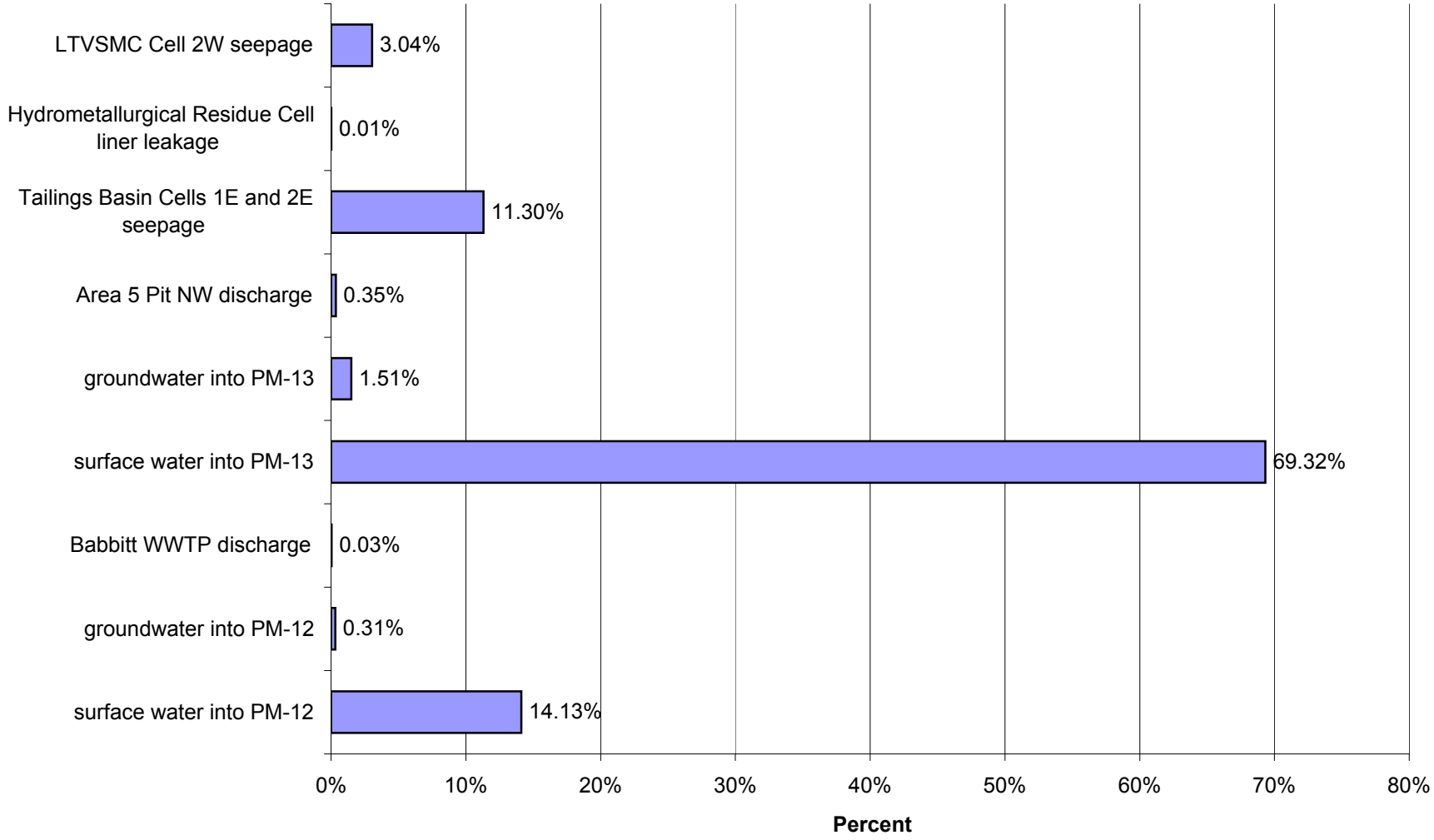
Proposed Action: Percent of Impacts at PM-13 in Year 20 for Average Flow for Arsenic (As)



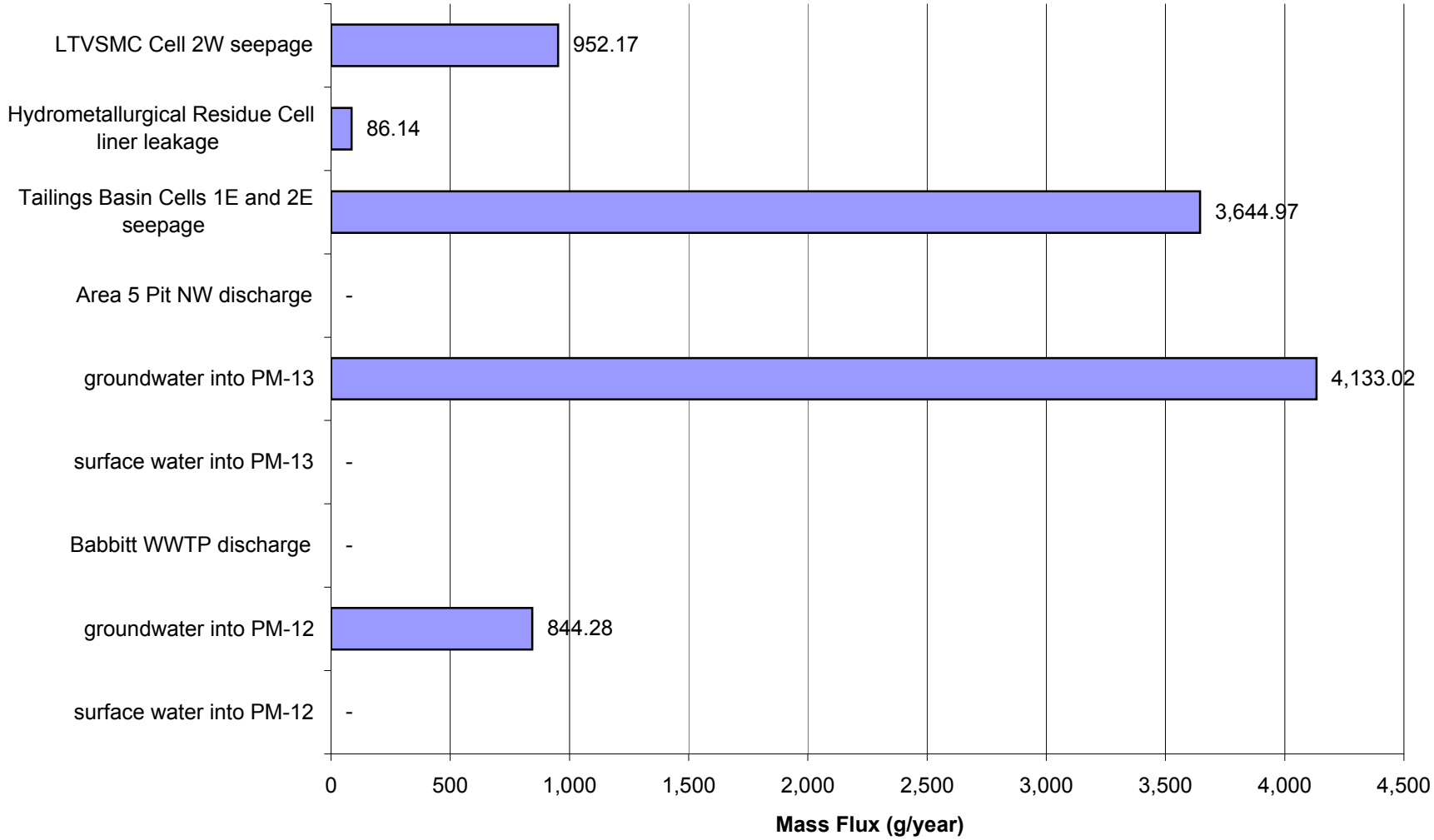
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for High Flow for Arsenic (As)



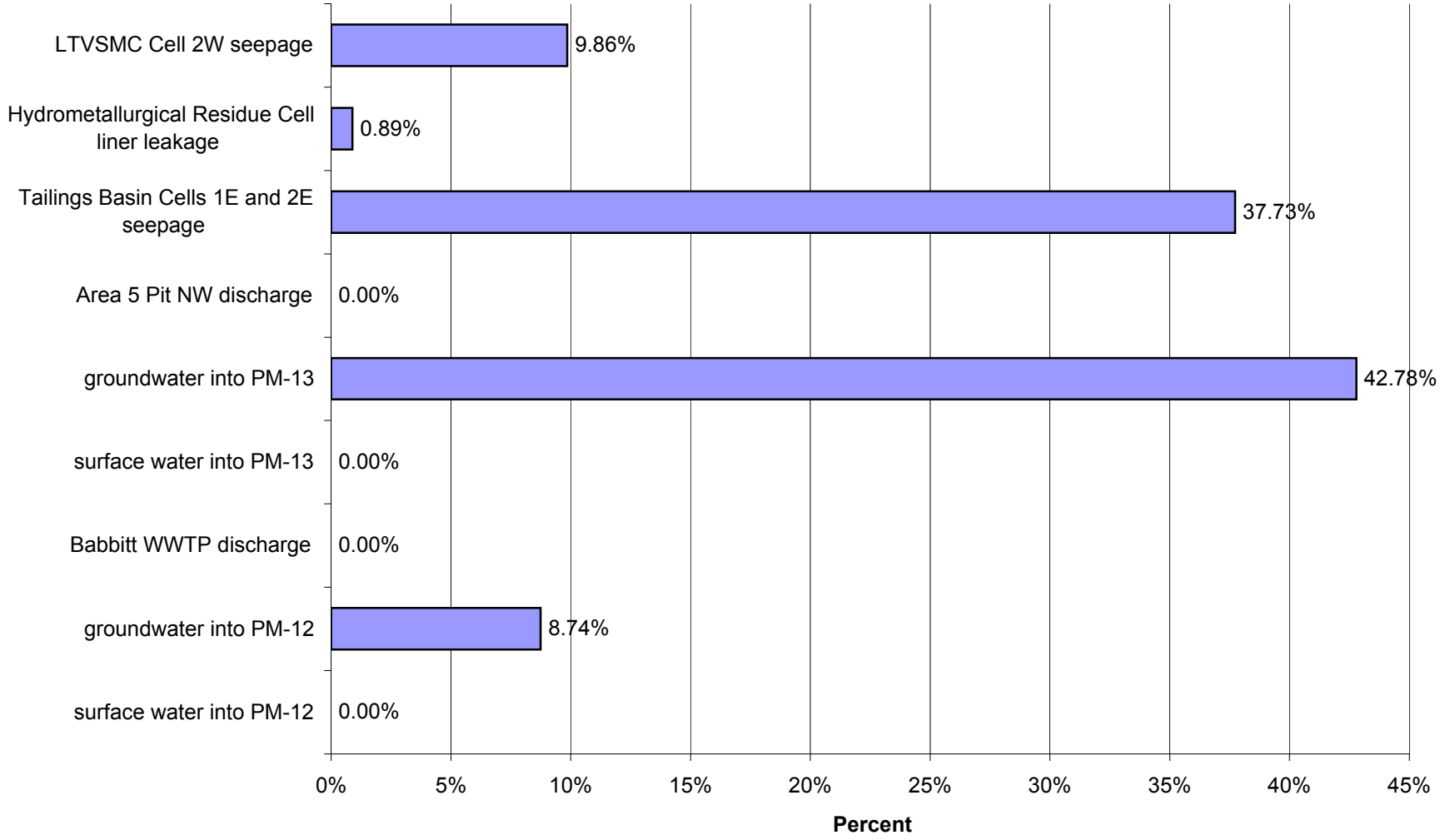
Proposed Action: Percent of Impacts at PM-13 in Year 20 for High Flow for Arsenic (As)



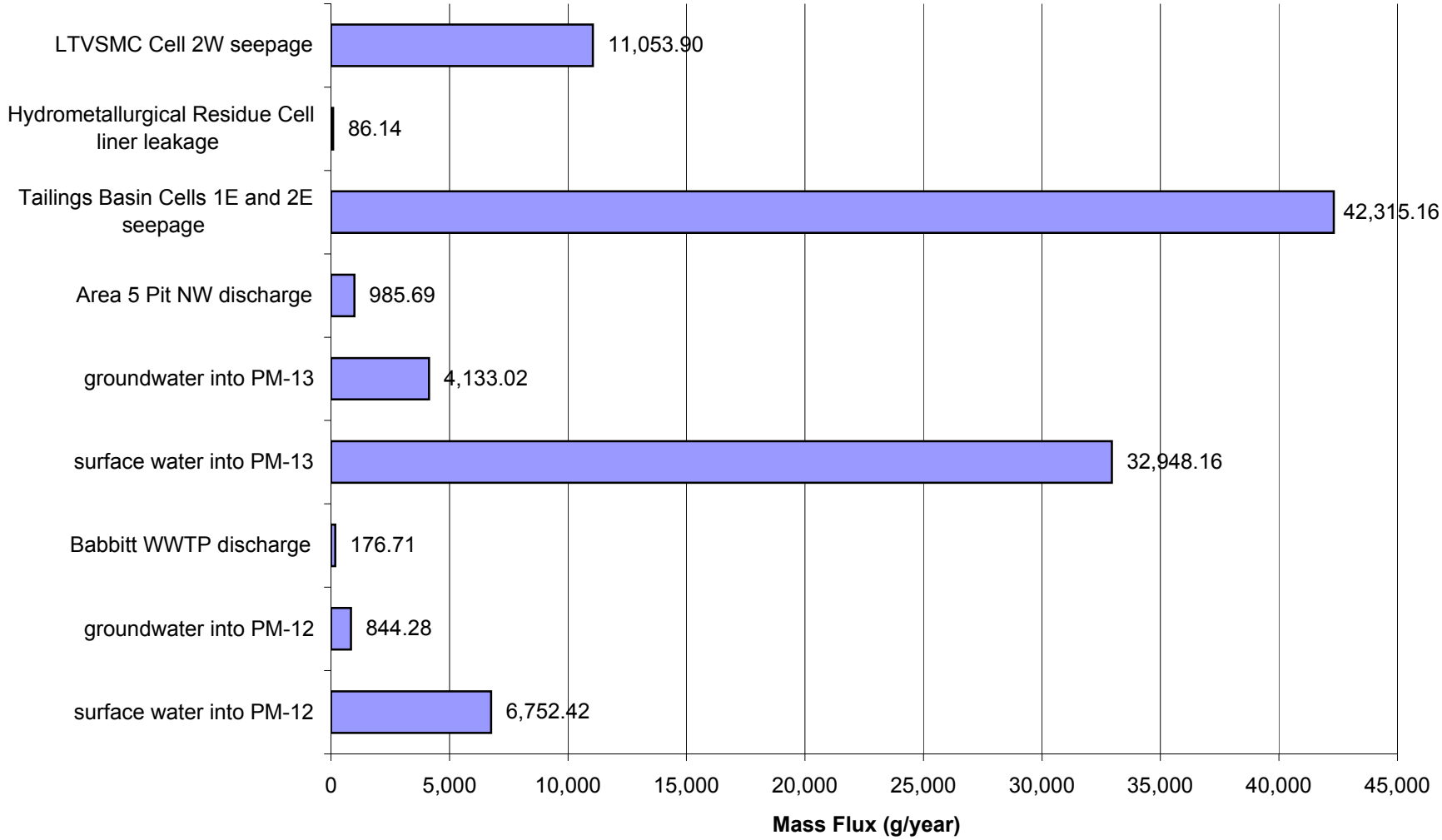
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for Low Flow for Cobalt (Co)



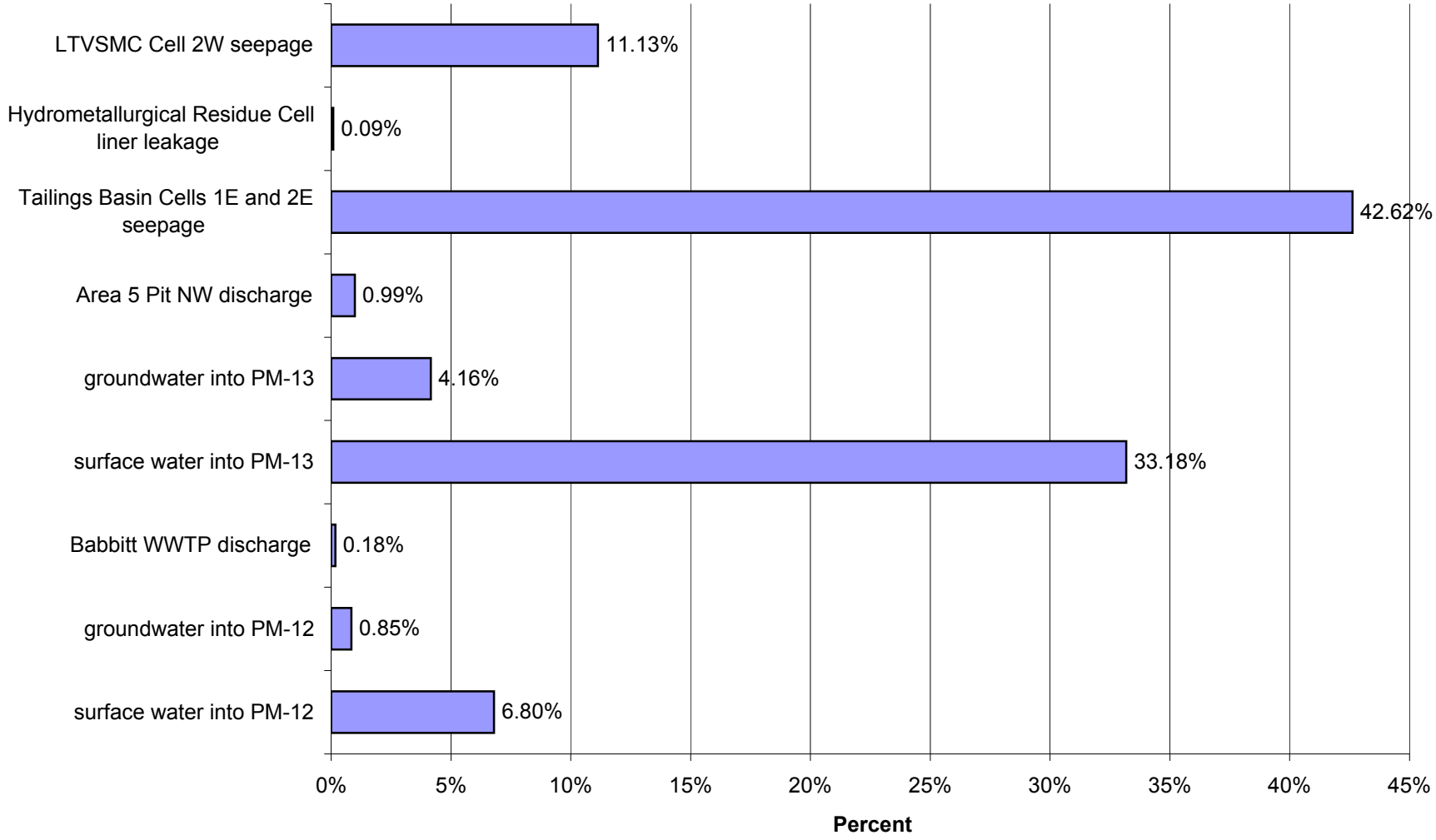
Proposed Action: Percent of Impacts at PM-13 in Year 20 for Low Flow for Cobalt (Co)



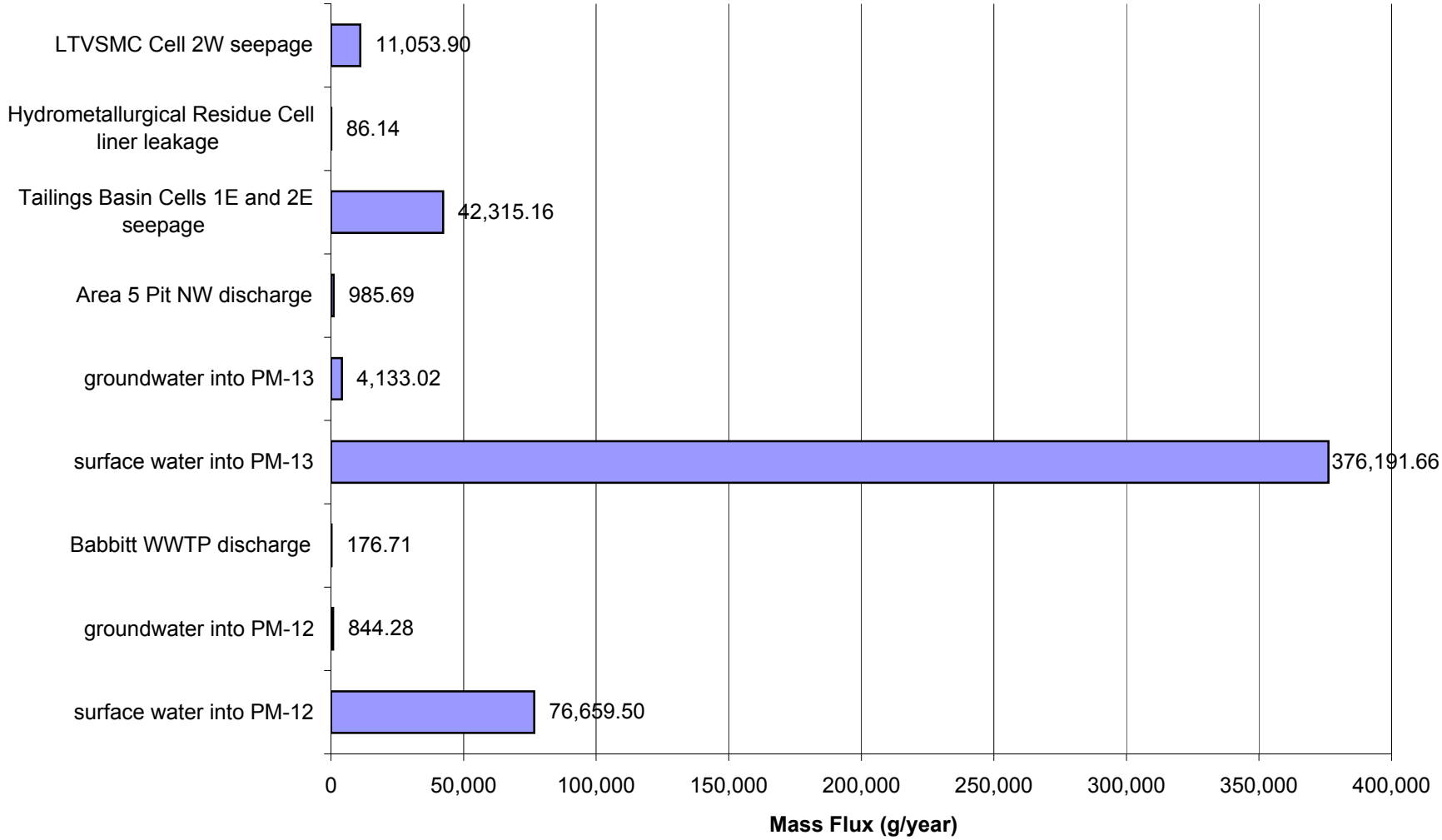
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for Average Flow for Cobalt (Co)



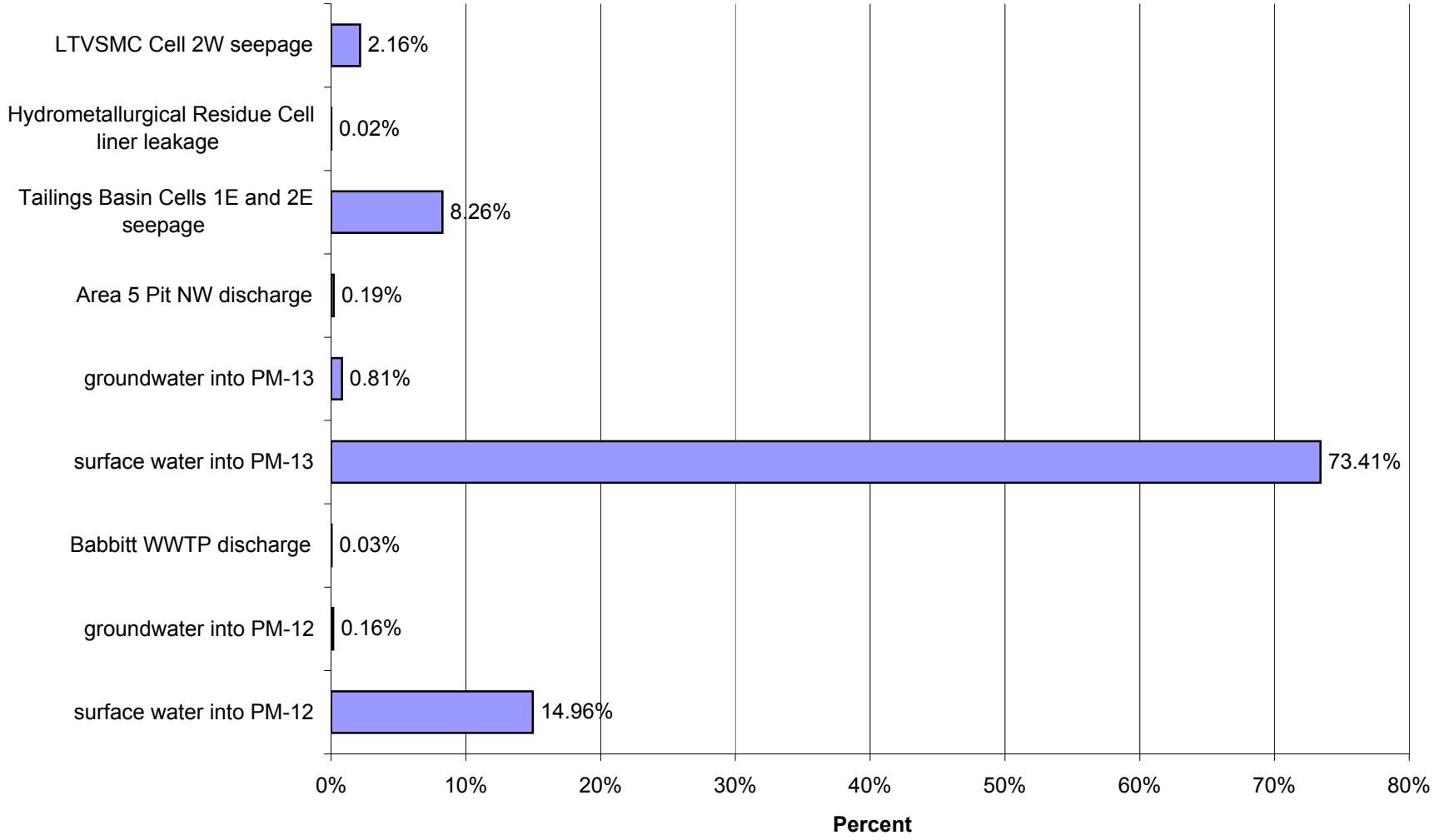
Proposed Action: Percent of Impacts at PM-13 in Year 20 for Average Flow for Cobalt (Co)



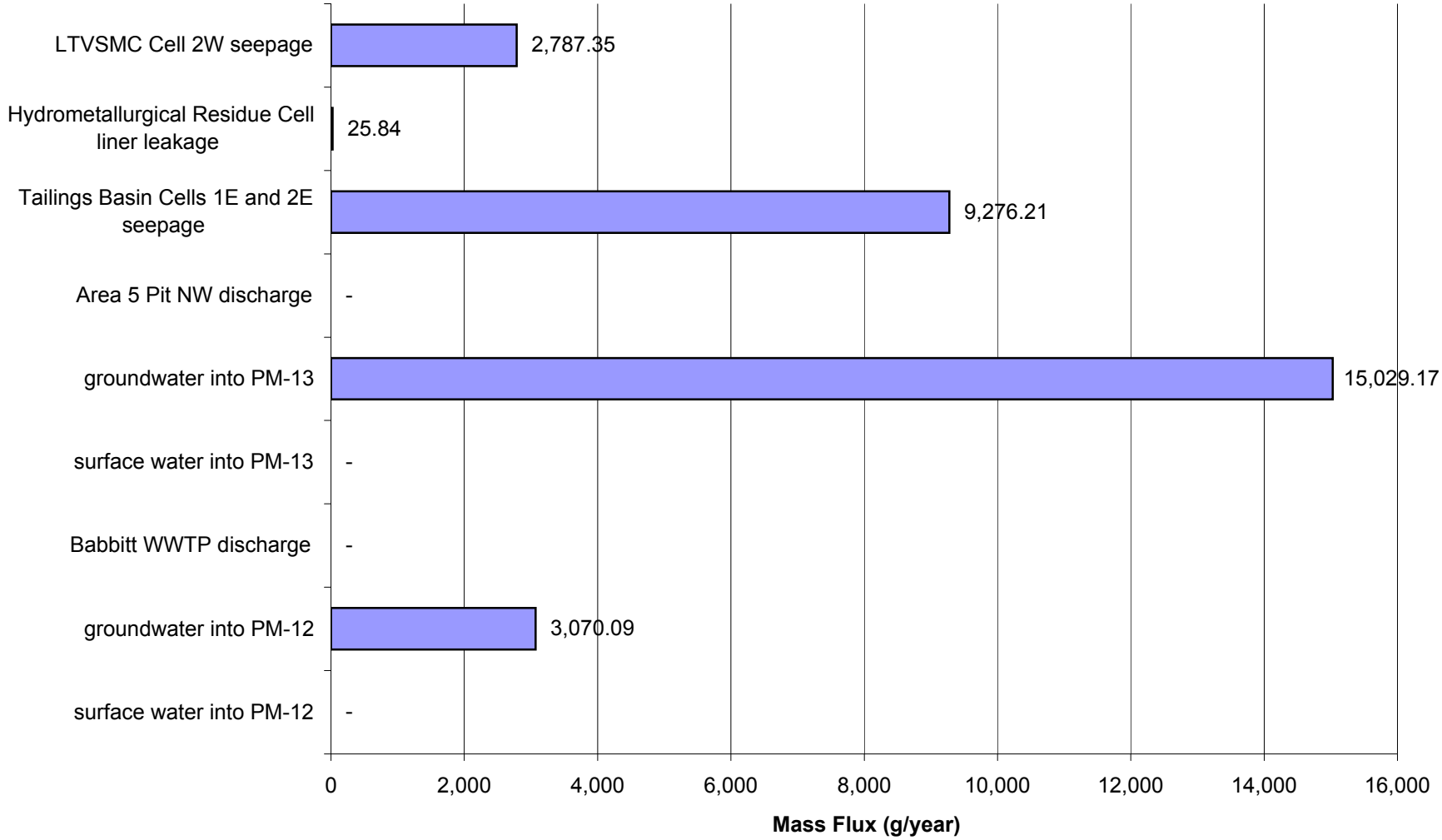
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for High Flow for Cobalt (Co)



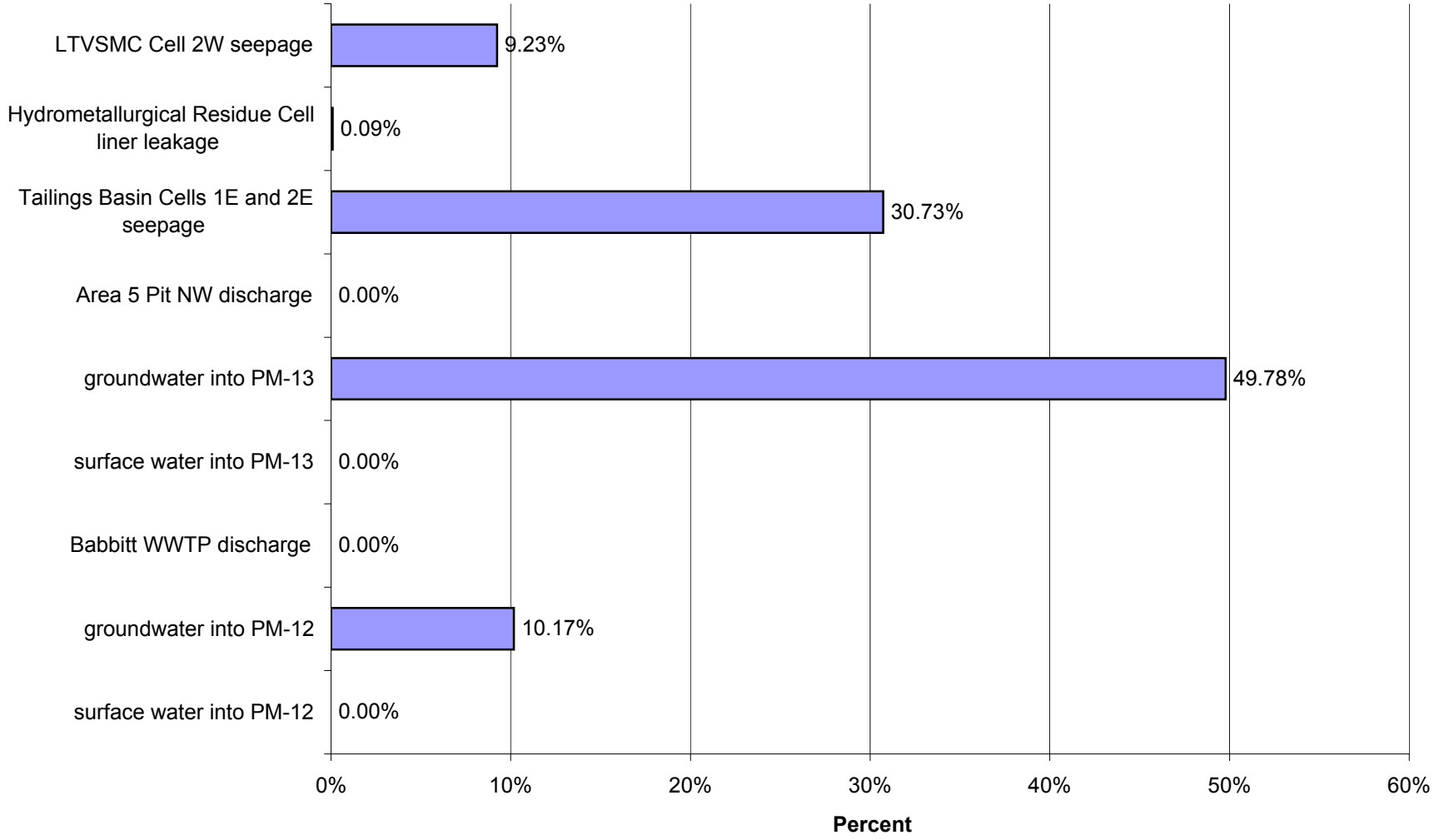
Proposed Action: Percent of Impacts at PM-13 in Year 20 for High Flow for Cobalt (Co)



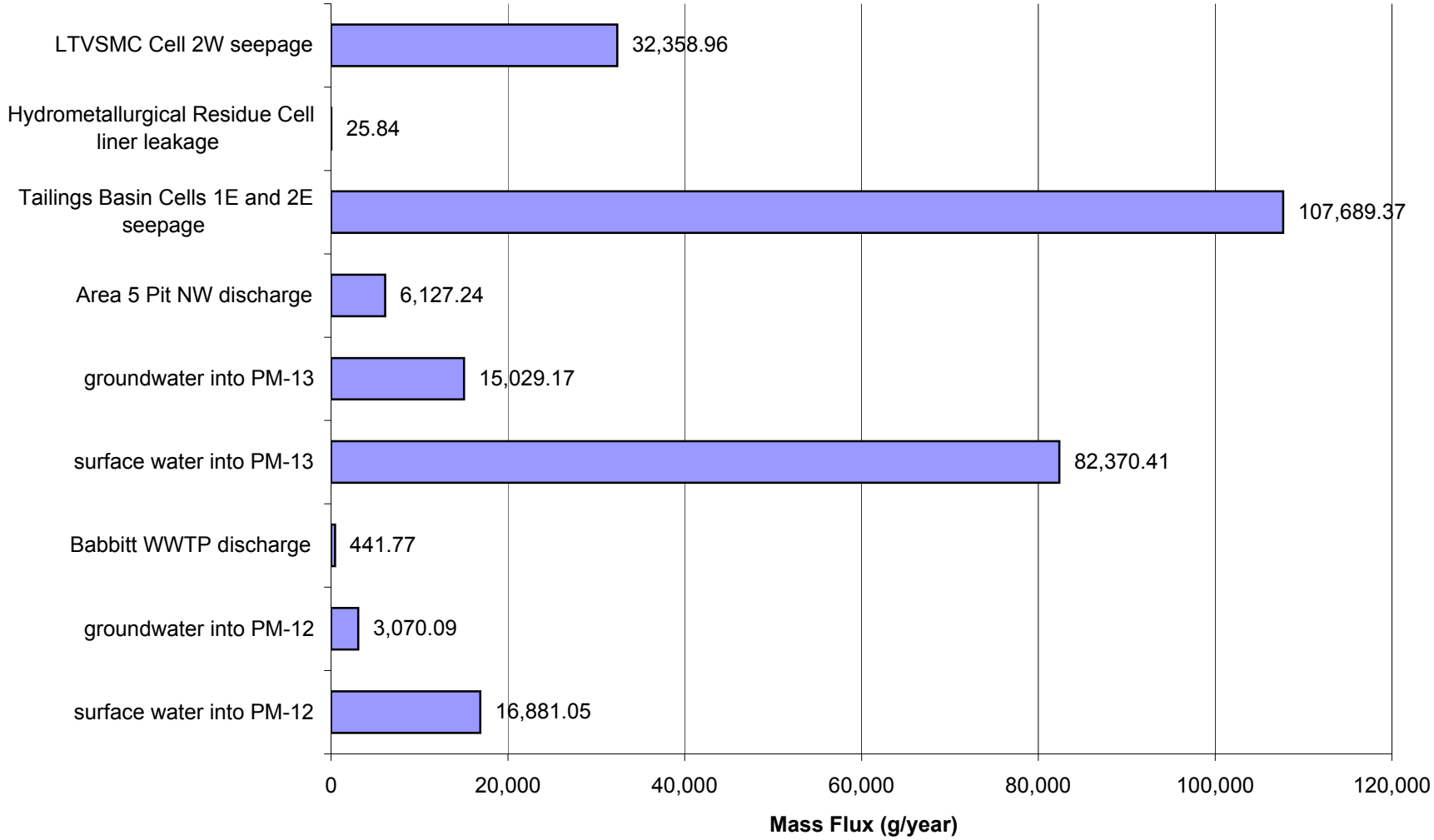
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for Low Flow for Copper (Cu)



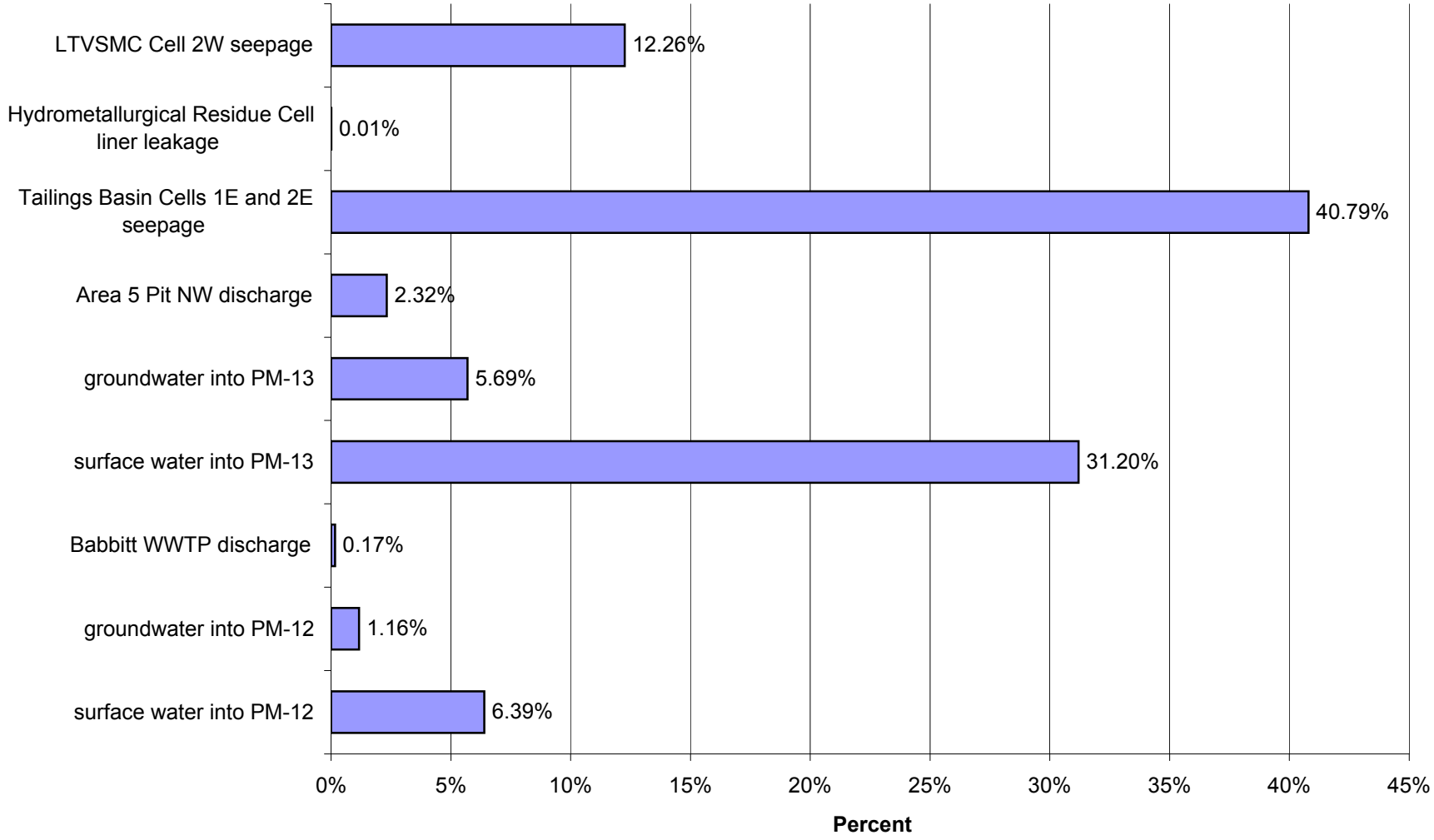
Proposed Action: Percent of Impacts at PM-13 in Year 20 for Low Flow for Copper (Cu)



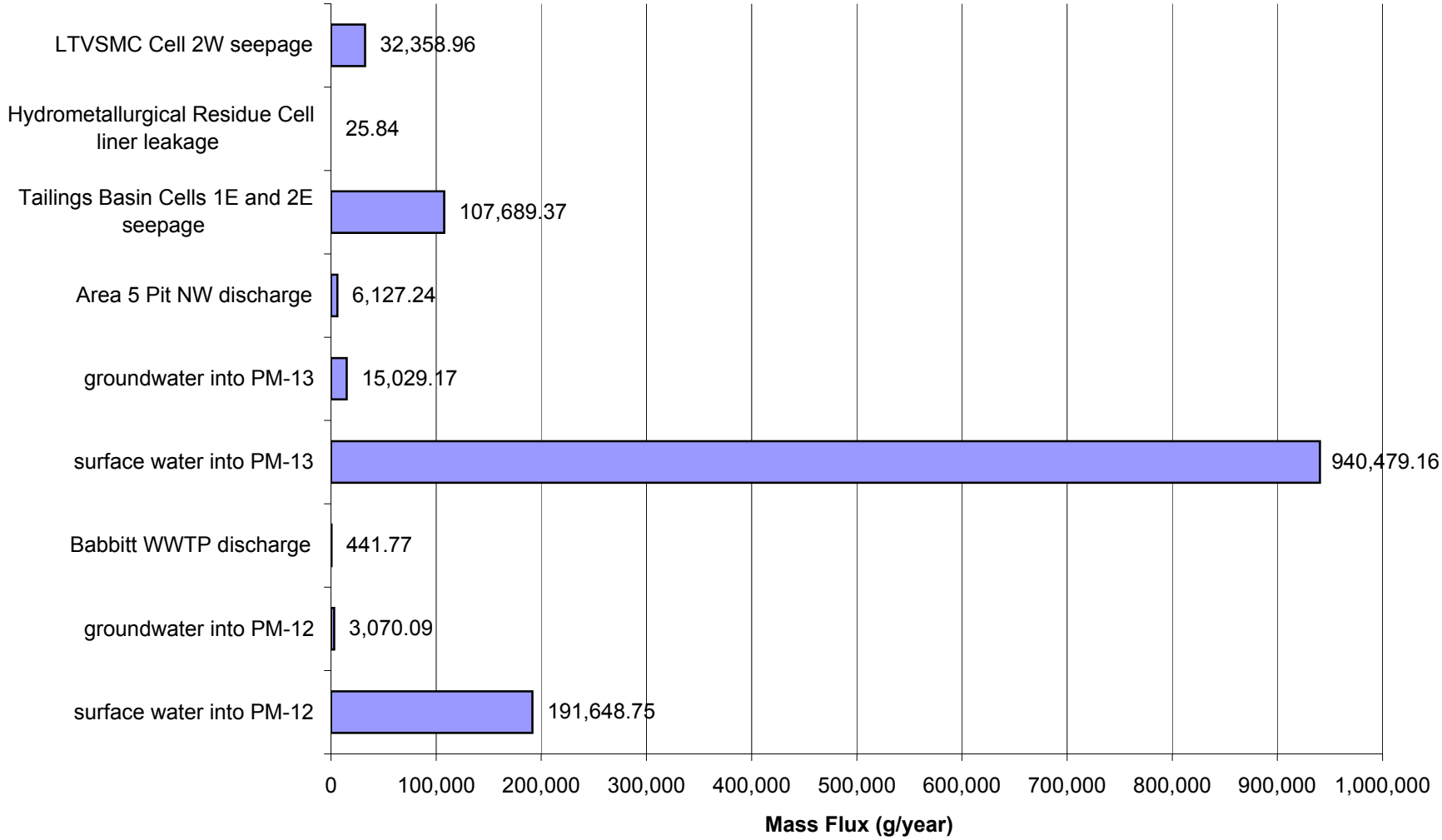
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for Average Flow for Copper (Cu)



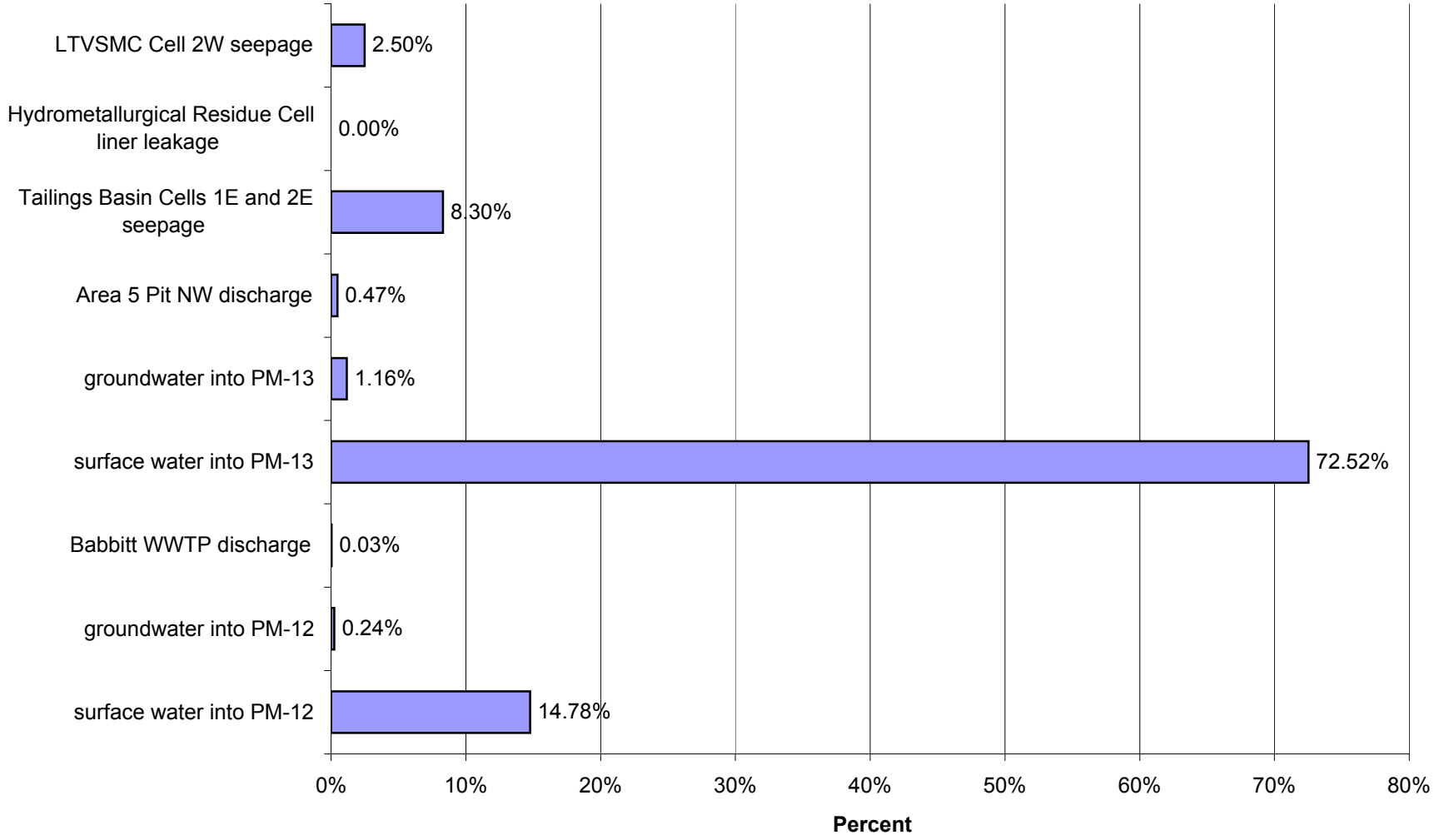
Proposed Action: Percent of Impacts at PM-13 in Year 20 for Average Flow for Copper (Cu)



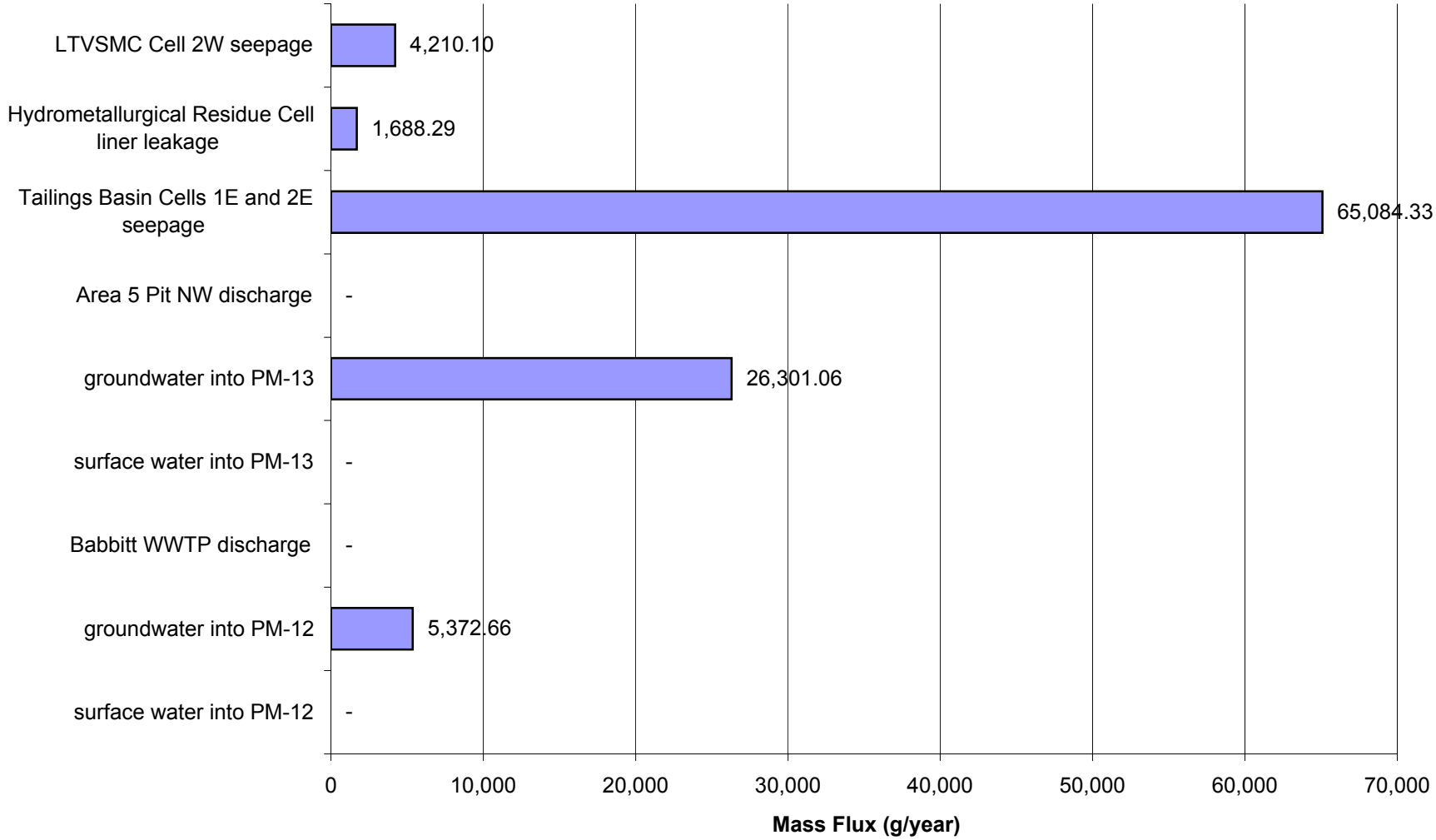
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for High Flow for Copper (Cu)



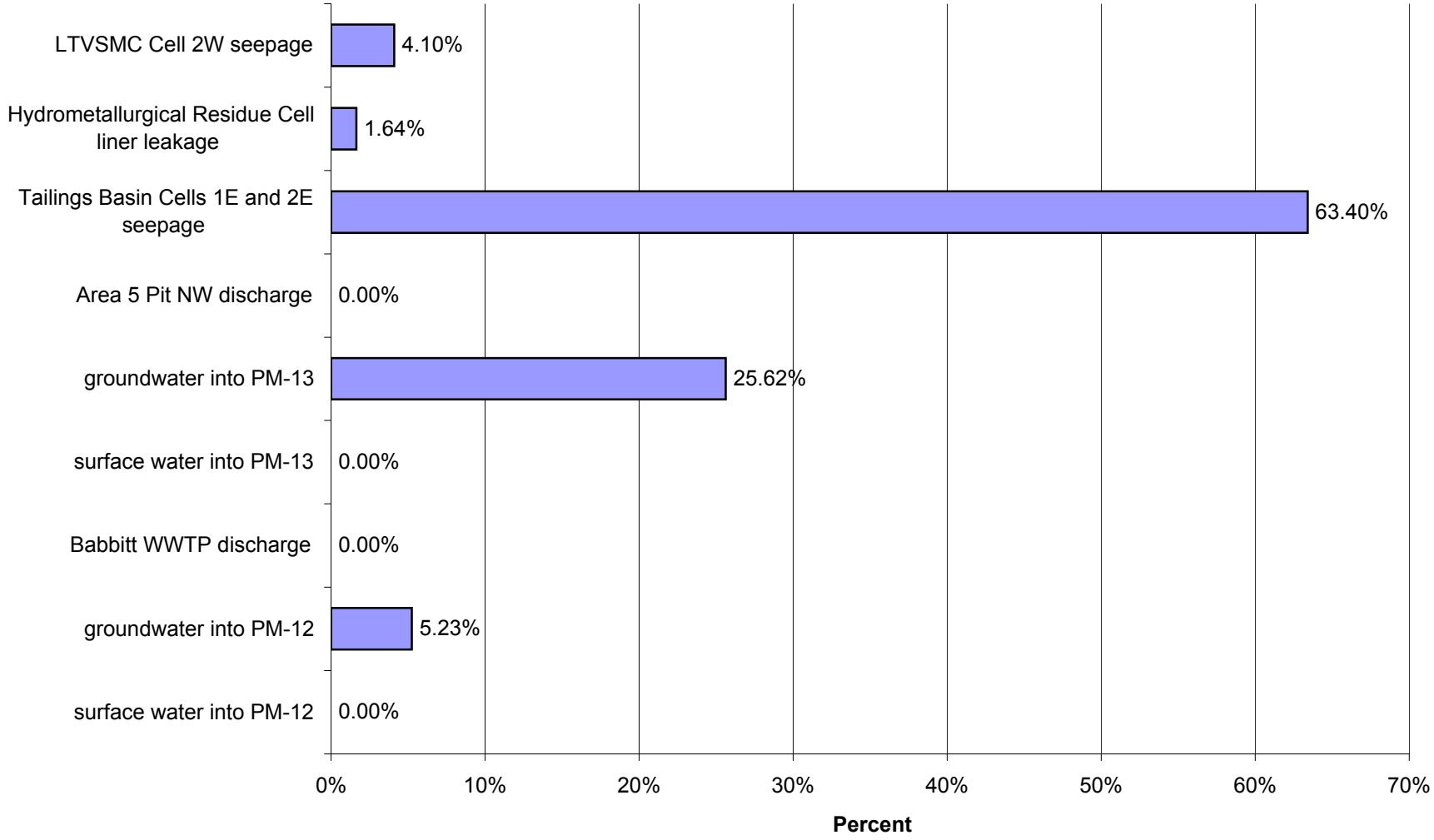
Proposed Action: Percent of Impacts at PM-13 in Year 20 for High Flow for Copper (Cu)



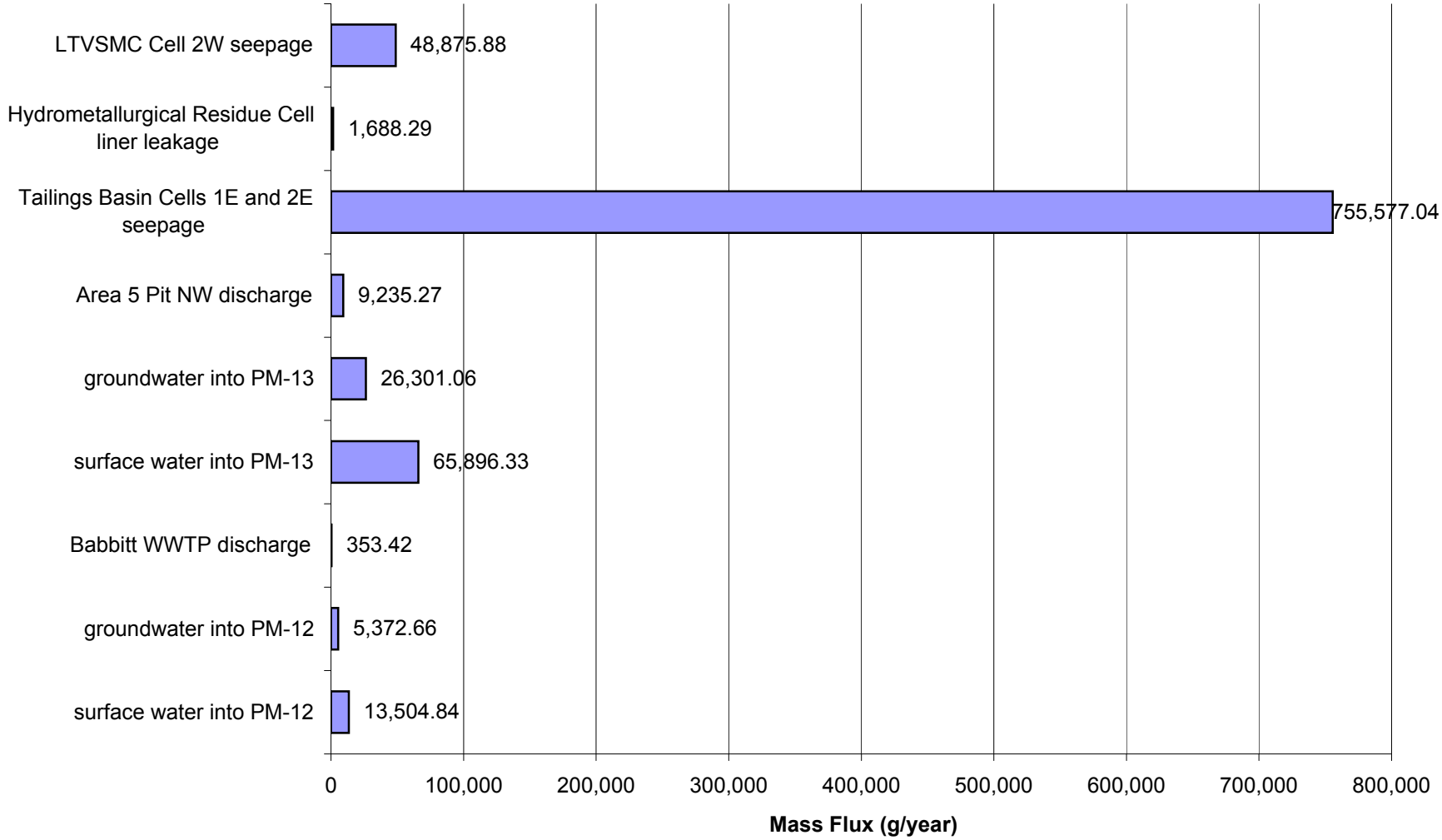
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for Low Flow for Nickel (Ni)



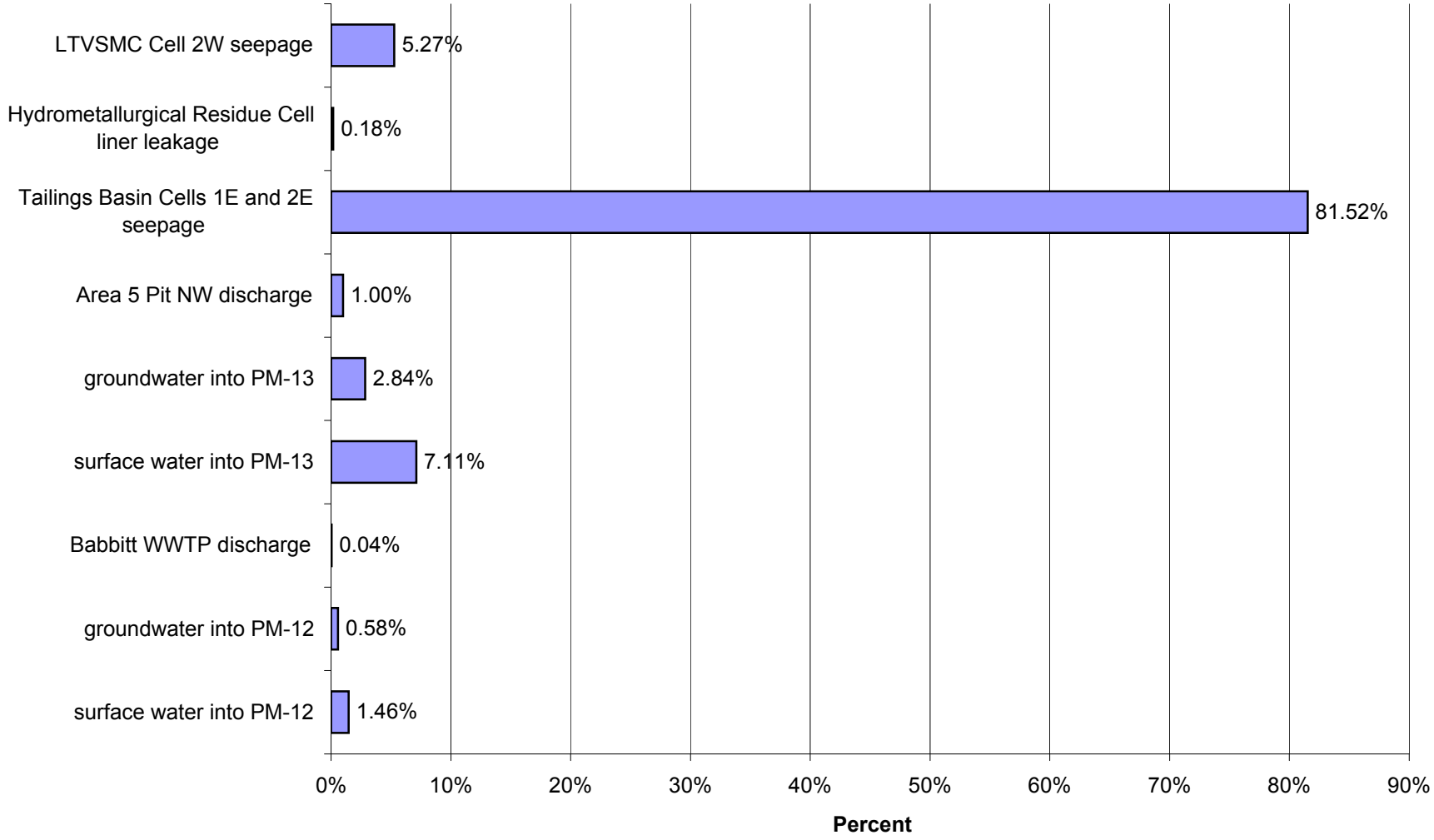
Proposed Action: Percent of Impacts at PM-13 in Year 20 for Low Flow for Nickel (Ni)



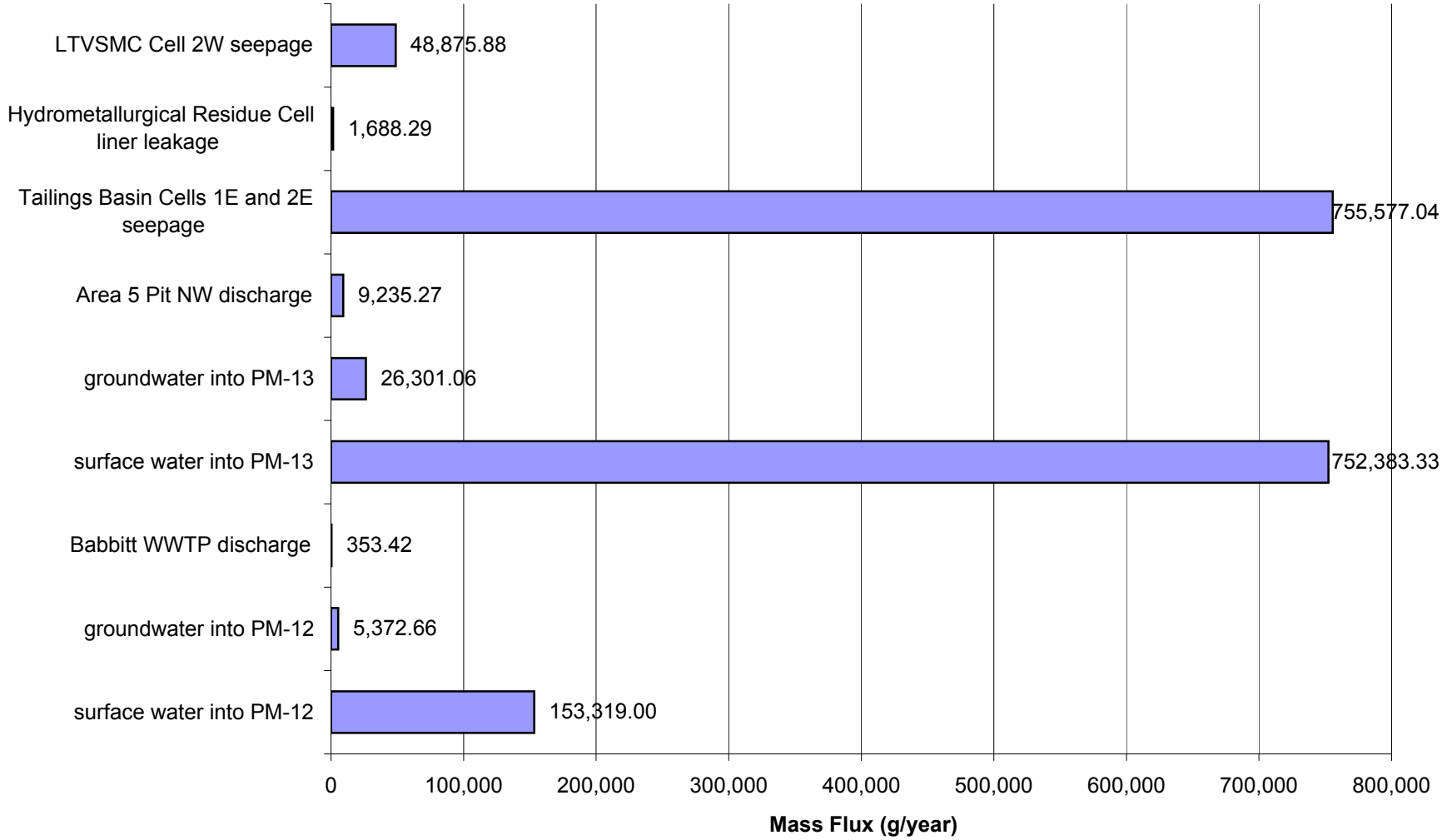
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for Average Flow for Nickel (Ni)



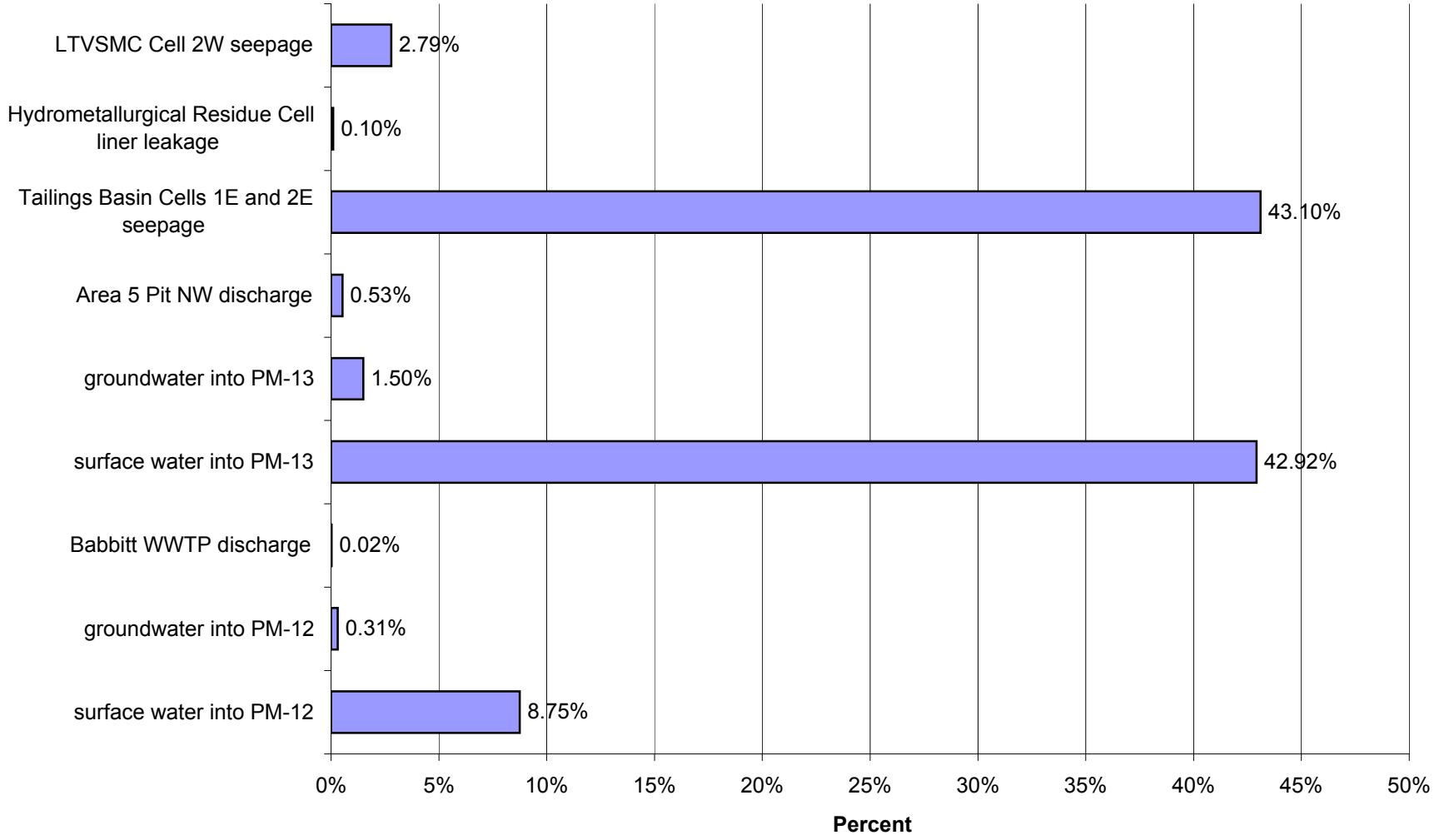
Proposed Action: Percent of Impacts at PM-13 in Year 20 for Average Flow for Nickel (Ni)



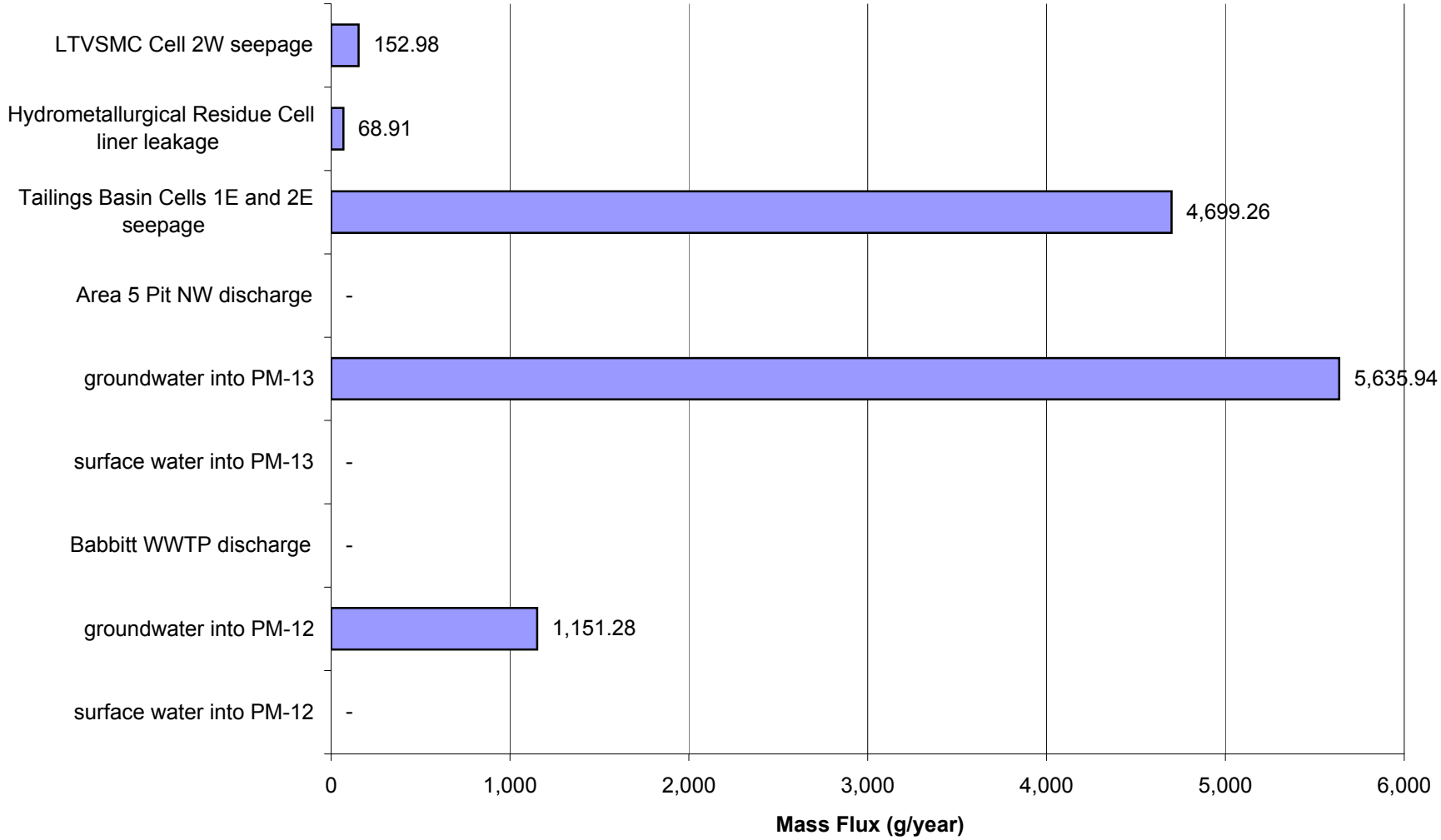
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for High Flow for Nickel (Ni)



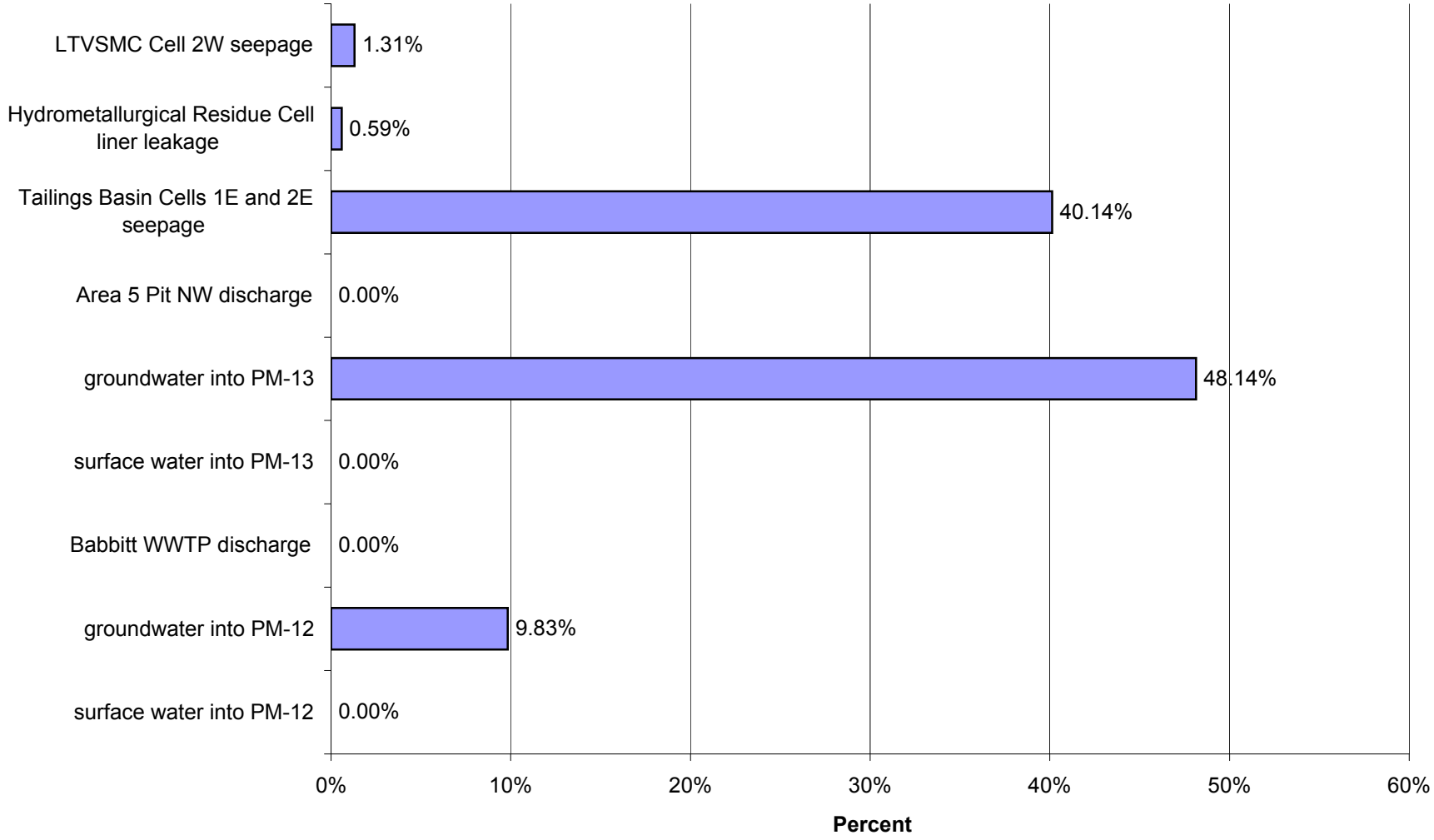
Proposed Action: Percent of Impacts at PM-13 in Year 20 for High Flow for Nickel (Ni)



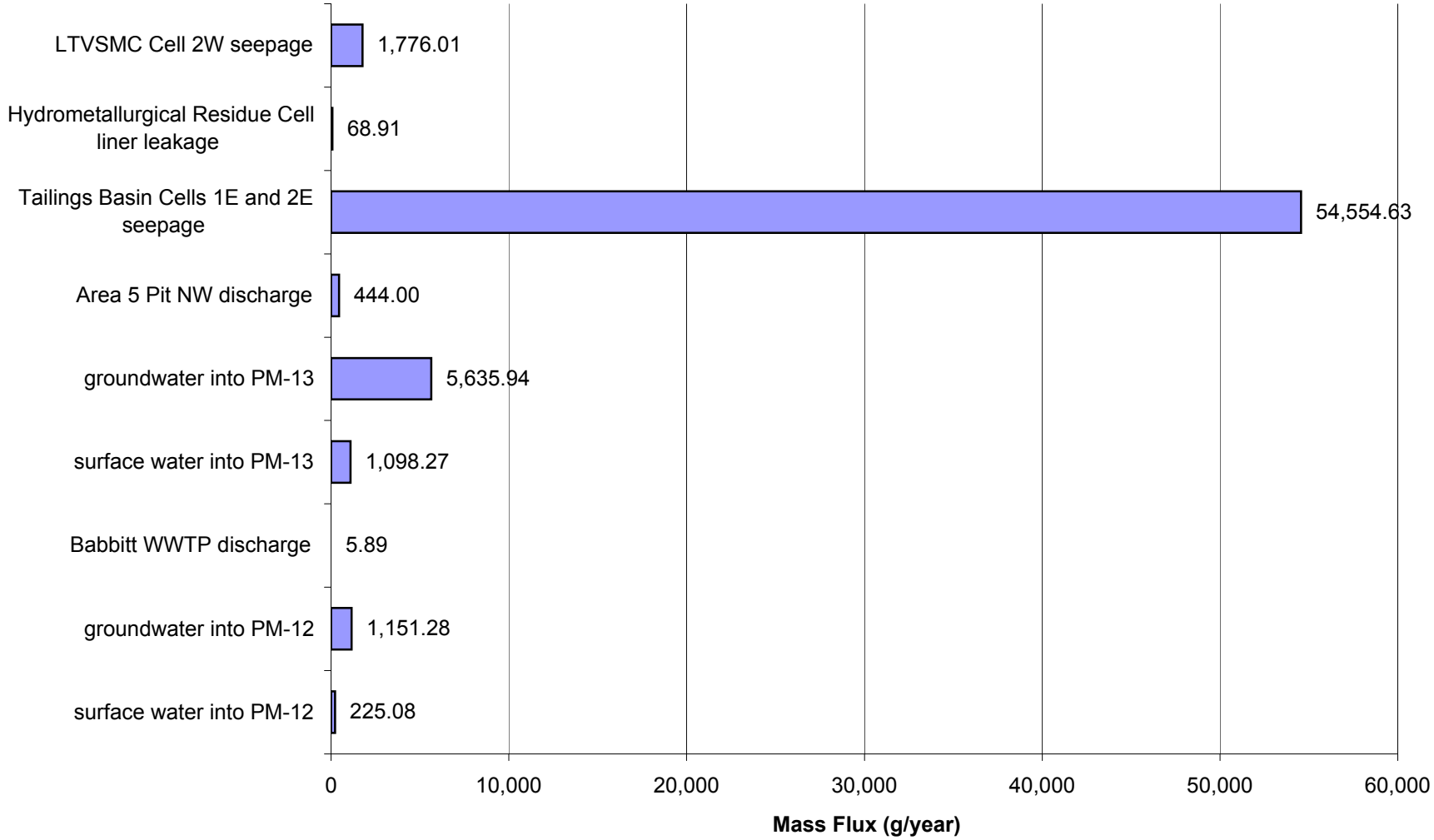
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for Low Flow for Antimony (Sb)



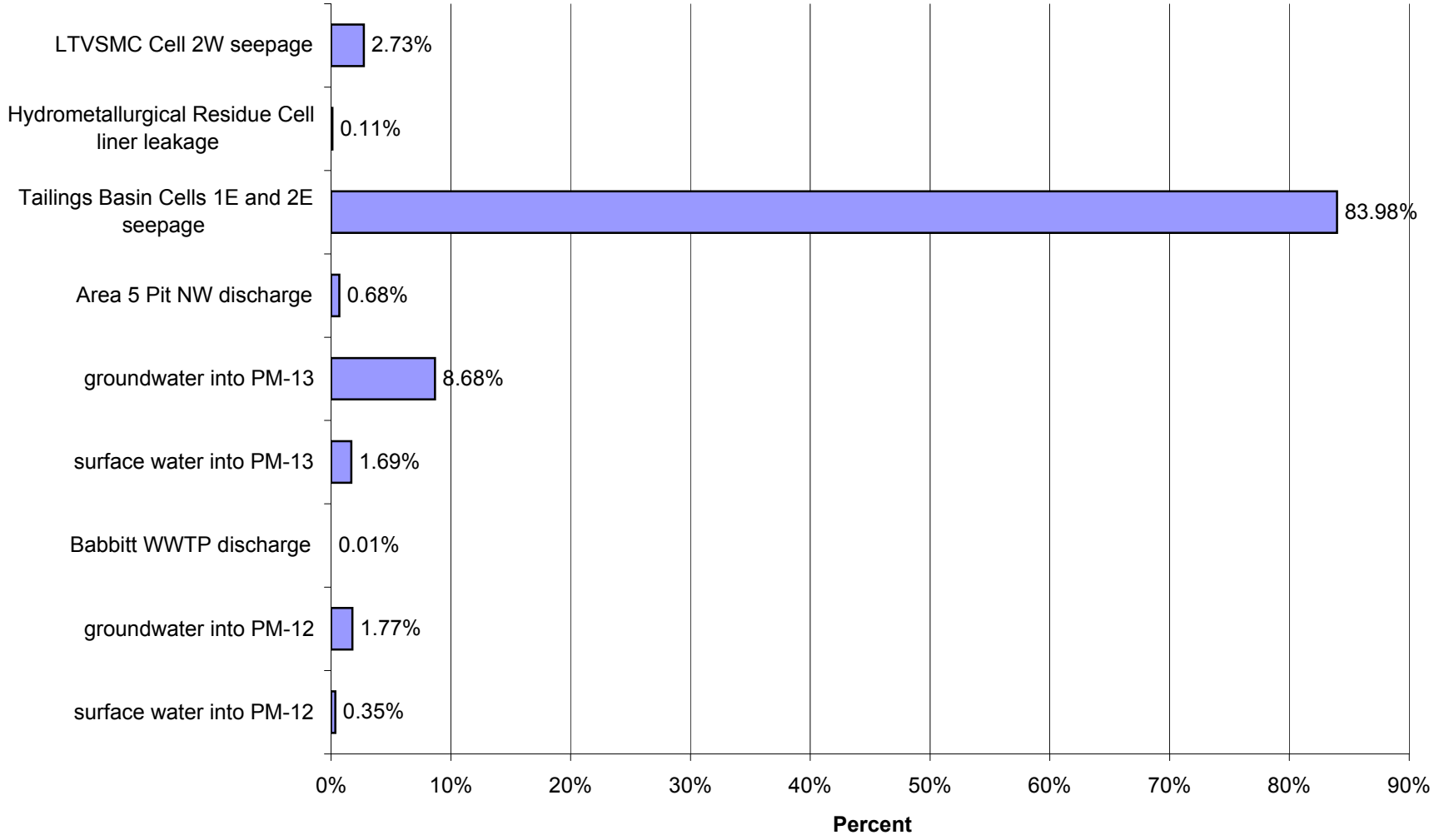
Proposed Action: Percent of Impacts at PM-13 in Year 20 for Low Flow for Antimony (Sb)



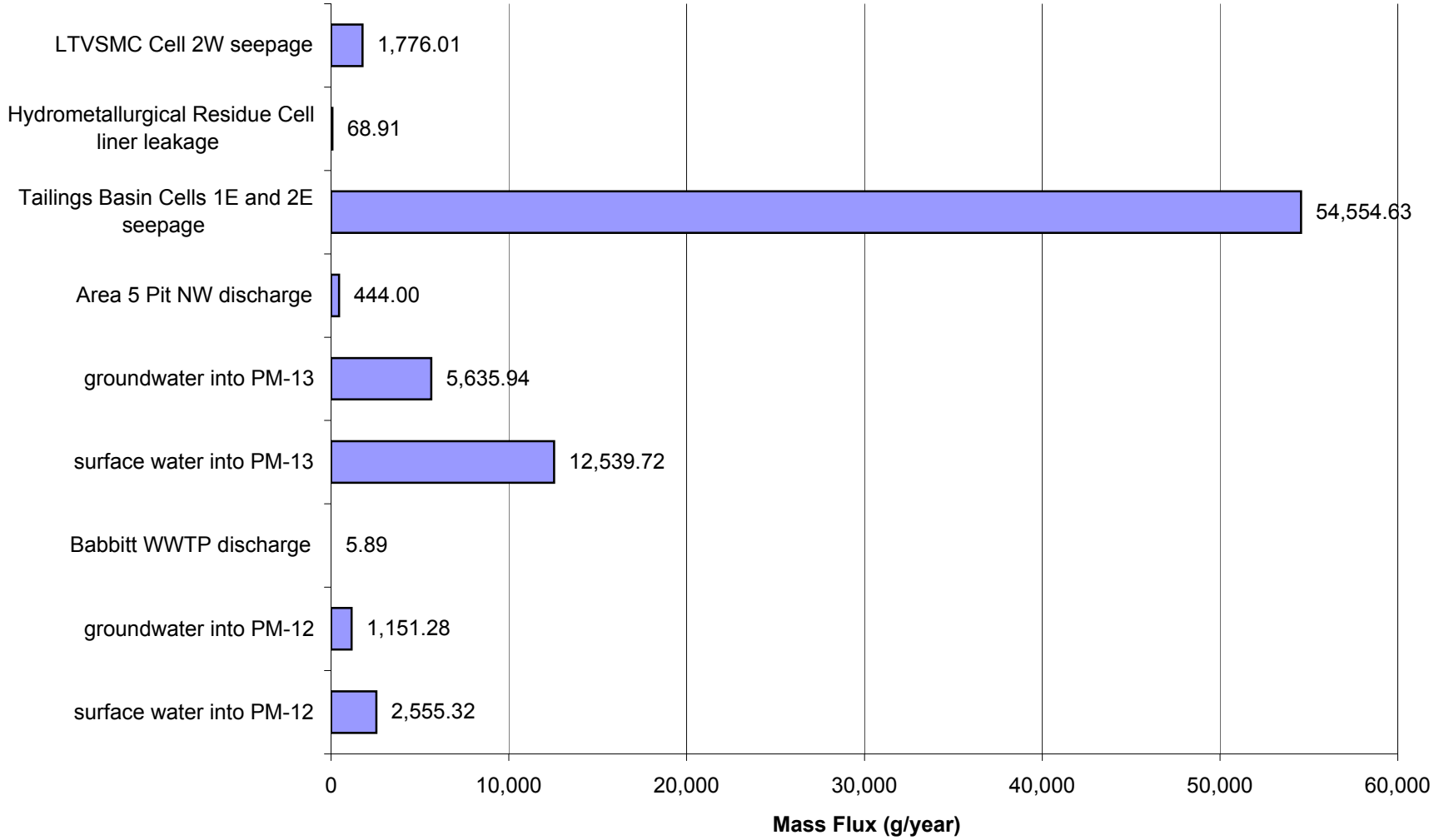
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for Average Flow for Antimony (Sb)



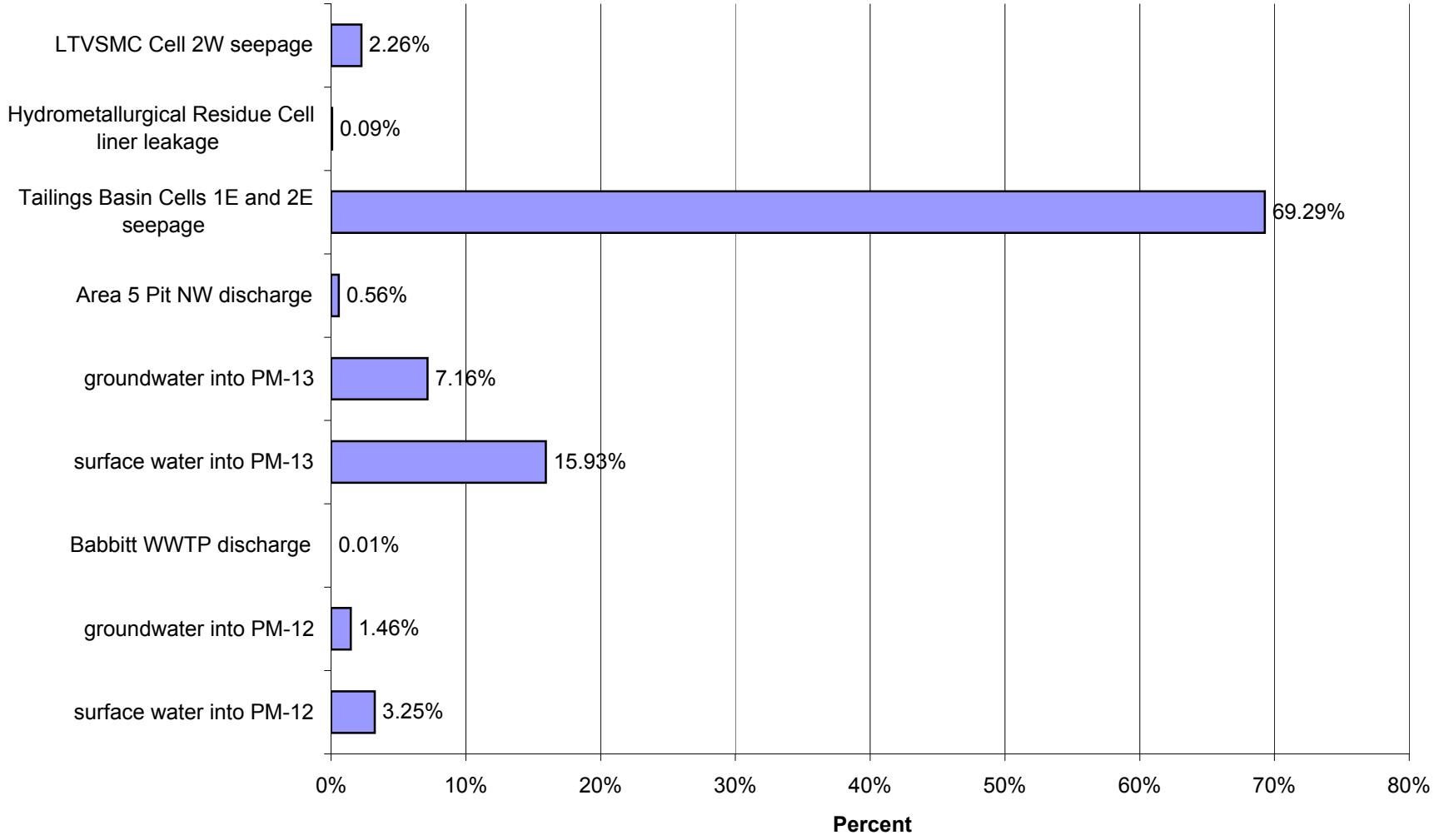
Proposed Action: Percent of Impacts at PM-13 in Year 20 for Average Flow for Antimony (Sb)



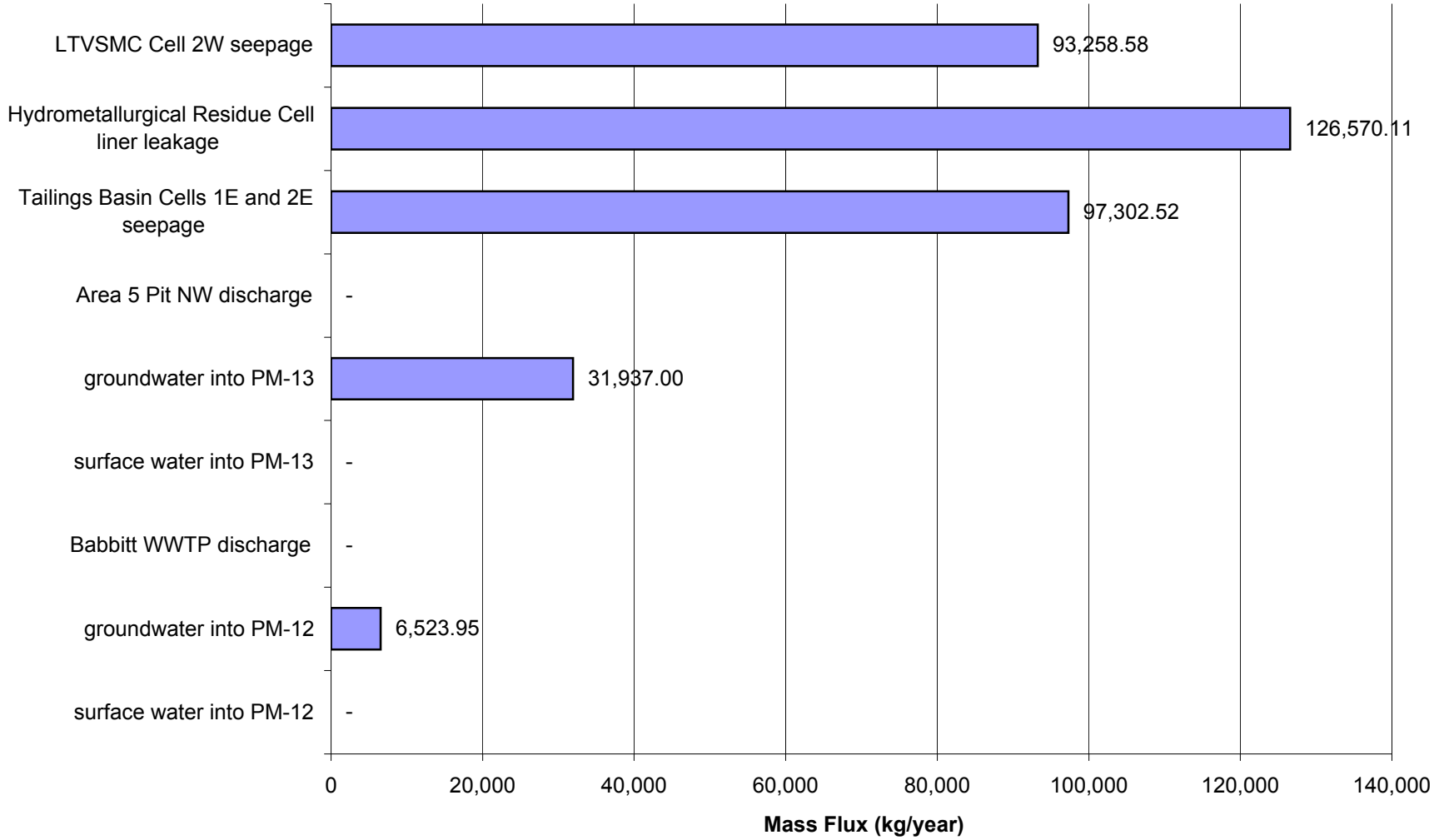
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for High Flow for Antimony (Sb)



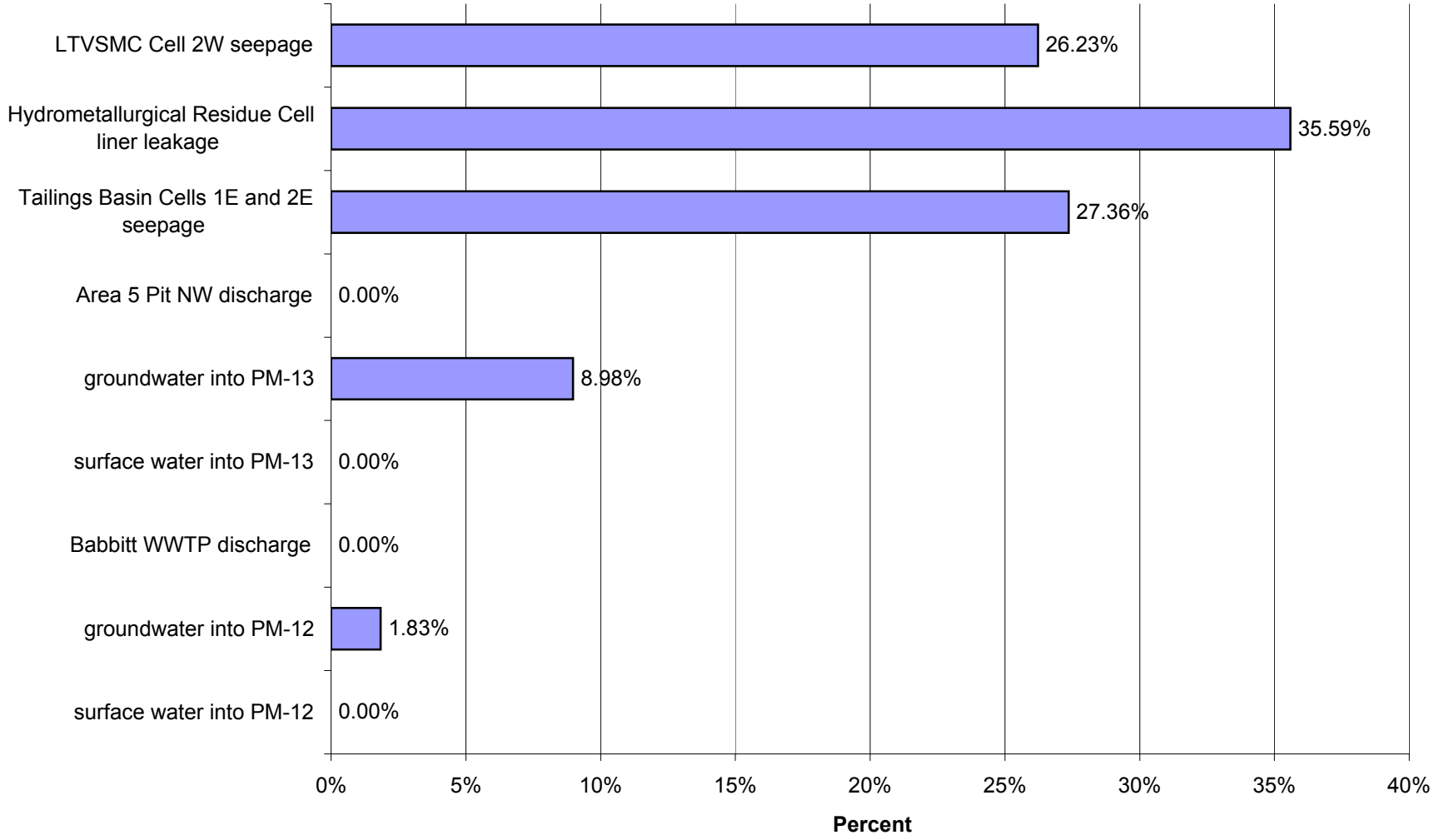
Proposed Action: Percent of Impacts at PM-13 in Year 20 for High Flow for Antimony (Sb)



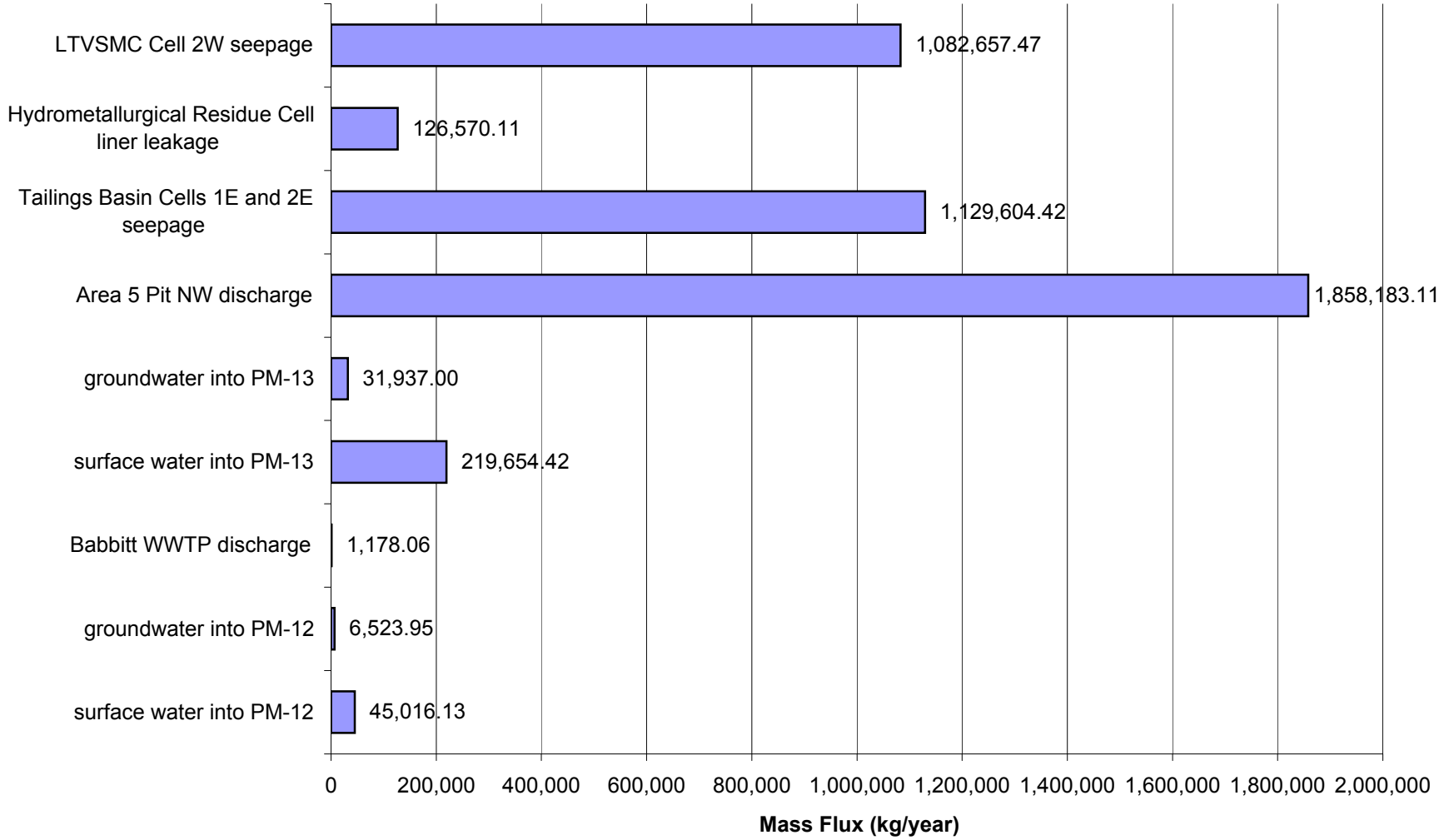
Proposed Action: Mass Flux (kg/year) of Impacts at PM-13 in Year 20 for Low Flow for Sulfate (SO_4)



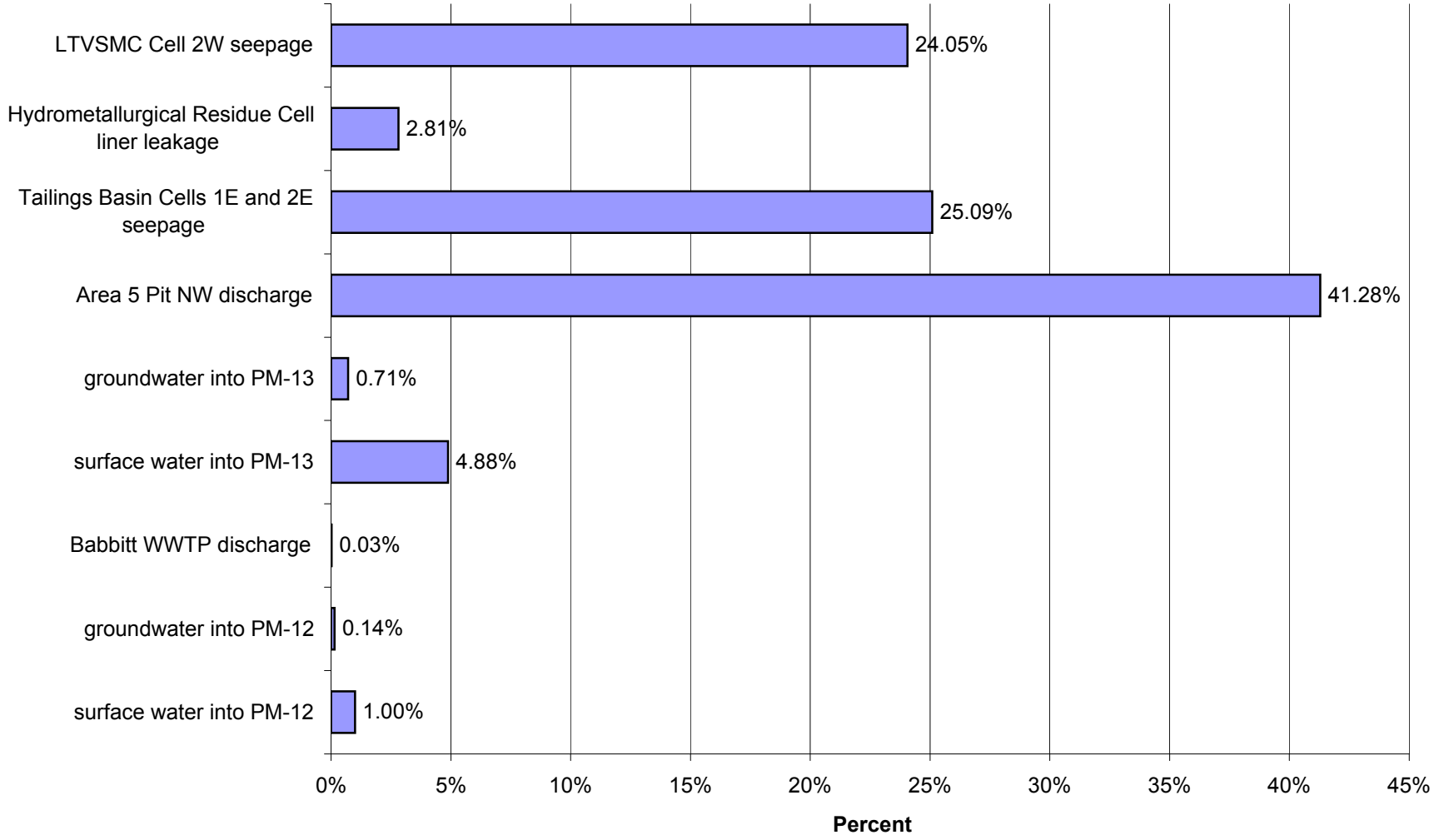
Proposed Action: Percent of Impacts at PM-13 in Year 20 for Low Flow for Sulfate (SO_4)



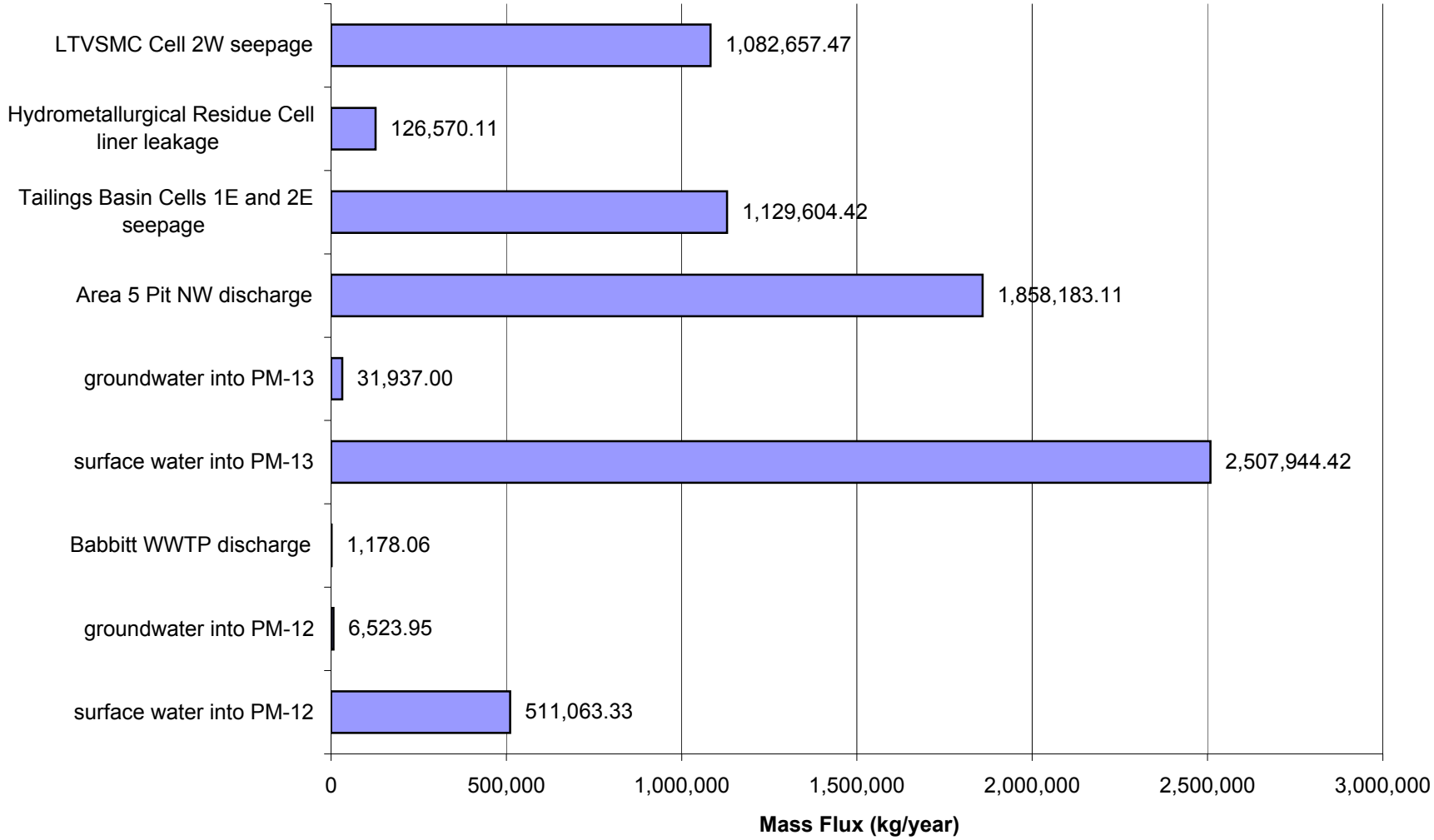
Proposed Action: Mass Flux (kg/year) of Impacts at PM-13 in Year 20 for Average Flow for Sulfate (SO_4)



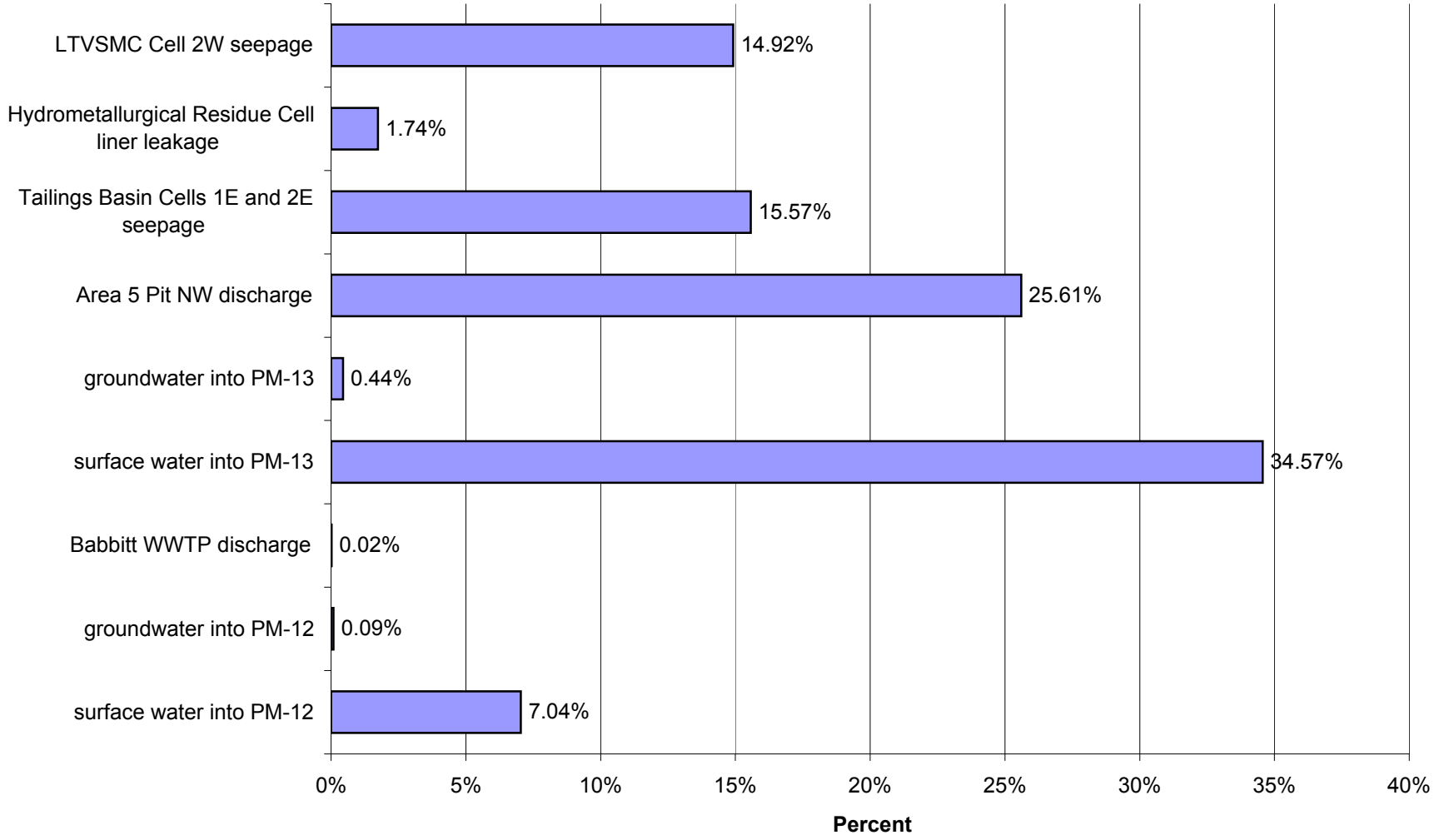
Proposed Action: Percent of Impacts at PM-13 in Year 20 for Average Flow for Sulfate (SO_4)



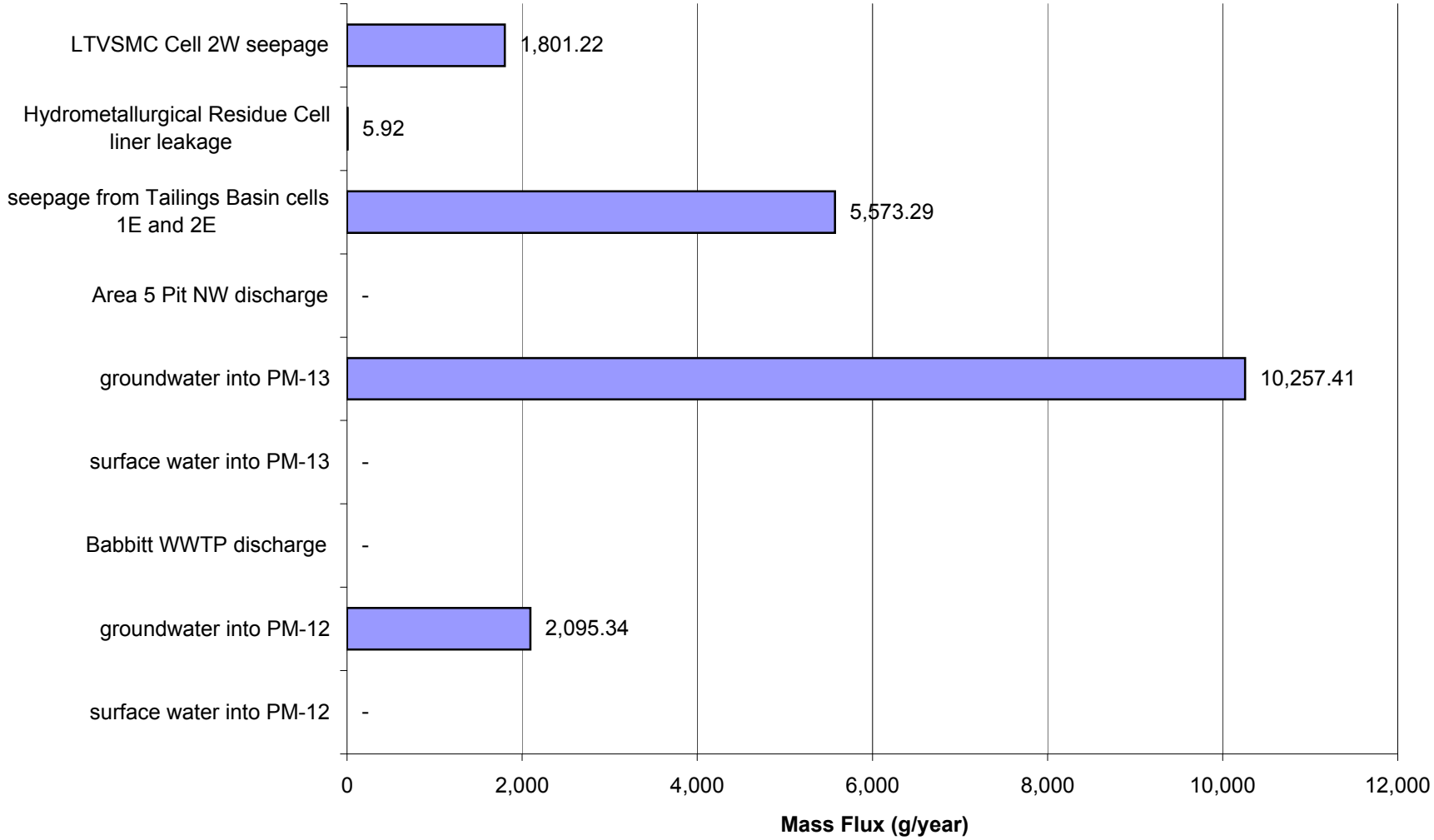
Proposed Action: Mass Flux (kg/year) of Impacts at PM-13 in Year 20 for High Flow for Sulfate (SO_4)



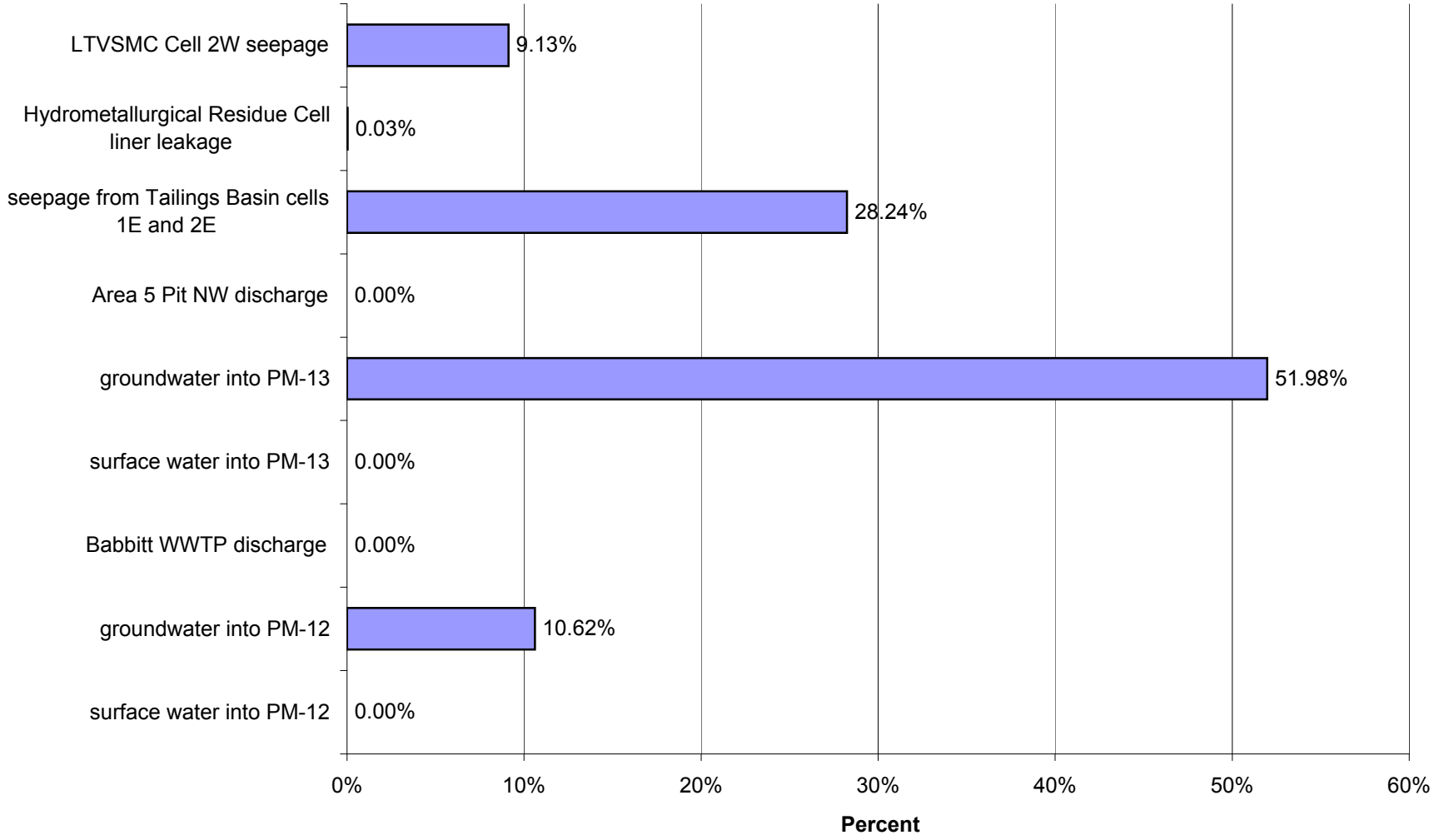
Proposed Action: Percent of Impacts at PM-13 in Year 20 for High Flow for Sulfate (SO_4)



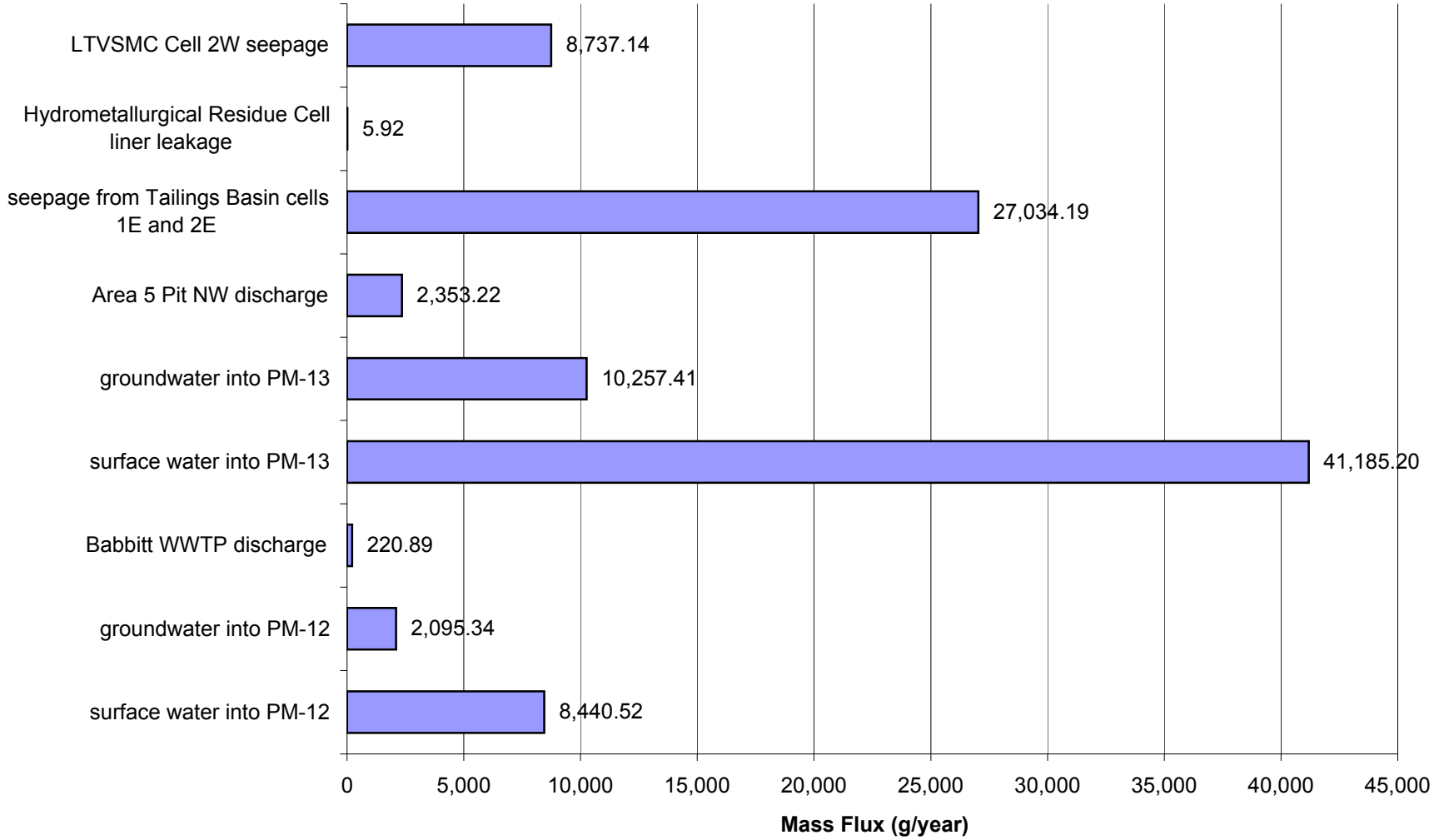
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Closure for Low Flow for Arsenic (As)



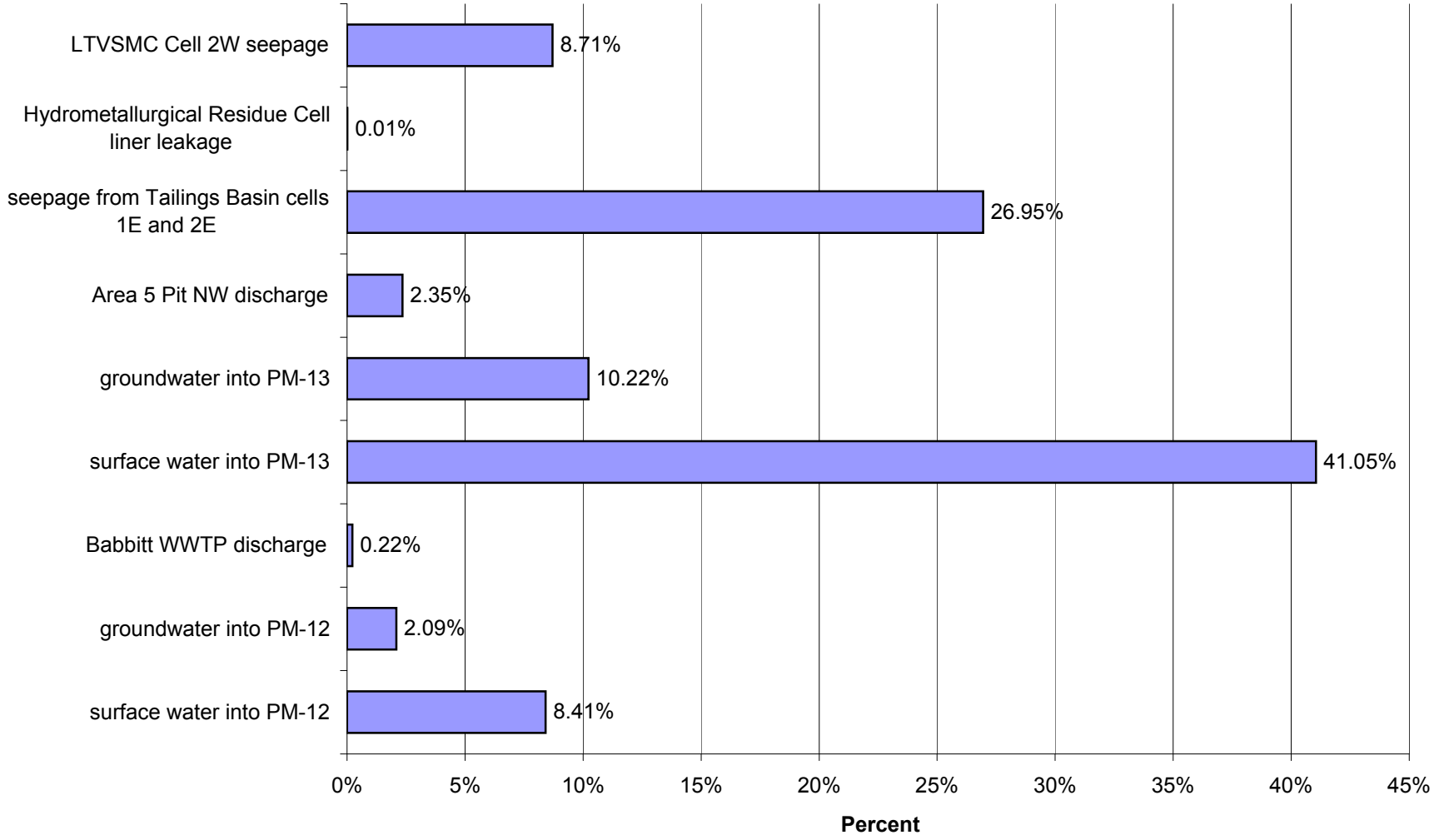
Proposed Action: Percent of Impacts at PM-13 in Closure for Low Flow for Arsenic (As)



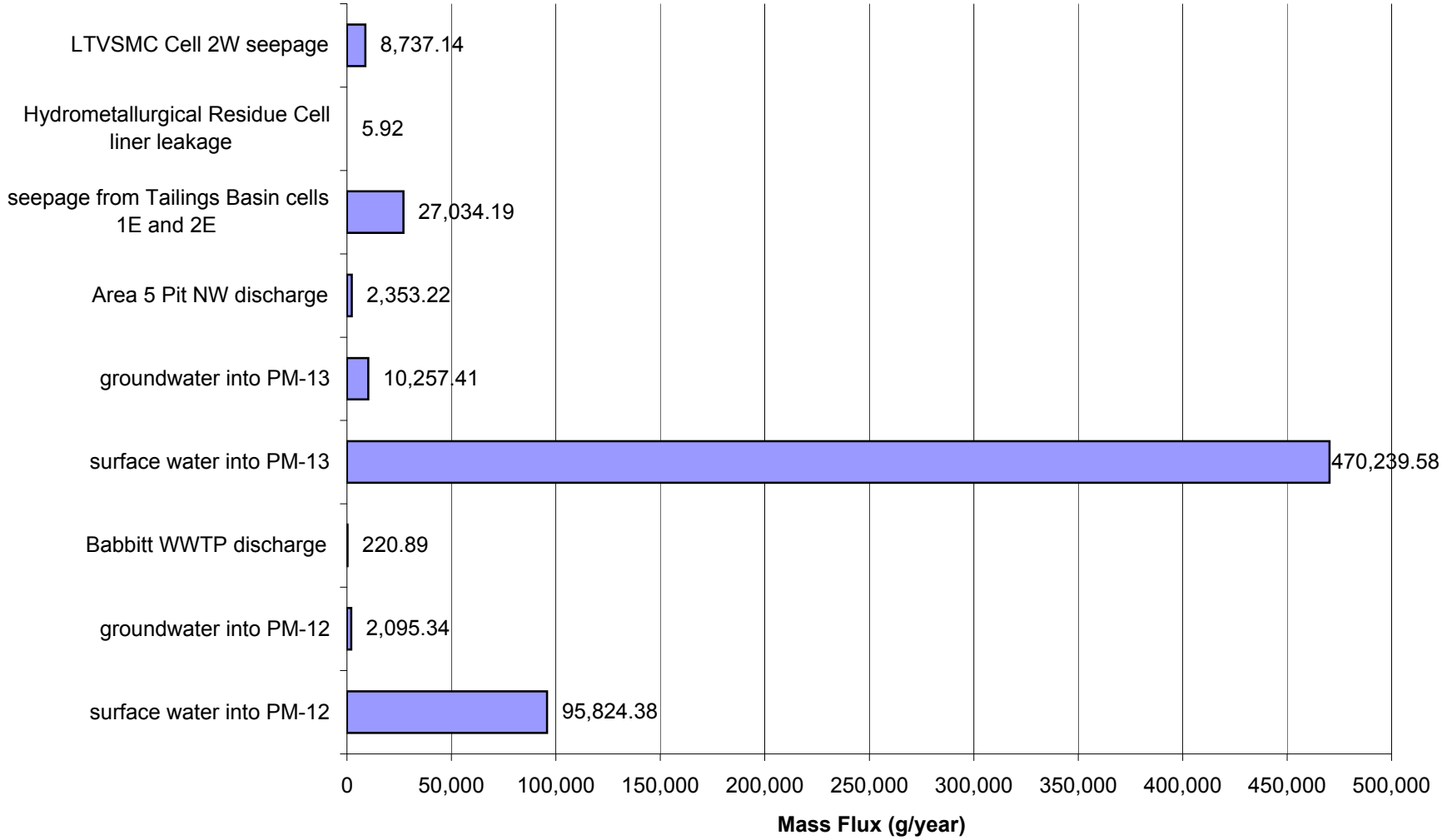
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Closure for Average Flow for Arsenic (As)



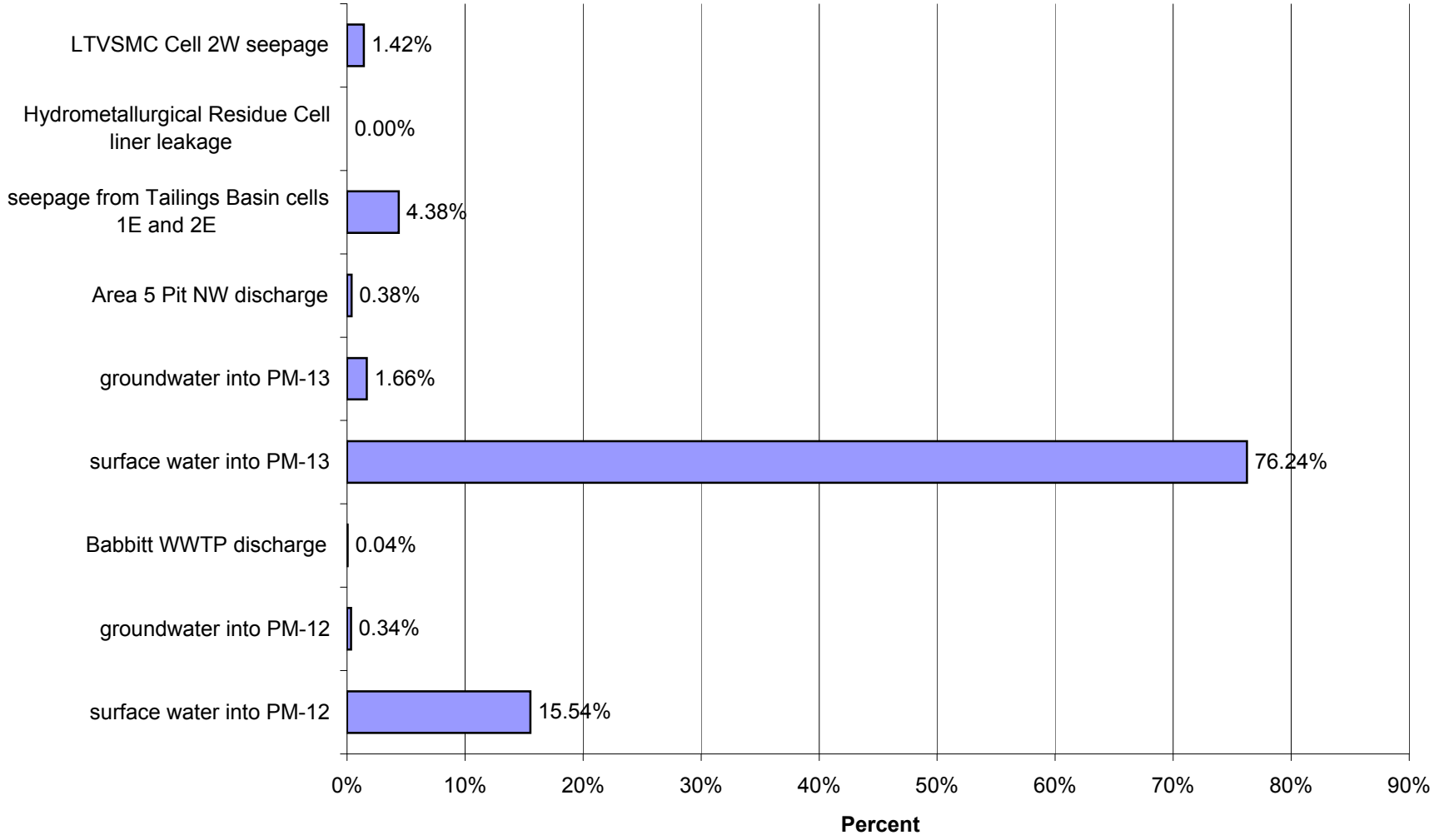
Proposed Action: Percent of Impacts at PM-13 in Closure for Average Flow for Arsenic (As)



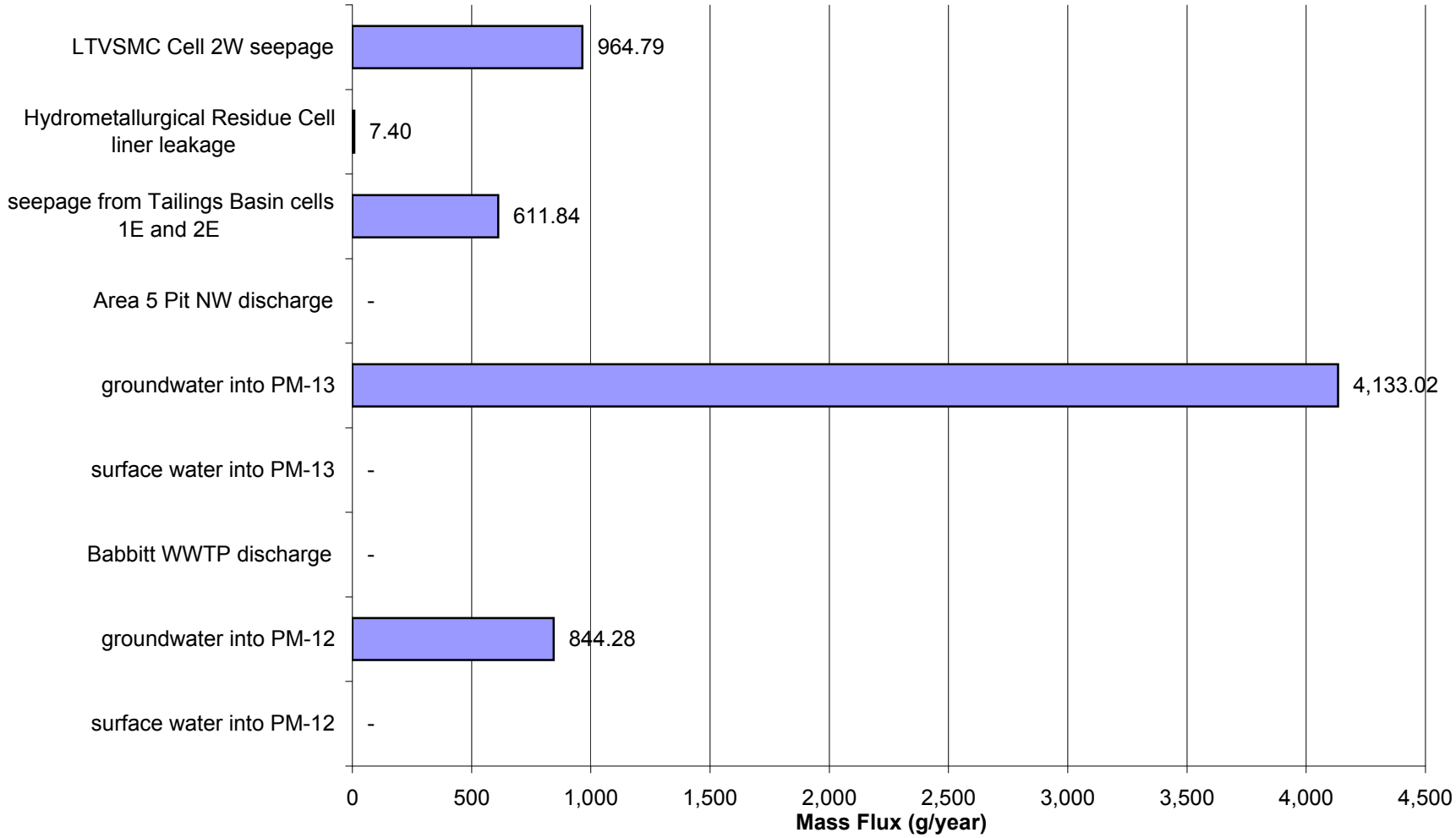
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Closure for High Flow for Arsenic (As)



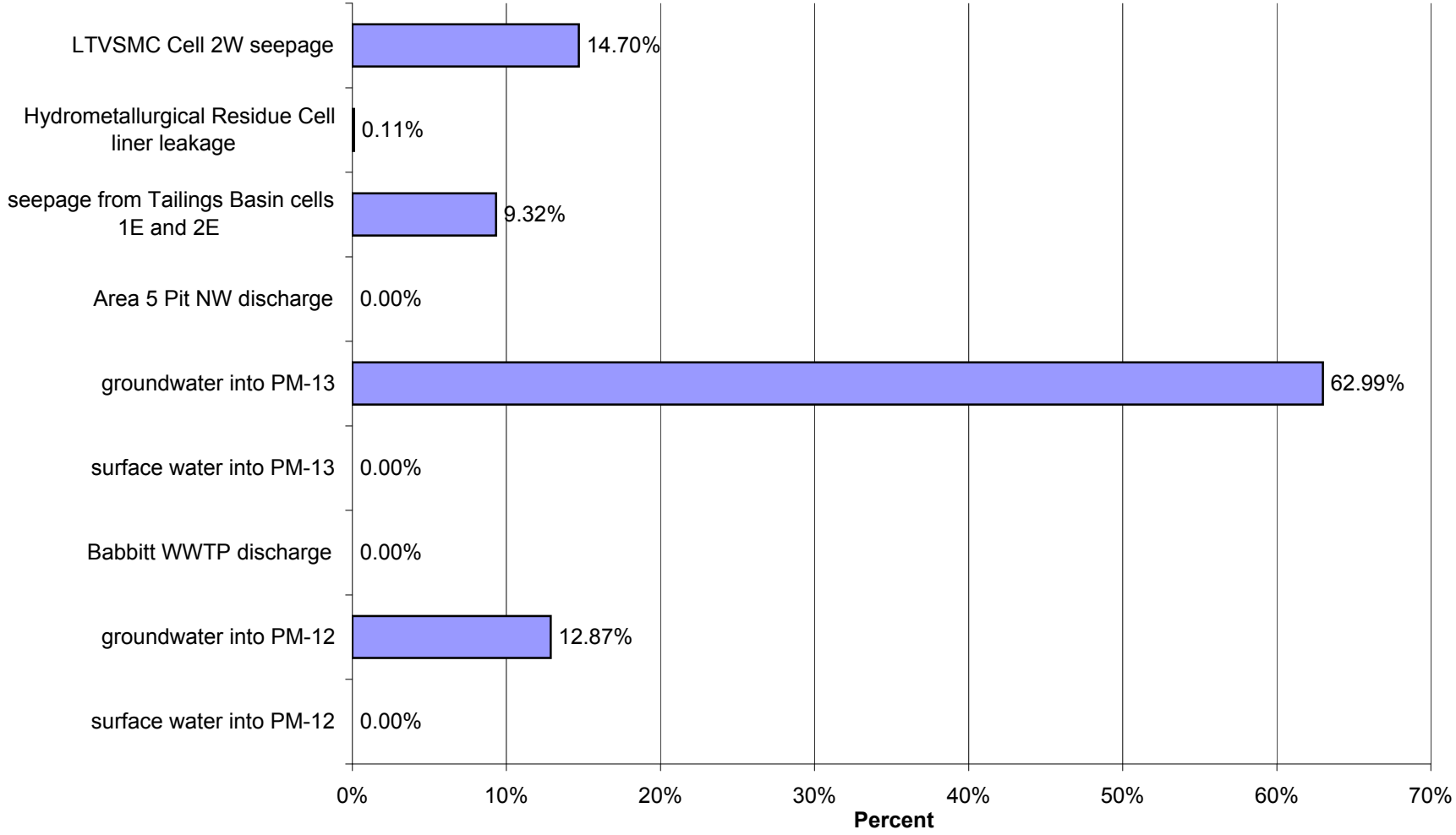
Proposed Action: Percent of Impacts at PM-13 in Closure for High Flow for Arsenic (As)



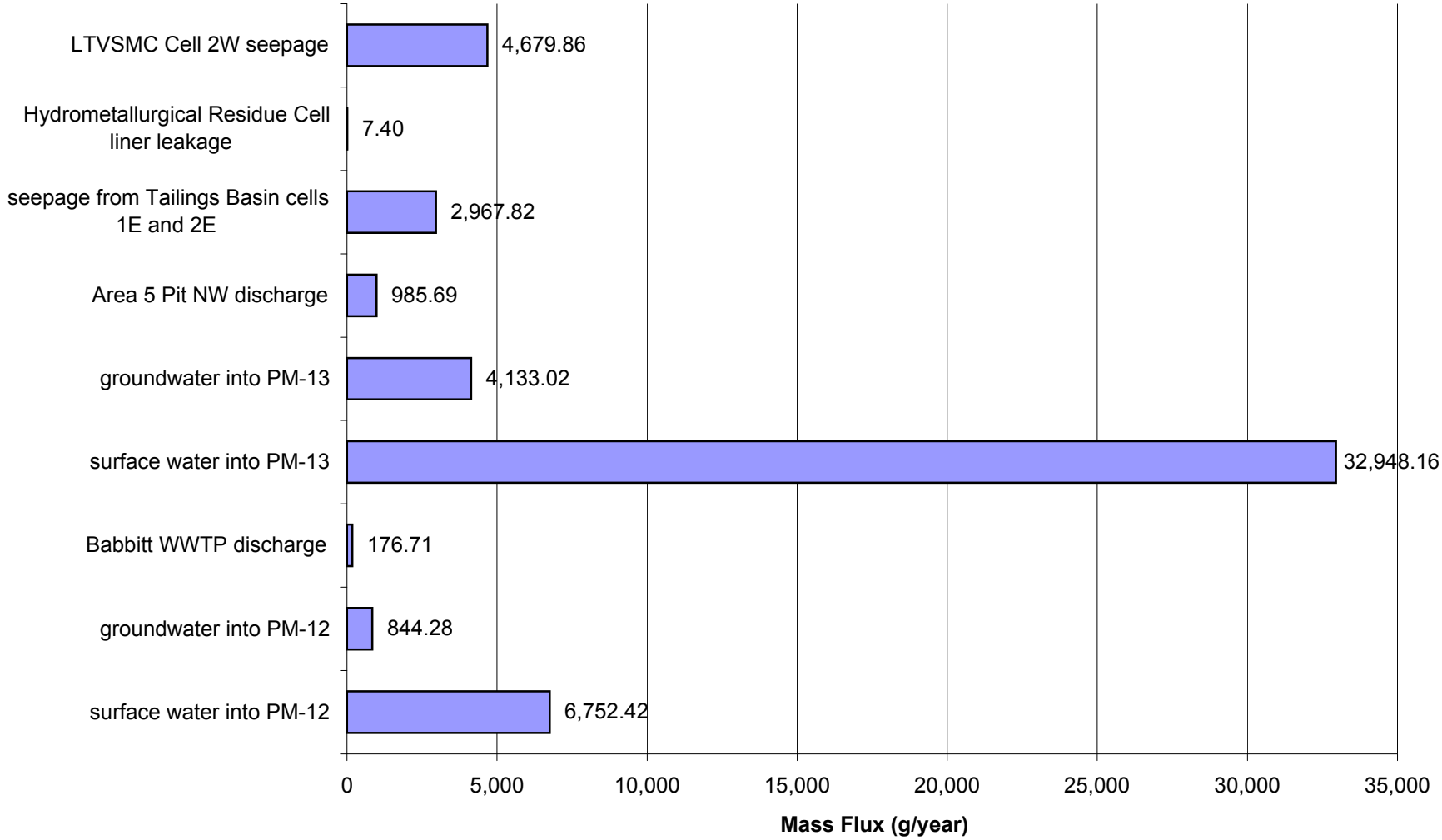
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Closure for Low Flow for Cobalt (Co)



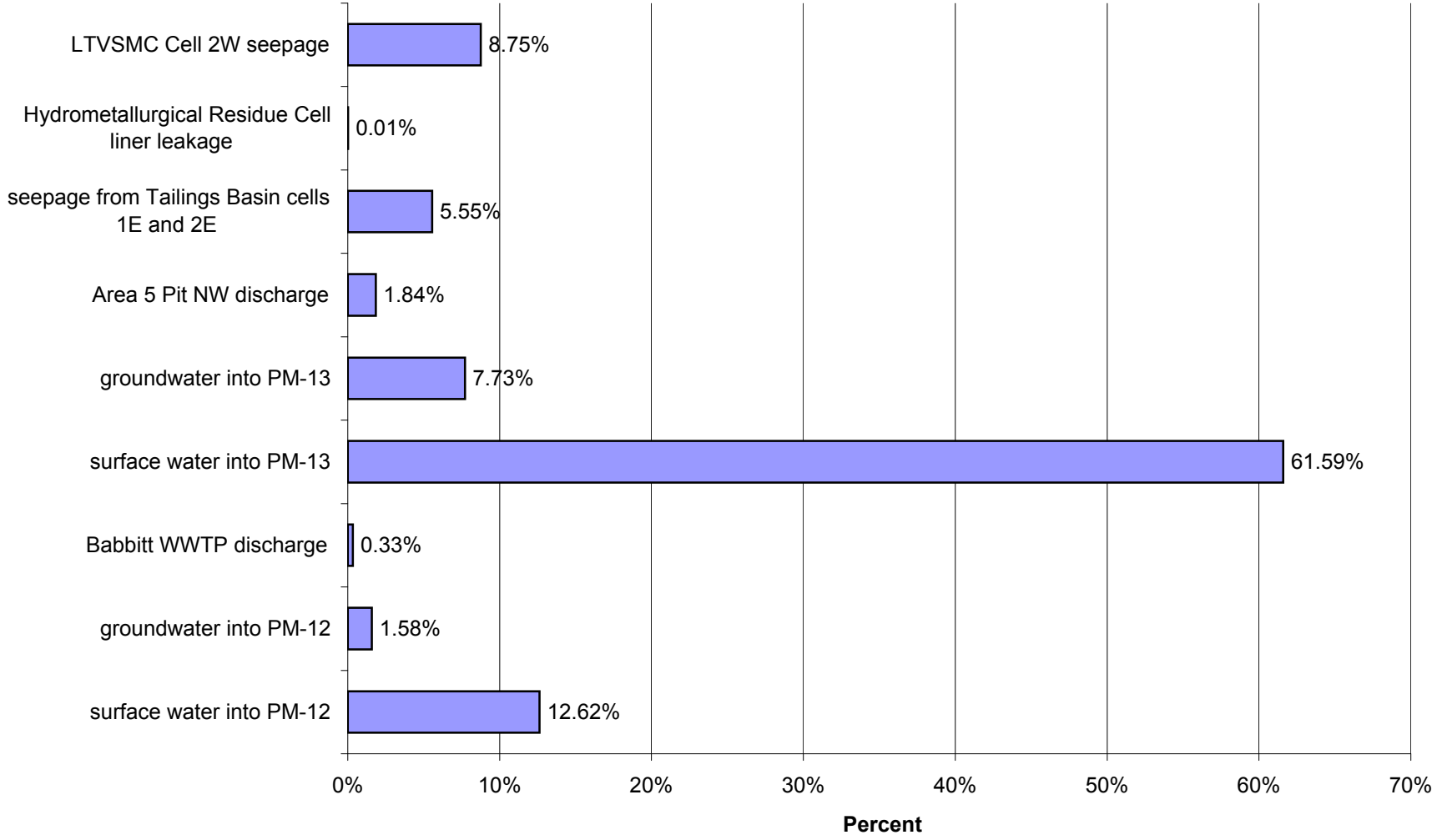
Proposed Action: Percent of Impacts at PM-13 in Closure for Low Flow for Cobalt (Co)



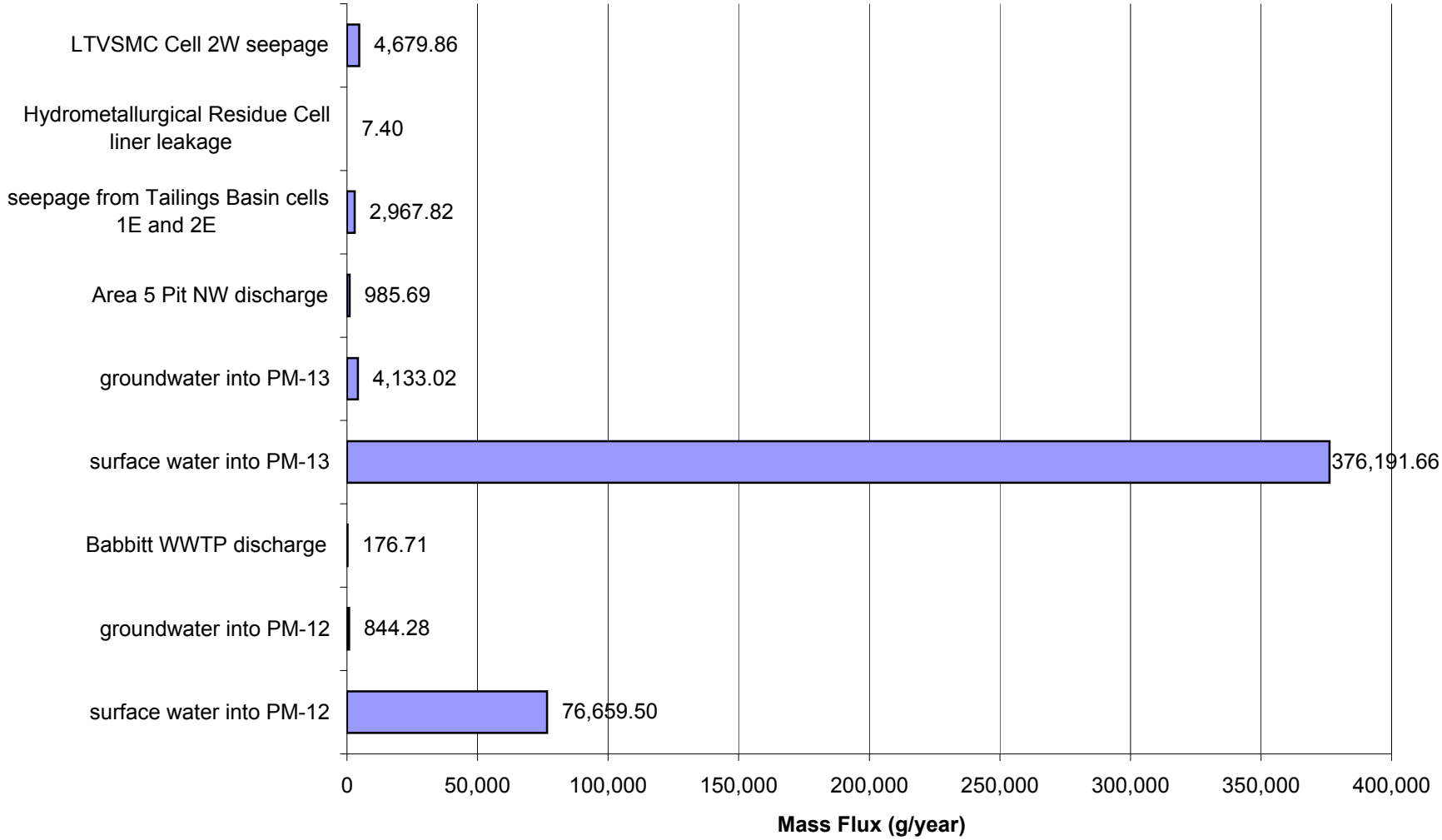
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Closure for Average Flow for Cobalt (Co)



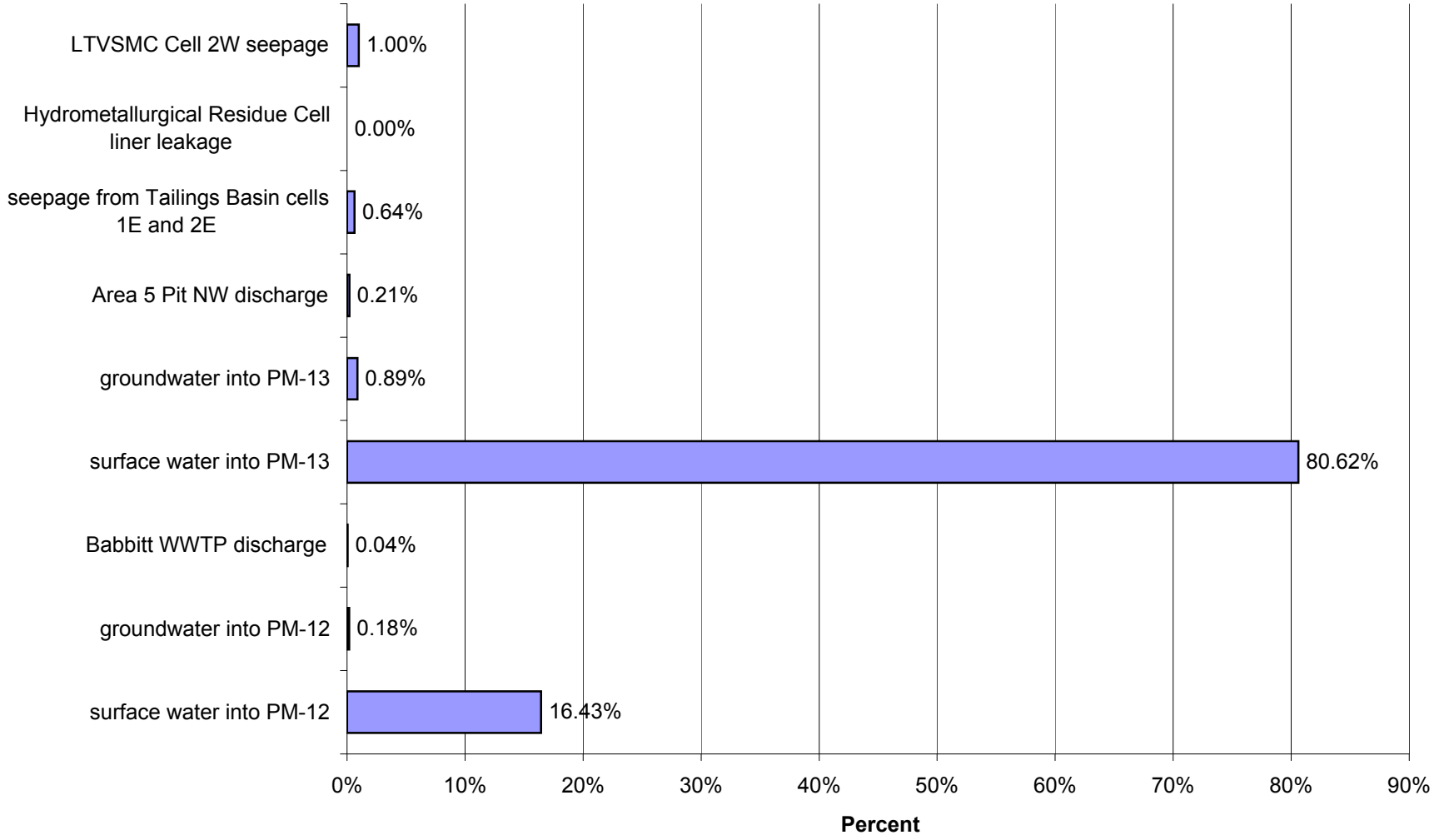
Proposed Action: Percent of Impacts at PM-13 in Closure for Average Flow for Cobalt (Co)



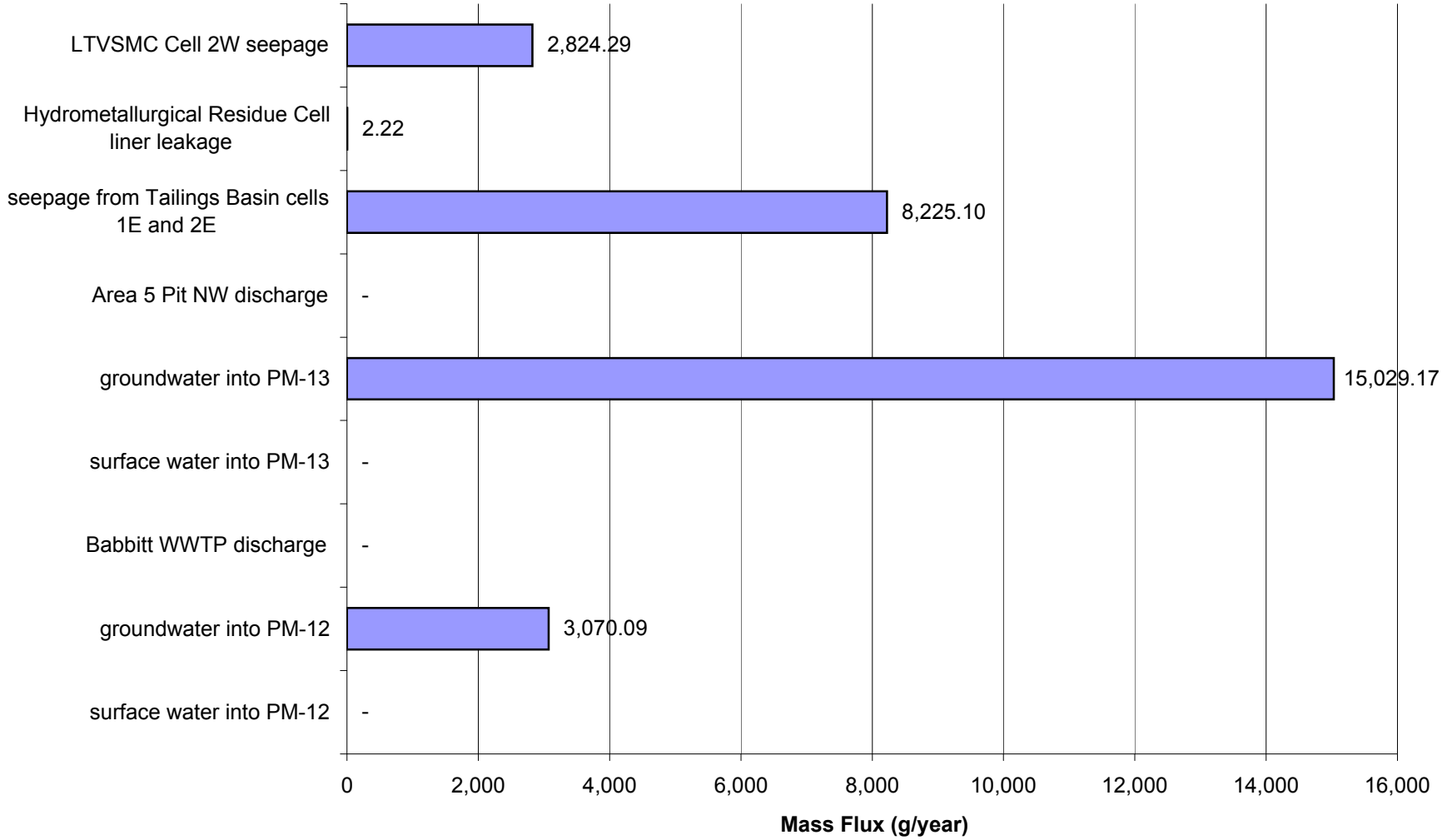
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Closure for High Flow for Cobalt (Co)



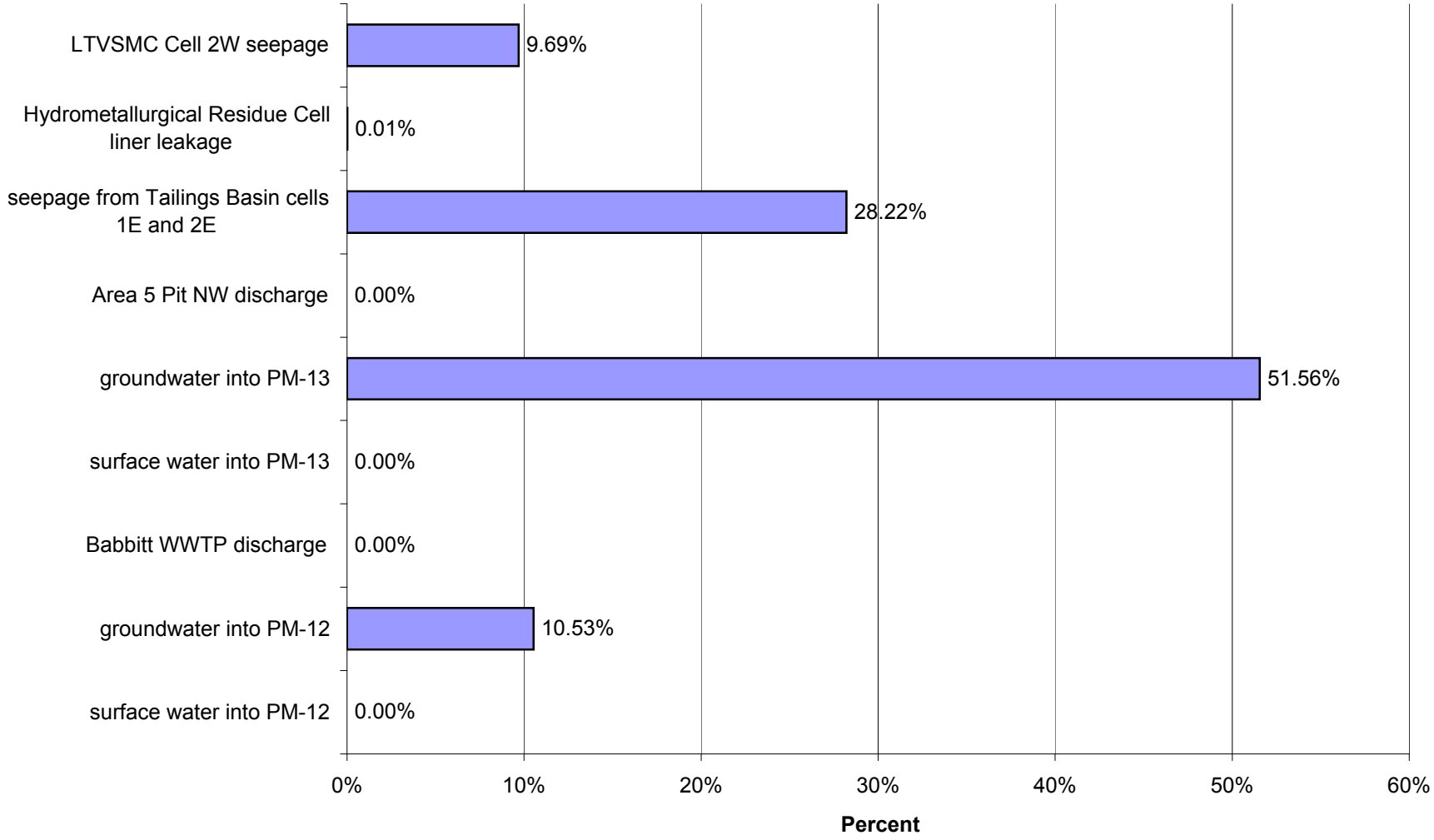
Proposed Action: Percent of Impacts at PM-13 in Closure for High Flow for Cobalt (Co)



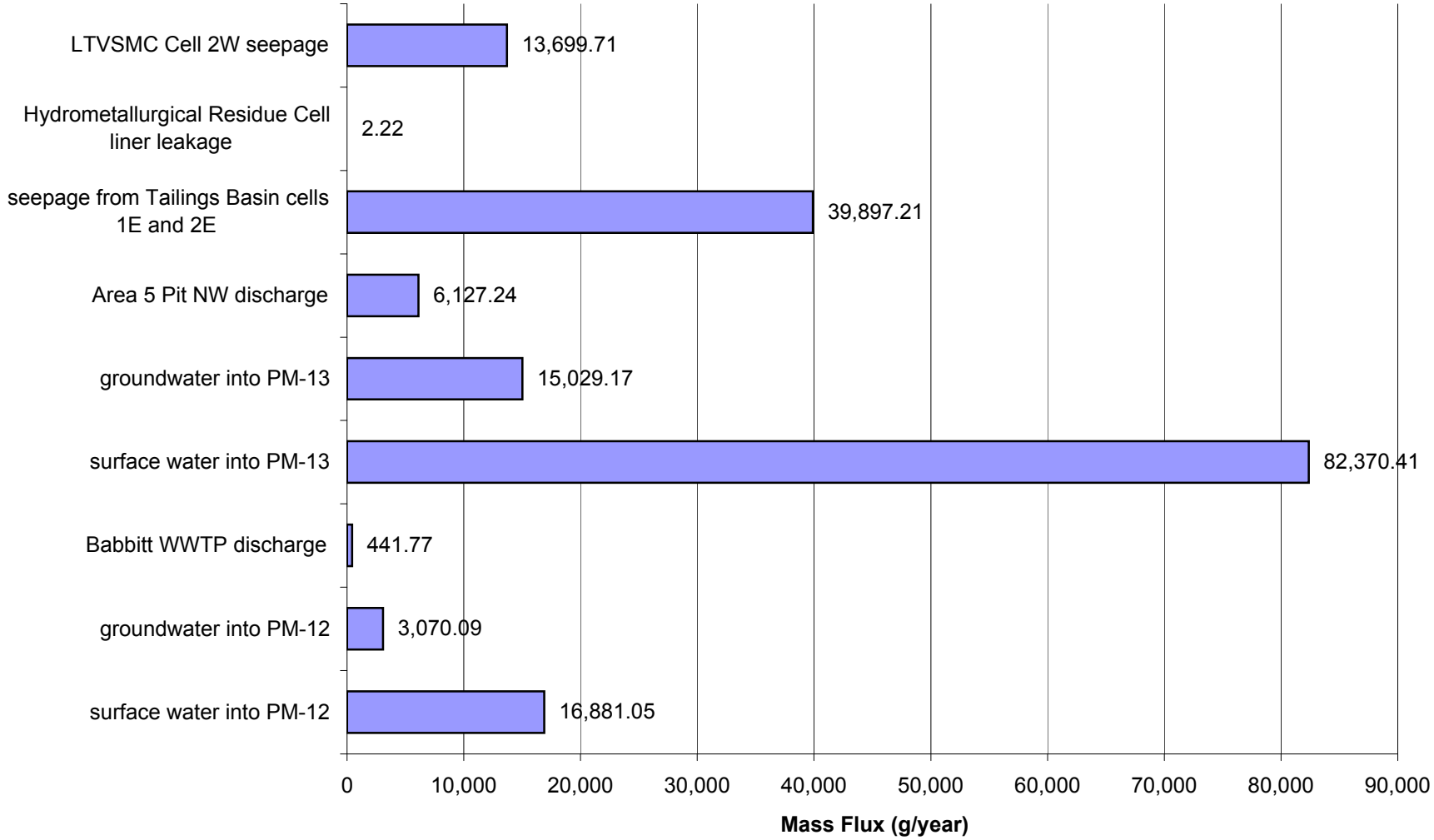
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Closure for Low Flow for Copper (Cu)



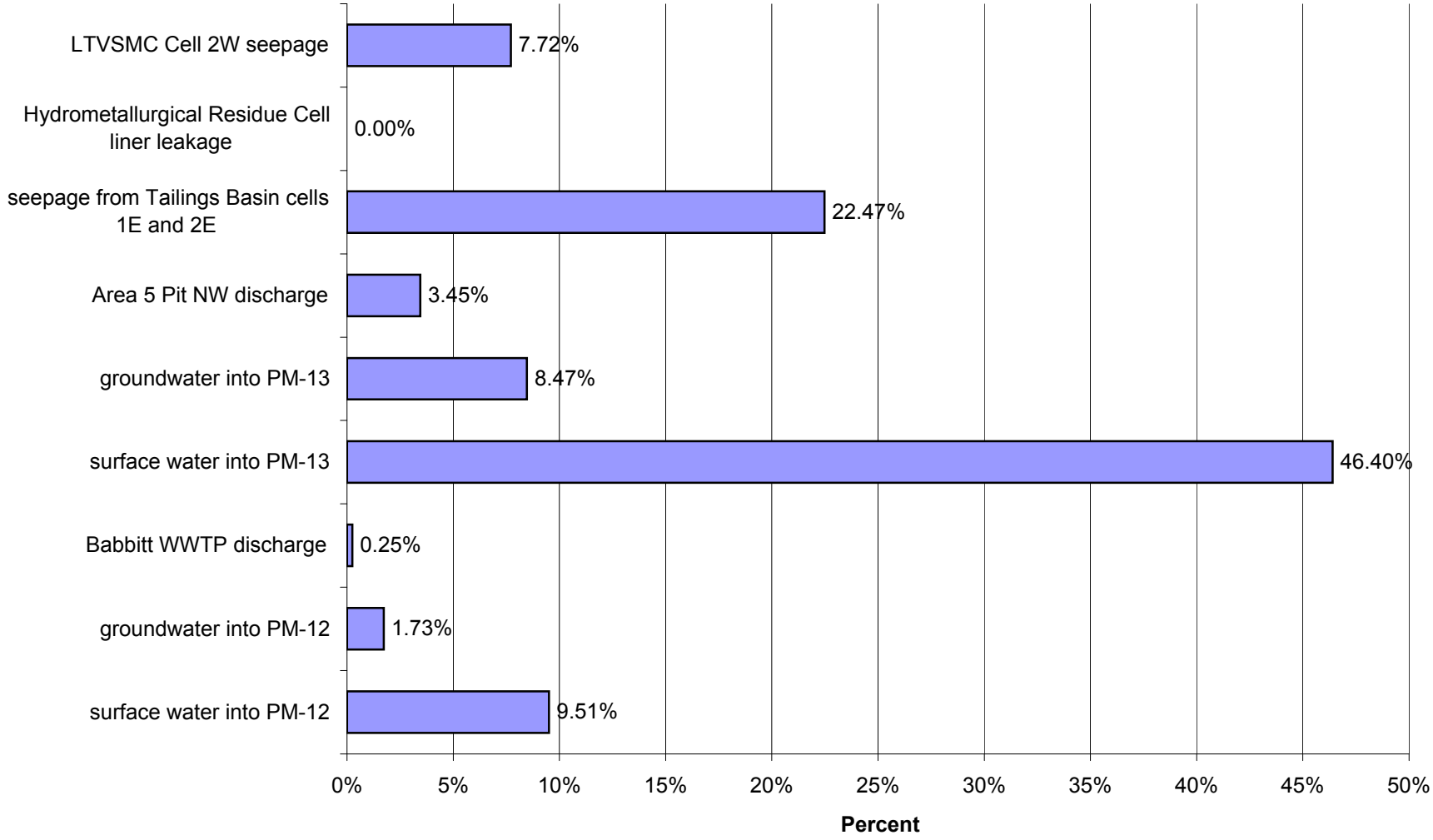
Proposed Action: Percent of Impacts at PM-13 in Closure for Low Flow for Copper (Cu)



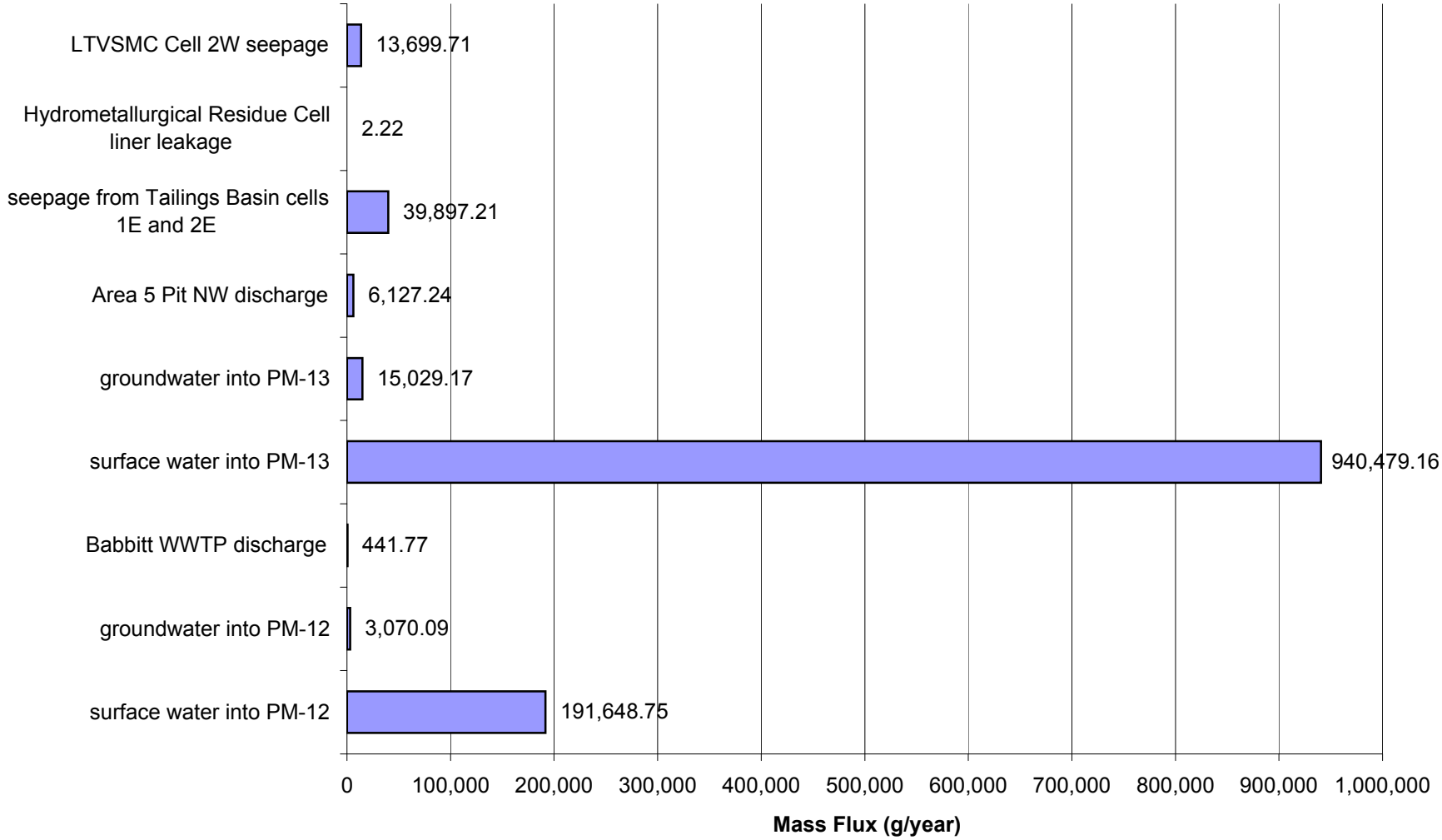
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Closure for Average Flow for Copper (Cu)



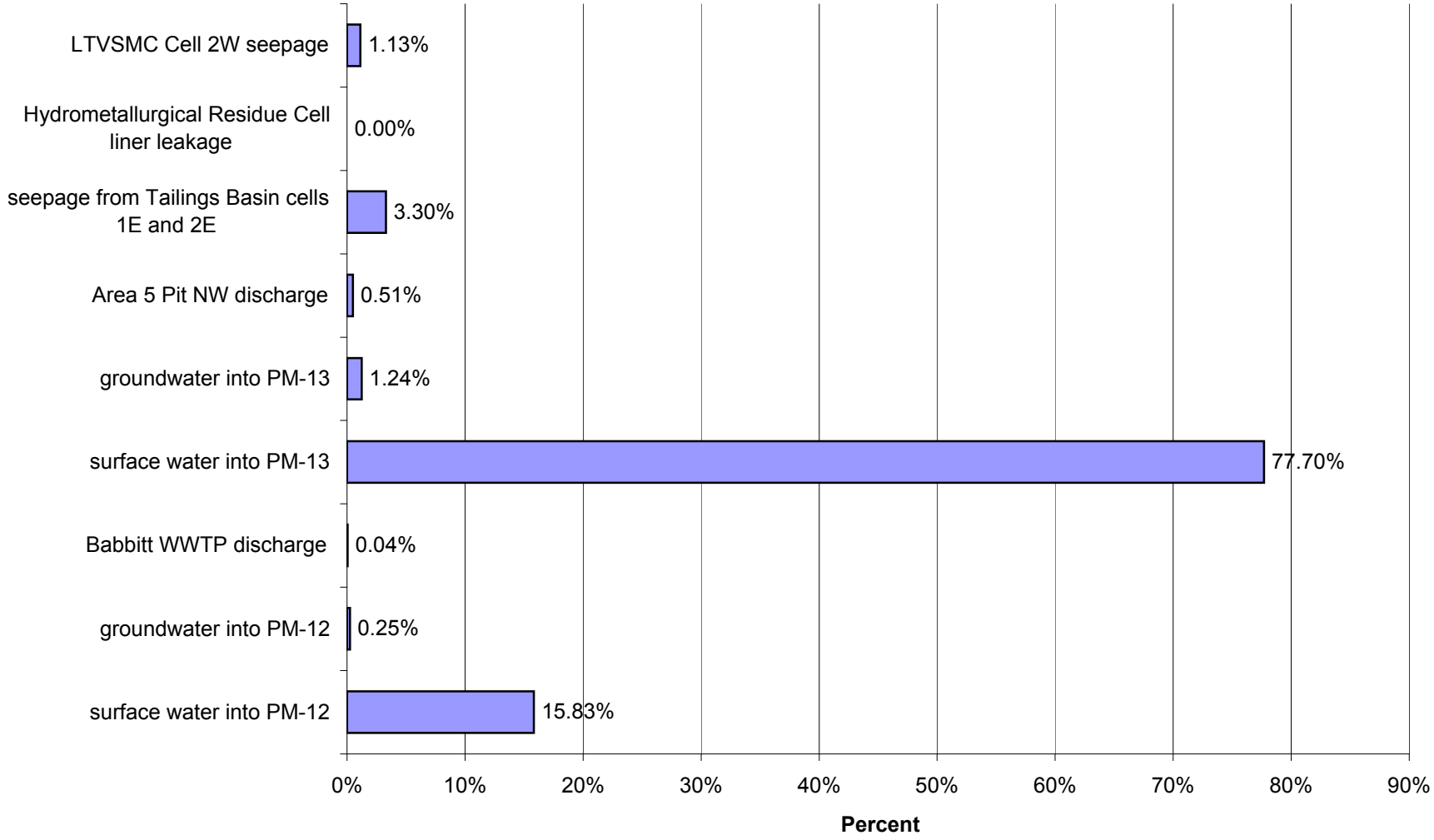
Proposed Action: Percent of Impacts at PM-13 in Closure for Average Flow for Copper (Cu)



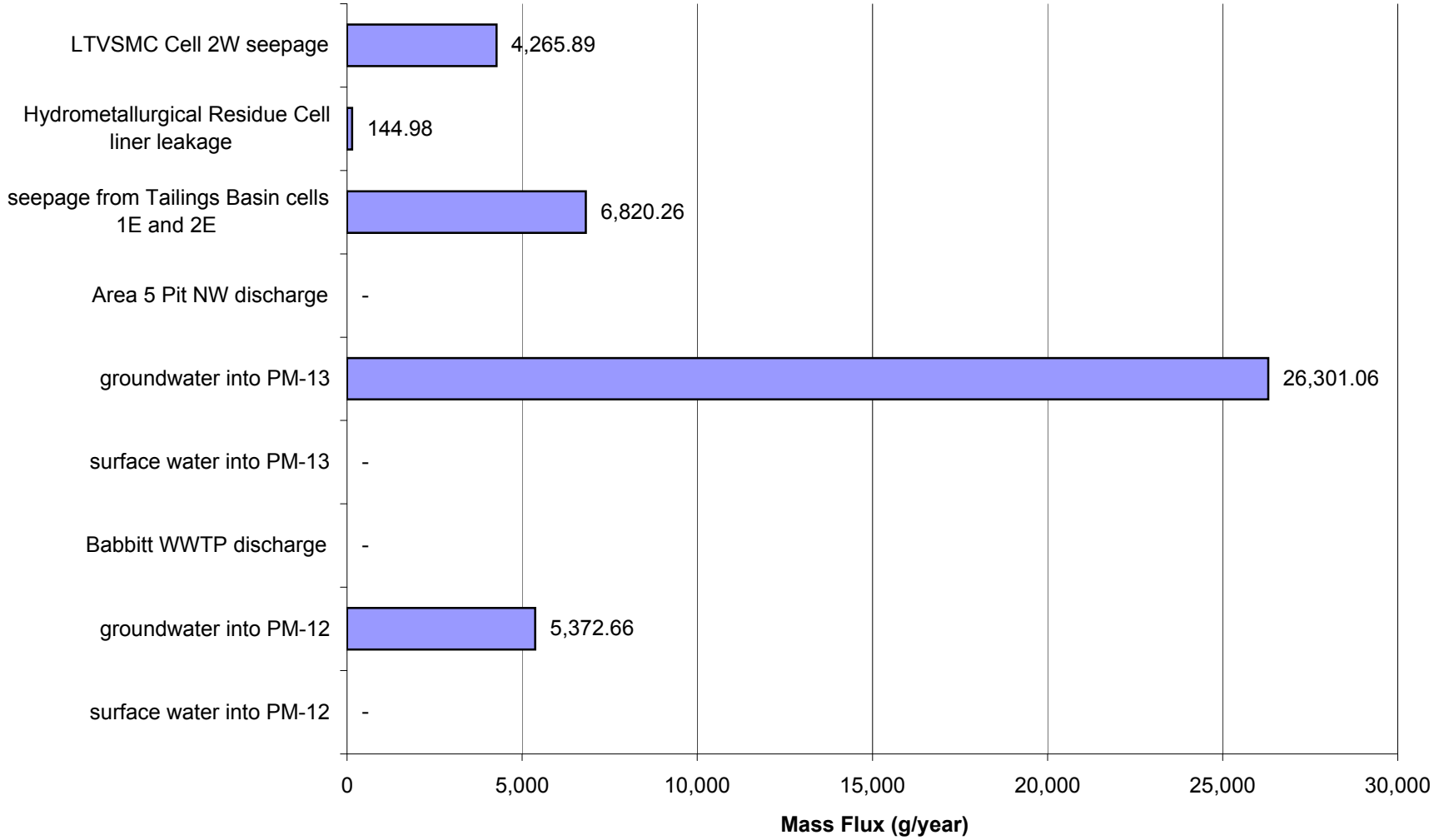
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Closure for High Flow for Copper (Cu)



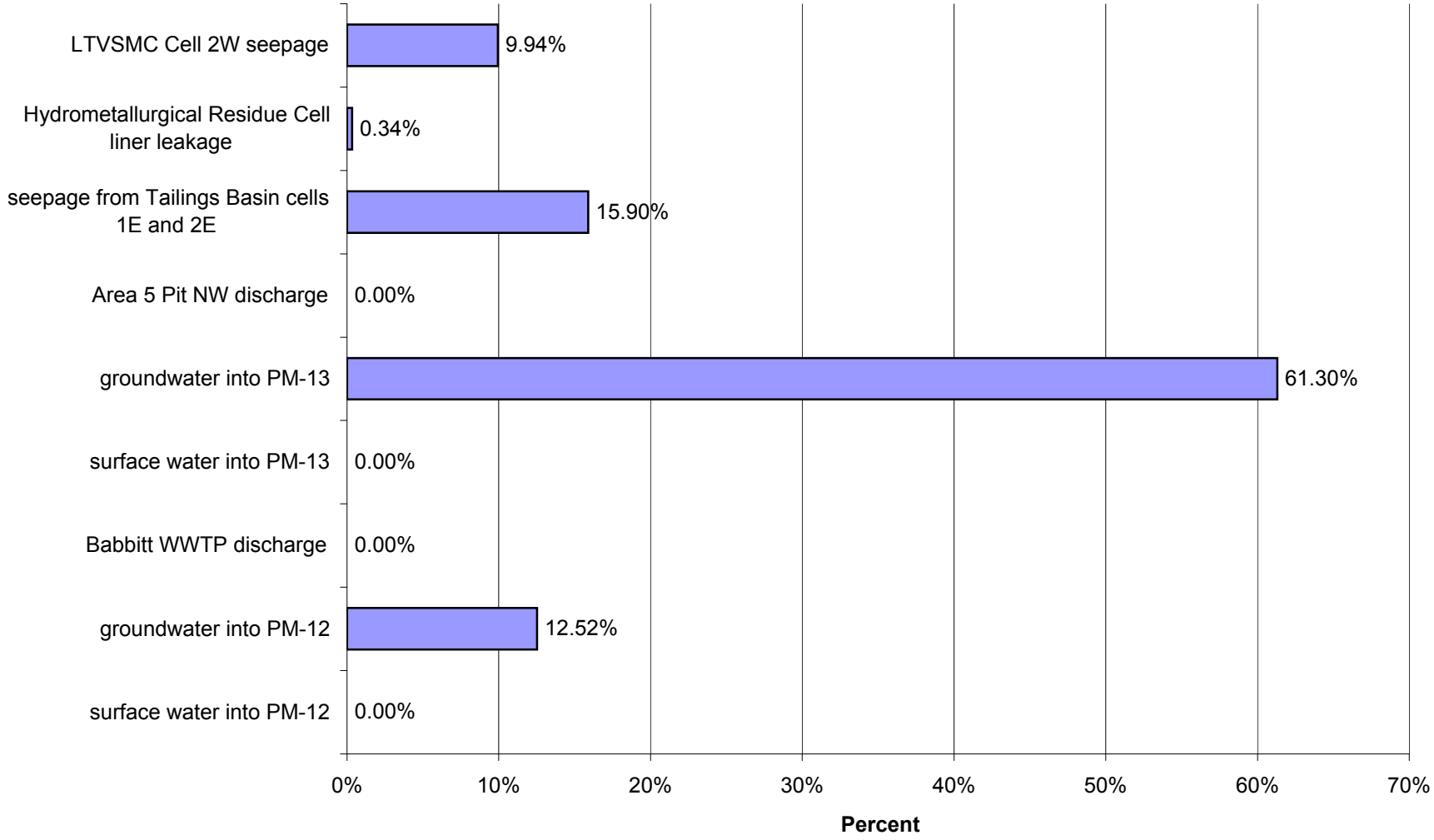
Proposed Action: Percent of Impacts at PM-13 in Closure for High Flow for Copper (Cu)



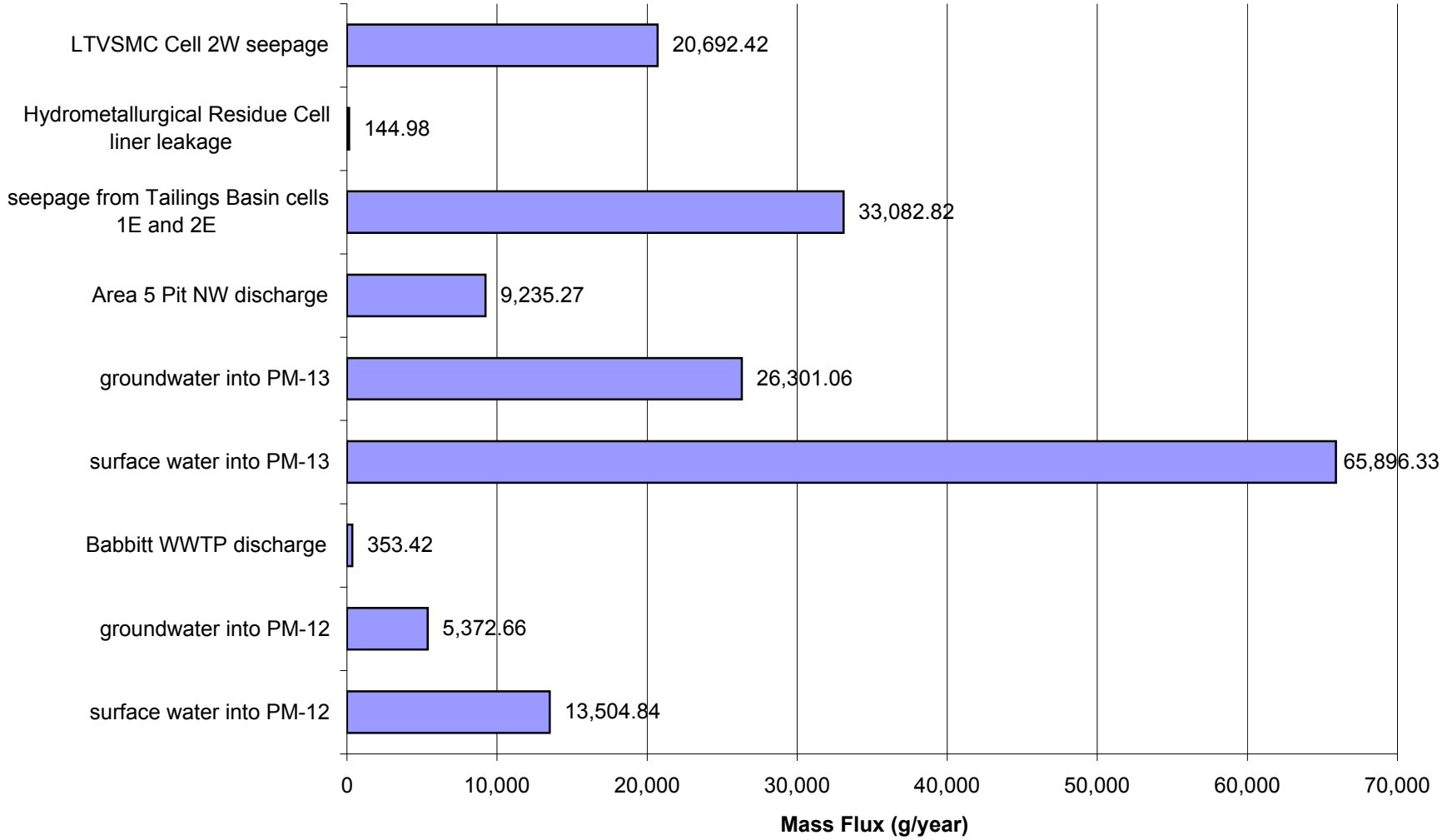
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Closure for Low Flow for Nickel (Ni)



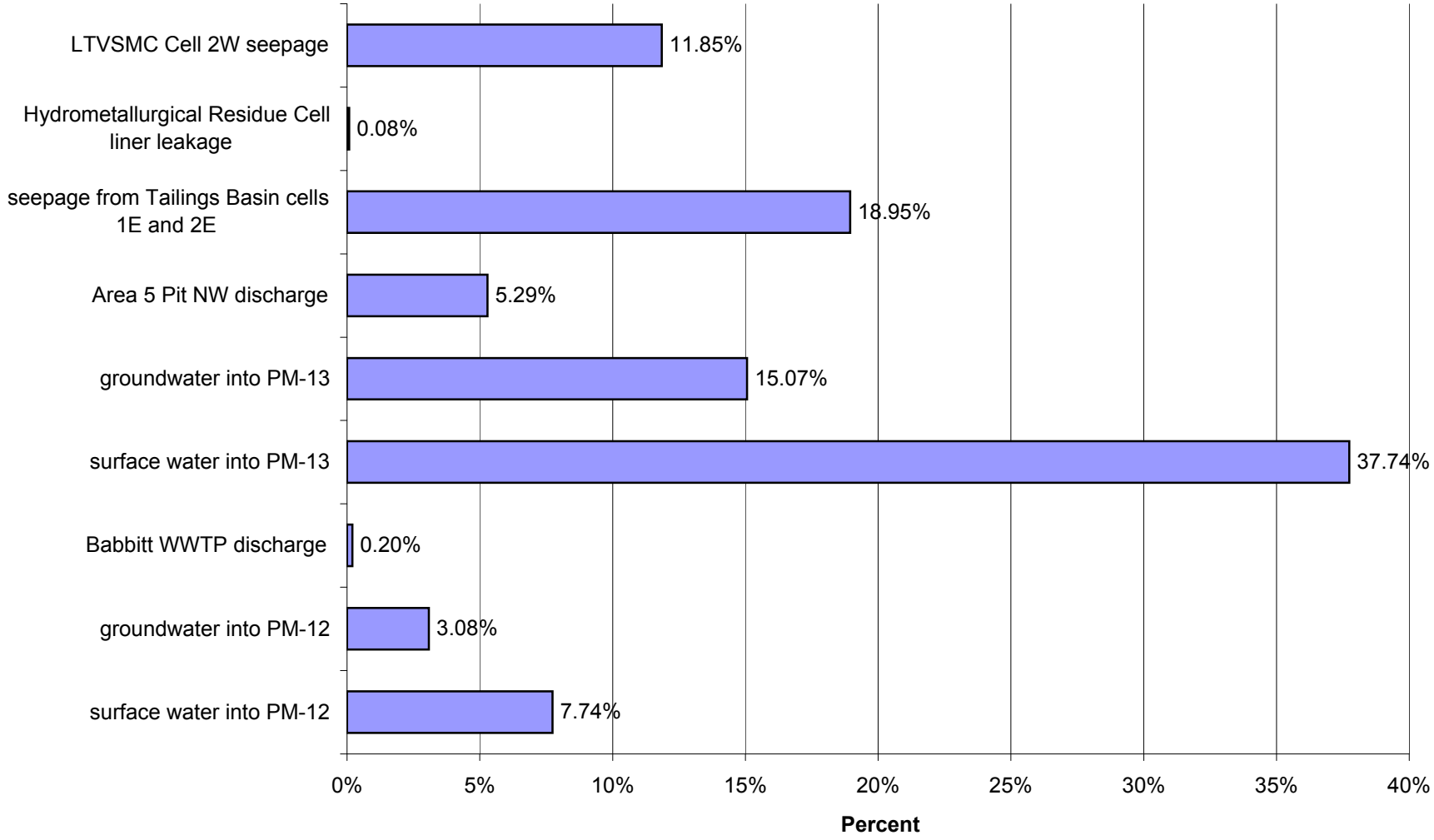
Proposed Action: Percent of Impacts at PM-13 in Closure for Low Flow for Nickel (Ni)



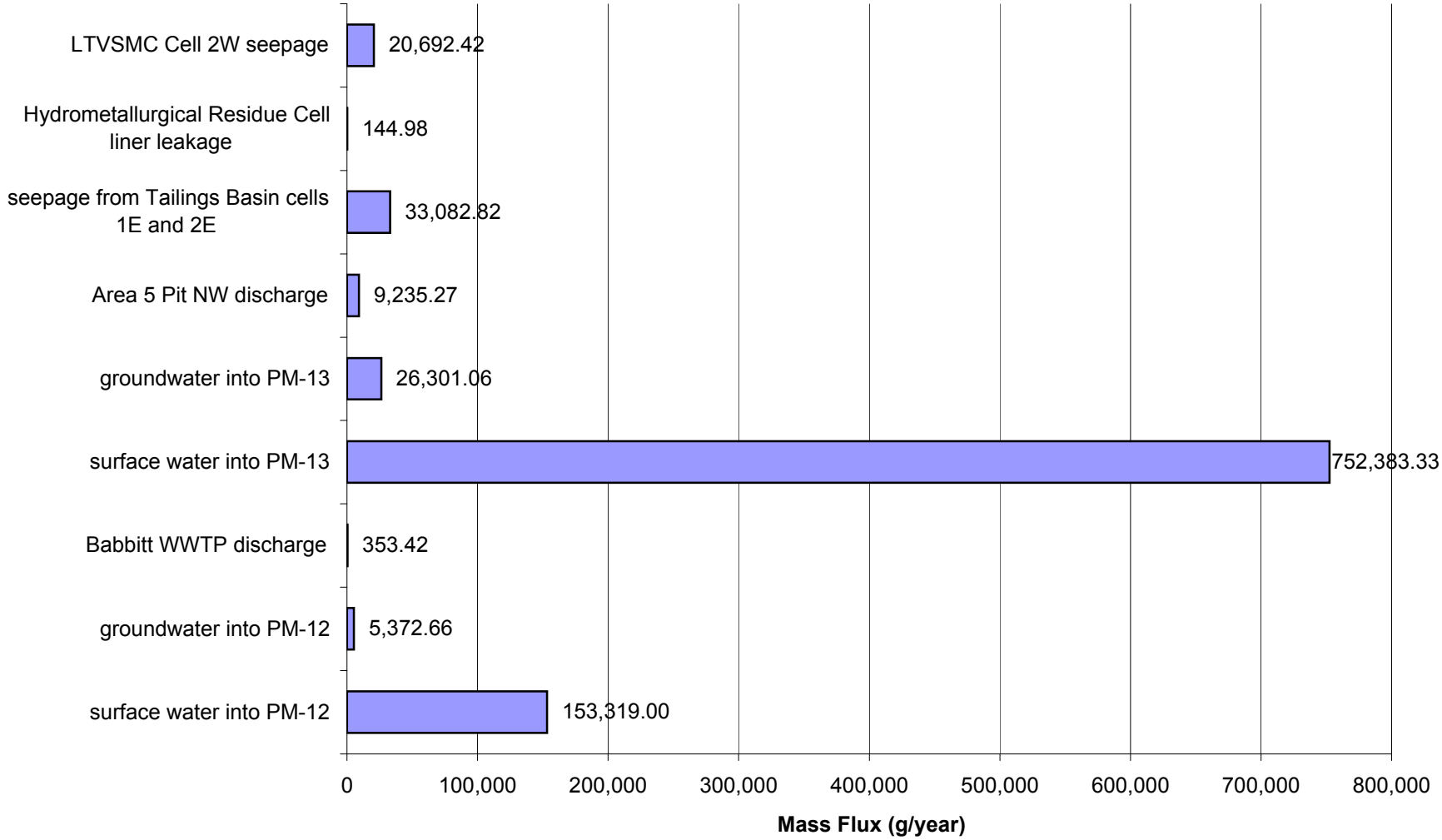
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Closure for Average Flow for Nickel (Ni)



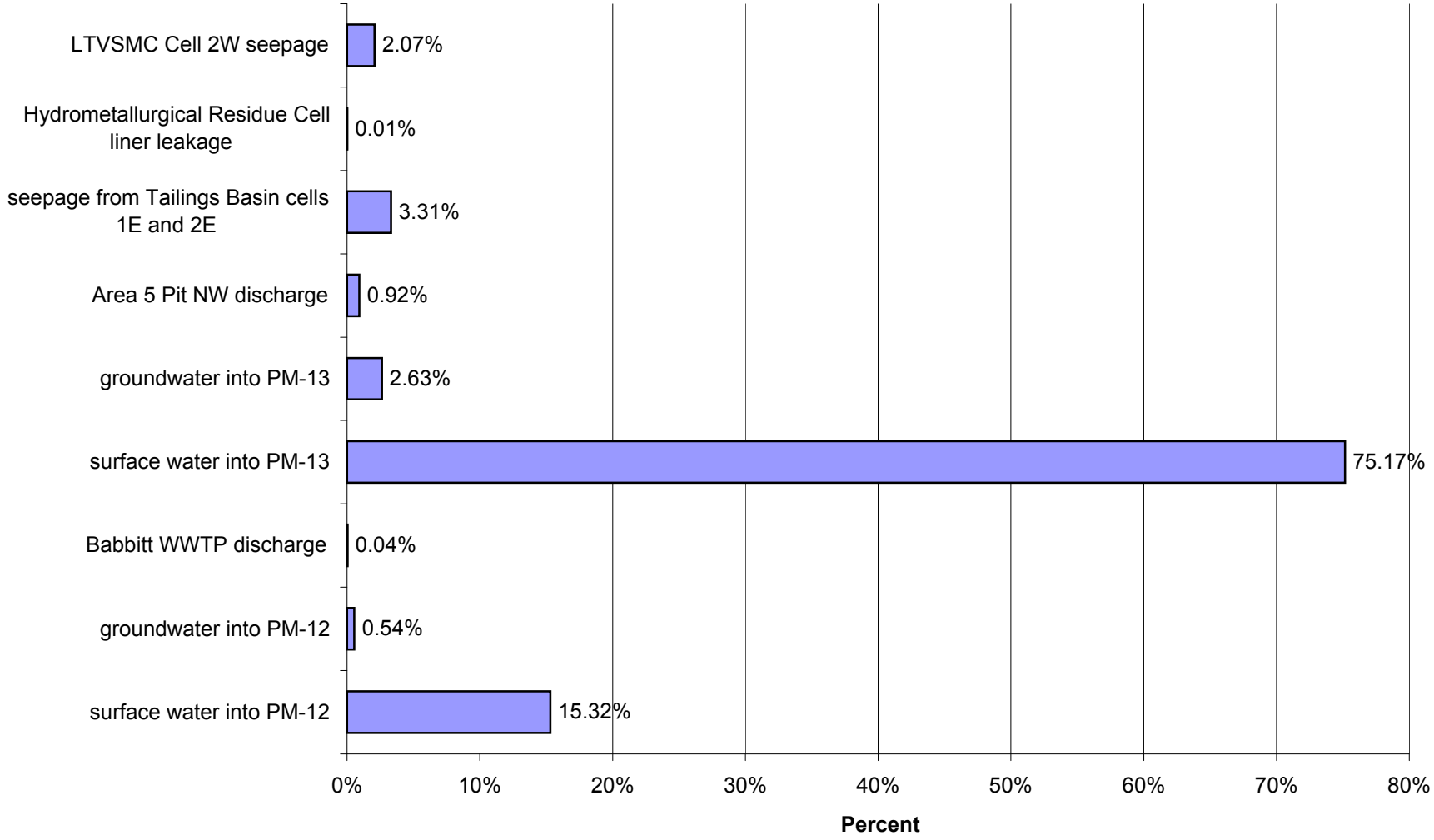
Proposed Action: Percent of Impacts at PM-13 in Closure for Average Flow for Nickel (Ni)



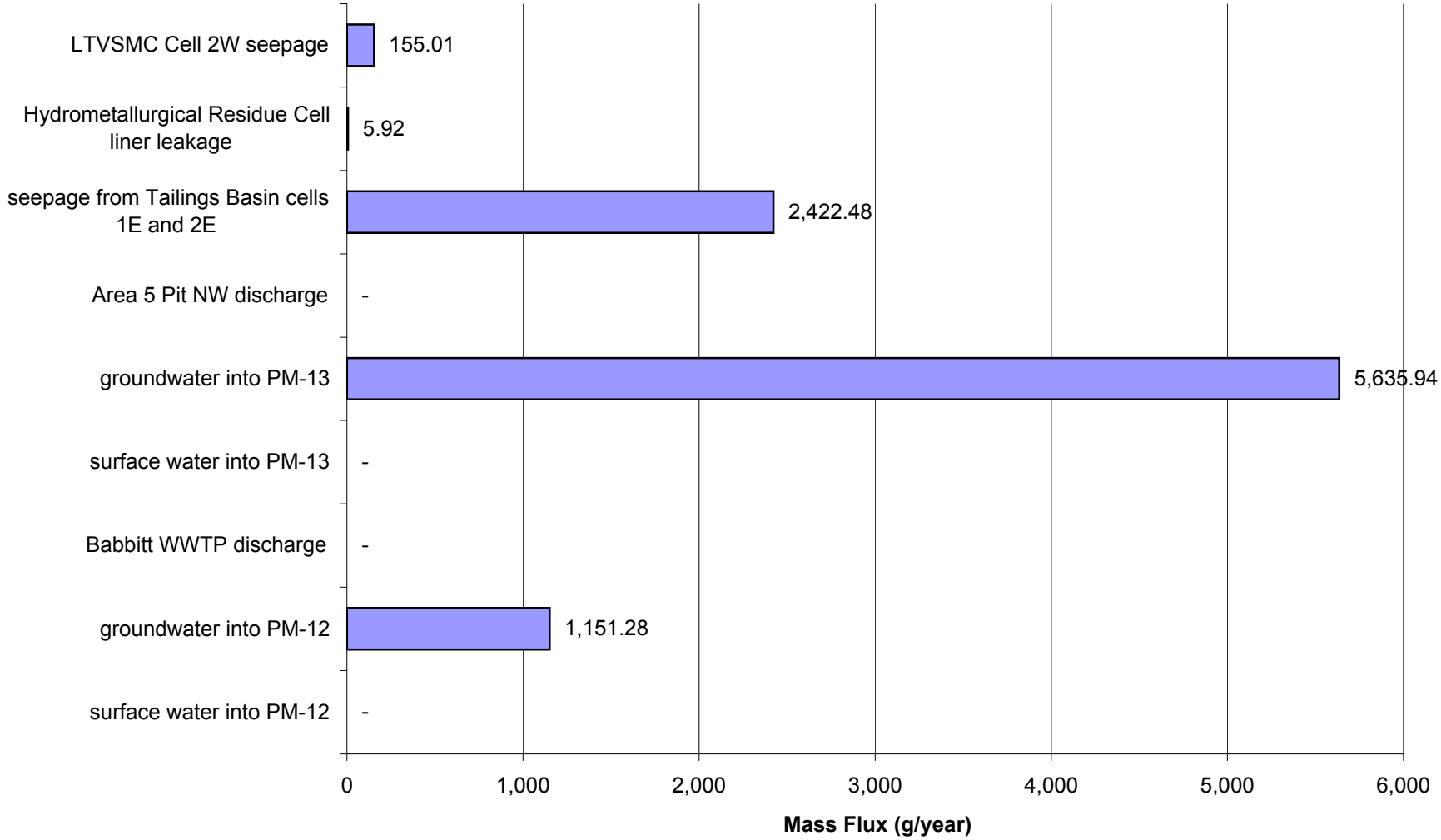
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Closure for High Flow for Nickel (Ni)



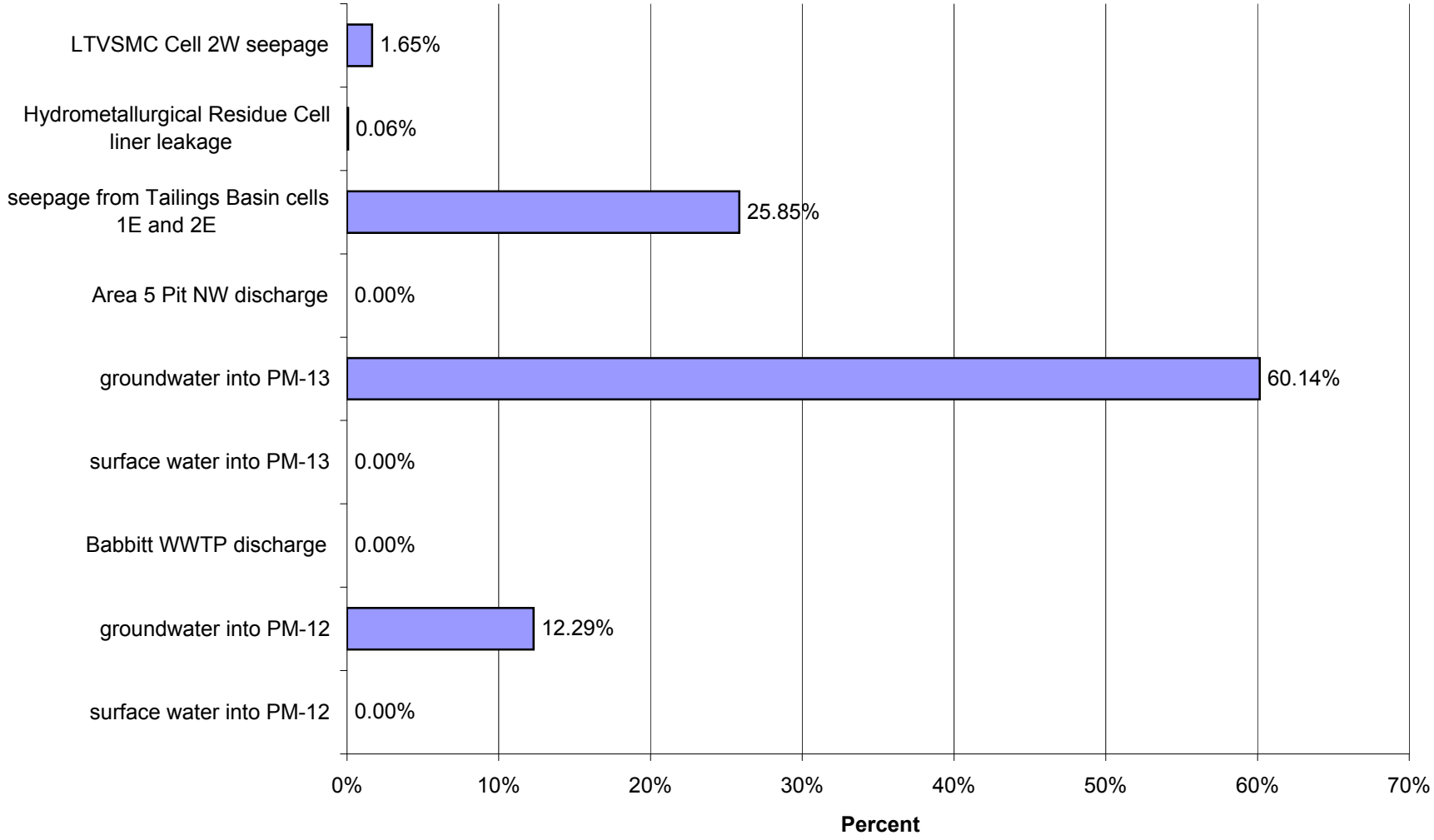
Proposed Action: Percent of Impacts at PM-13 in Closure for High Flow for Nickel (Ni)



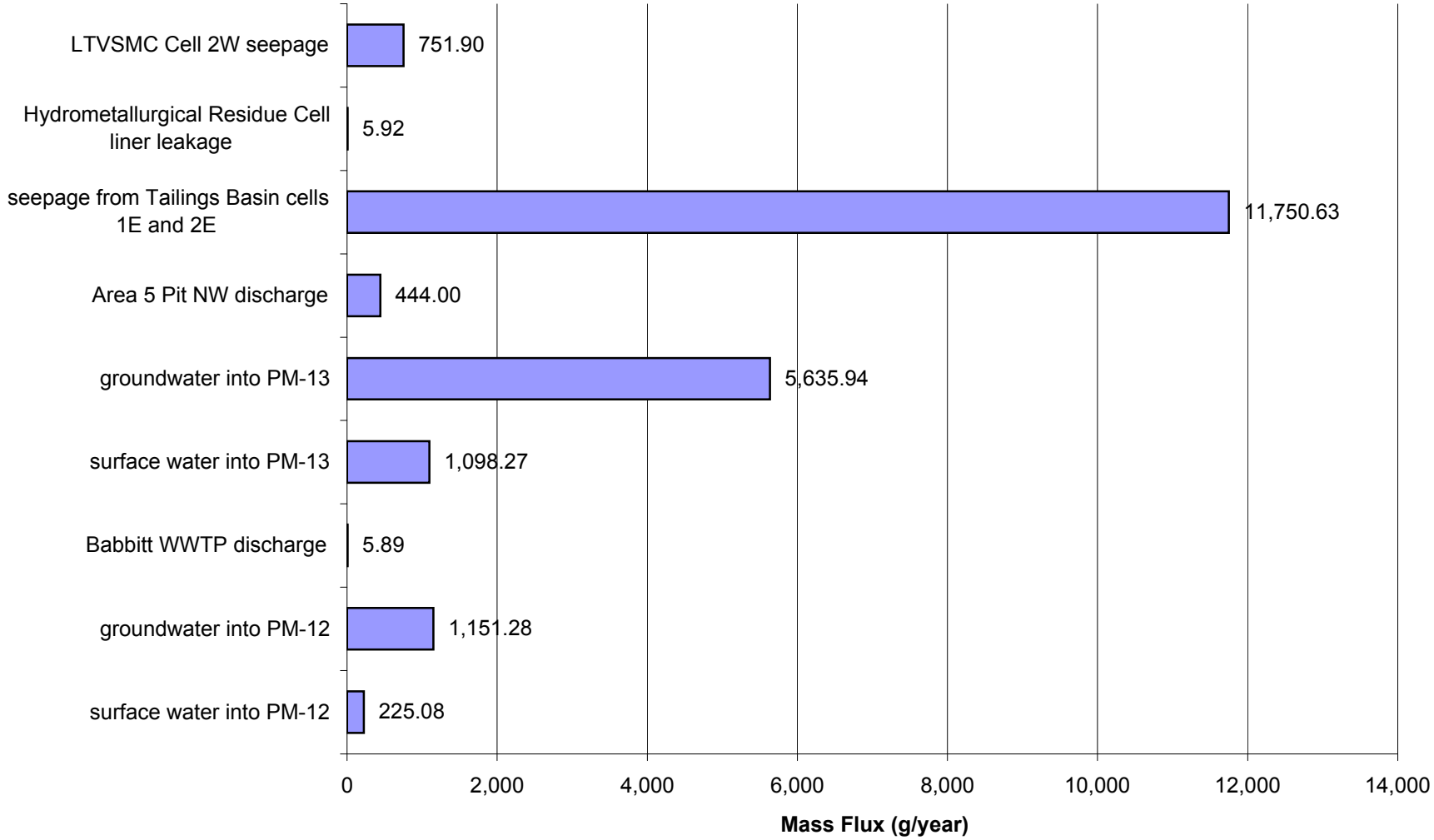
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Closure for Low Flow for Antimony (Sb)



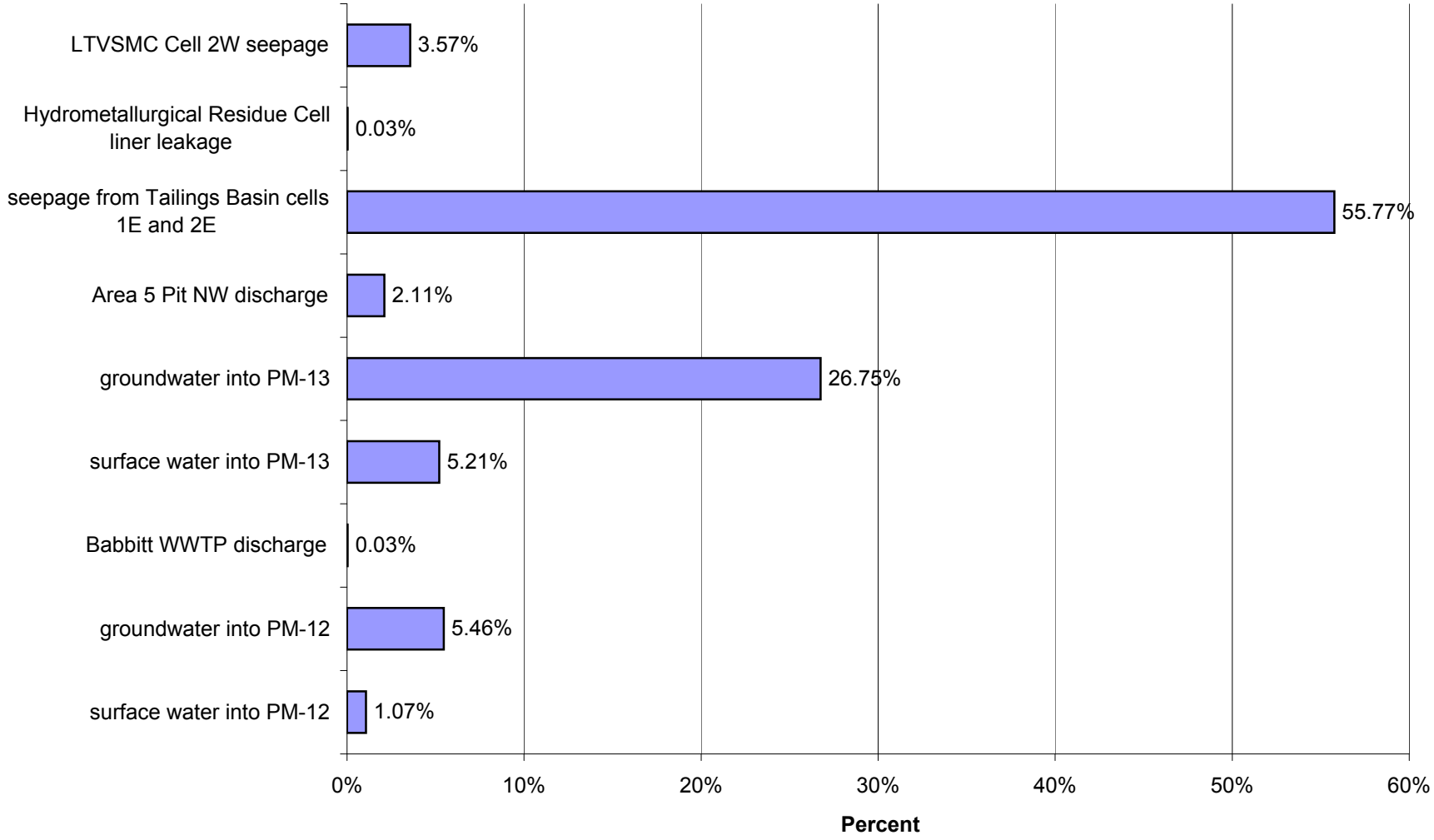
Proposed Action: Percent of Impacts at PM-13 in Closure for Low Flow for Antimony (Sb)



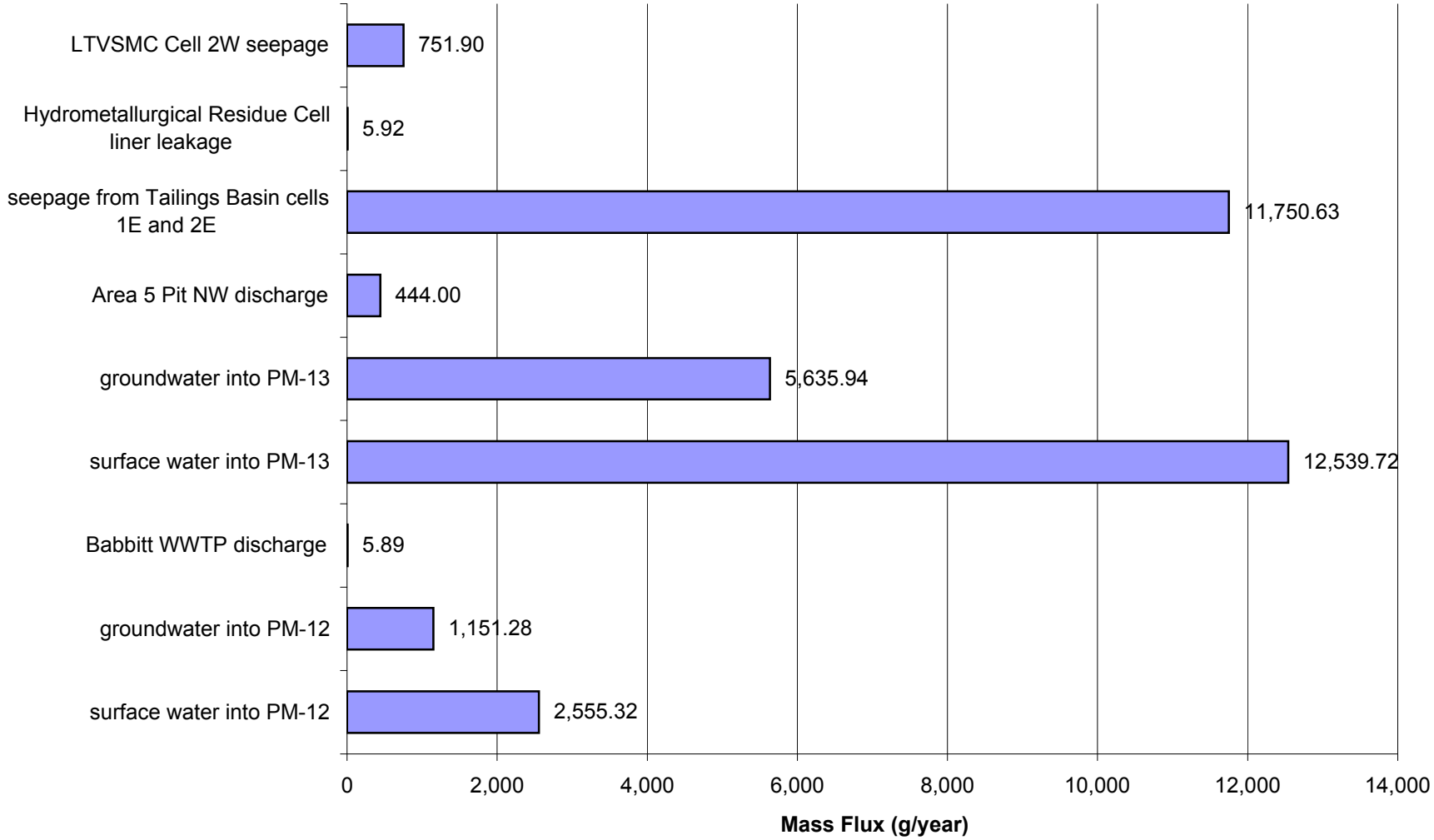
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Closure for Average Flow for Antimony (Sb)



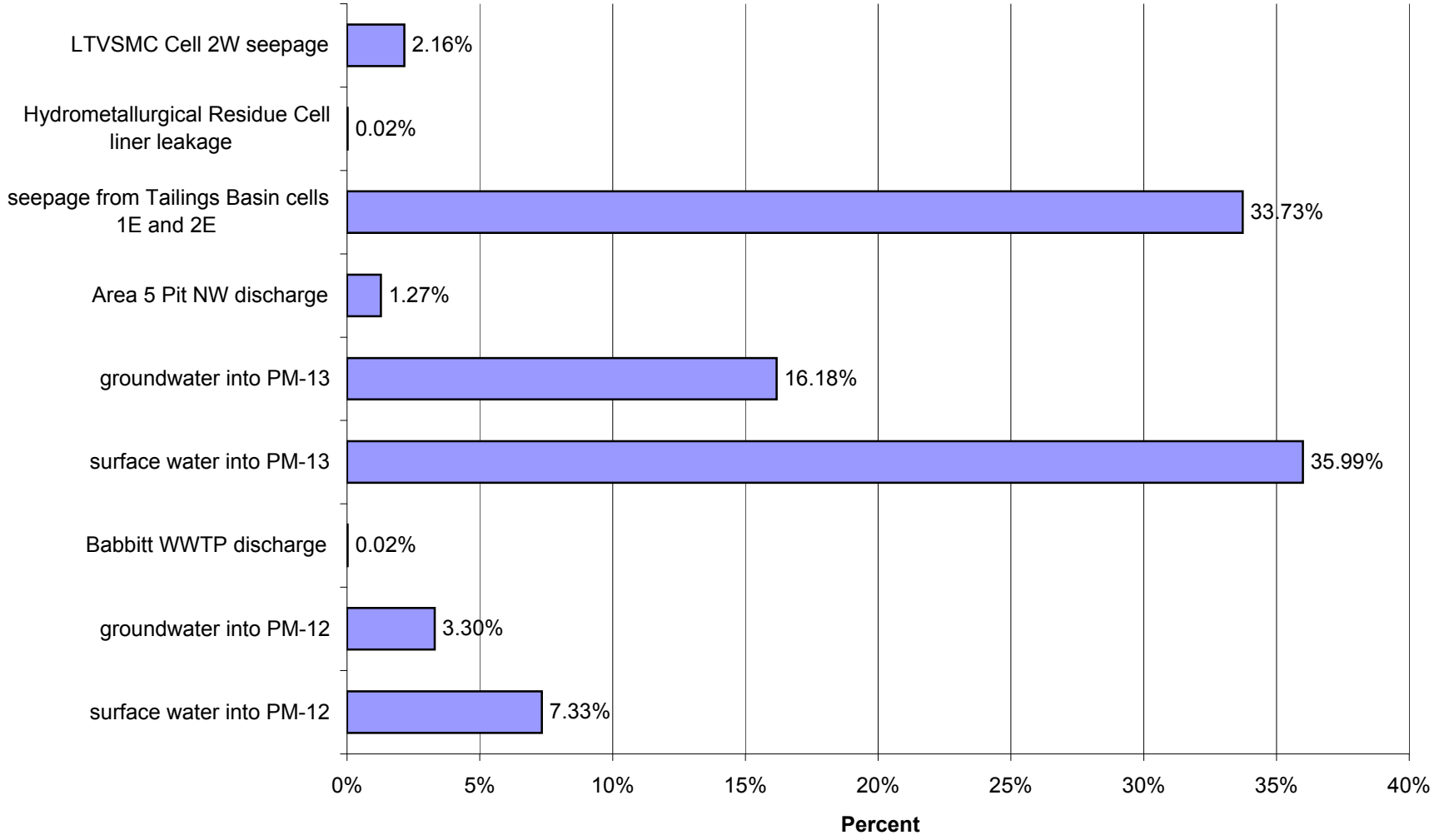
Proposed Action: Percent of Impacts at PM-13 in Closure for Average Flow for Antimony (Sb)



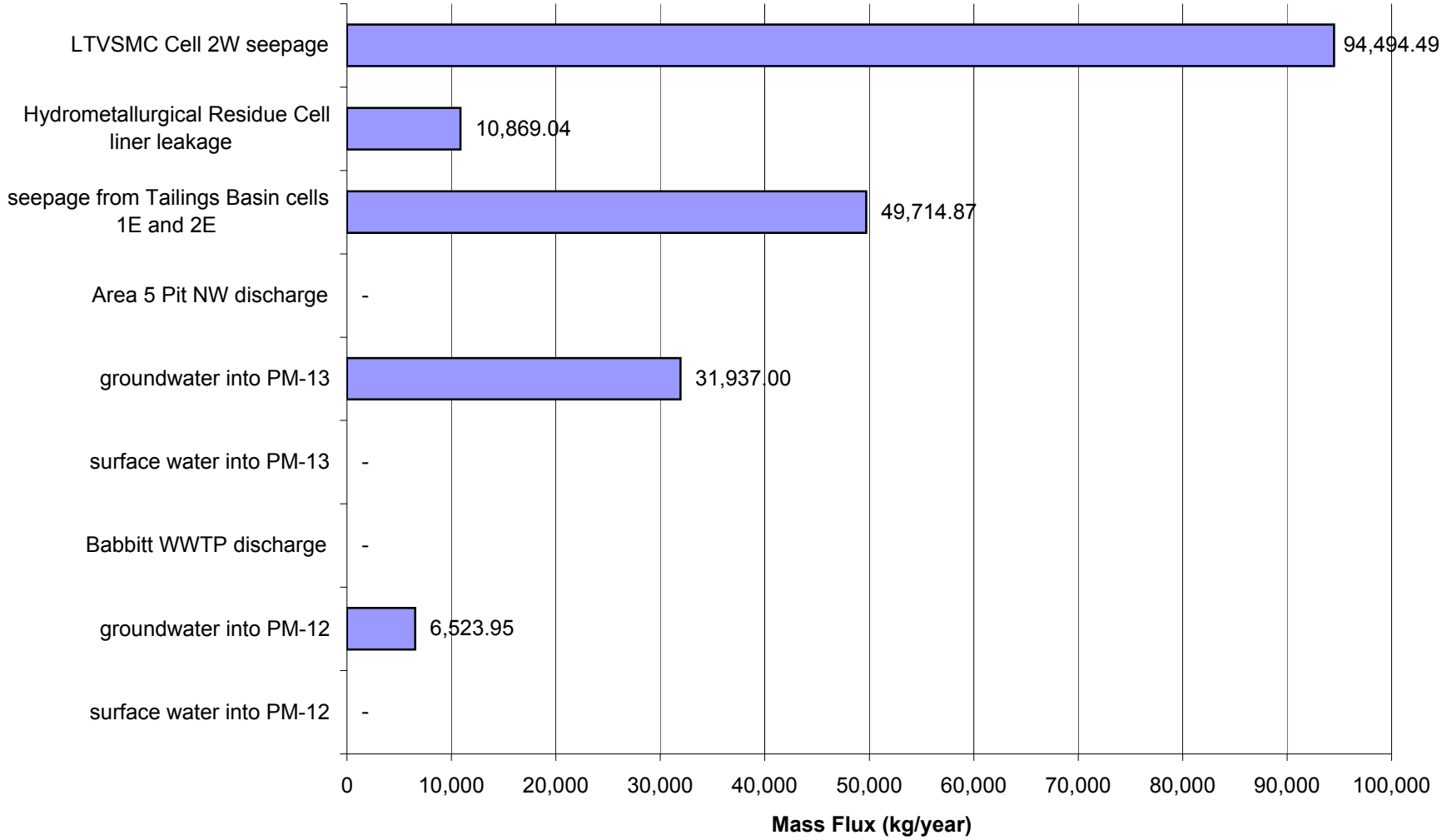
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Closure for High Flow for Antimony (Sb)



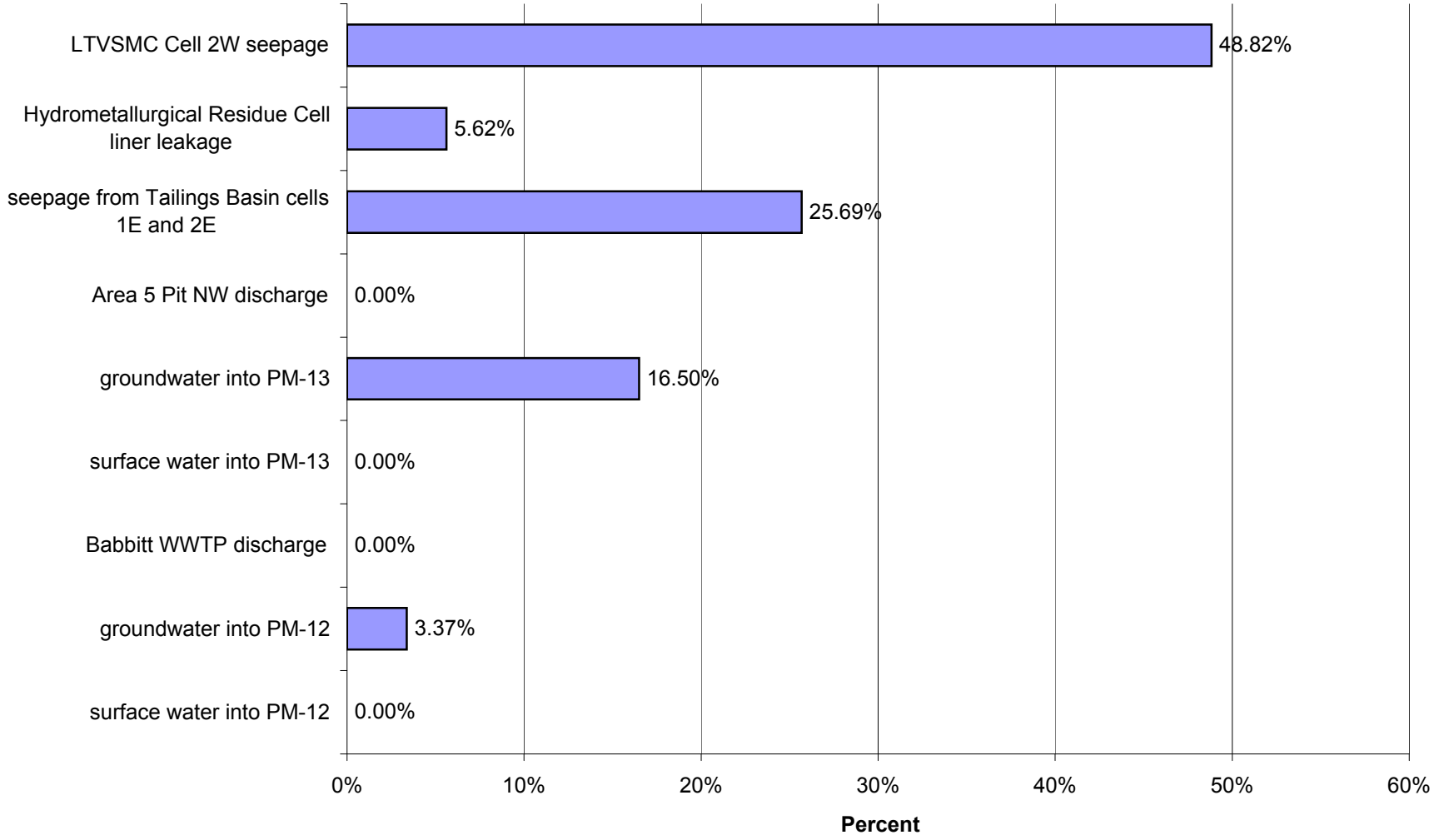
Proposed Action: Percent of Impacts at PM-13 in Closure for High Flow for Antimony (Sb)



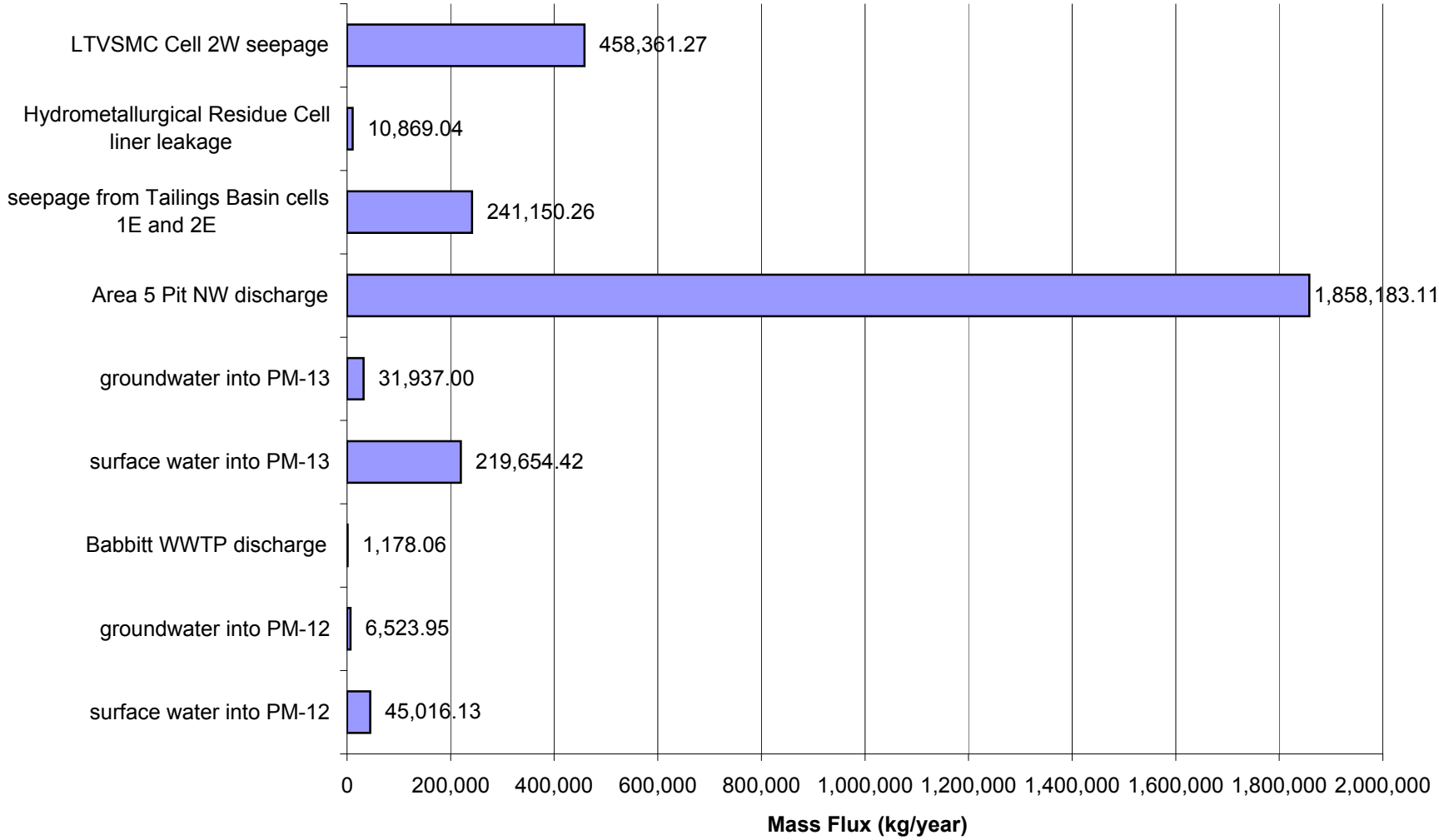
Proposed Action: Mass Flux (kg/year) of Impacts at PM-13 in Closure for Low Flow for Sulfate (SO4)



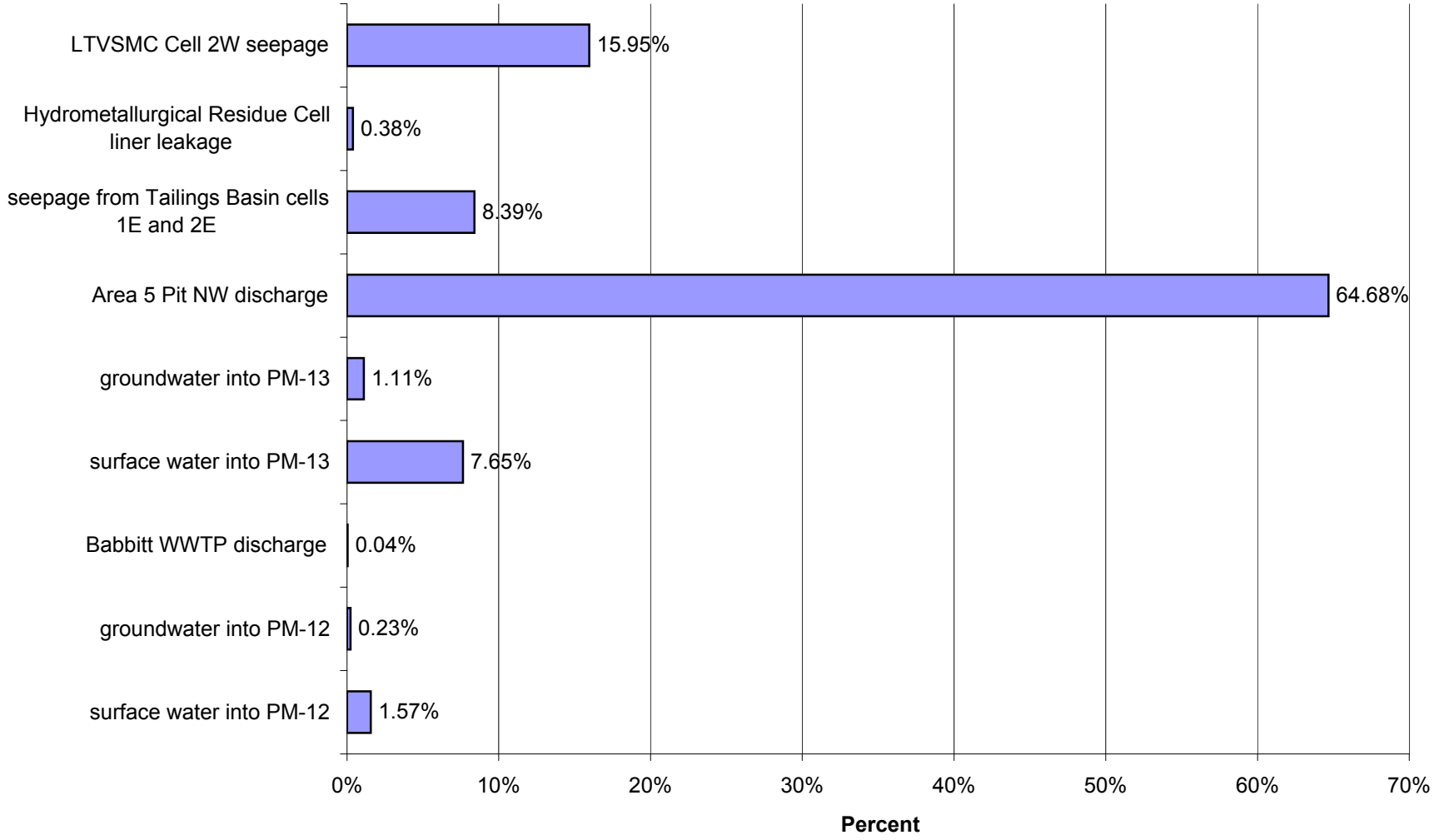
Proposed Action: Percent of Impacts at PM-13 in Closure for Low Flow for Sulfate (SO4)



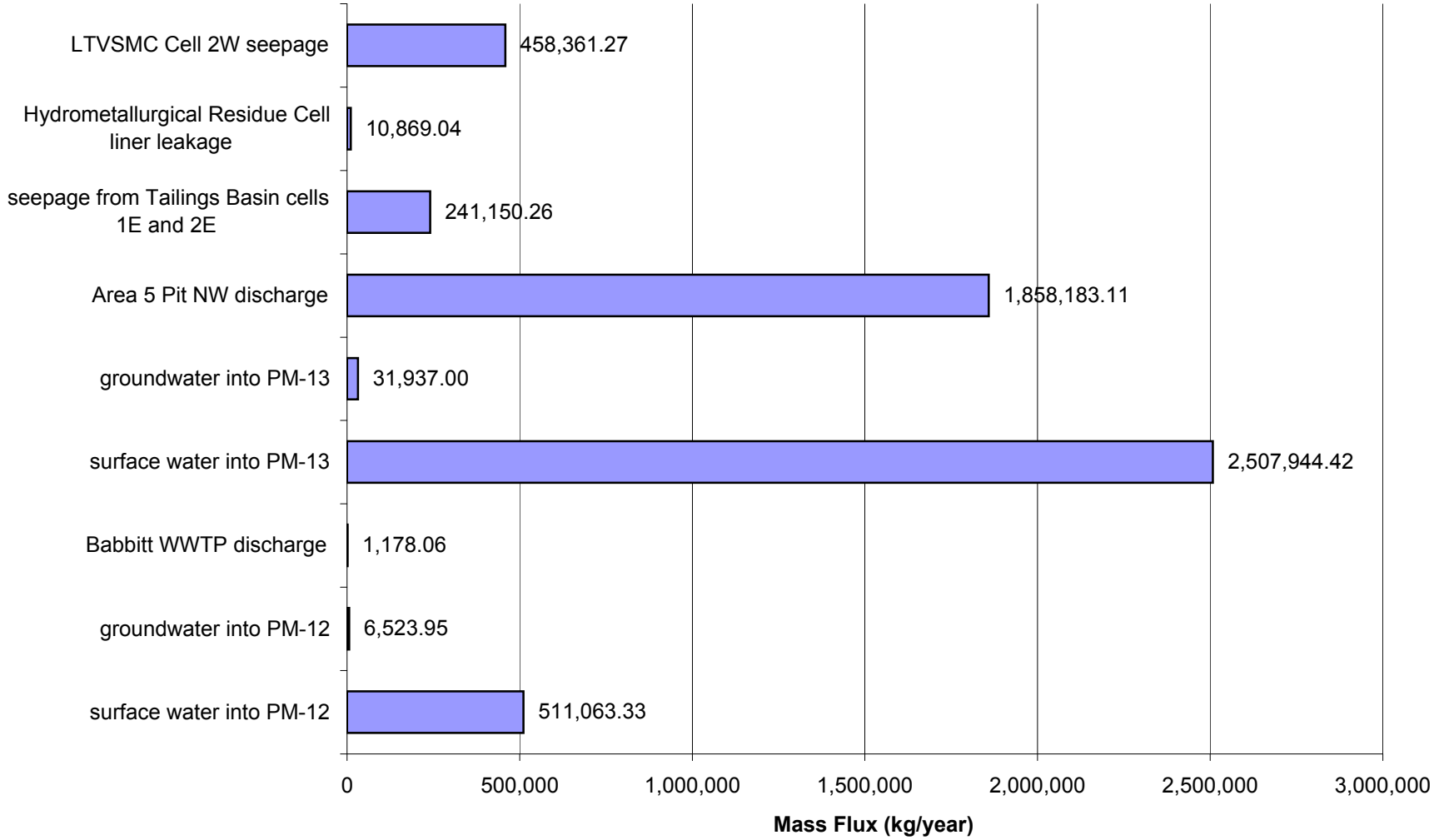
Proposed Action: Mass Flux (kg/year) of Impacts at PM-13 in Closure for Average Flow for Sulfate (SO4)



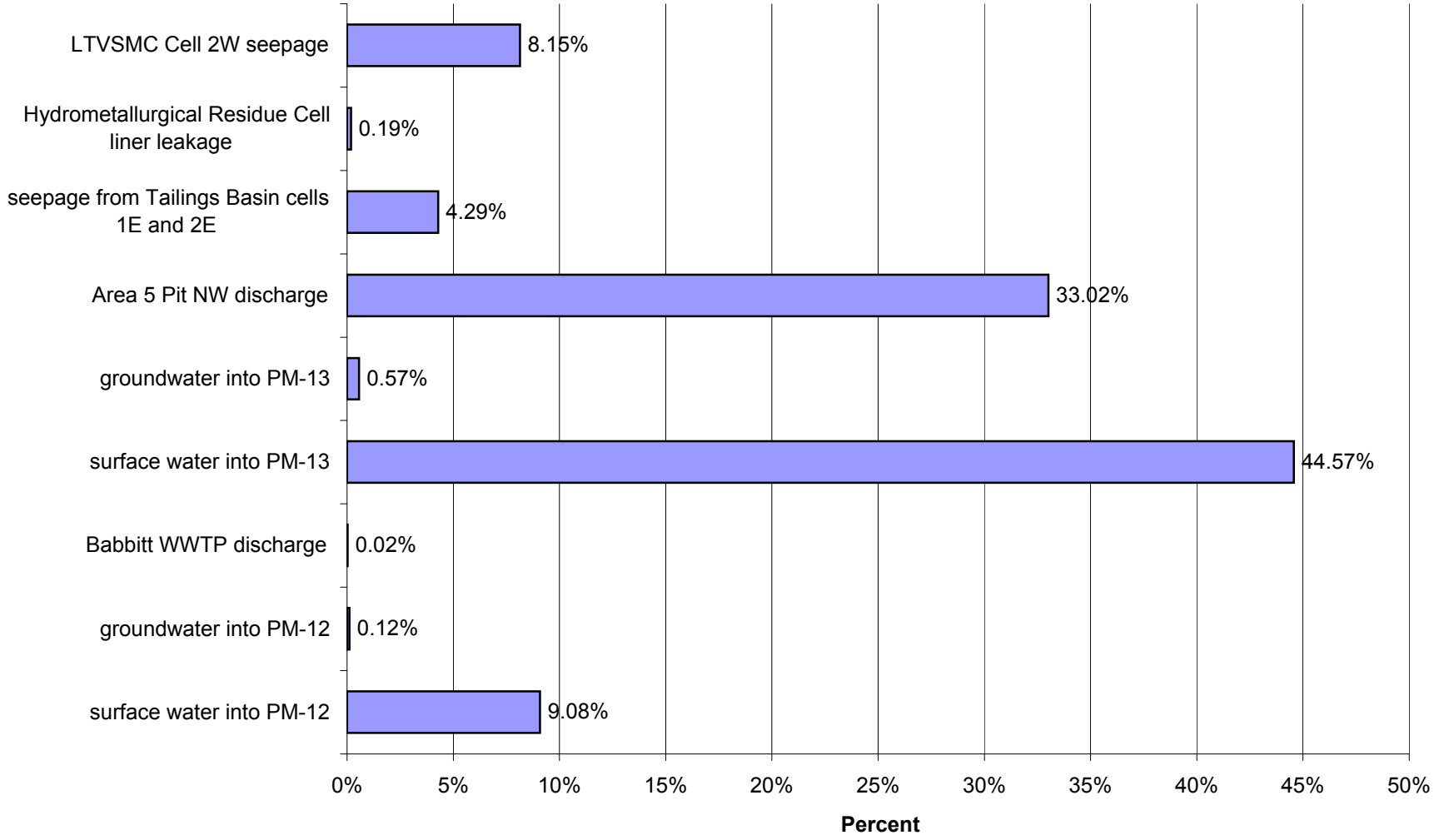
Proposed Action: Percent of Impacts at PM-13 in Closure for Average Flow for Sulfate (SO4)



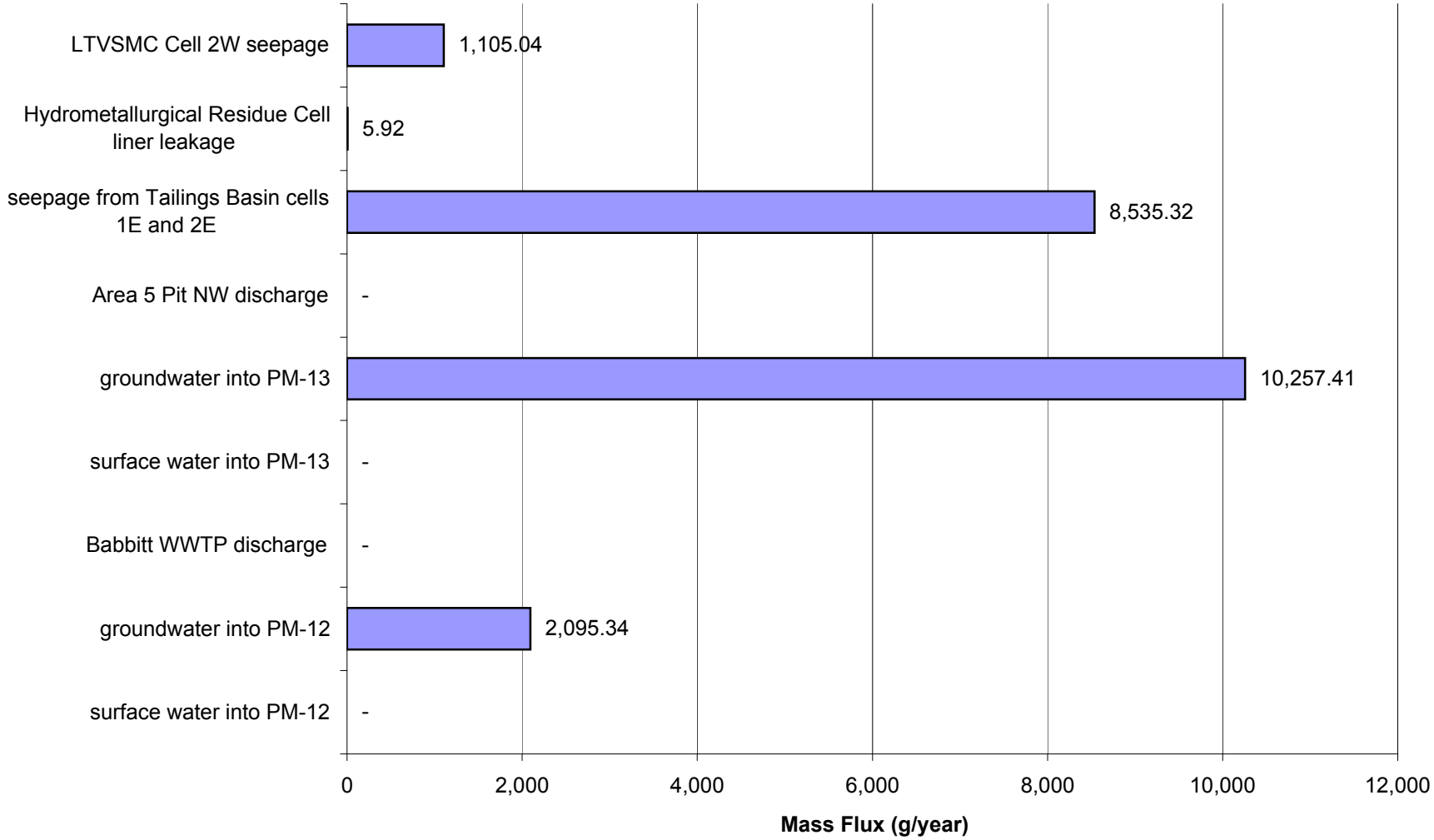
Proposed Action: Mass Flux (kg/year) of Impacts at PM-13 in Closure for High Flow for Sulfate (SO4)



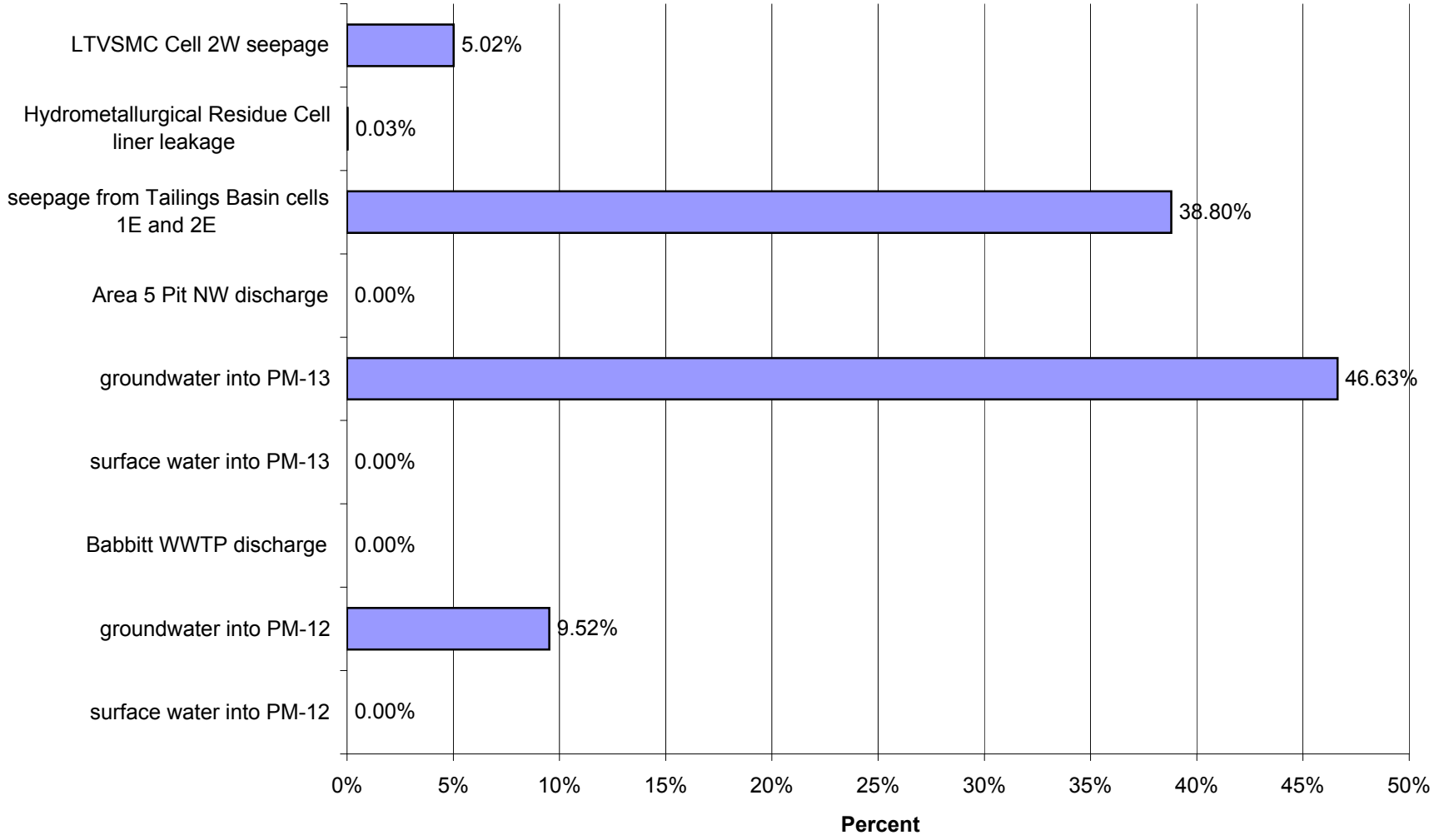
Proposed Action: Percent of Impacts at PM-13 in Closure for High Flow for Sulfate (SO4)



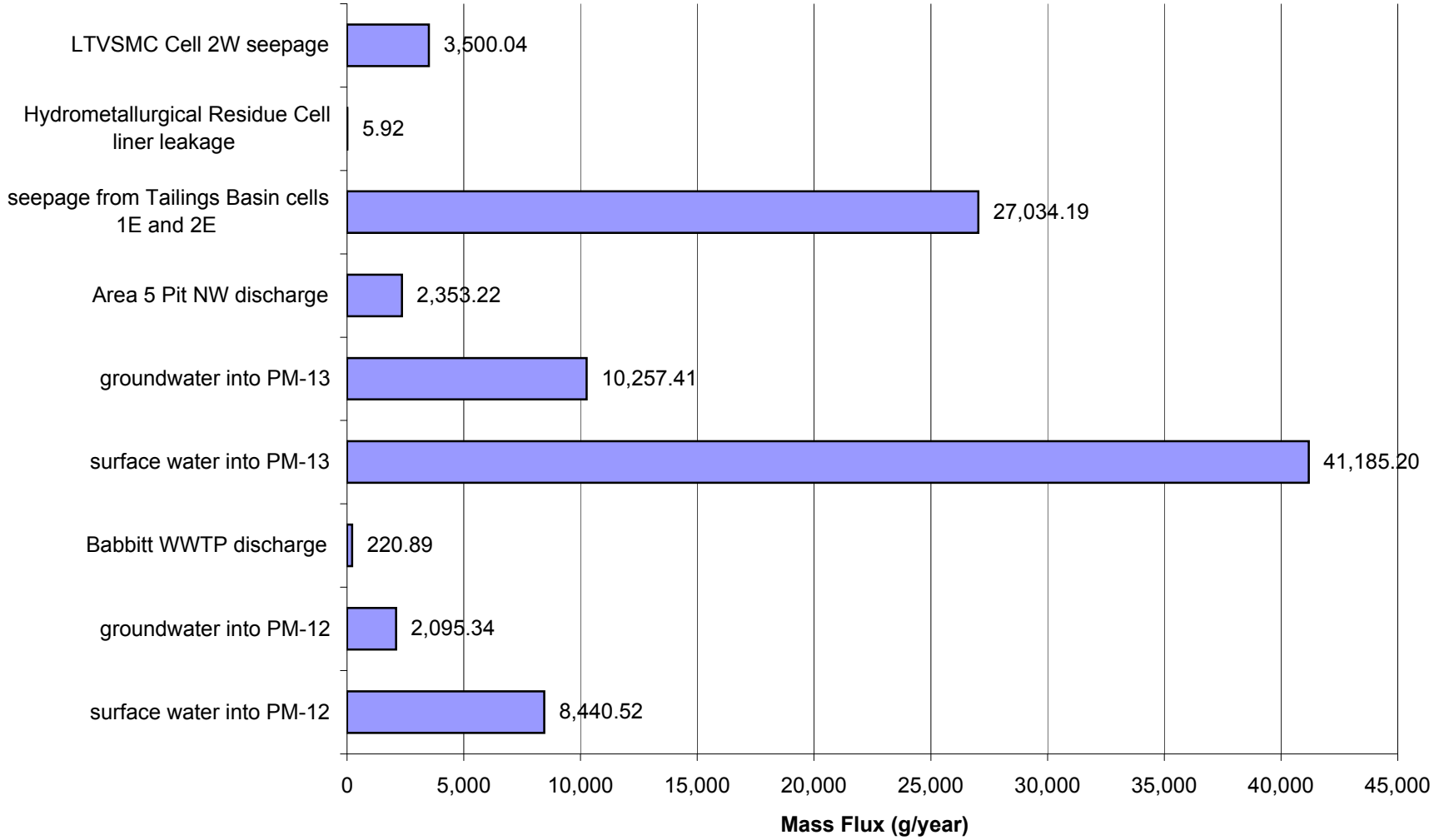
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for Low Flow for Arsenic (As)



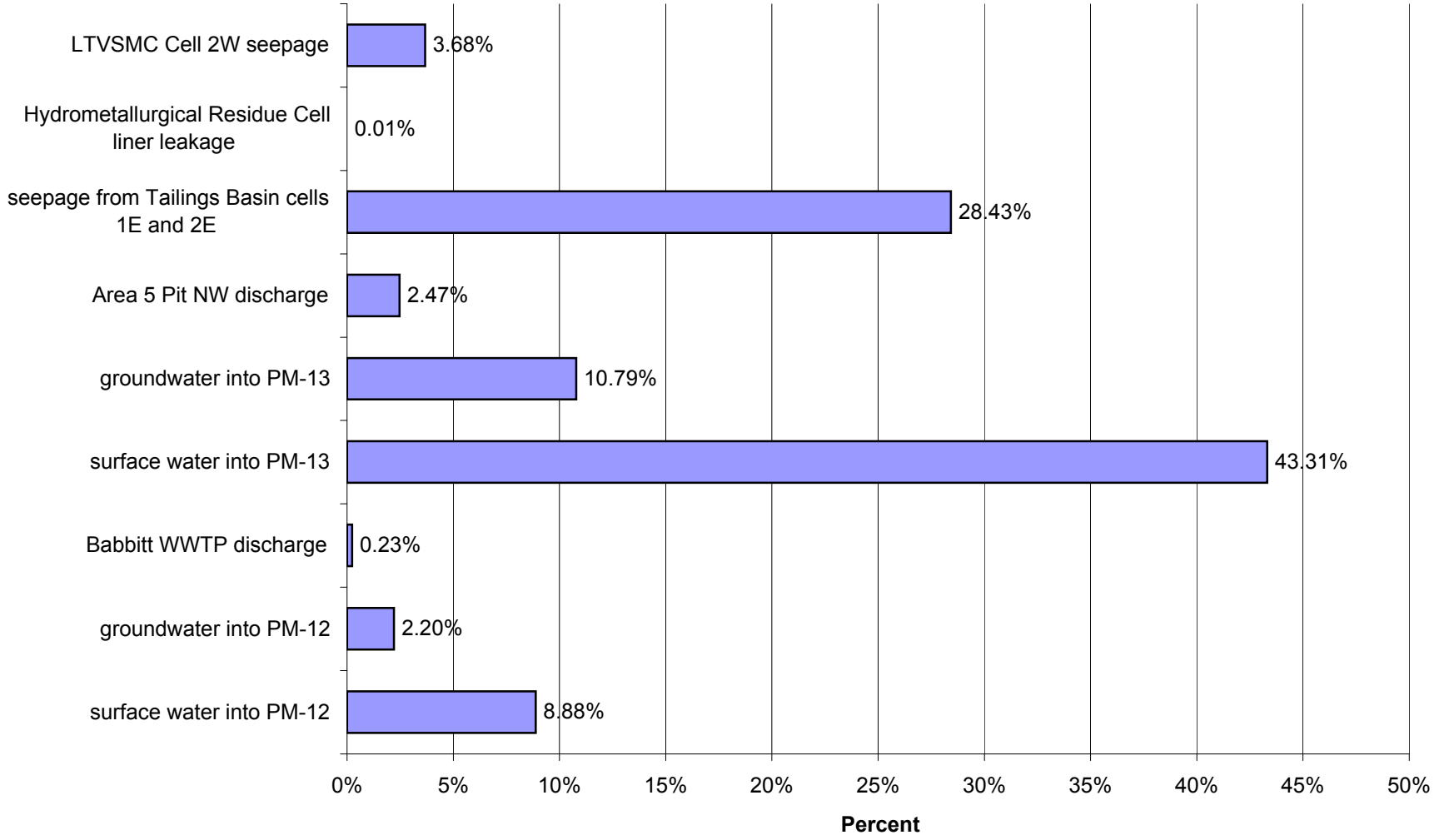
Proposed Action: Percent of Impacts at PM-13 in Post - Closure for Low Flow for Arsenic (As)



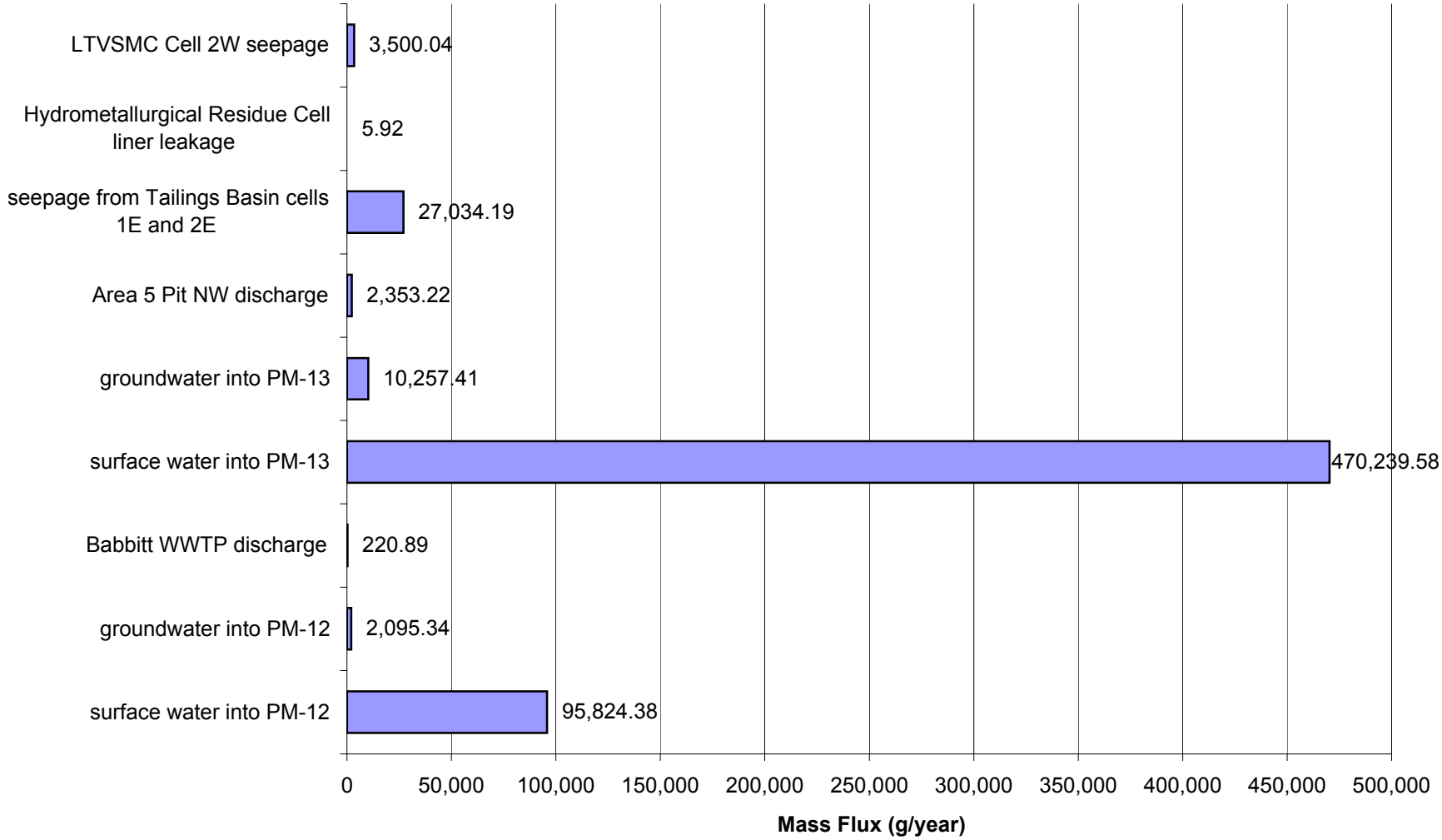
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for Average Flow for Arsenic (As)



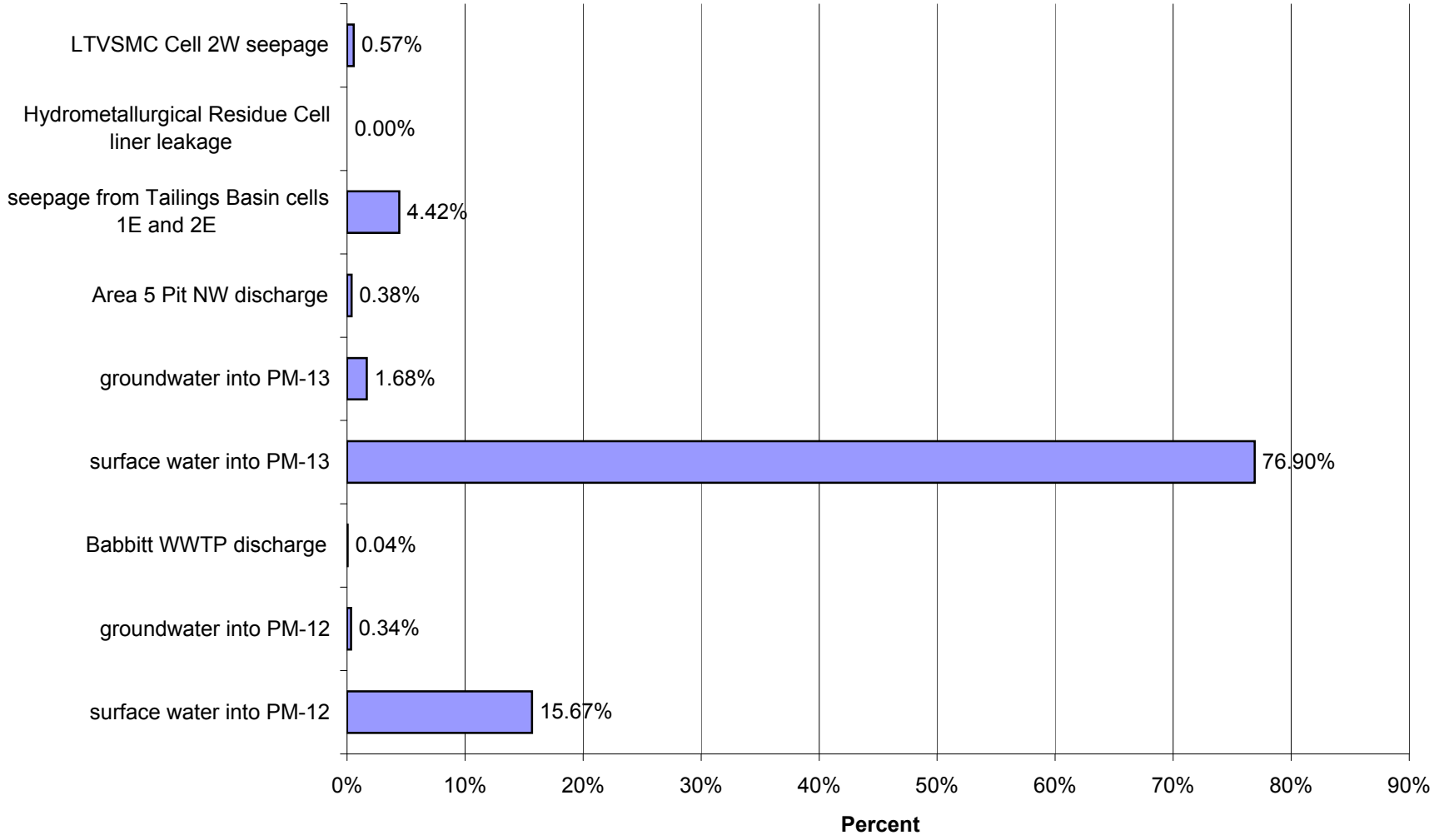
Proposed Action: Percent of Impacts at PM-13 in Post - Closure for Average Flow for Arsenic (As)



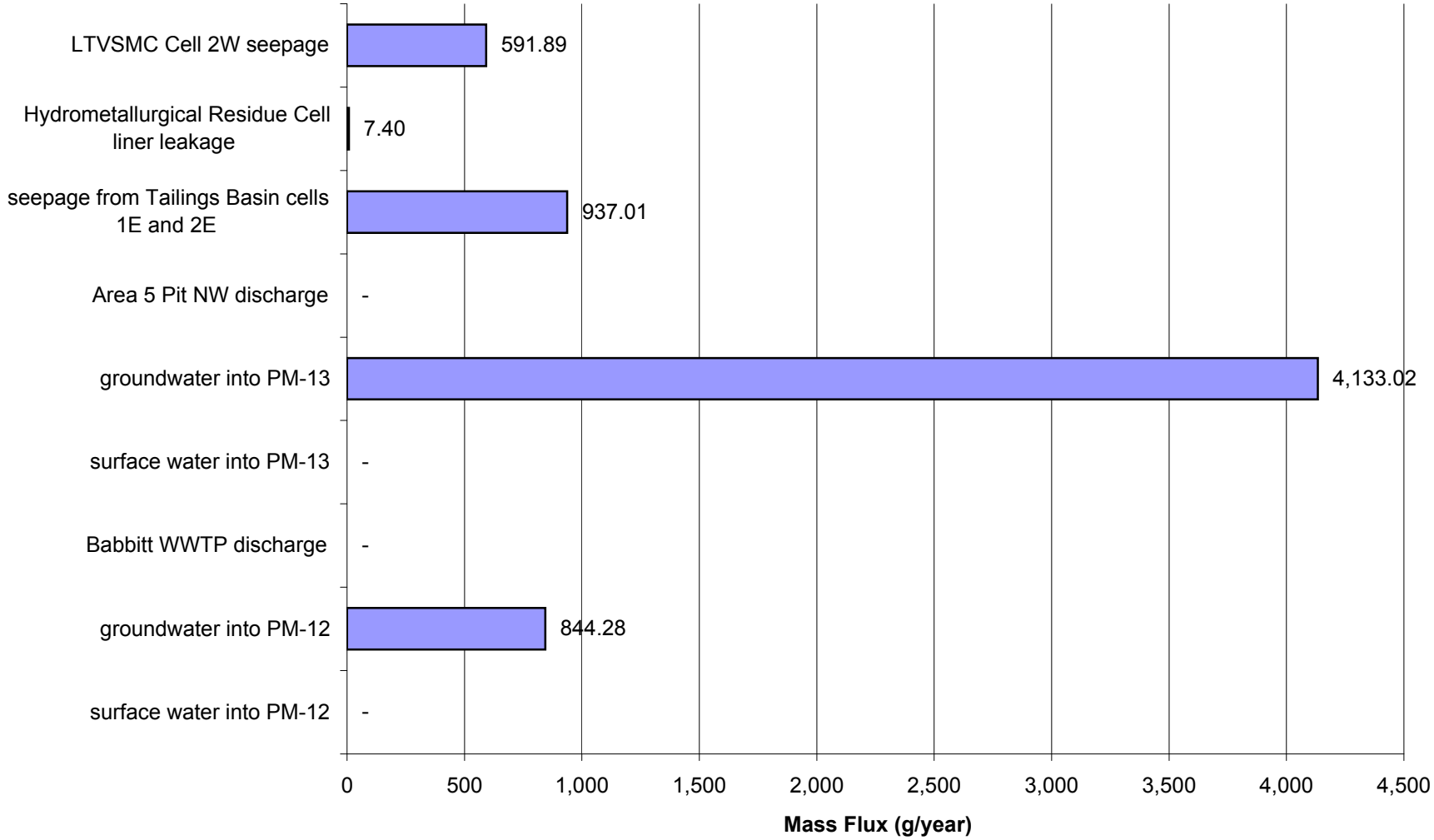
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for High Flow for Arsenic (As)



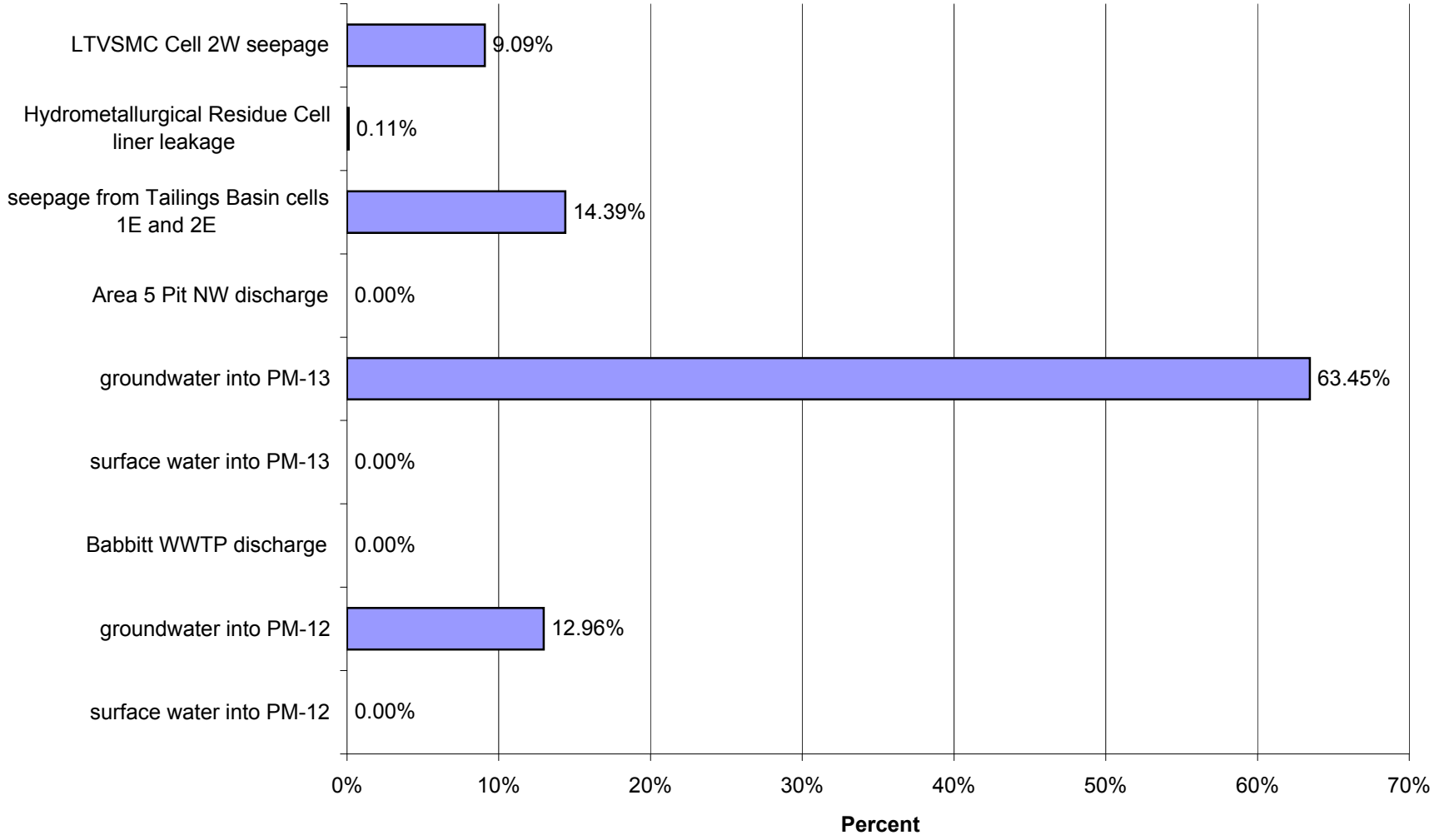
Proposed Action: Percent of Impacts at PM-13 in Post - Closure for High Flow for Arsenic (As)



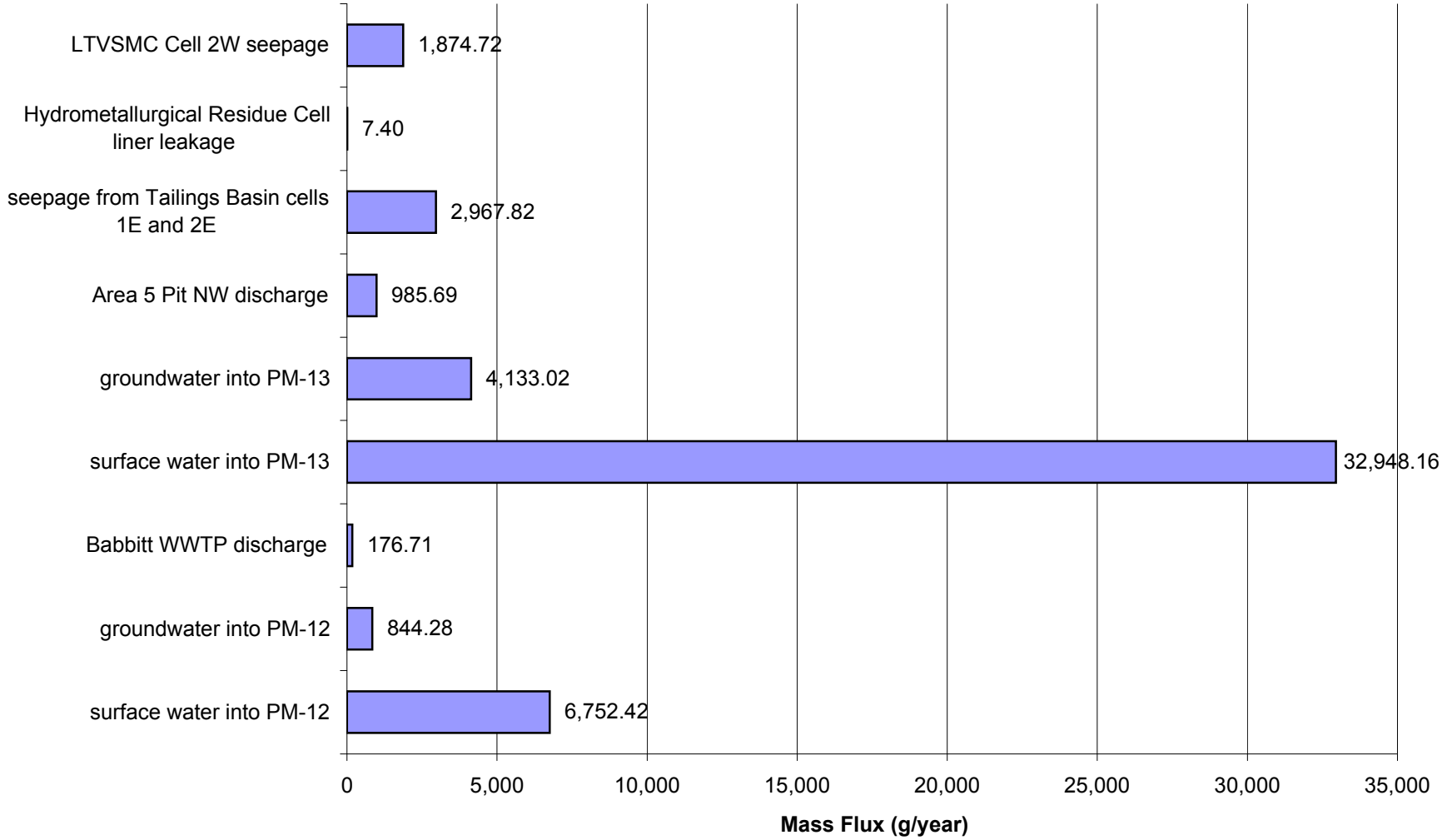
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for Low Flow for Cobalt (Co)



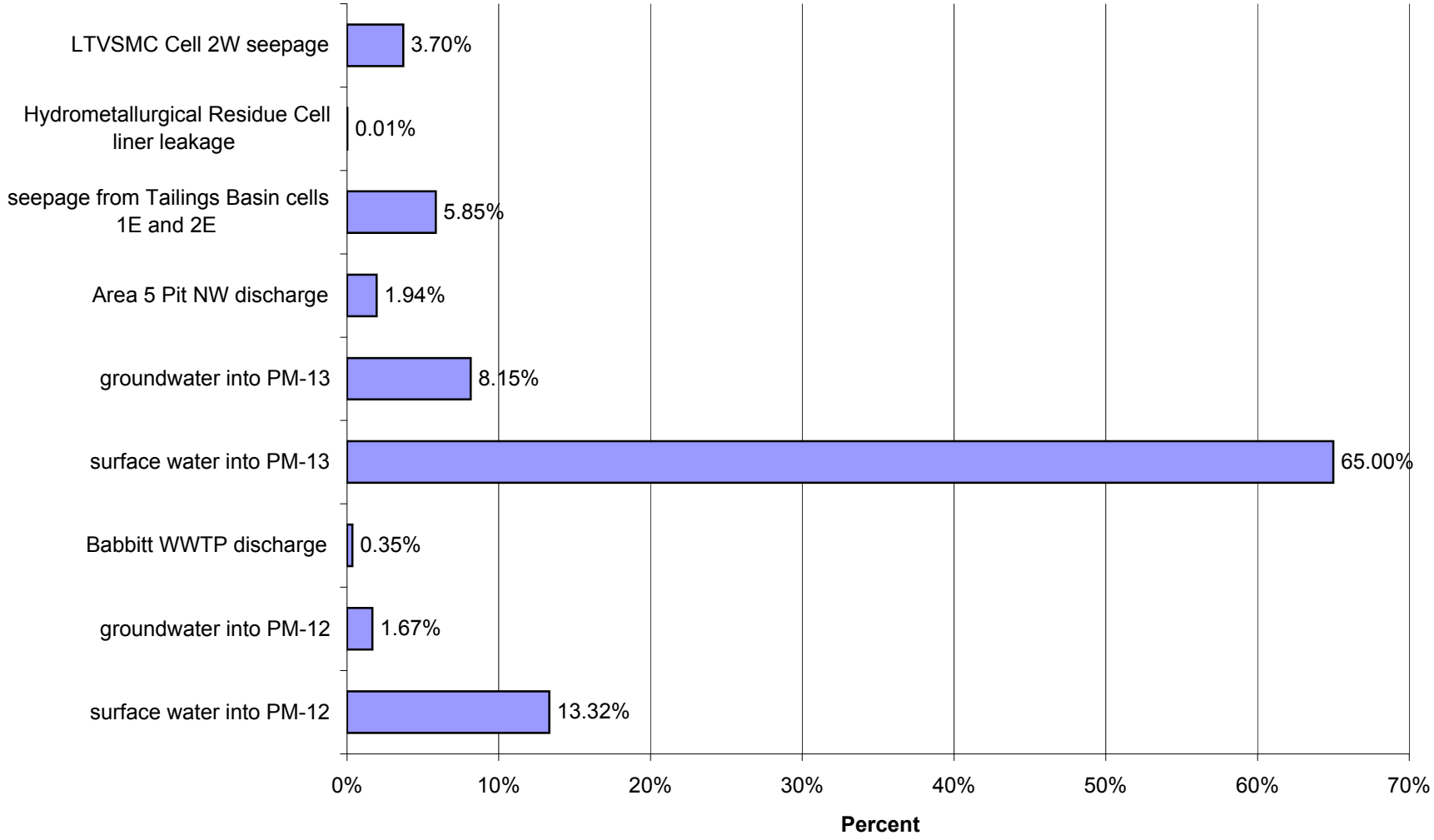
Proposed Action: Percent of Impacts at PM-13 in Post - Closure for Low Flow for Cobalt (Co)



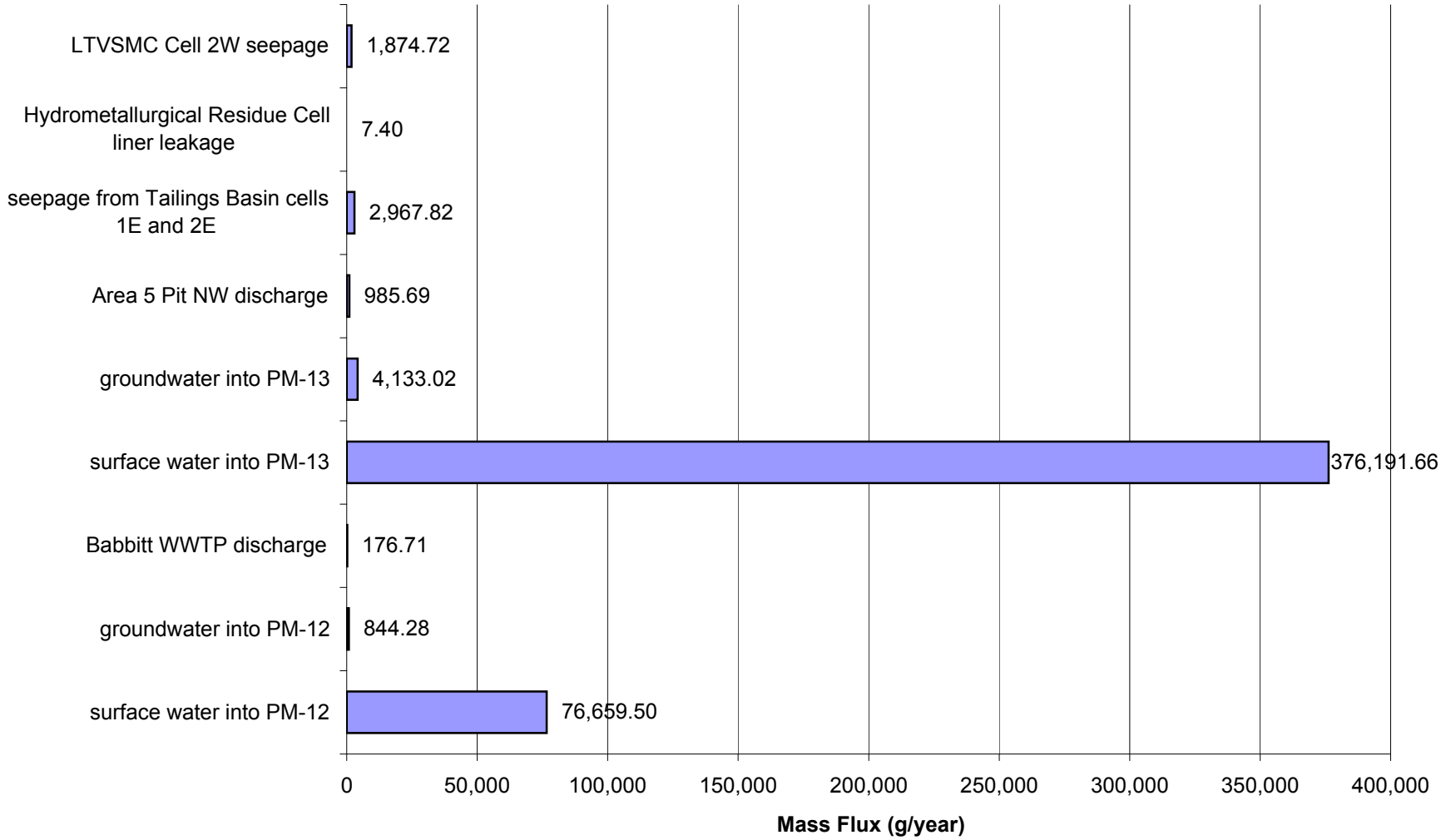
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for Average Flow for Cobalt (Co)



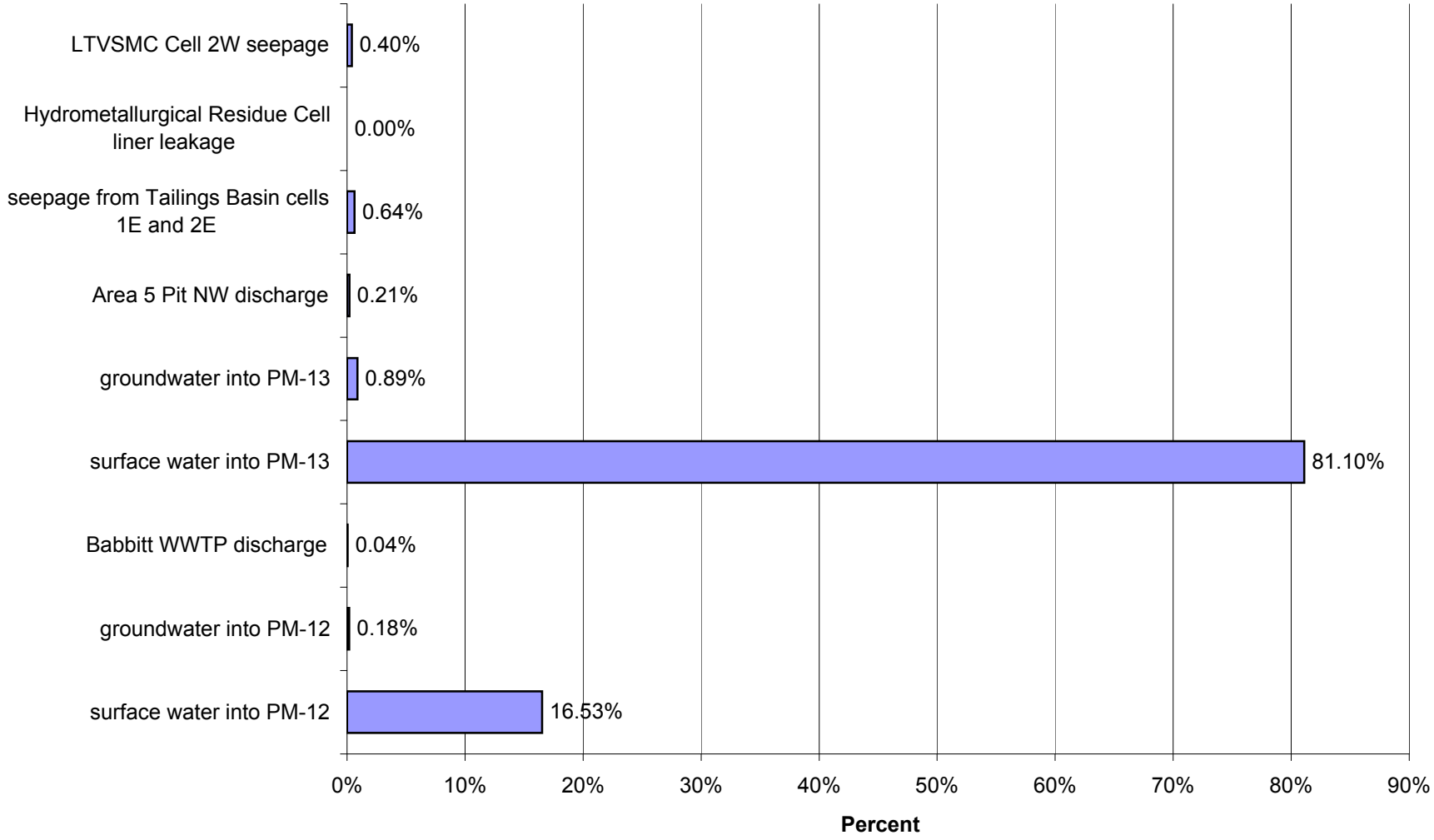
Proposed Action: Percent of Impacts at PM-13 in Post - Closure for Average Flow for Cobalt (Co)



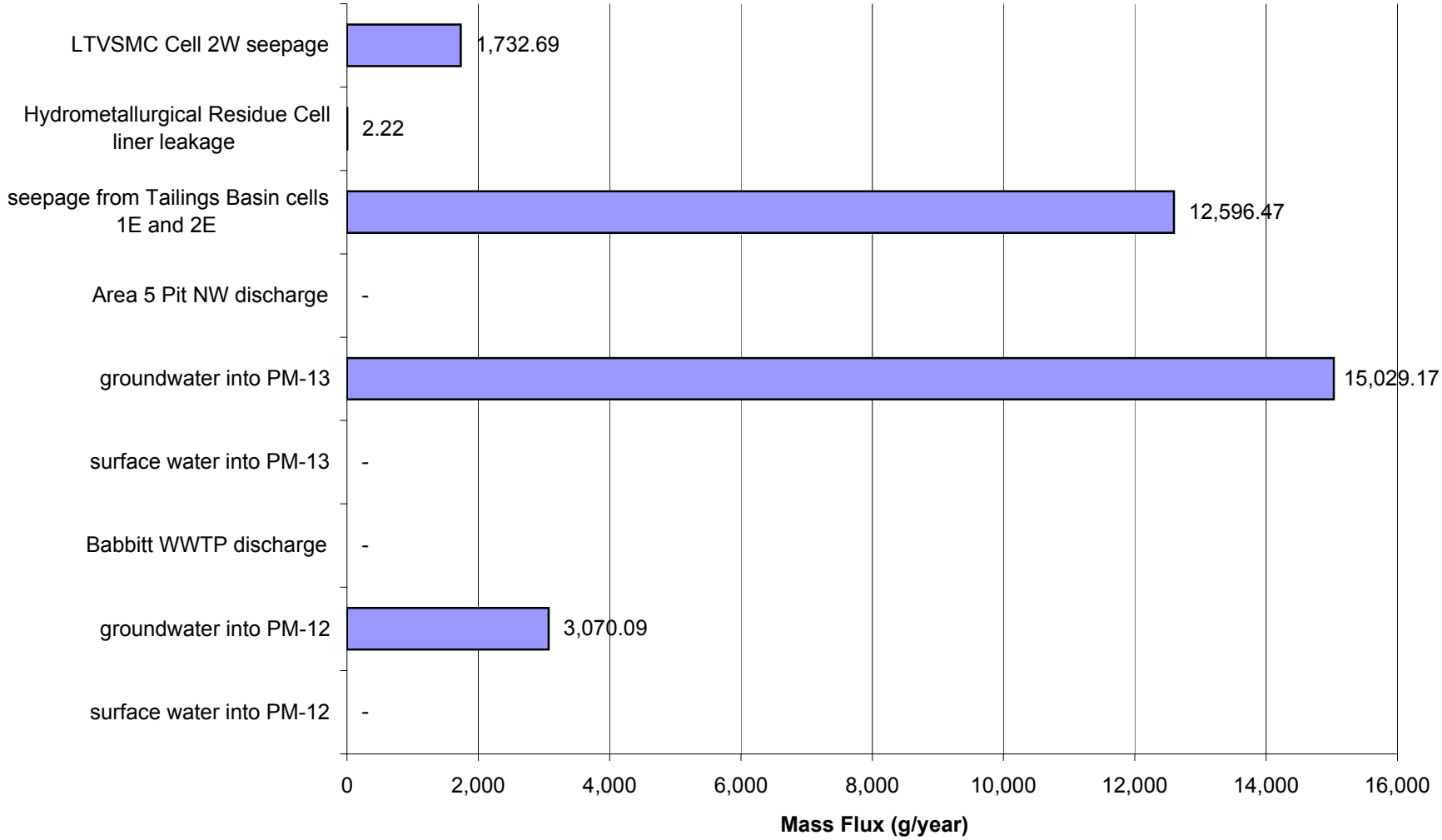
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for High Flow for Cobalt (Co)



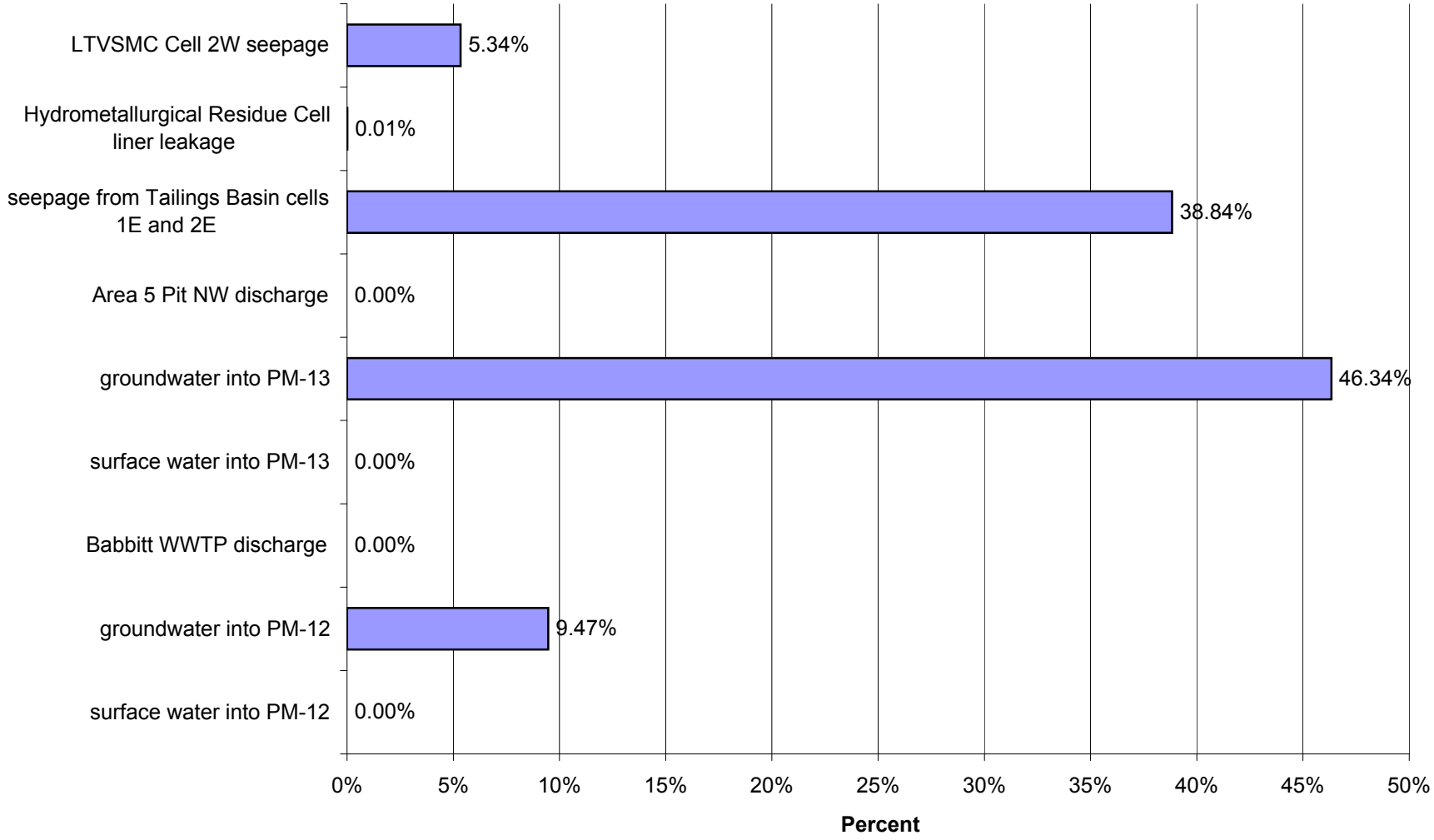
Proposed Action: Percent of Impacts at PM-13 in Post - Closure for High Flow for Cobalt (Co)



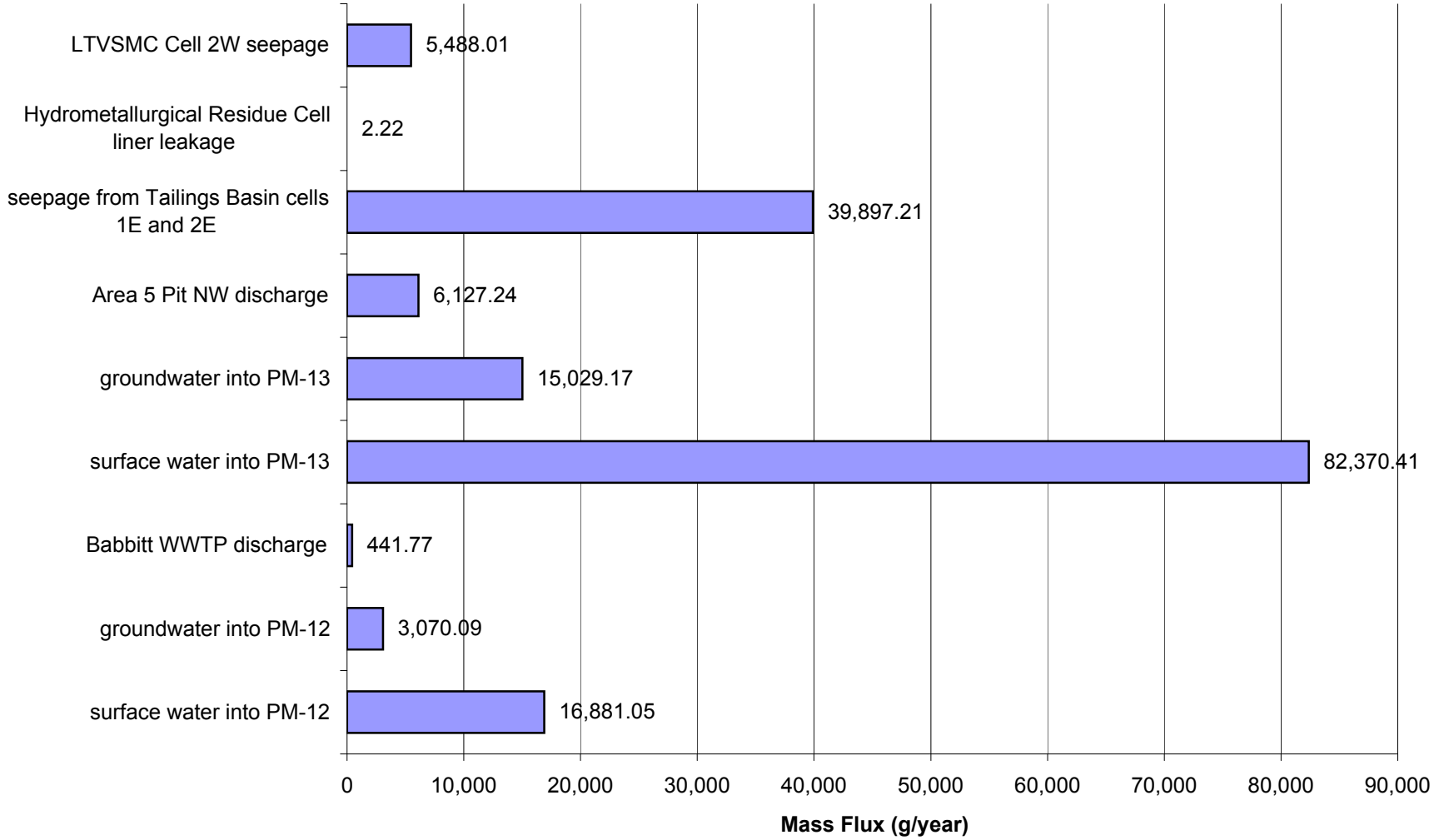
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for Low Flow for Copper (Cu)



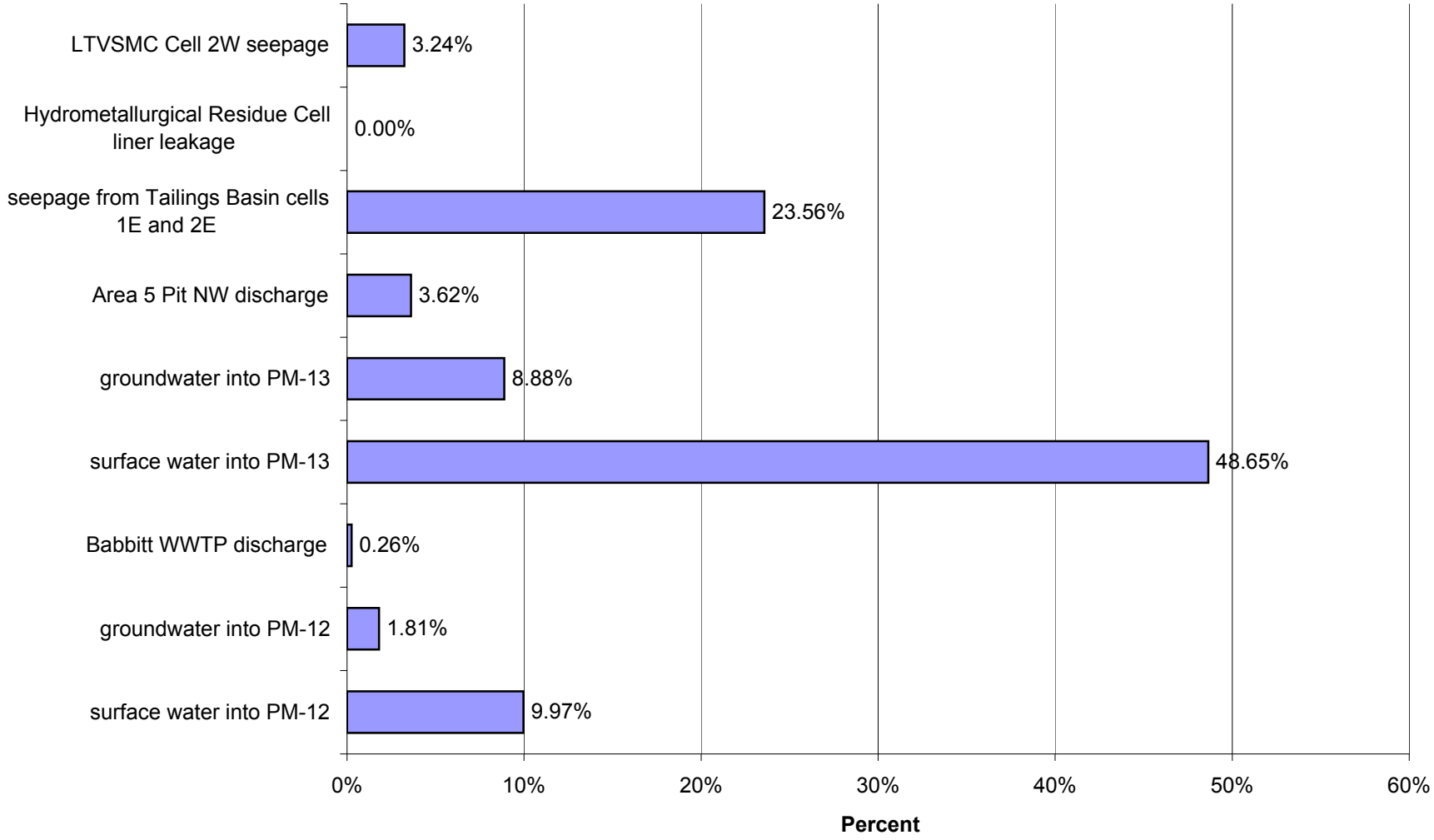
Proposed Action: Percent of Impacts at PM-13 in Post - Closure for Low Flow for Copper (Cu)



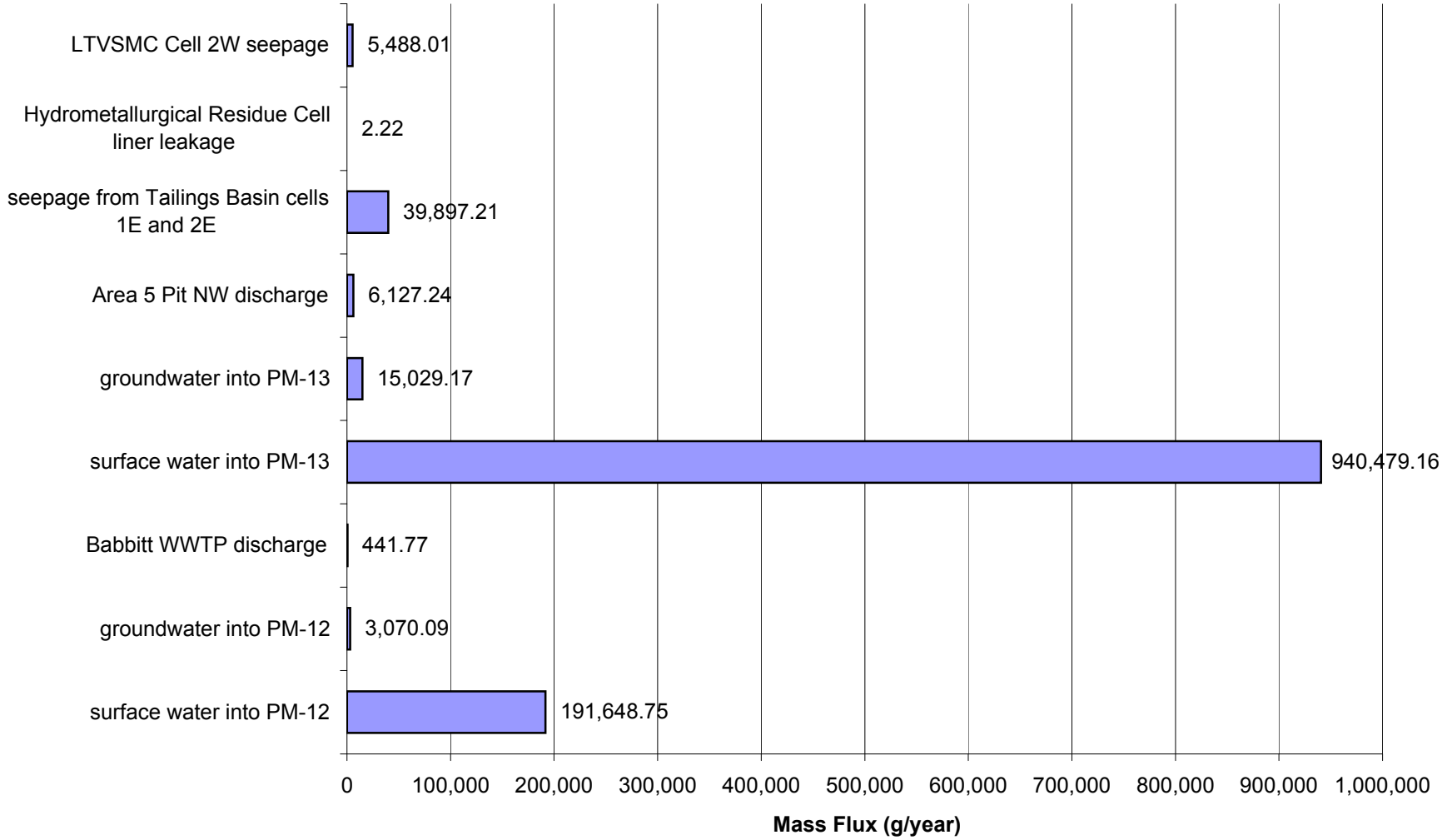
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for Average Flow for Copper (Cu)



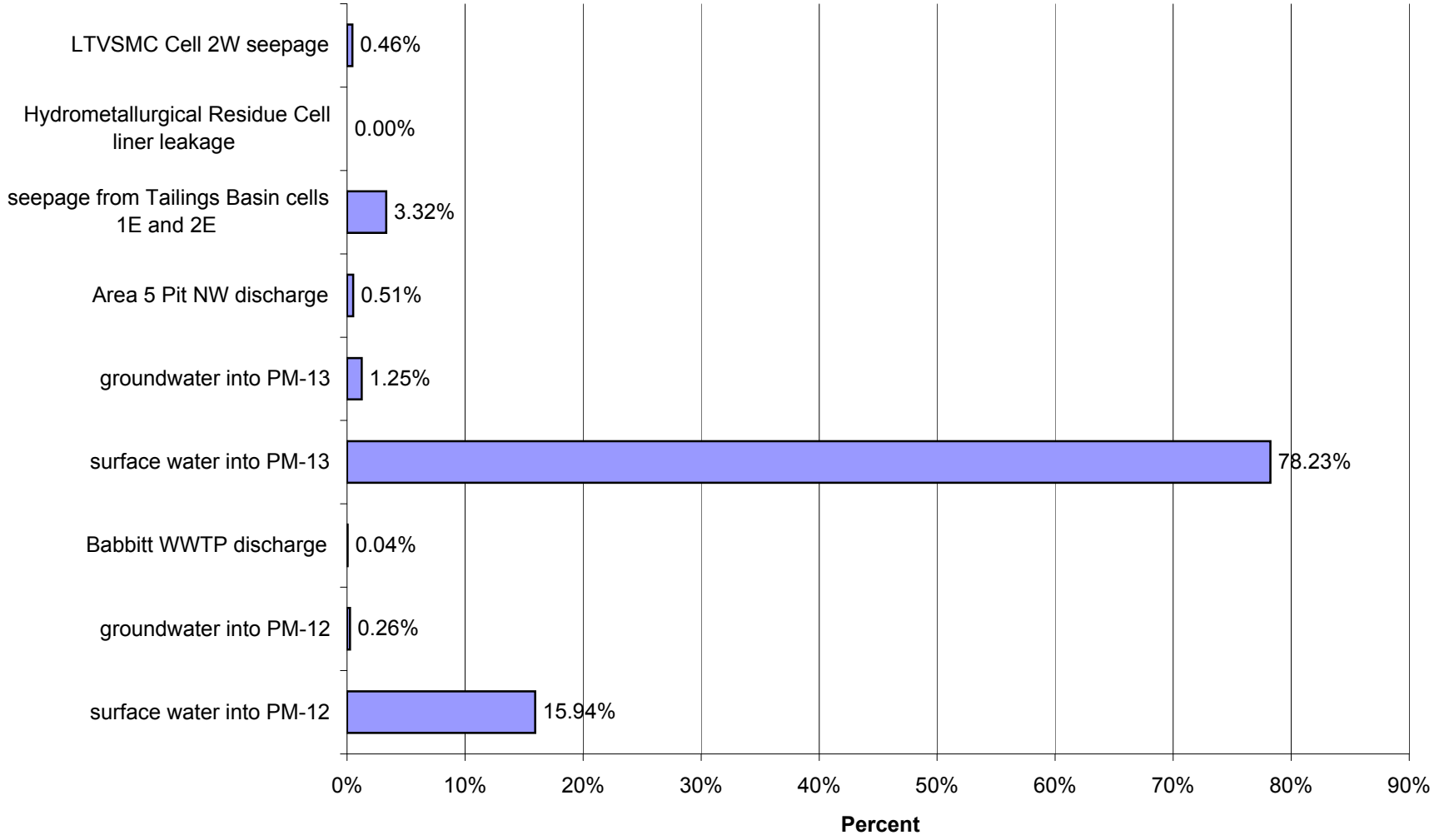
Proposed Action: Percent of Impacts at PM-13 in Post - Closure for Average Flow for Copper (Cu)



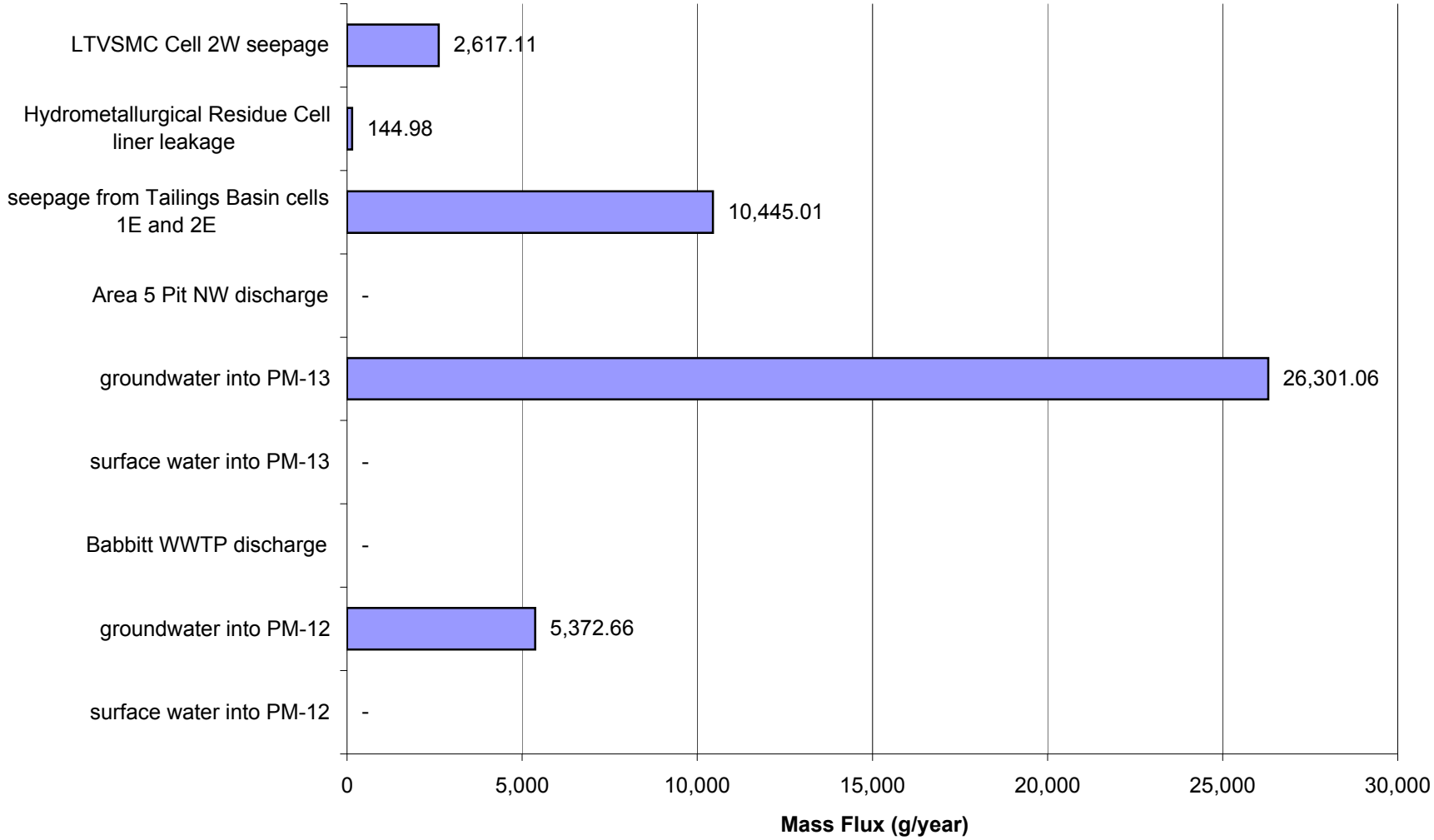
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for High Flow for Copper (Cu)



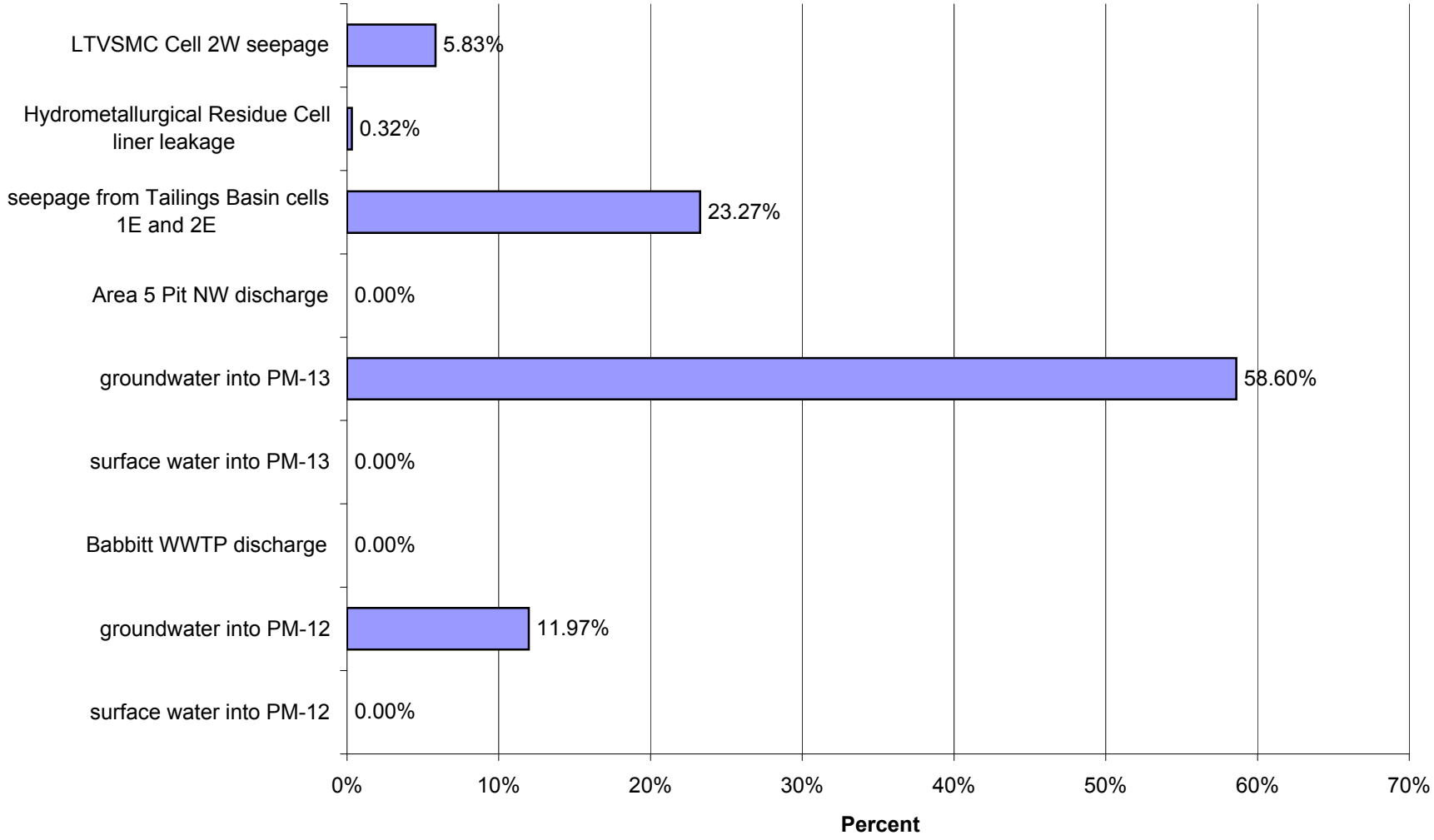
Proposed Action: Percent of Impacts at PM-13 in Post - Closure for High Flow for Copper (Cu)



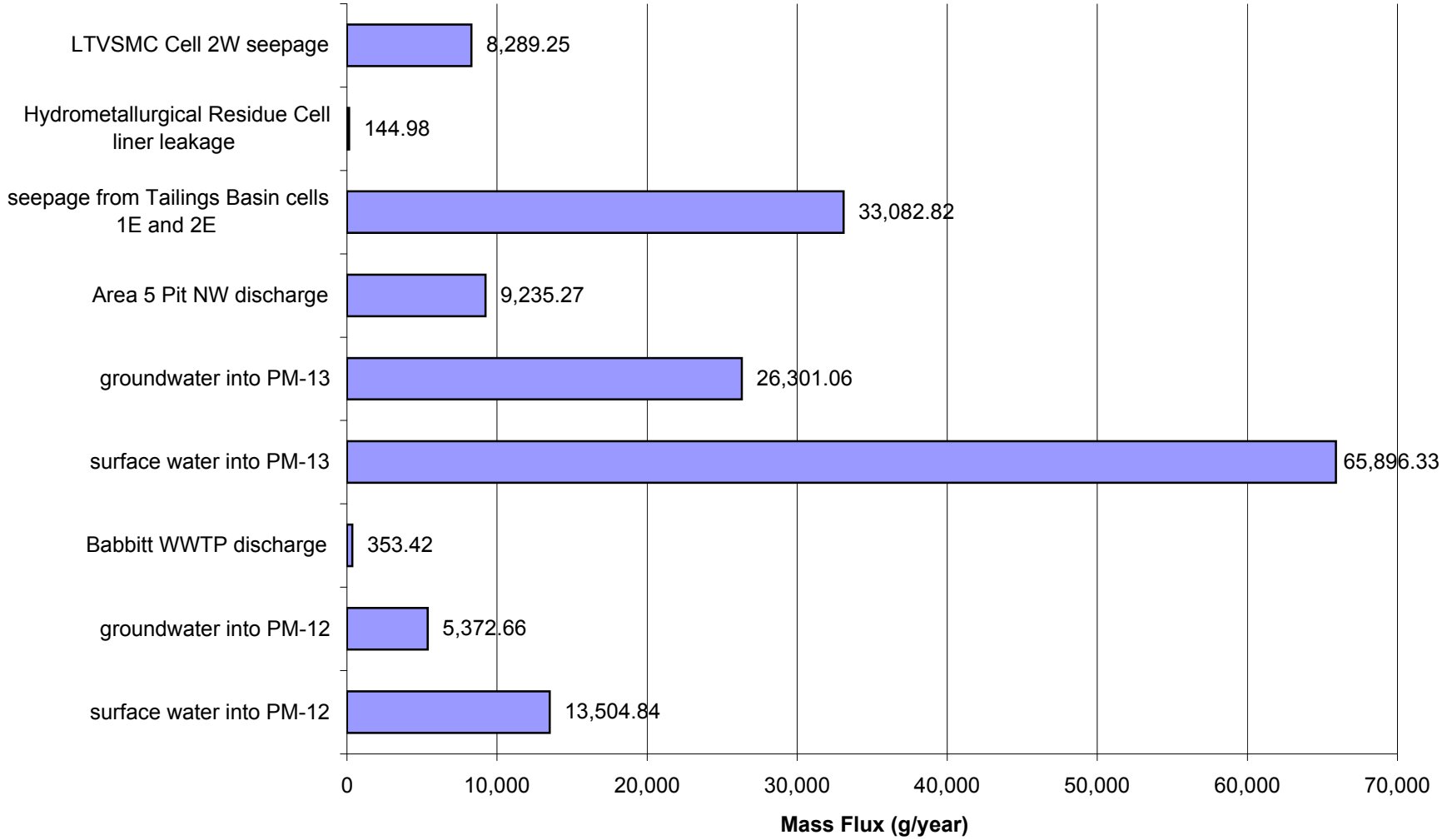
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for Low Flow for Nickel (Ni)



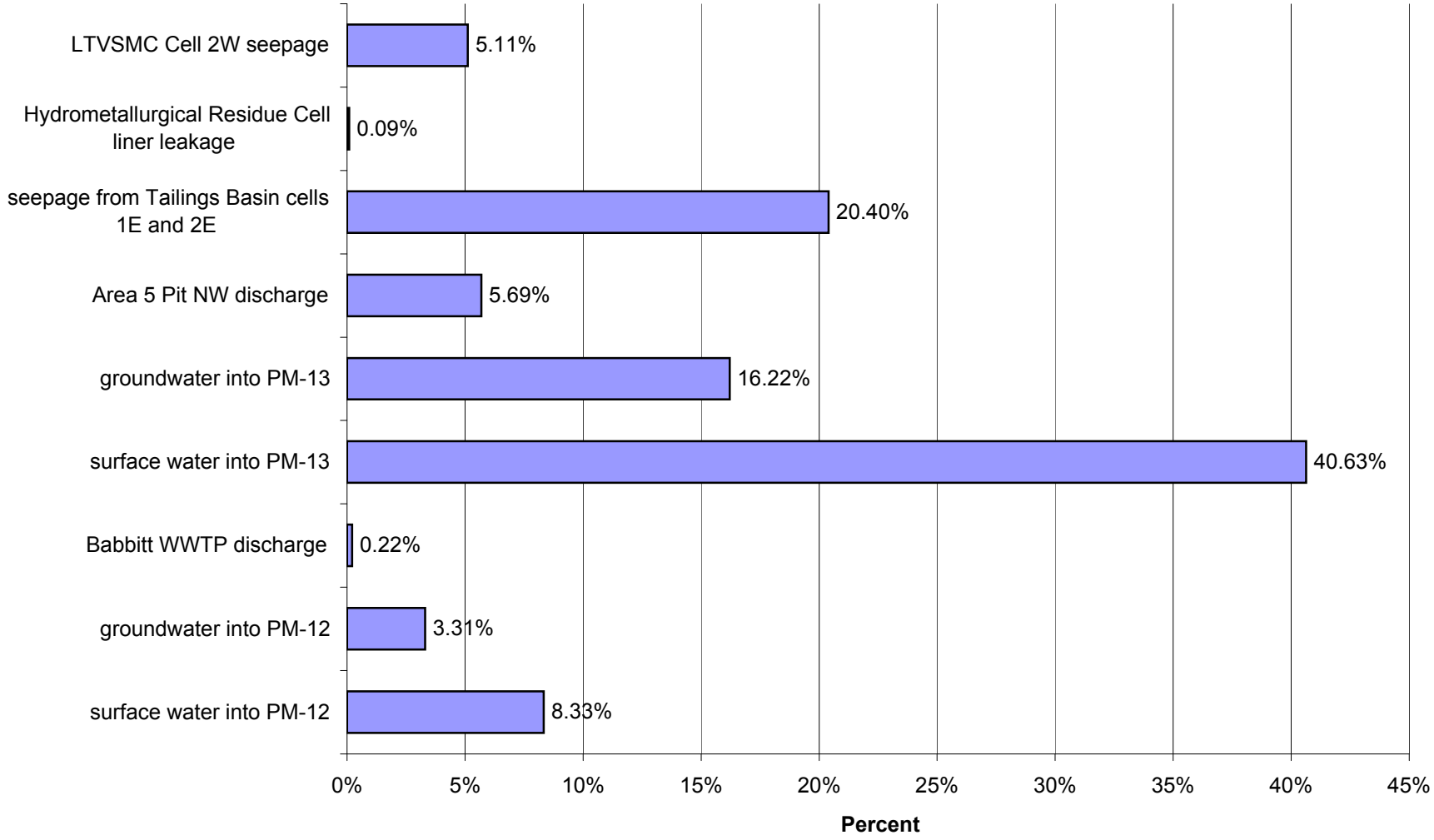
Proposed Action: Percent of Impacts at PM-13 in Post - Closure for Low Flow for Nickel (Ni)



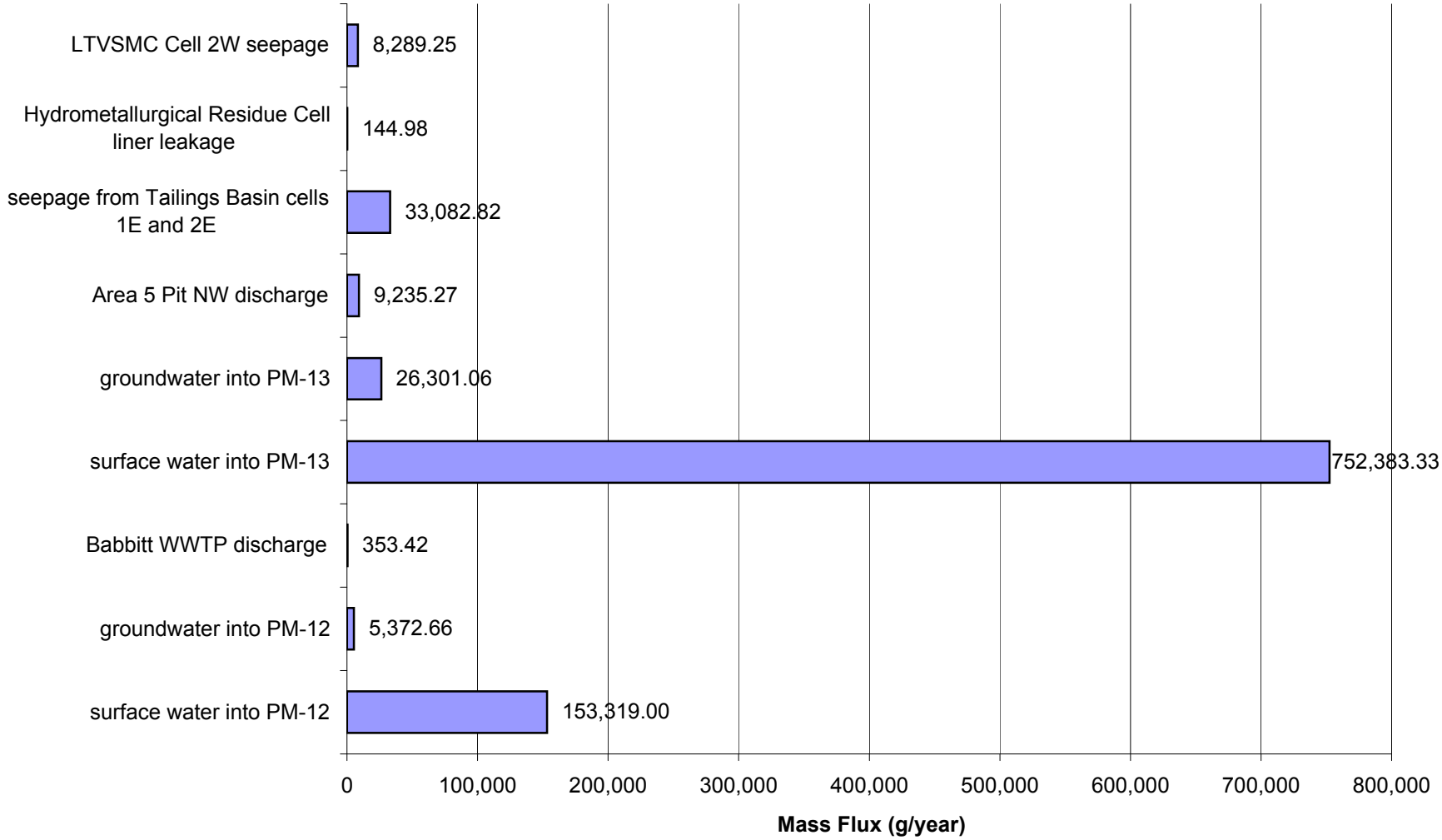
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for Average Flow for Nickel (Ni)



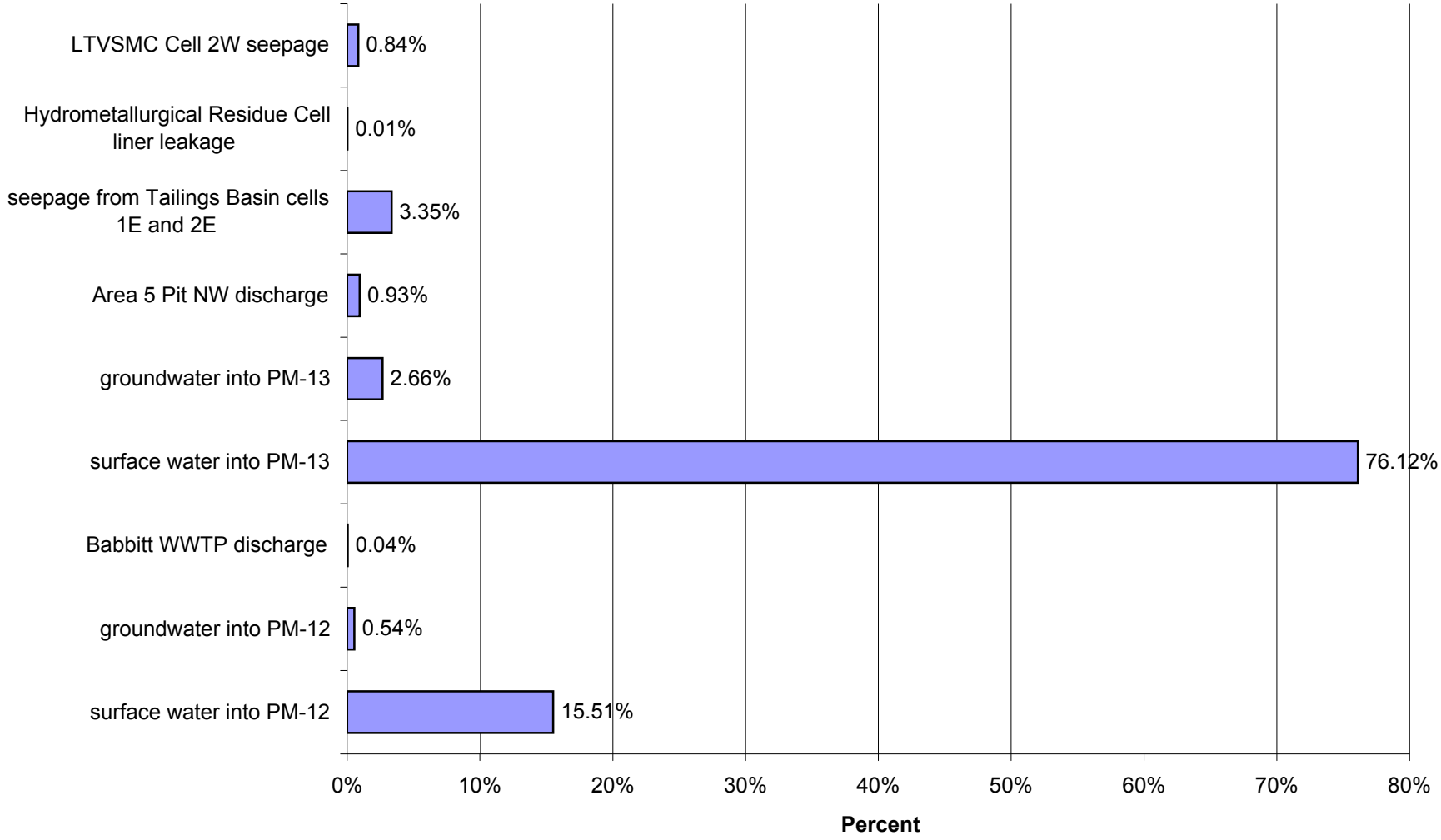
Proposed Action: Percent of Impacts at PM-13 in Post - Closure for Average Flow for Nickel (Ni)



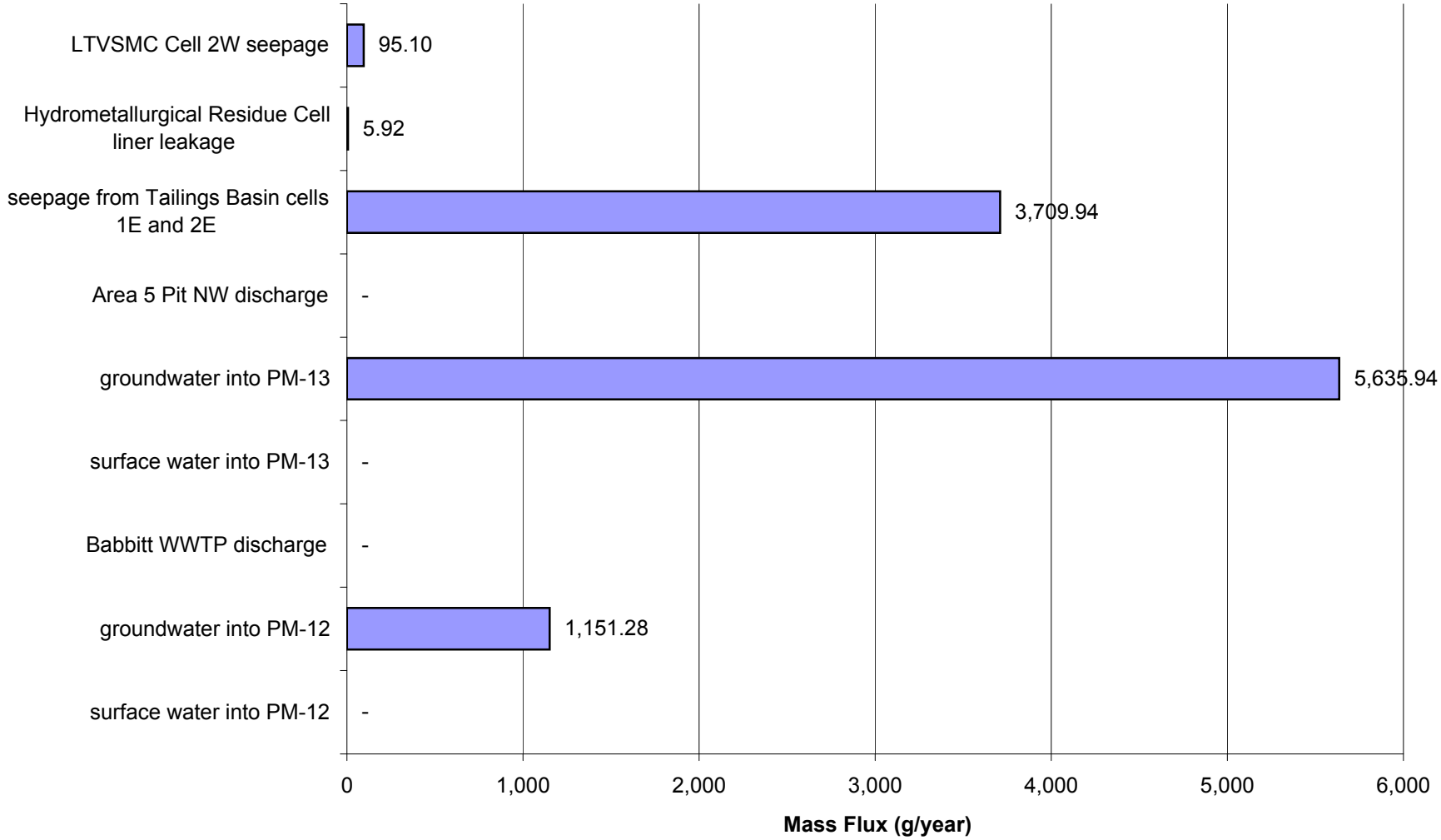
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for High Flow for Nickel (Ni)



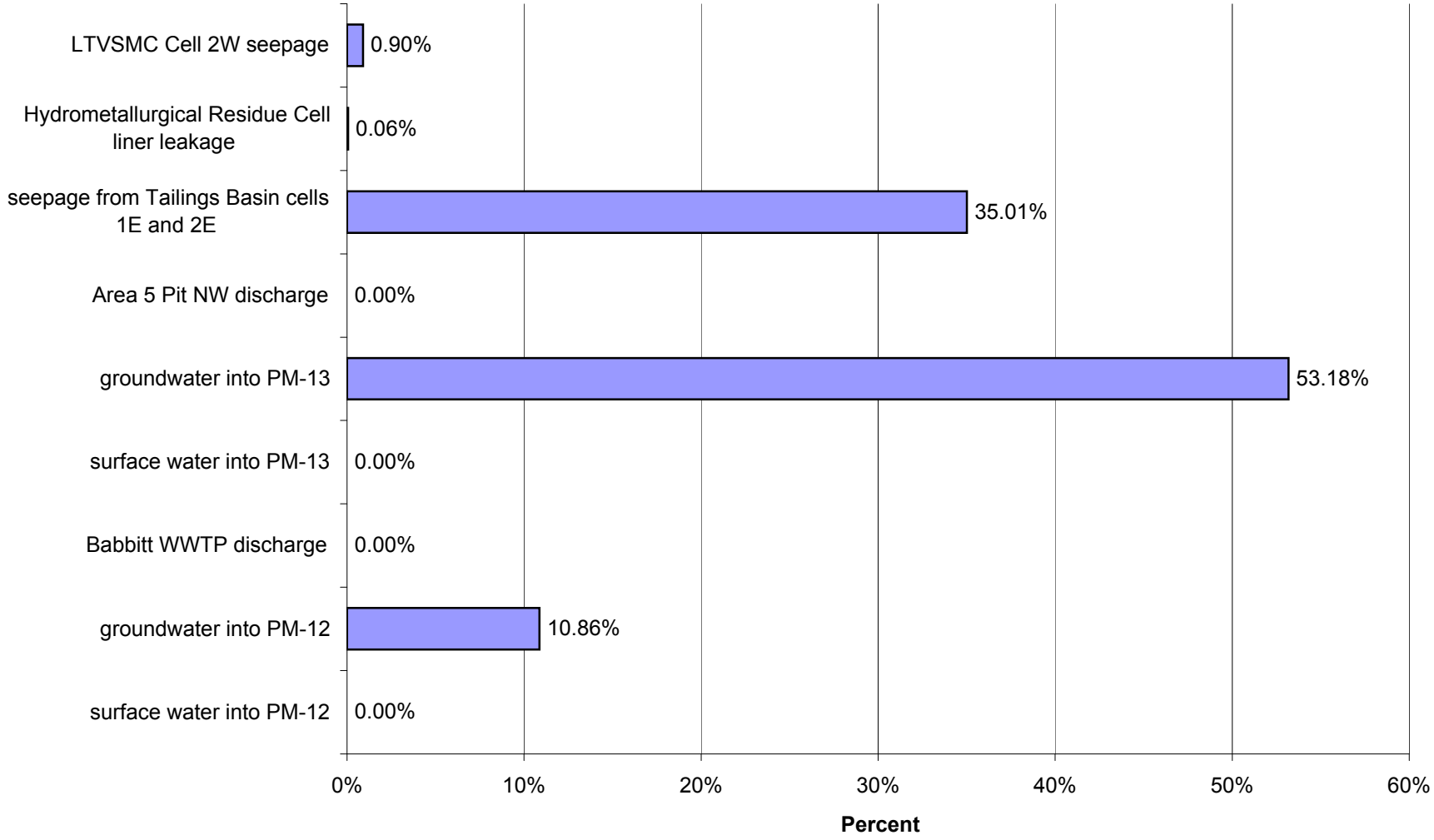
Proposed Action: Percent of Impacts at PM-13 in Post - Closure for High Flow for Nickel (Ni)



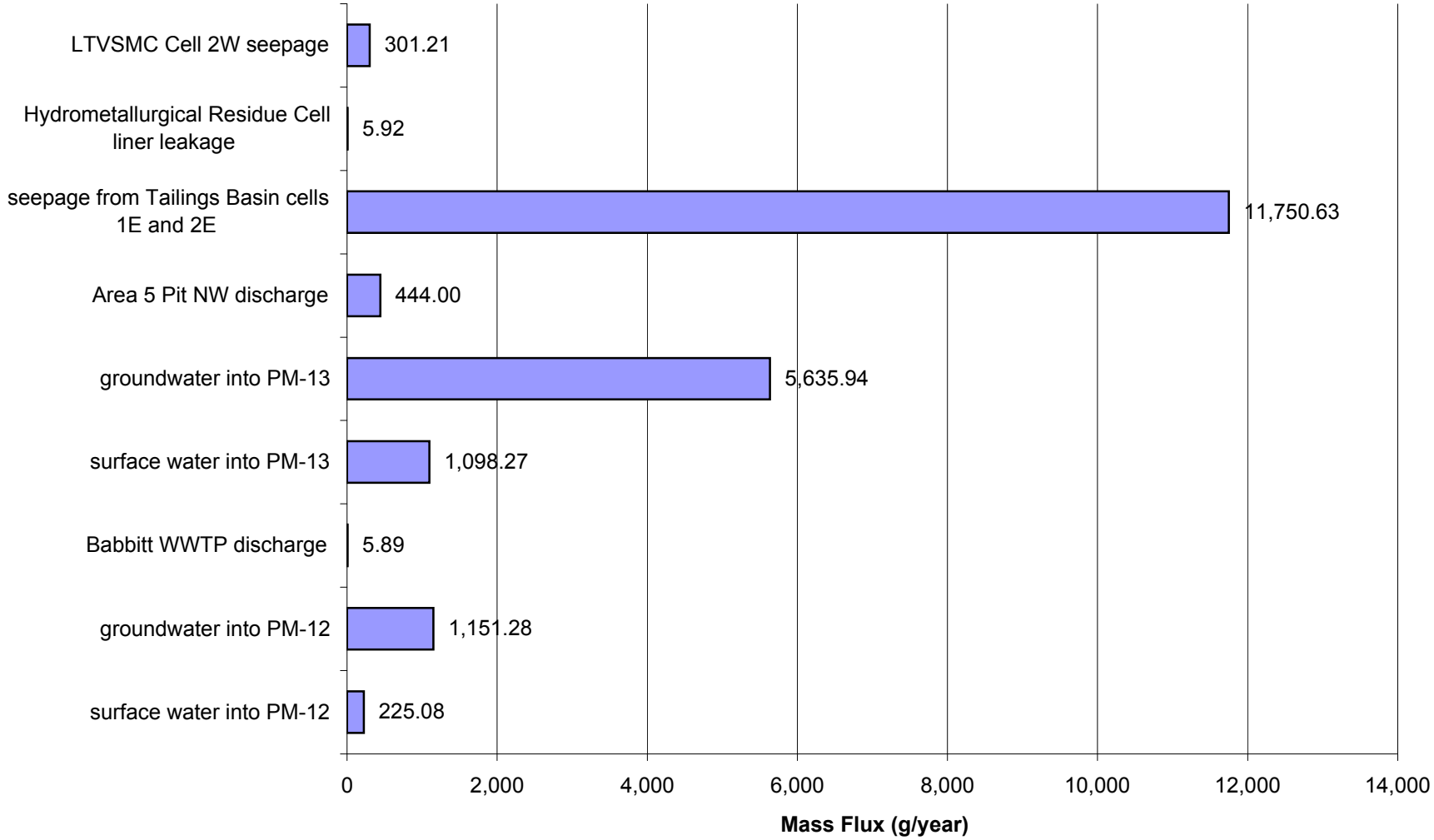
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for Low Flow for Antimony (Sb)



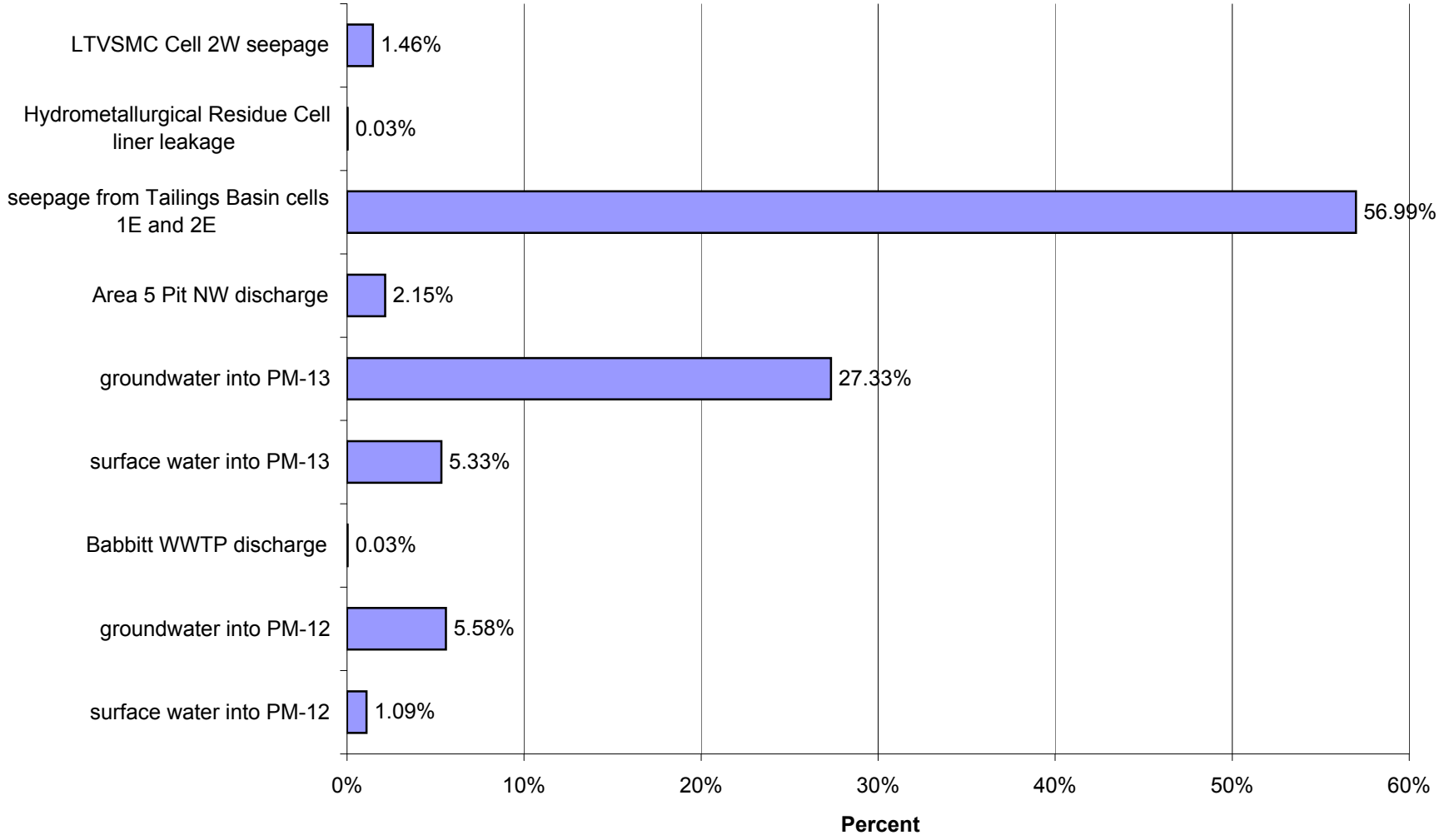
Proposed Action: Percent of Impacts at PM-13 in Post - Closure for Low Flow for Antimony (Sb)



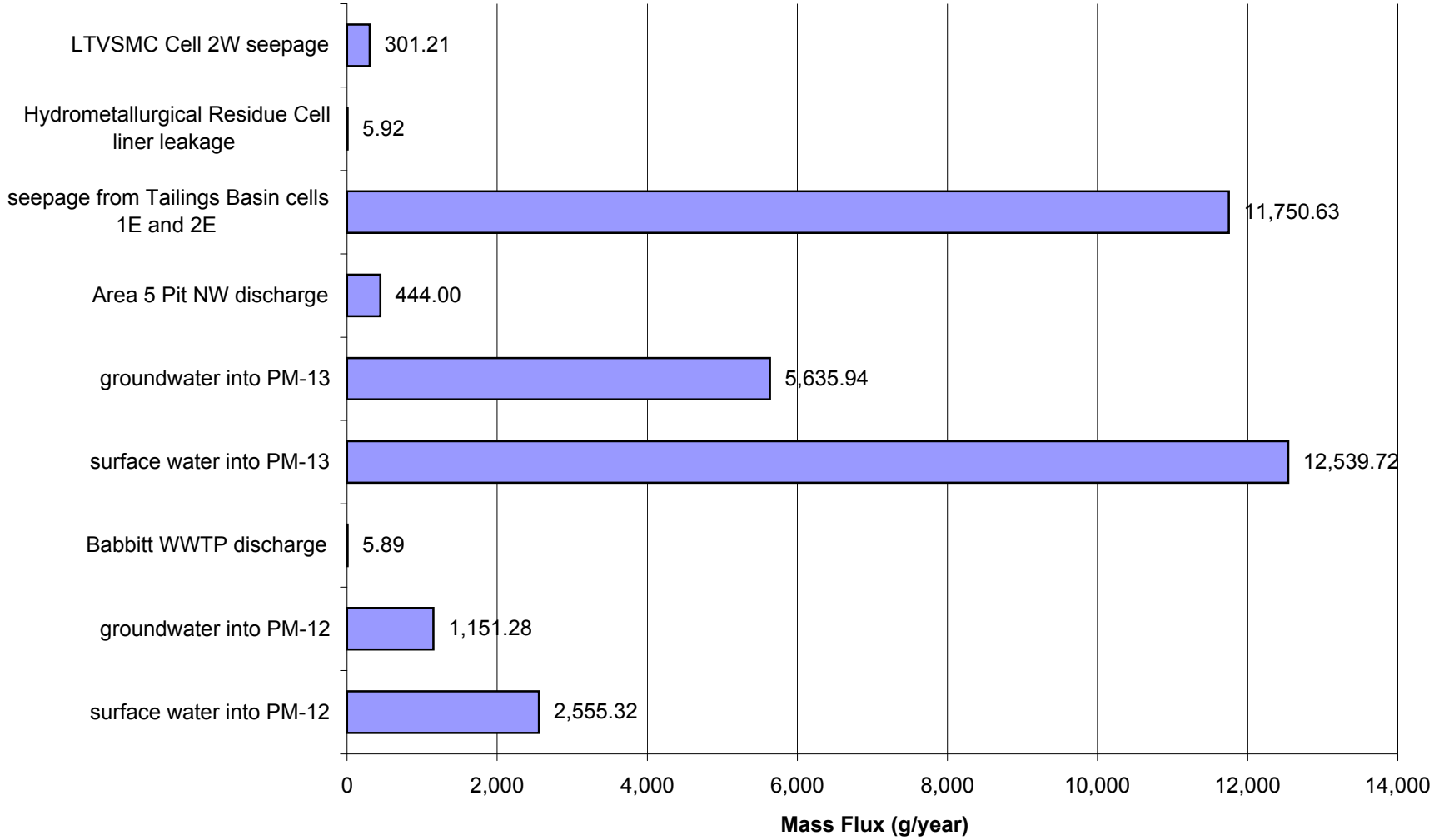
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for Average Flow for Antimony (Sb)



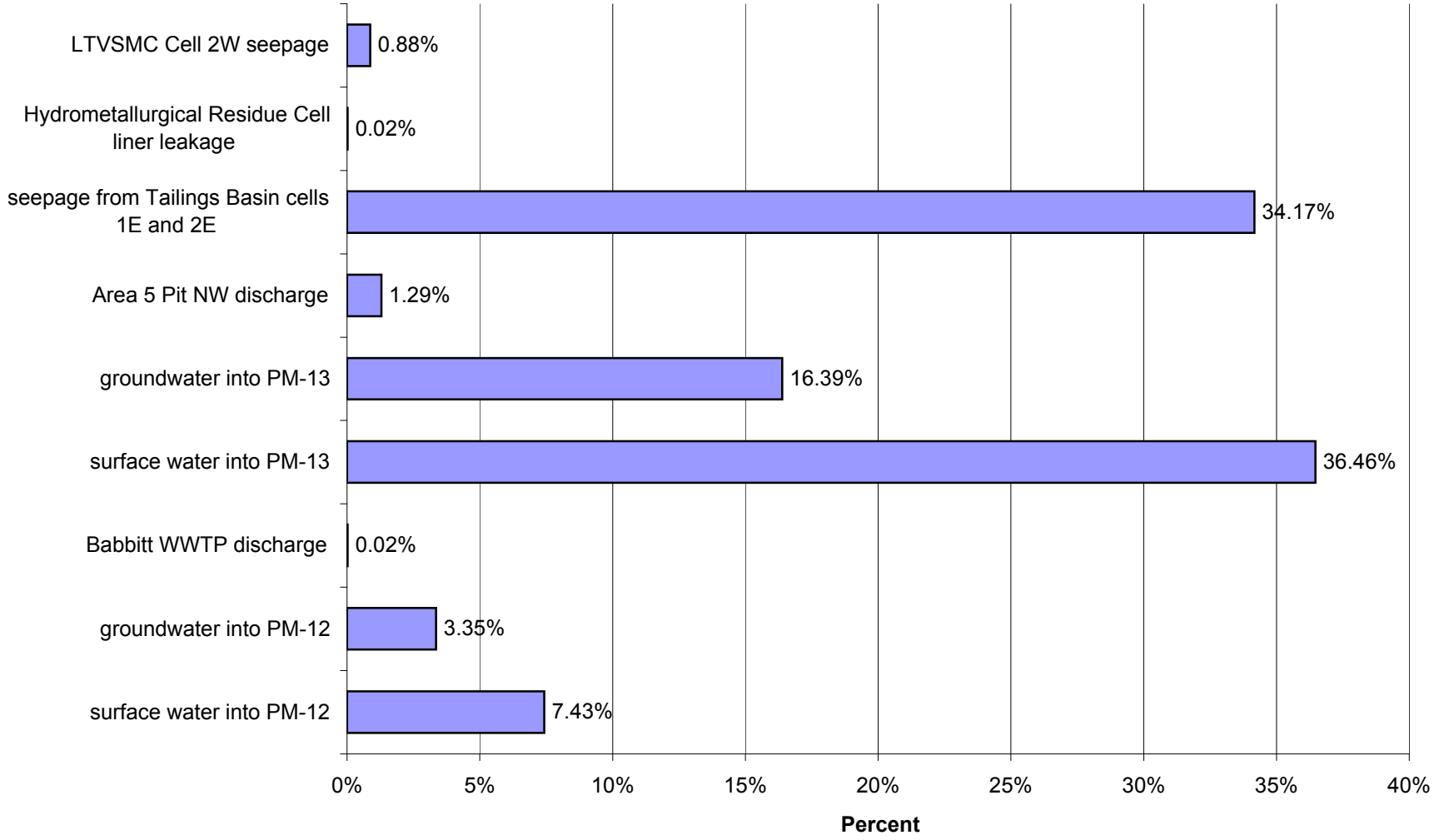
Proposed Action: Percent of Impacts at PM-13 in Post - Closure for Average Flow for Antimony (Sb)



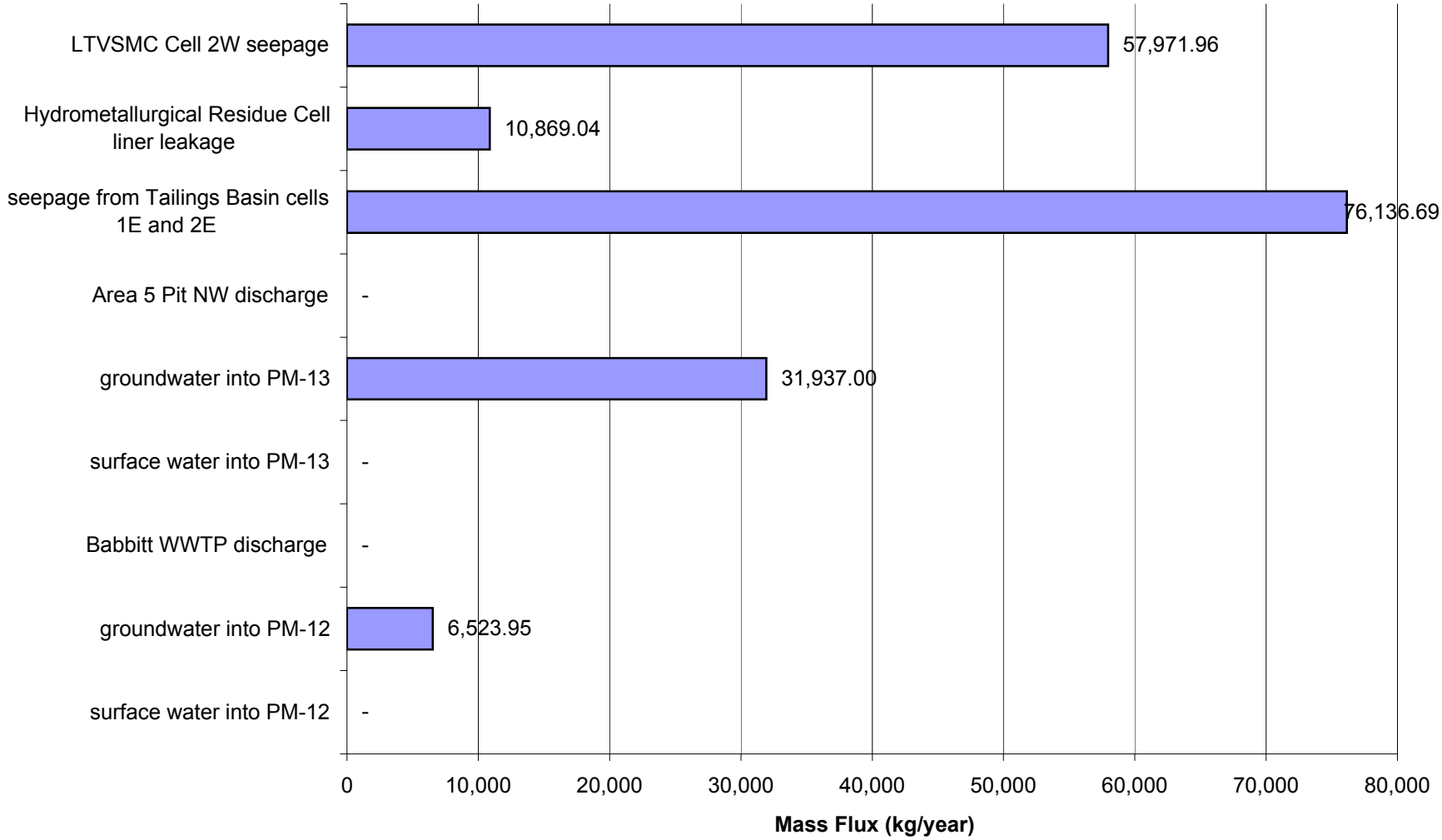
Proposed Action: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for High Flow for Antimony (Sb)



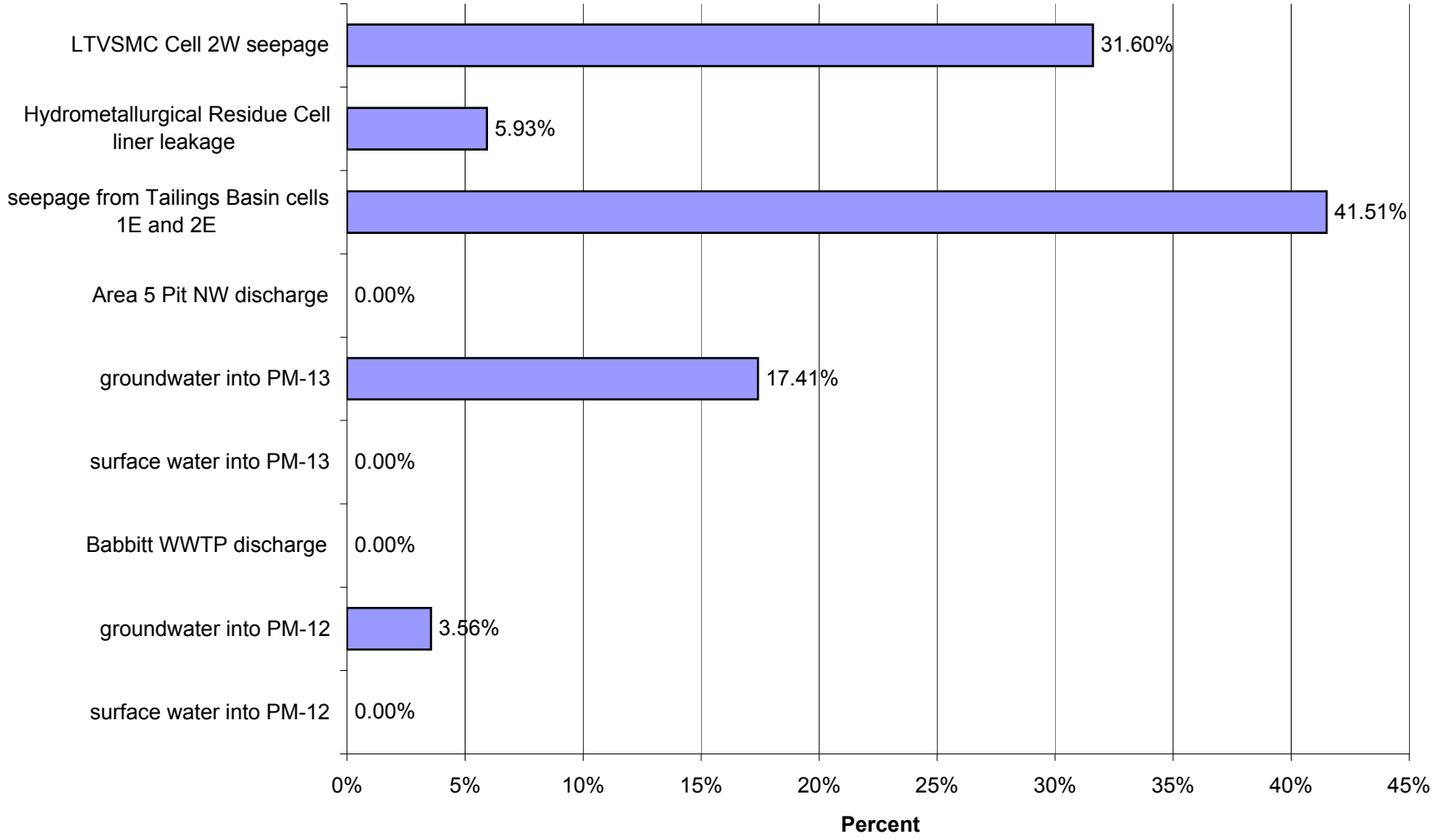
Proposed Action: Percent of Impacts at PM-13 in Post - Closure for High Flow for Antimony (Sb)



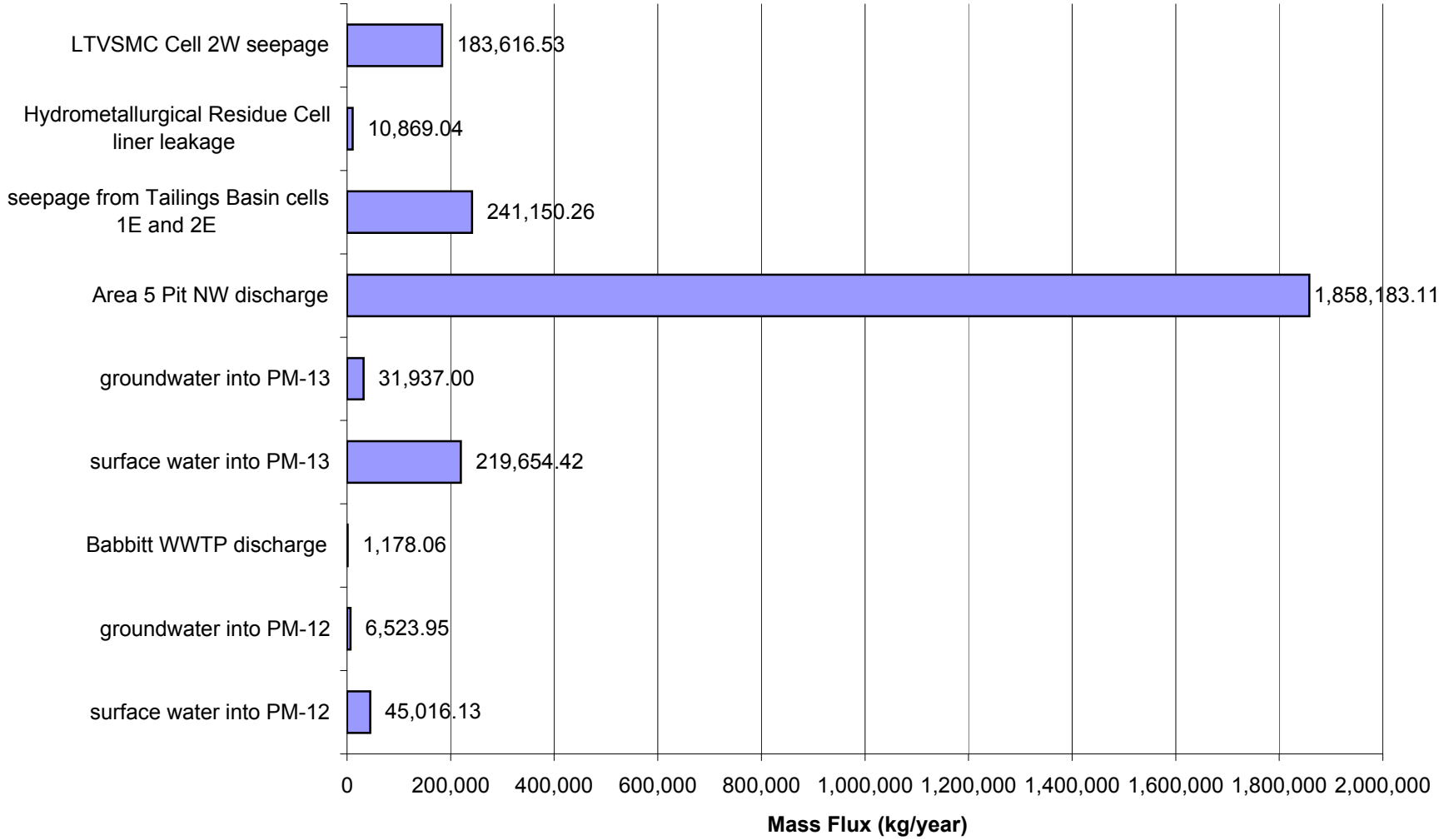
Proposed Action: Mass Flux (kg/year) of Impacts at PM-13 in Post - Closure for Low Flow for Sulfate (SO_4)



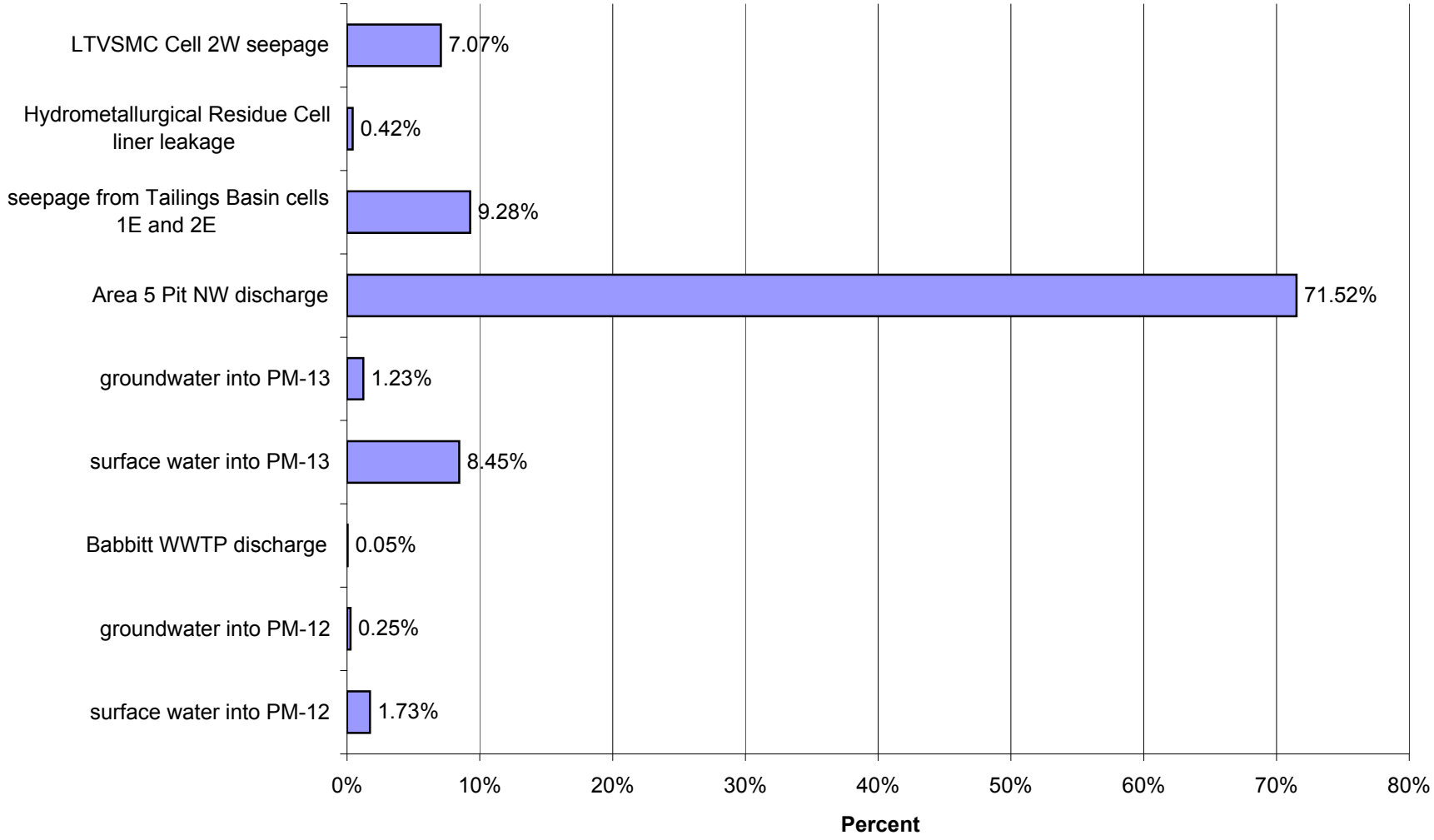
Proposed Action: Percent of Impacts at PM-13 in Post - Closure for Low Flow for Sulfate (SO_4)



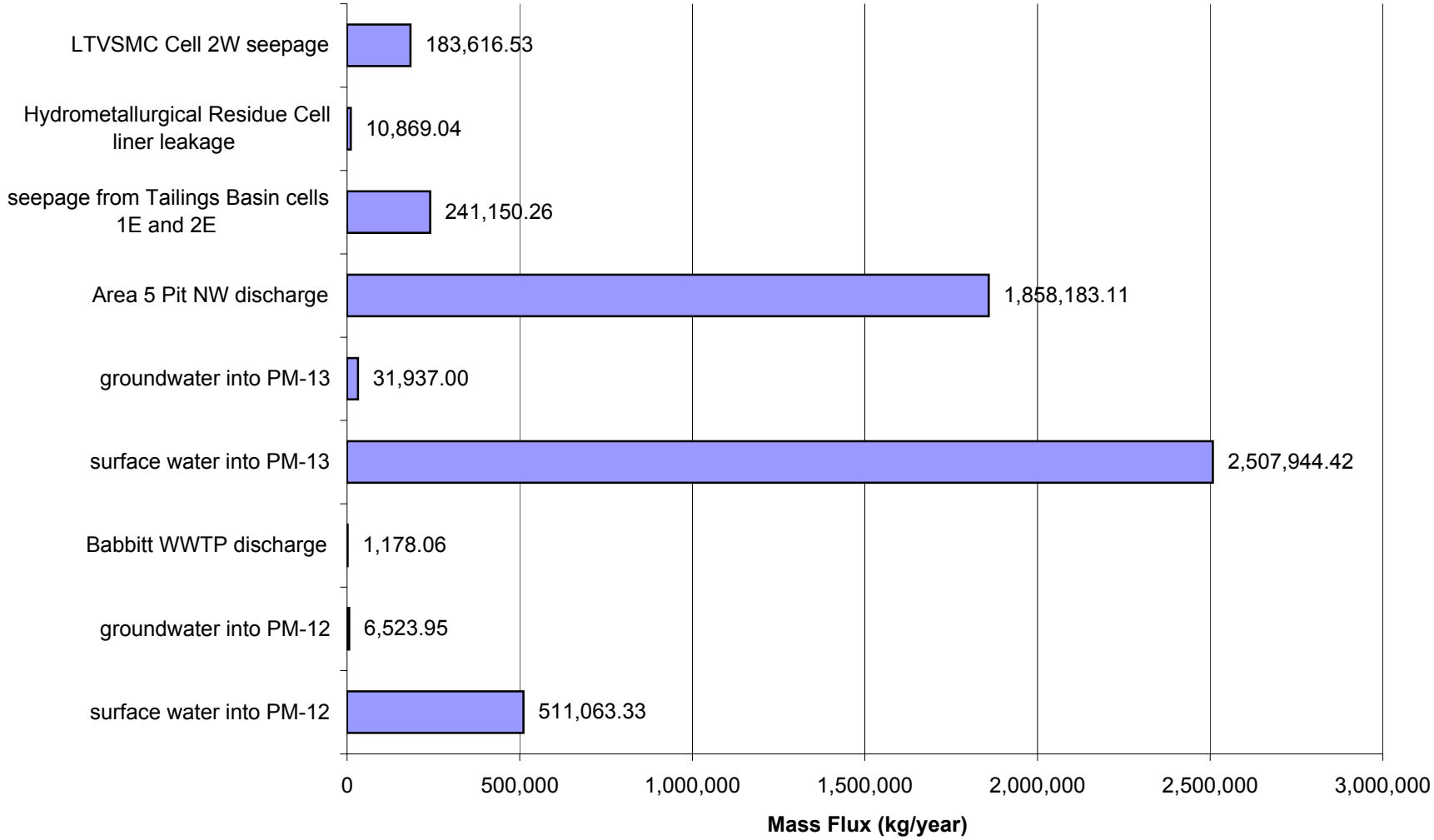
Proposed Action: Mass Flux (kg/year) of Impacts at PM-13 in Post - Closure for Average Flow for Sulfate (SO_4)



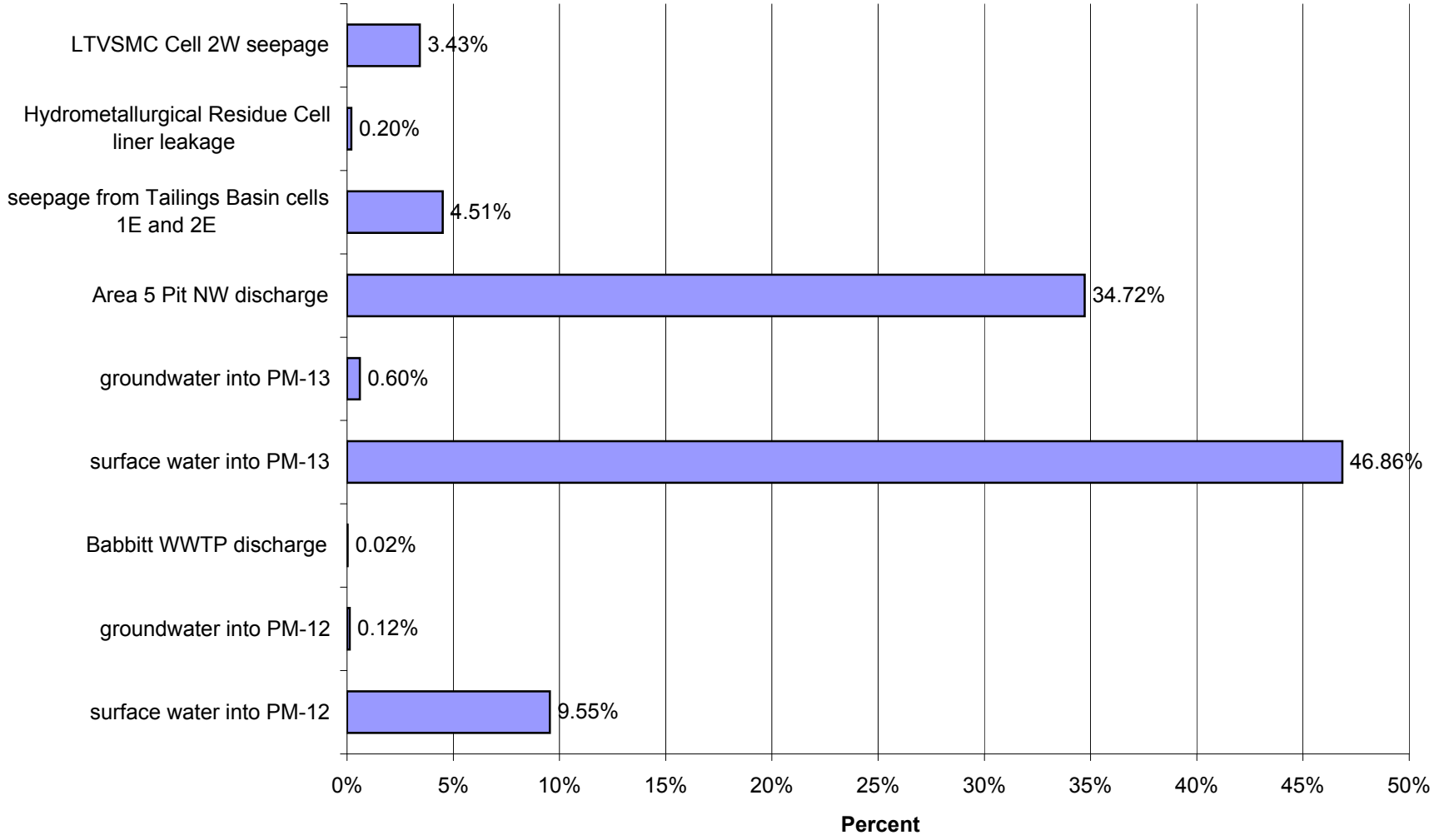
Proposed Action: Percent of Impacts at PM-13 in Post - Closure for Average Flow for Sulfate (SO_4)



Proposed Action: Mass Flux (kg/year) of Impacts at PM-13 in Post - Closure for High Flow for Sulfate (SO_4)

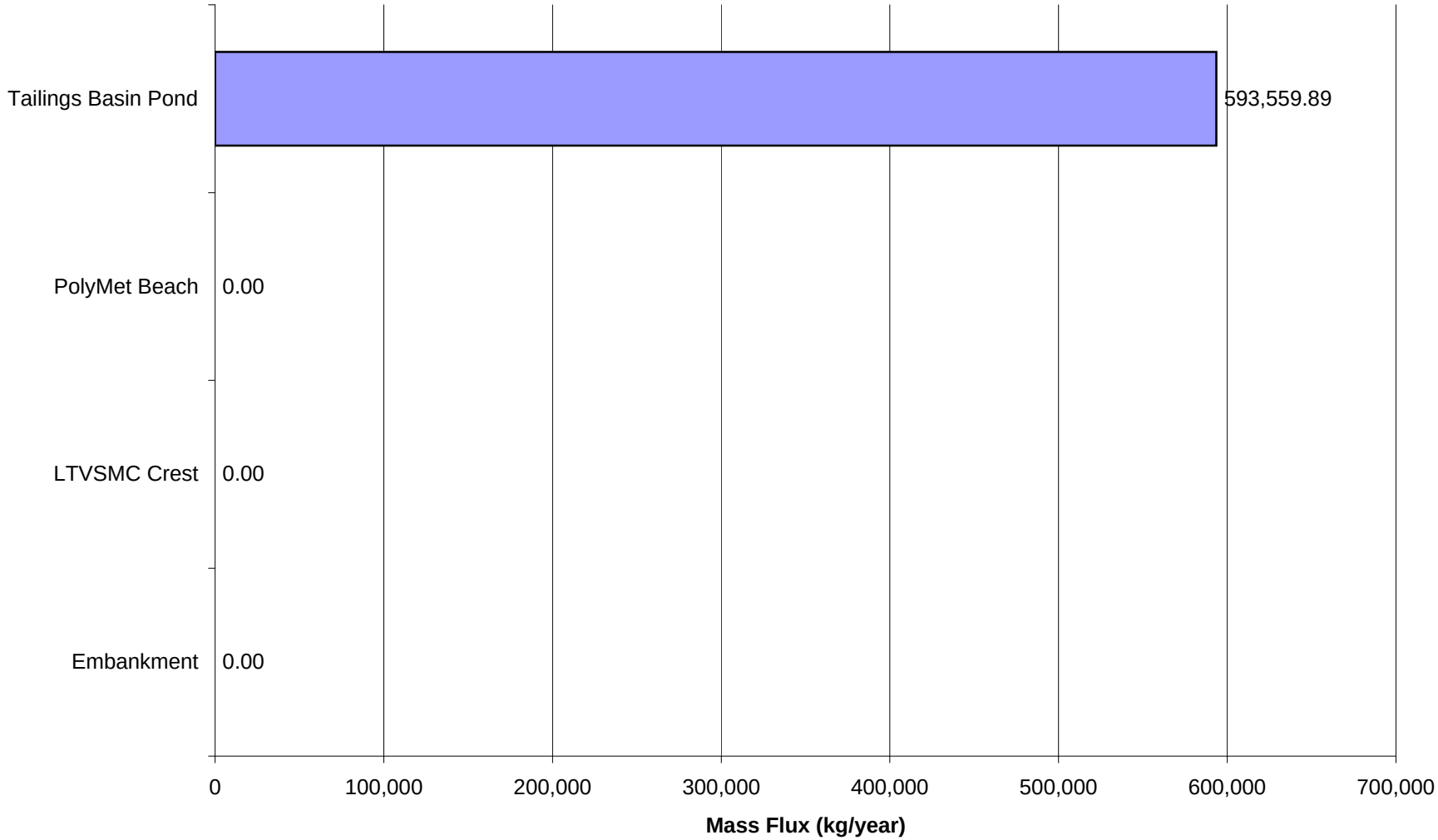


Proposed Action: Percent of Impacts at PM-13 in Post - Closure for High Flow for Sulfate (SO_4)

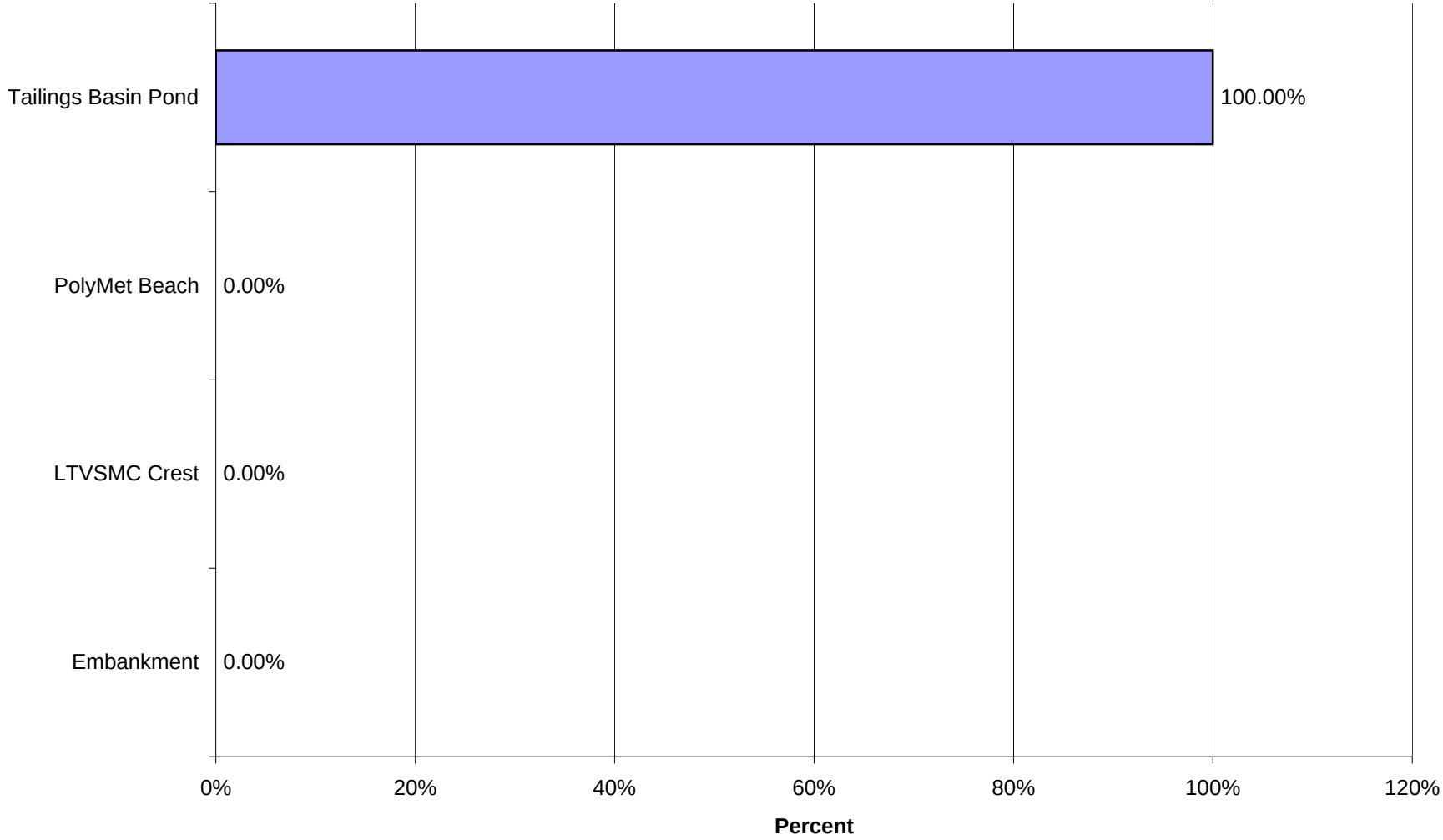


Appendix G.3
Tailings Basin
Geotechnical Mitigation

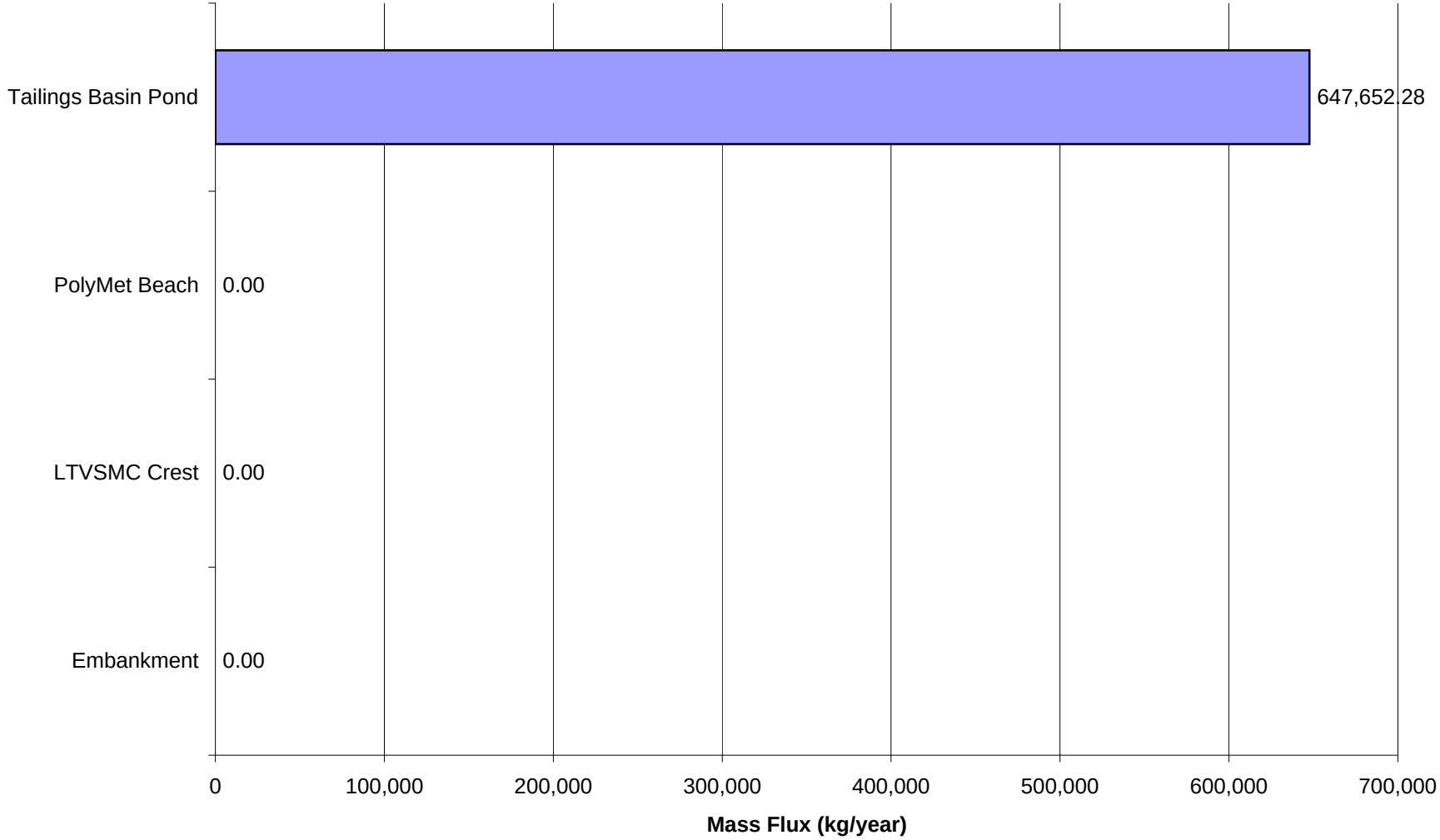
Geotechnical Mitigation: Mass Flux (kg/year) of Tailings Basin Features in Year 1 for Sulfate (SO_4)



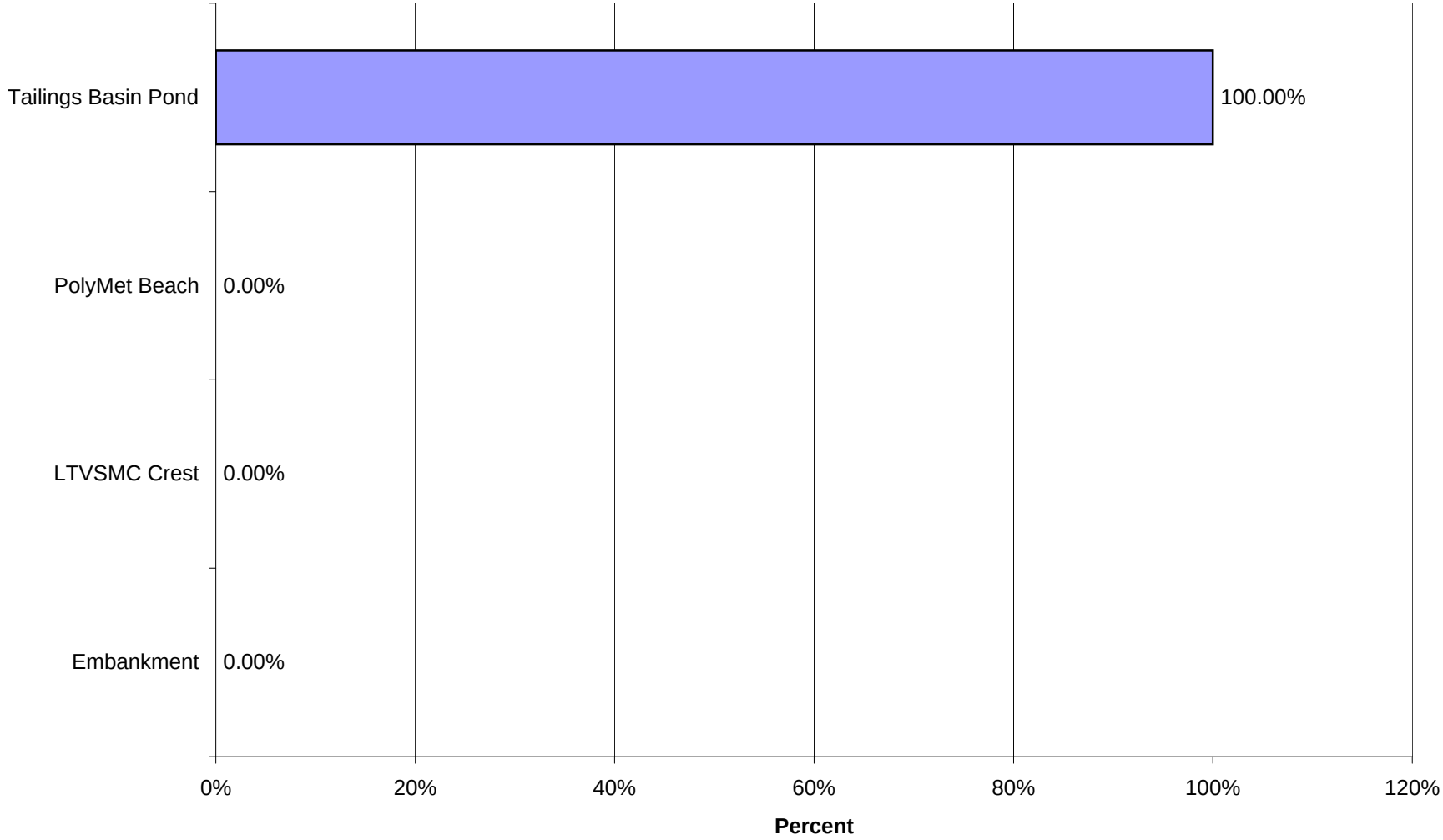
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 1 for Sulfate (SO_4)



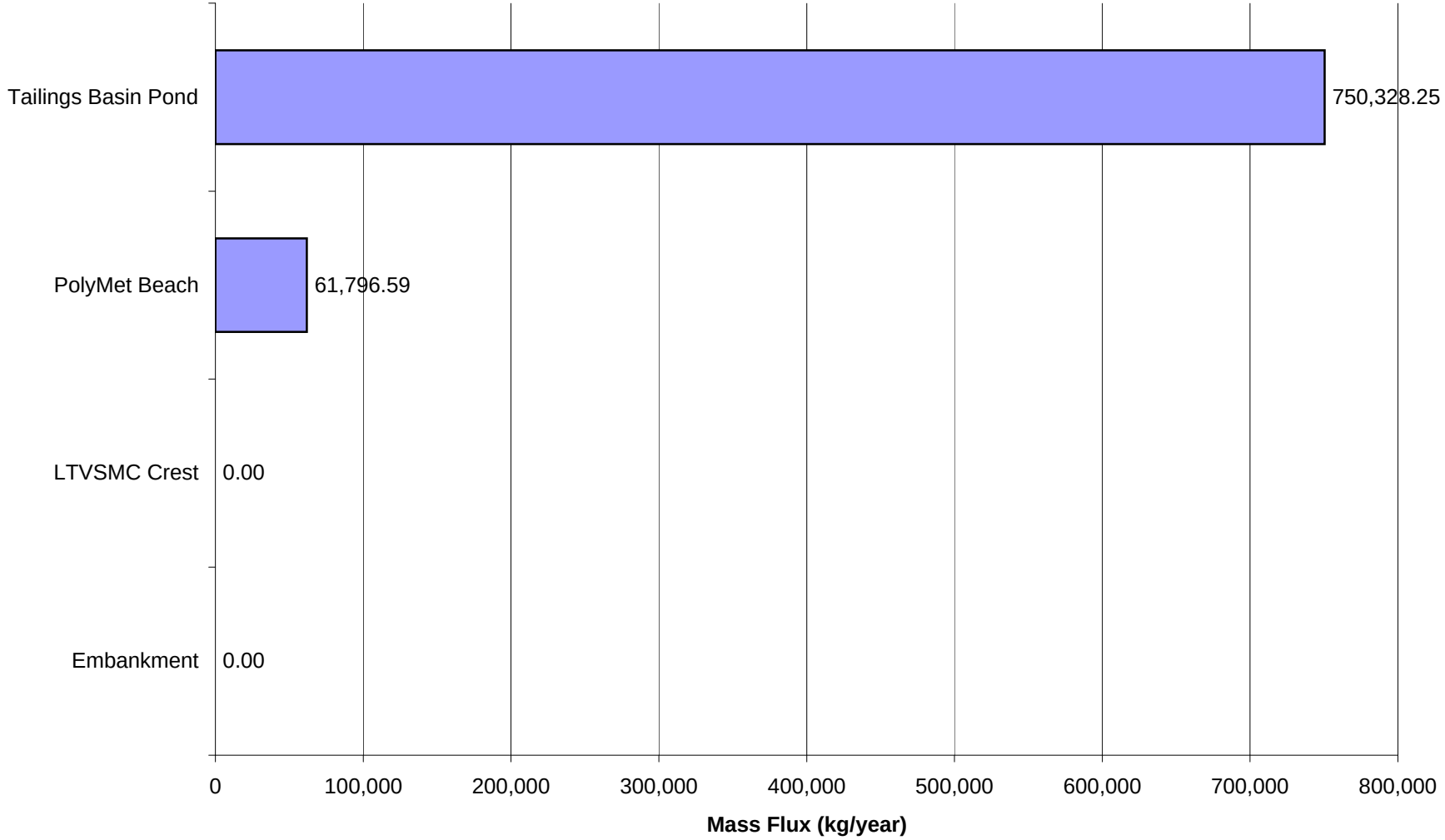
Geotechnical Mitigation: Mass Flux (kg/year) of Tailings Basin Features in Year 5 for Sulfate (SO_4)



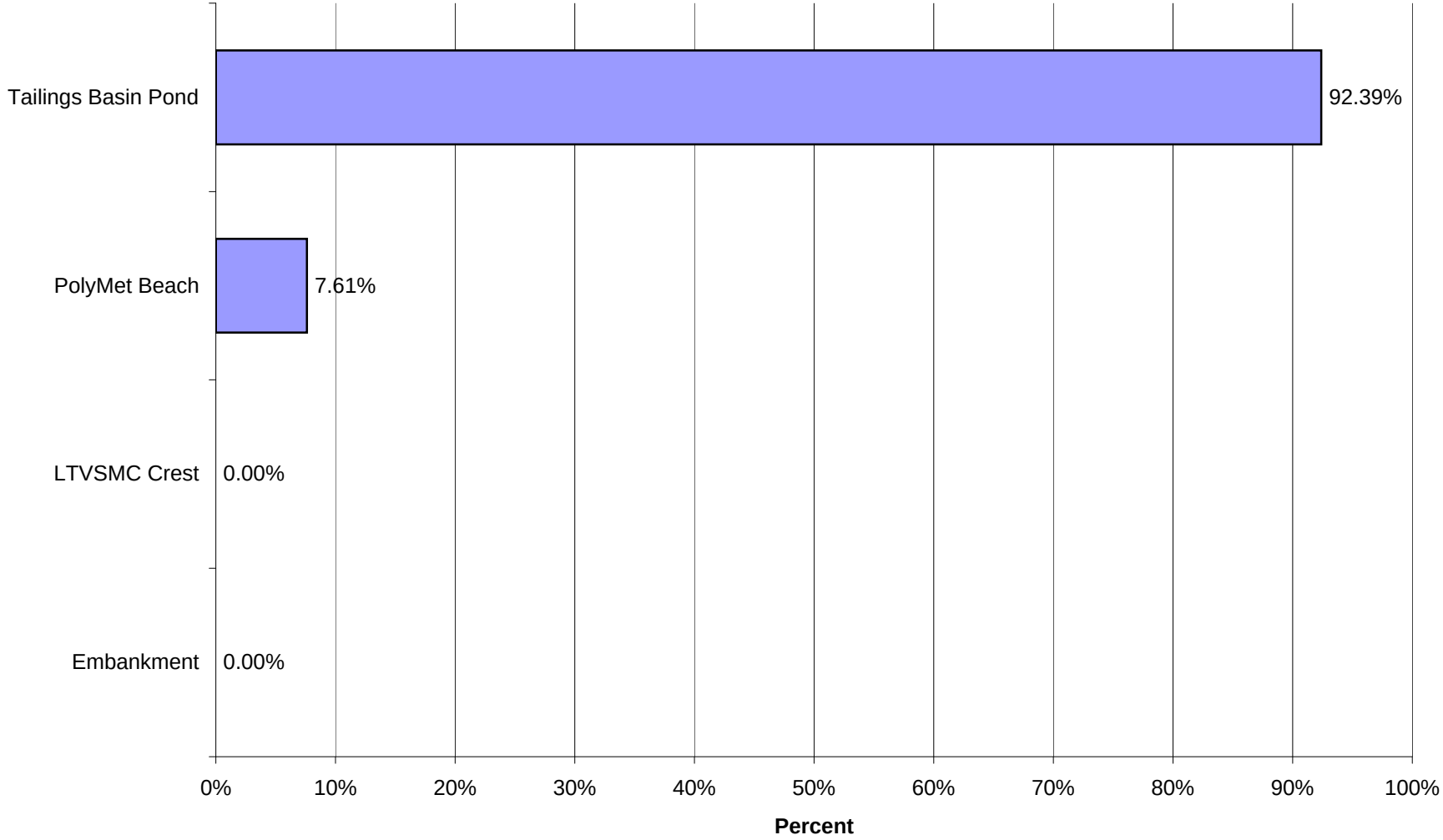
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 5 for Sulfate (SO_4)



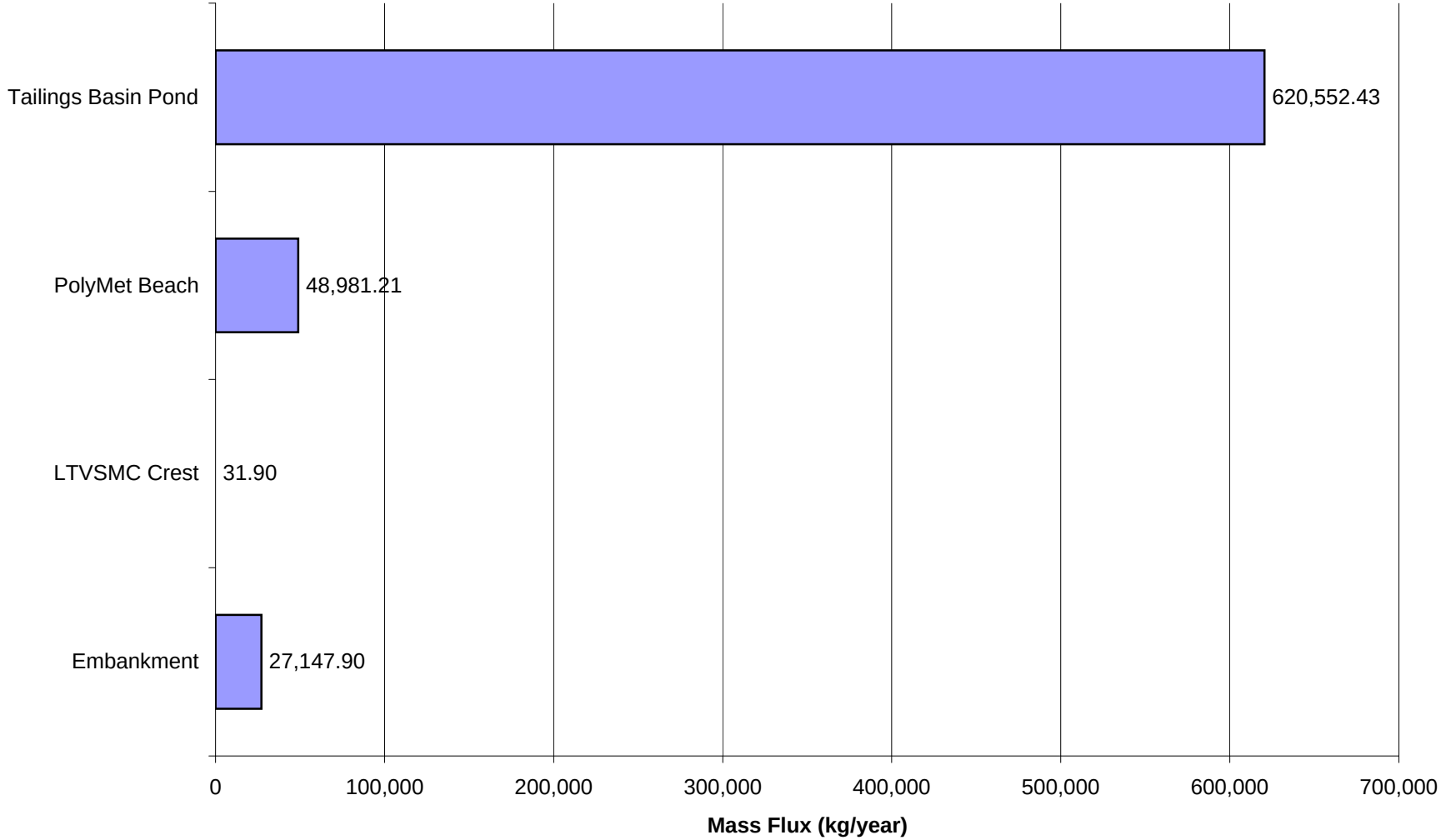
Geotechnical Mitigation: Mass Flux (kg/year) of Tailings Basin Features in Year 10 for Sulfate (SO_4)



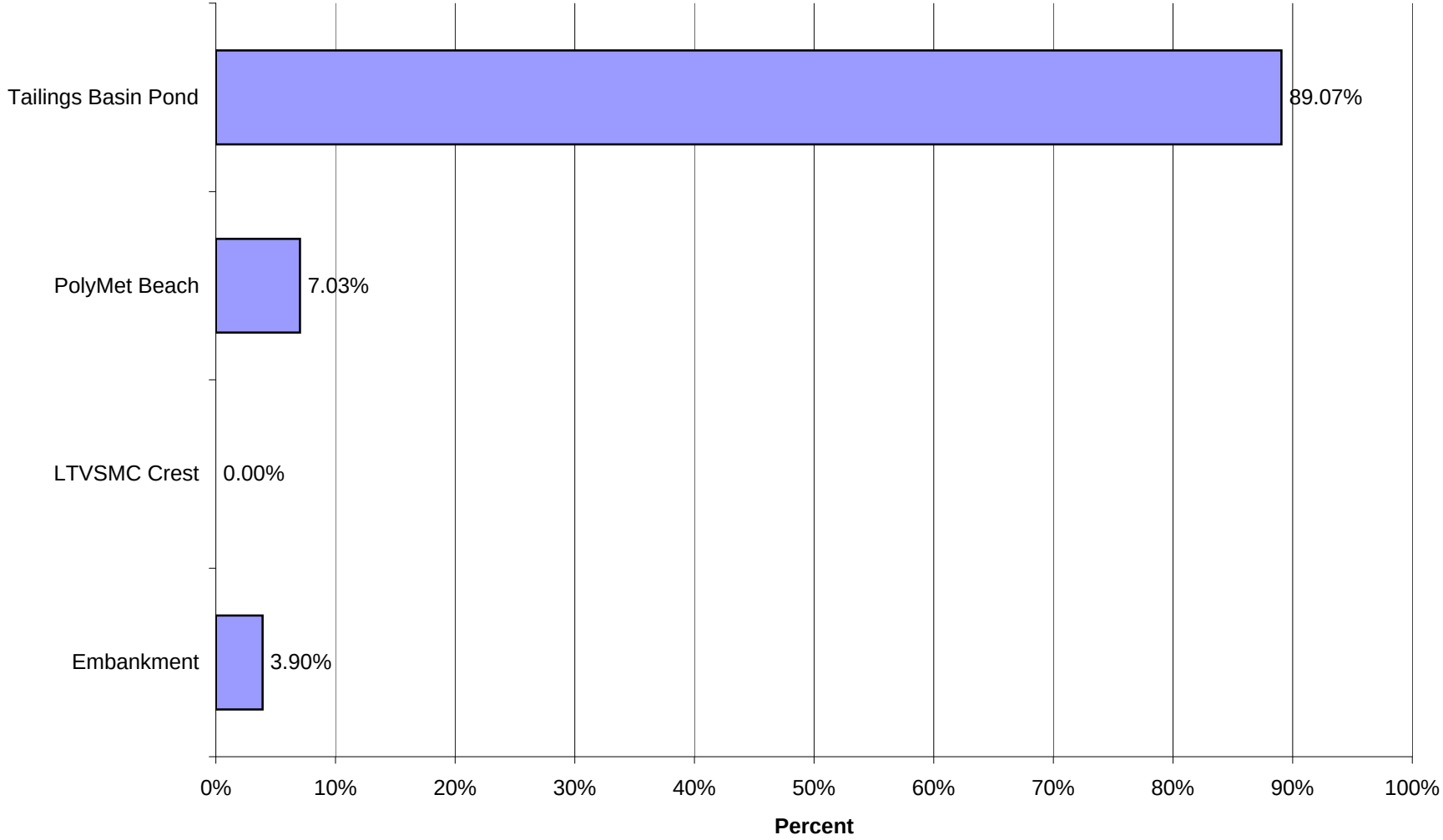
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 10 for Sulfate (SO_4)



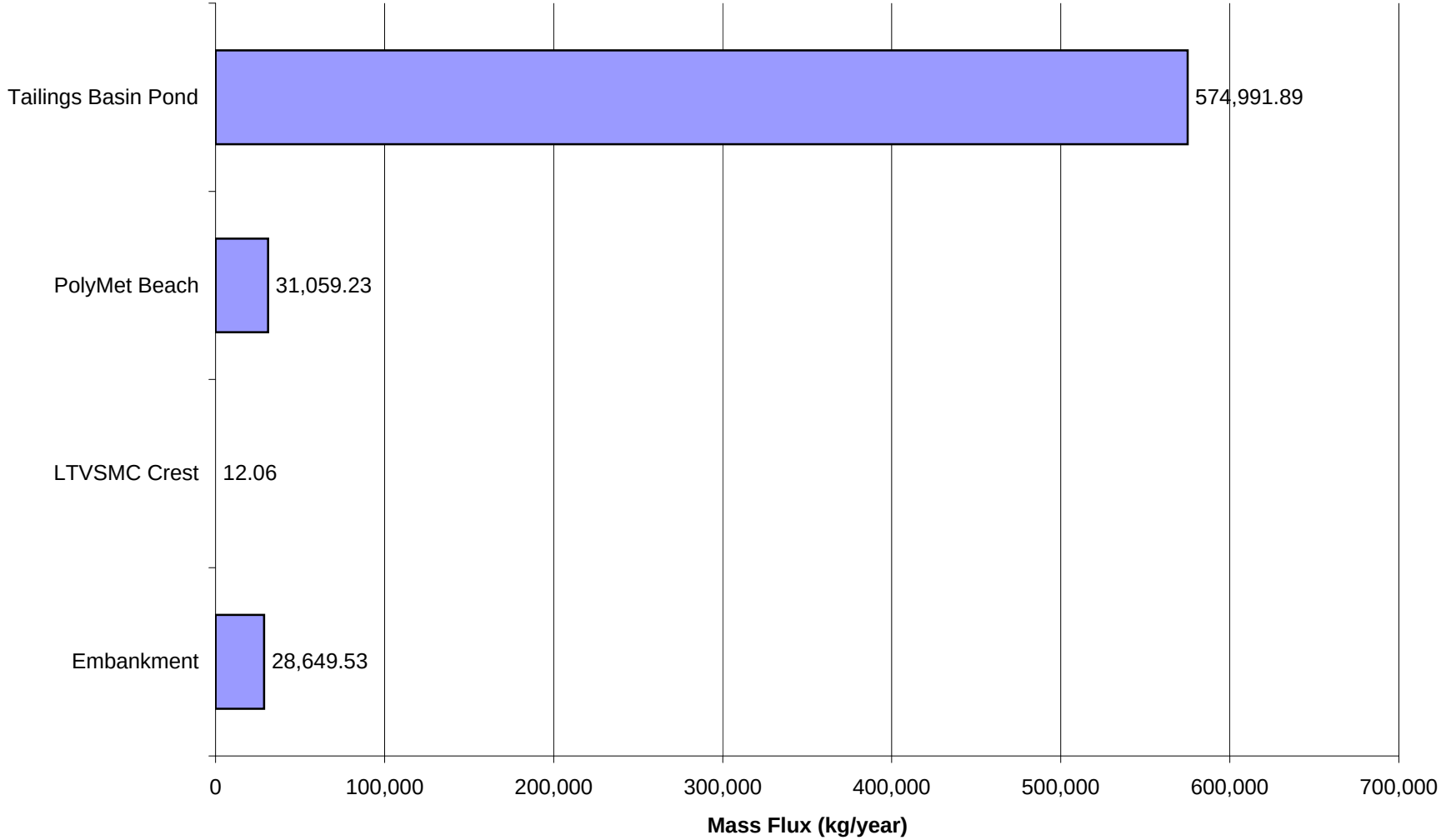
Geotechnical Mitigation: Mass Flux (kg/year) of Tailings Basin Features in Year 15 for Sulfate (SO_4)



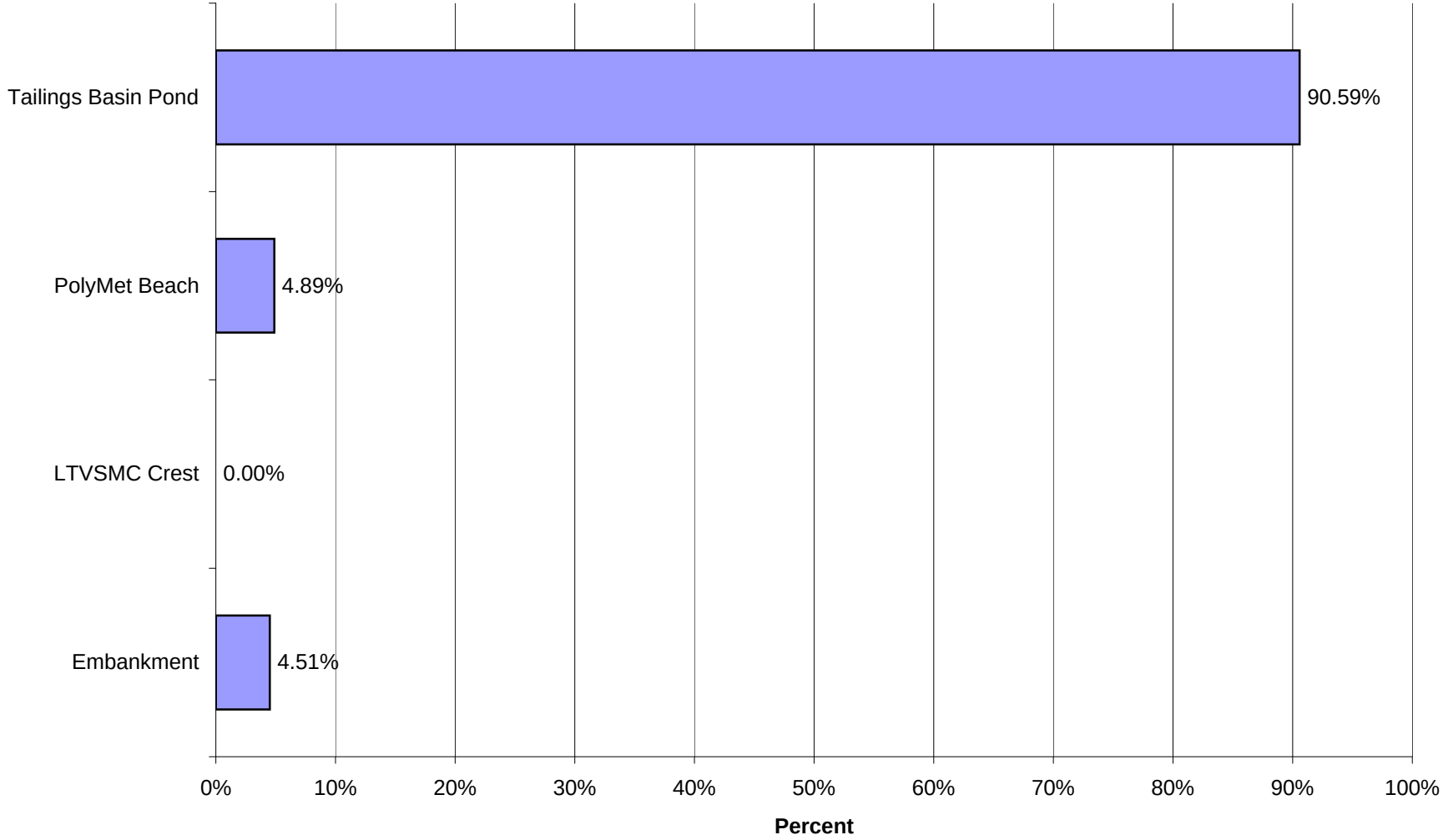
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 15 for Sulfate (SO_4)



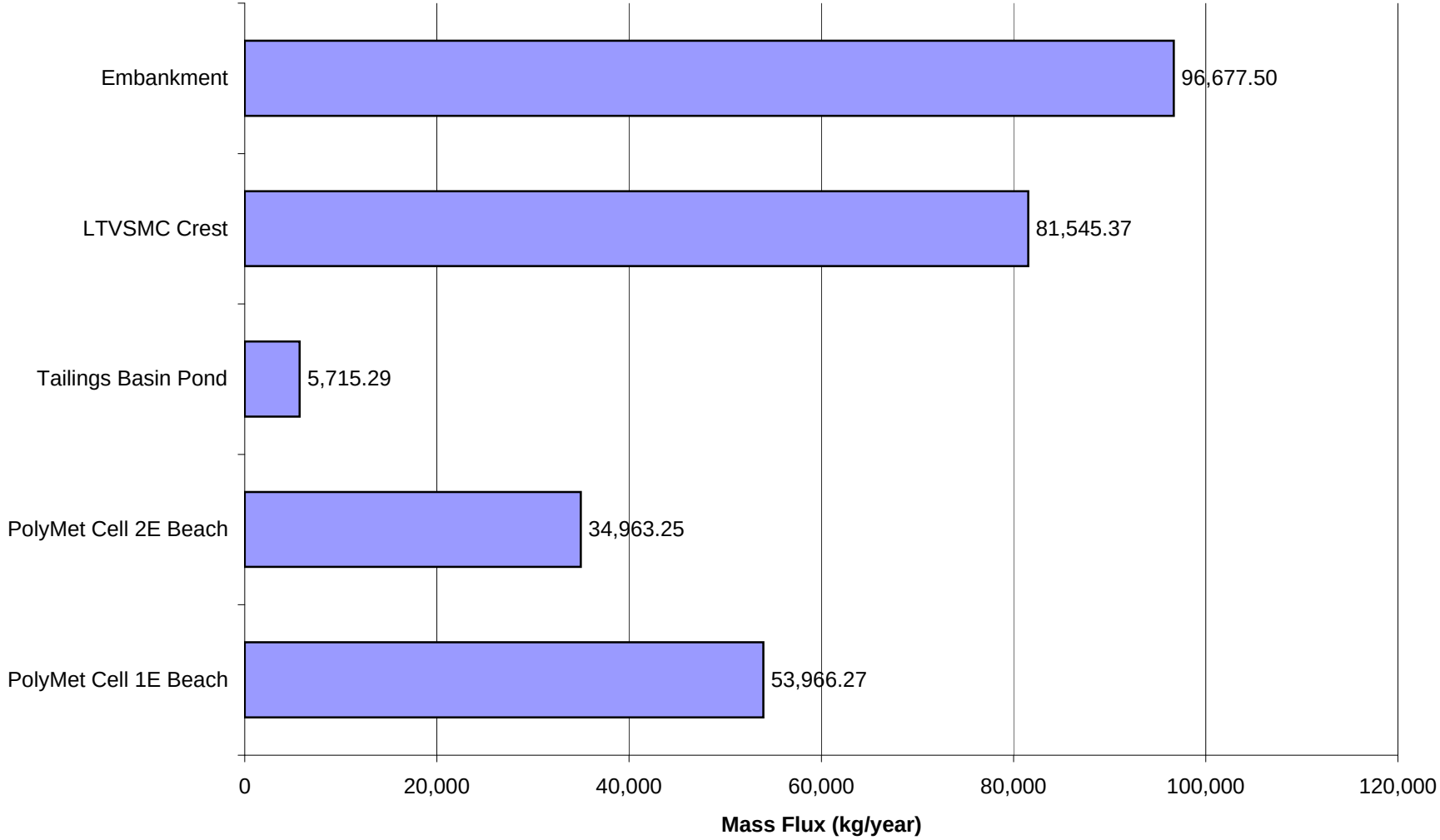
Geotechnical Mitigation: Mass Flux (kg/year) of Tailings Basin Features in Year 20 for Sulfate (SO_4)



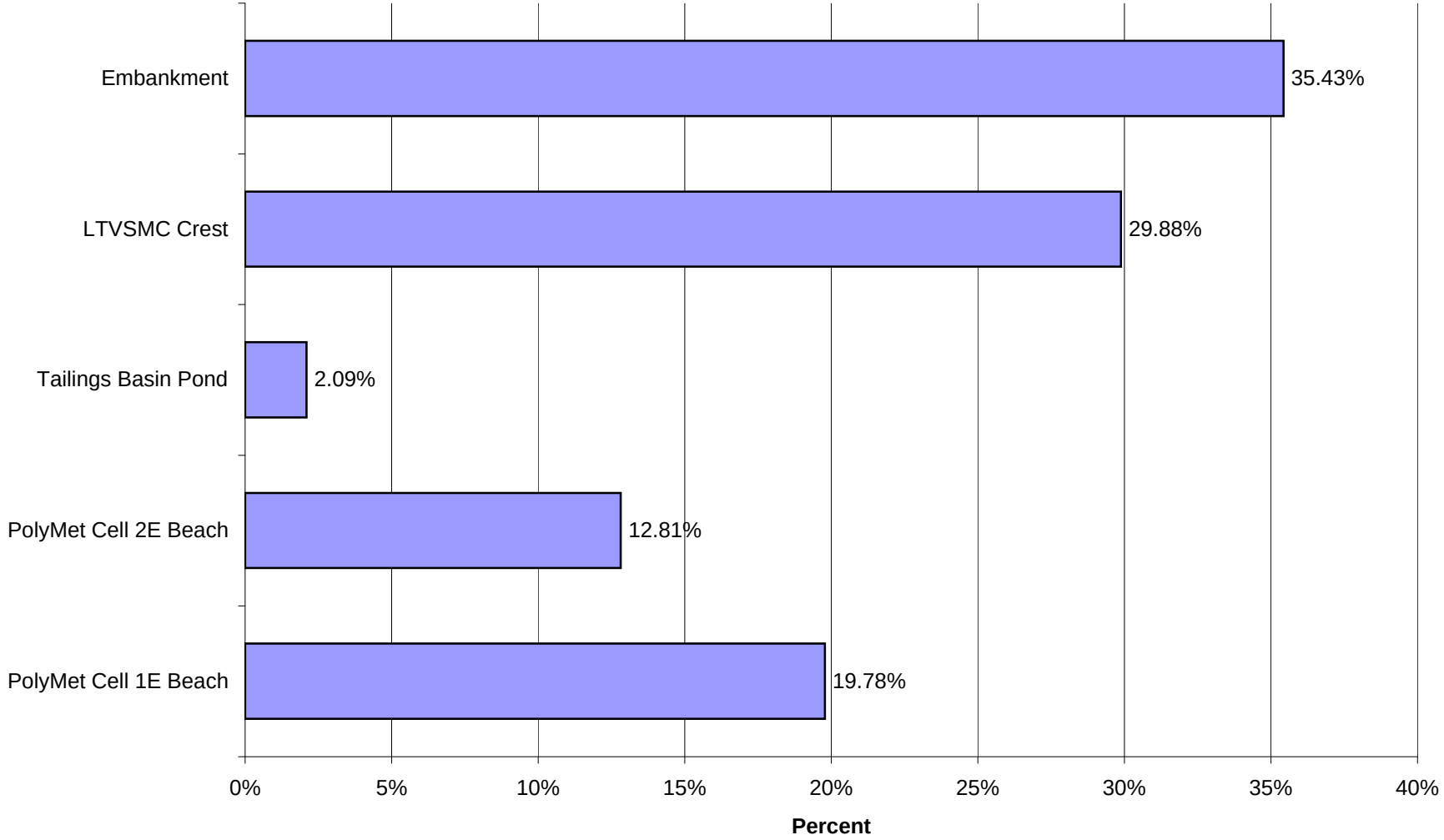
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 20 for Sulfate (SO_4)



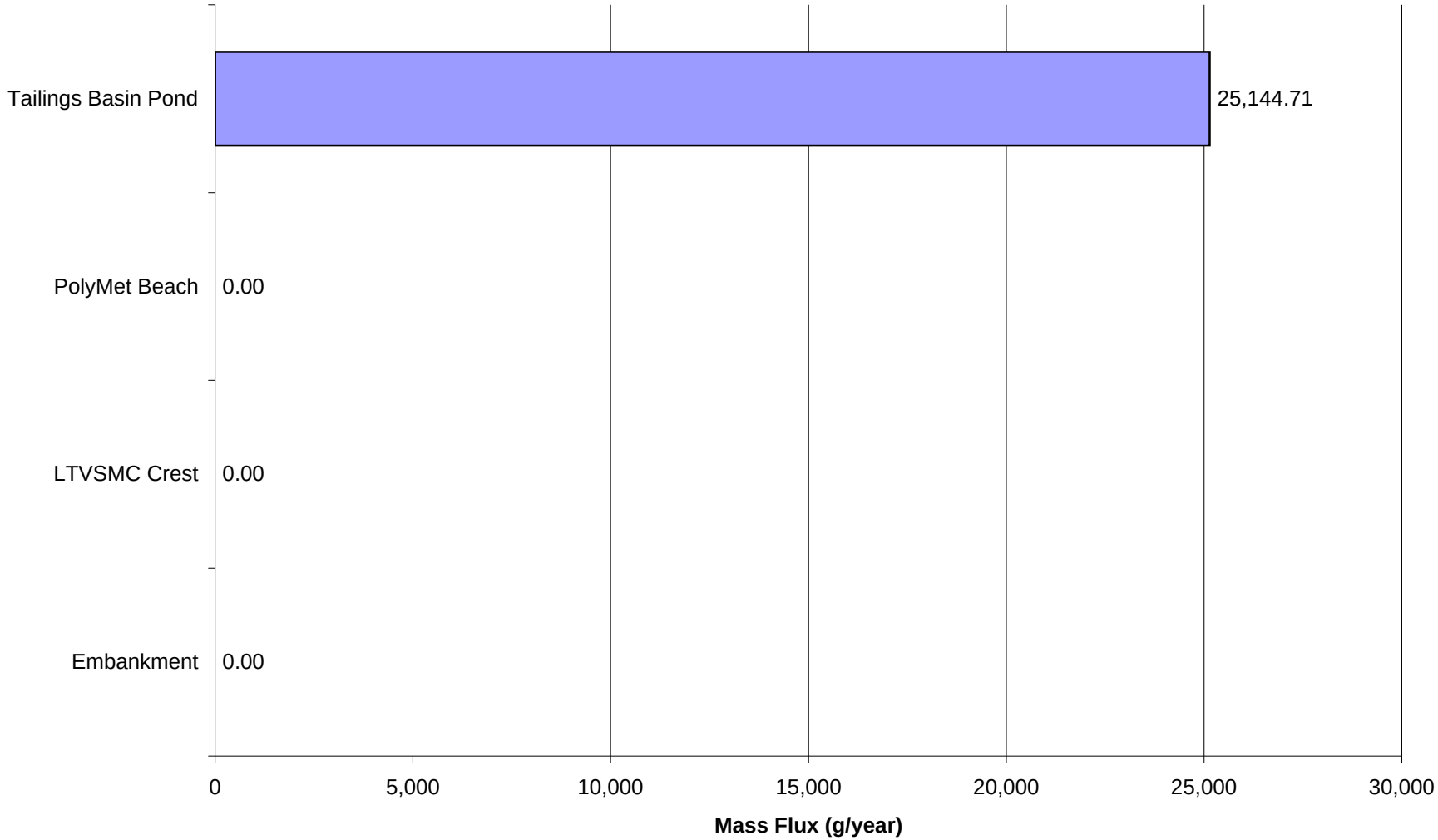
Geotechnical Mitigation: Mass Flux (kg/year) of Tailings Basin Features in Closure for Sulfate (SO_4)



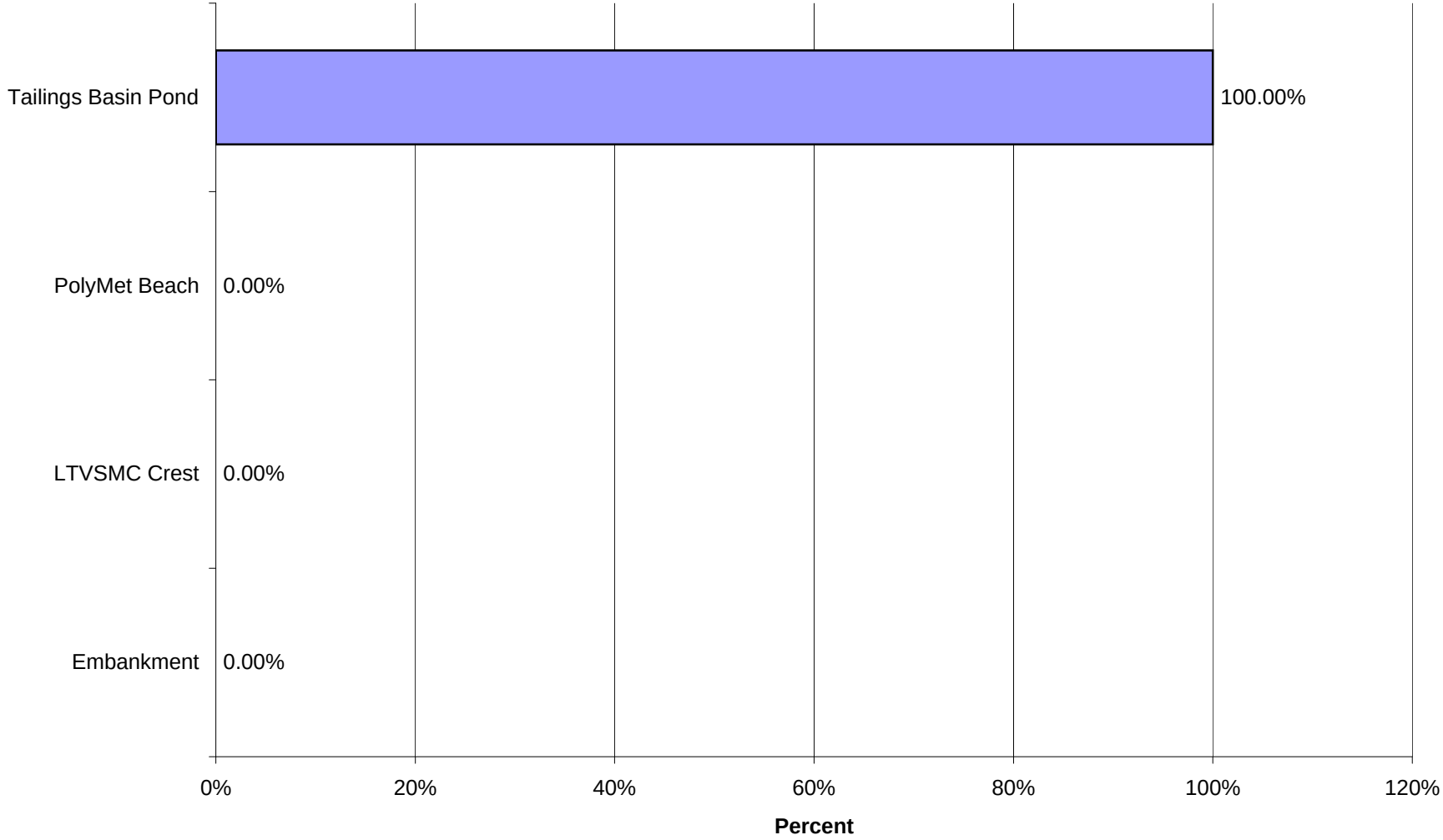
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Closure for Sulfate (SO_4)



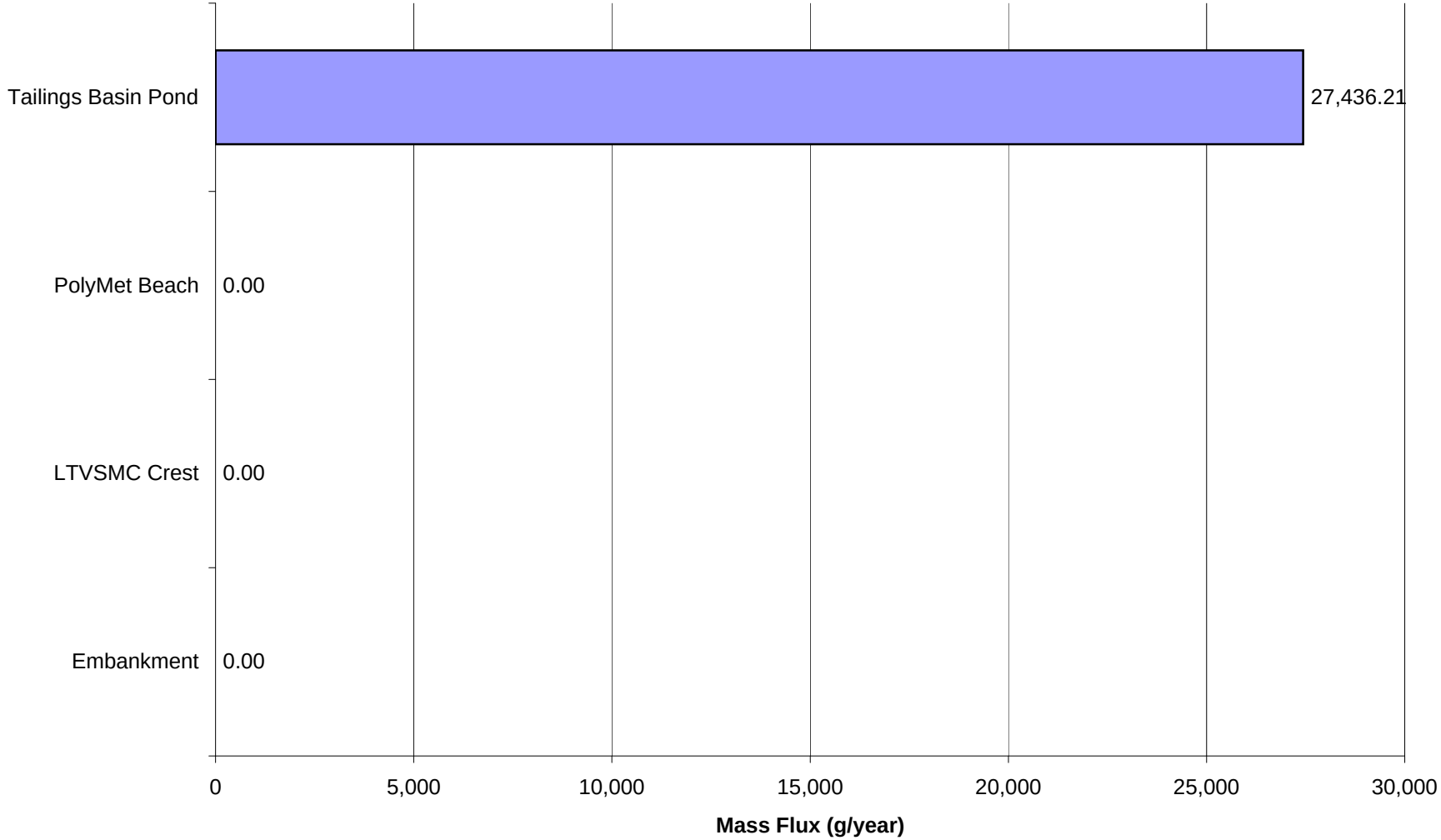
Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Year 1 for Antimony (Sb)



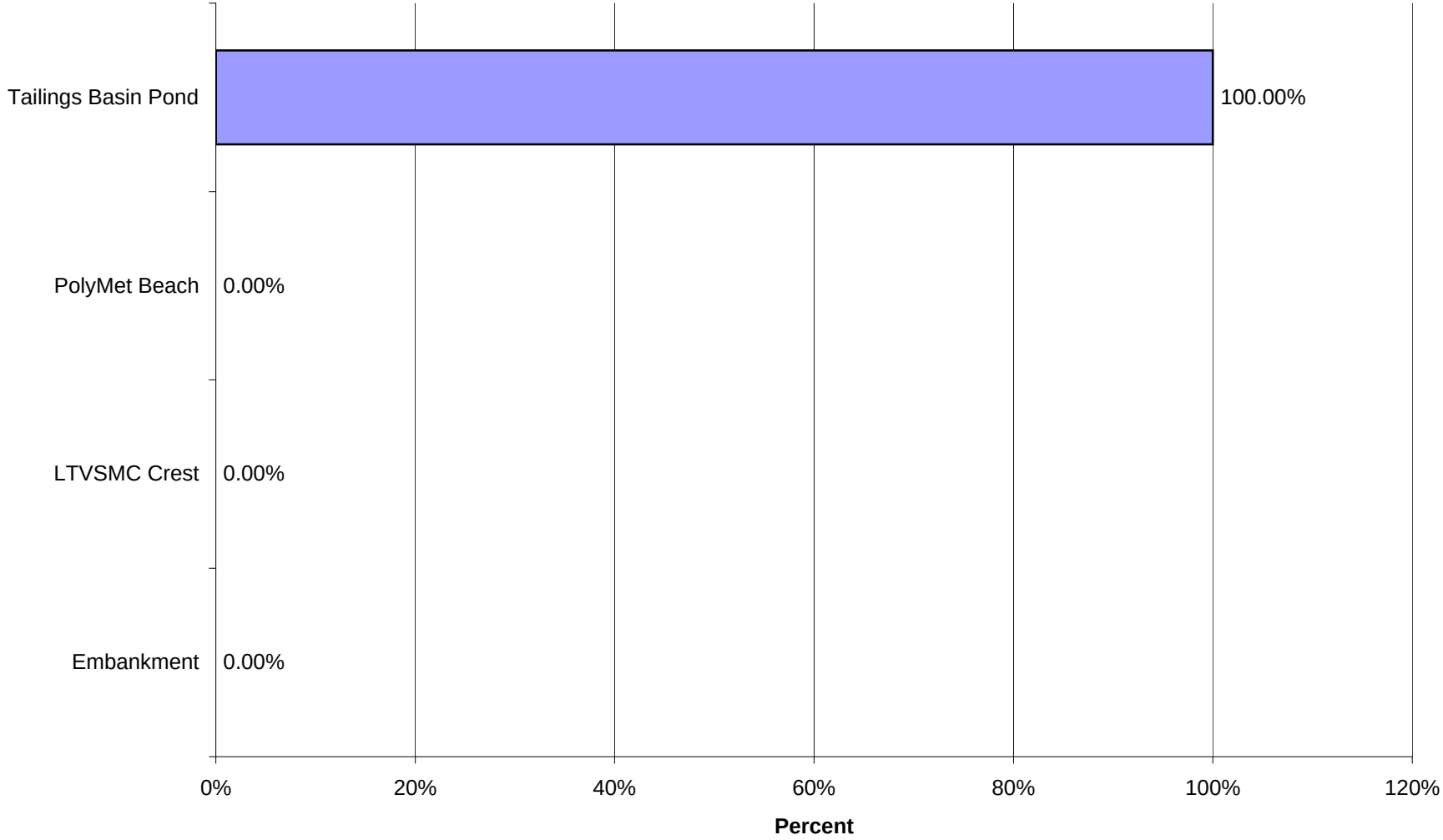
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 1 for Antimony (Sb)



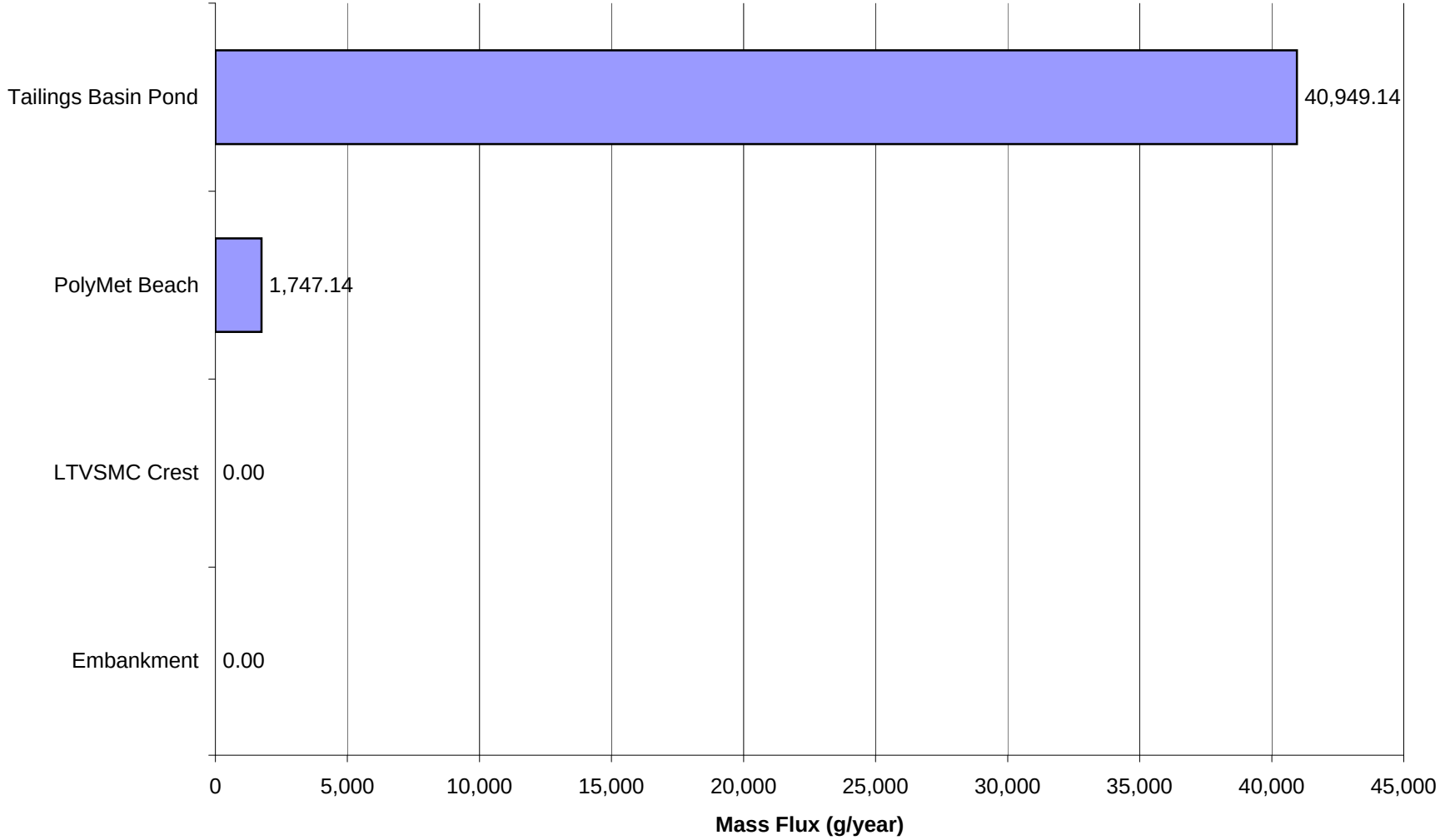
Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Year 5 for Antimony (Sb)



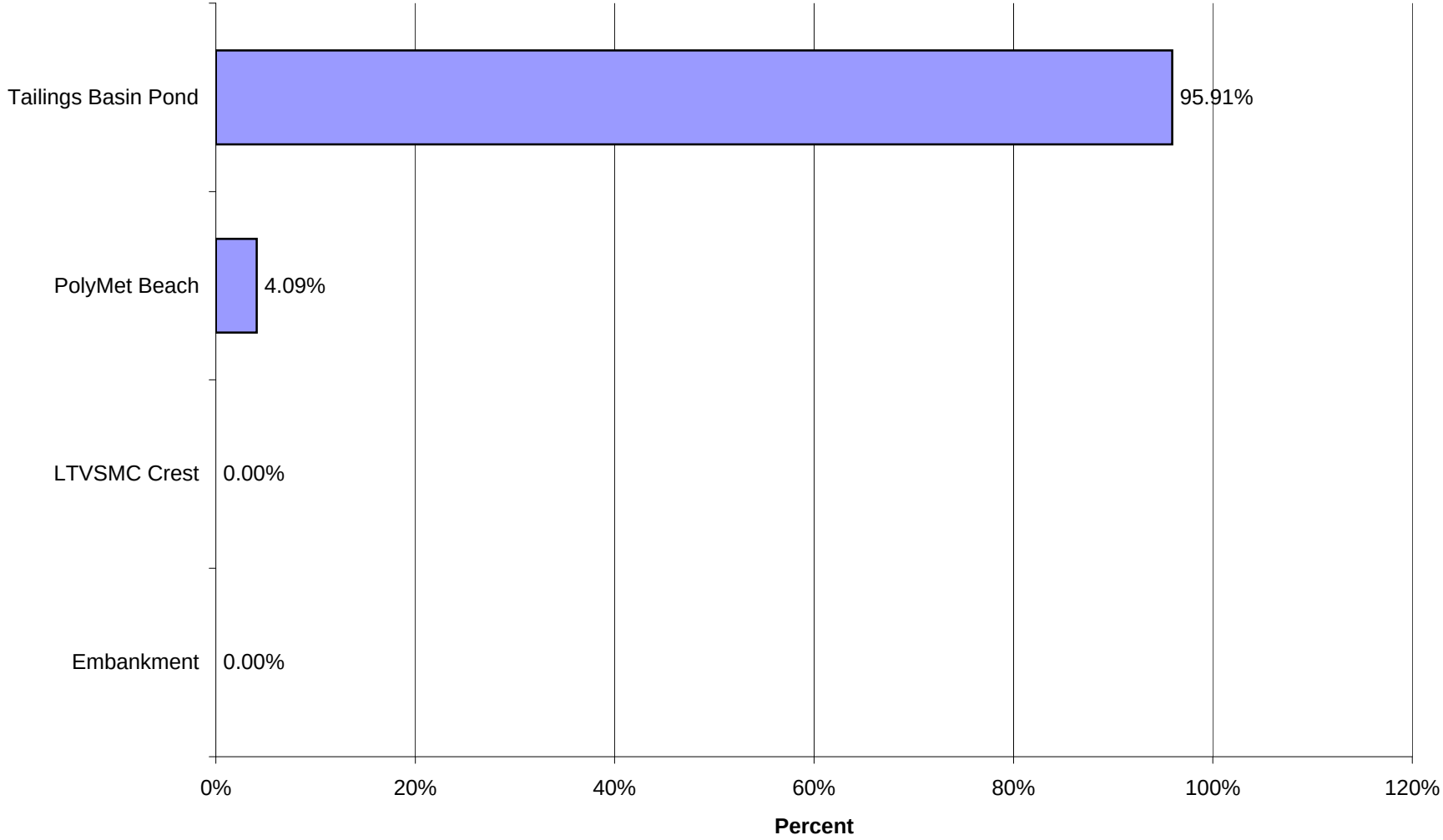
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 5 for Antimony (Sb)



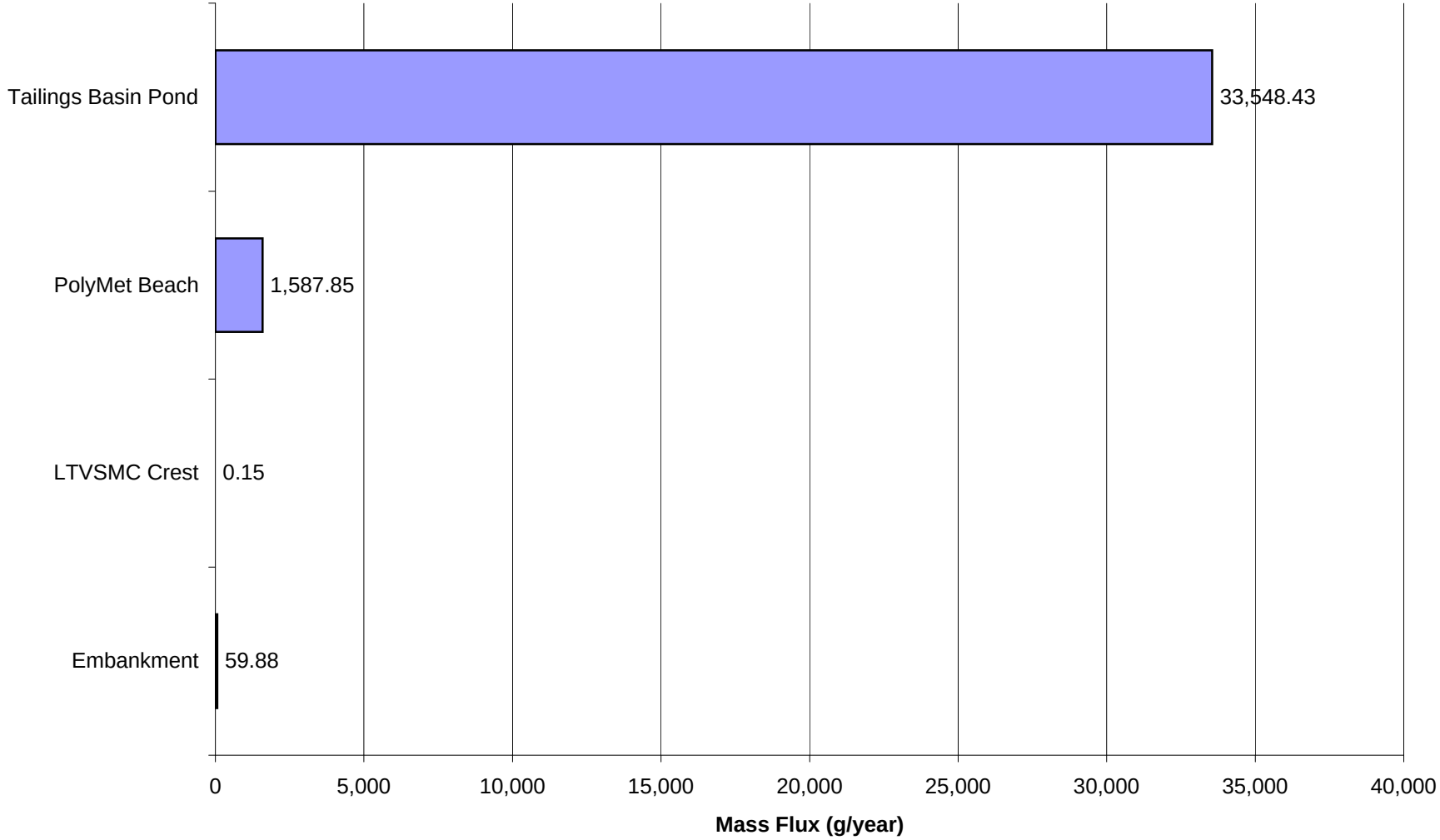
Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Year 10 for Antimony (Sb)



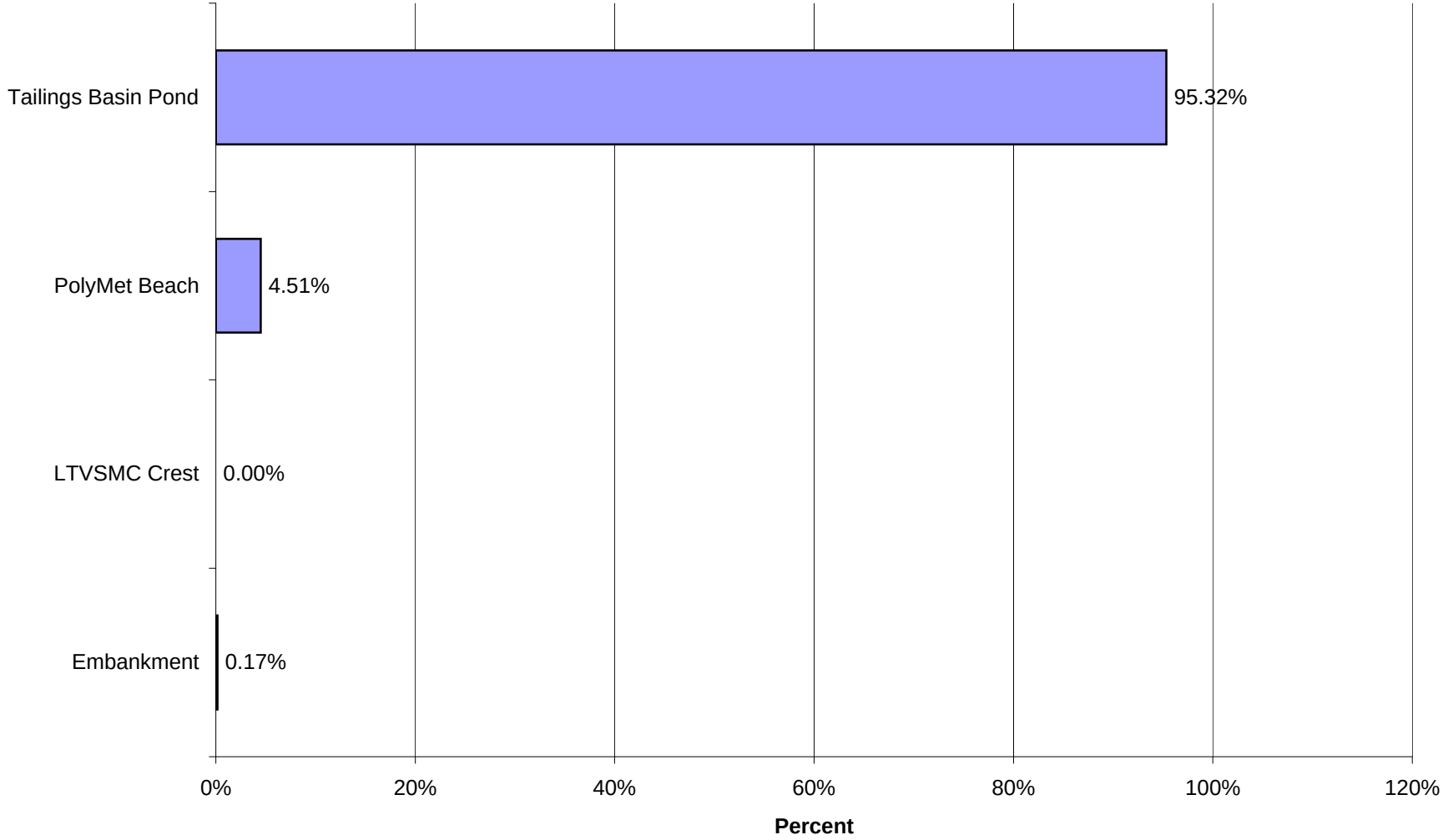
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 10 for Antimony (Sb)



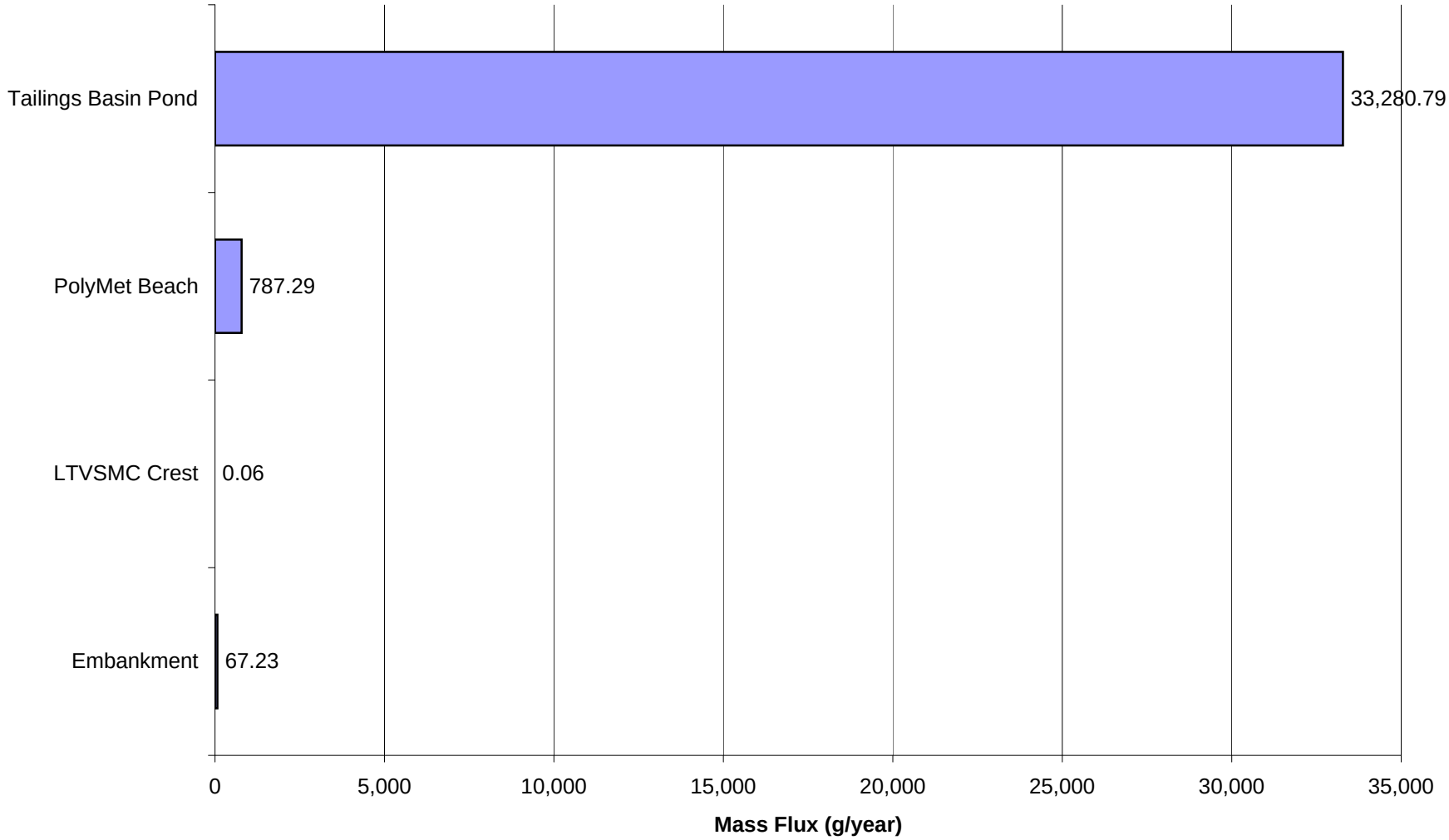
Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Year 15 for Antimony (Sb)



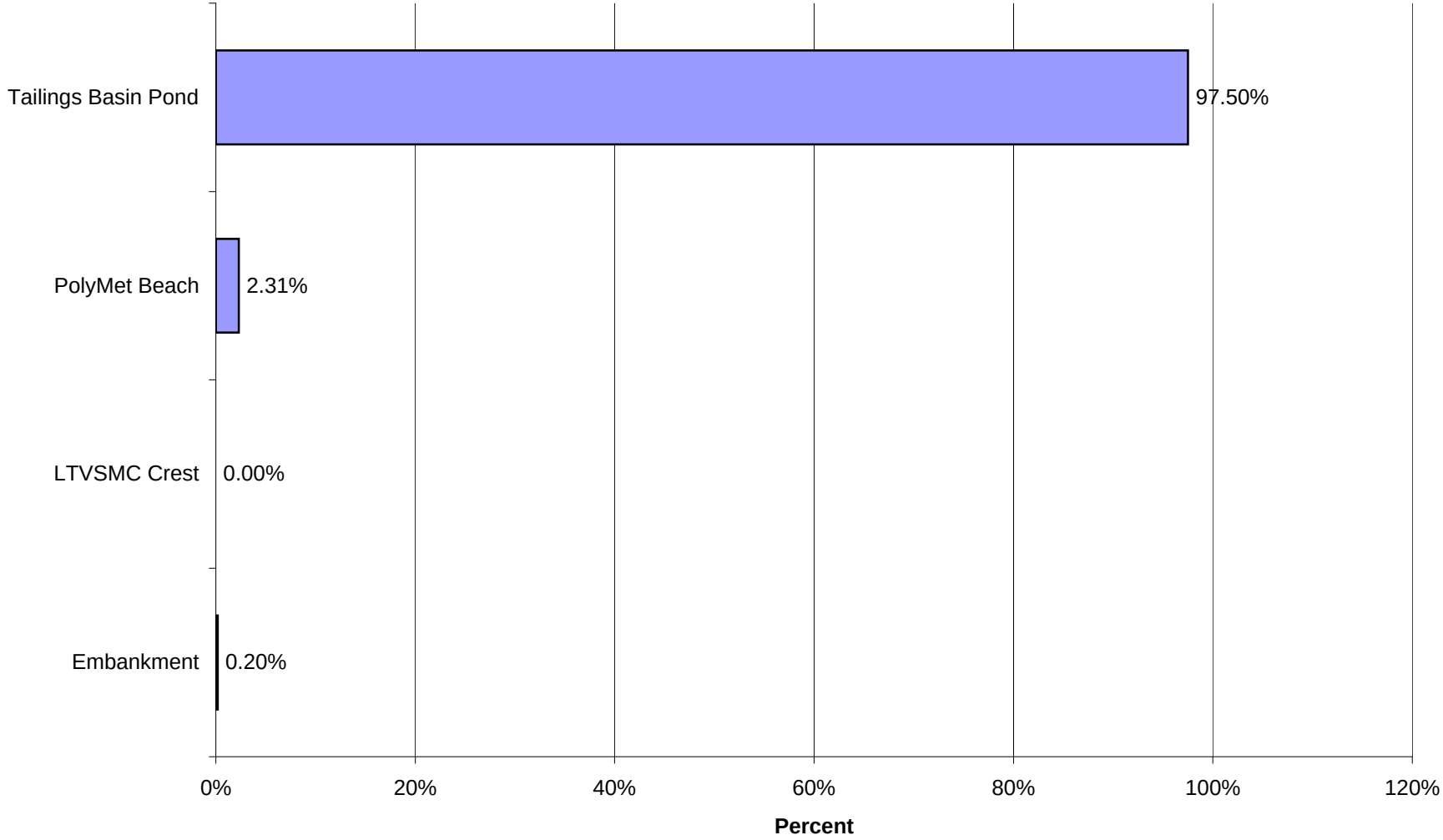
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 15 for Antimony (Sb)



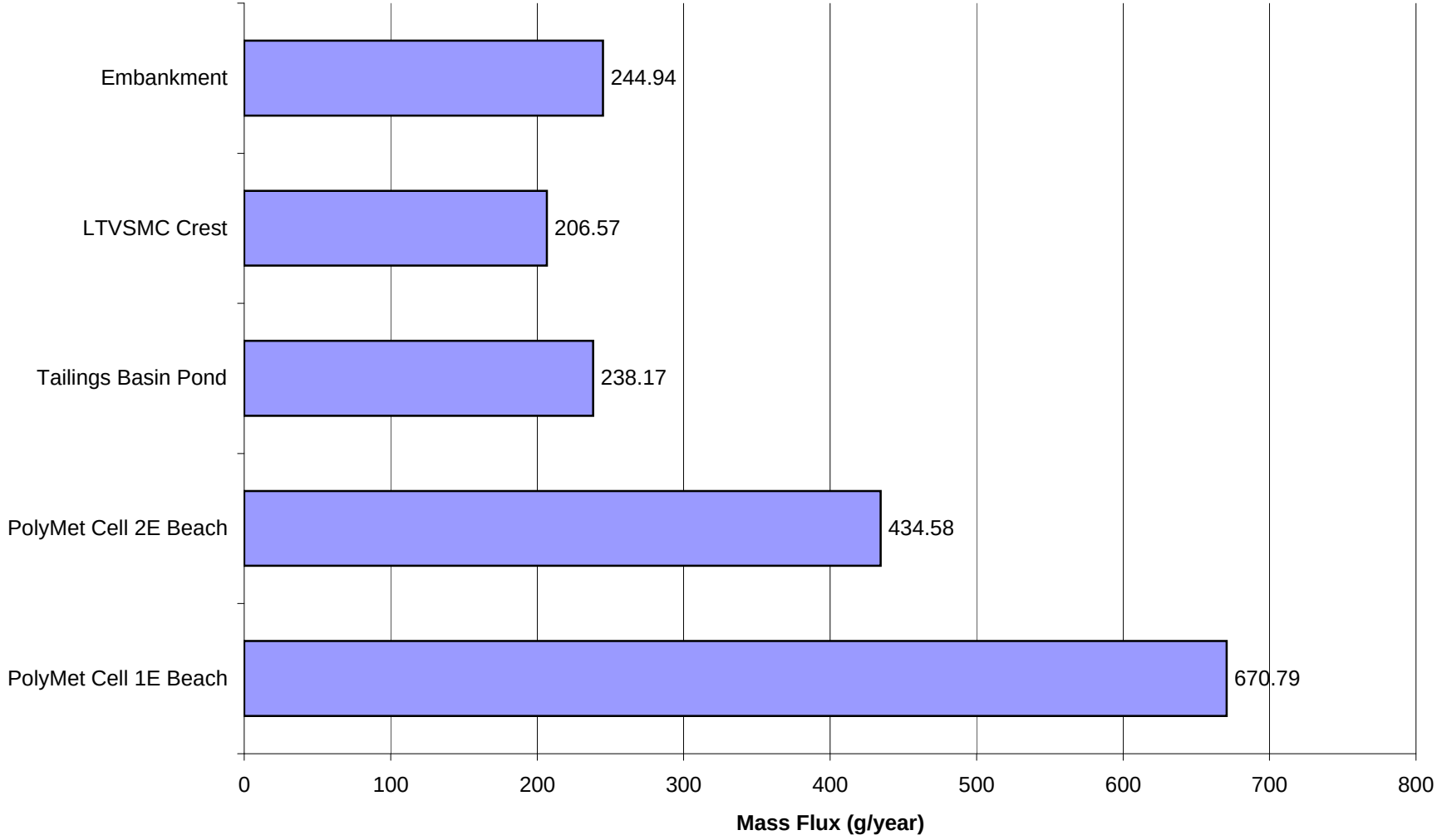
Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Year 20 for Antimony (Sb)



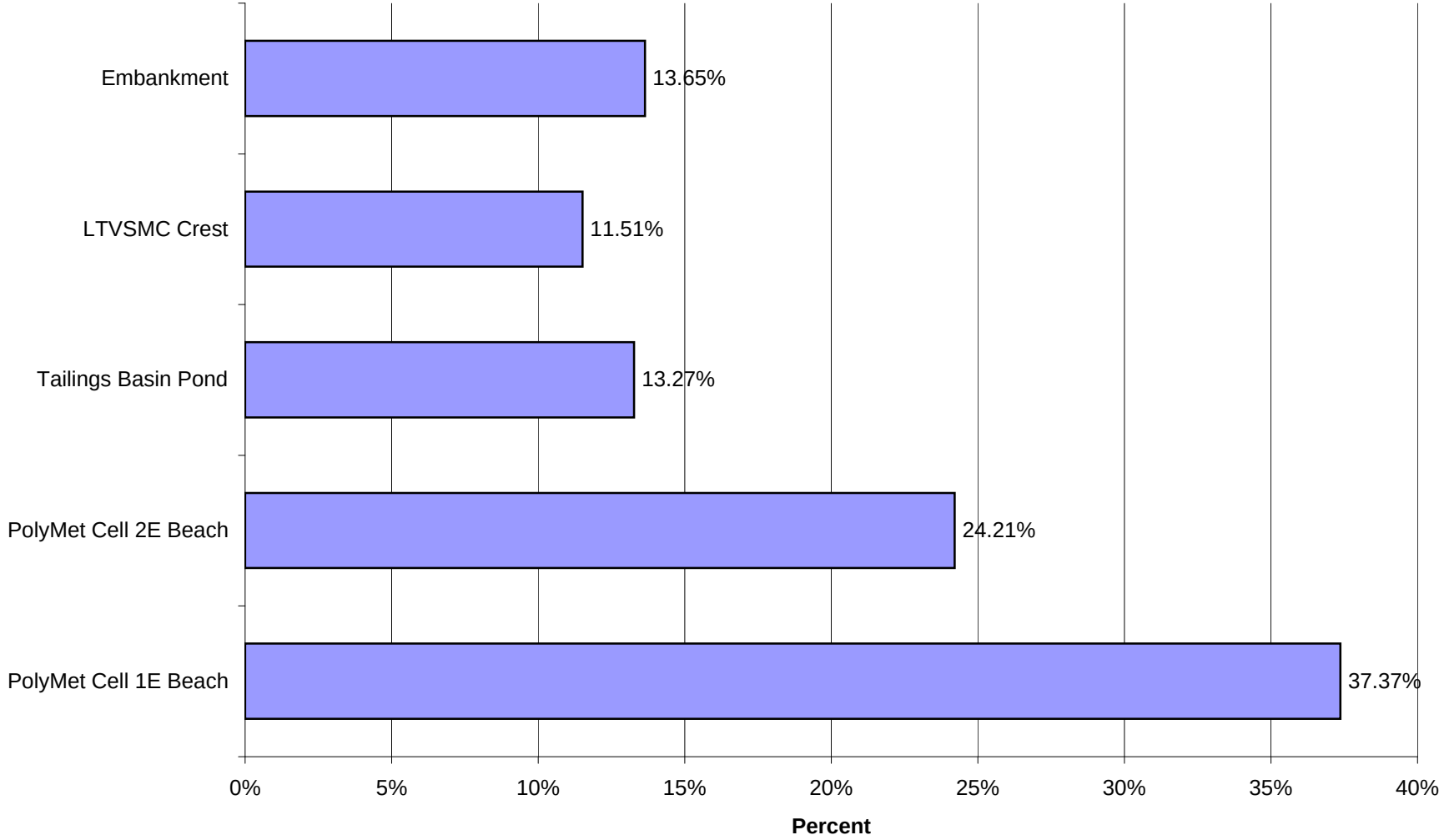
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 20 for Antimony (Sb)



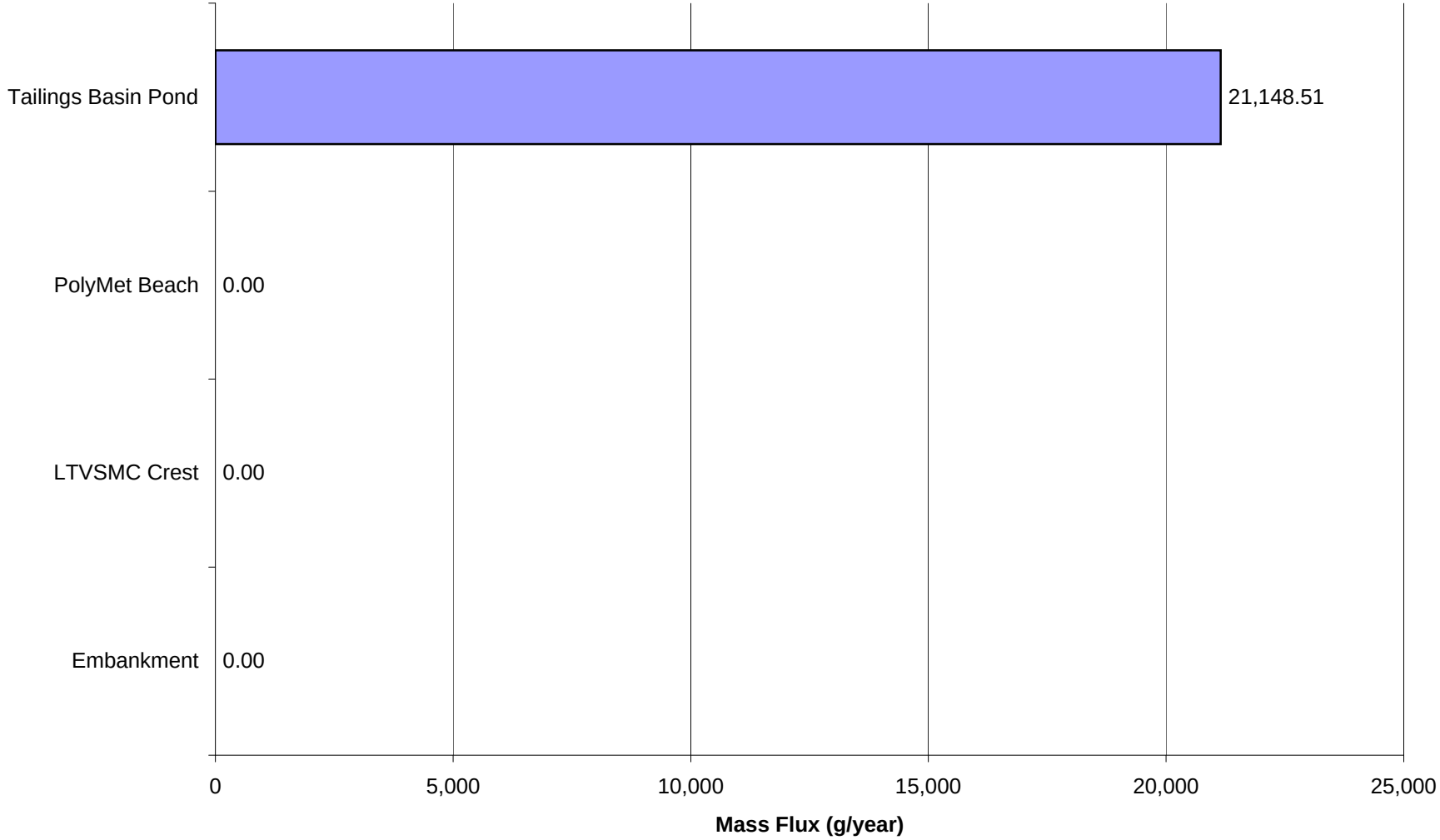
Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Closure for Antimony (Sb)



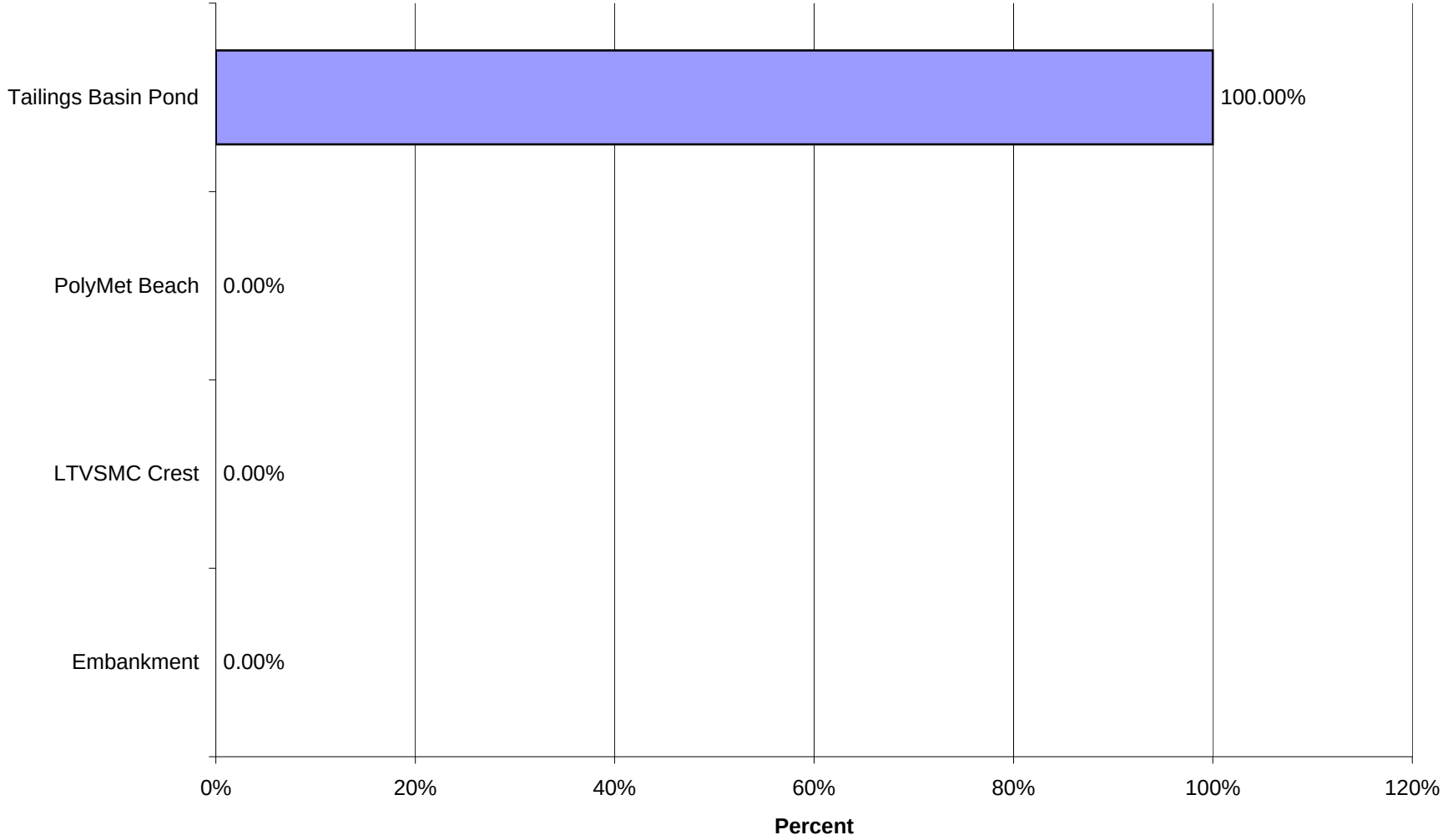
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Closure for Antimony (Sb)



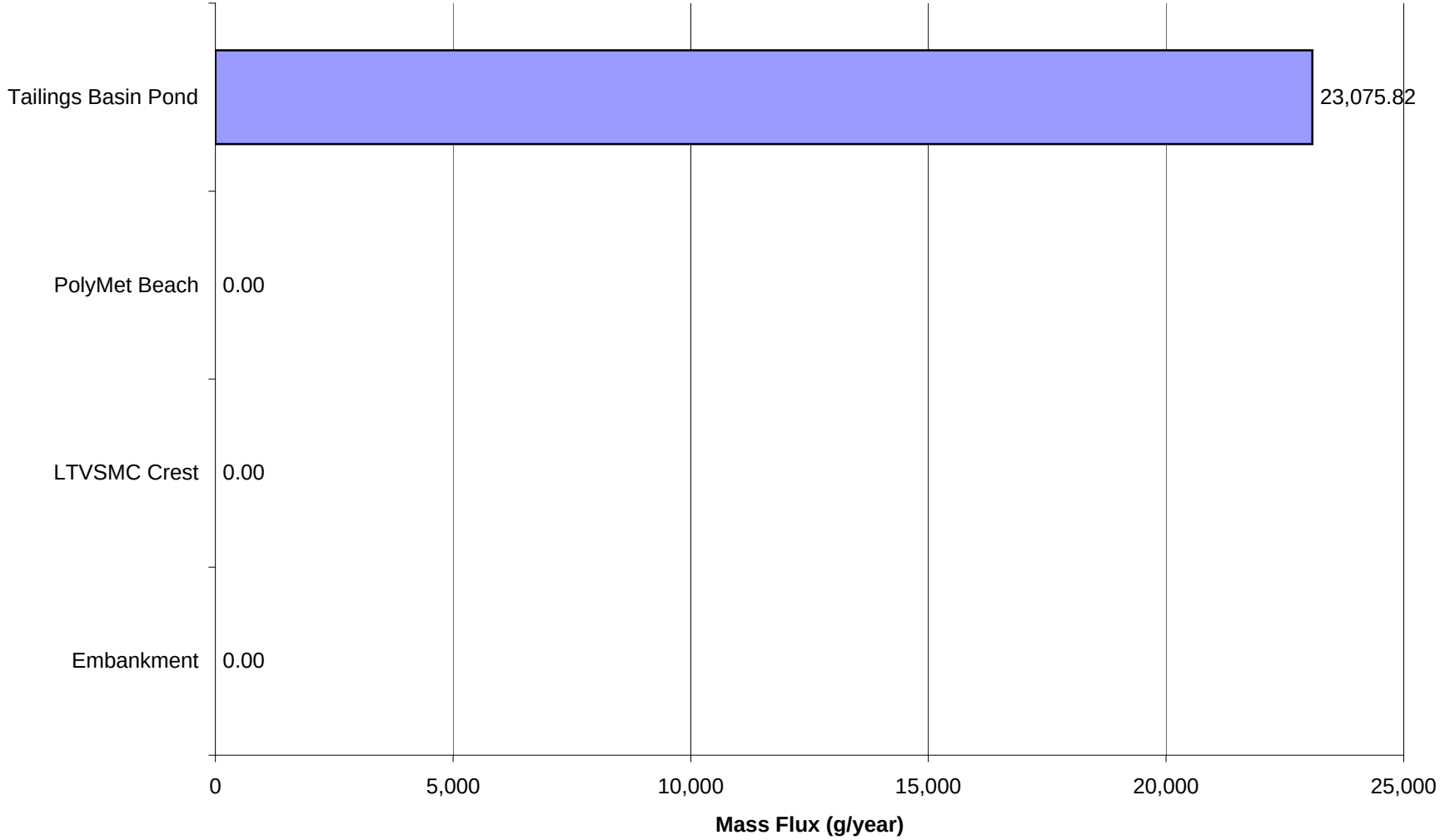
Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Year 1 for Arsenic (As)



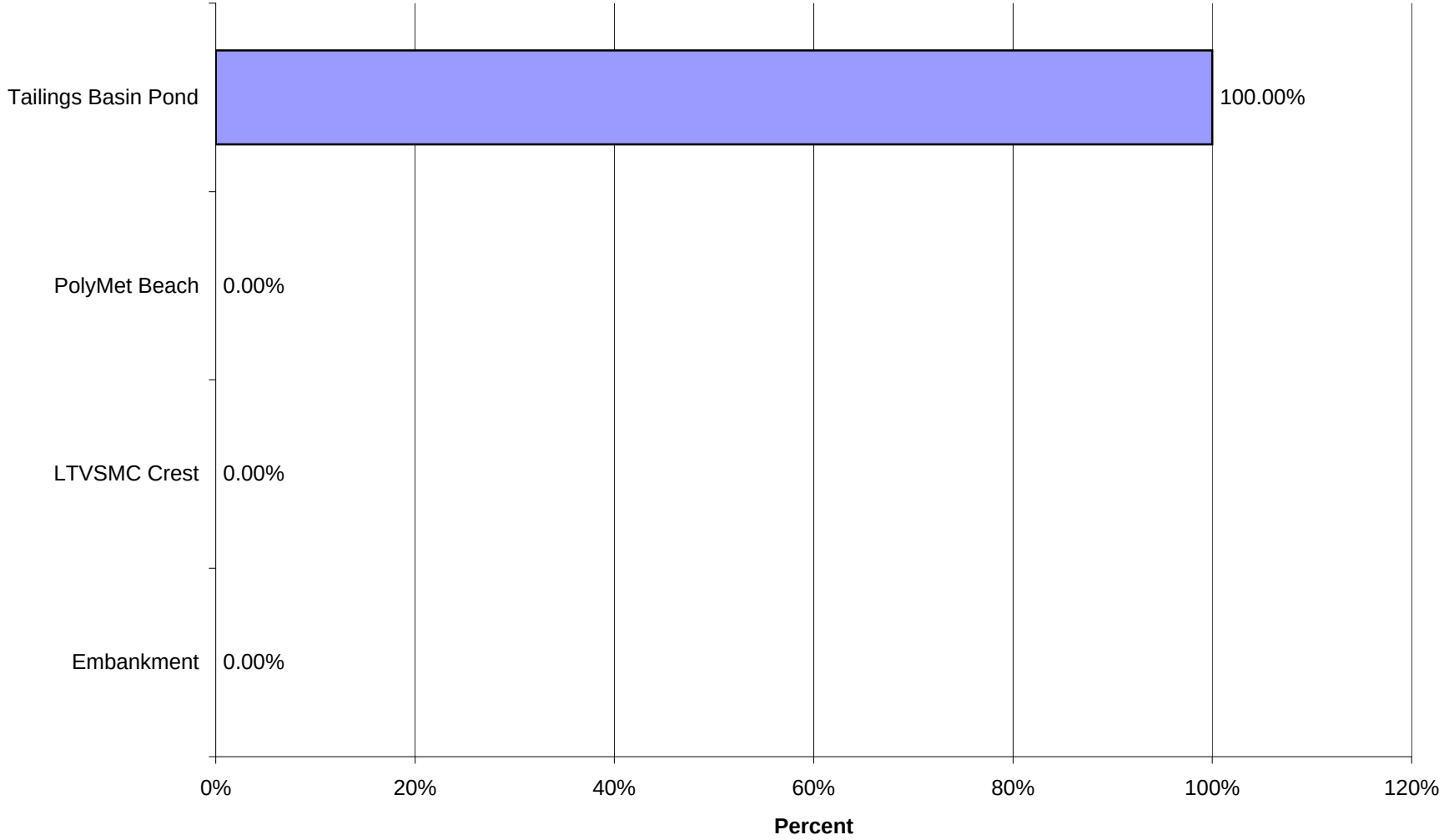
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 1 for Arsenic (As)



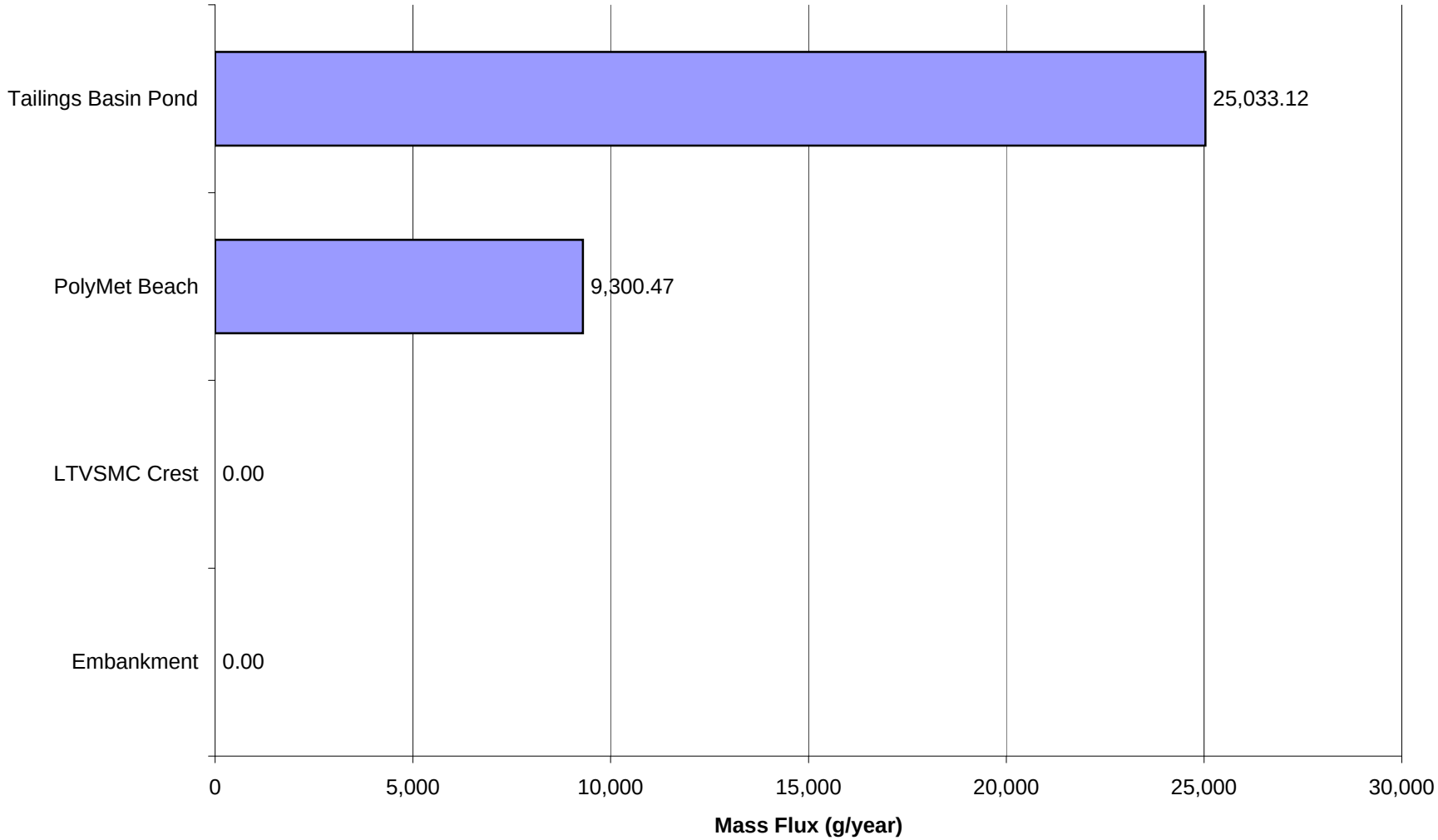
Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Year 5 for Arsenic (As)



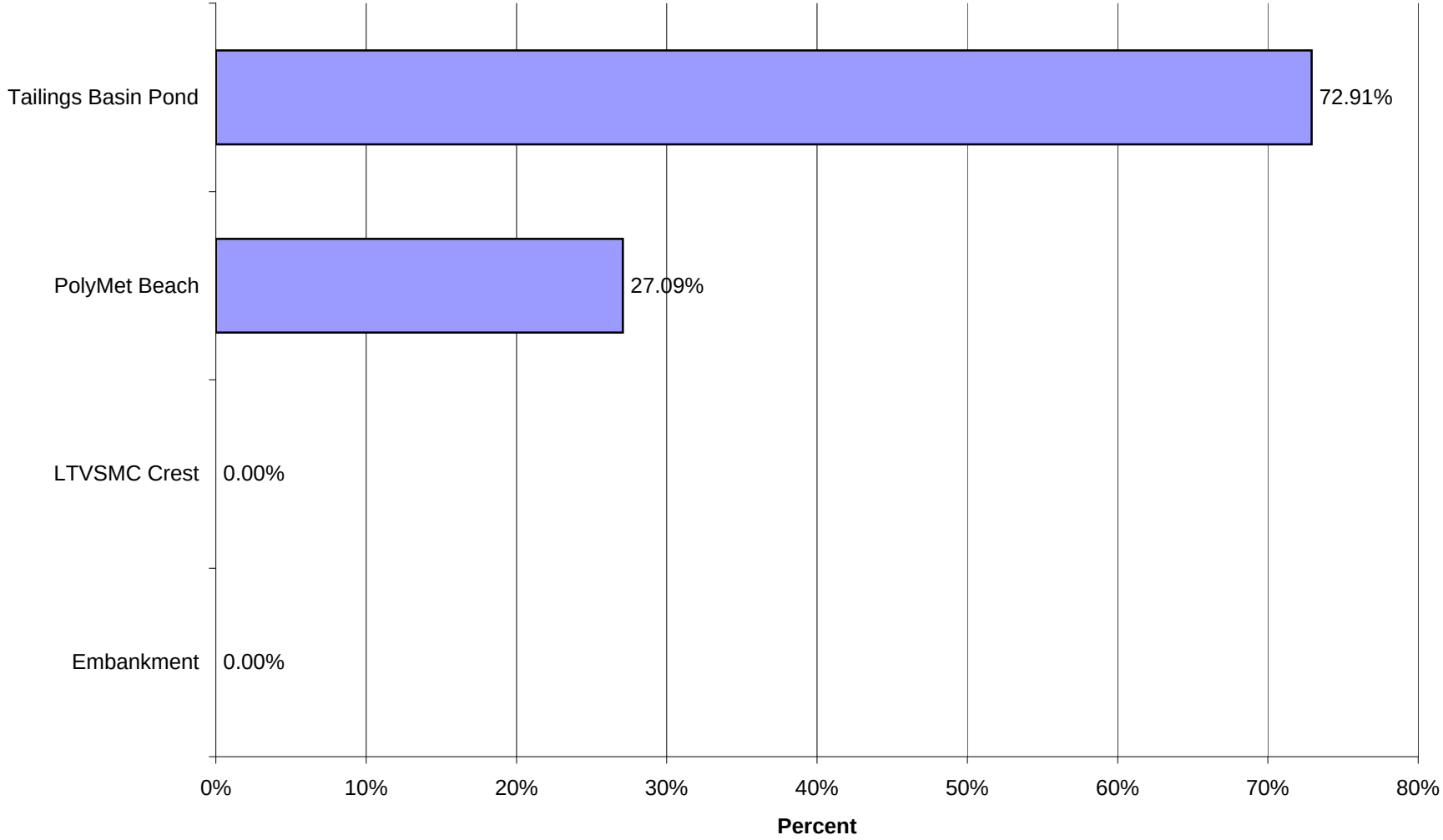
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 5 for Arsenic (As)



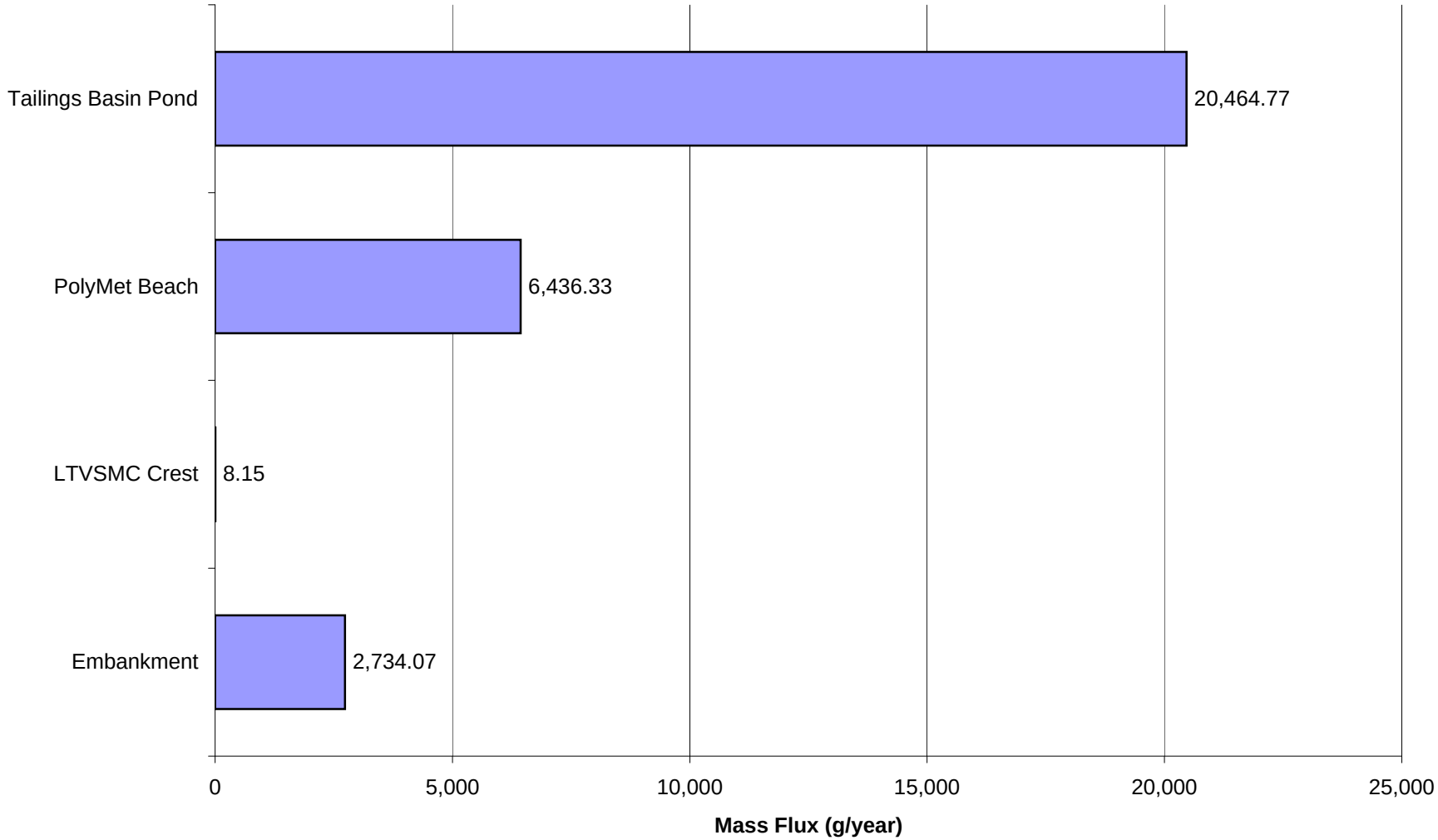
Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Year 10 for Arsenic (As)



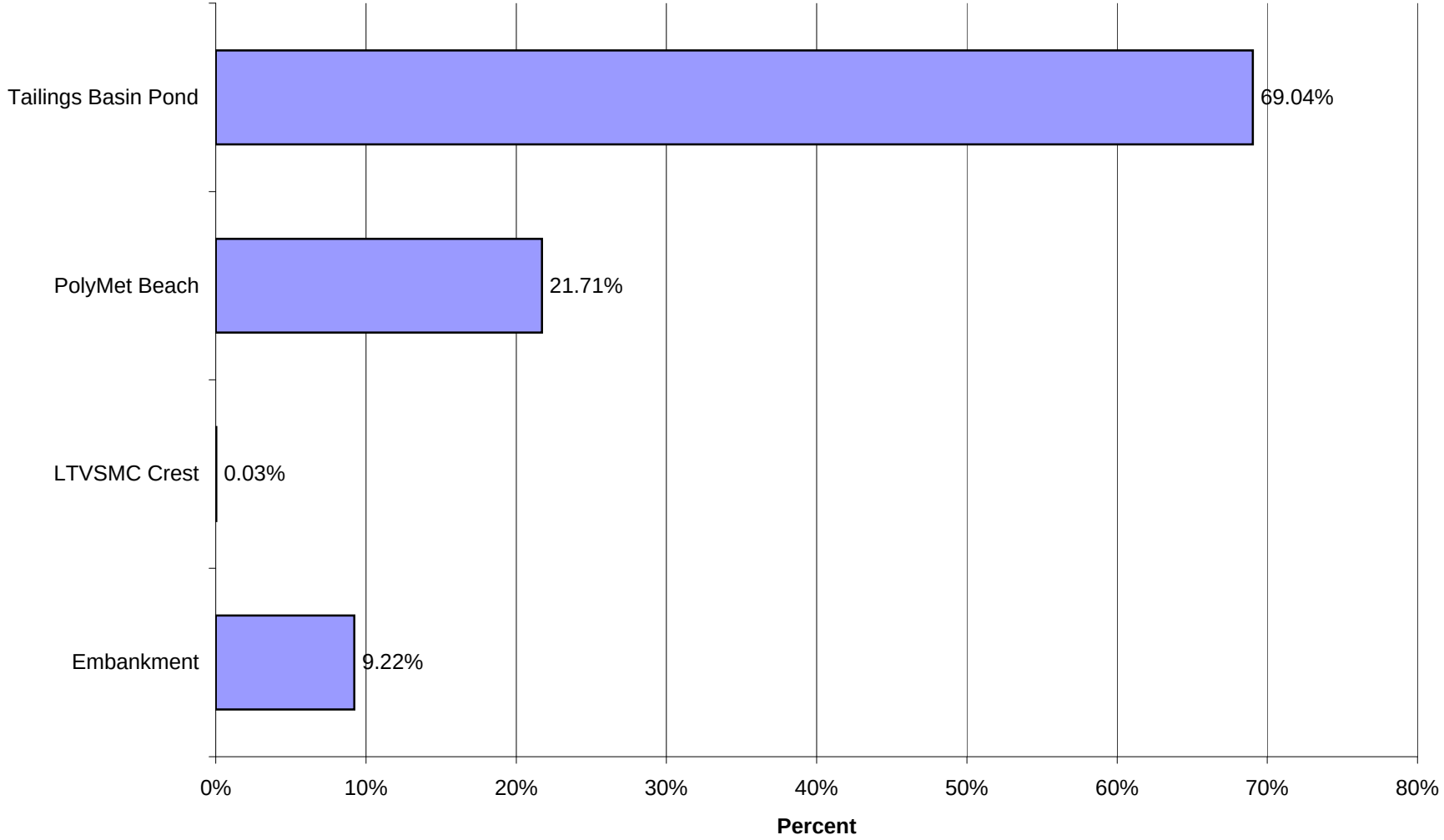
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 10 for Arsenic (As)



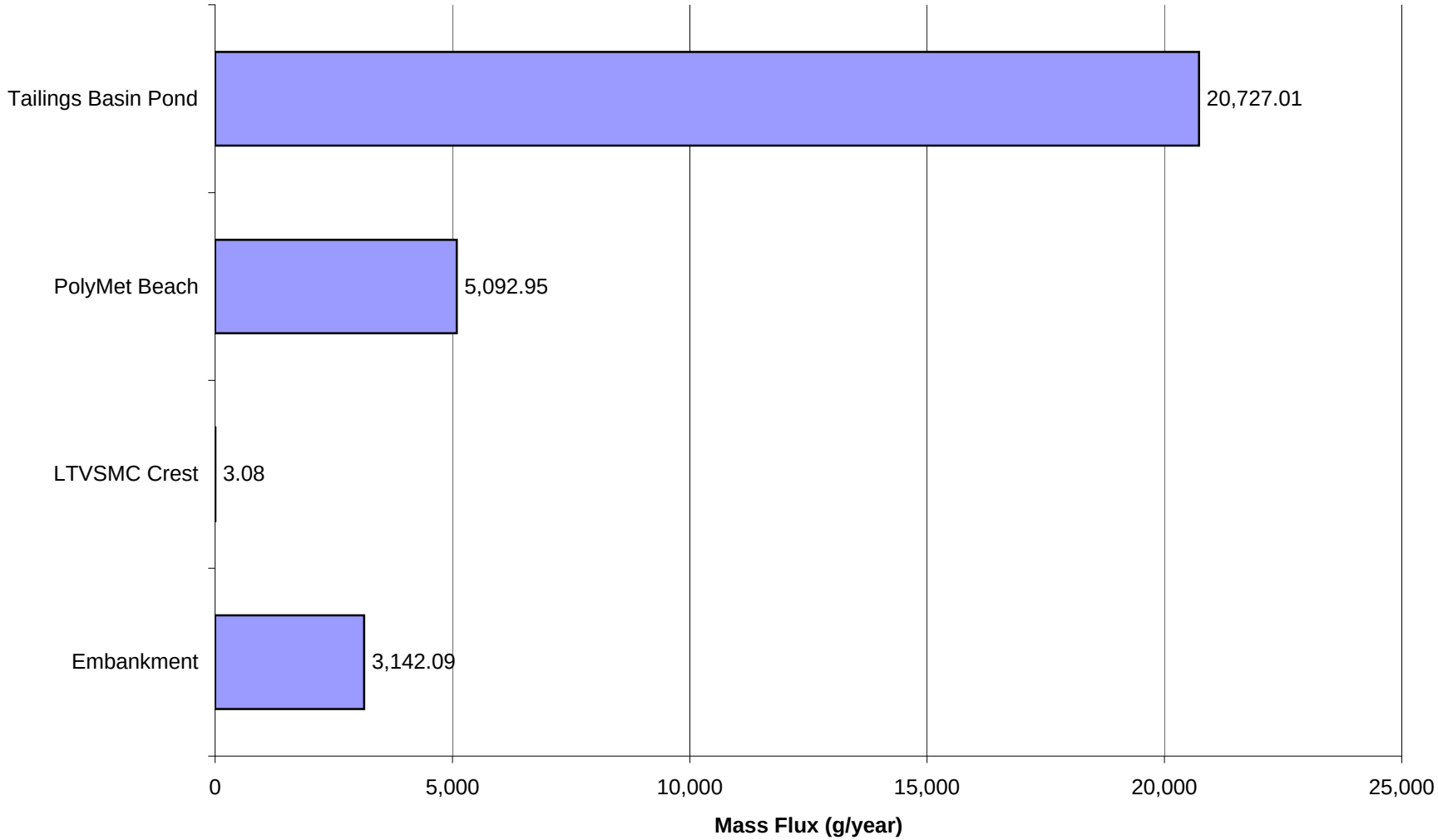
Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Year 15 for Arsenic (As)



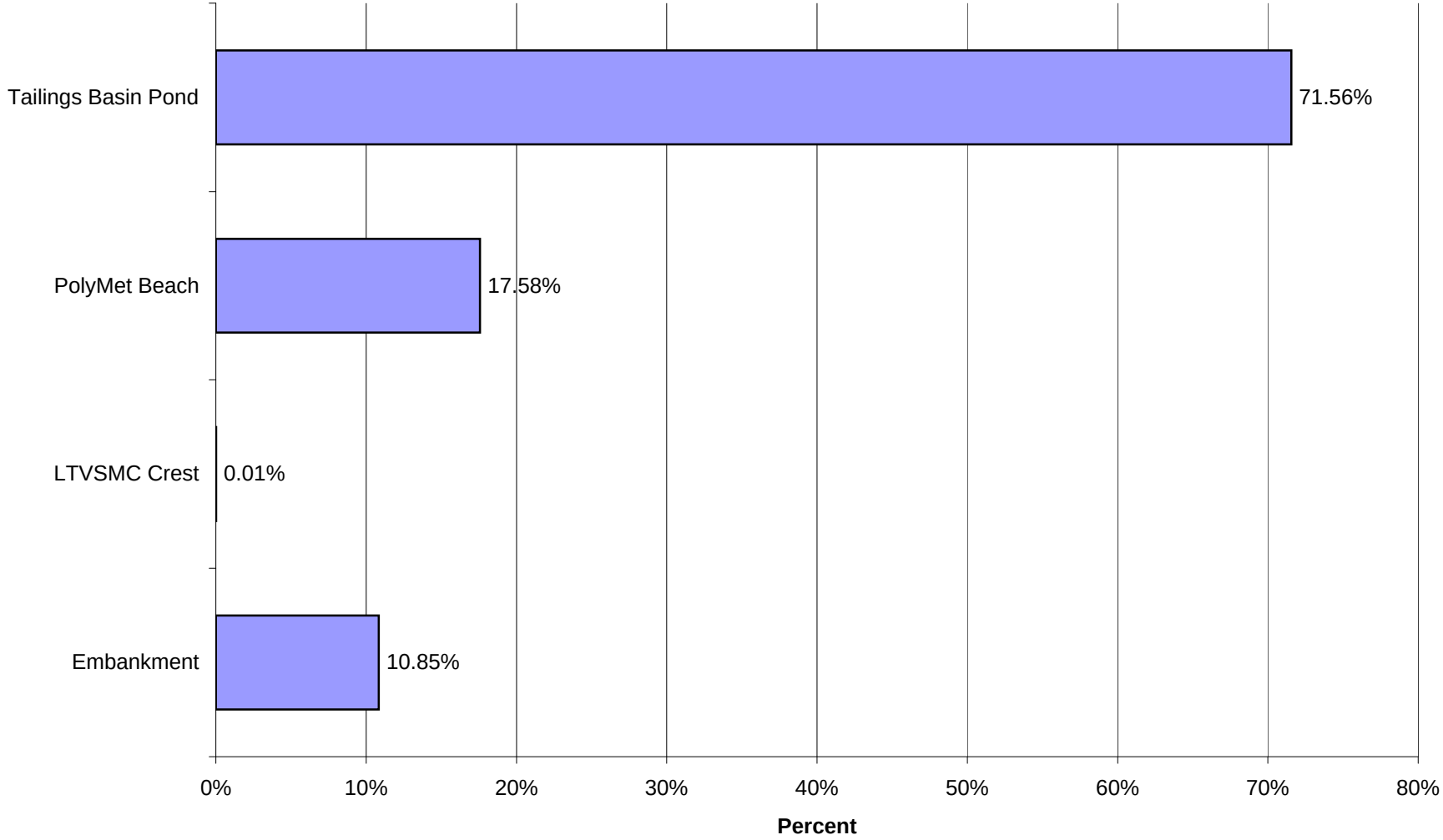
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 15 for Arsenic (As)



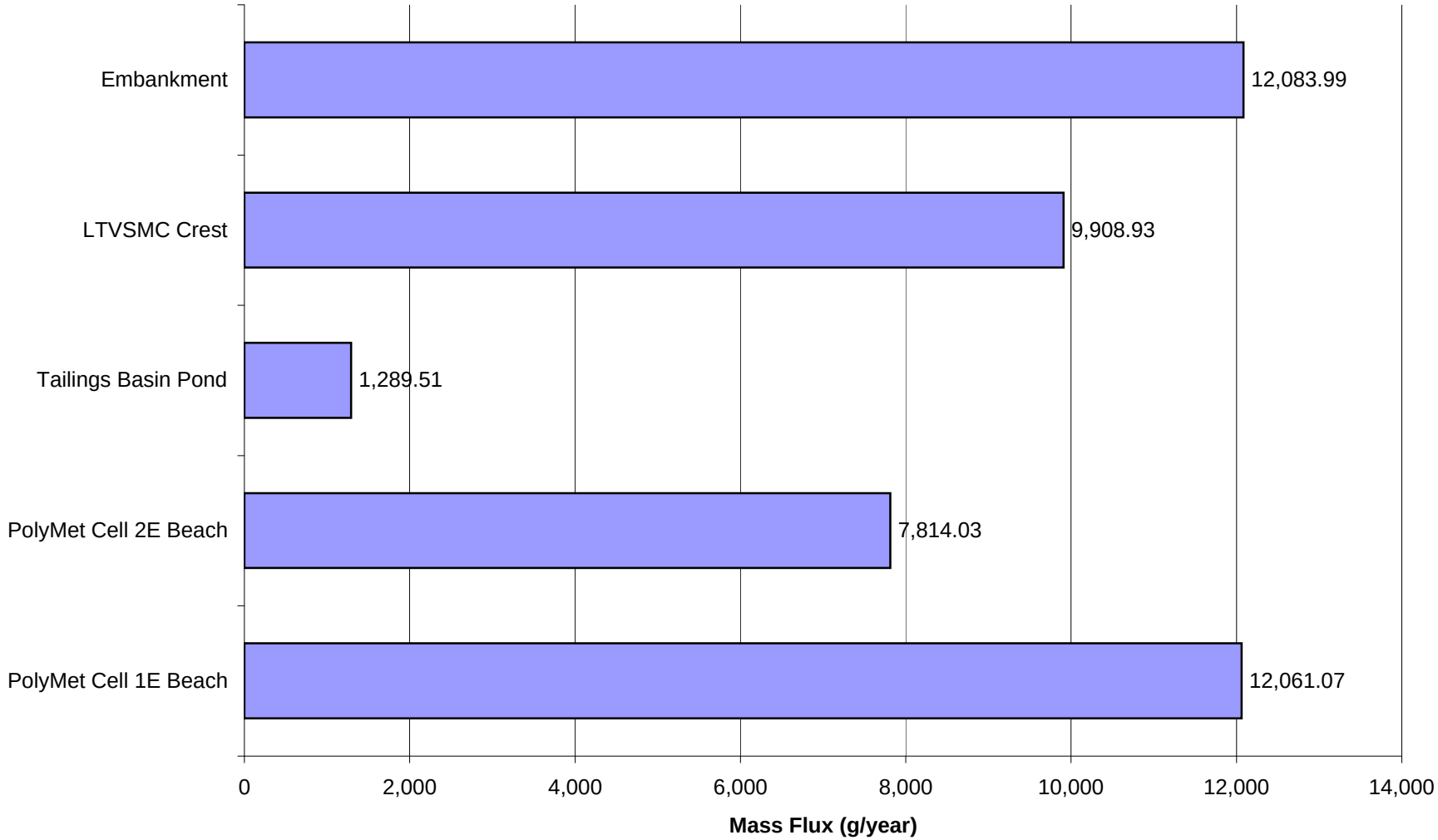
Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Year 20 forArsenic (As)



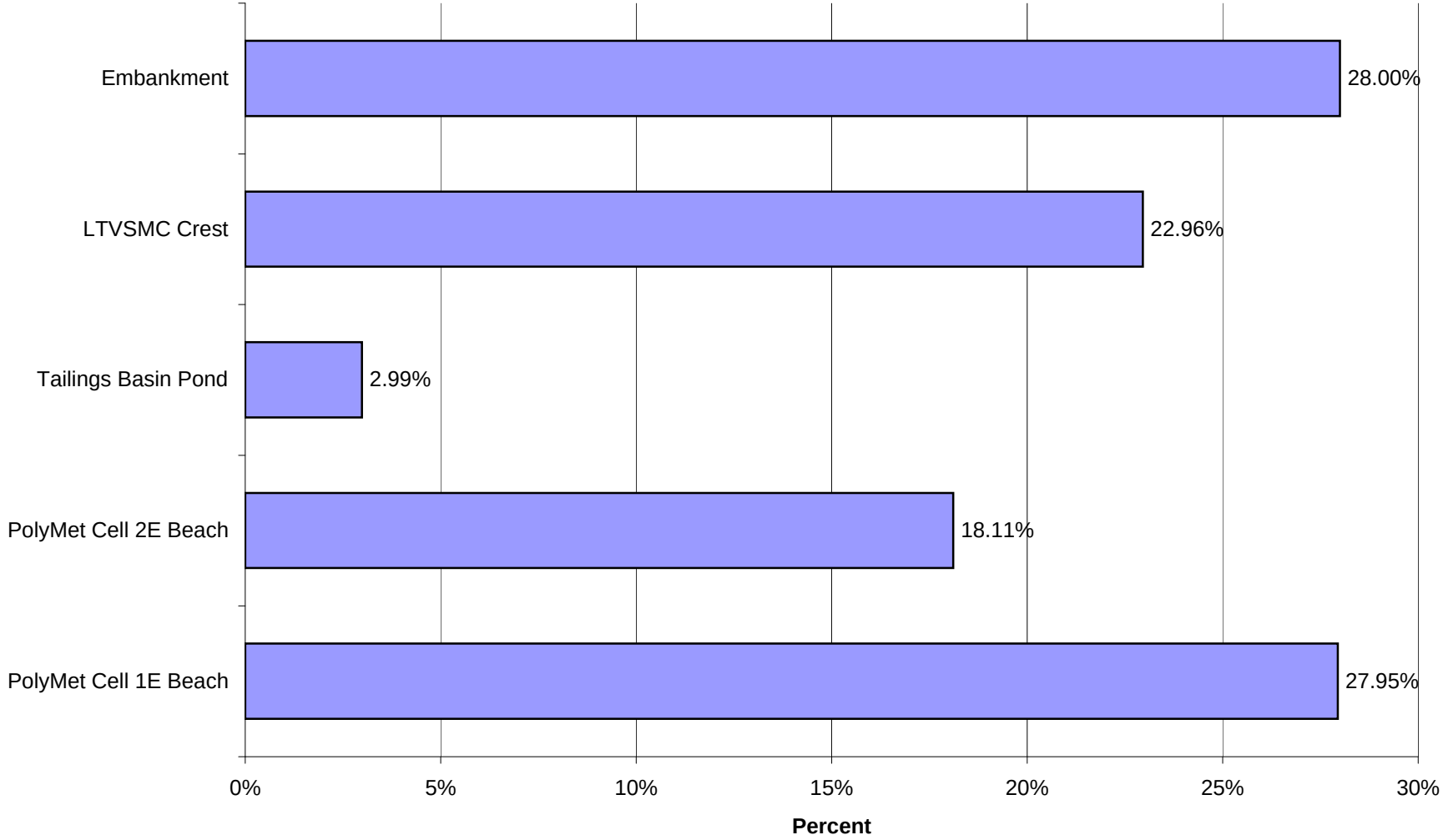
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 20 for Arsenic (As)



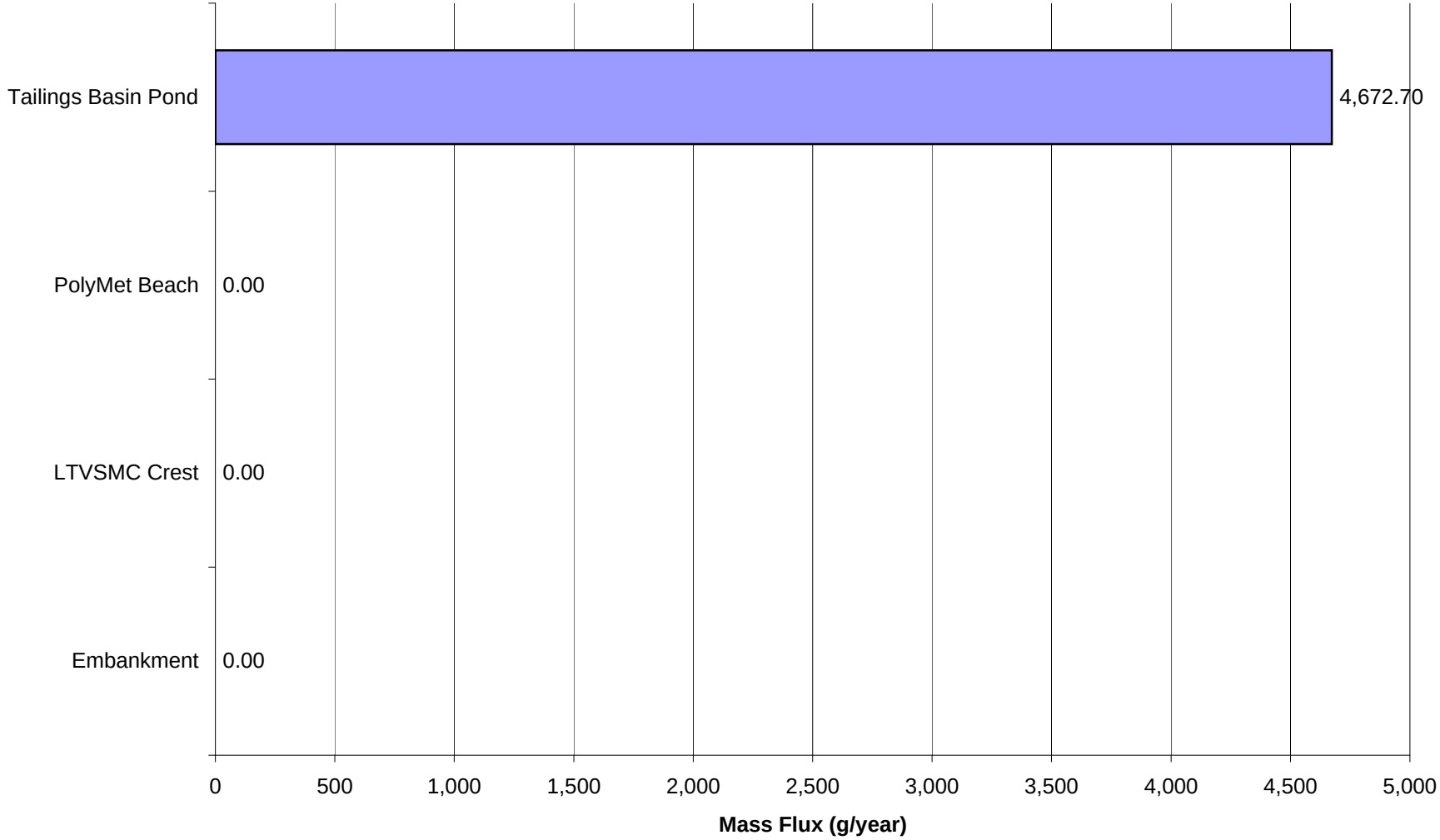
Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Closure for Arsenic (As)



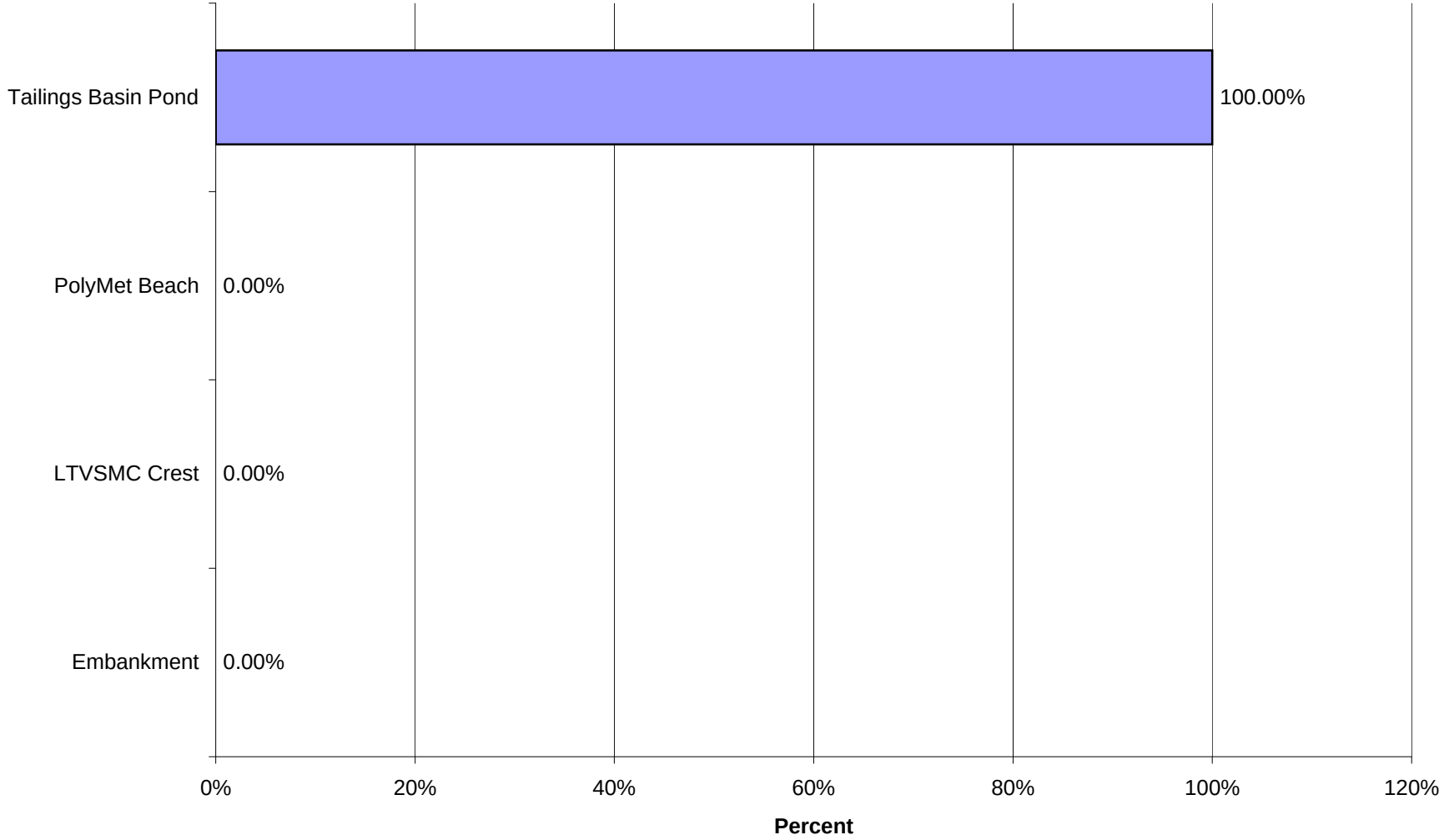
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Closure for Arsenic (As)



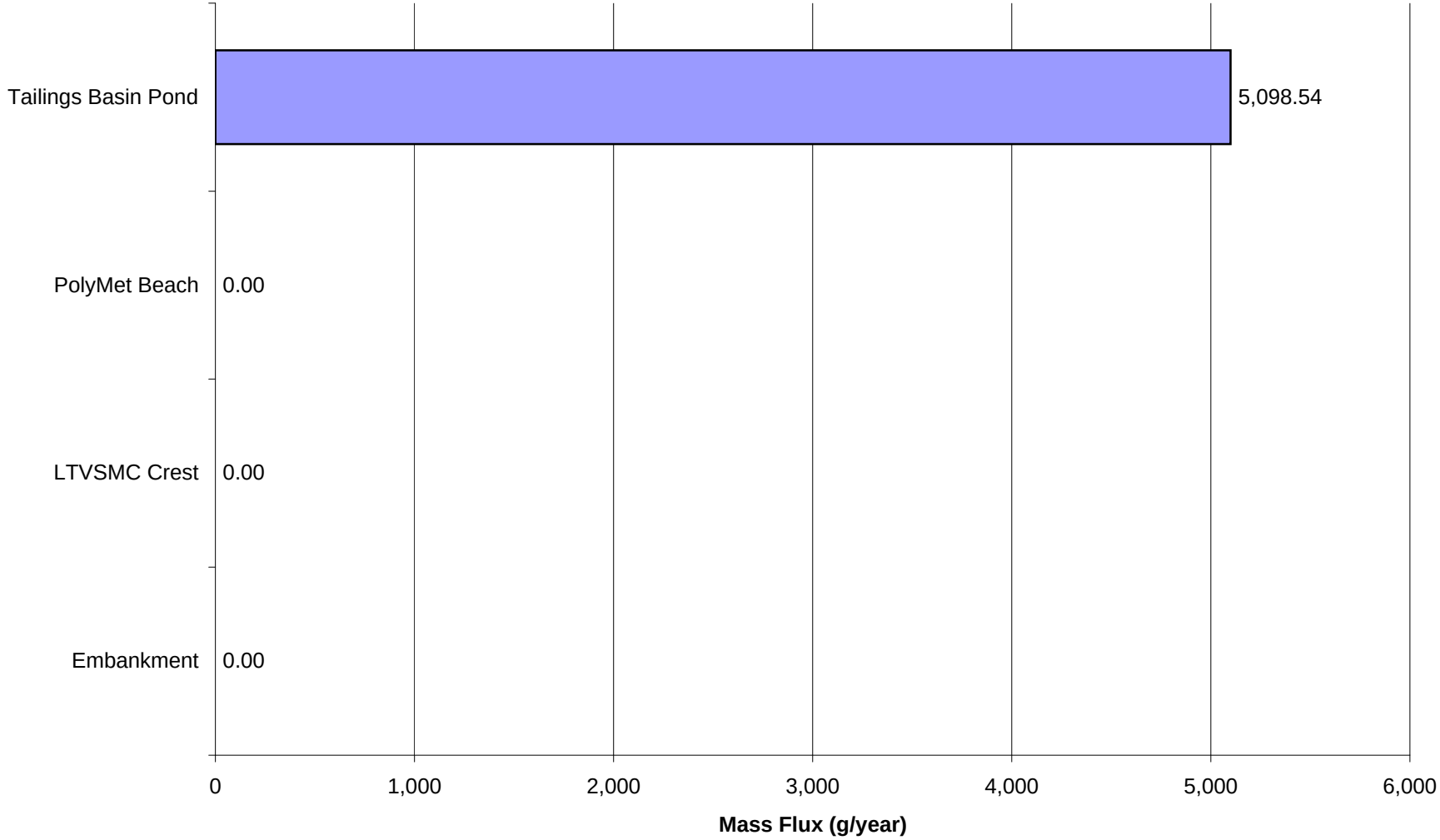
Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Year 1 for Cobalt (Co)



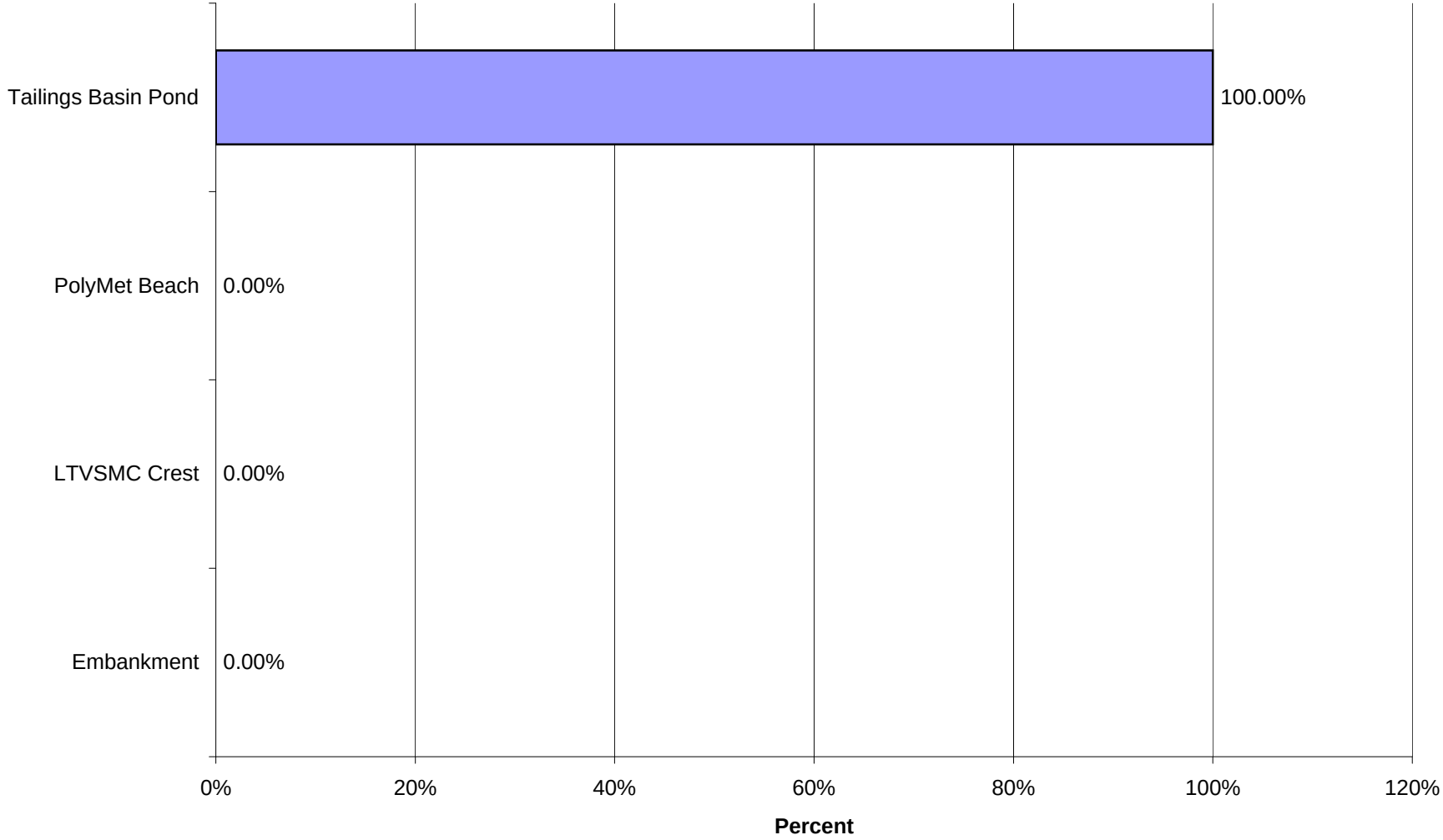
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 1 for Cobalt (Co)



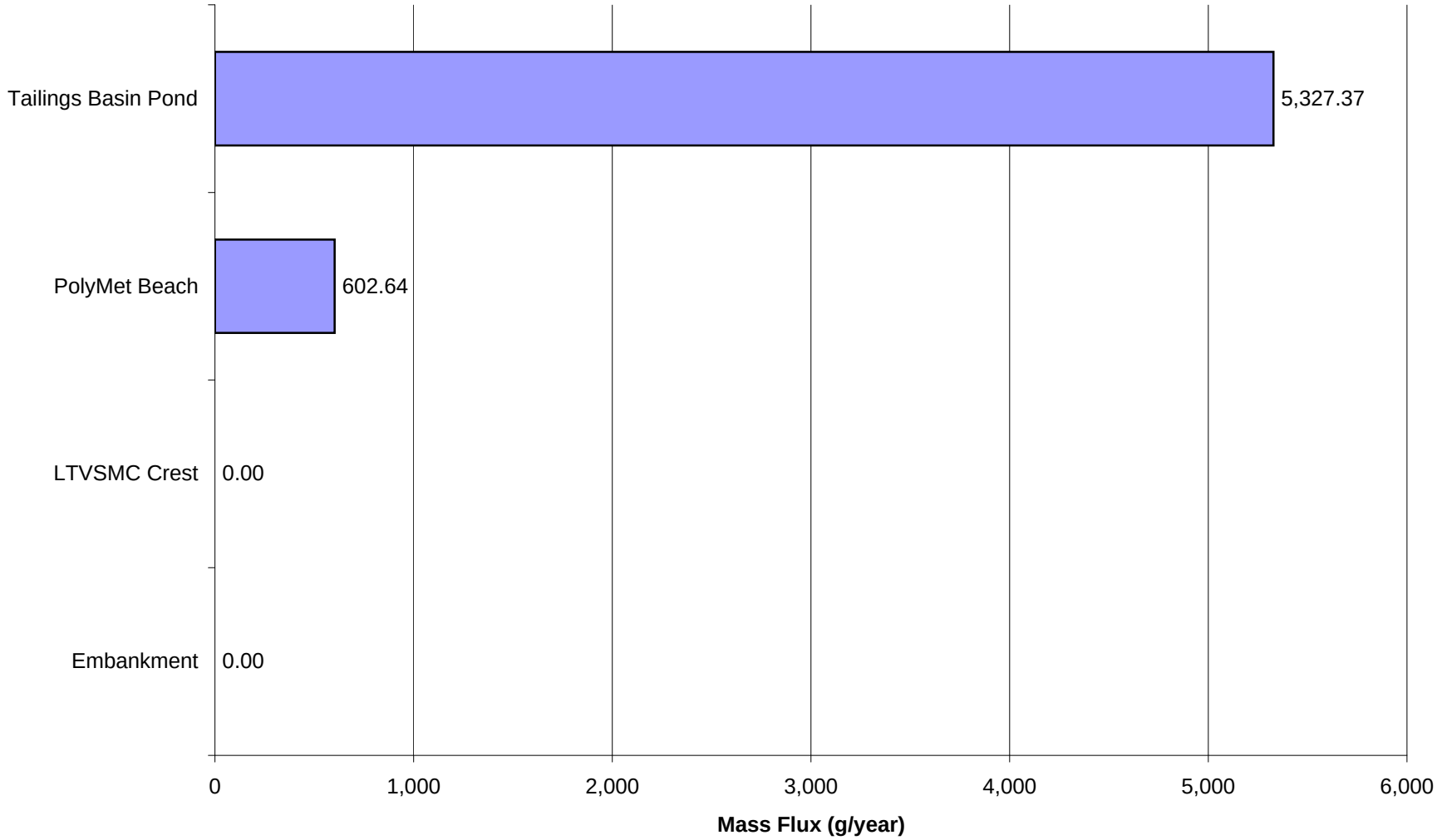
Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Year 5 for Cobalt (Co)



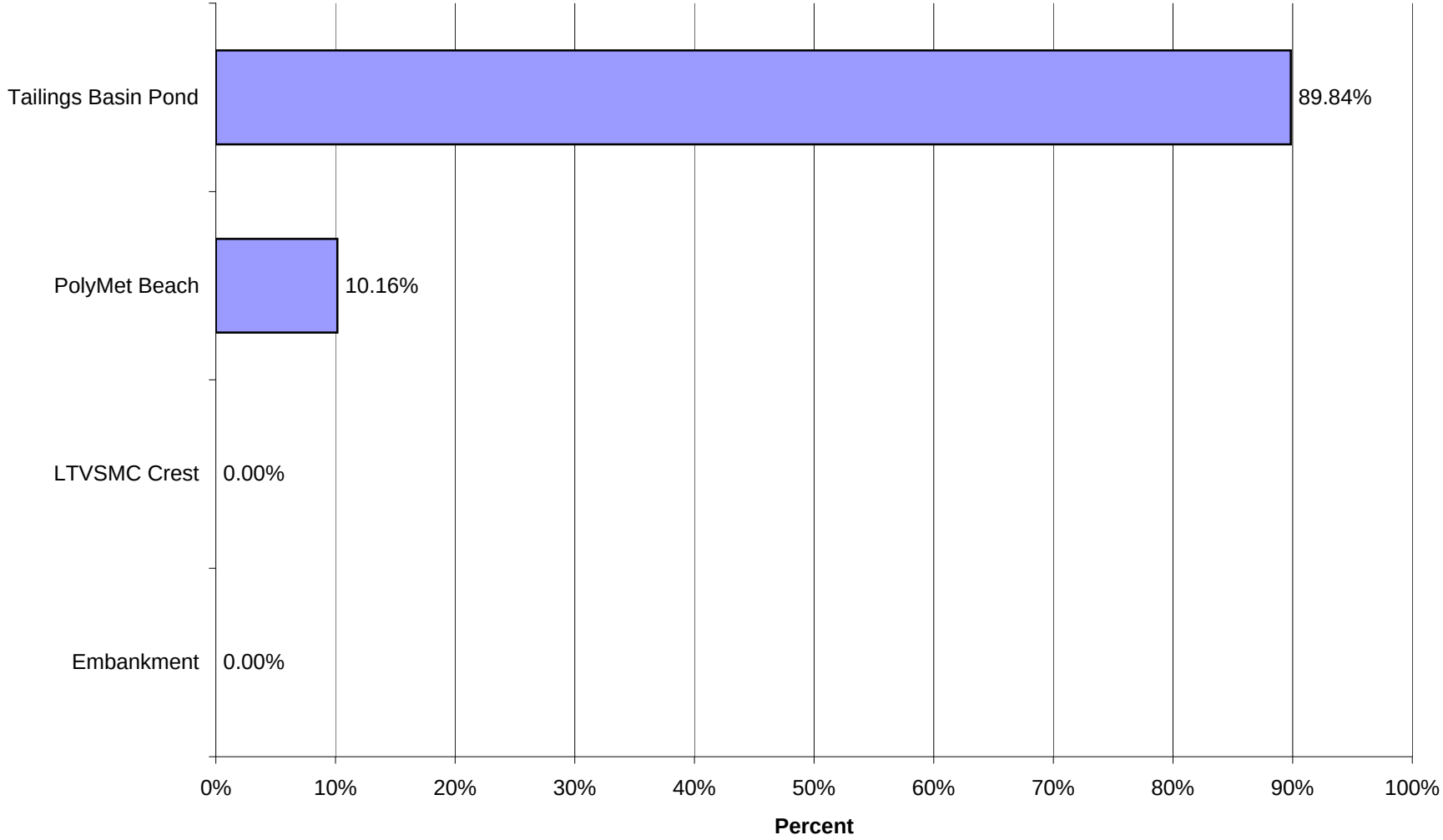
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 5 for Cobalt (Co)



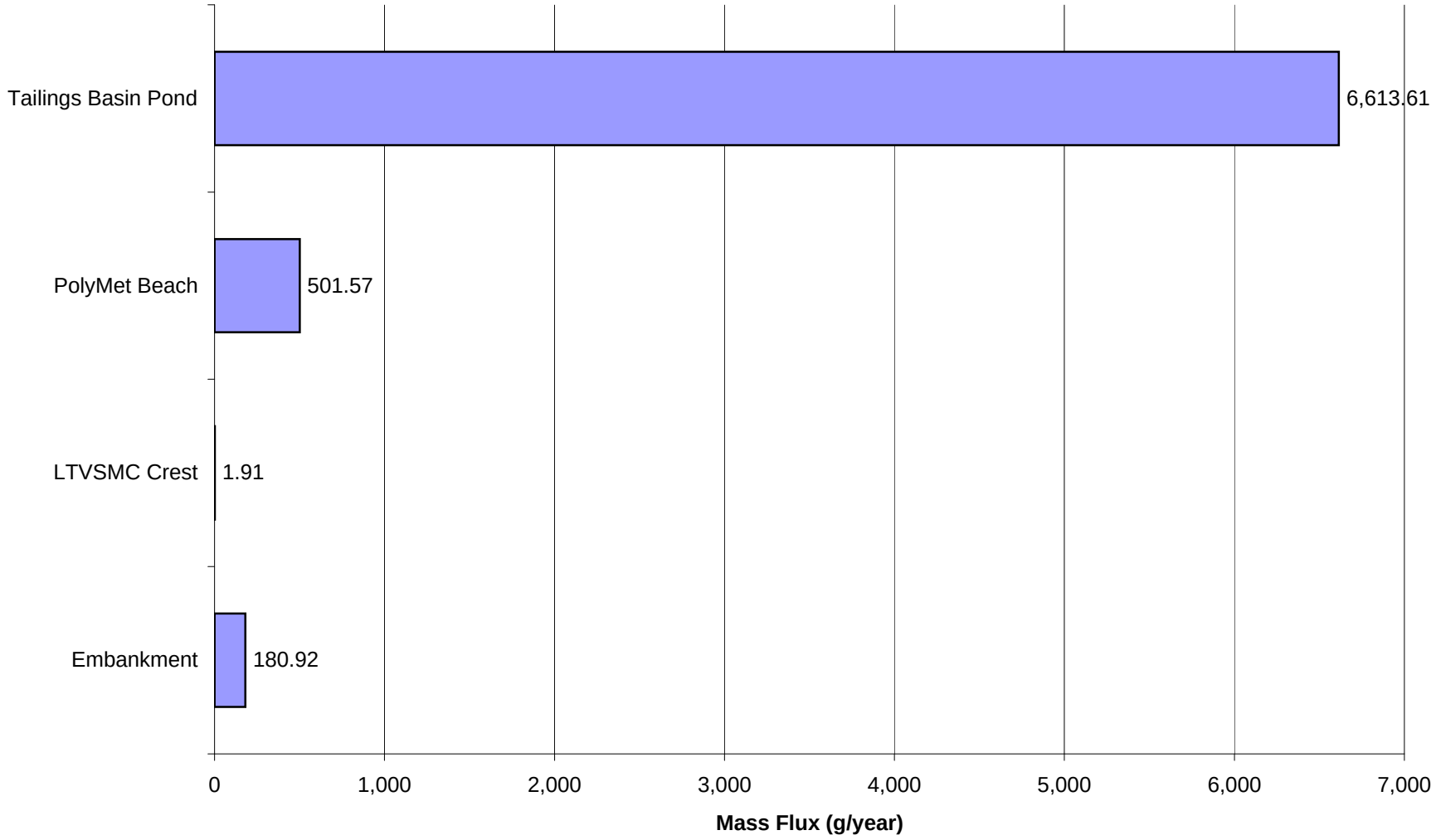
Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Year 10 for Cobalt (Co)



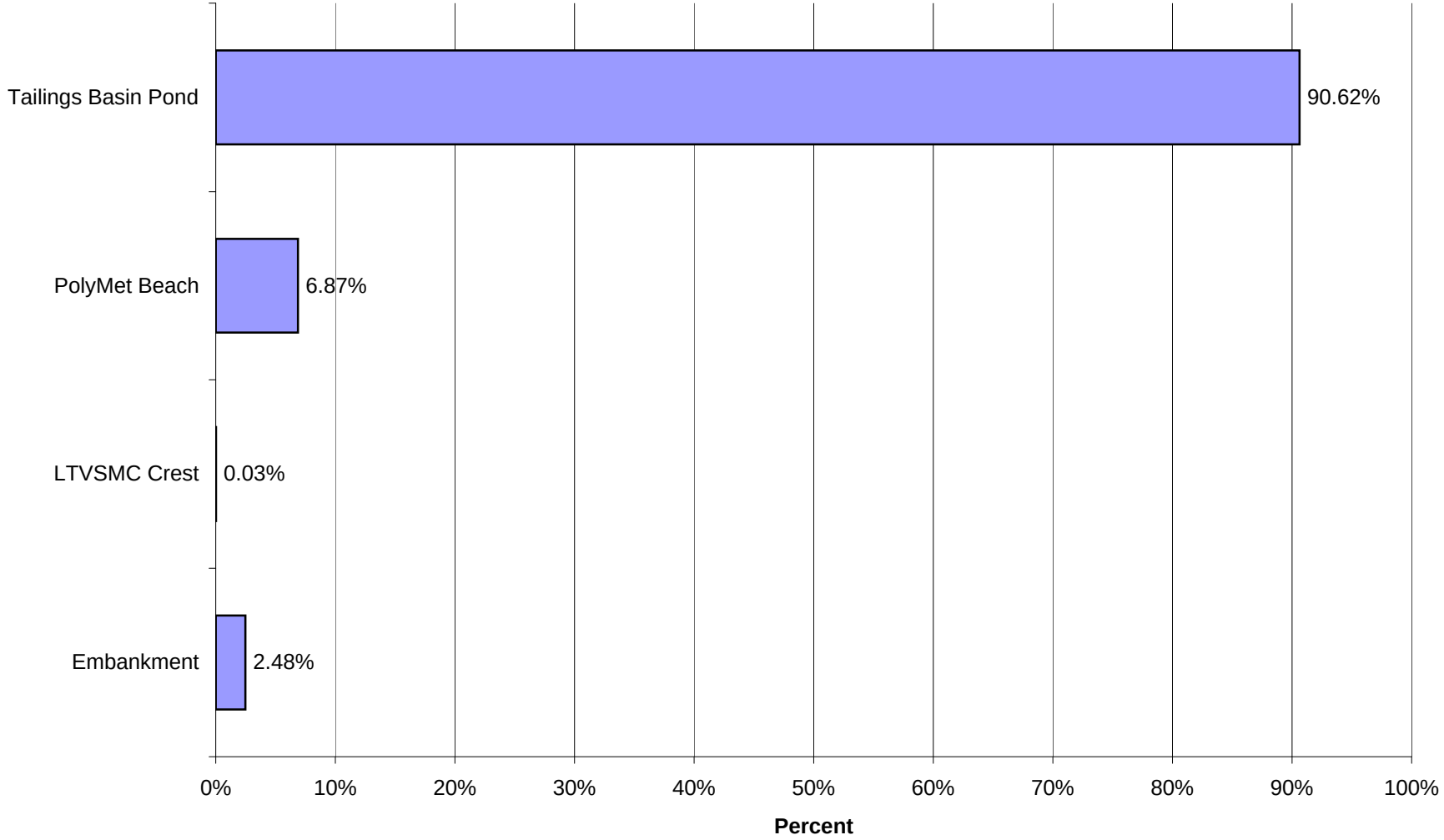
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 10 for Cobalt (Co)



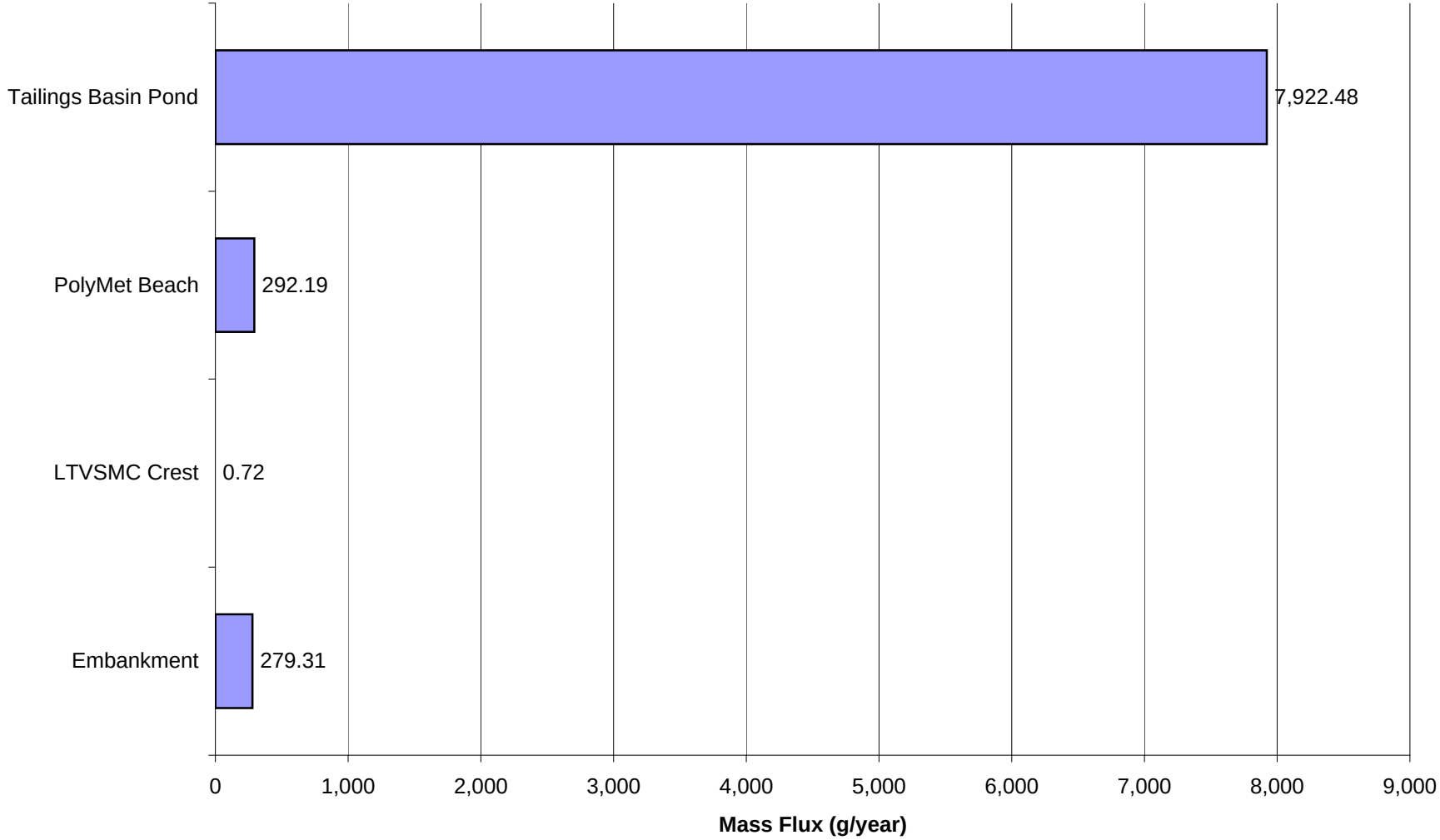
Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Year 15 for Cobalt (Co)



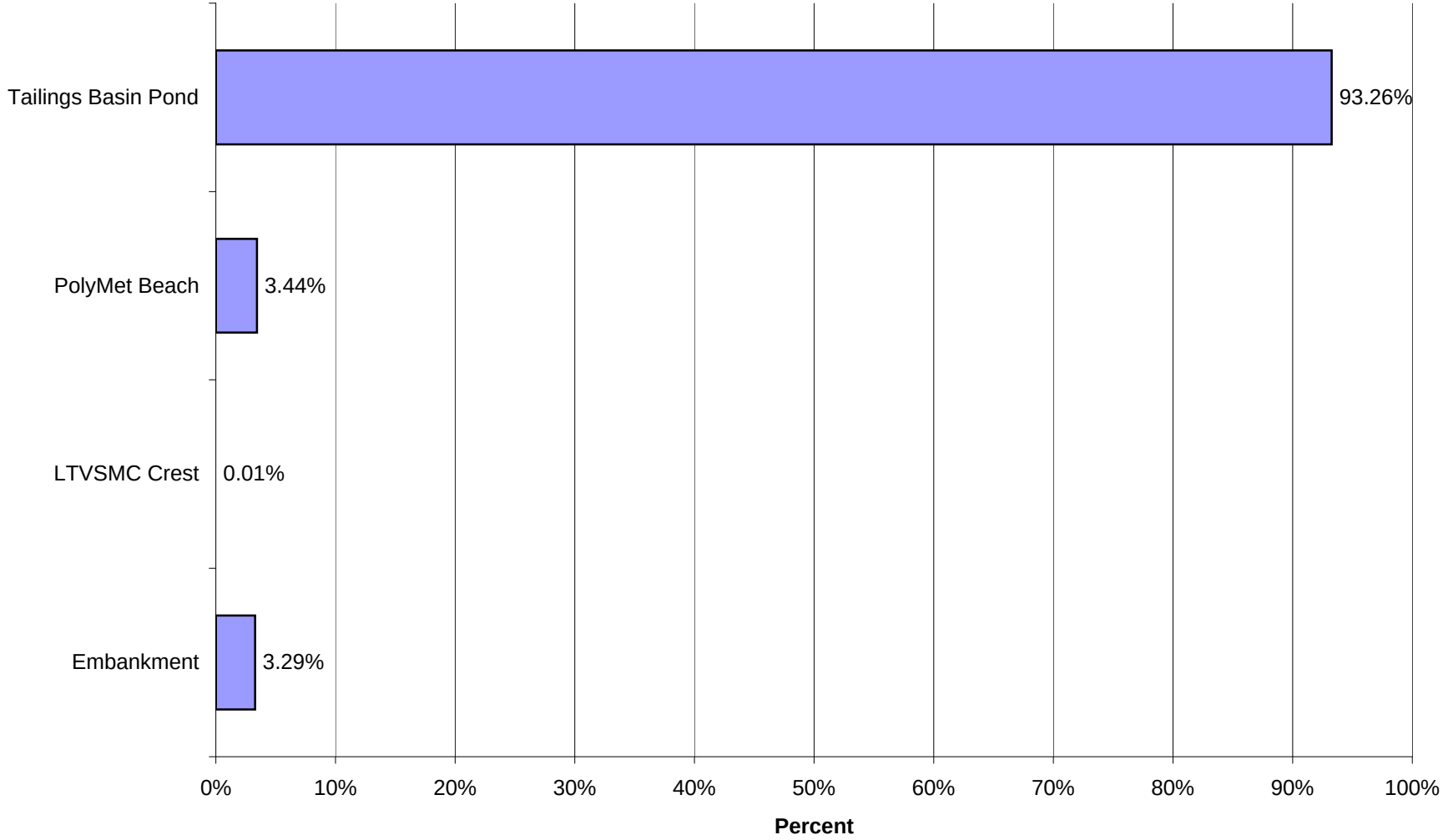
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 15 for Cobalt (Co)



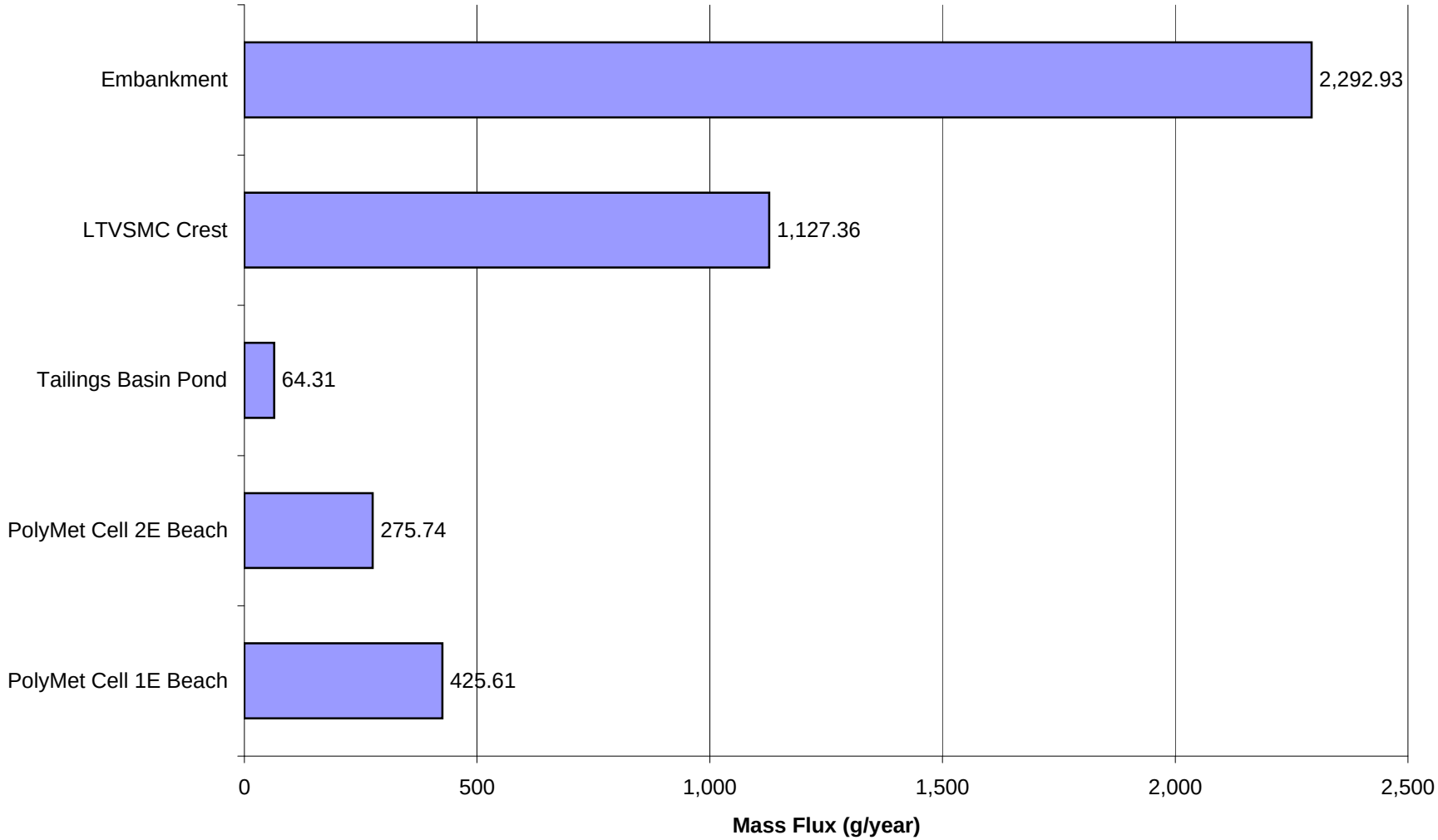
Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Year 20 for Cobalt (Co)



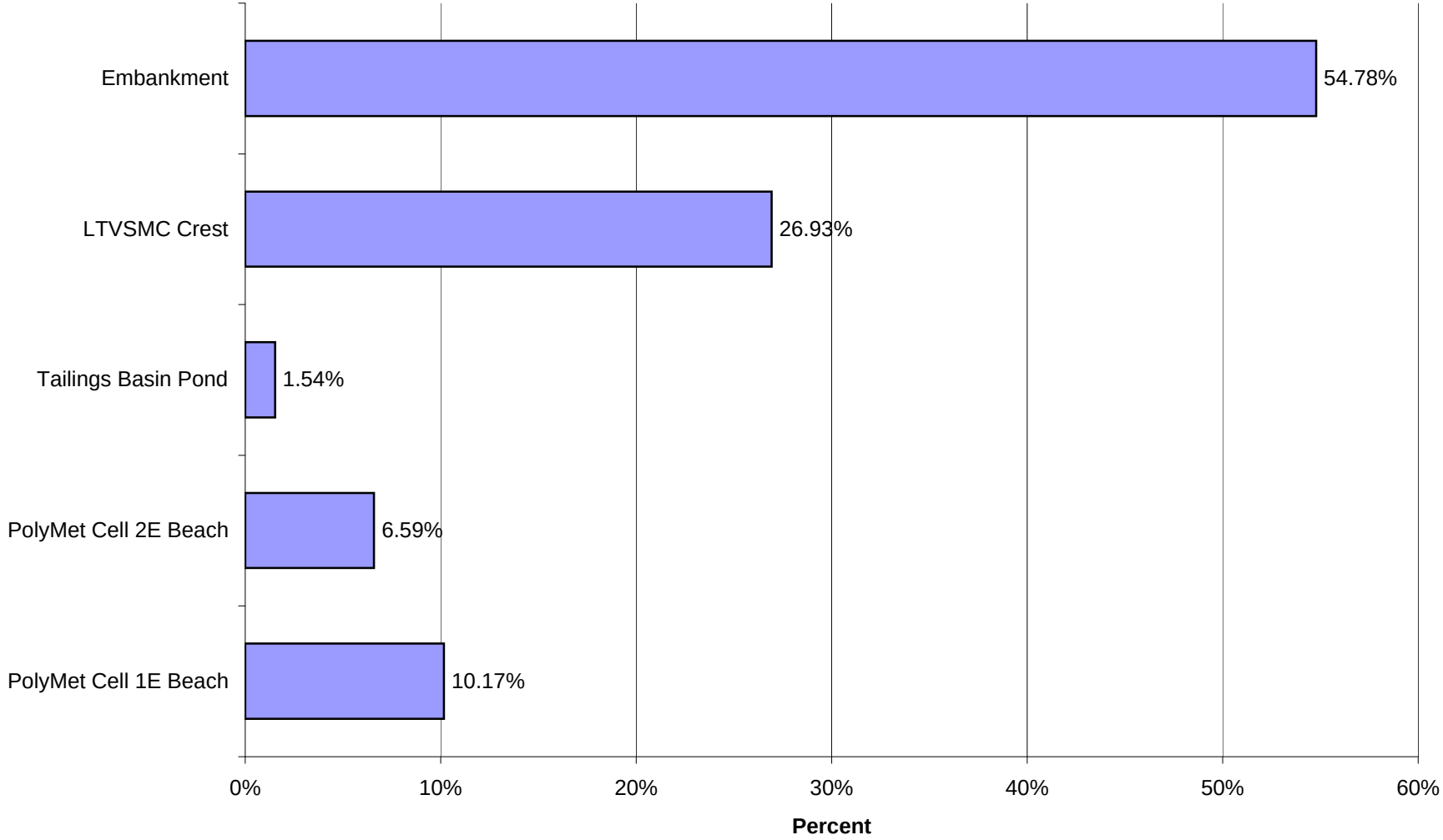
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 20 for Cobalt (Co)



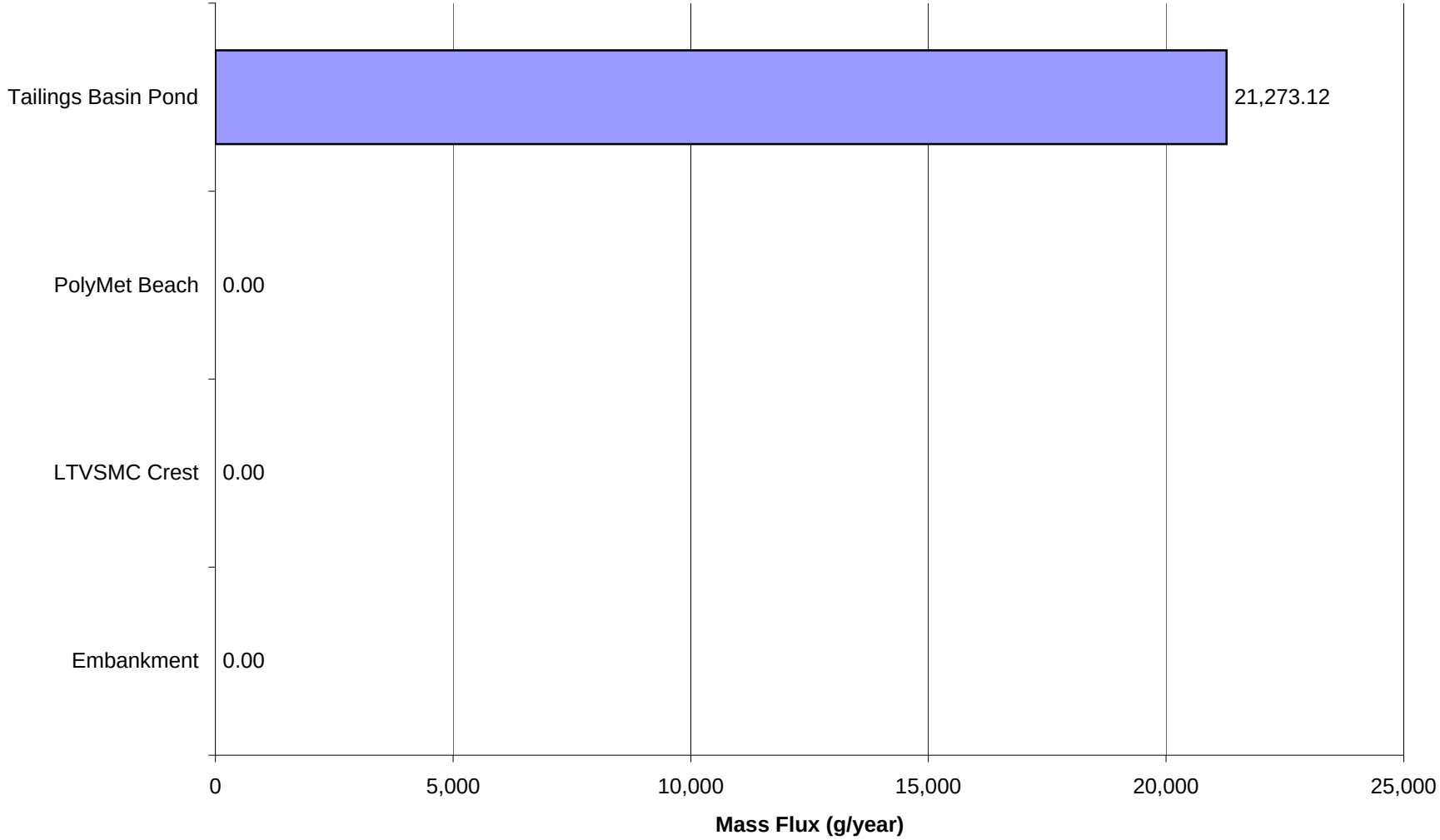
Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Closure for Cobalt (Co)



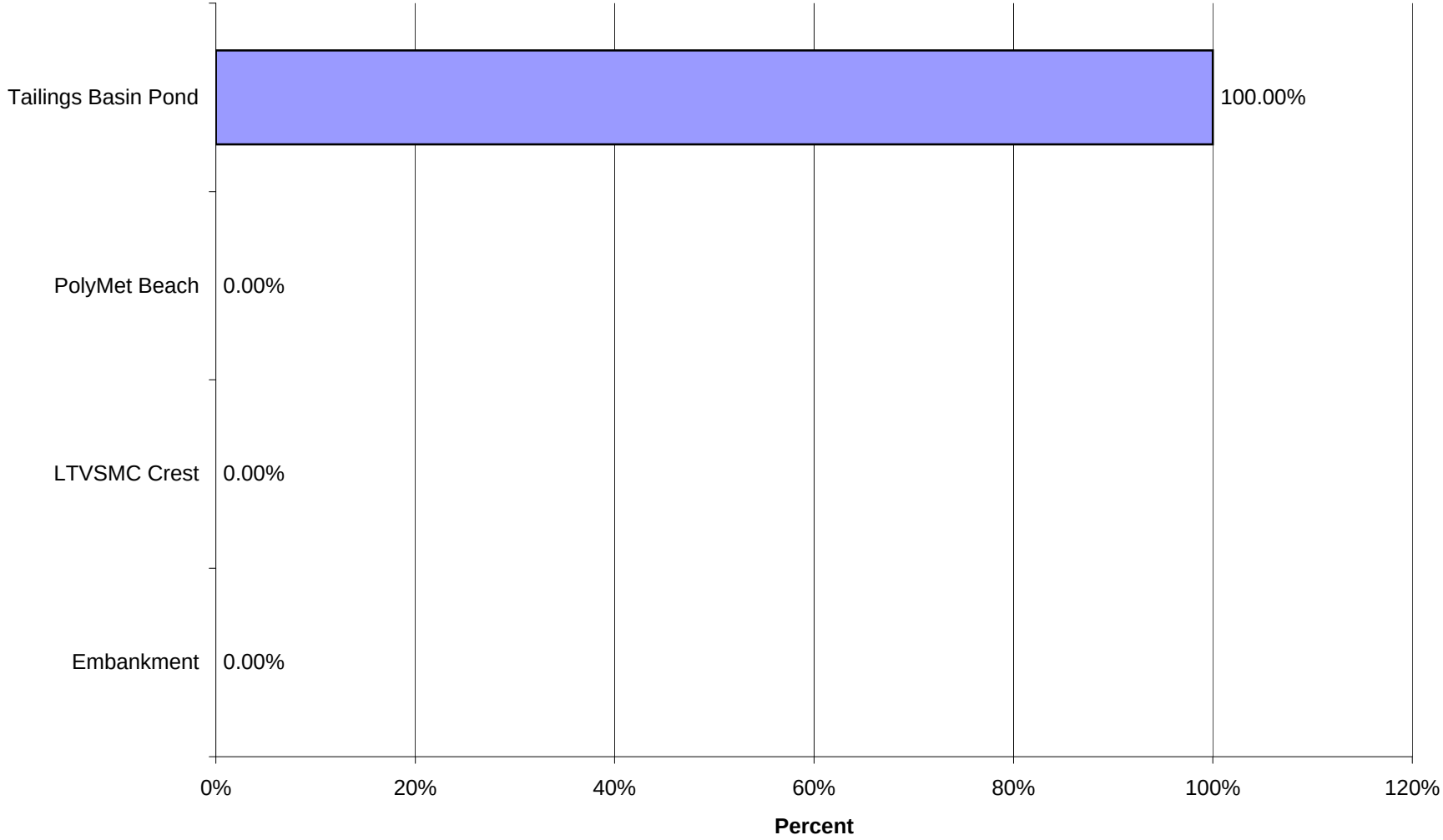
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Closure for Cobalt (Co)



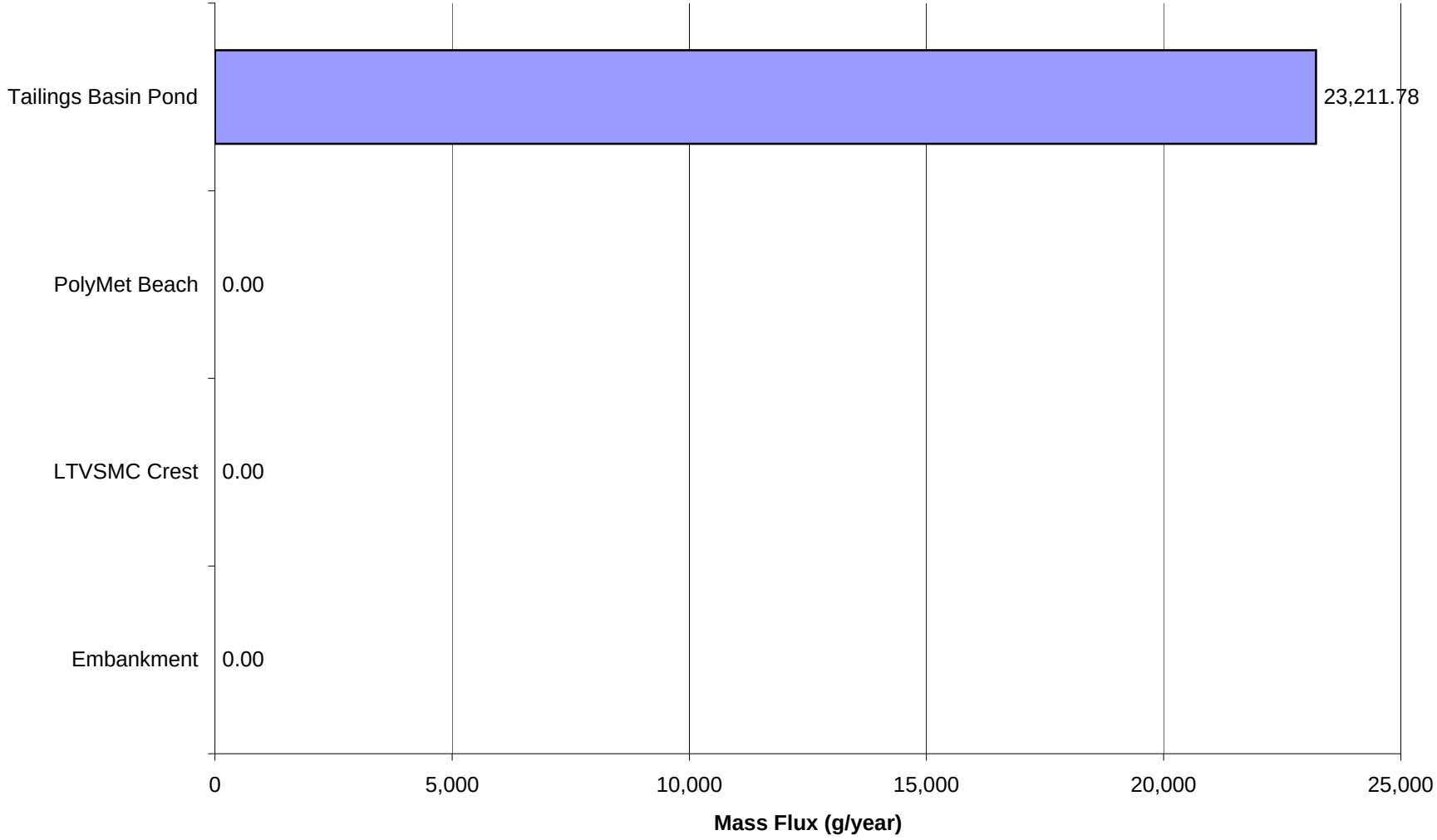
Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Year 1 for Copper (Cu)



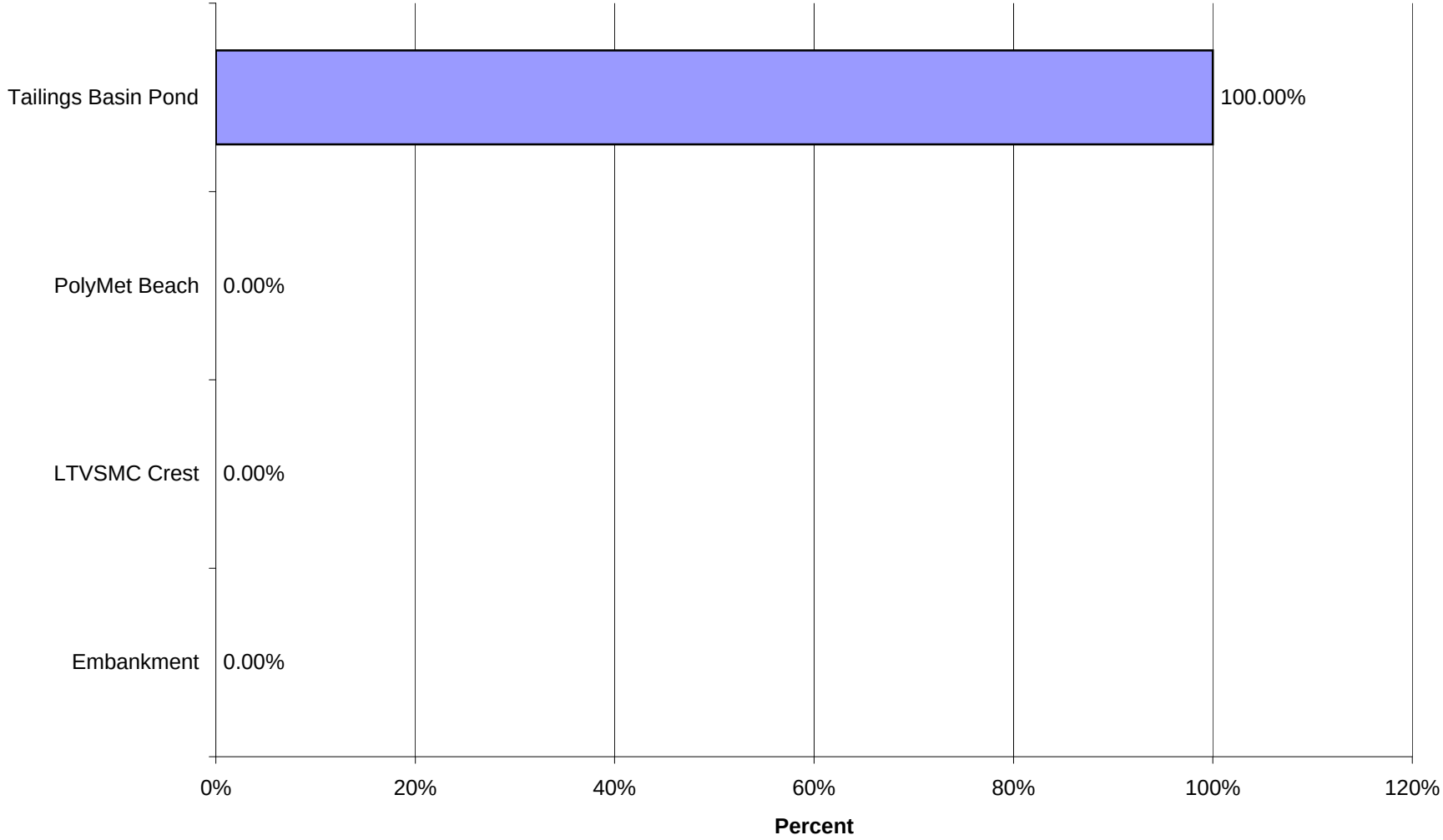
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 1 for Copper (Cu)



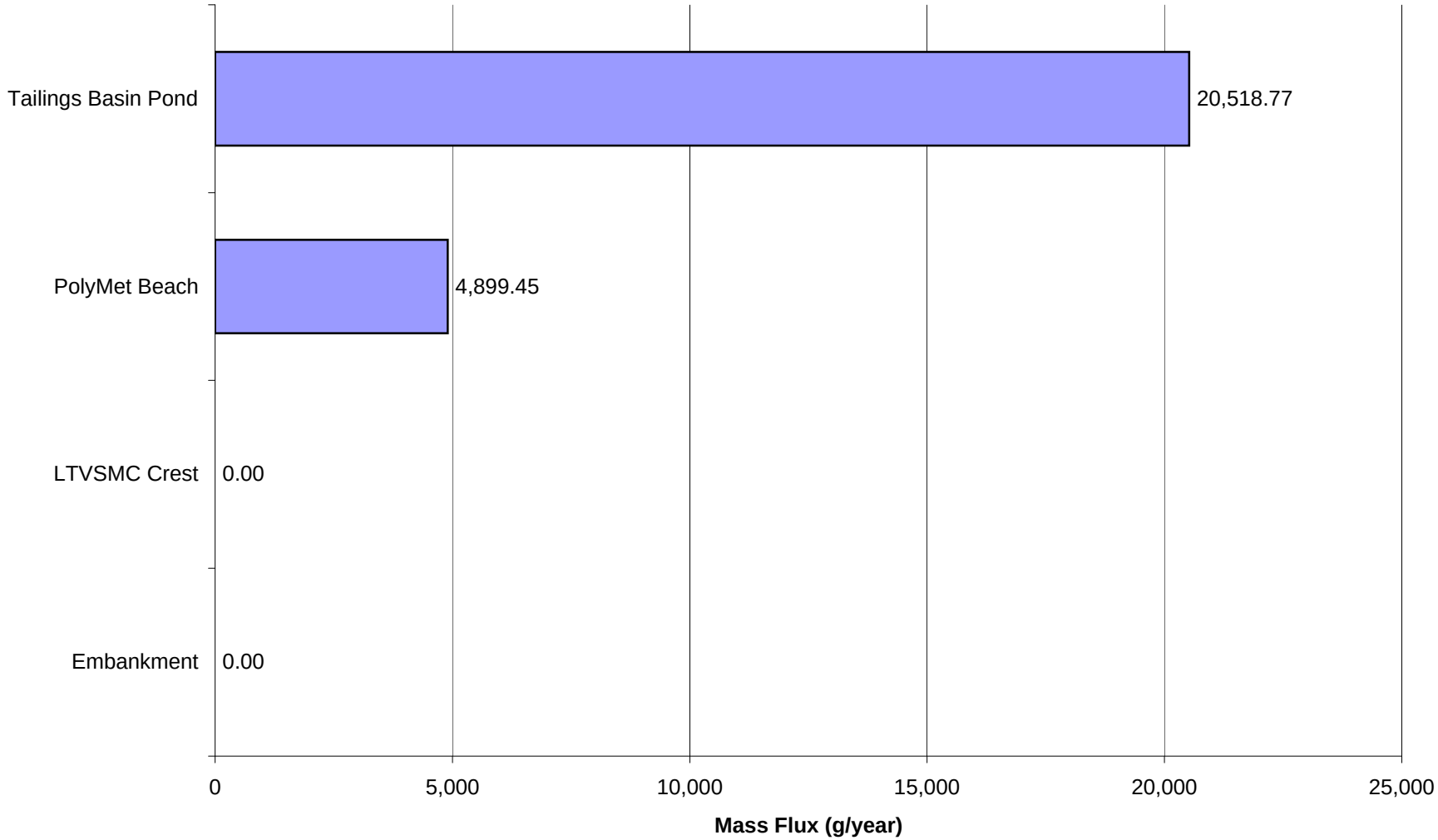
Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Year 5 for Copper (Cu)



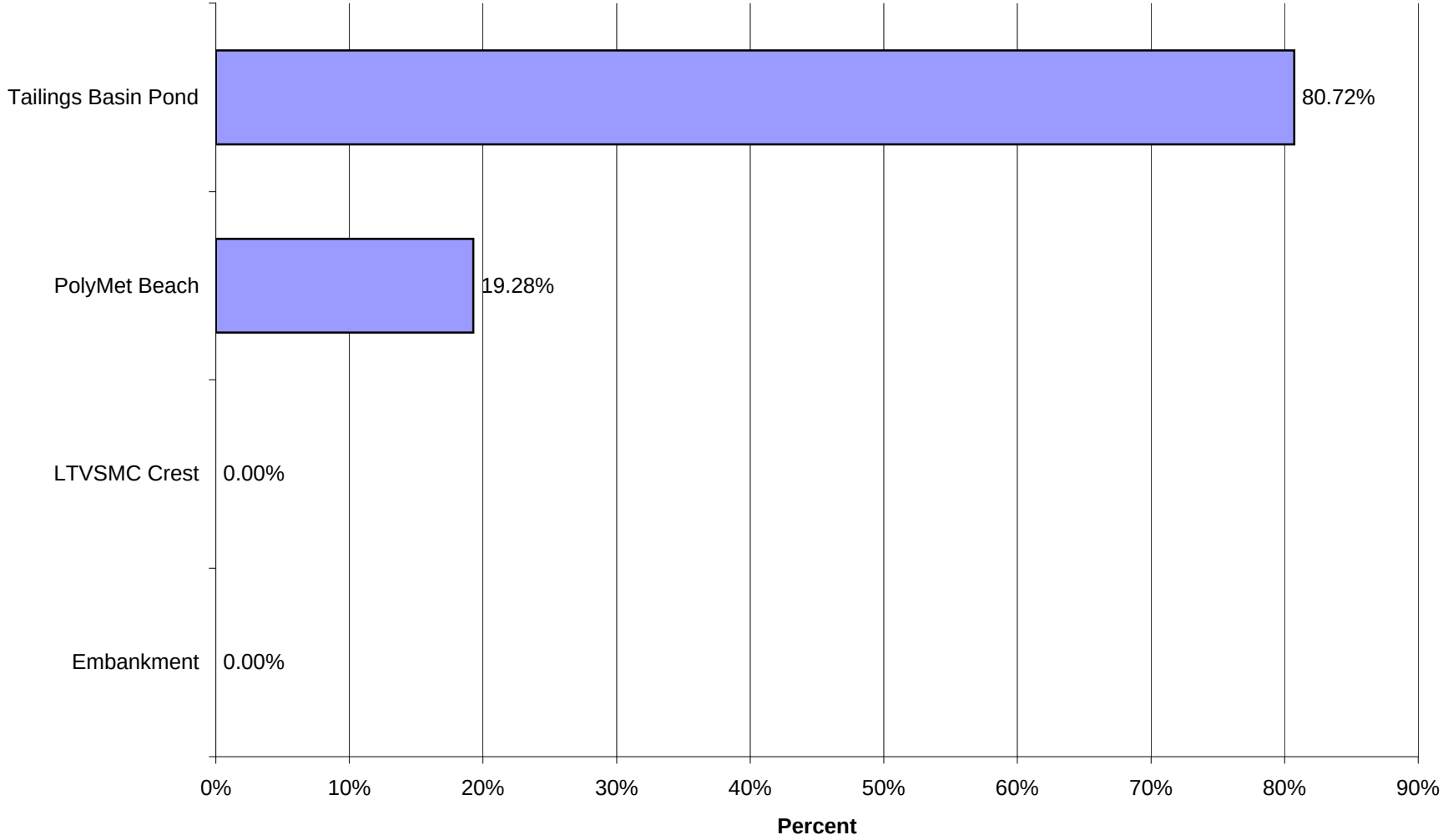
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 5 for Copper (Cu)



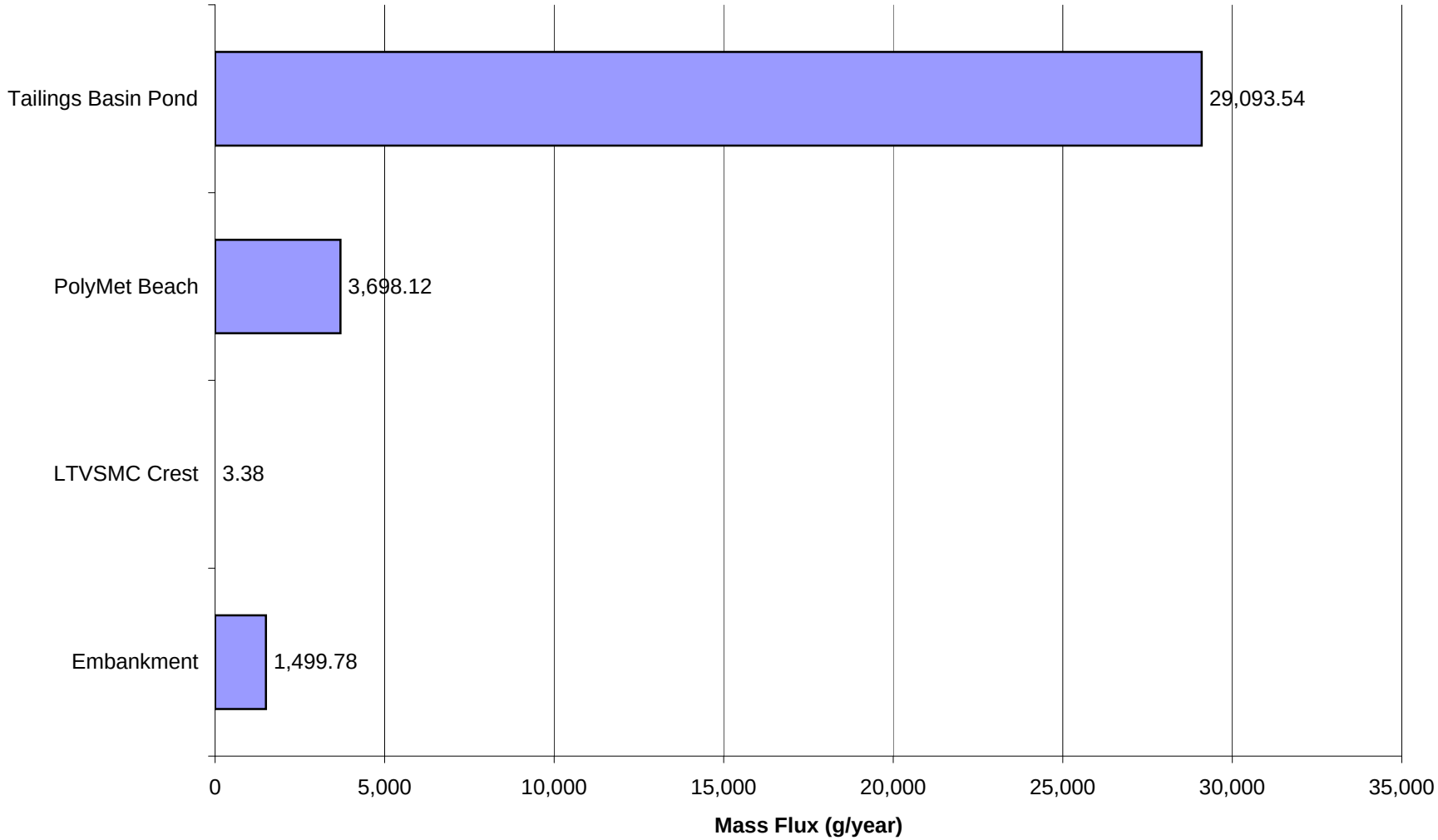
Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Year 10 for Copper (Cu)



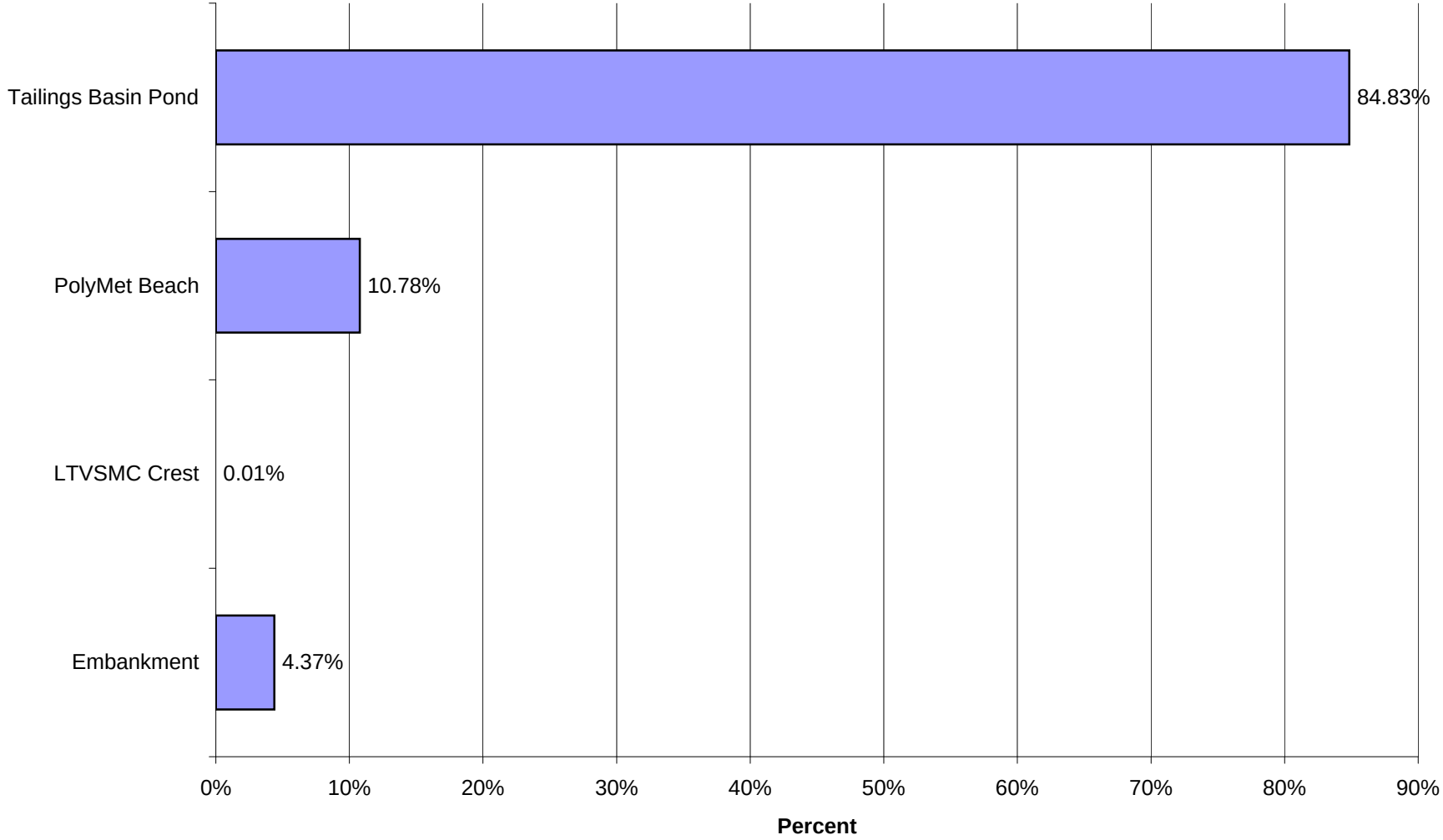
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 10 for Copper (Cu)



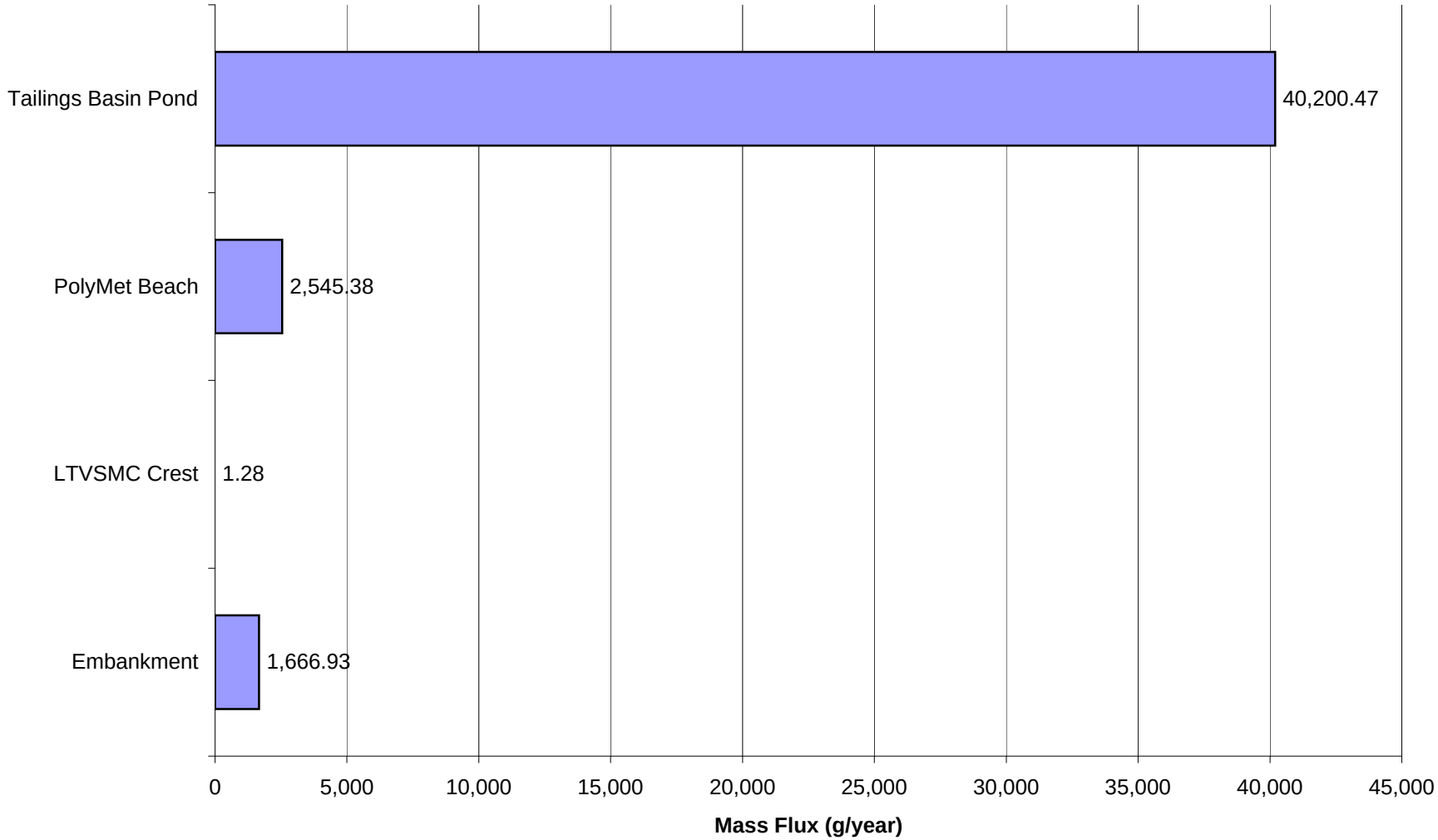
Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Year 15 for Copper (Cu)



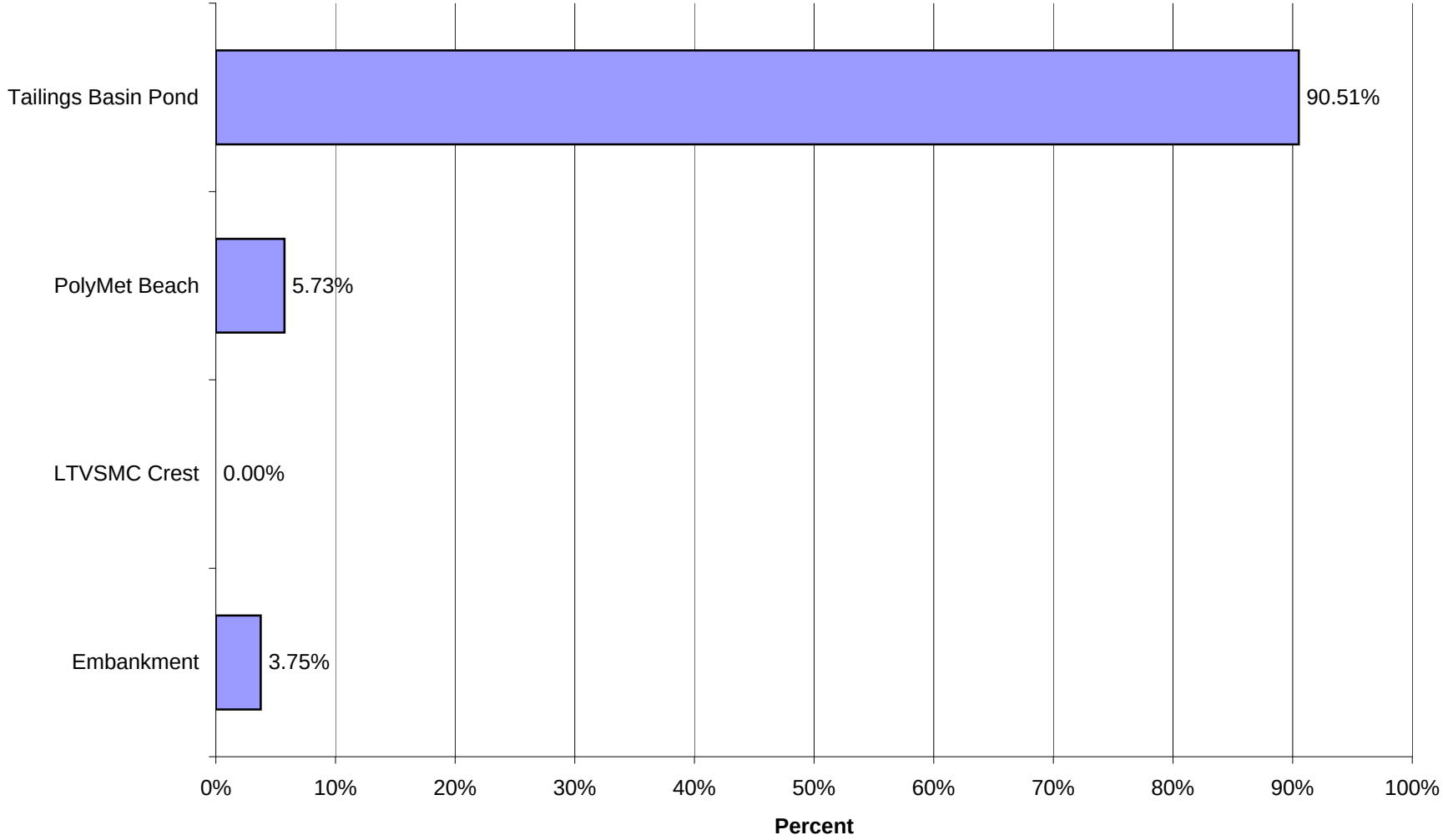
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 15 for Copper (Cu)



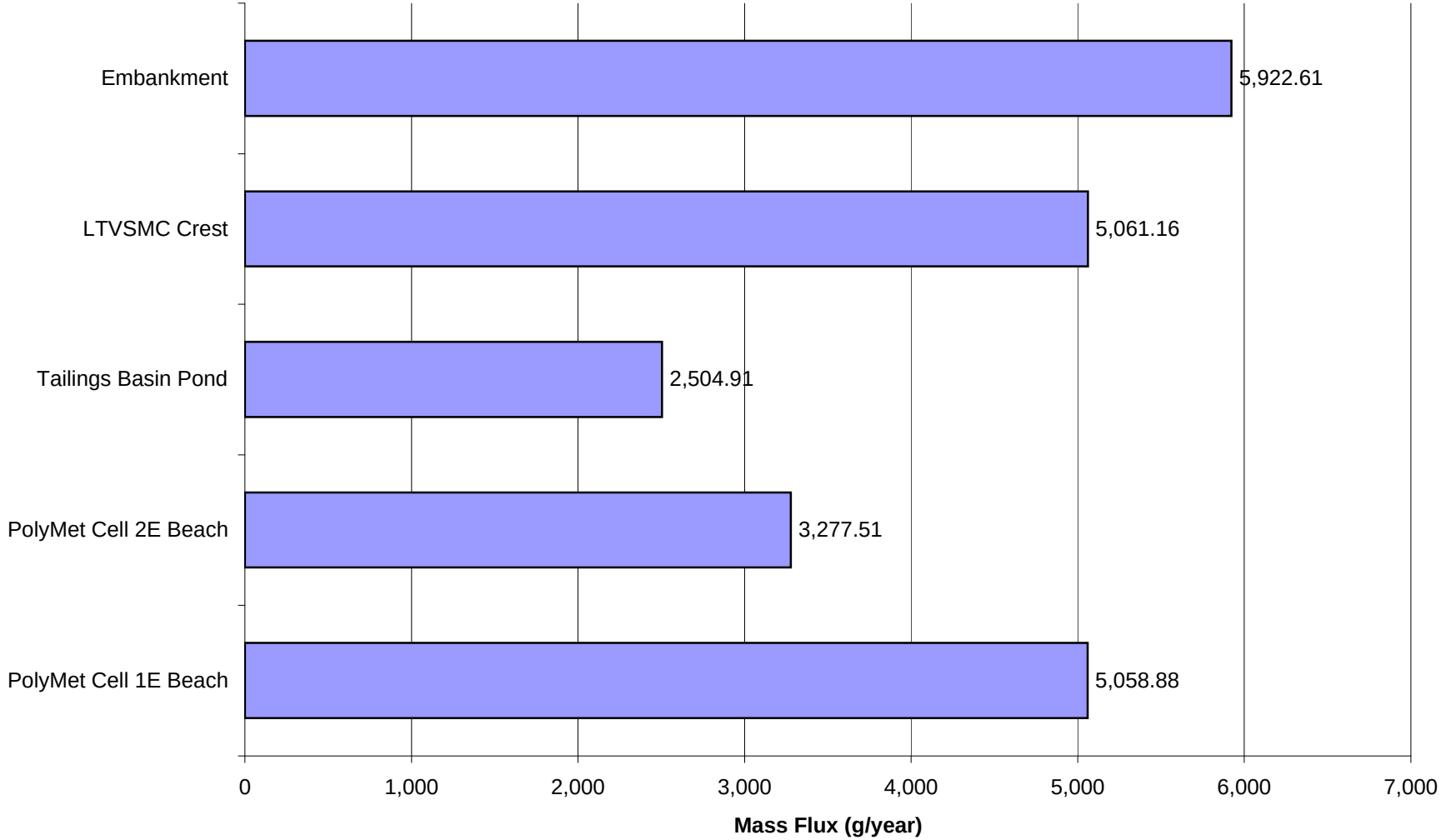
Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Year 20 for Copper (Cu)



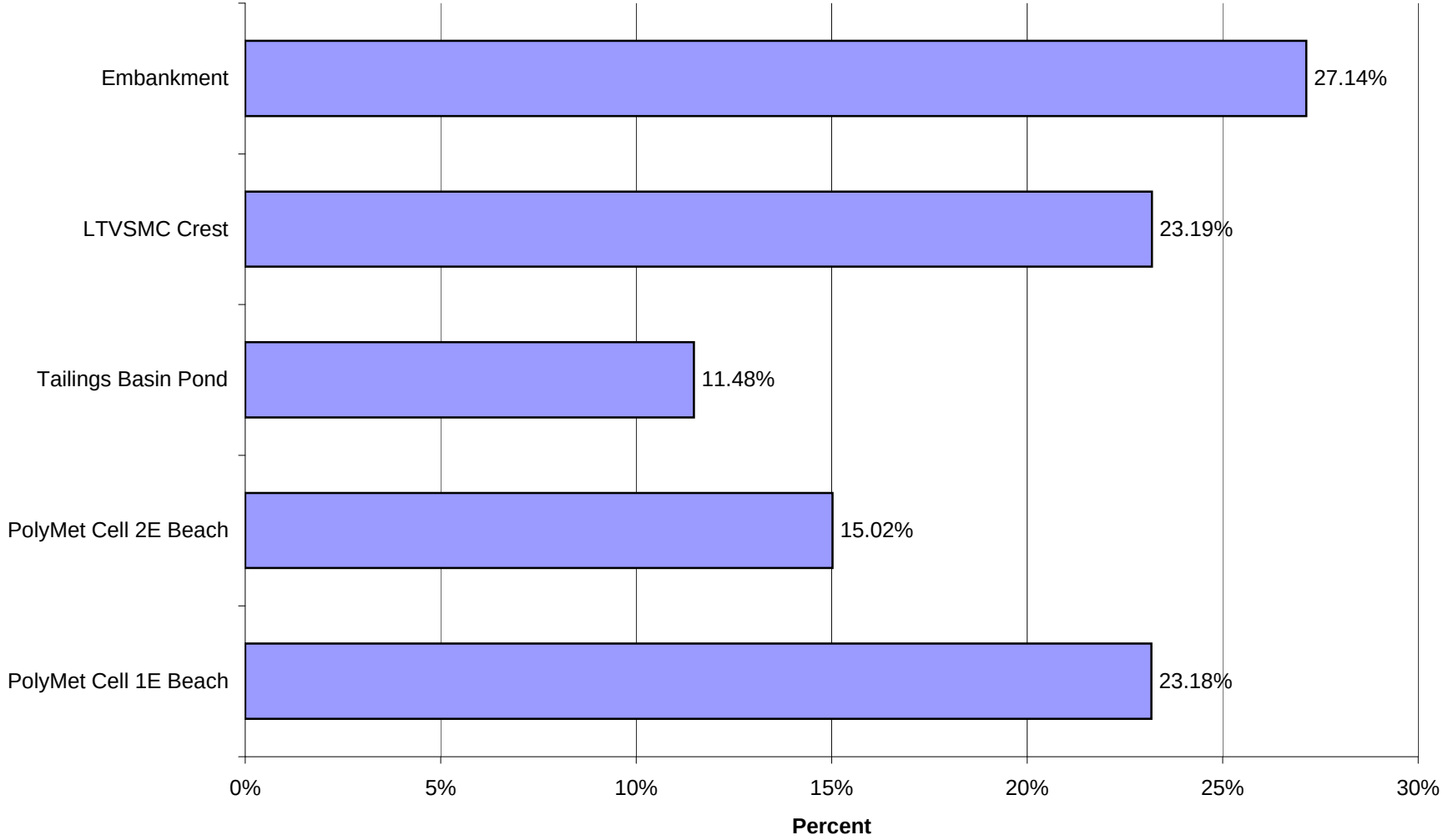
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 20 for Copper (Cu)



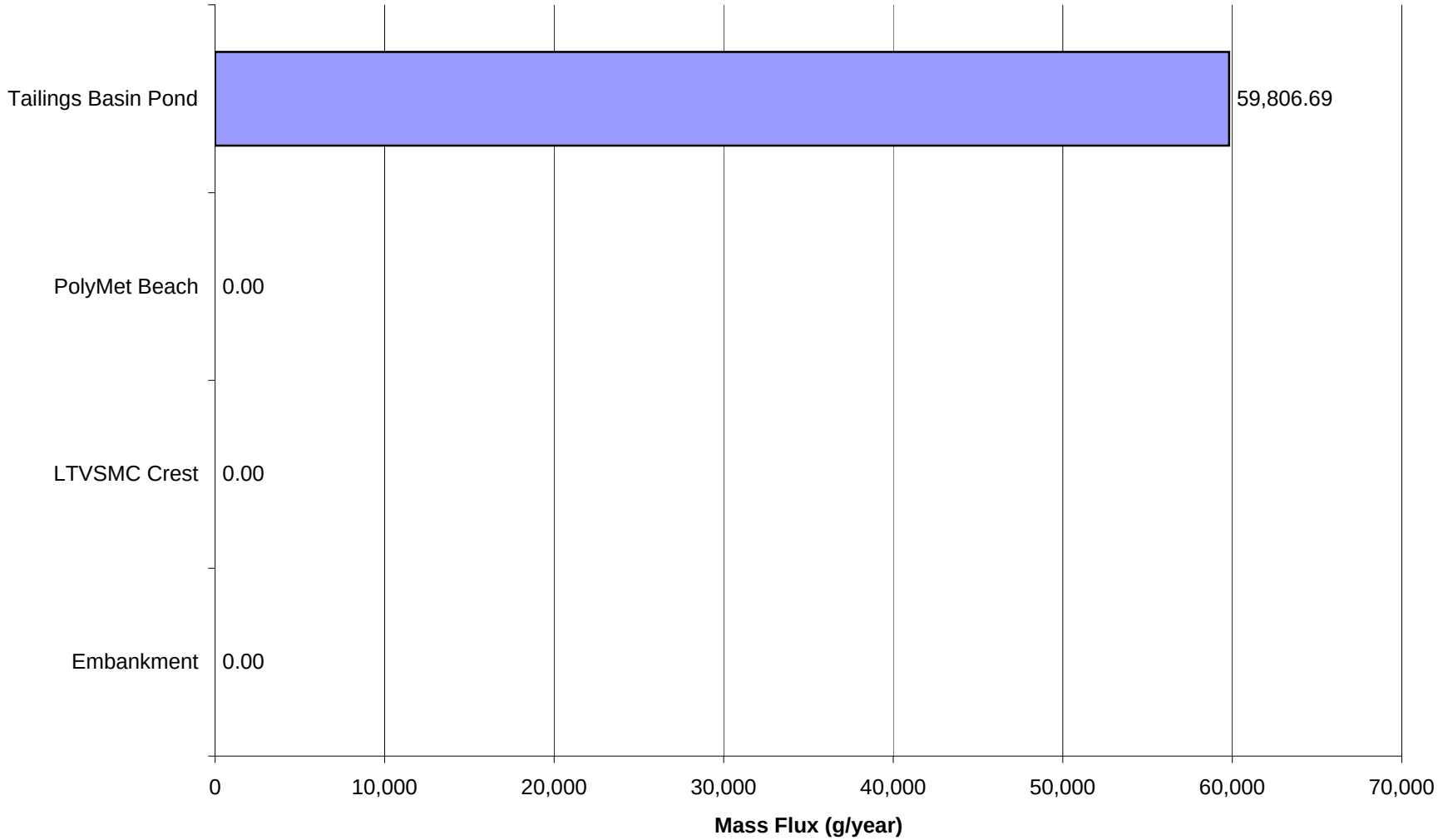
Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Closure for Copper (Cu)



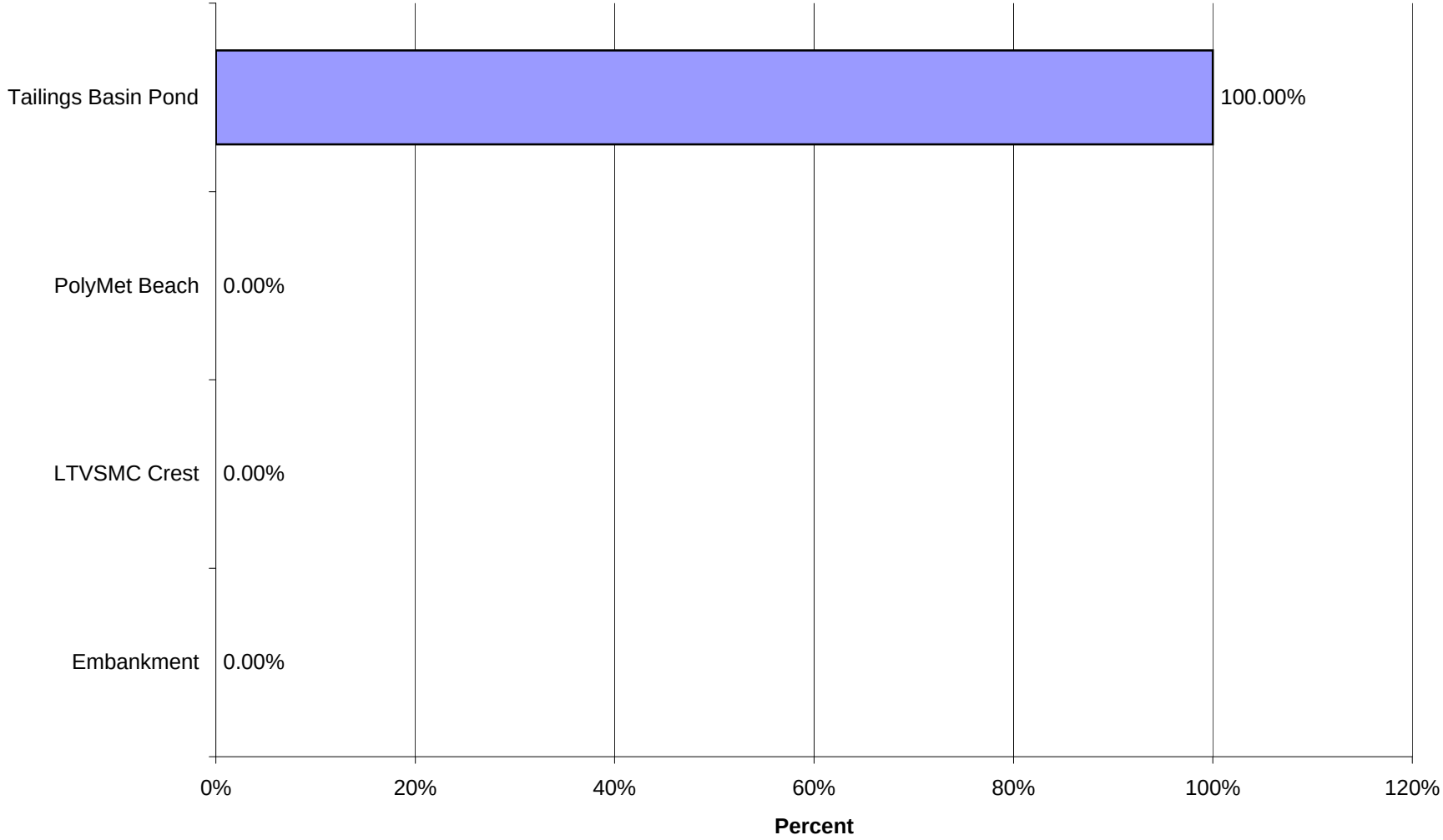
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Closure for Copper (Cu)



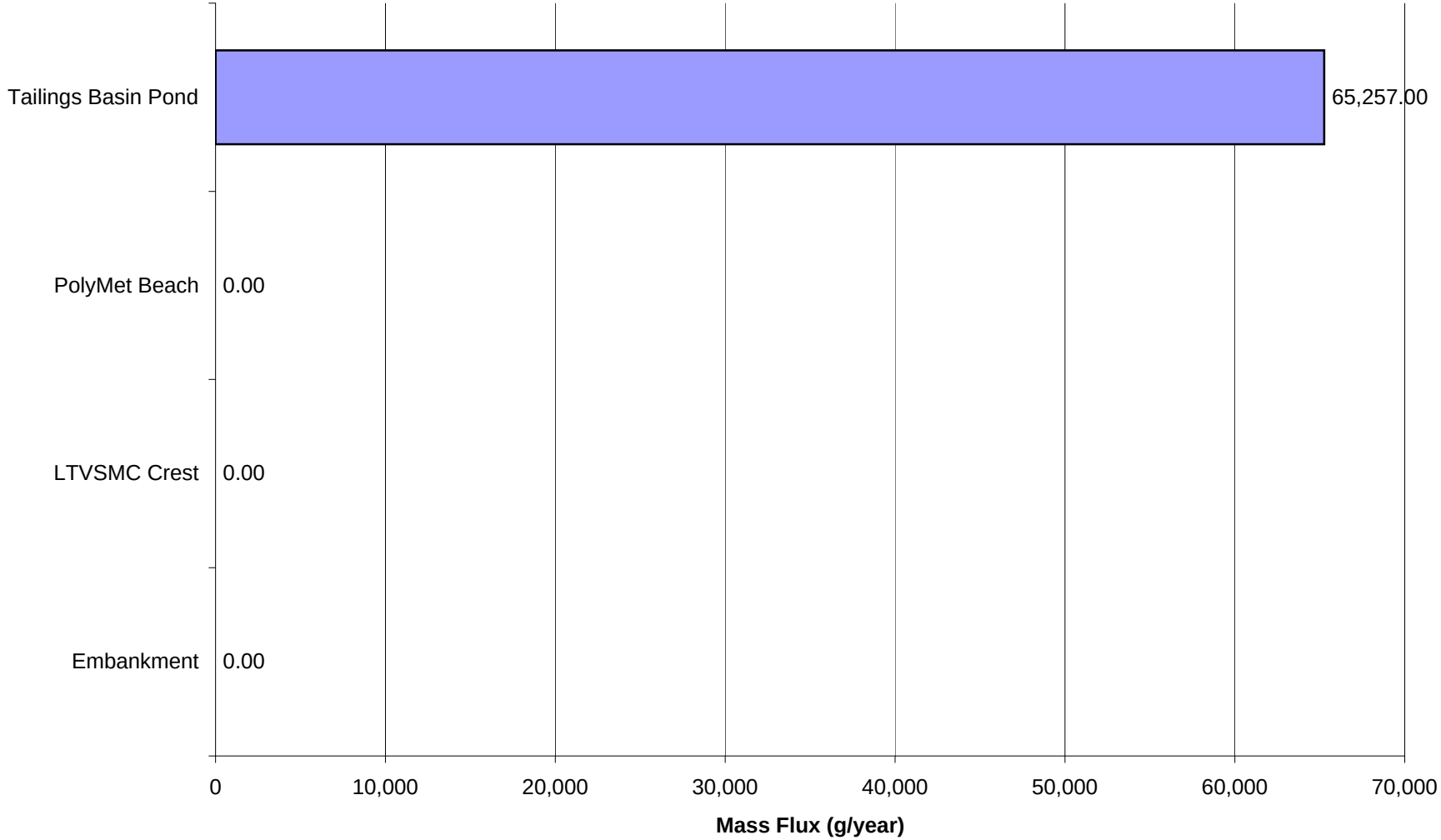
Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Year 1 for Nickel (Ni)



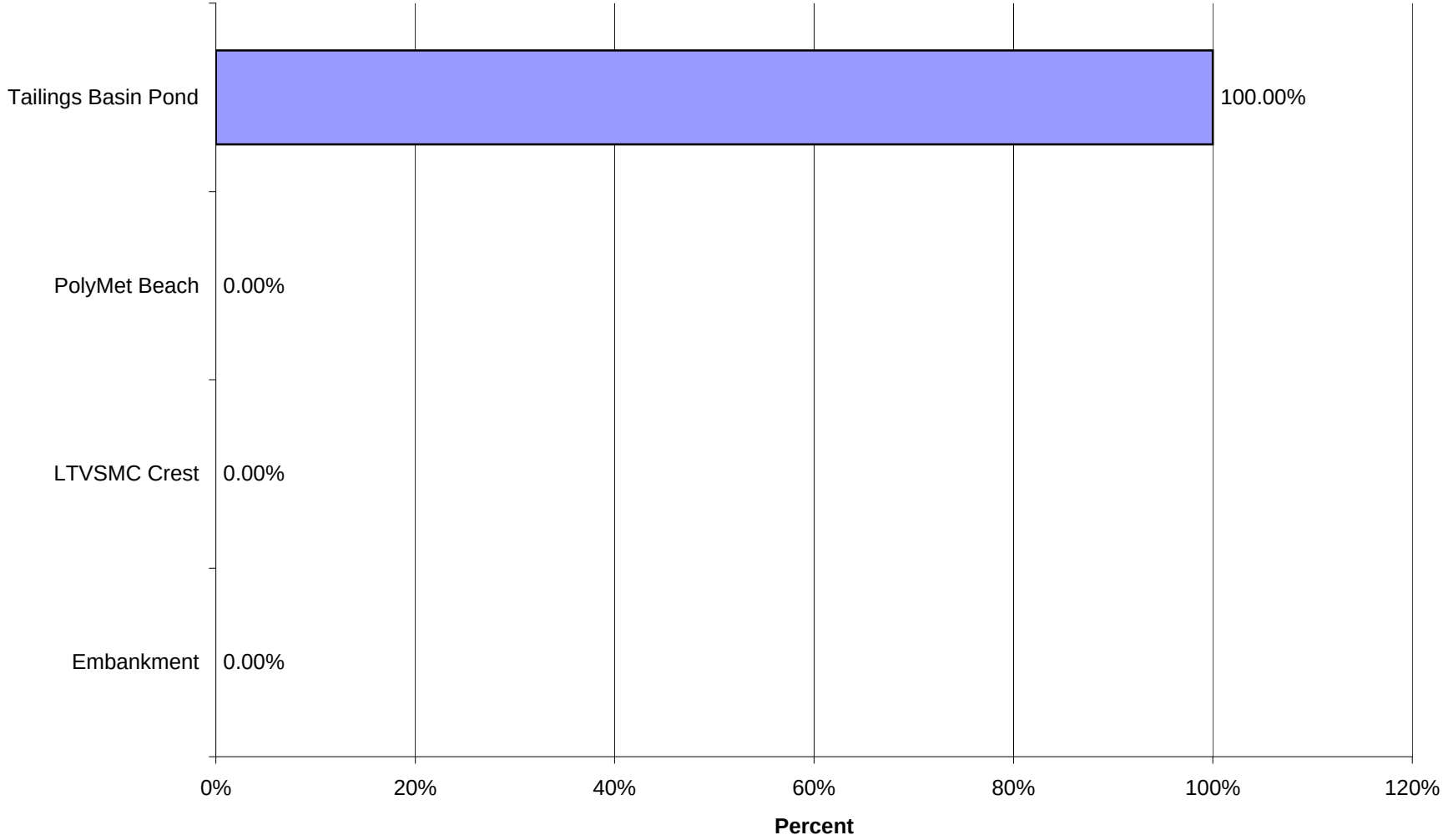
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 1 for Nickel (Ni)



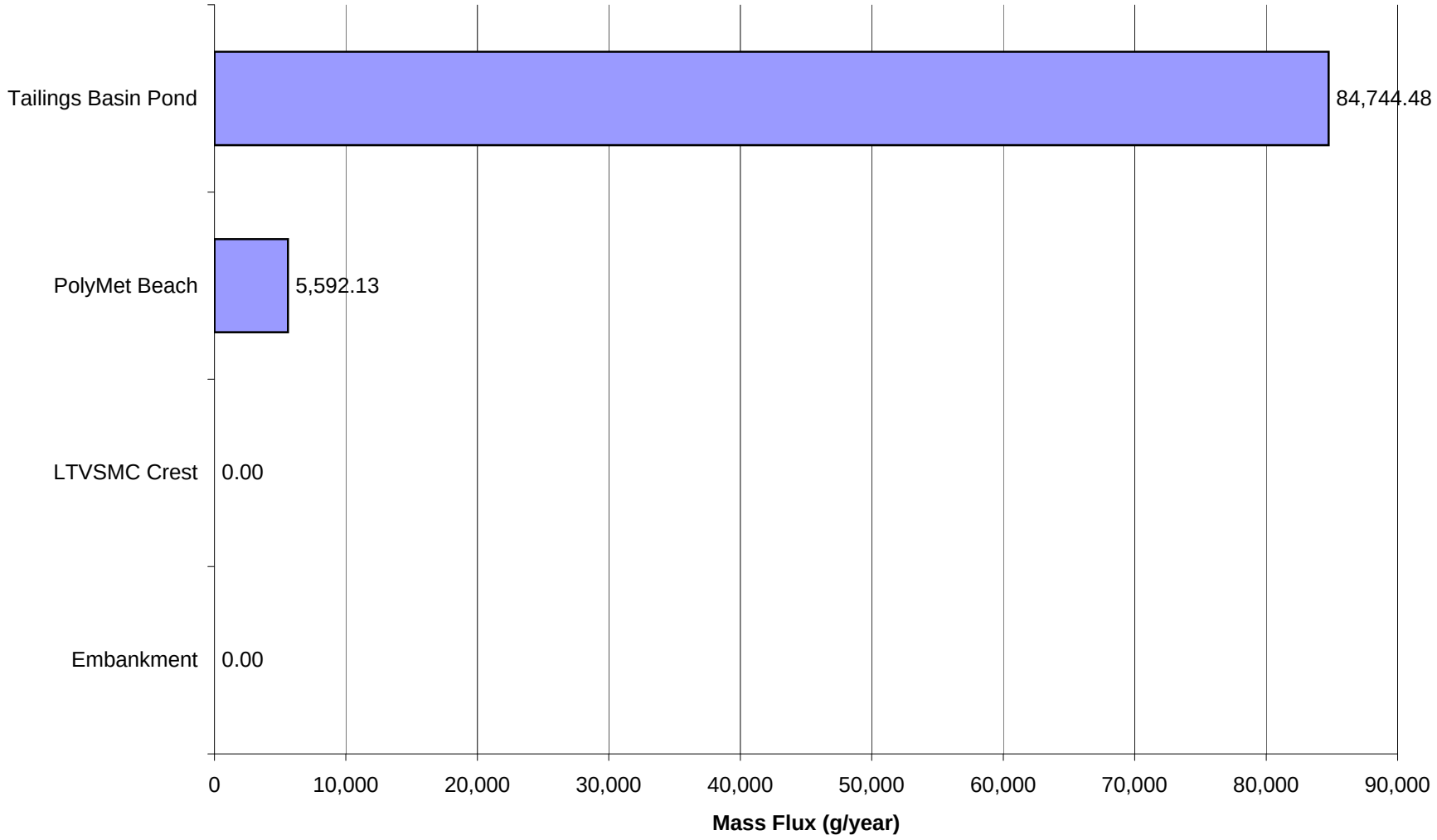
Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Year 5 for Nickel (Ni)



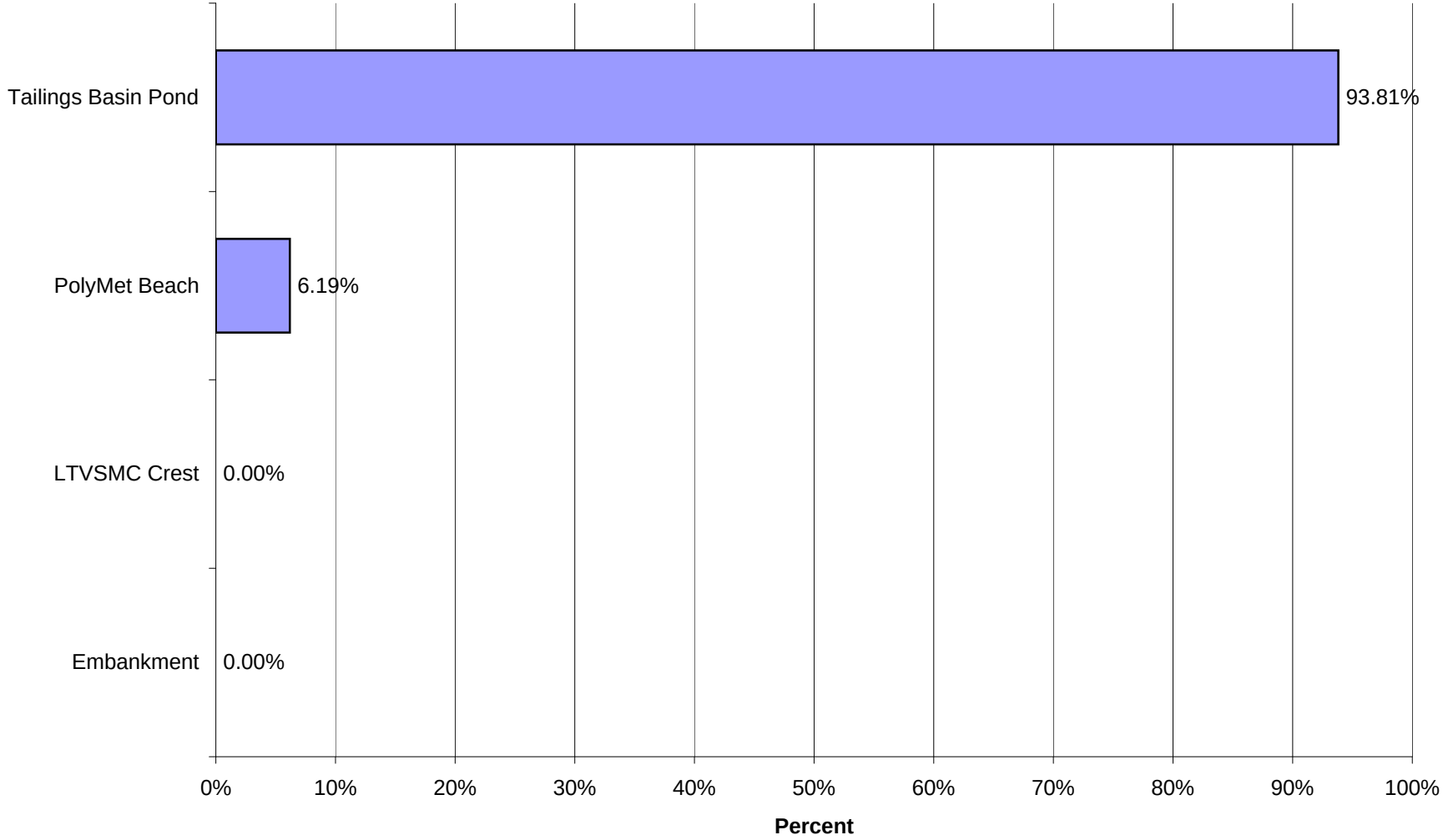
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 5 for Nickel (Ni)



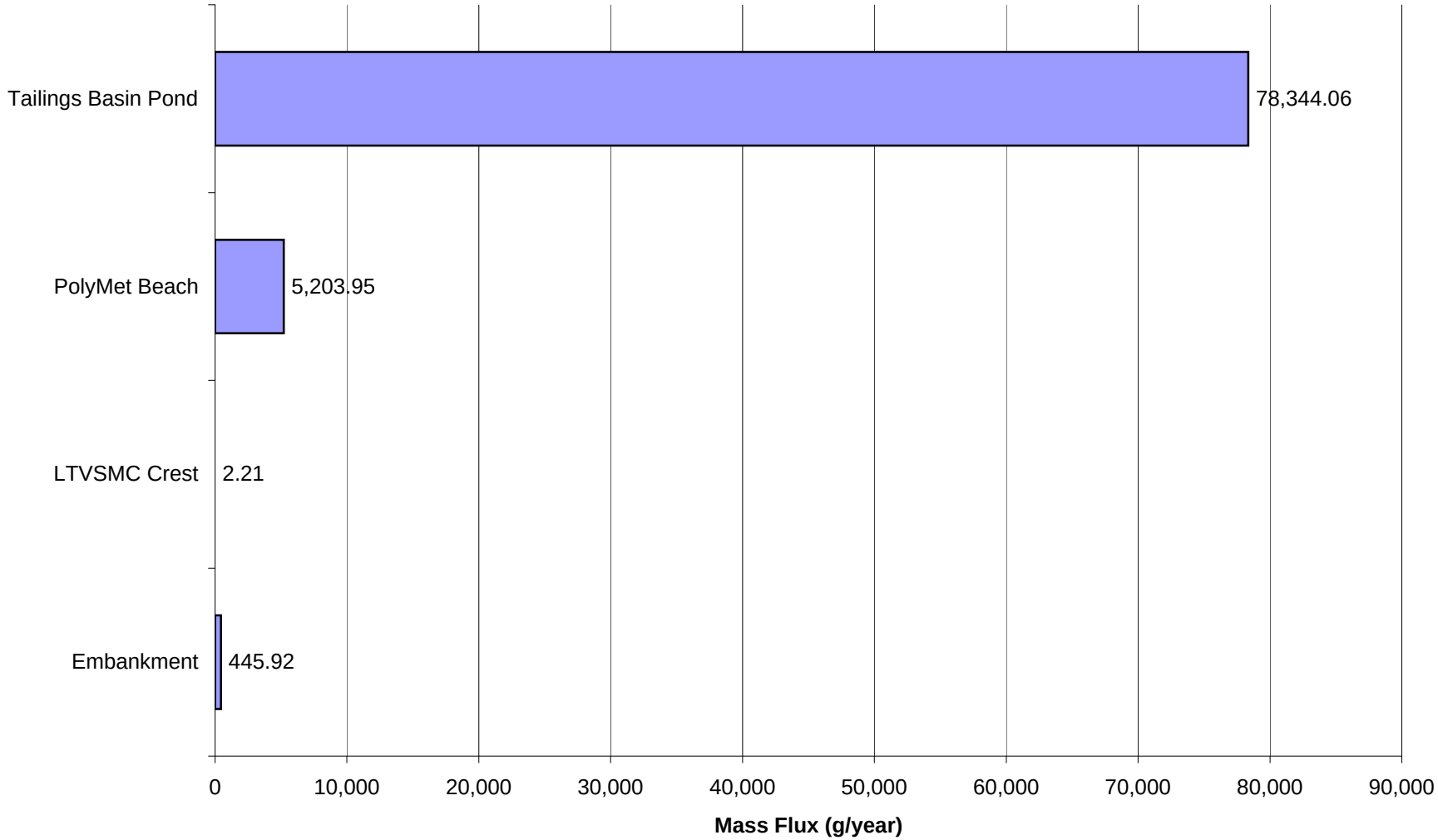
Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Year 10 for Nickel (Ni)



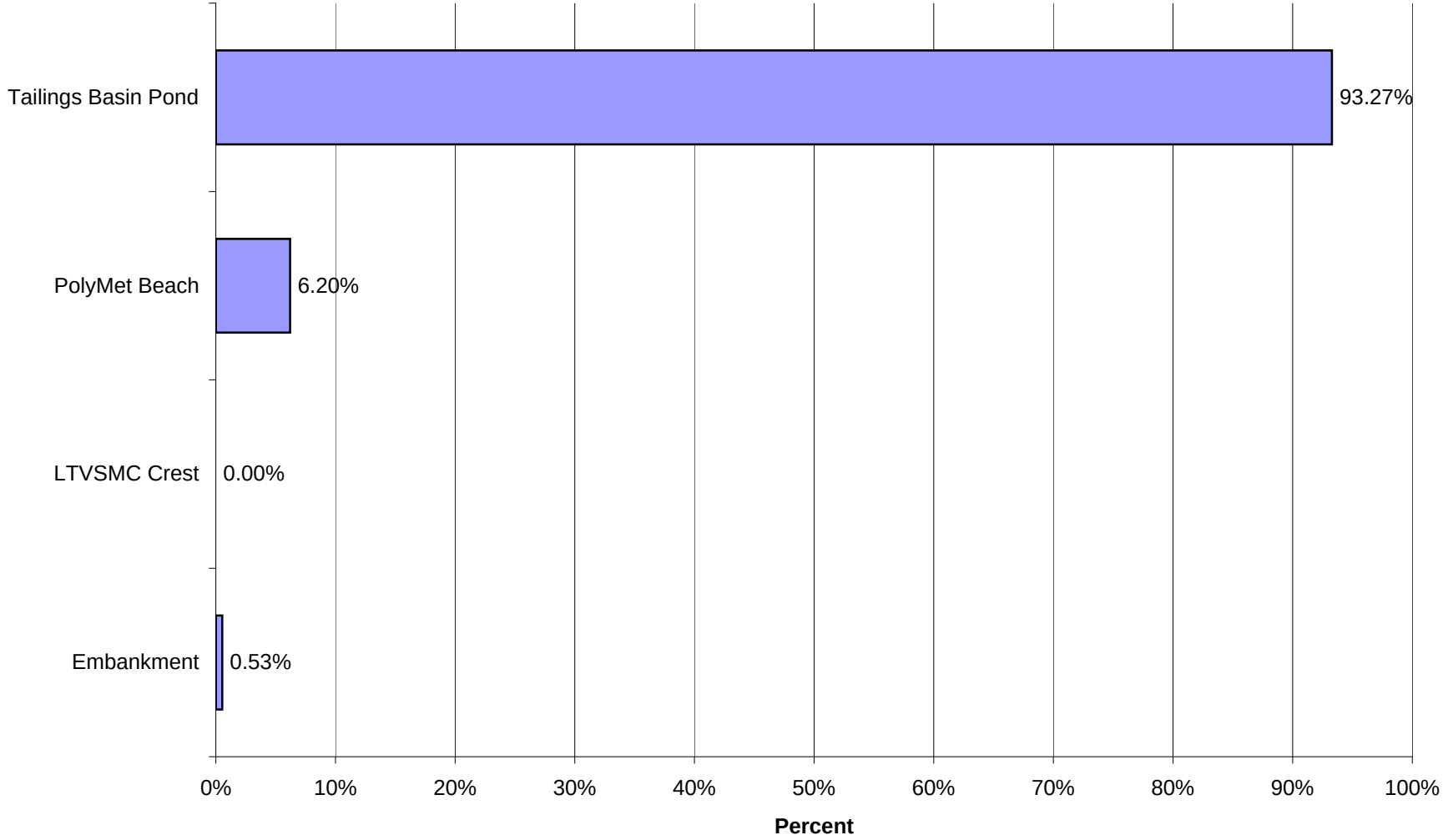
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 10 for Nickel (Ni)



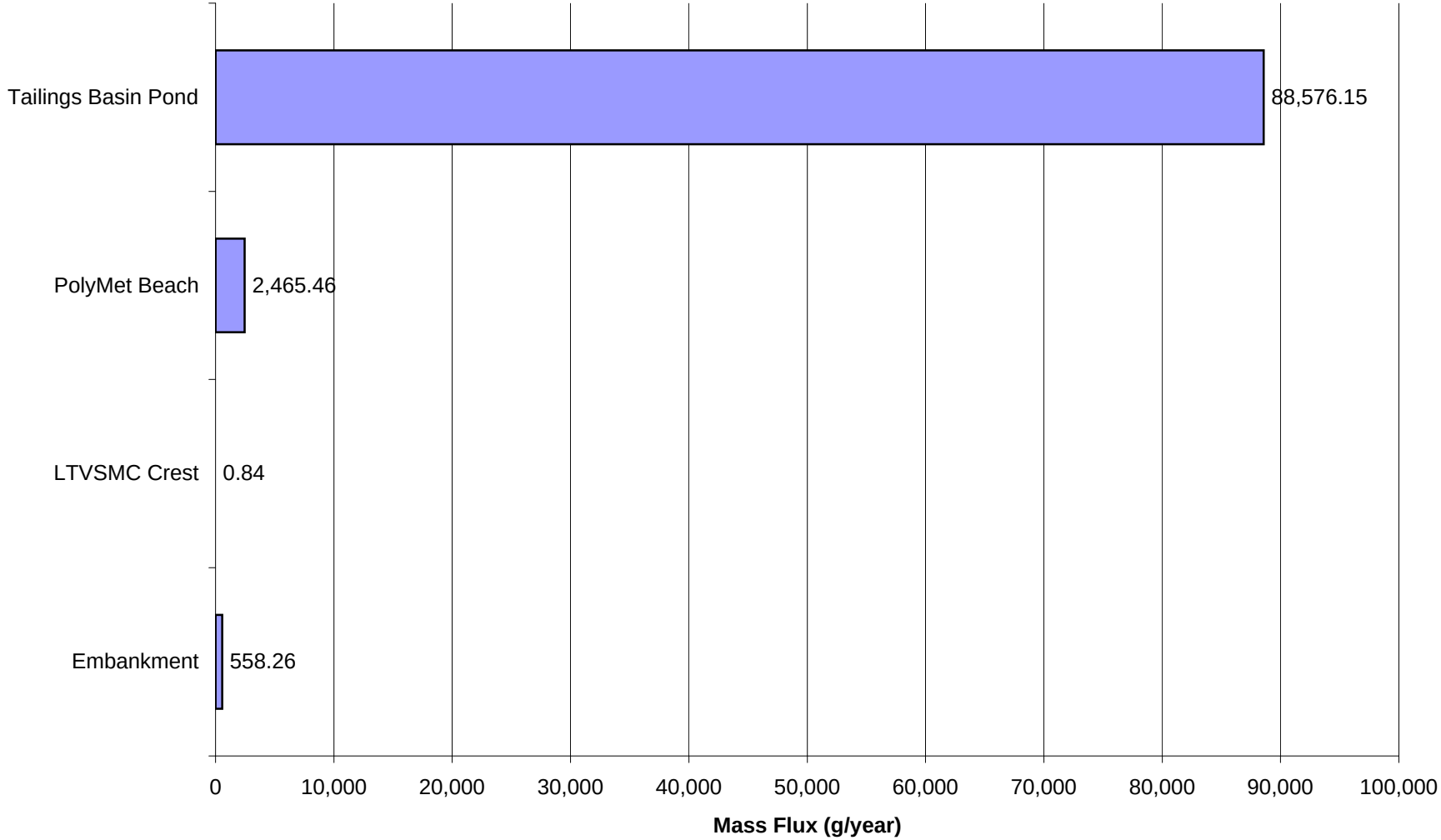
Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Year 15 for Nickel (Ni)



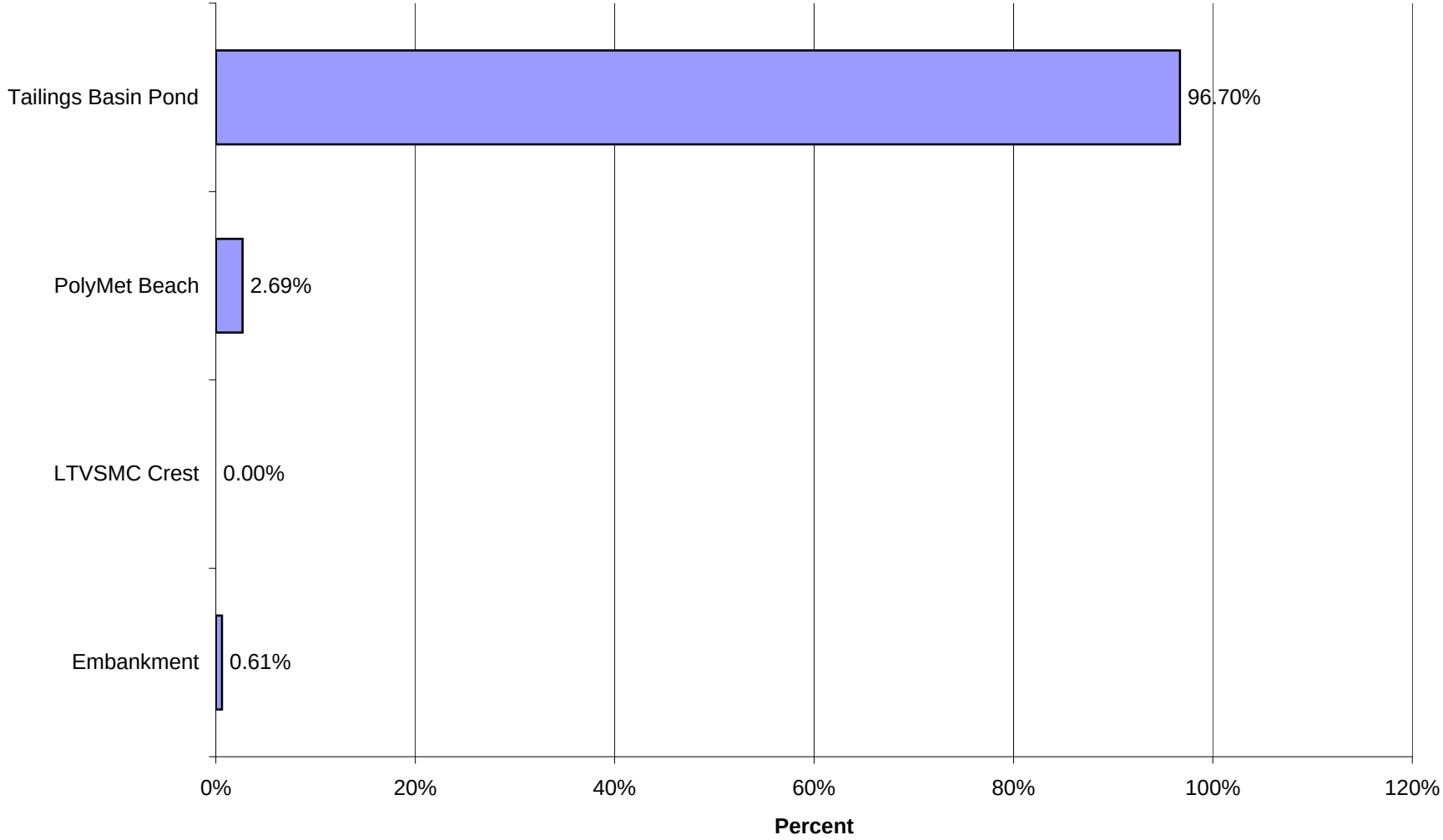
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 15 for Nickel (Ni)



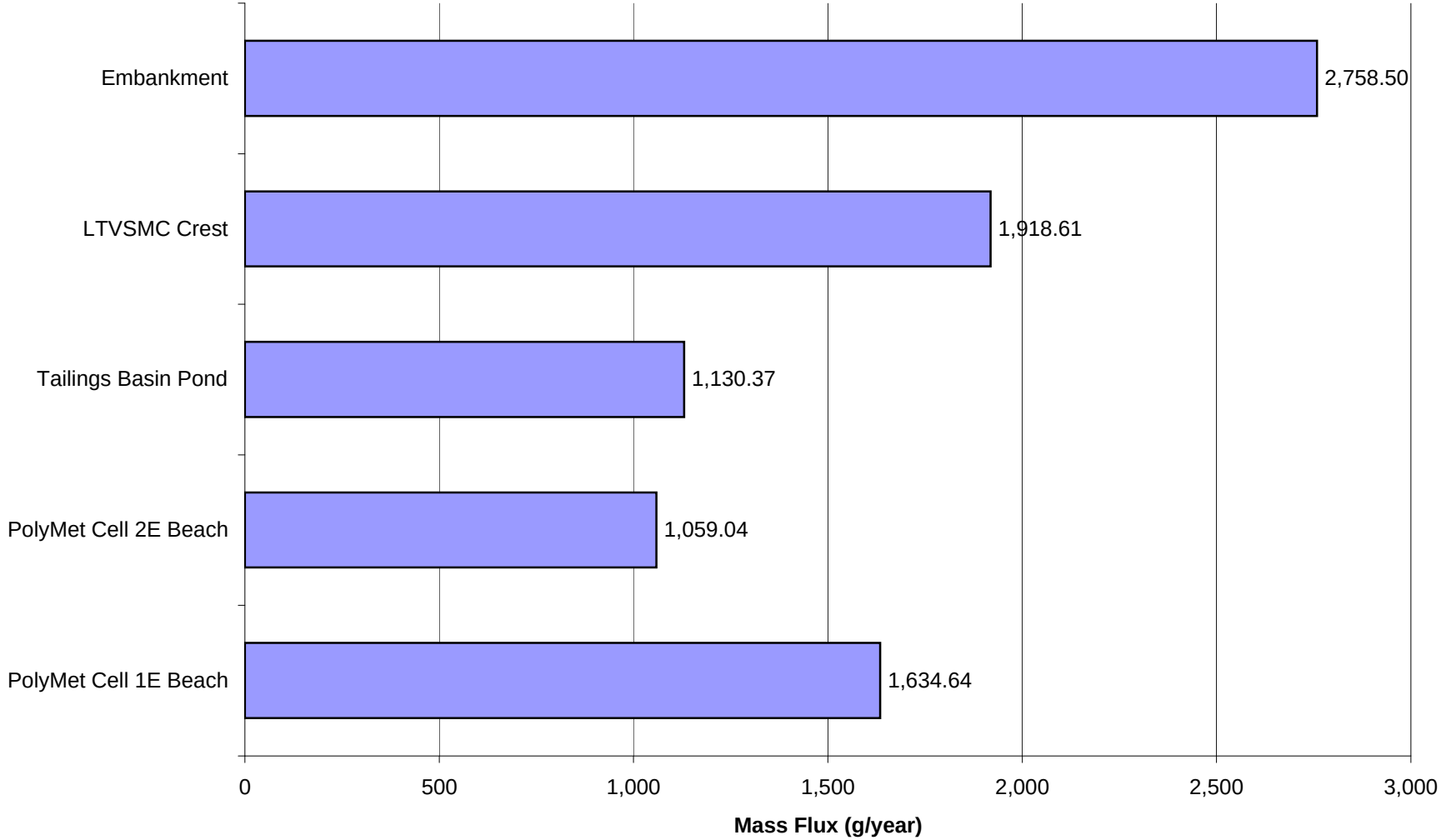
Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Year 20 for Nickel (Ni)



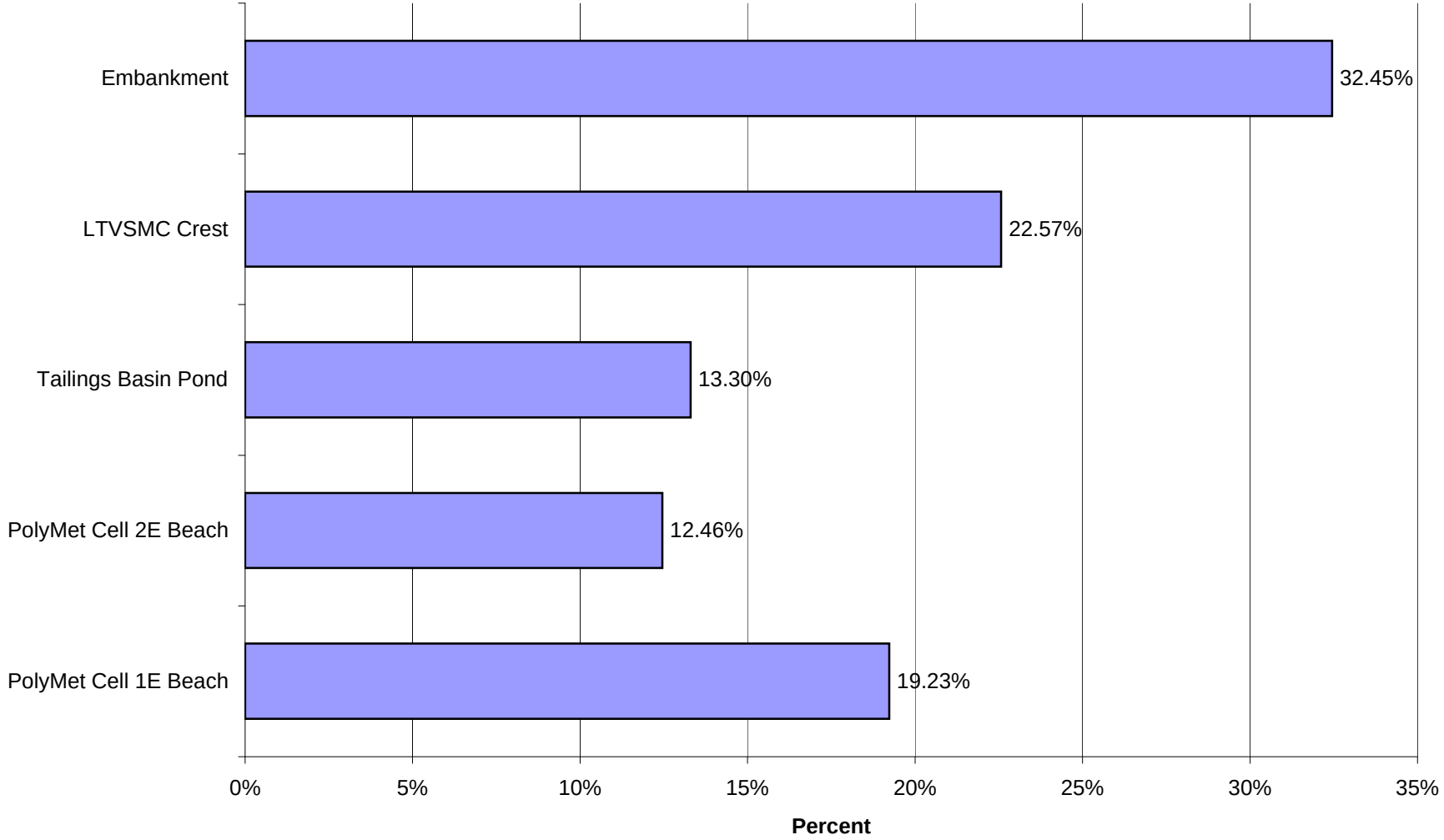
Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Year 20 for Nickel (Ni)



Geotechnical Mitigation: Mass Flux (g/year) of Tailings Basin Features in Closure for Nickel (Ni)

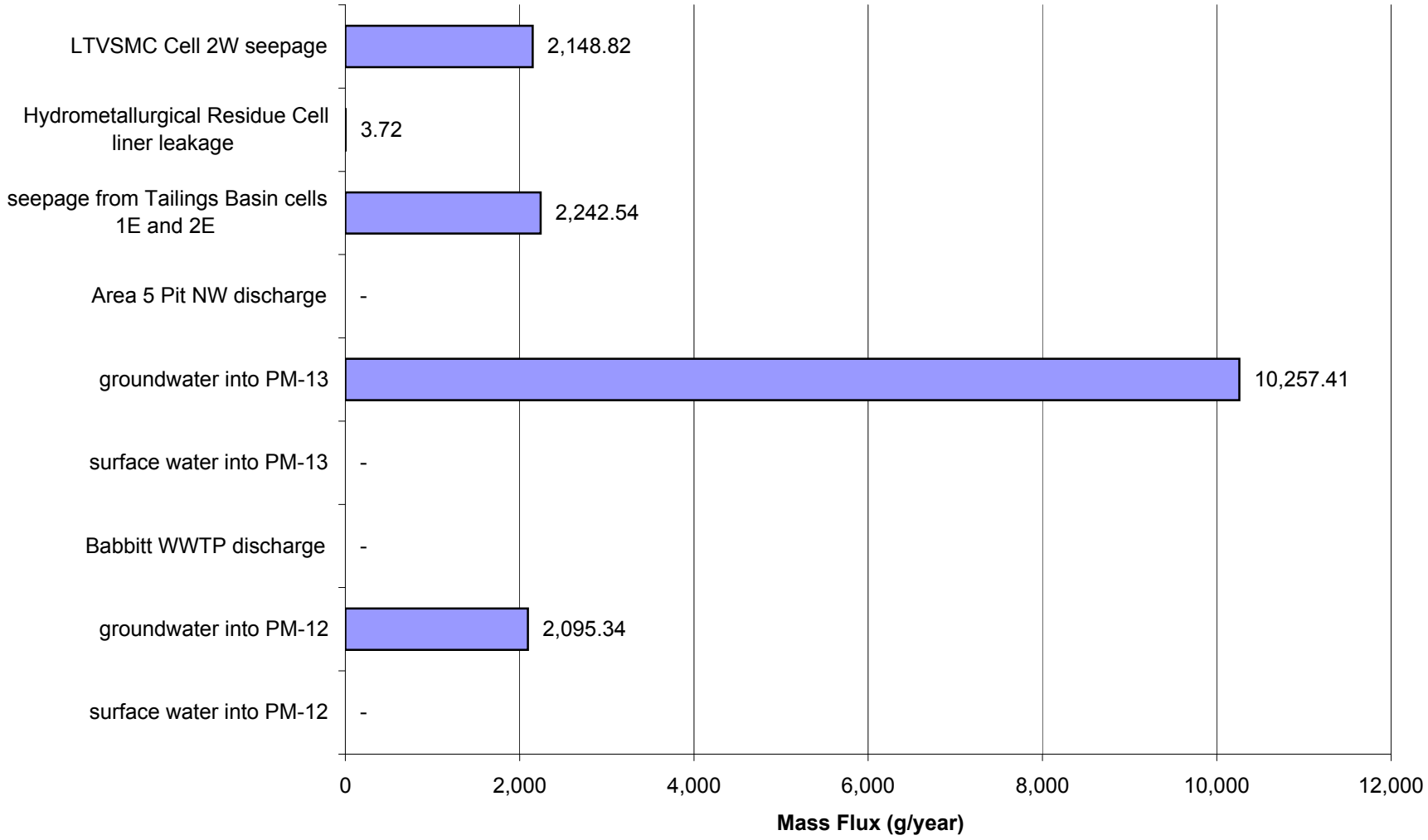


Geotechnical Mitigation: Percent of Tailings Basin Features' Impacts in Closure for Nickel (Ni)

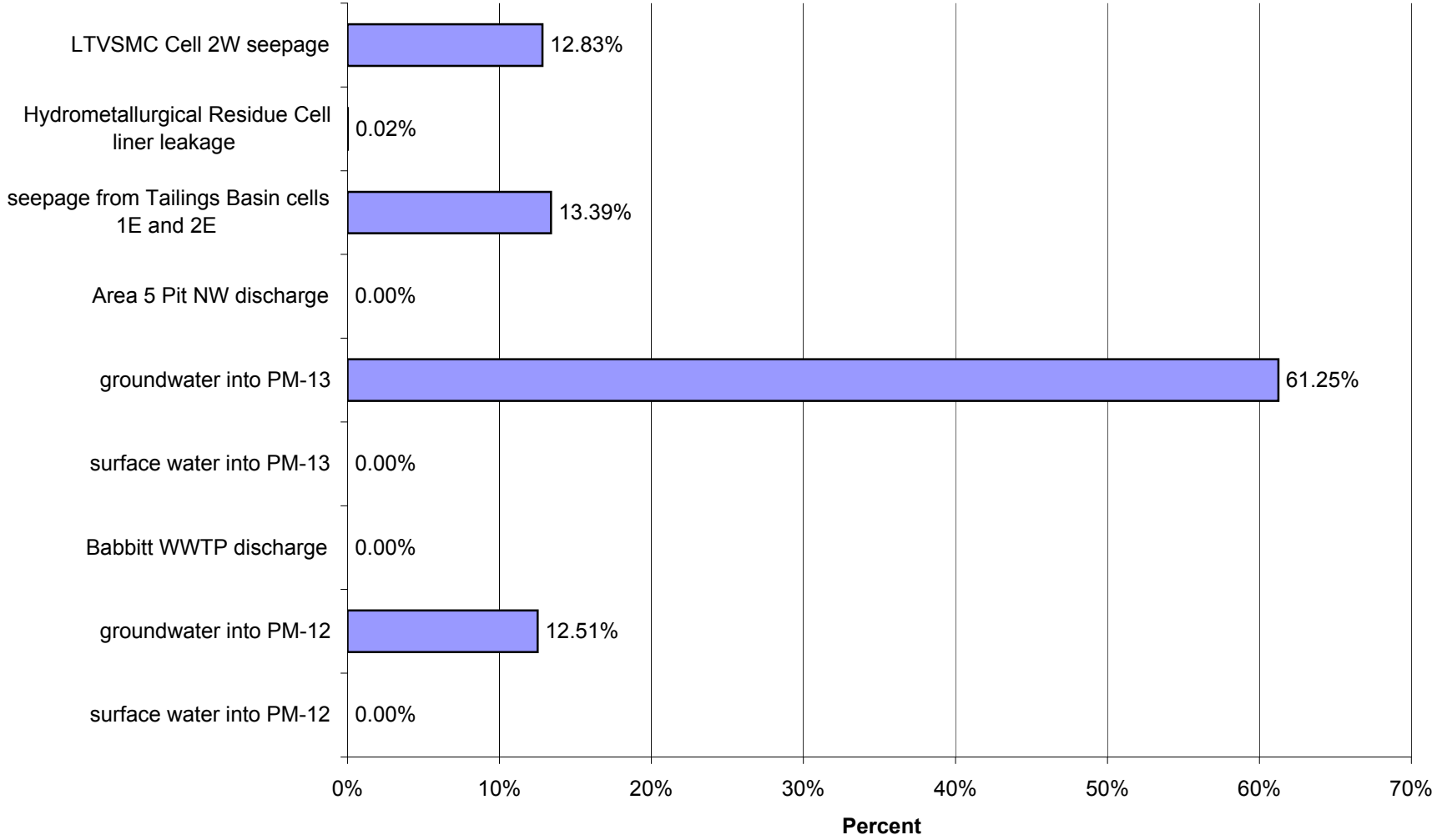


Appendix G.4
Embarass River Watershed
Geotechnical Mitigation

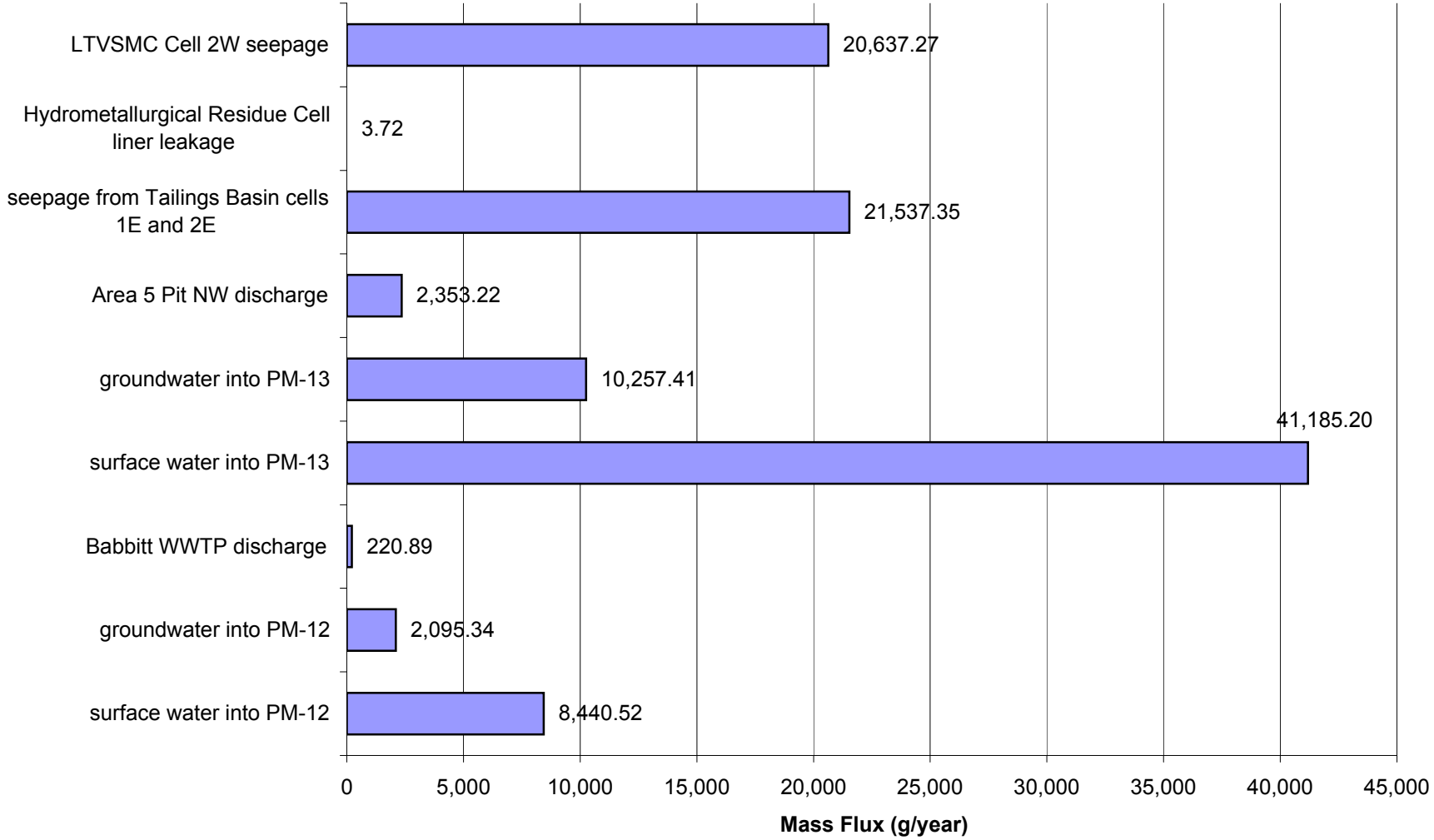
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for Low Flow for Arsenic (As)



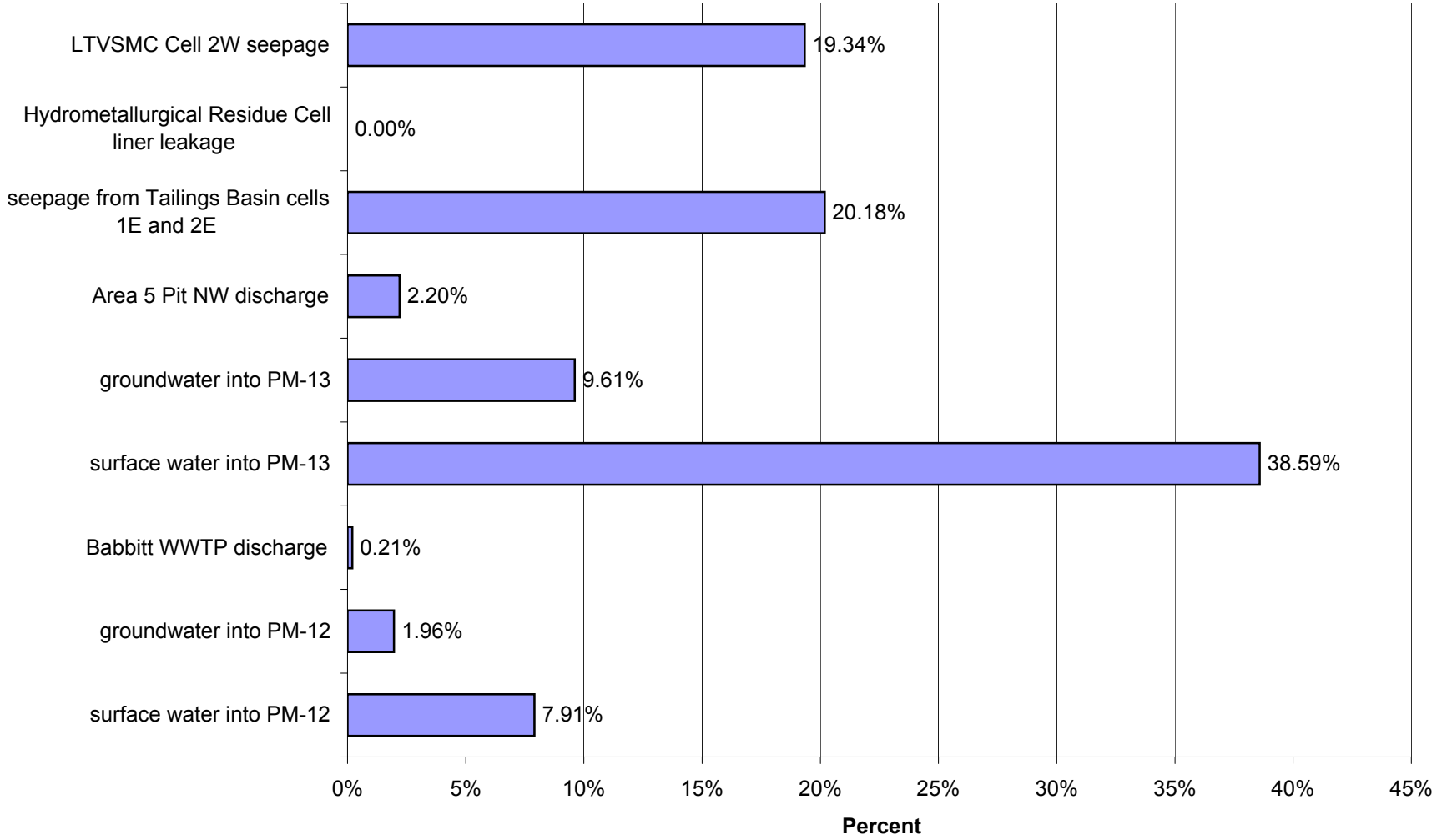
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 1 for Low Flow for Arsenic (As)



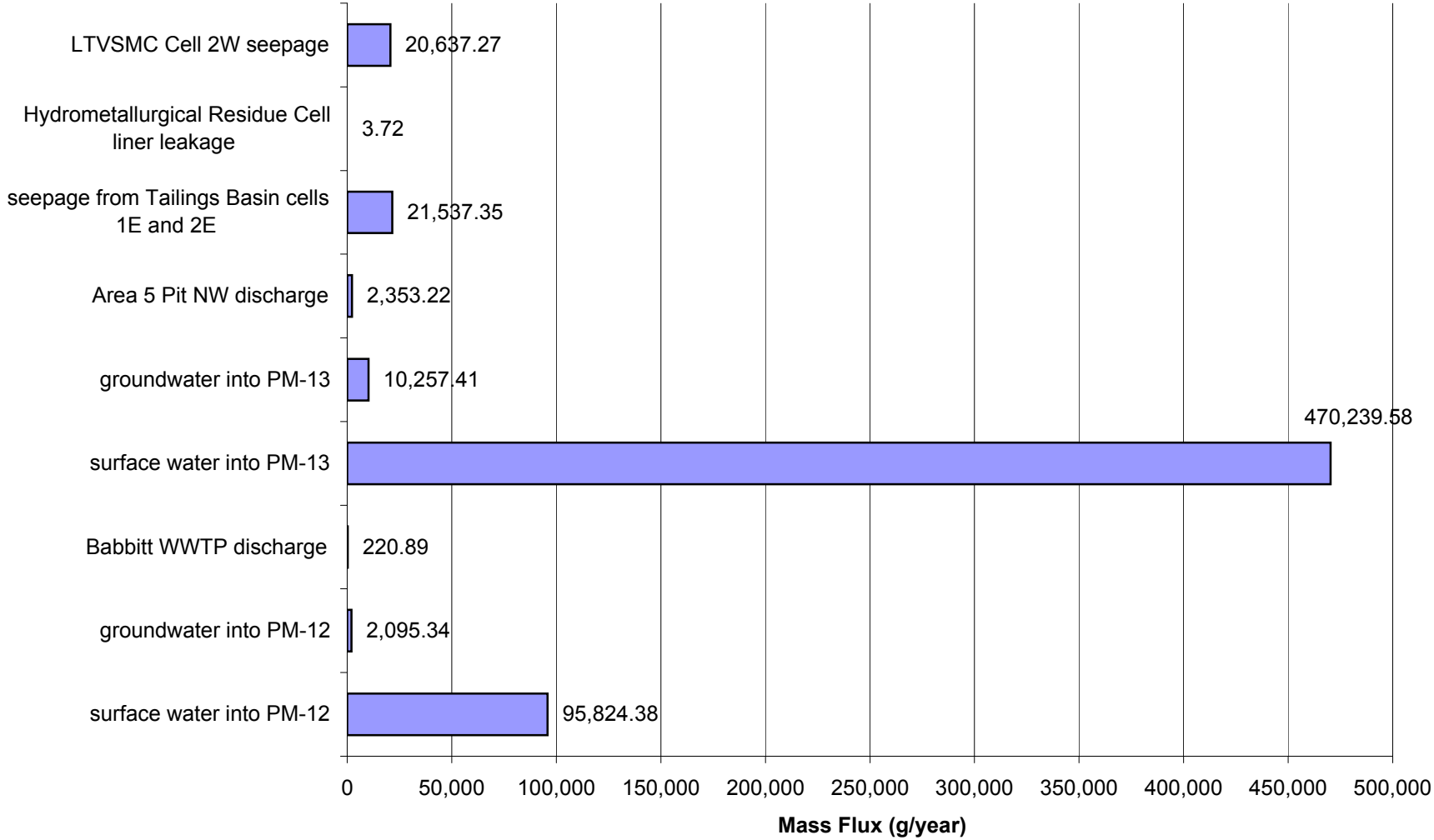
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for Average Flow for Arsenic (As)



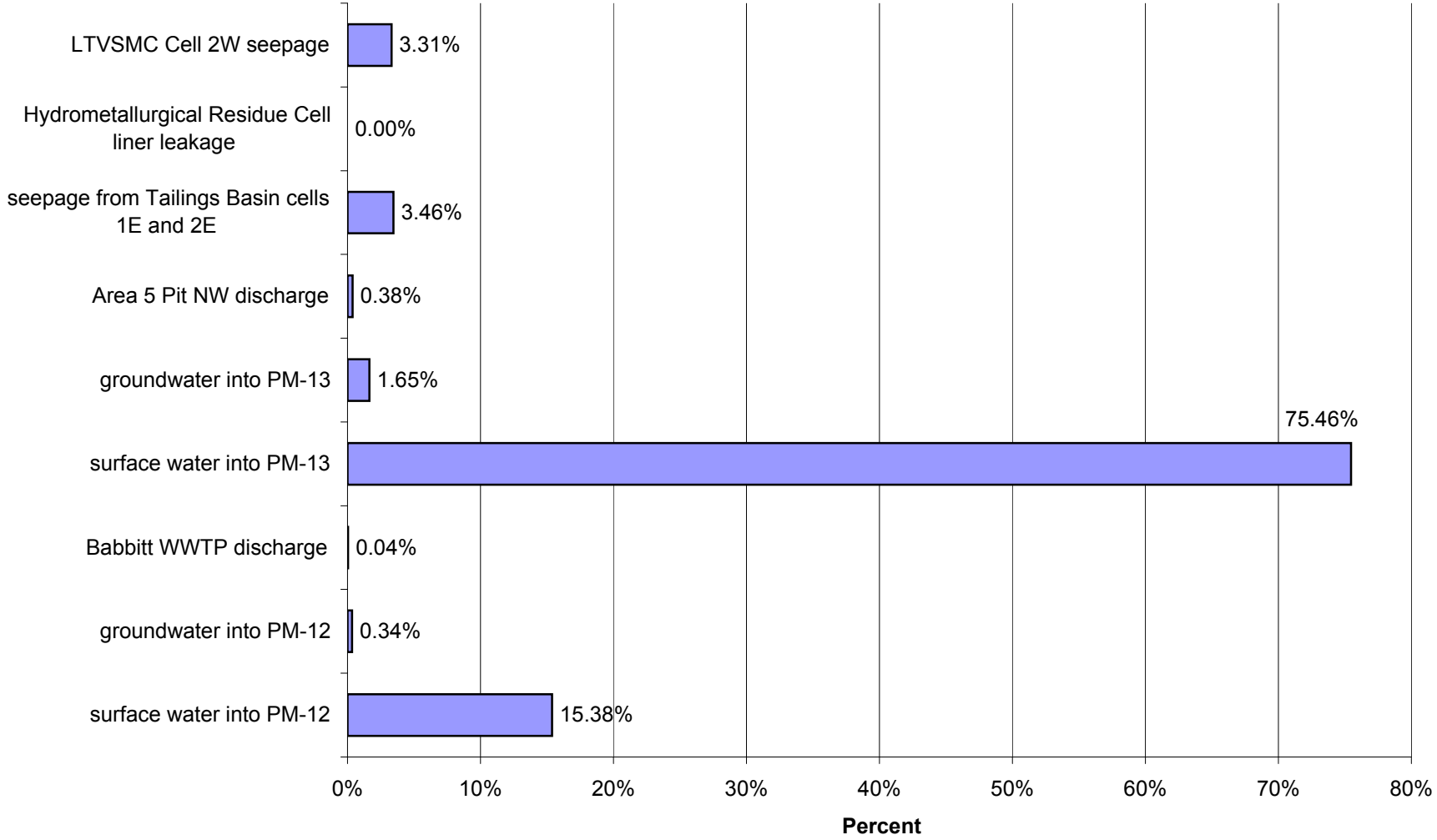
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 1 for Average Flow for Arsenic (As)



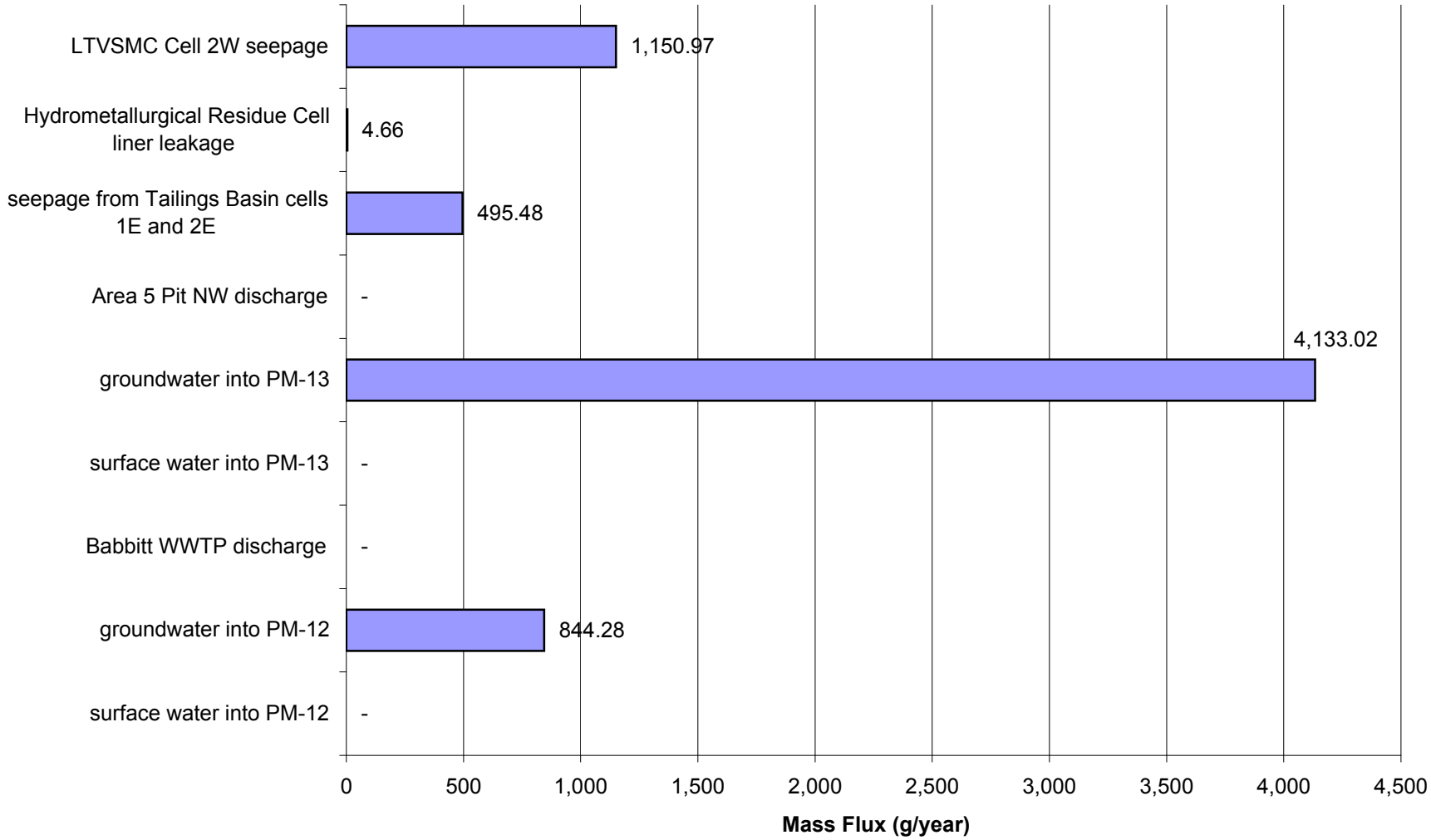
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for High Flow for Arsenic (As)



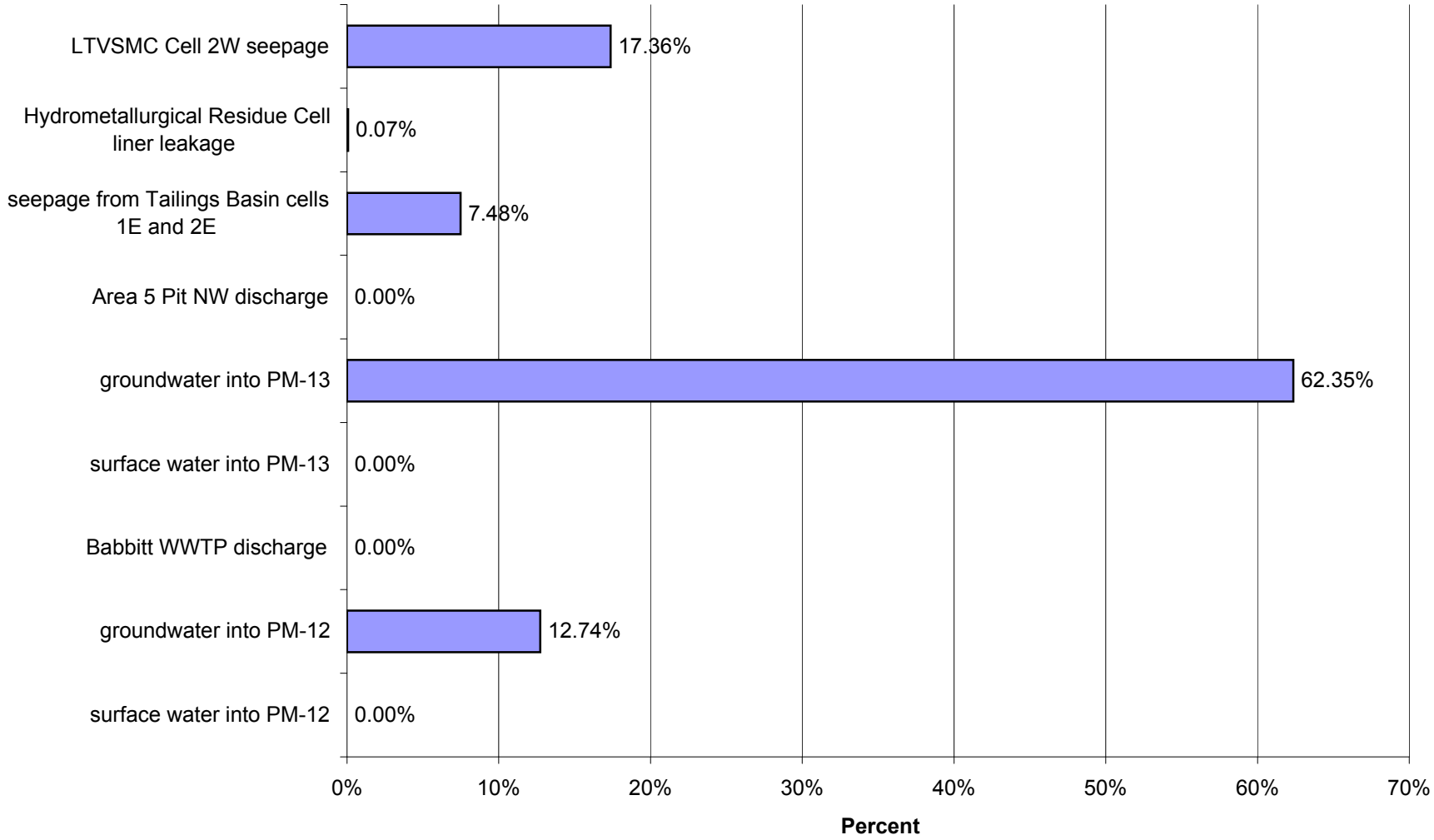
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 1 for High Flow for Arsenic (As)



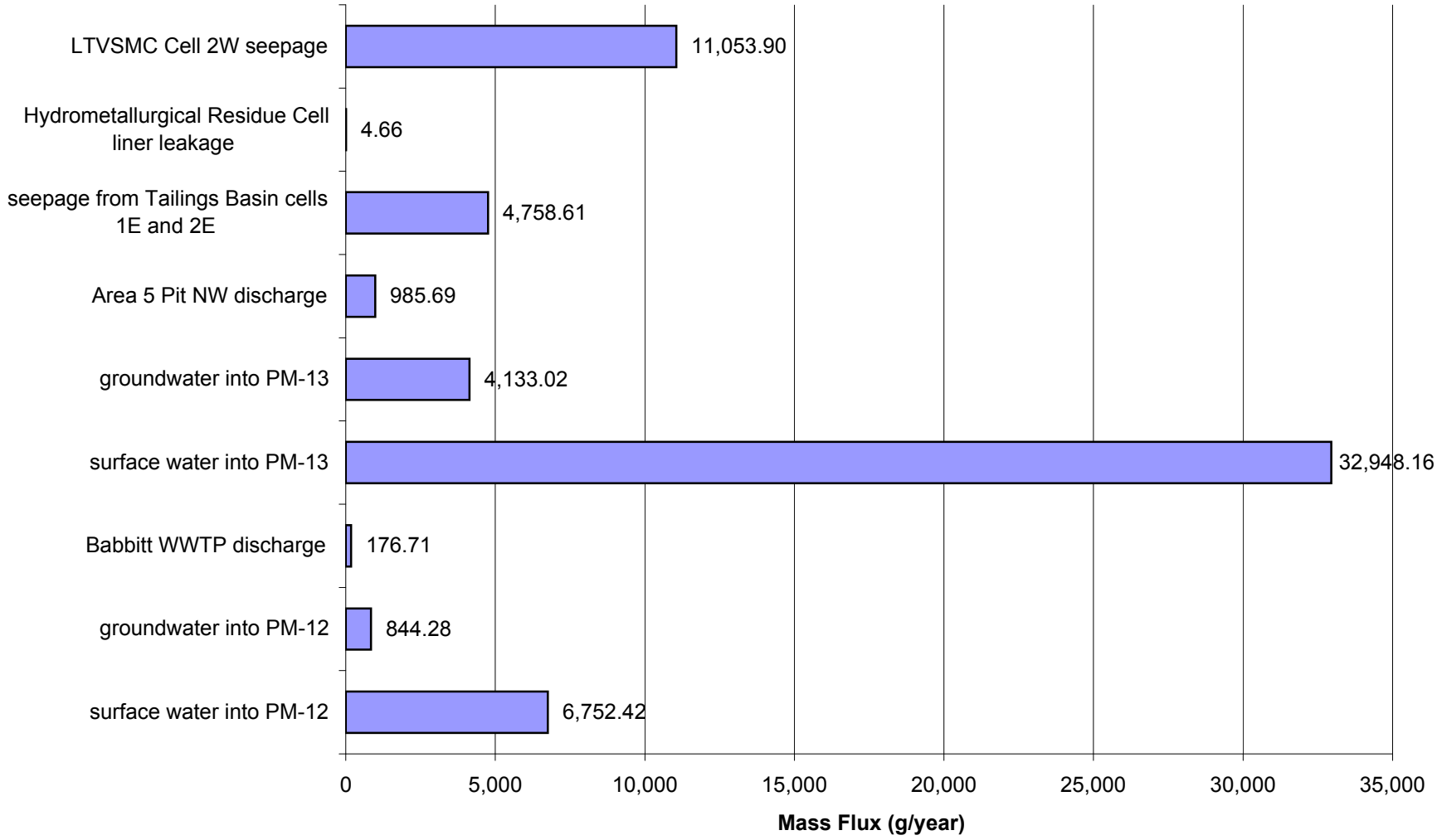
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for Low Flow for Cobalt (Co)



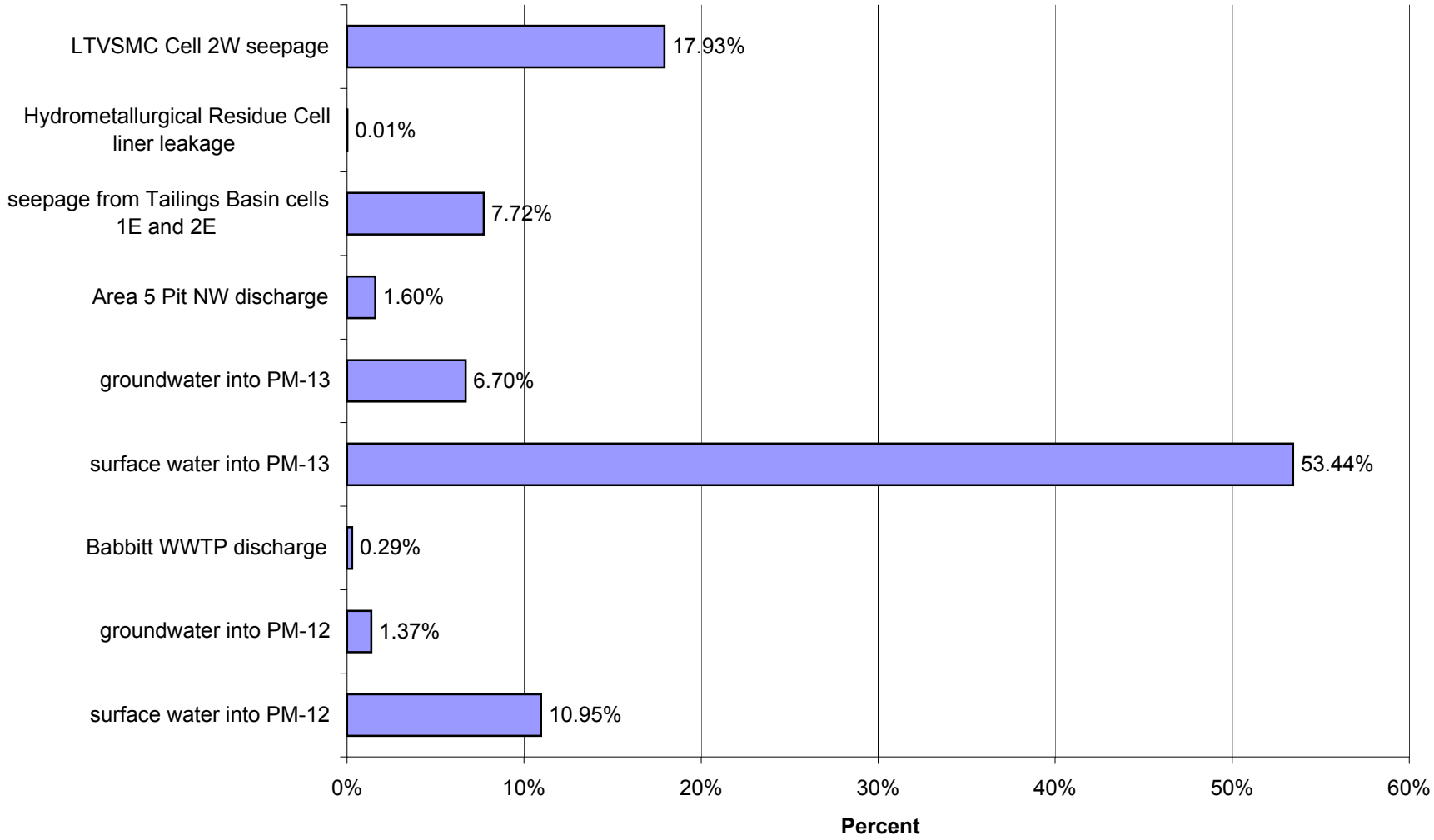
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 1 for Low Flow for Cobalt (Co)



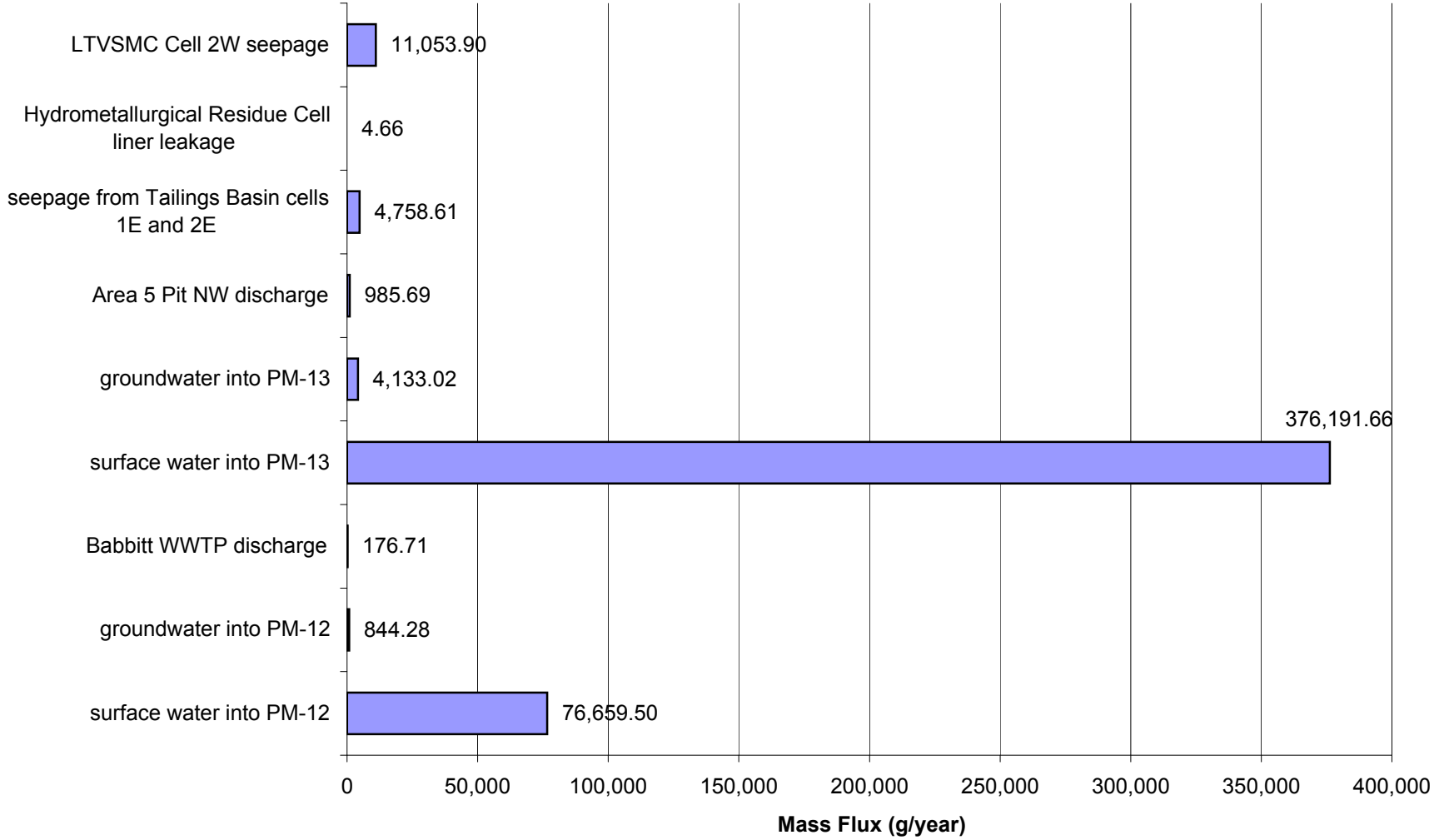
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for Average Flow for Cobalt (Co)



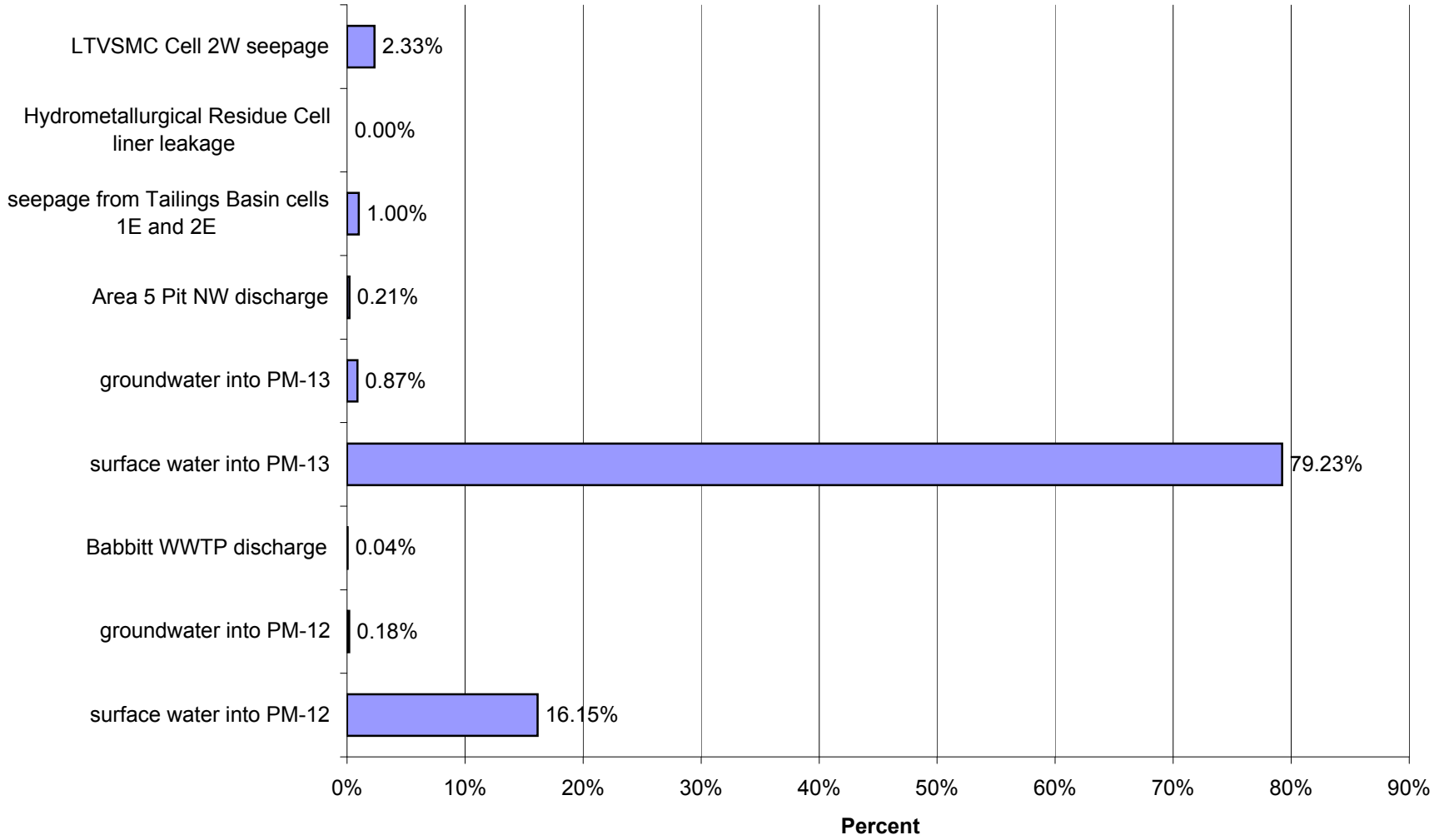
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 1 for Average Flow for Cobalt (Co)



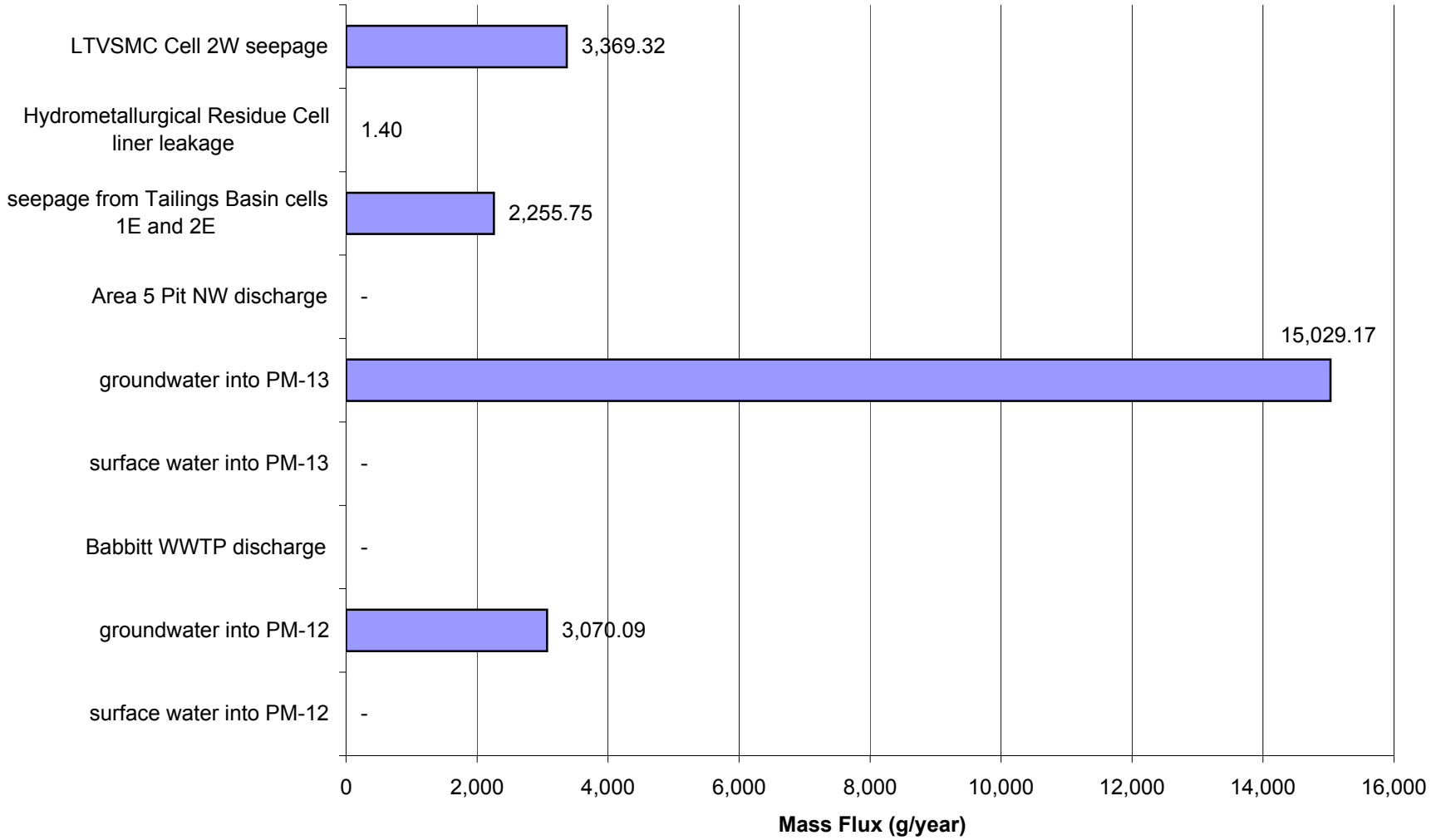
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for High Flow for Cobalt (Co)



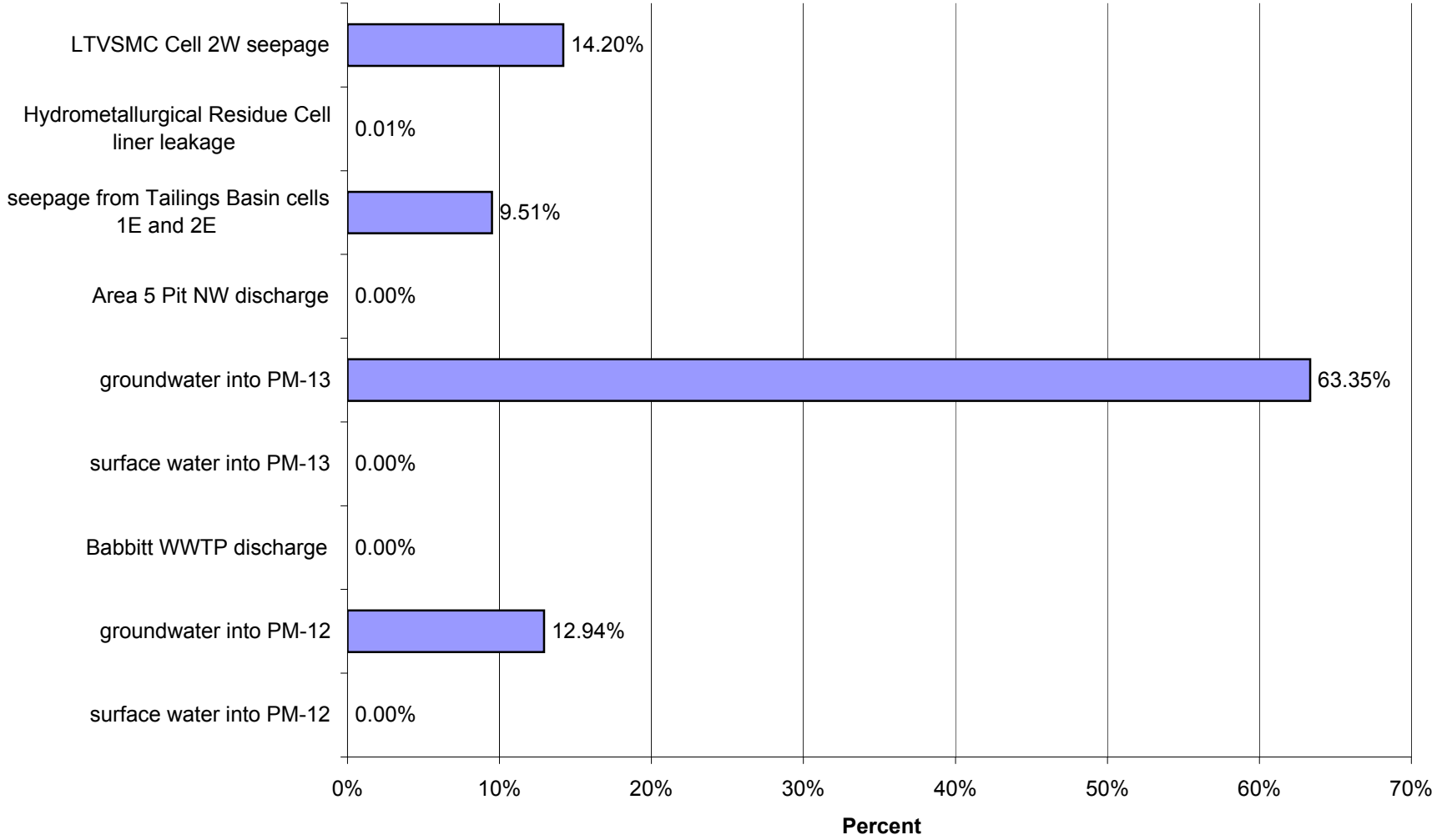
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 1 for High Flow for Cobalt (Co)



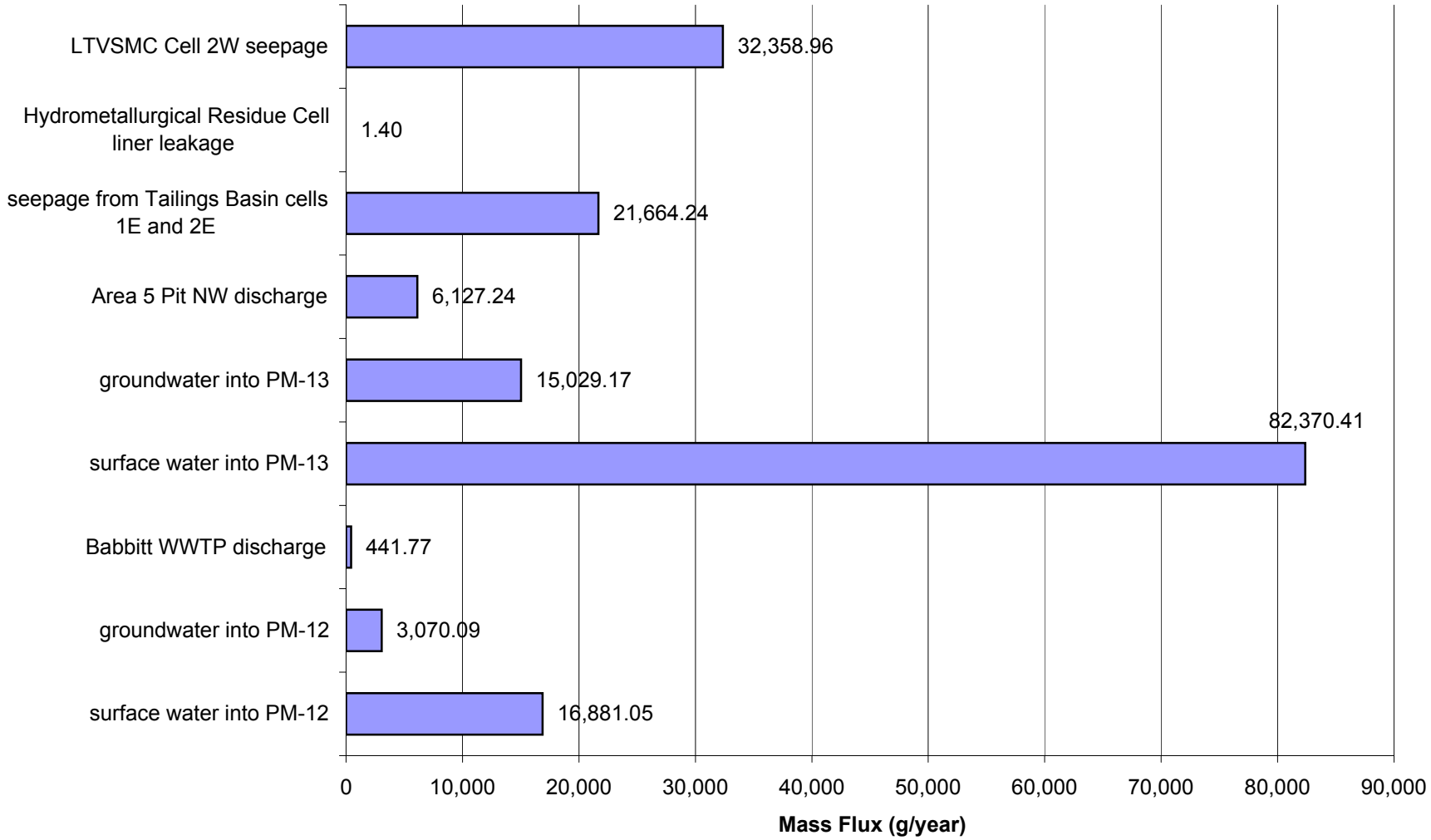
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for Low Flow for Copper (Cu)



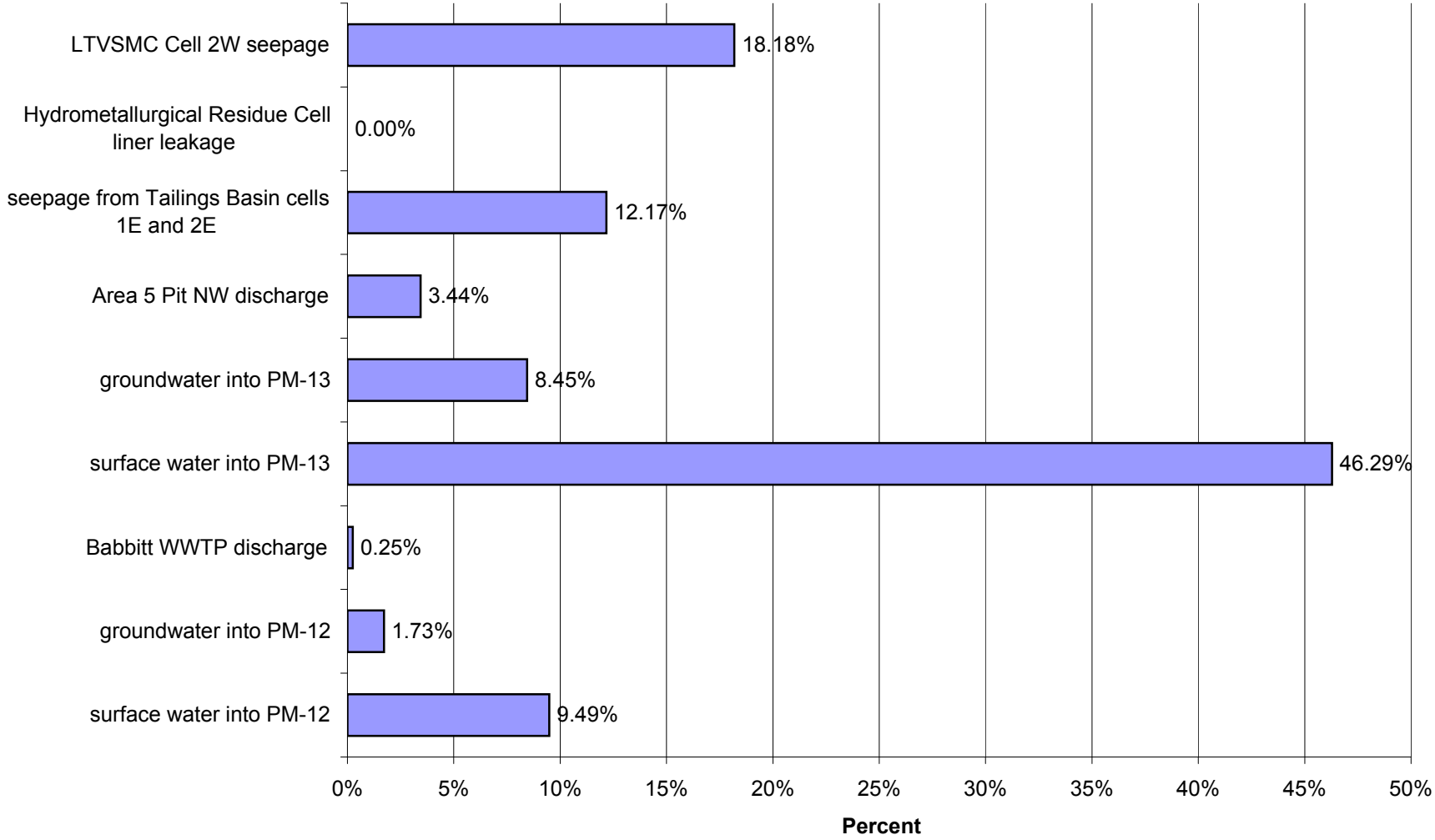
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 1 for Low Flow for Copper (Cu)



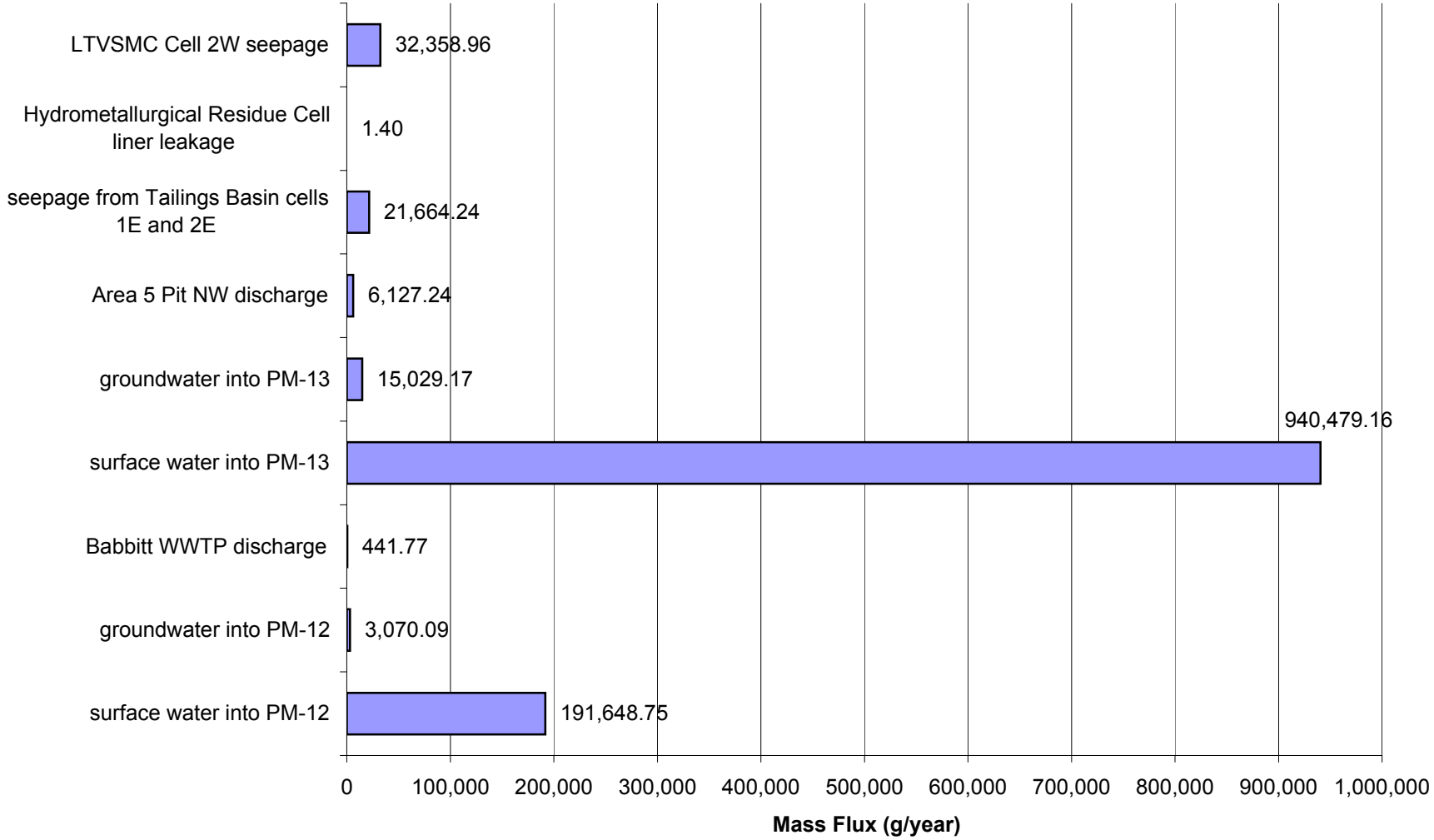
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for Average Flow for Copper (Cu)



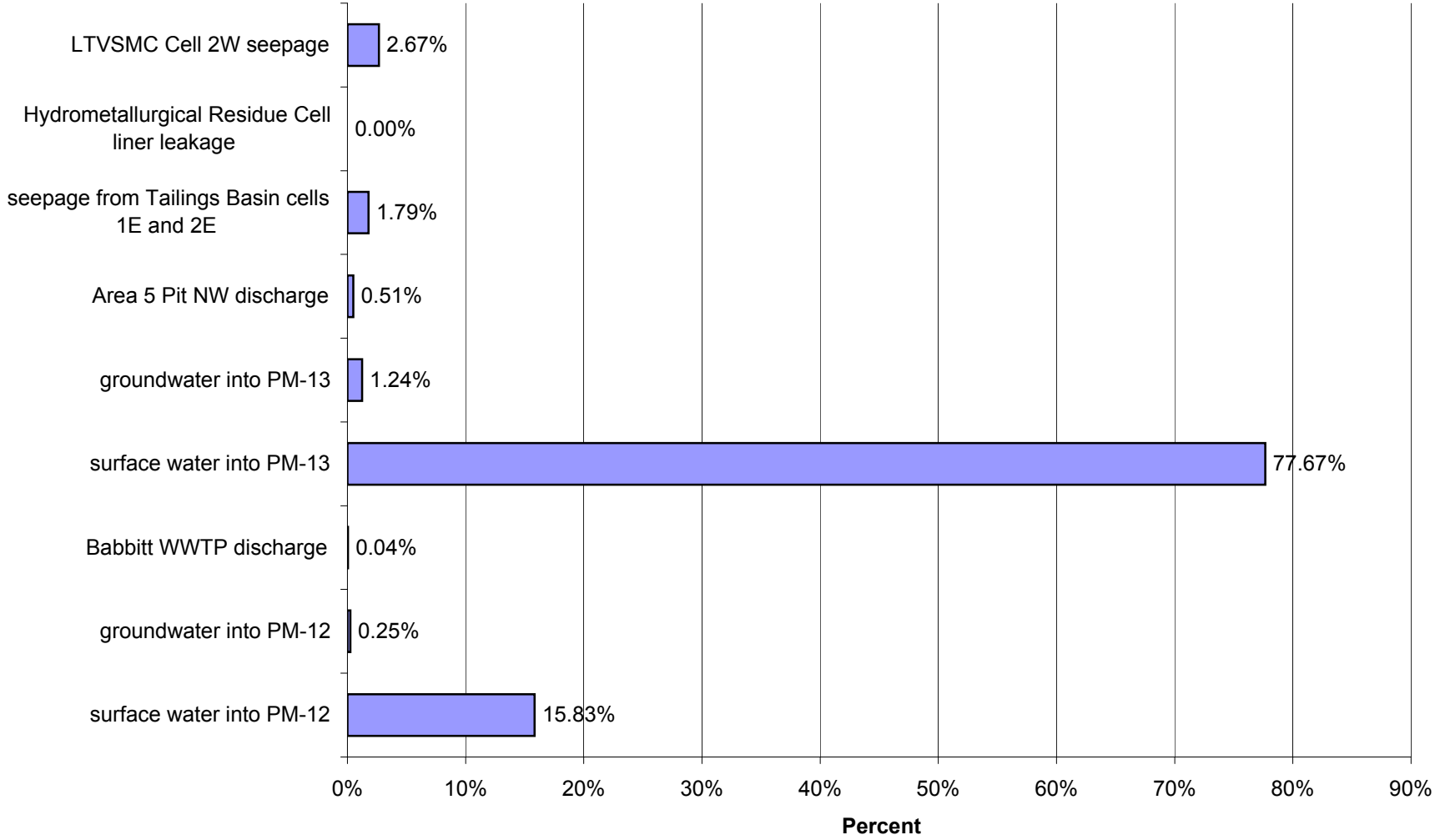
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 1 for Average Flow for Copper (Cu)



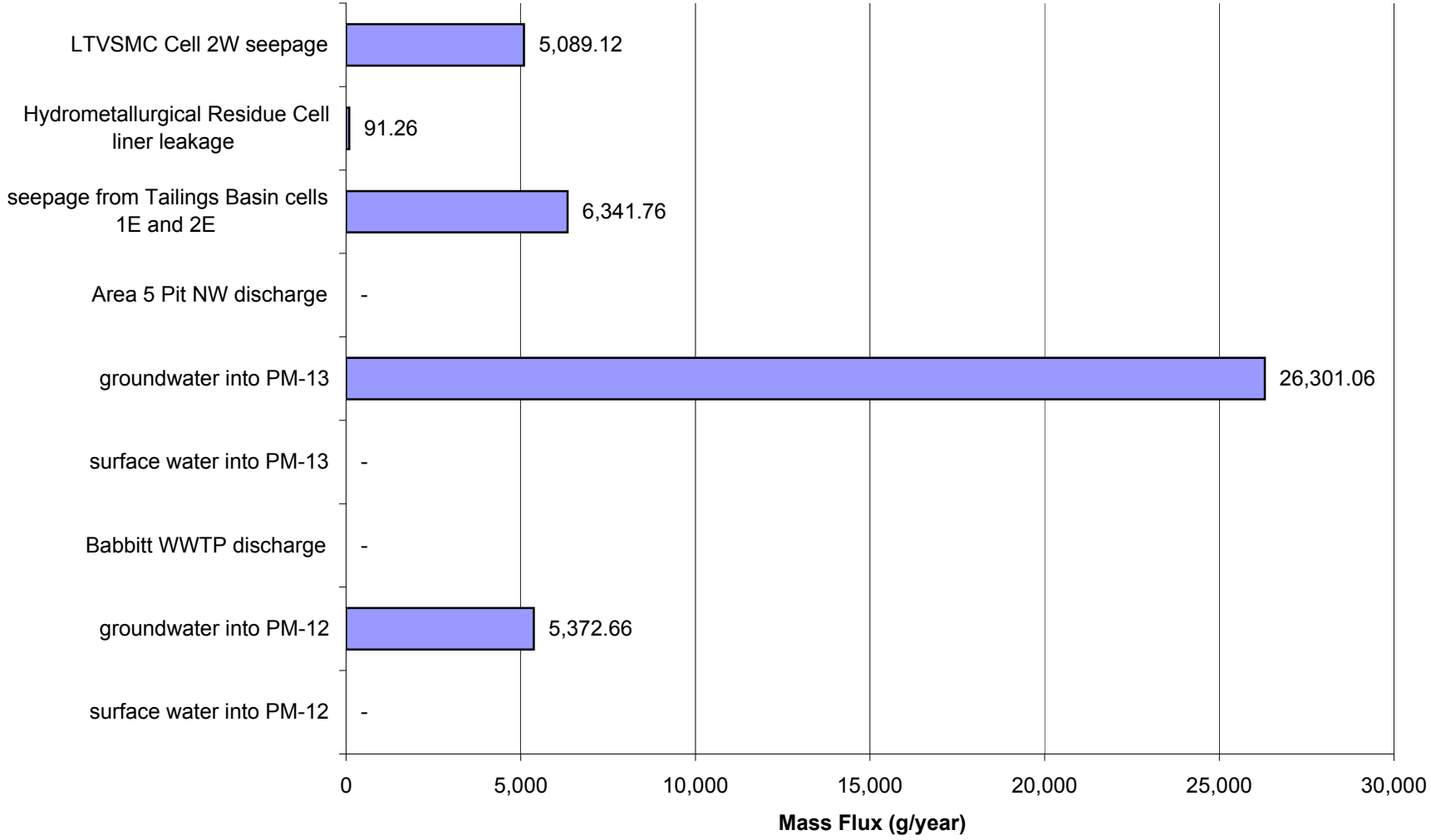
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for High Flow for Copper (Cu)



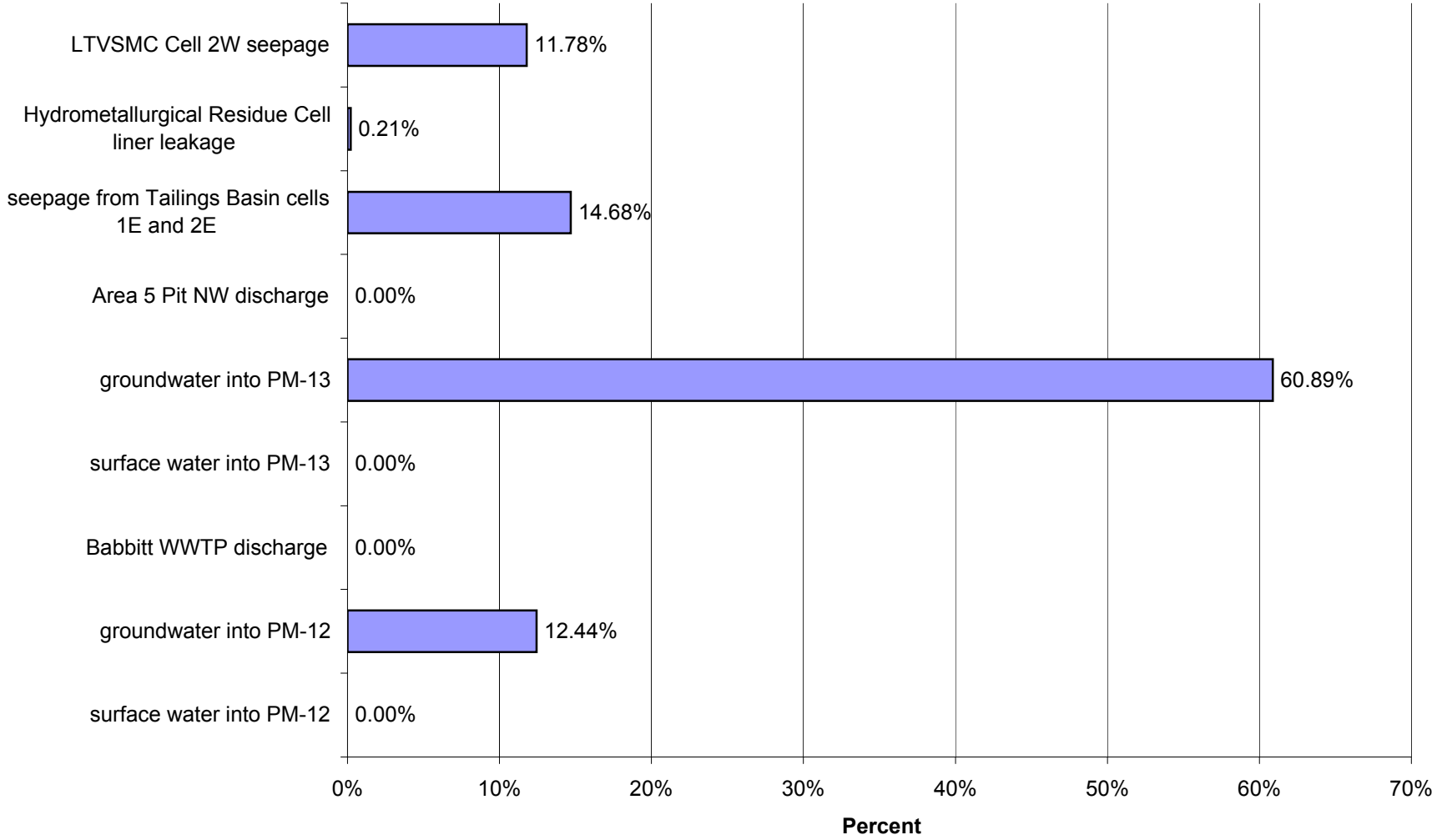
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 1 for High Flow for Copper (Cu)



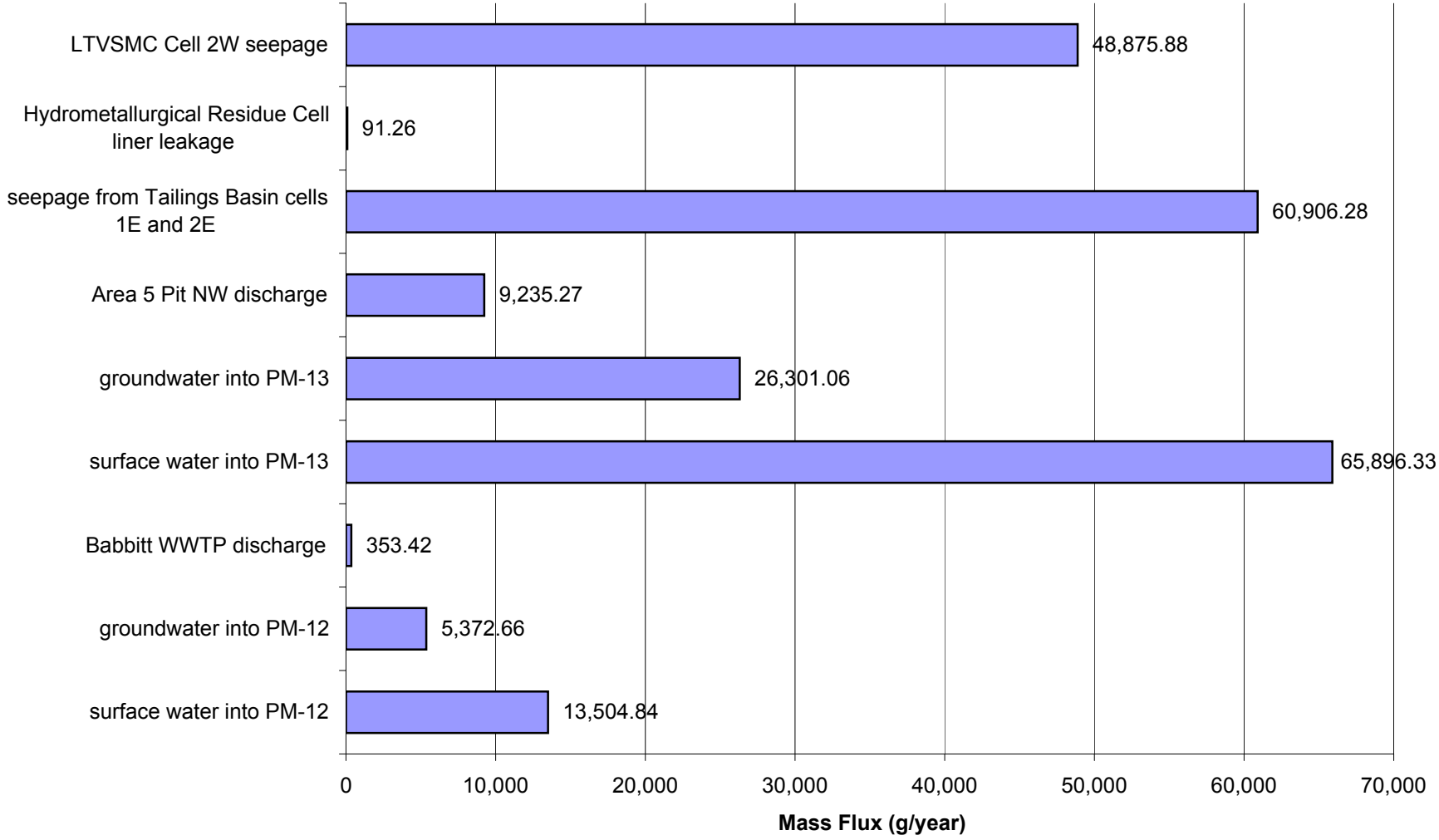
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for Low Flow for Nickel (Ni)



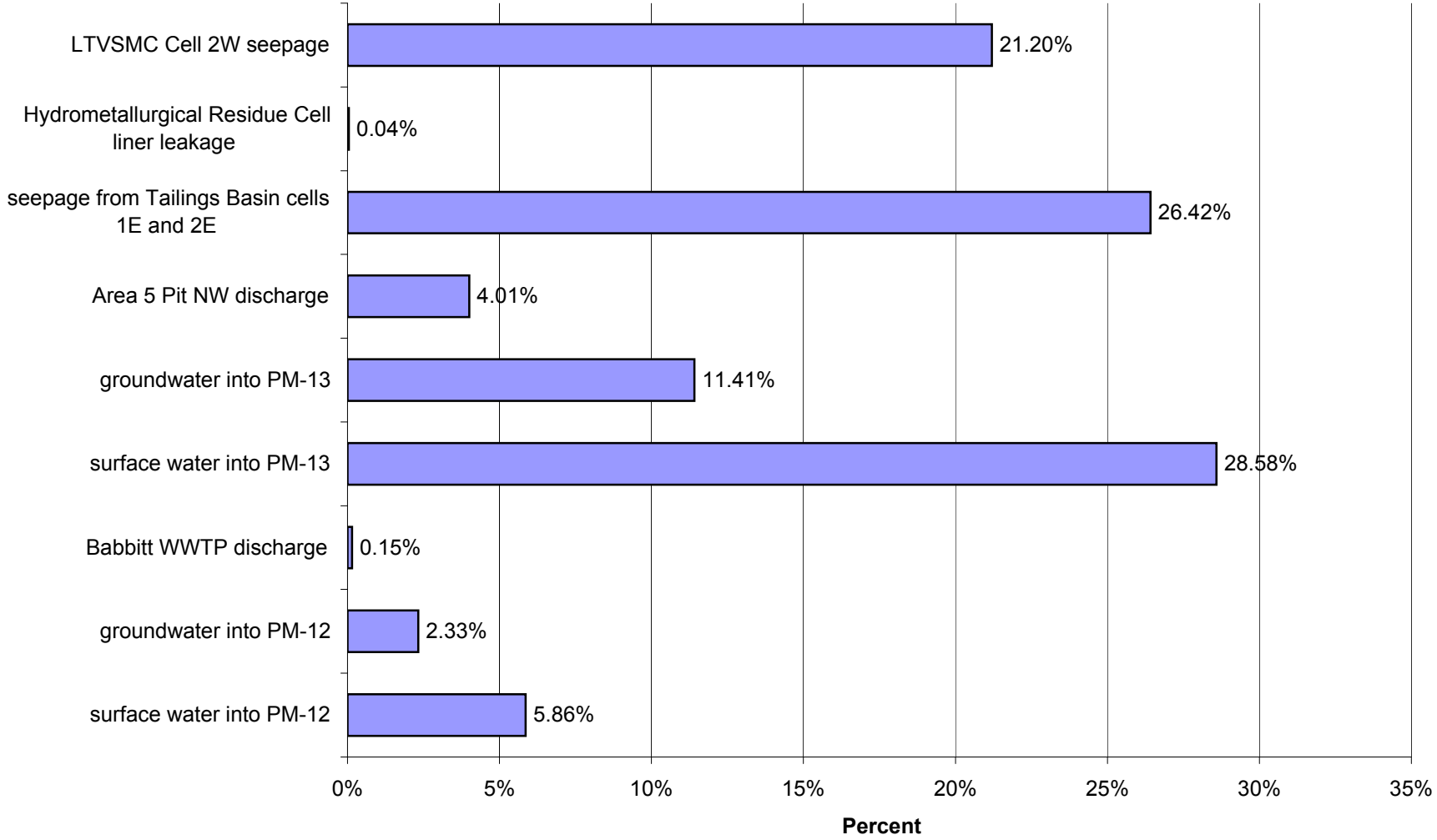
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 1 for Low Flow for Nickel (Ni)



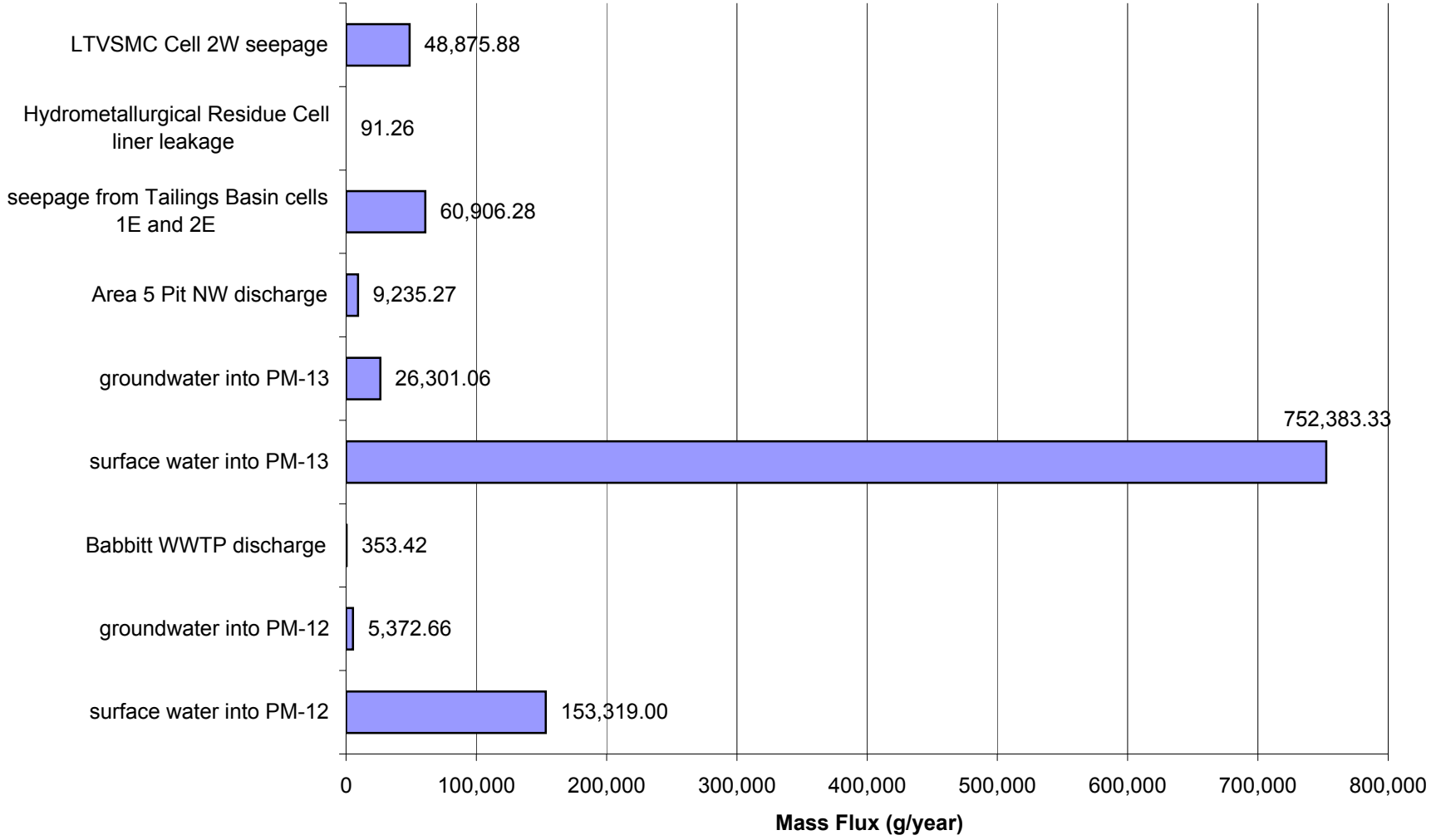
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for Average Flow for Nickel (Ni)



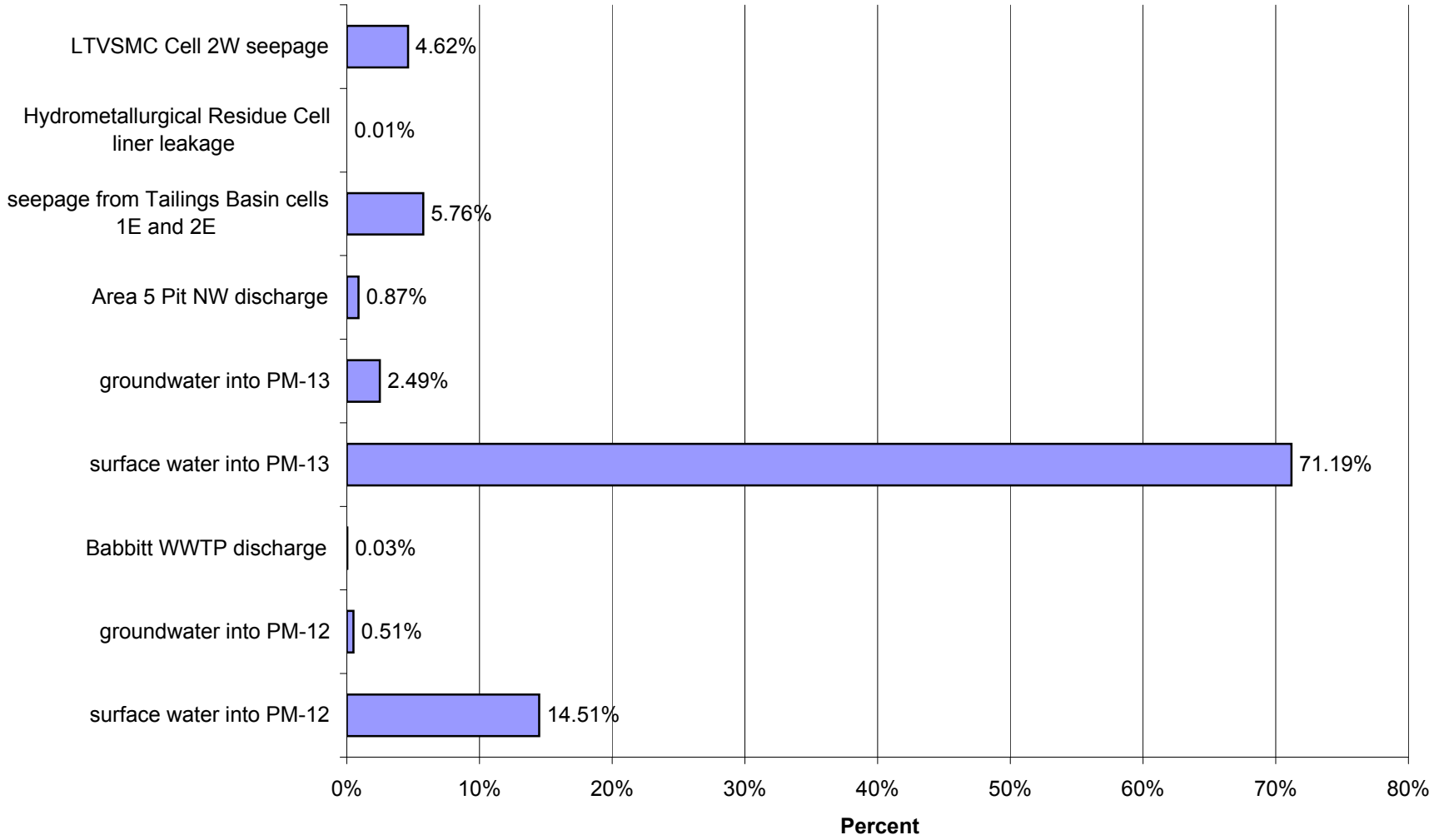
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 1 for Average Flow for Nickel (Ni)



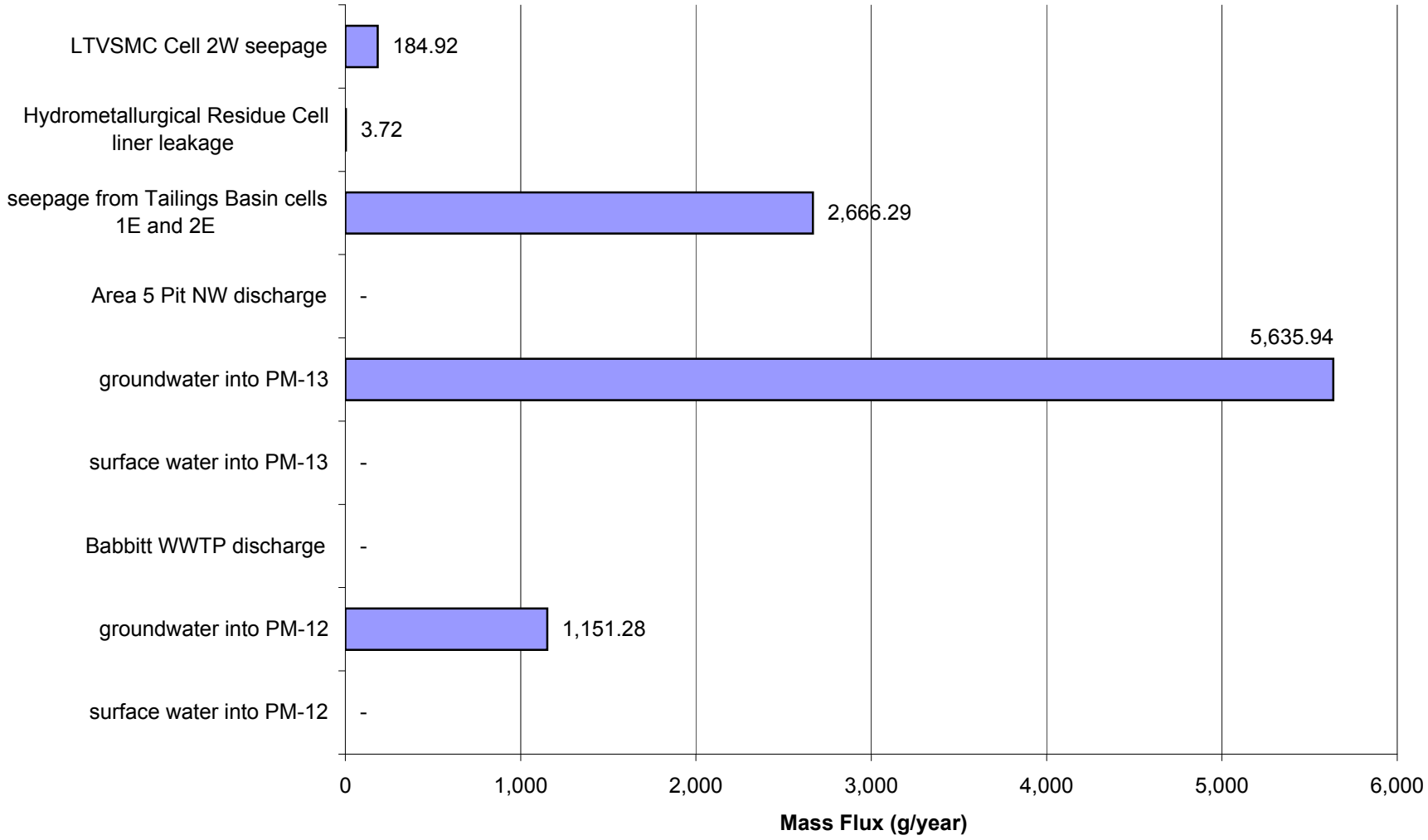
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for High Flow for Nickel (Ni)



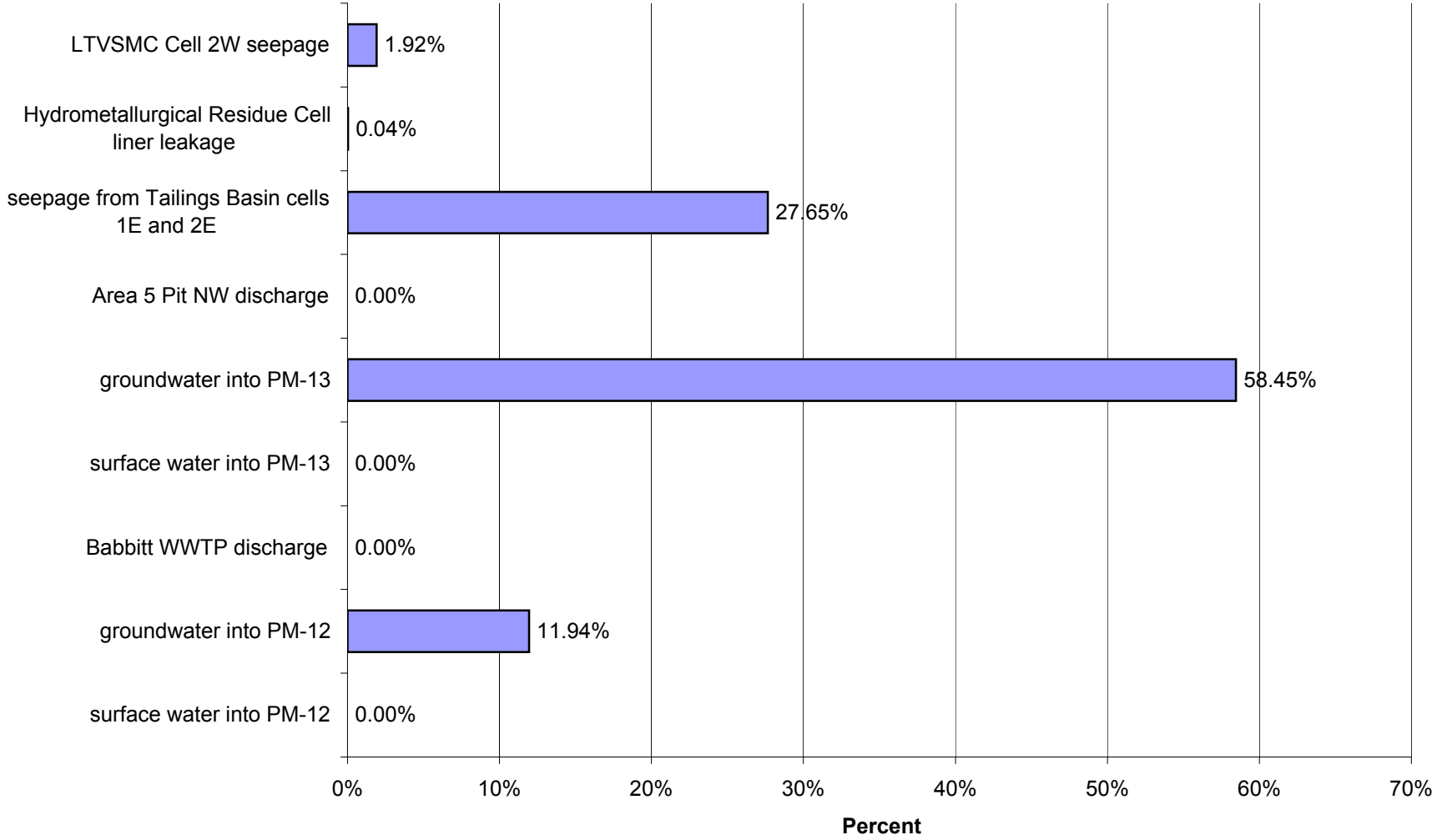
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 1 for High Flow for Nickel (Ni)



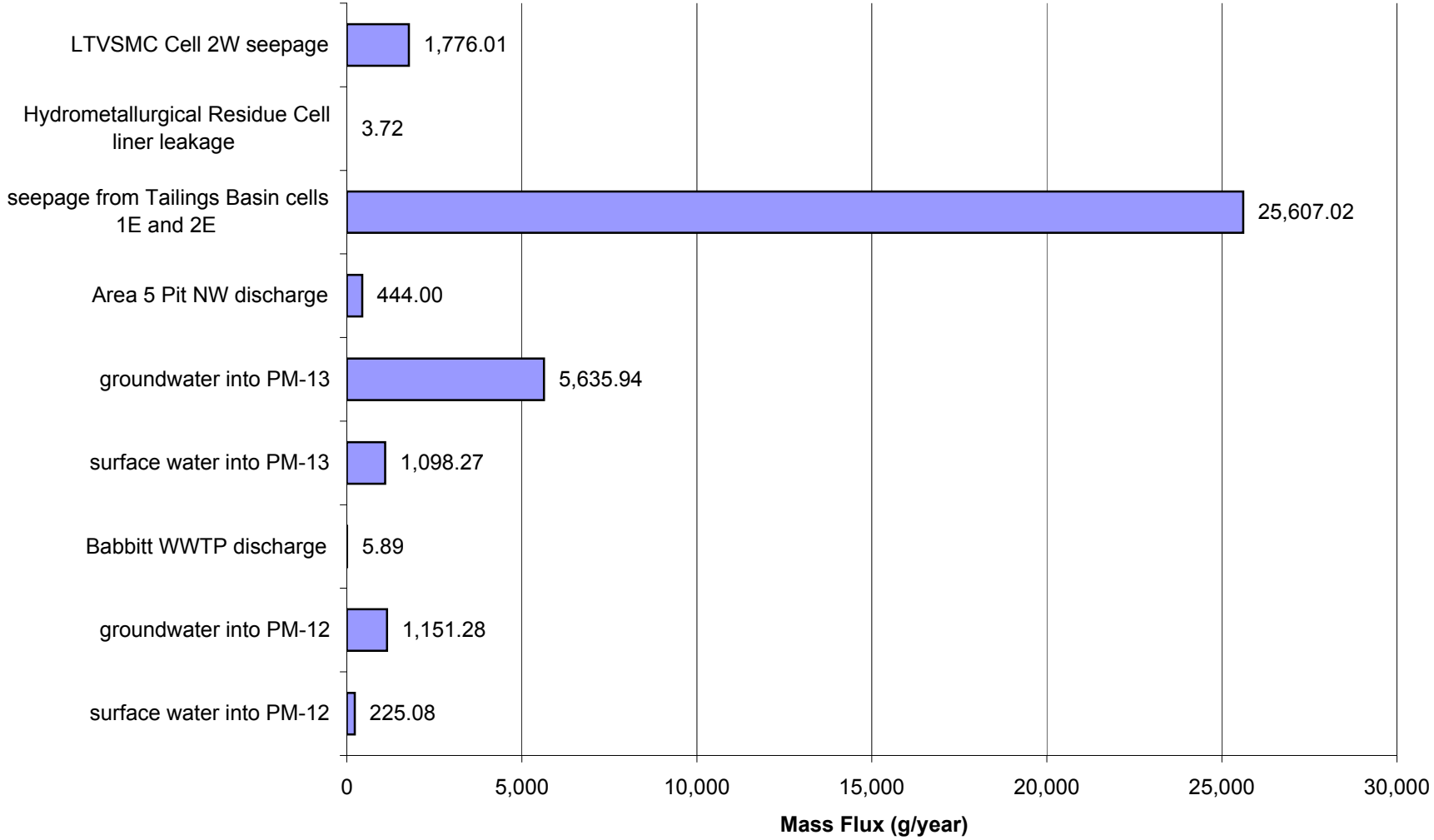
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for Low Flow for Antimony (Sb)



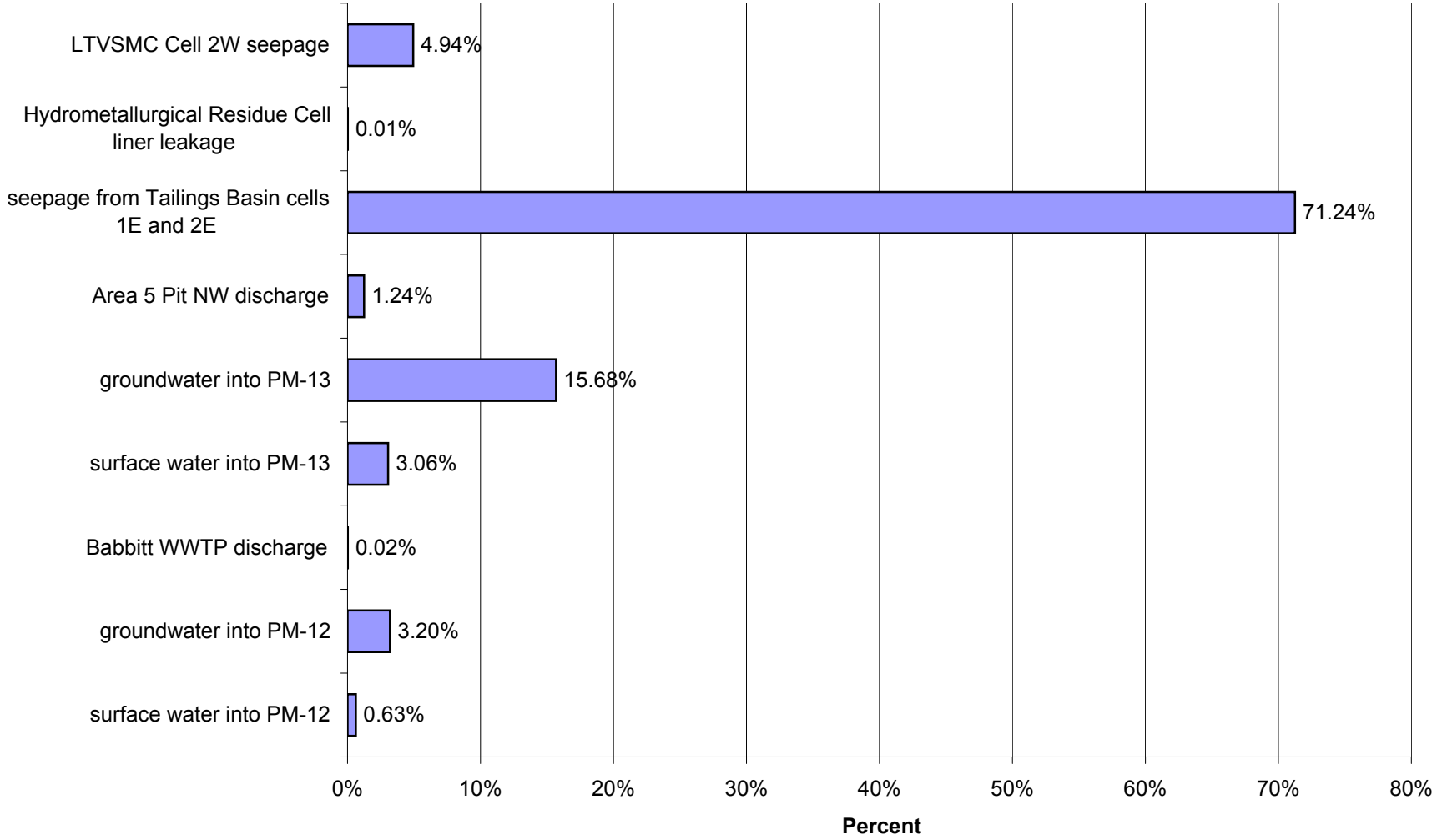
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 1 for Low Flow for Antimony (Sb)



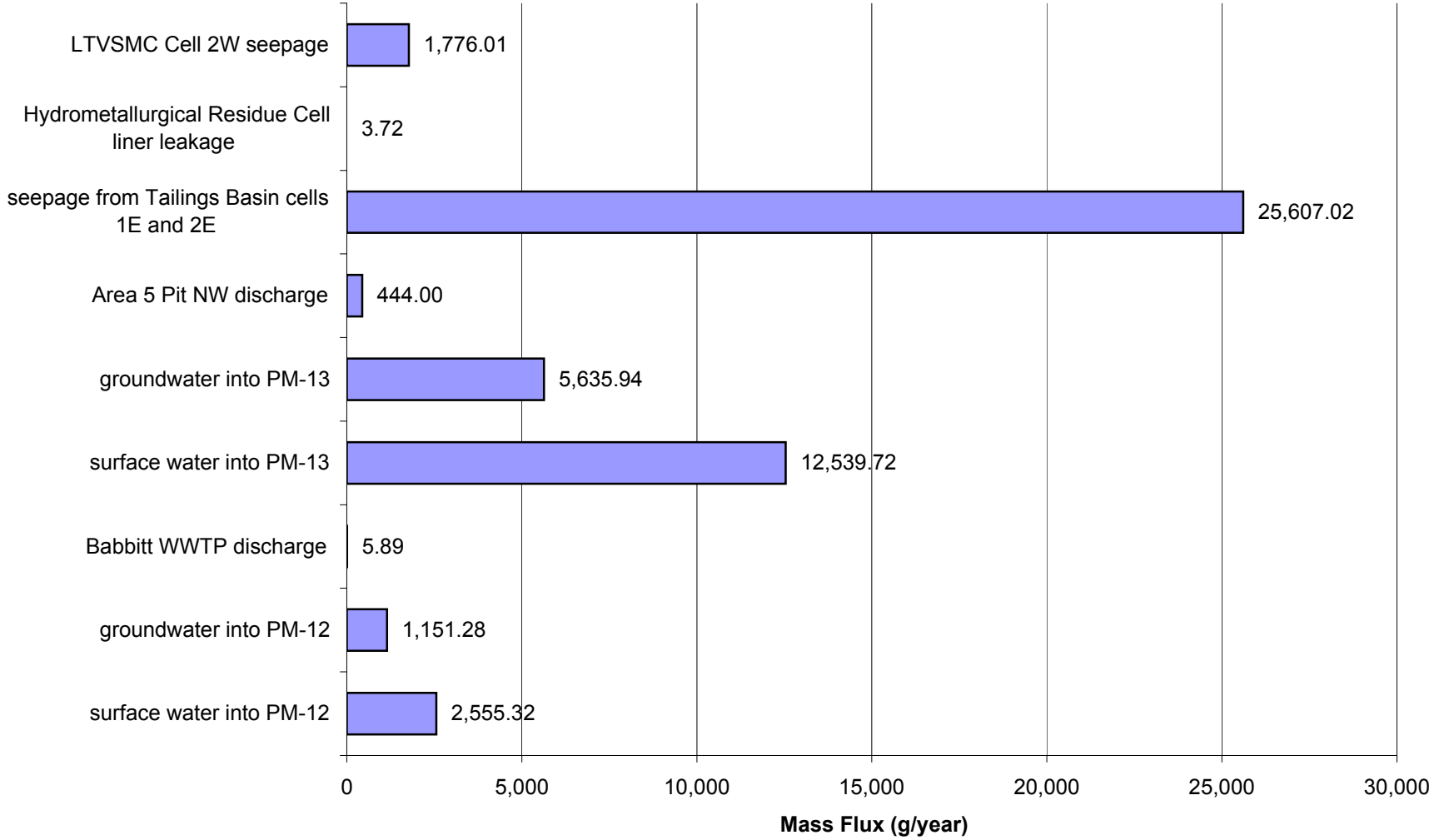
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for Average Flow for Antimony (Sb)



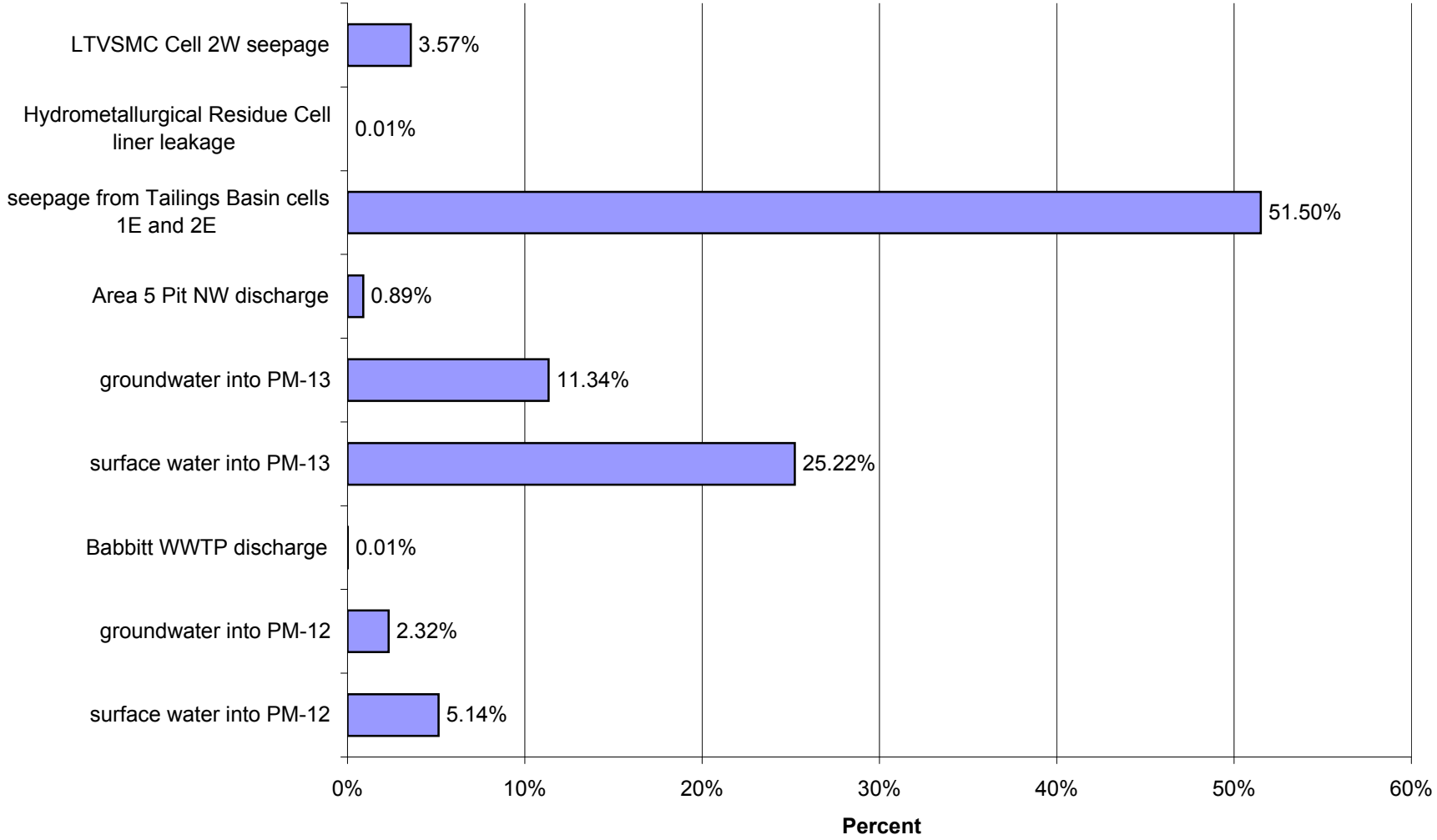
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 1 for Average Flow for Antimony (Sb)



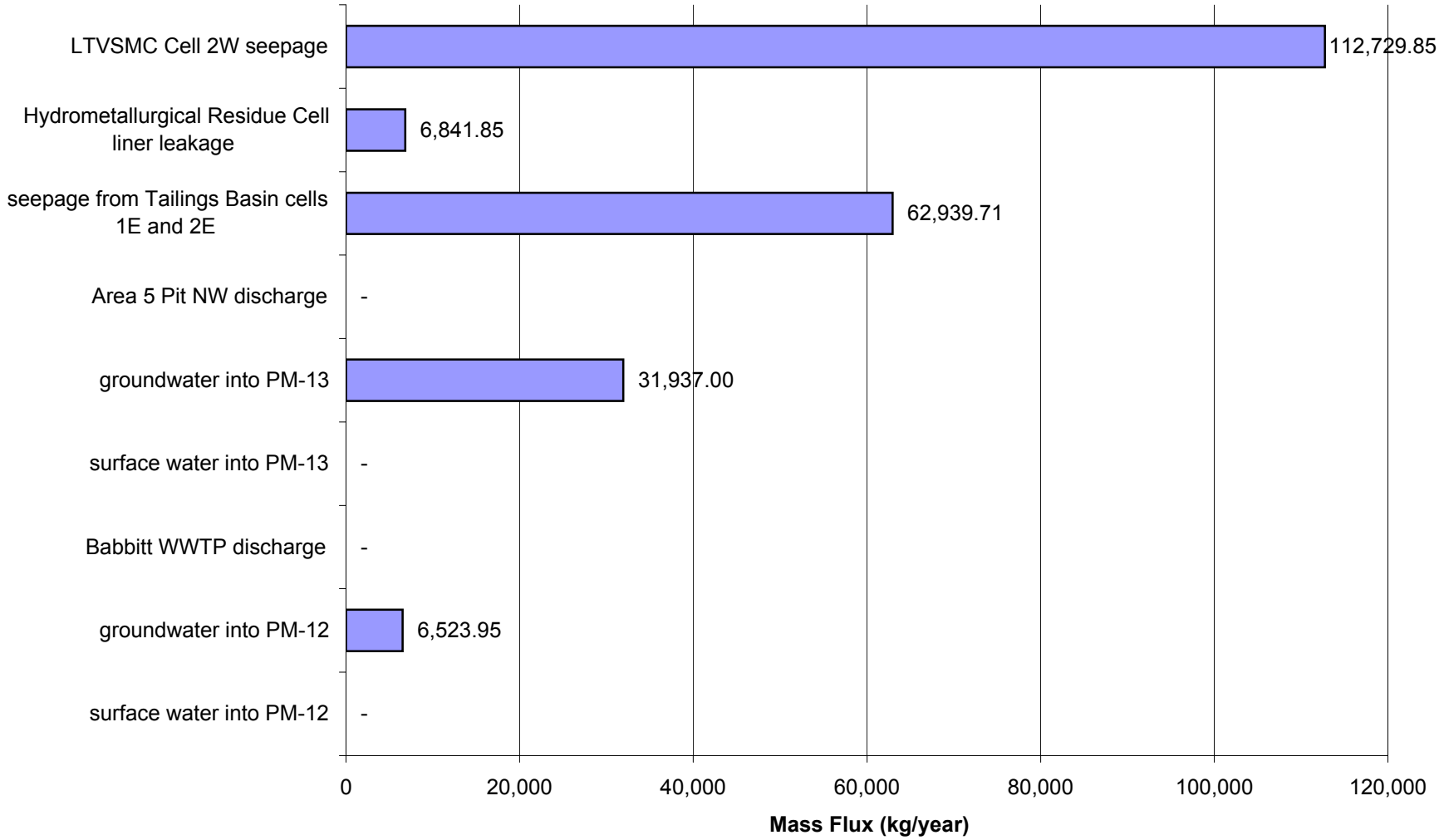
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 1 for High Flow for Antimony (Sb)



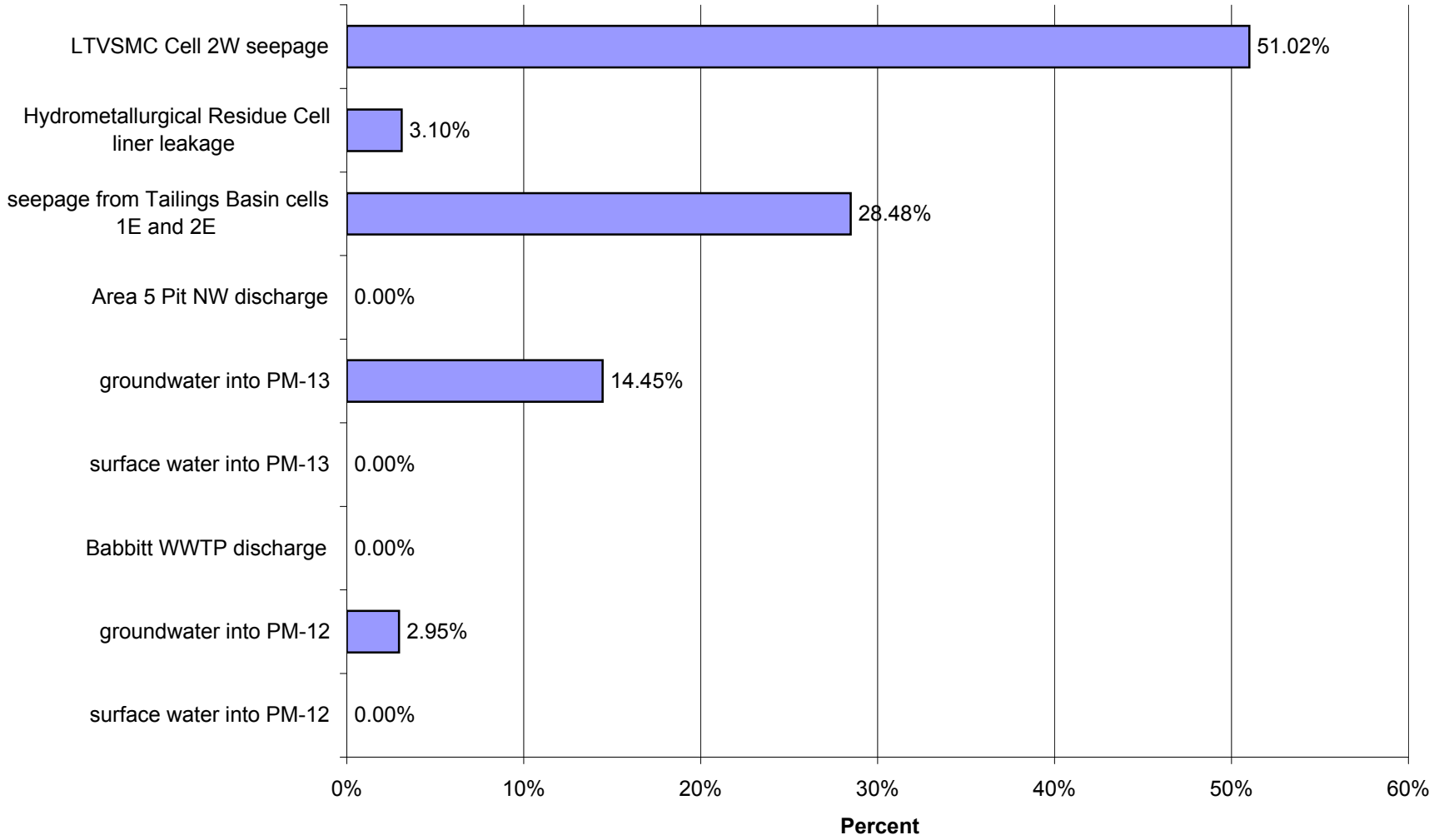
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 1 for High Flow for Antimony (Sb)



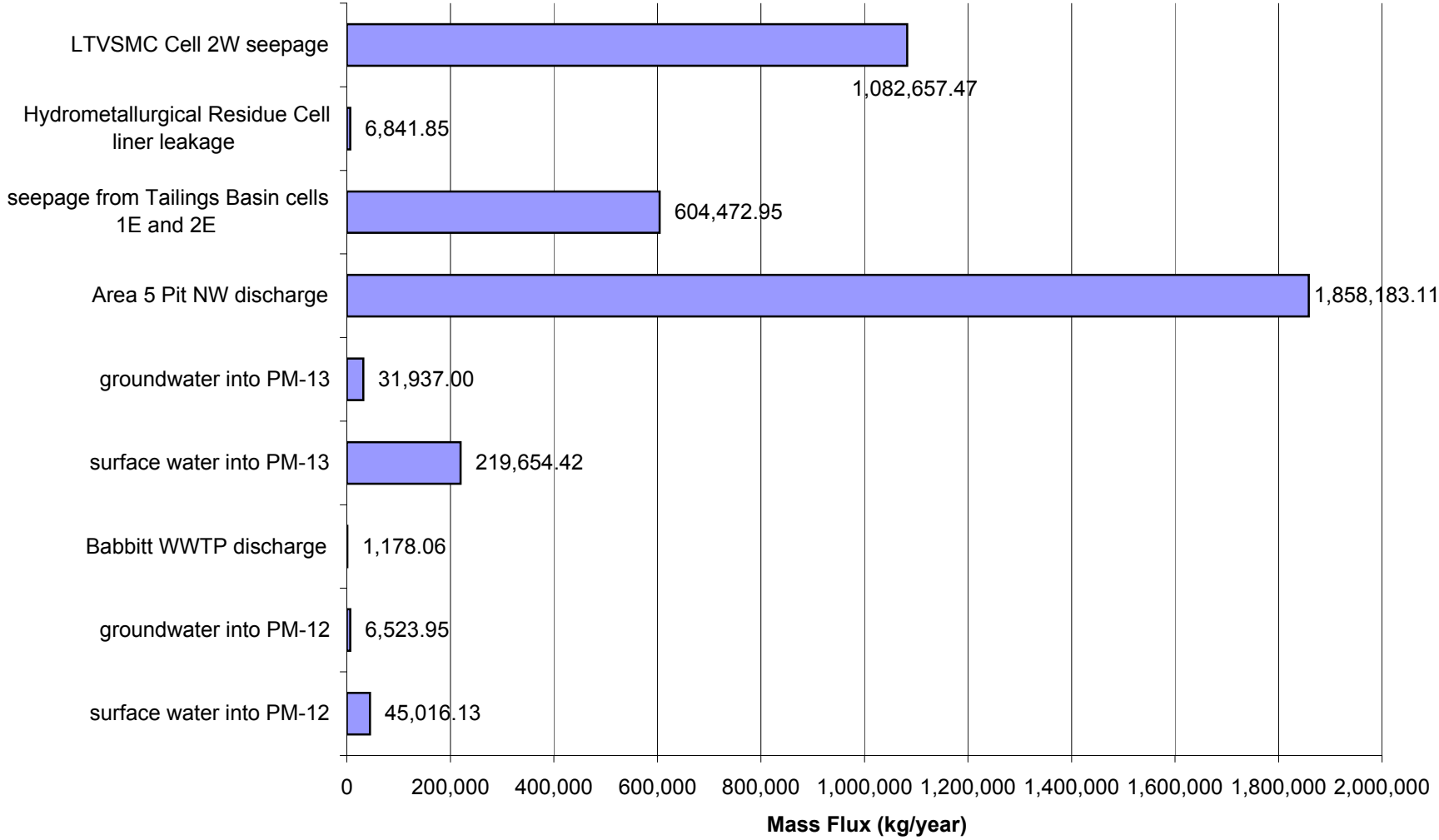
Geotechnical Mitigation: Mass Flux (kg/year) of Impacts at PM-13 in Year 1 for Low Flow for Sulfate (SO_4)



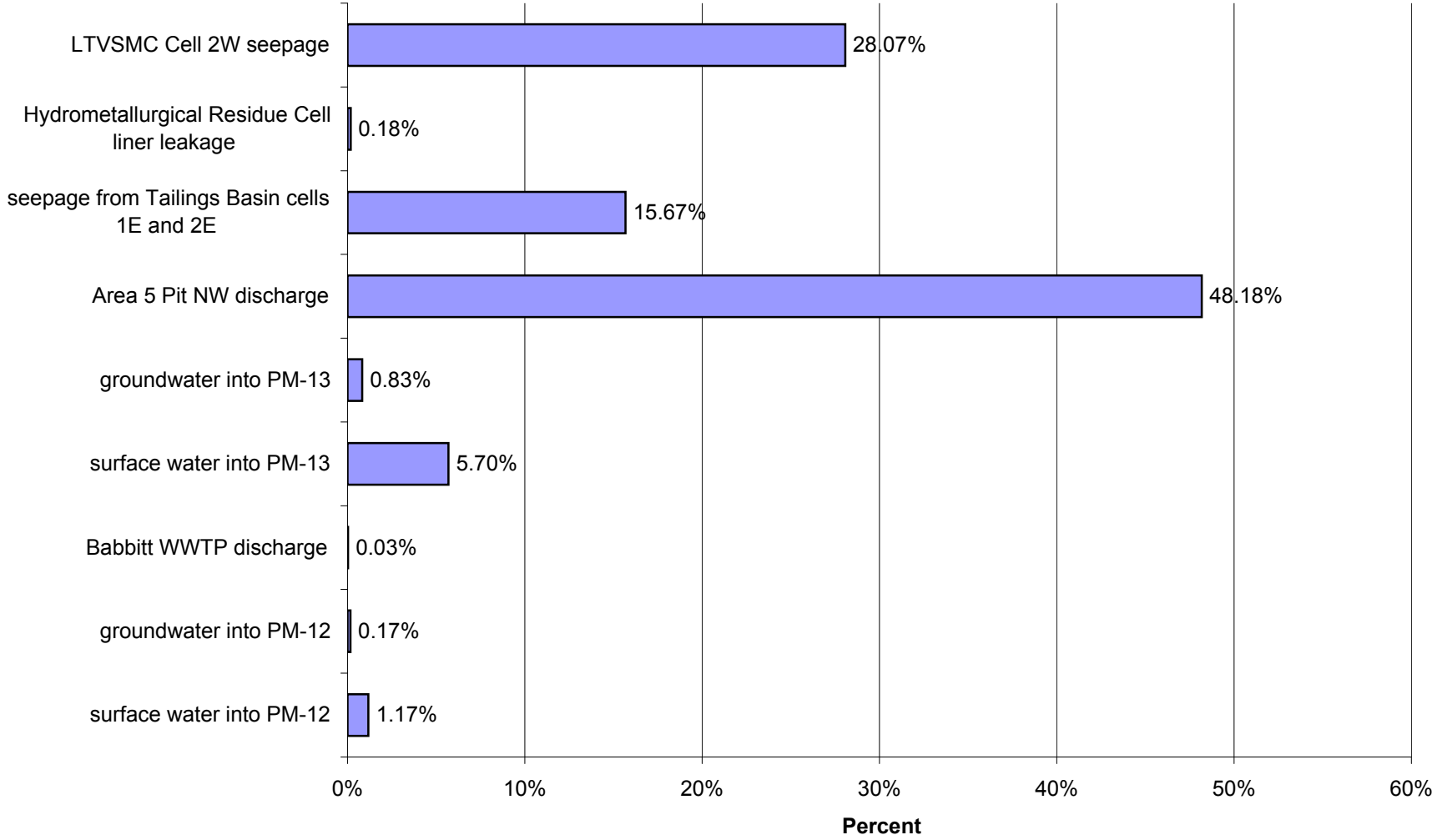
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 1 for Low Flow for Sulfate (SO_4)



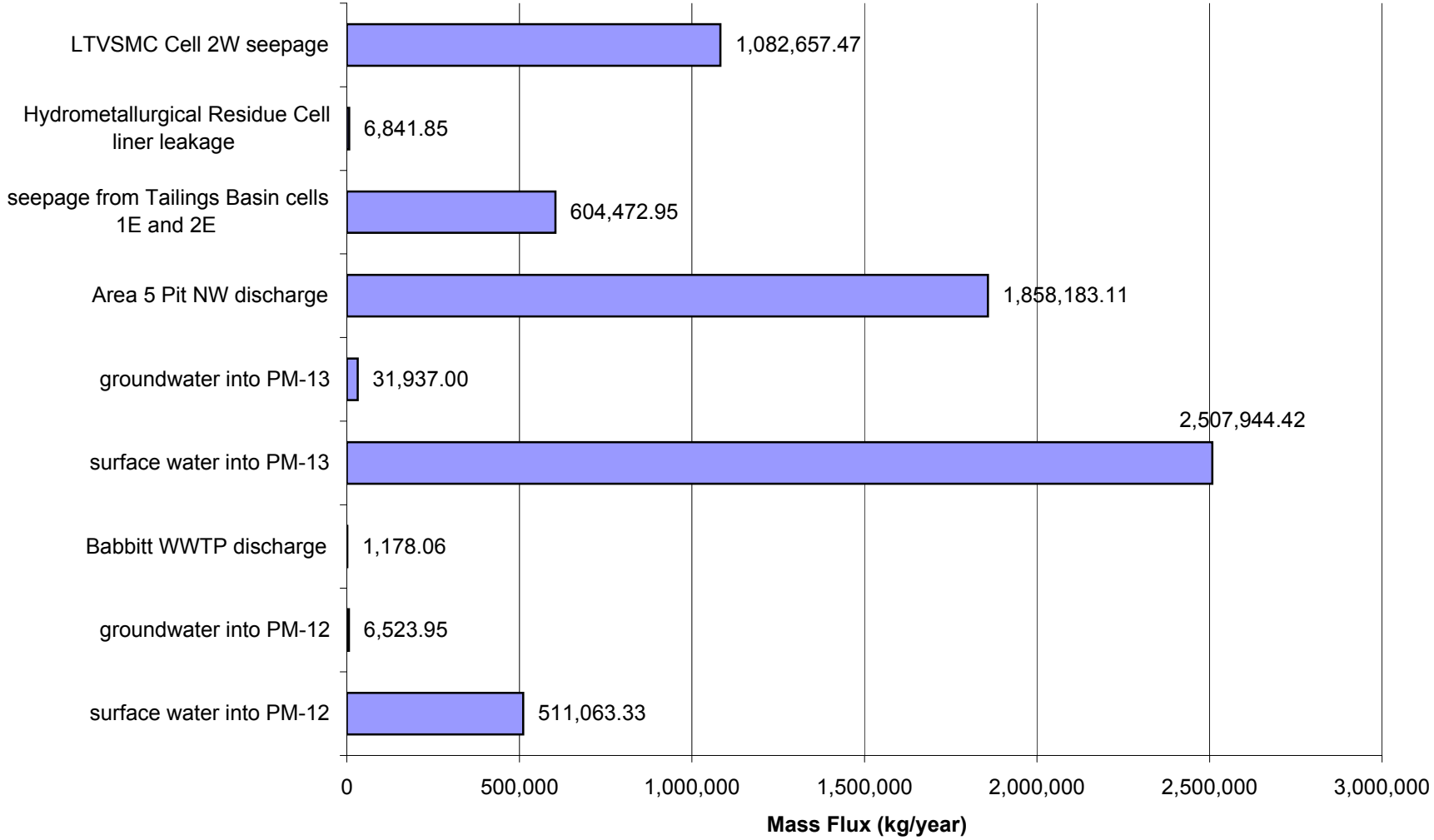
Geotechnical Mitigation: Mass Flux (kg/year) of Impacts at PM-13 in Year 1 for Average Flow for Sulfate (SO_4)



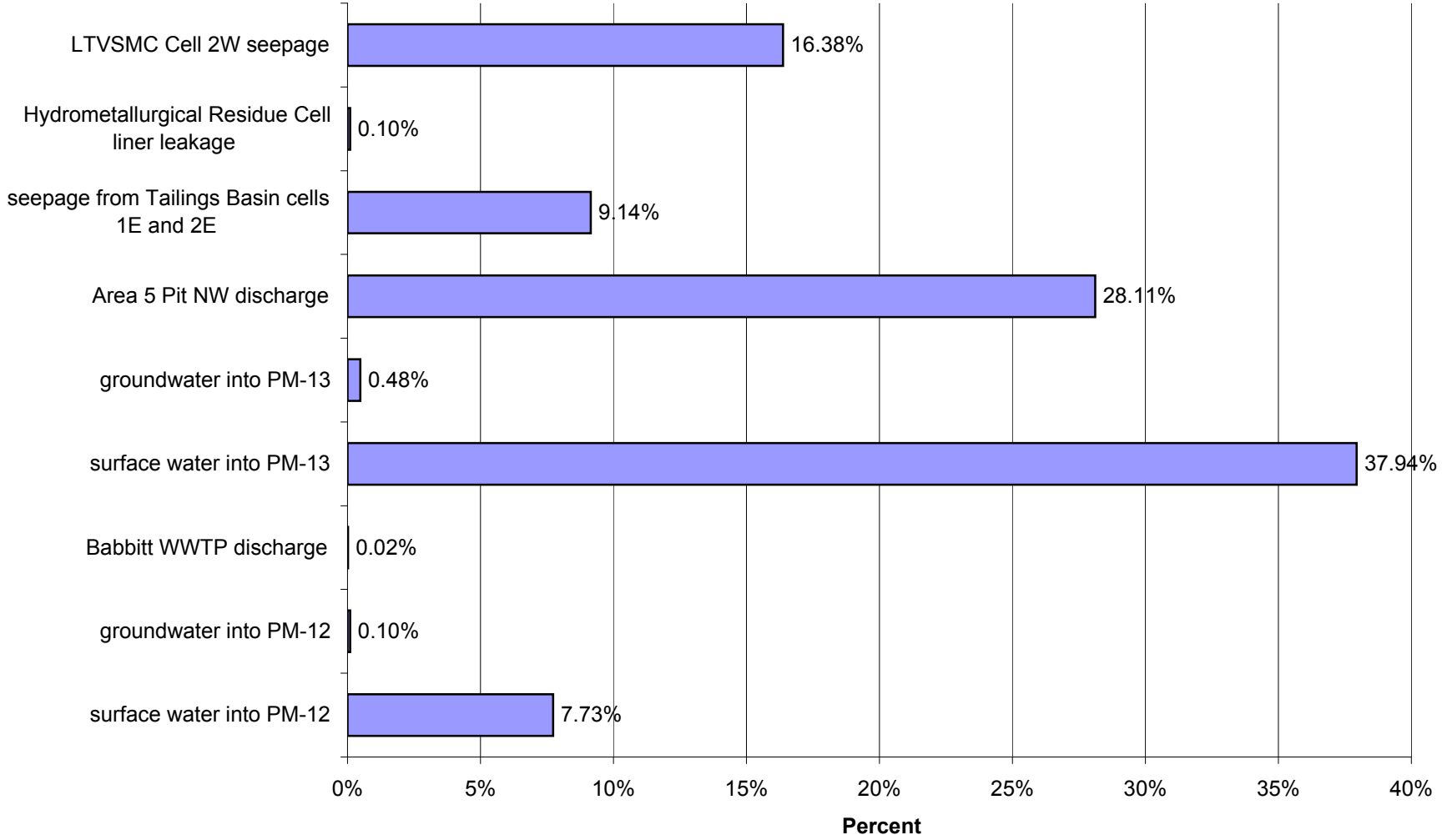
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 1 for Average Flow for Sulfate (SO_4)



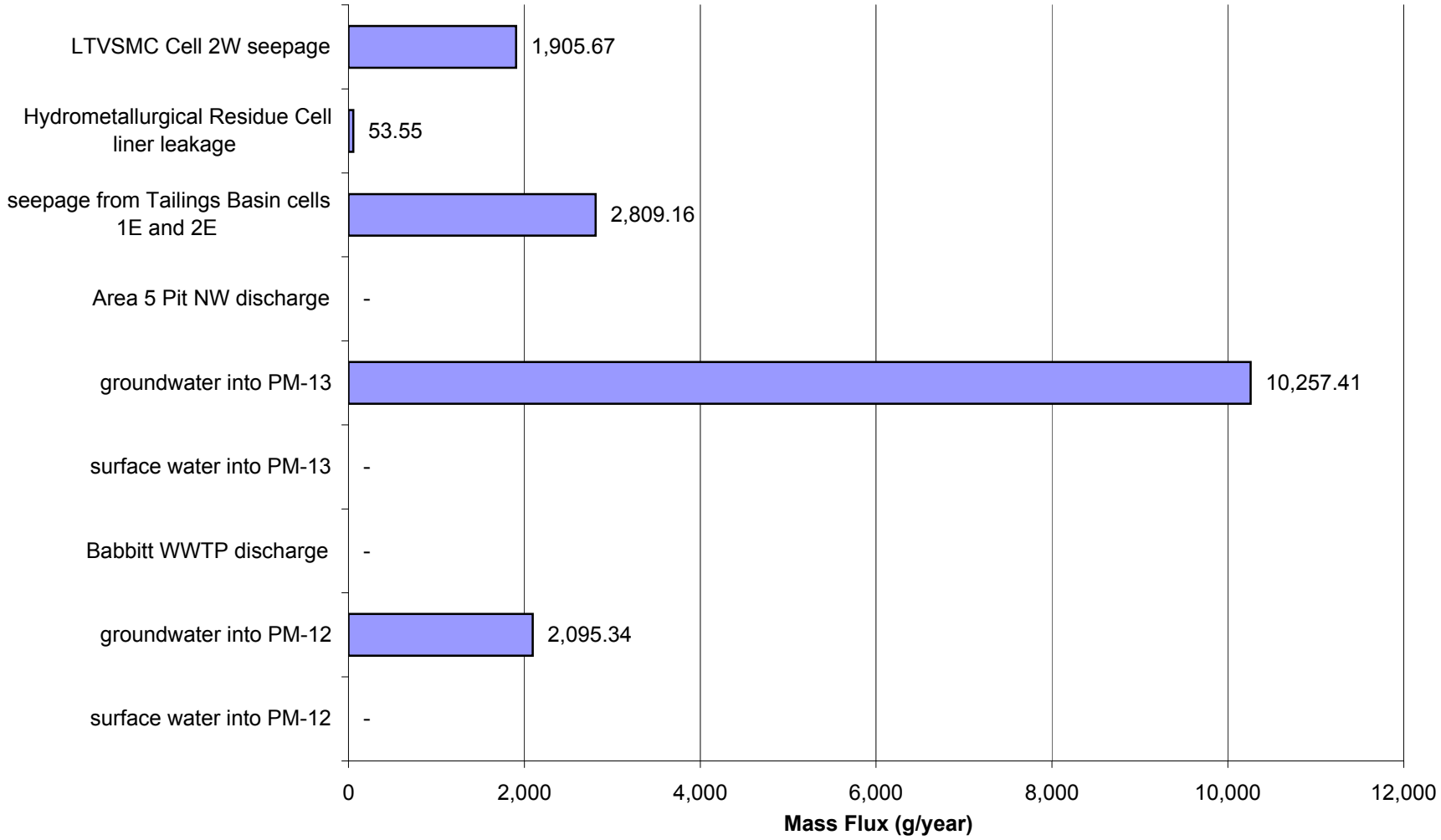
Geotechnical Mitigation: Mass Flux (kg/year) of Impacts at PM-13 in Year 1 for High Flow for Sulfate (SO_4)



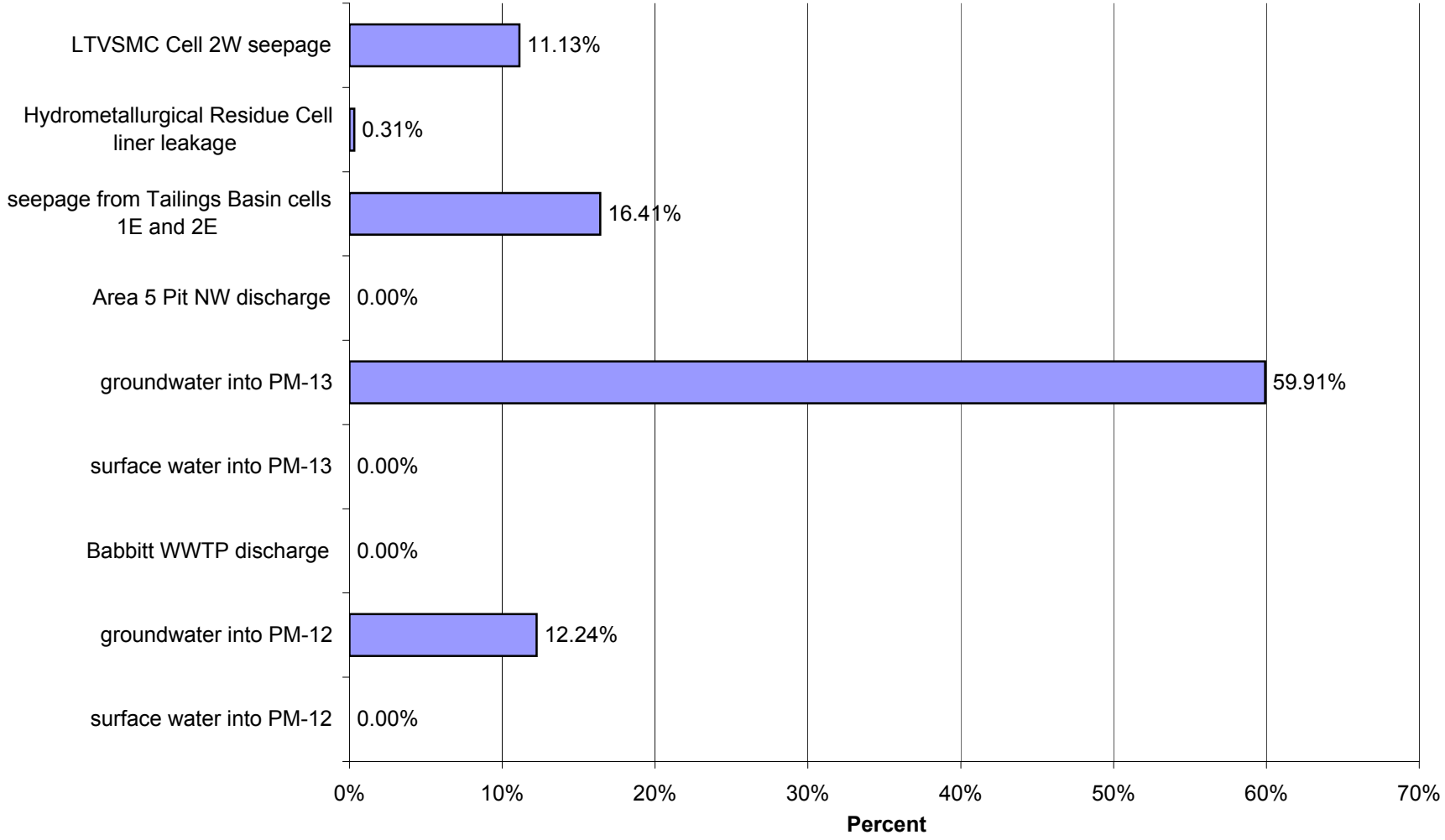
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 1 for High Flow for Sulfate (SO_4)



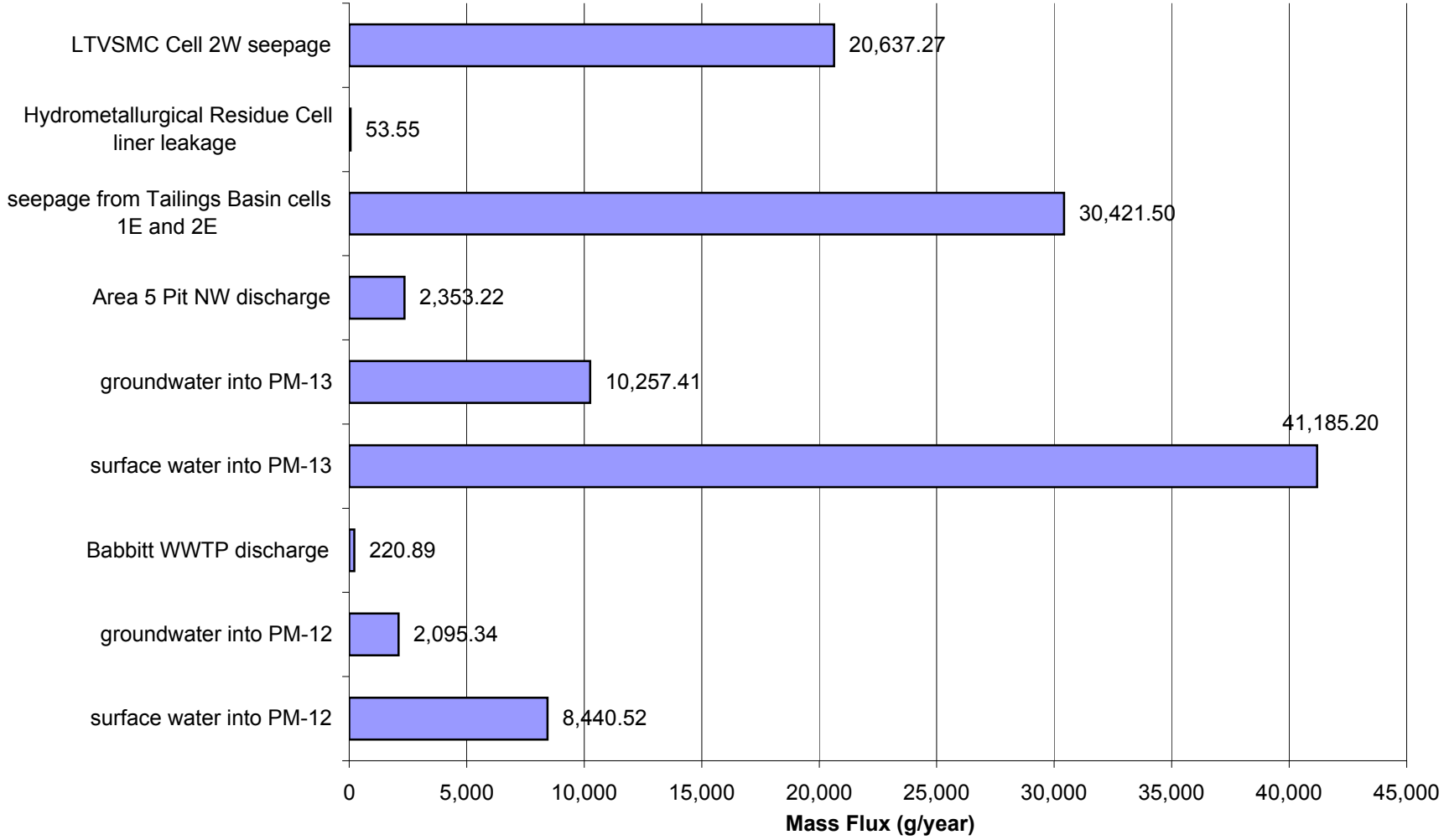
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for Low Flow for Arsenic (As)



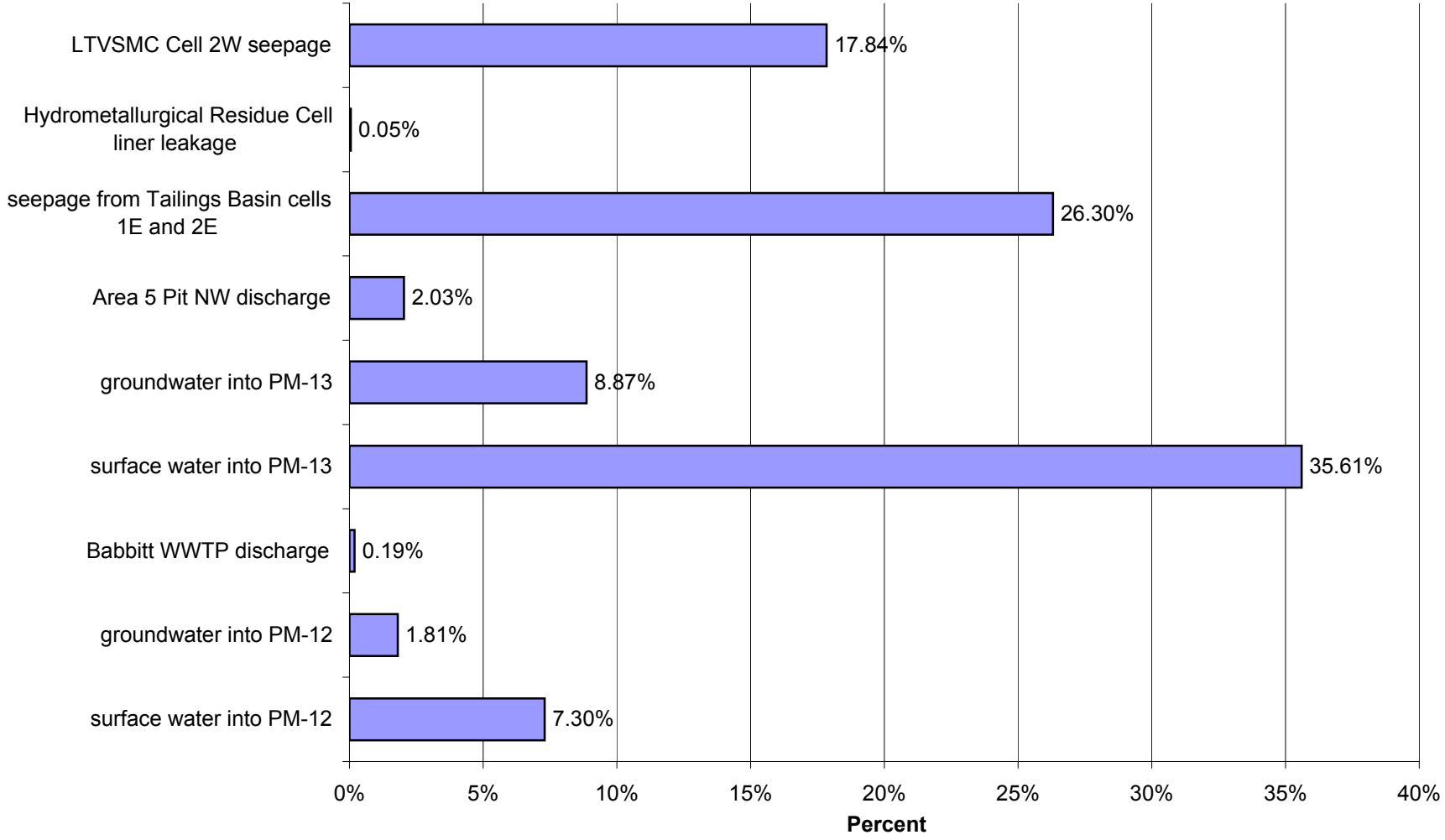
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 5 for Low Flow for Arsenic (As)



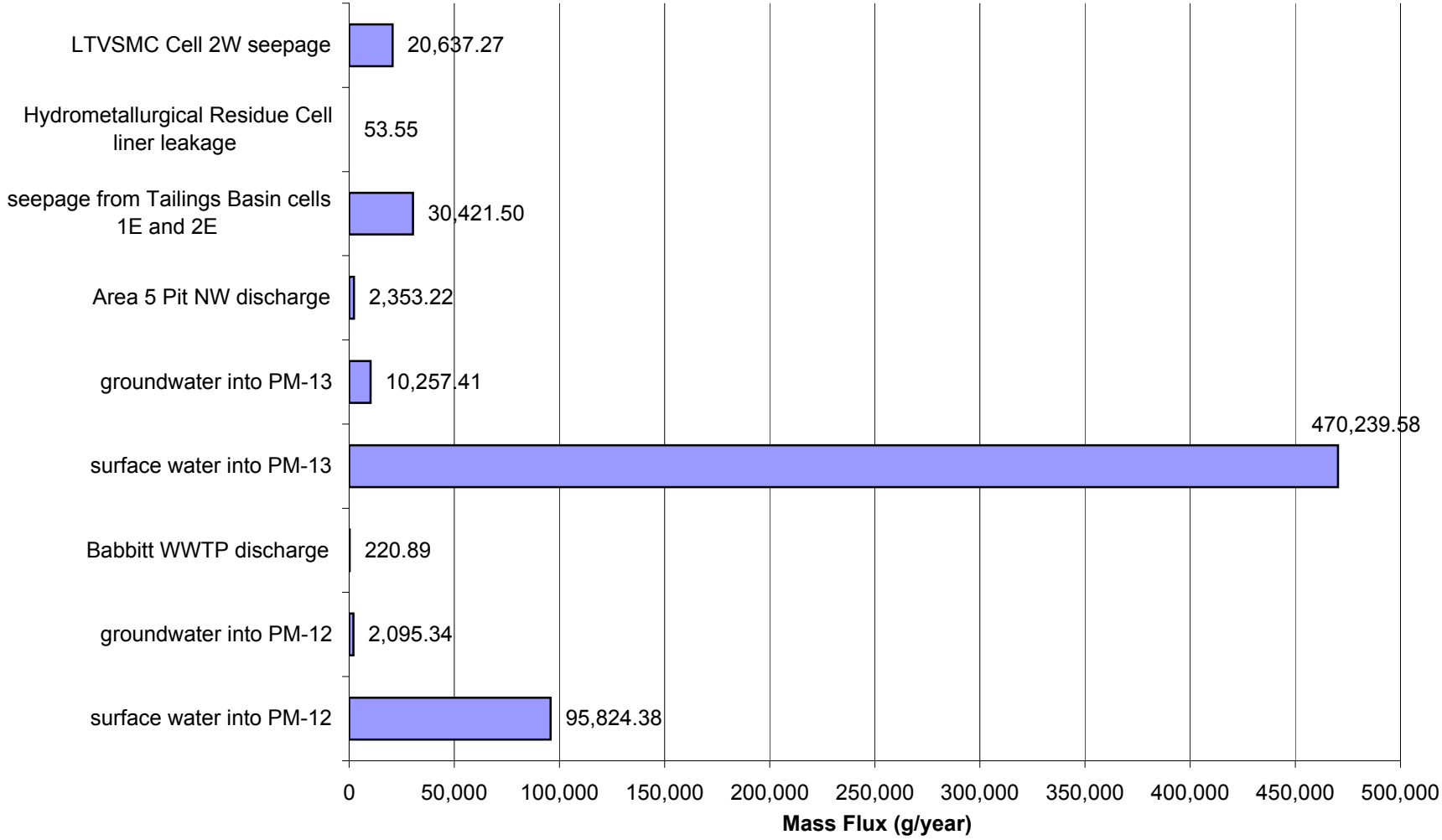
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for Average Flow for Arsenic (As)



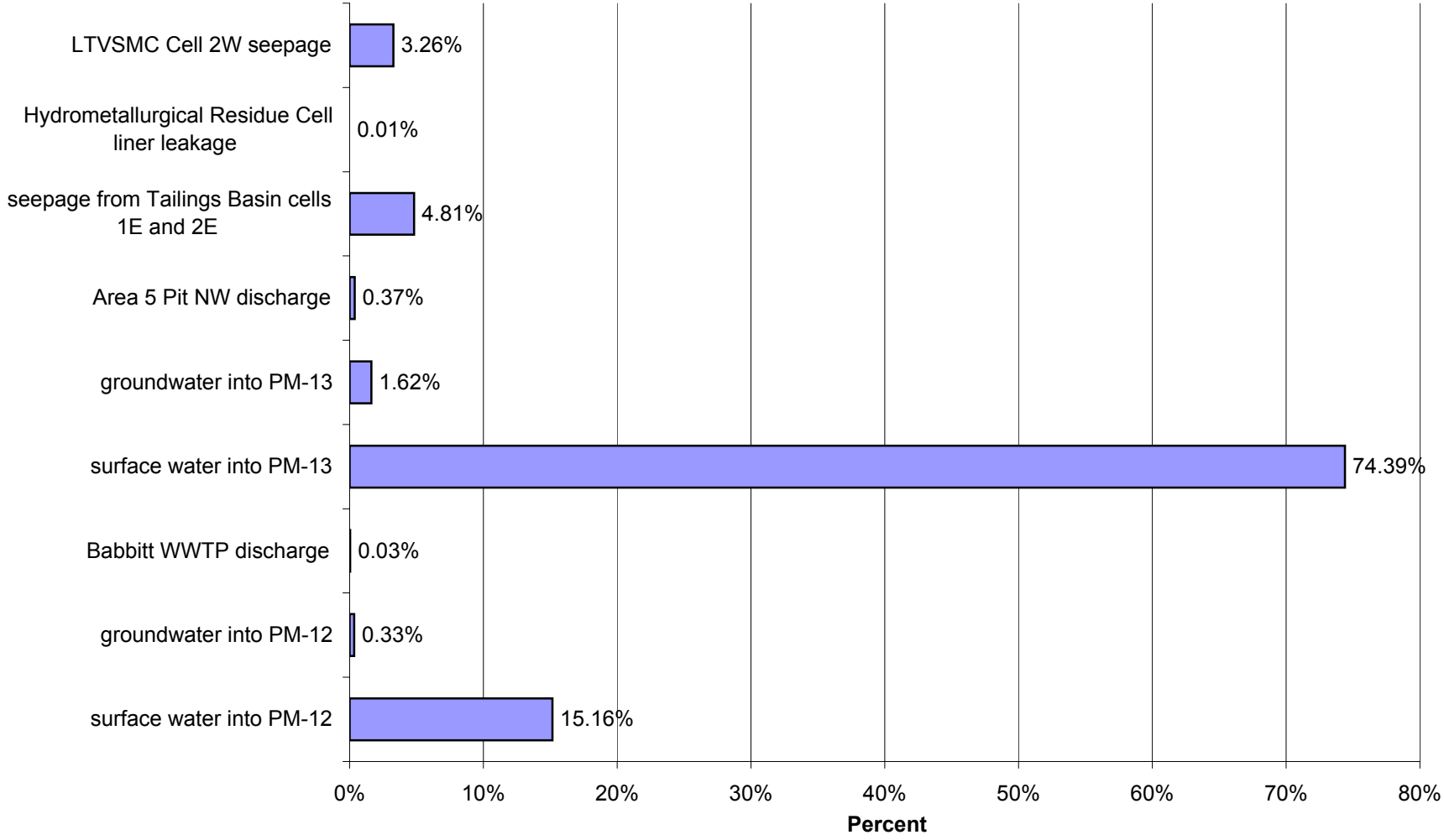
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 5 for Average Flow for Arsenic (As)



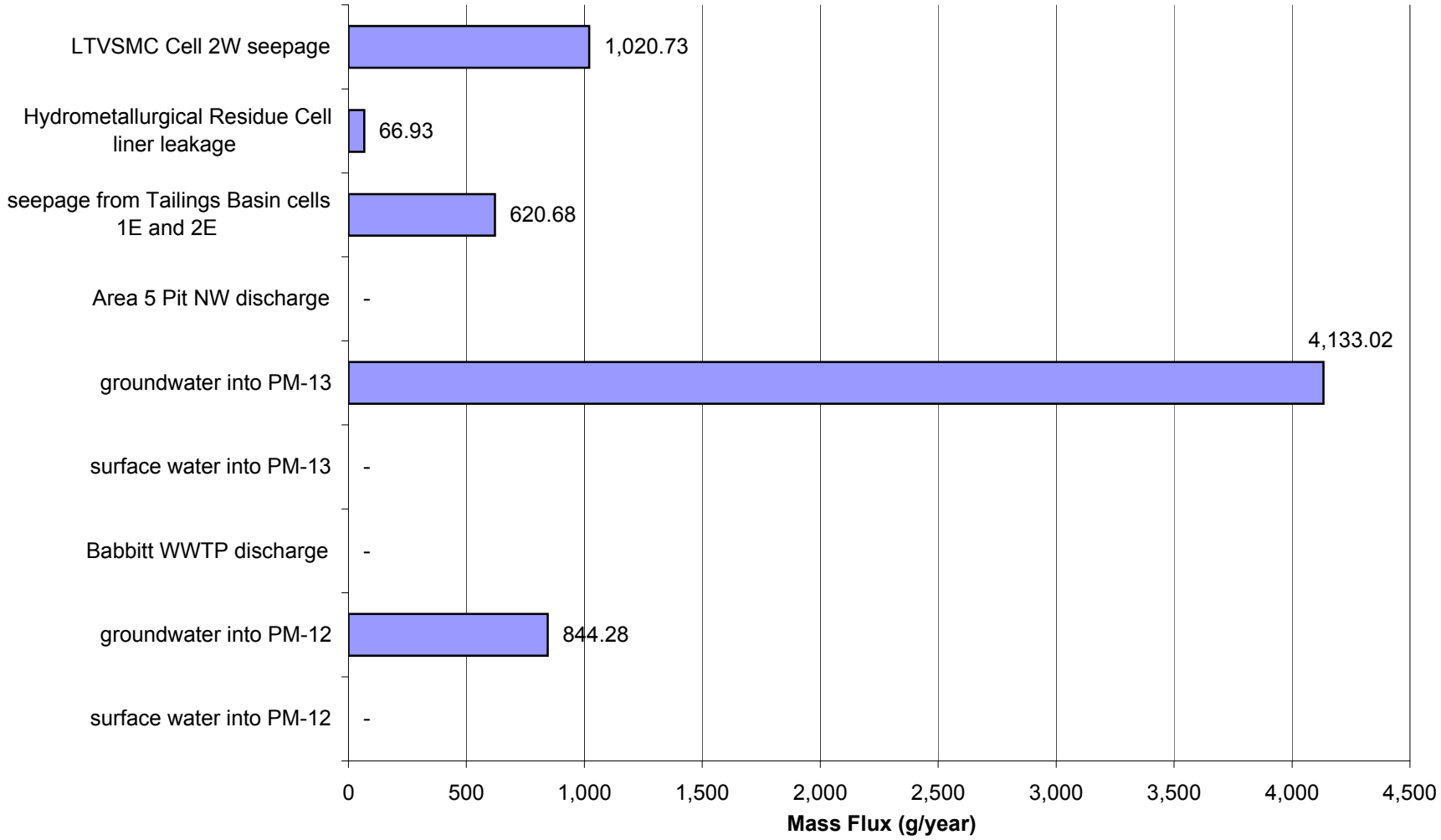
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for High Flow for Arsenic (As)



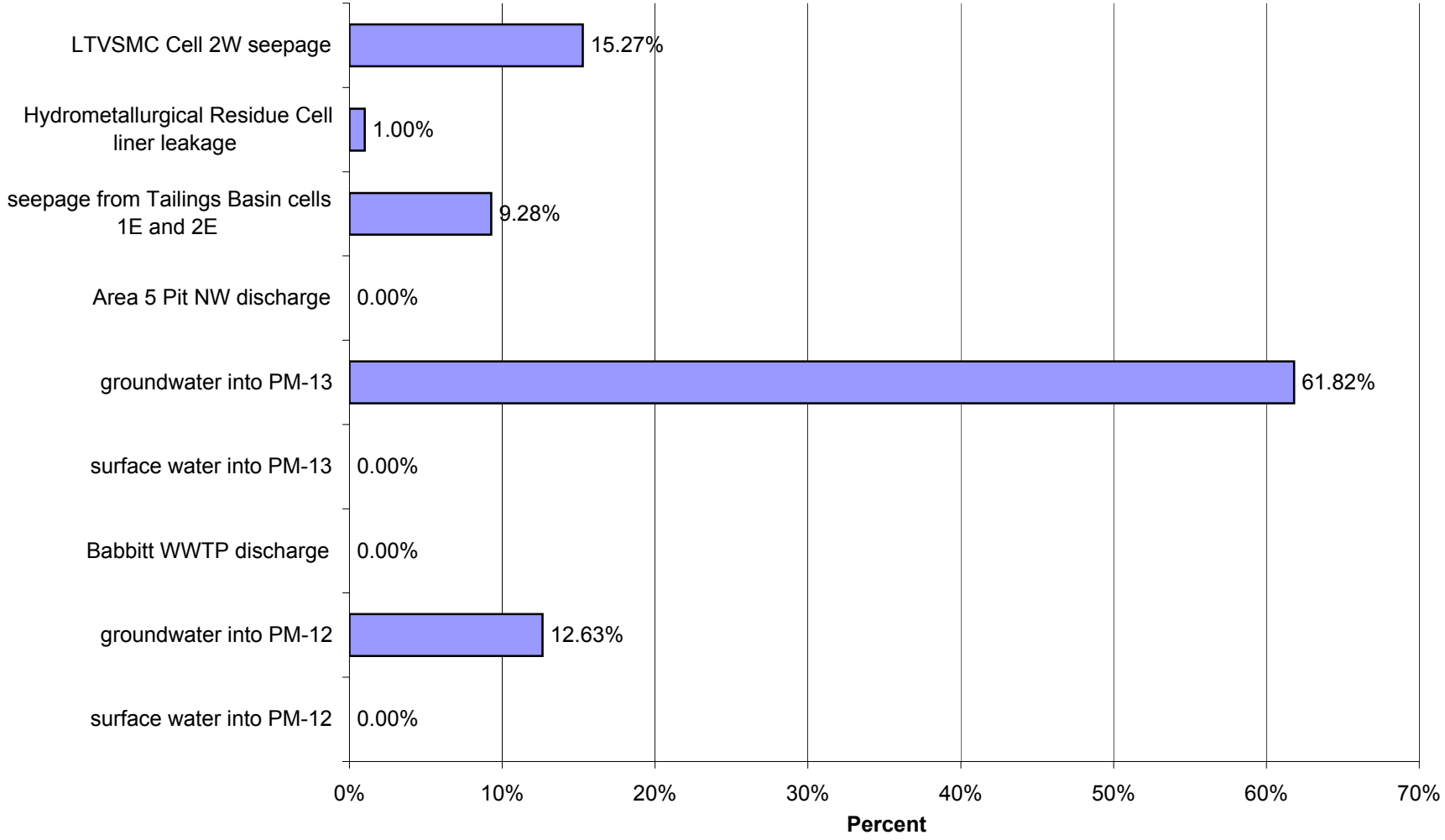
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 5 for High Flow for Arsenic (As)



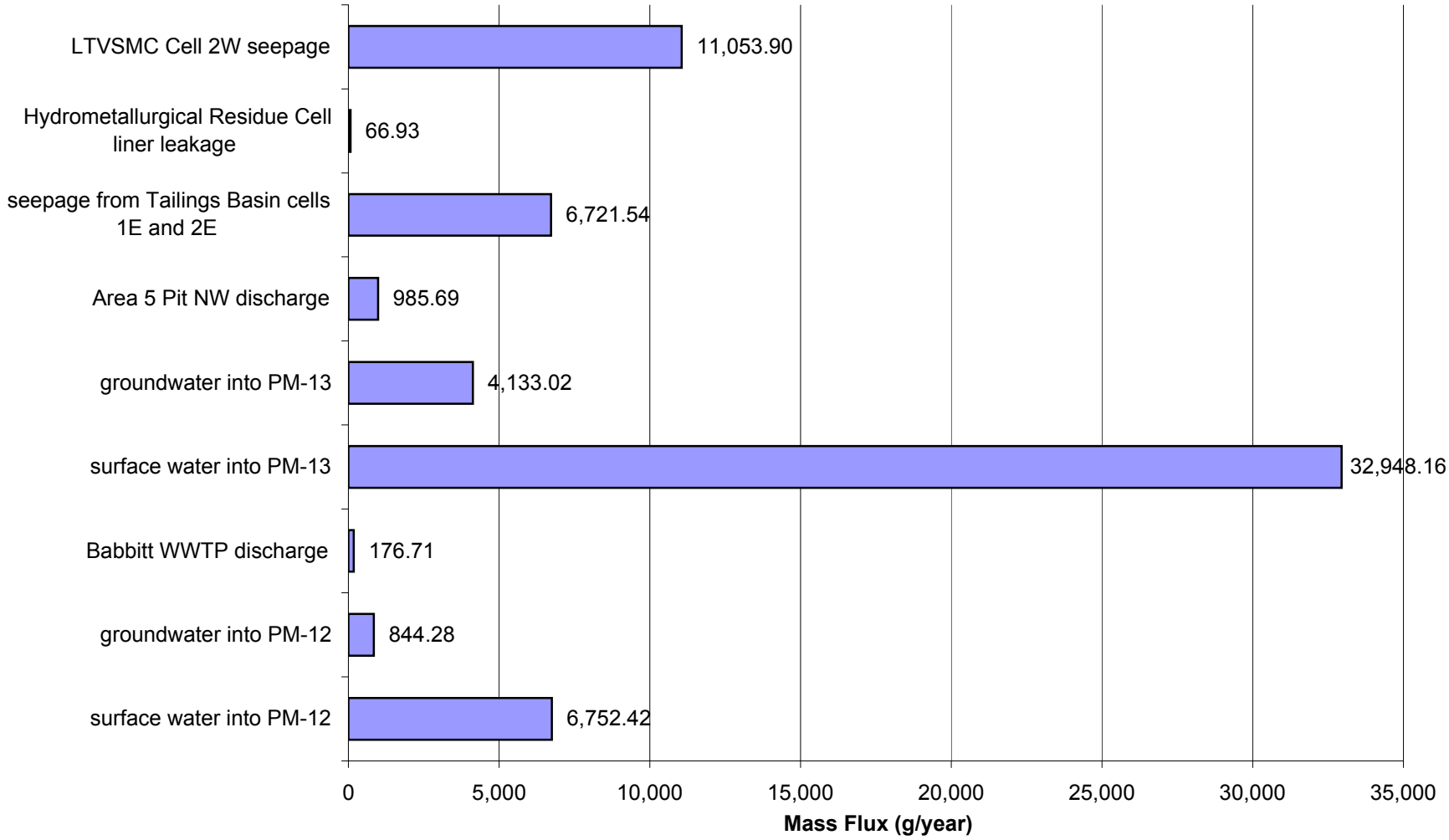
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for Low Flow for Cobalt (Co)



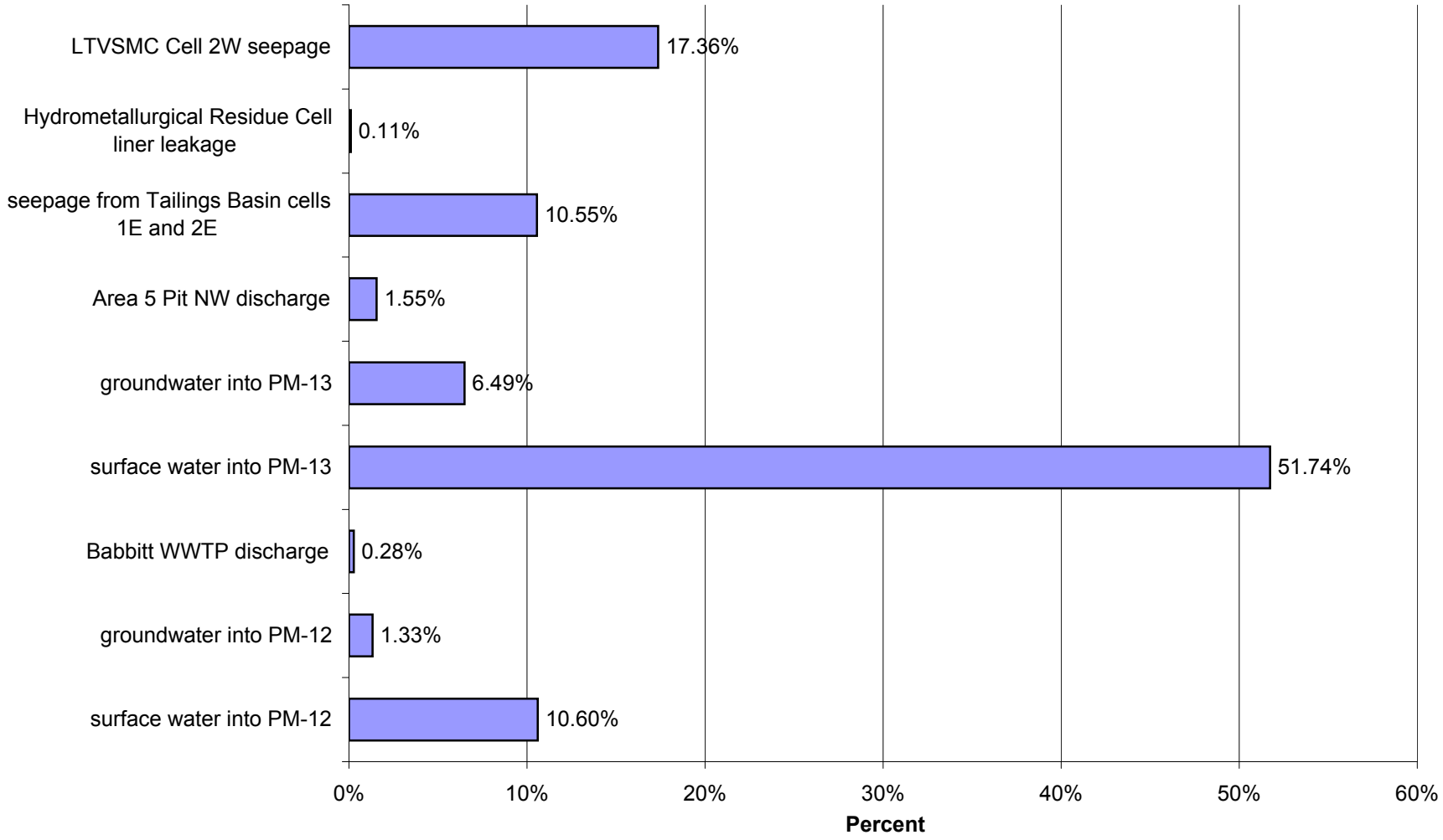
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 5 for Low Flow for Cobalt (Co)



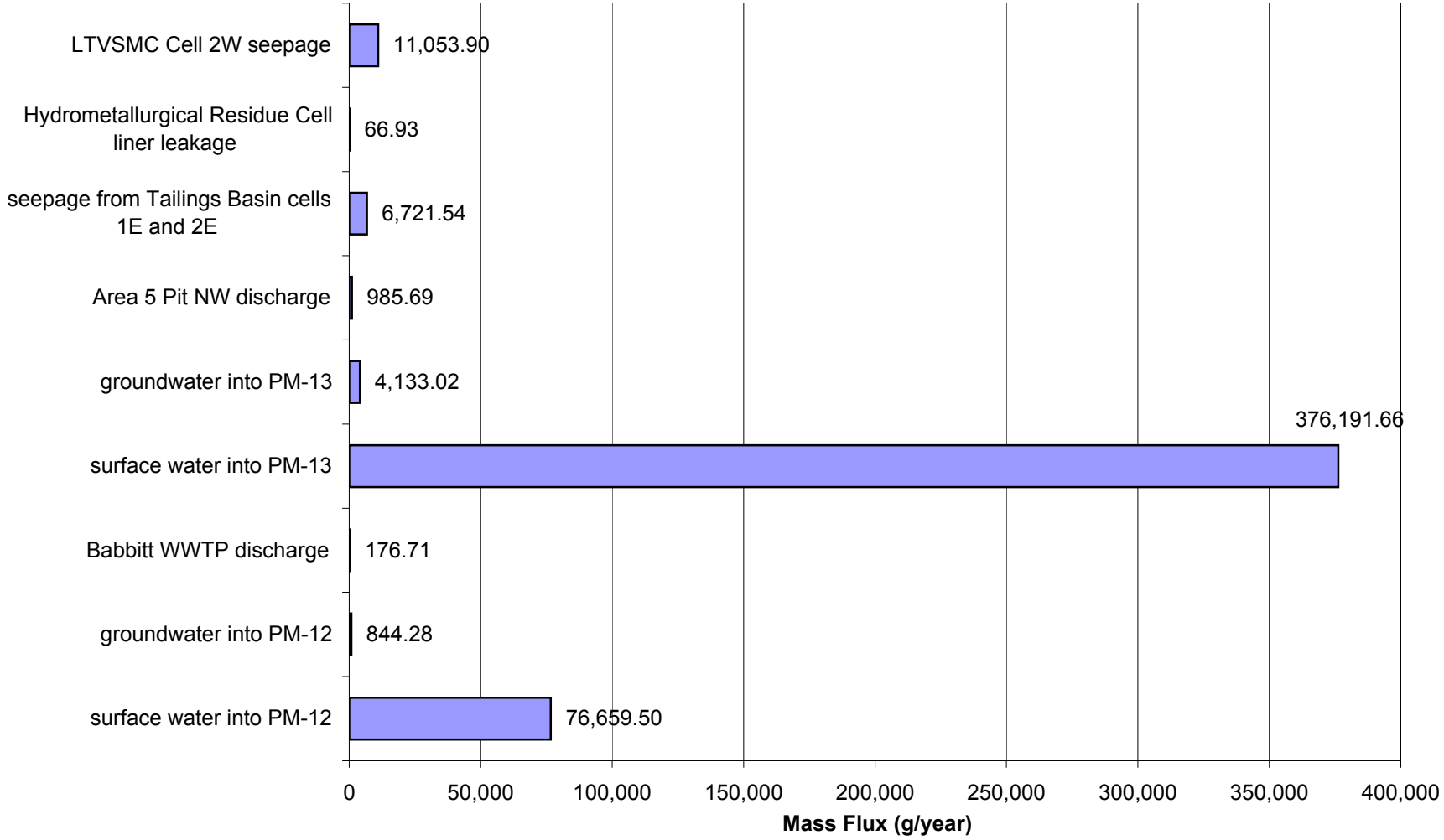
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for Average Flow for Cobalt (Co)



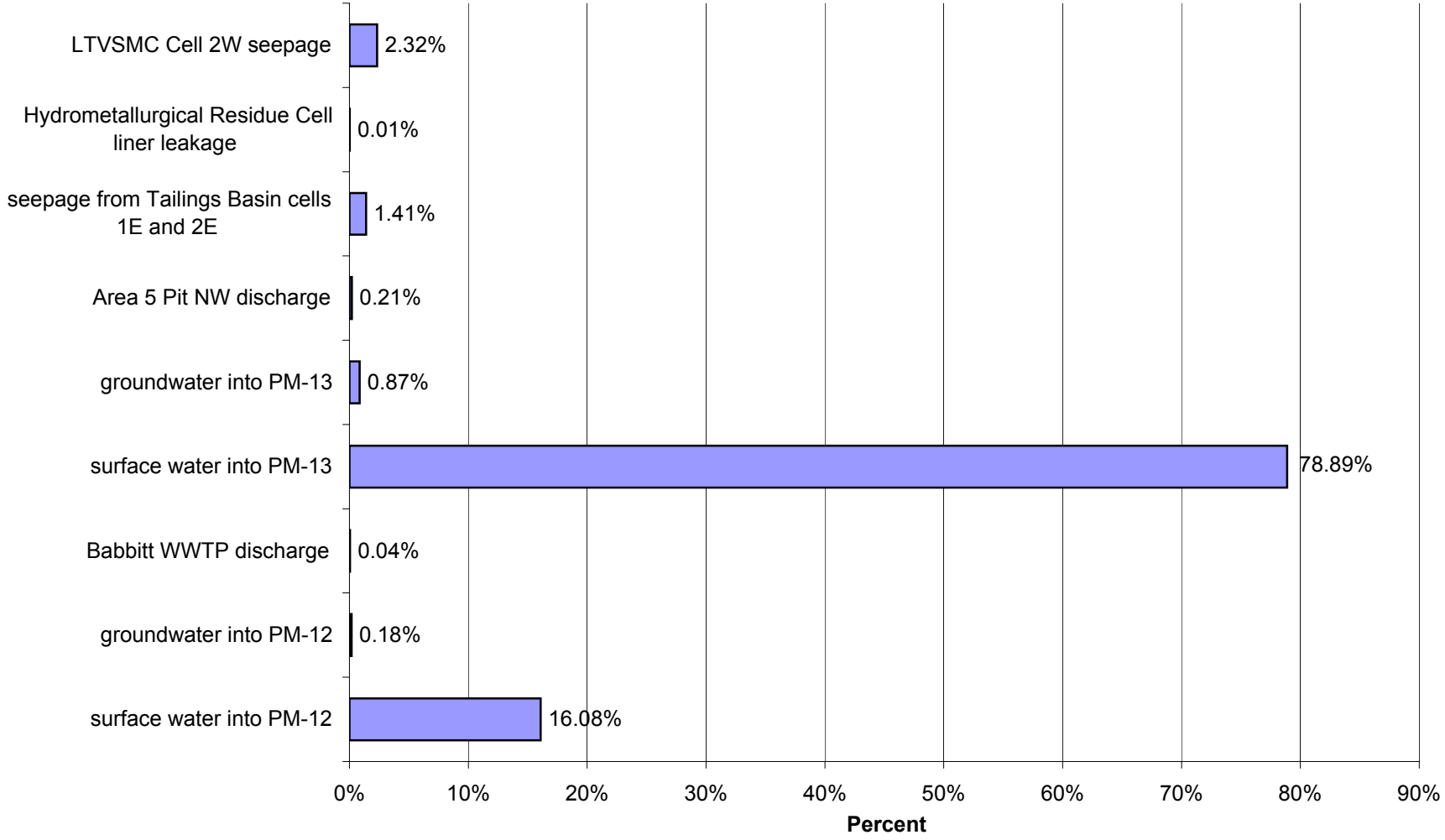
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 5 for Average Flow for Cobalt (Co)



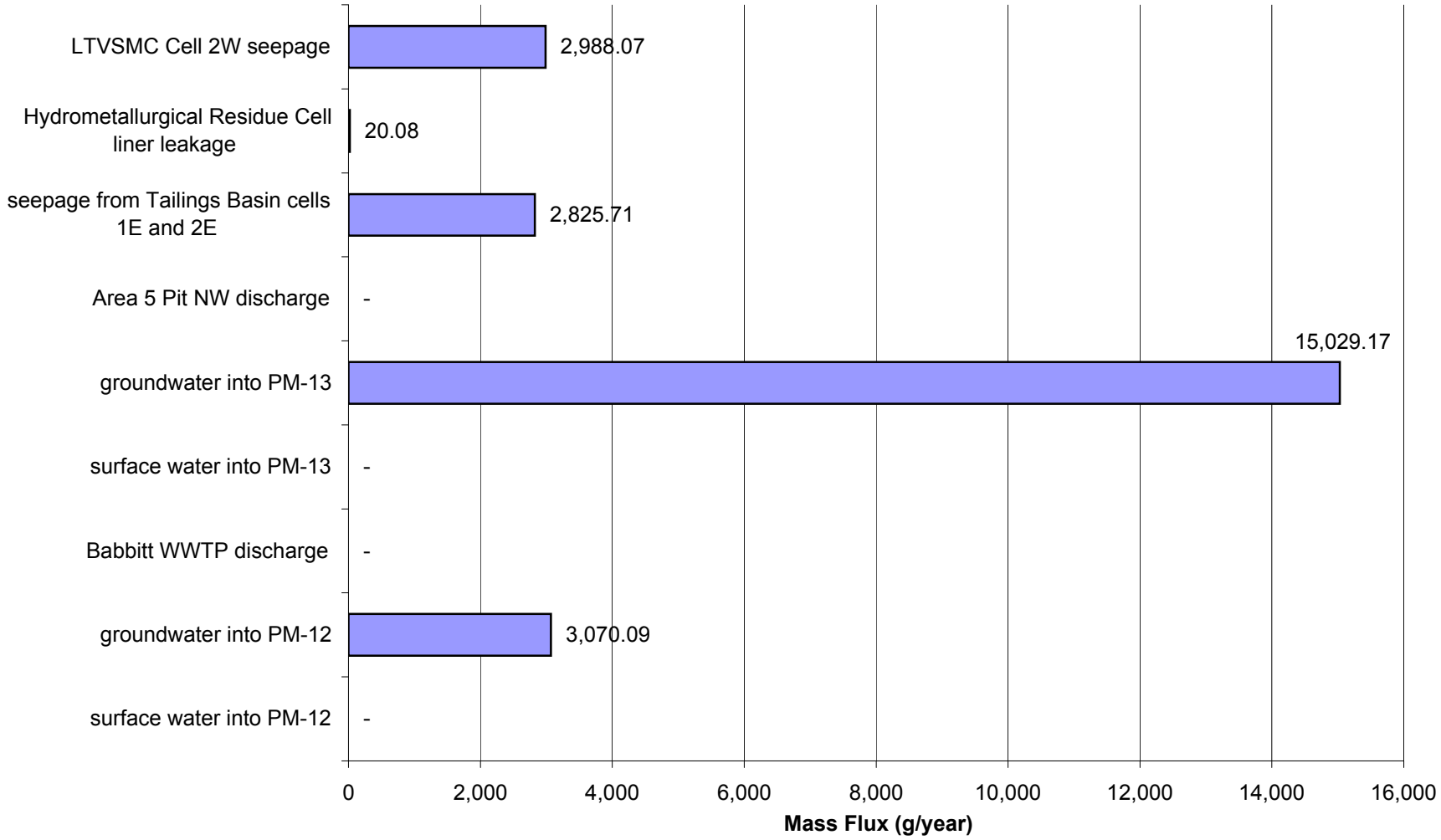
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for High Flow for Cobalt (Co)



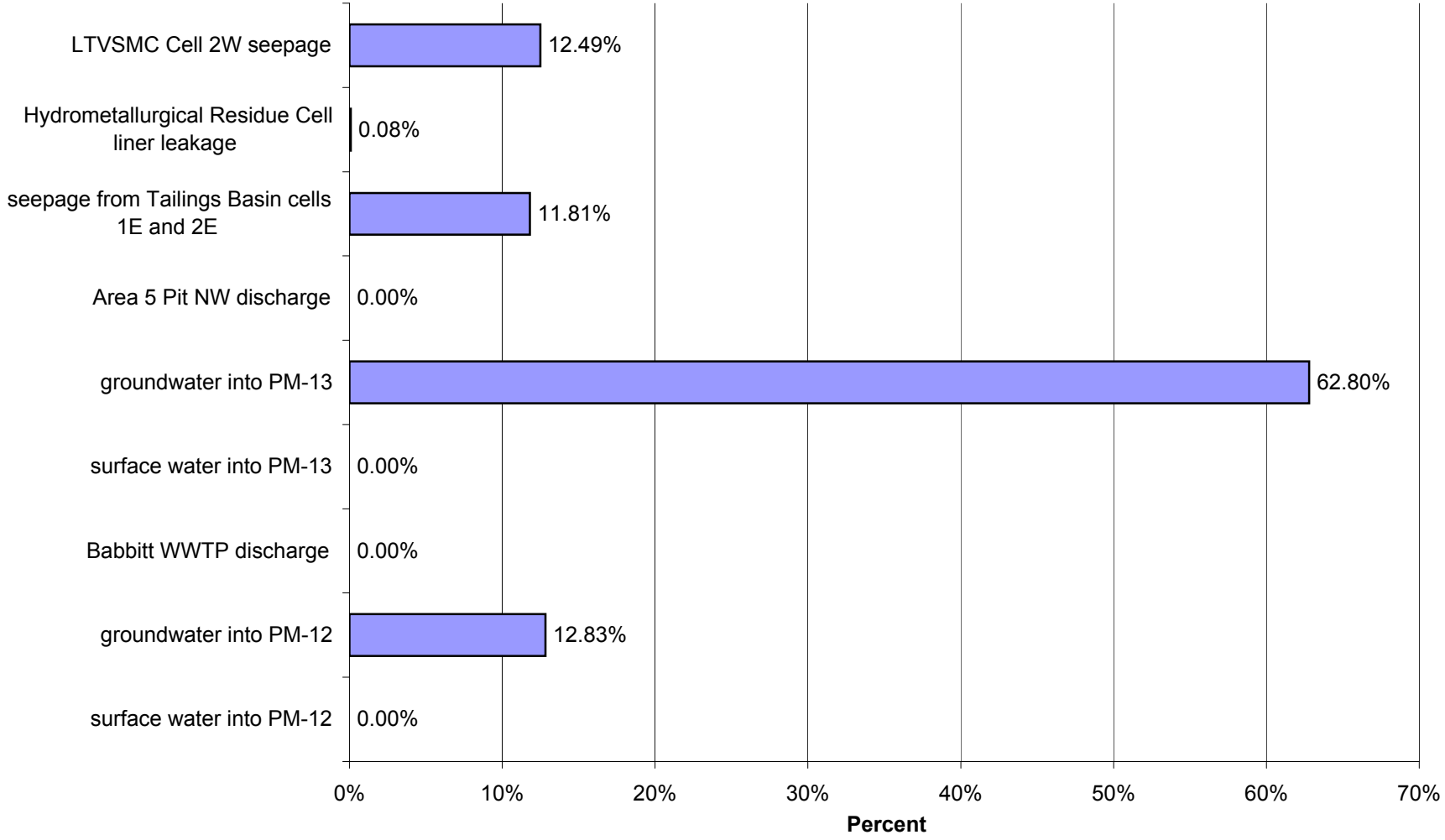
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 5 for High Flow for Cobalt (Co)



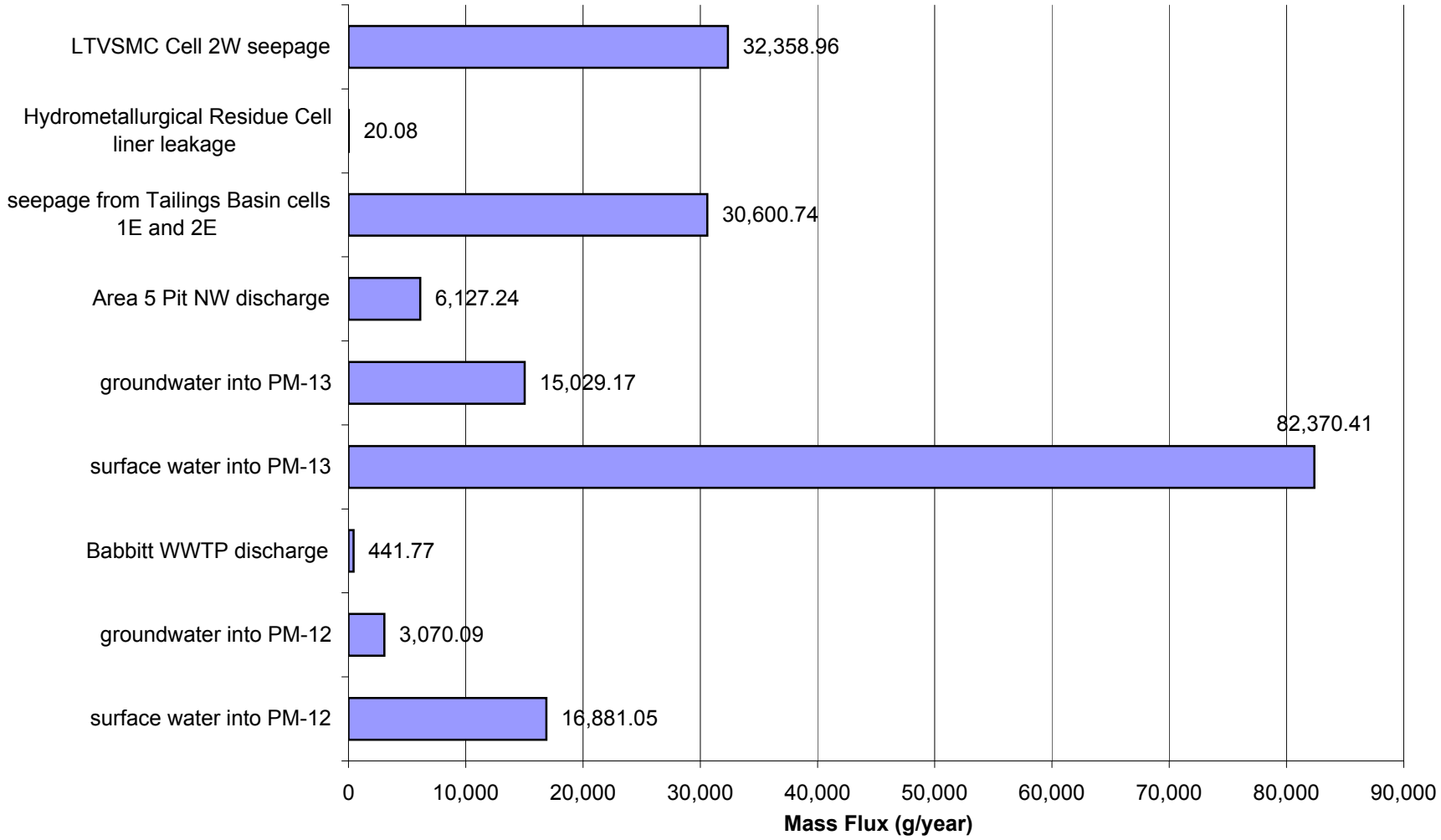
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for Low Flow for Copper (Cu)



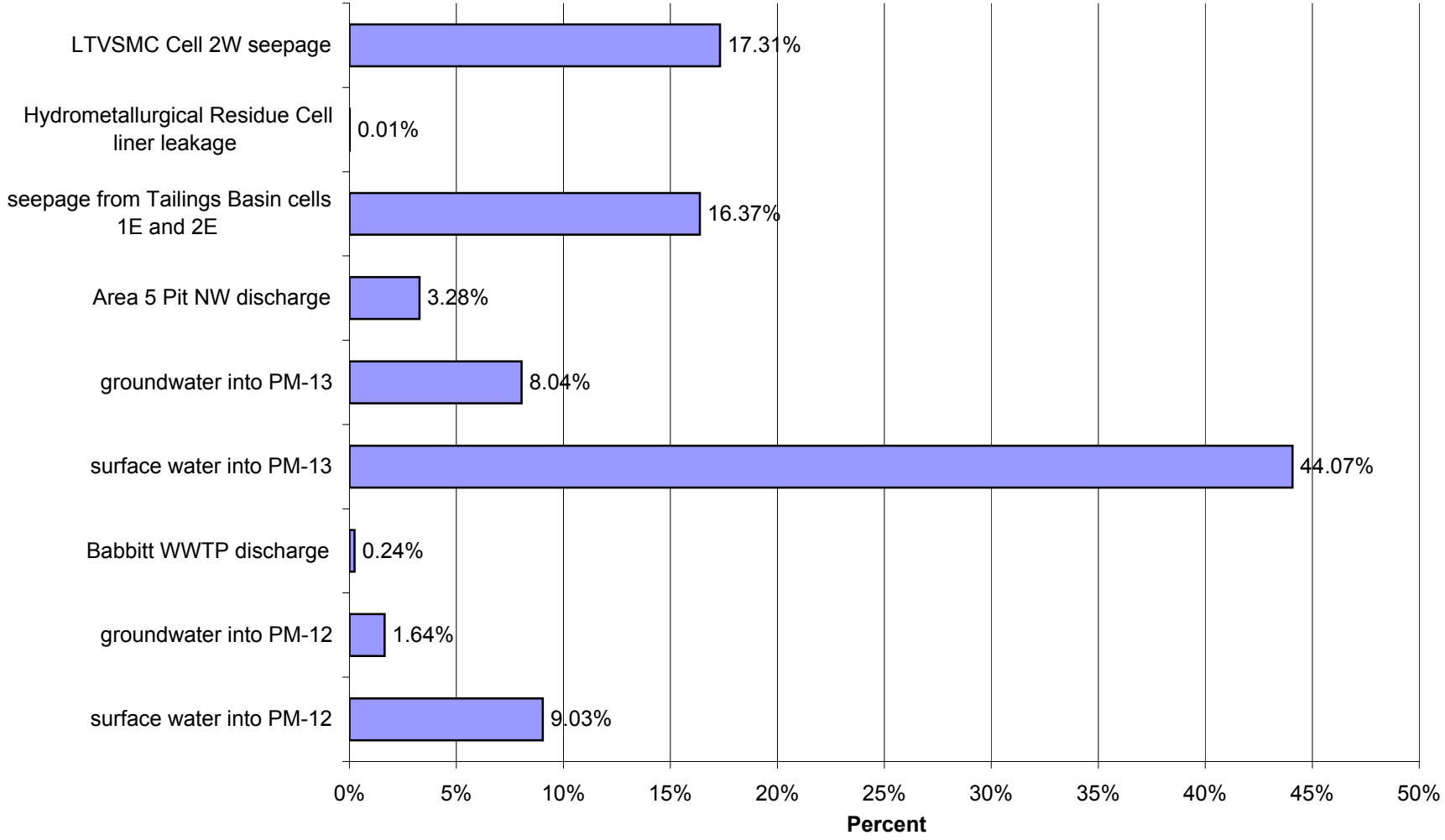
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 5 for Low Flow for Copper (Cu)



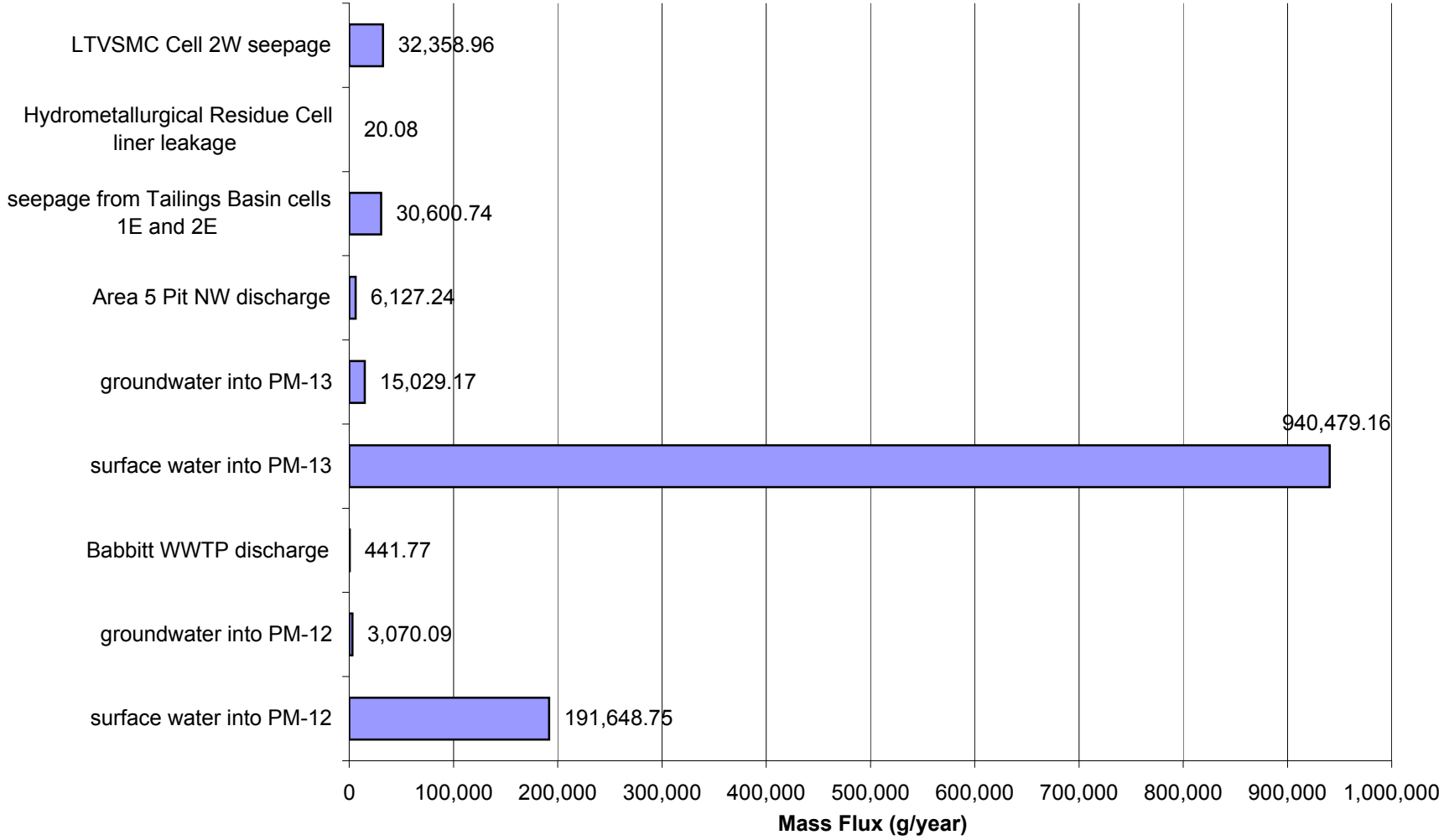
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for Average Flow for Copper (Cu)



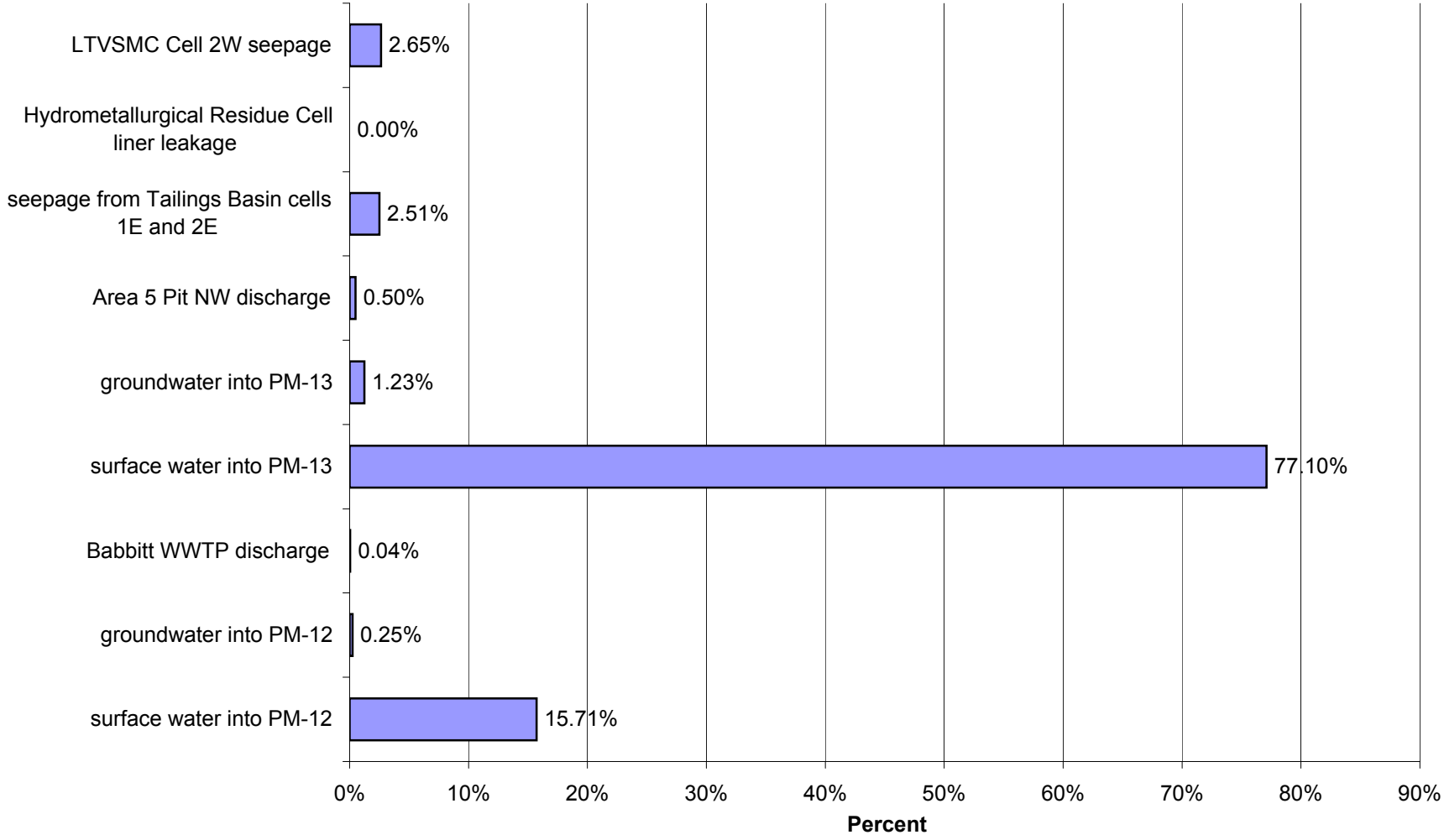
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 5 for Average Flow for Copper (Cu)



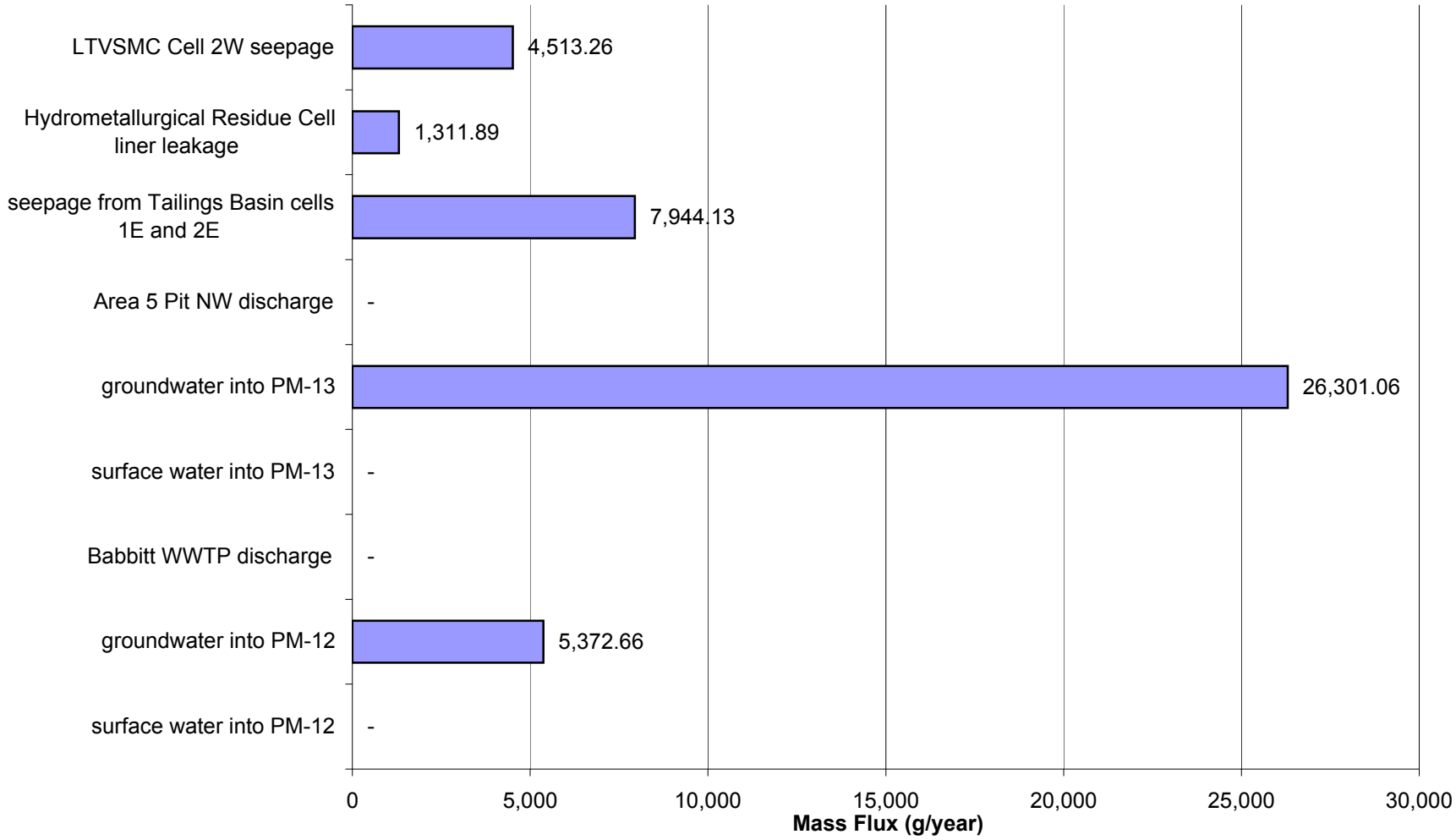
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for High Flow for Copper (Cu)



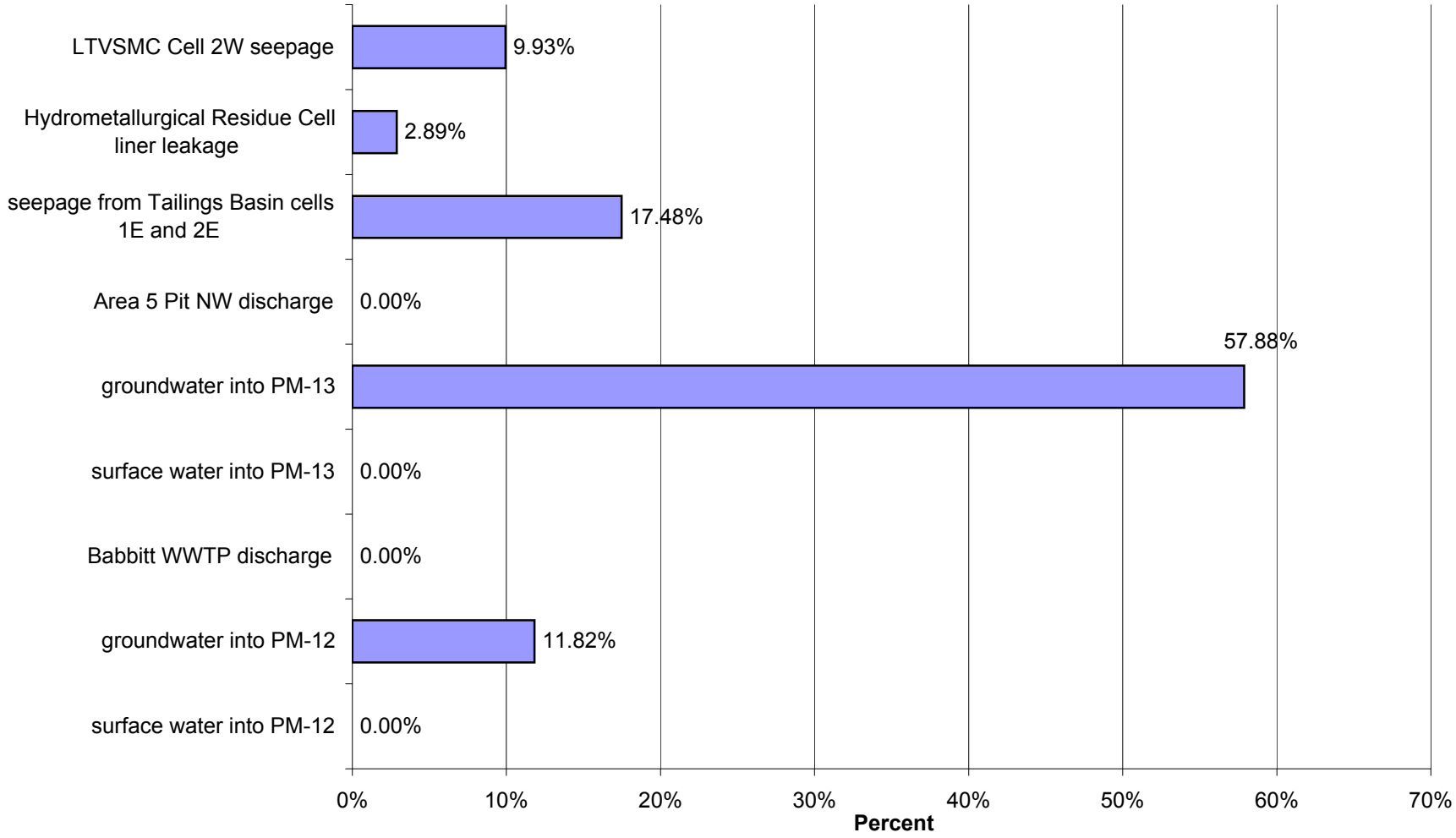
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 5 for High Flow for Copper (Cu)



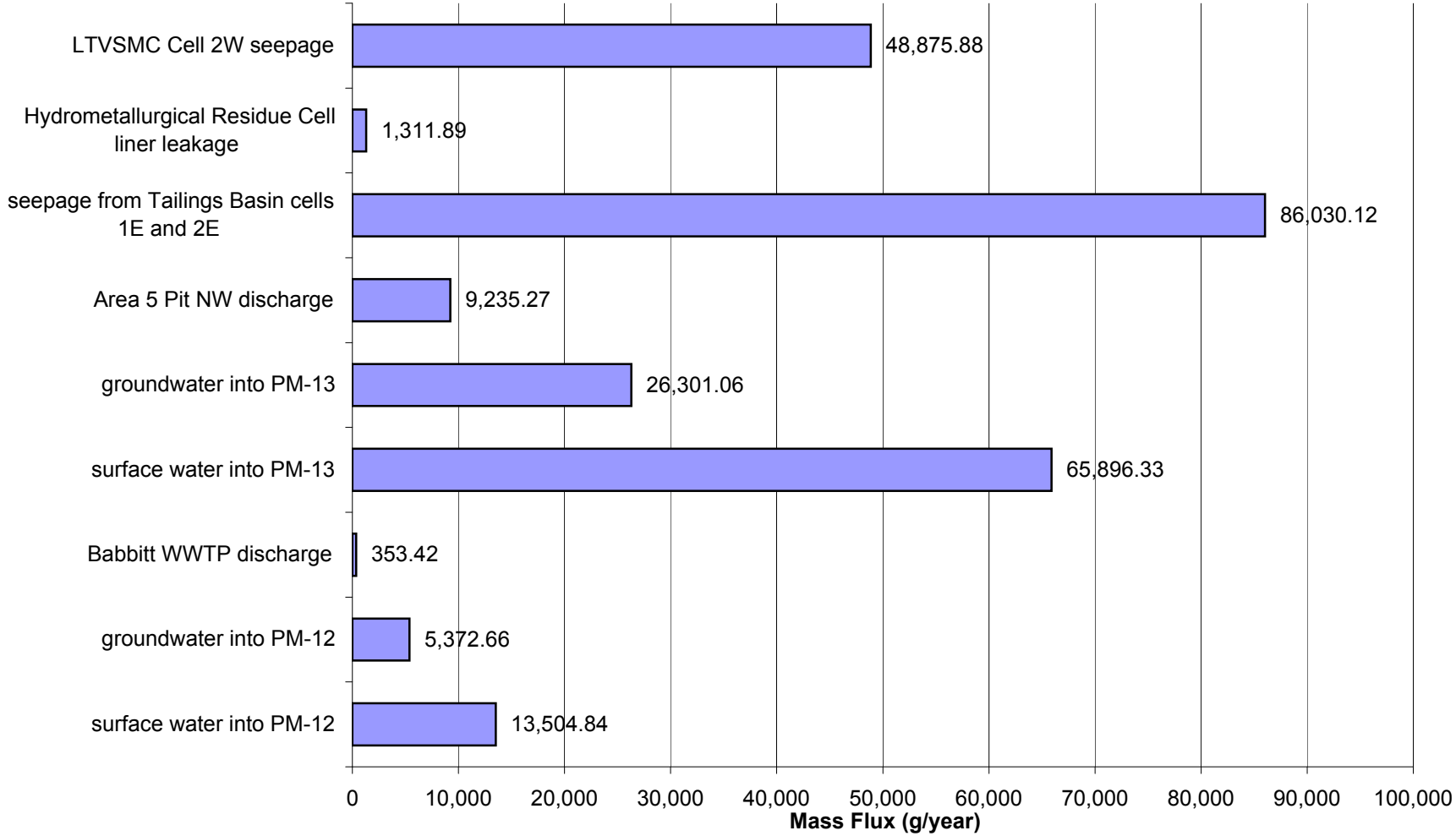
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for Low Flow for Nickel (Ni)



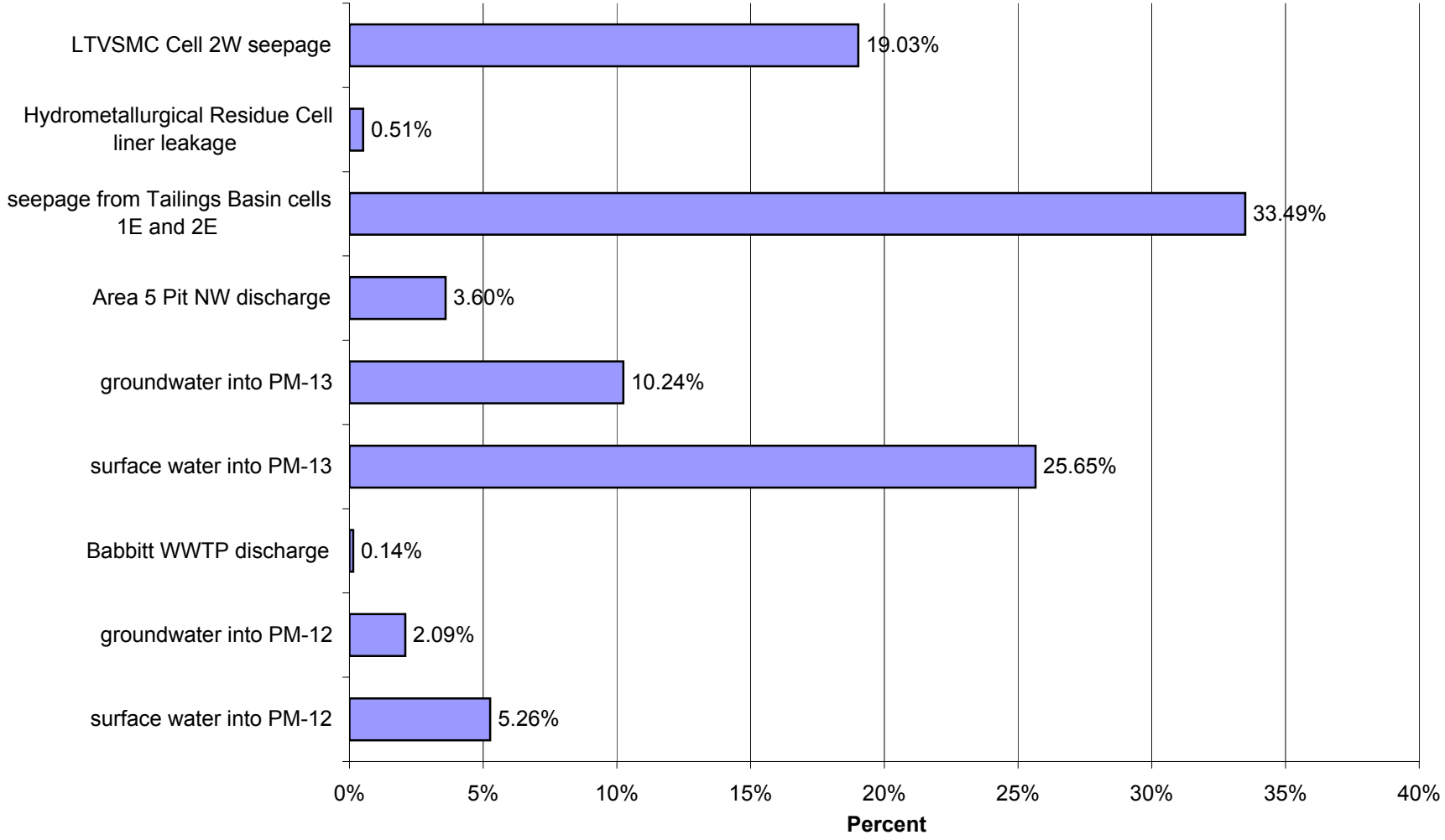
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 5 for Low Flow for Nickel (Ni)



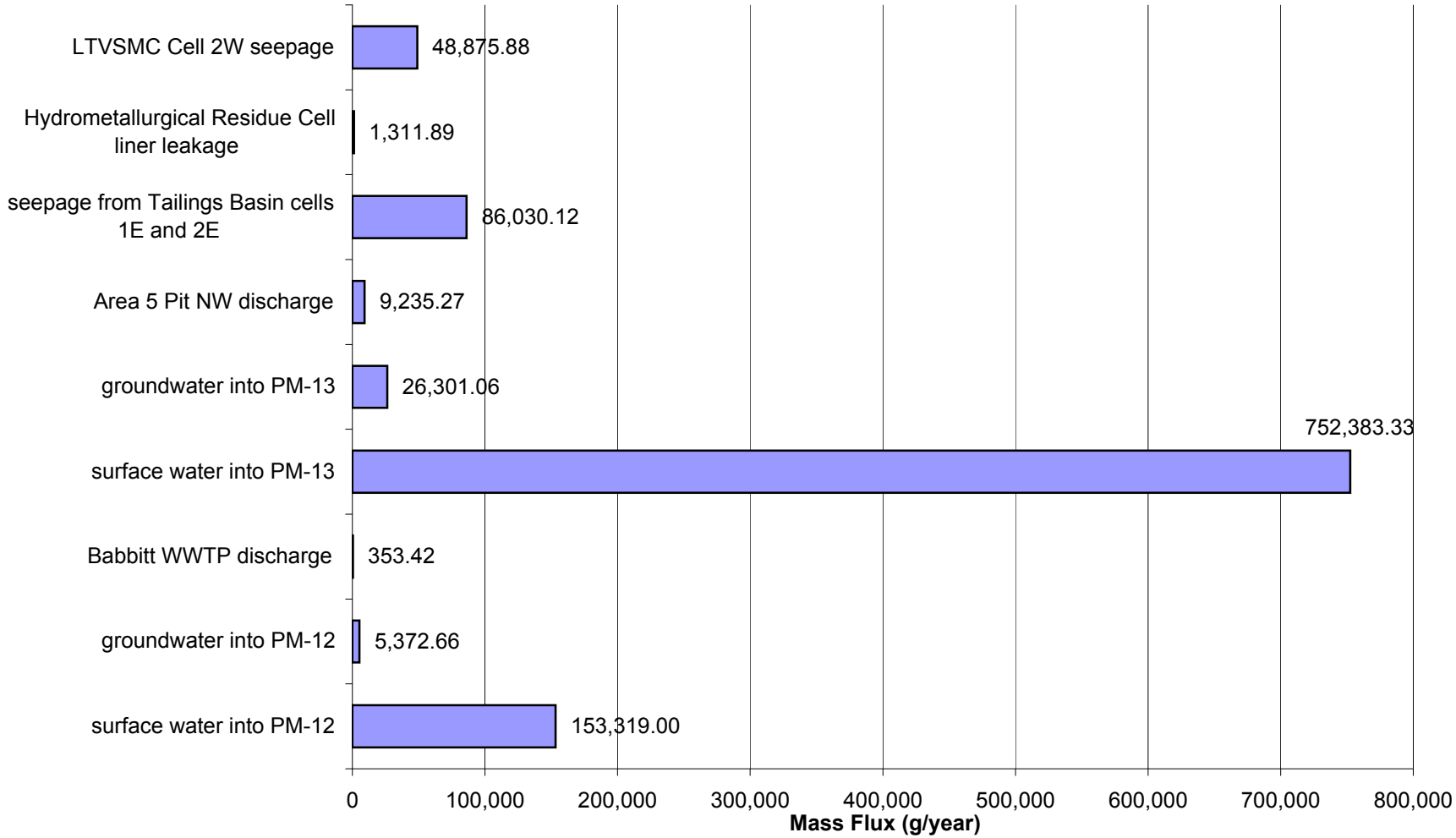
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for Average Flow for Nickel (Ni)



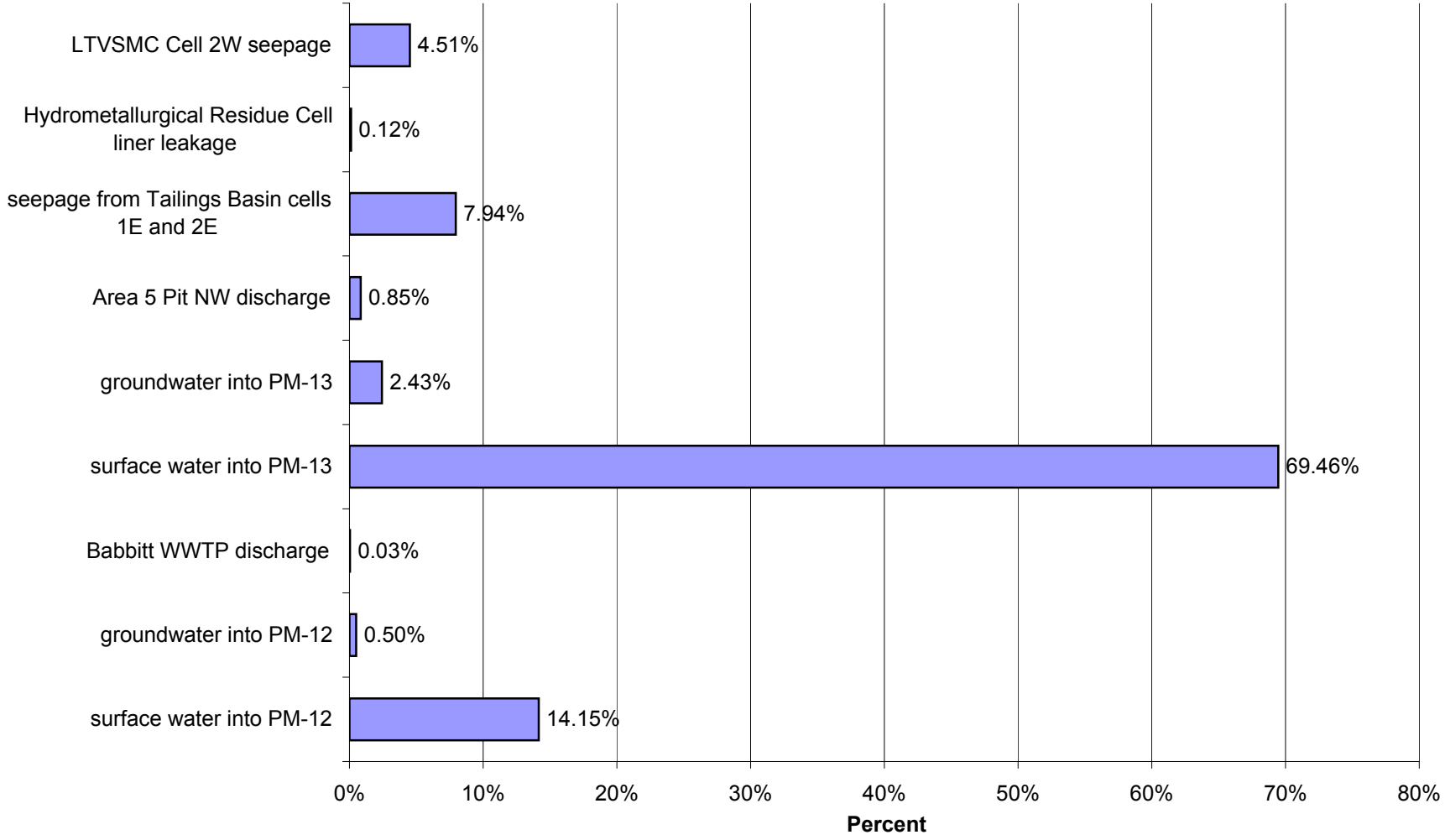
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 5 for Average Flow for Nickel (Ni)



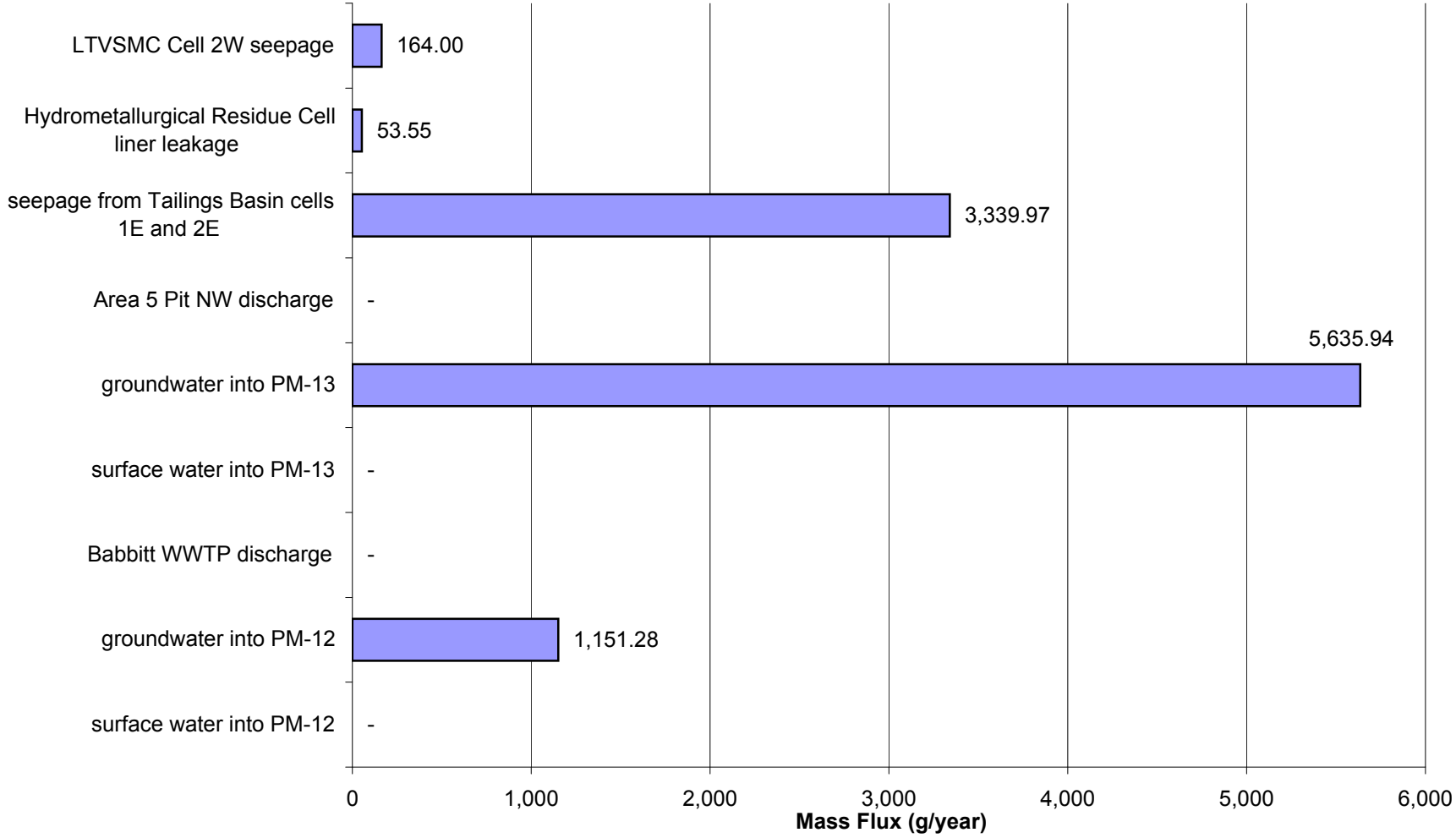
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for High Flow for Nickel (Ni)



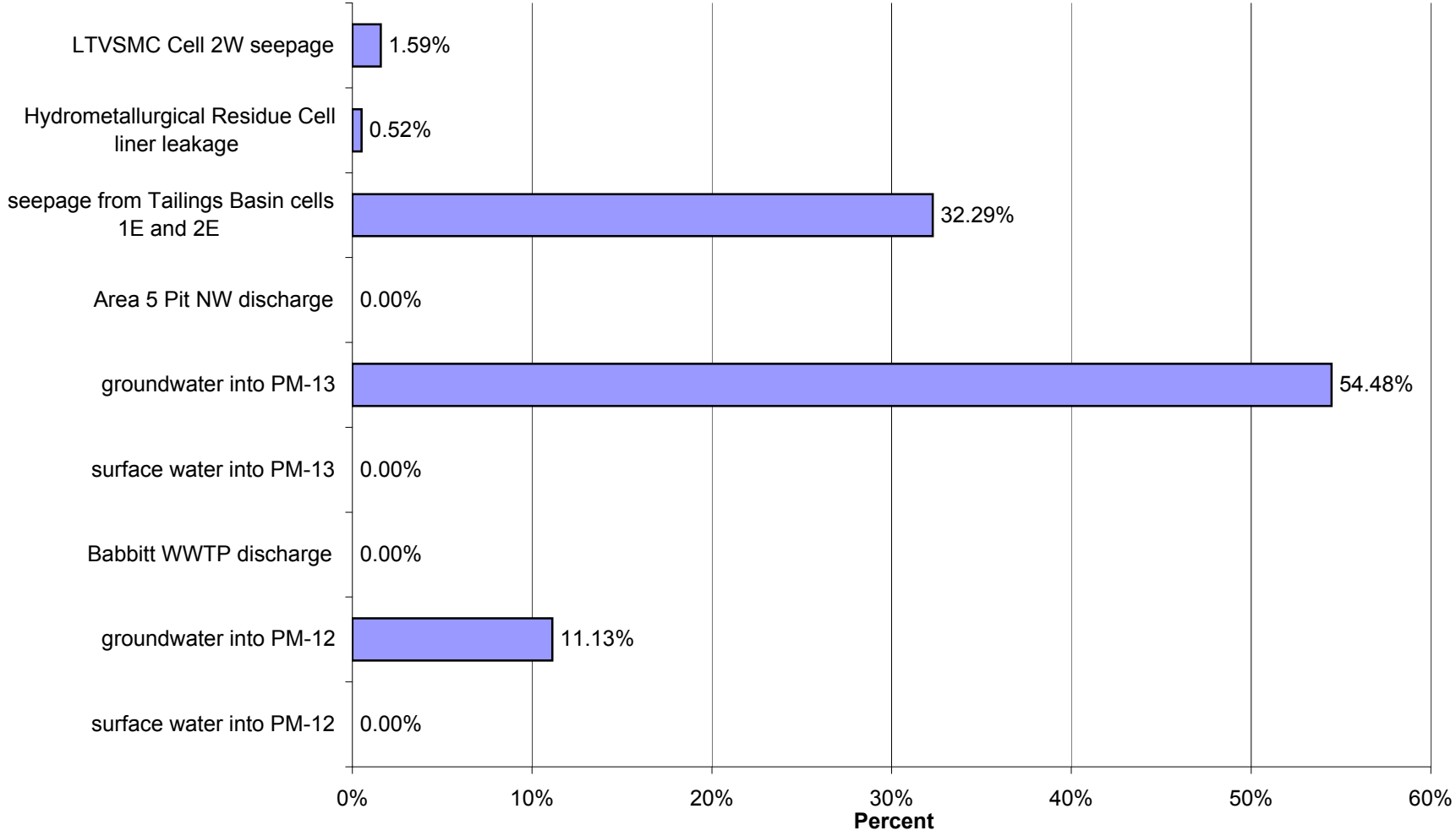
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 5 for High Flow for Nickel (Ni)



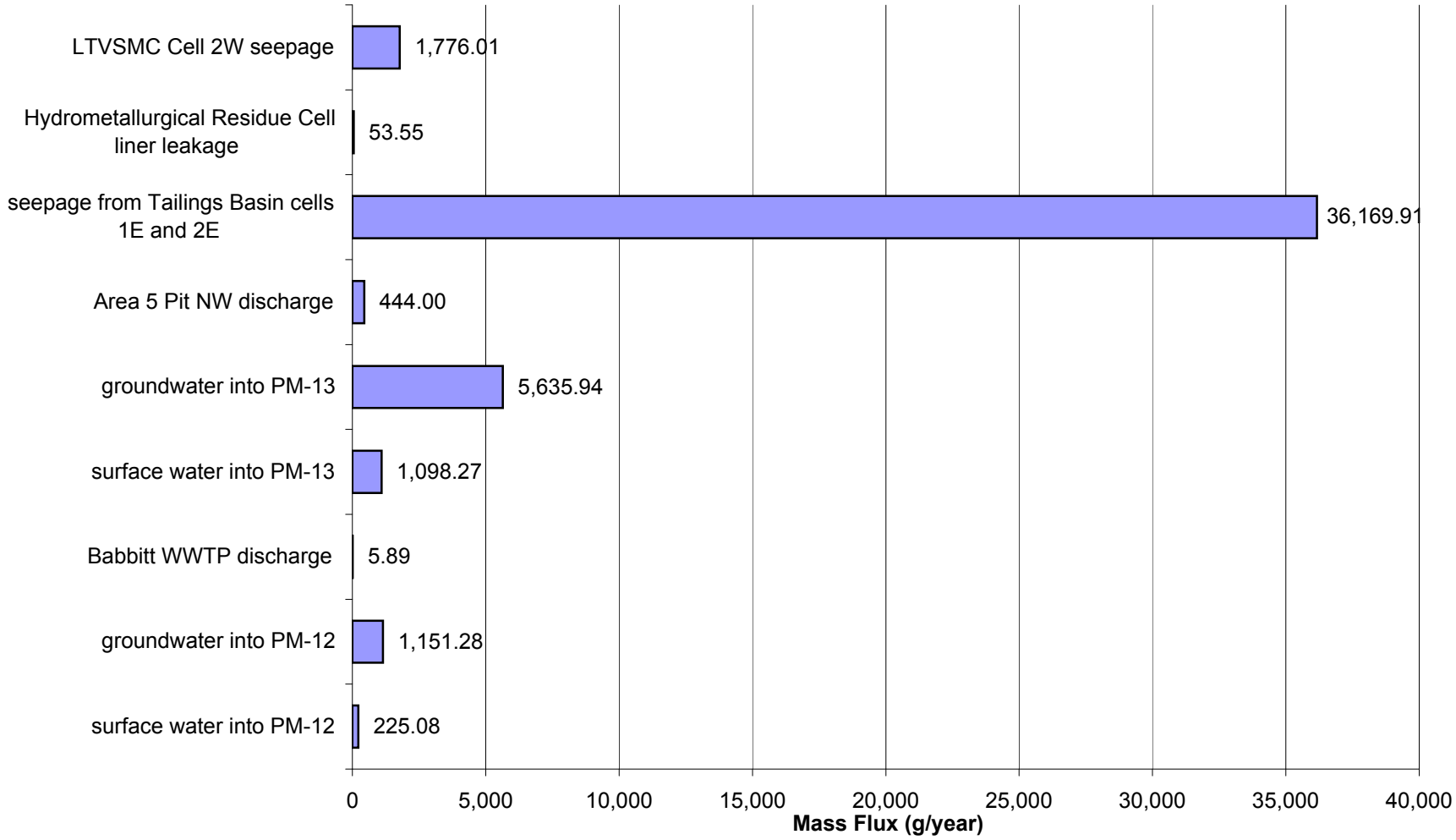
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for Low Flow for Antimony (Sb)



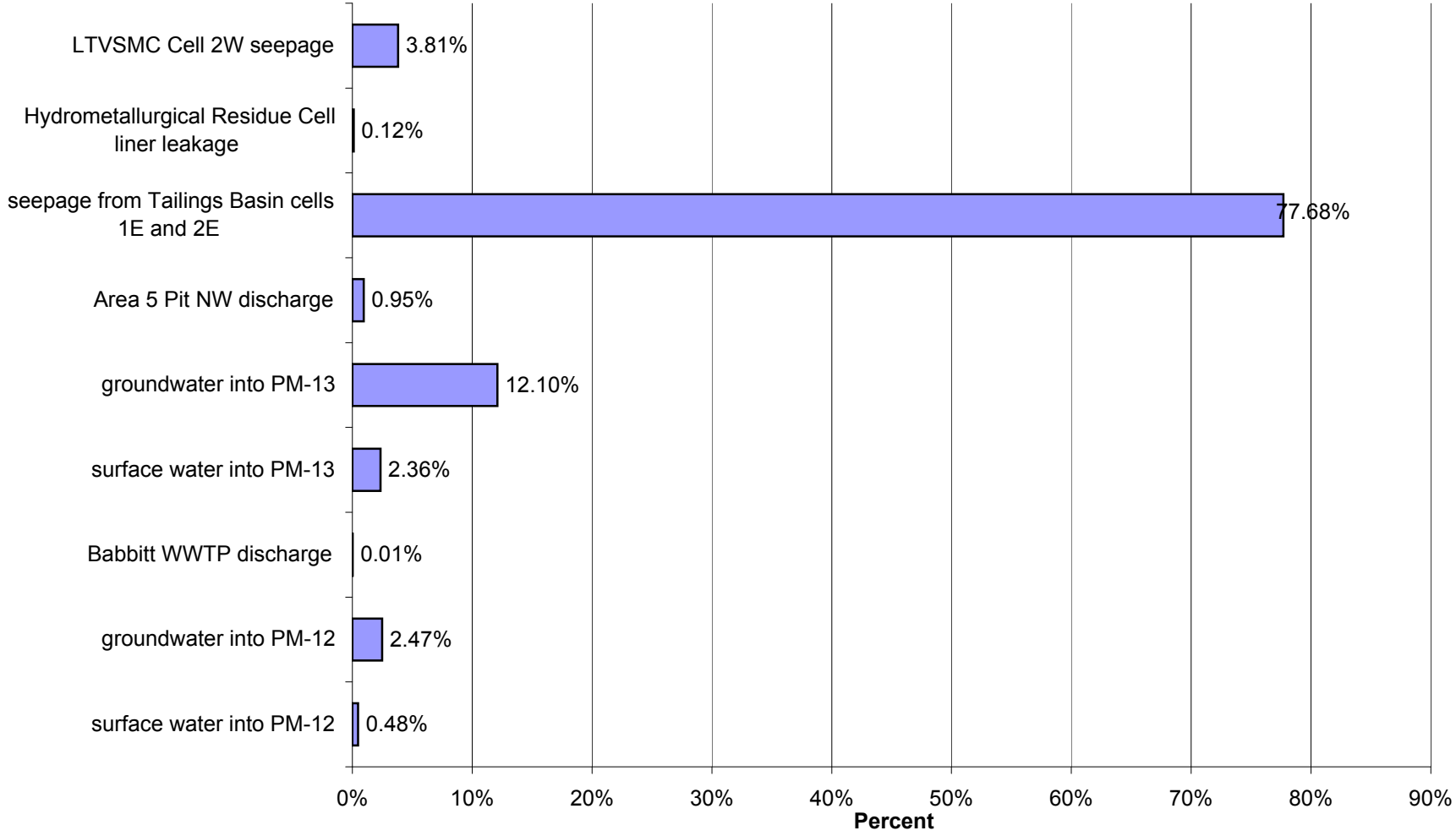
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 5 for Low Flow for Antimony (Sb)



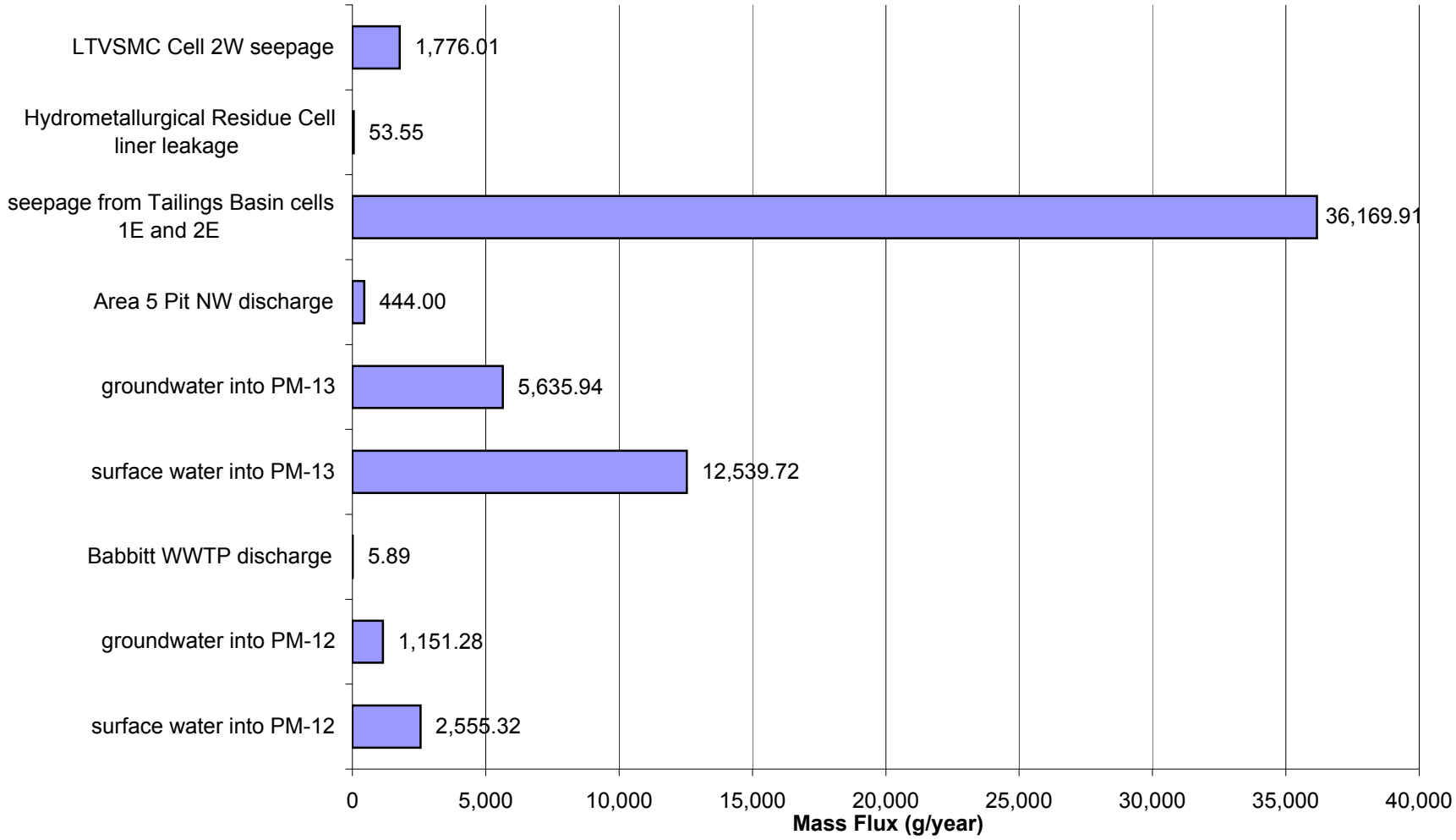
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for Average Flow for Antimony (Sb)



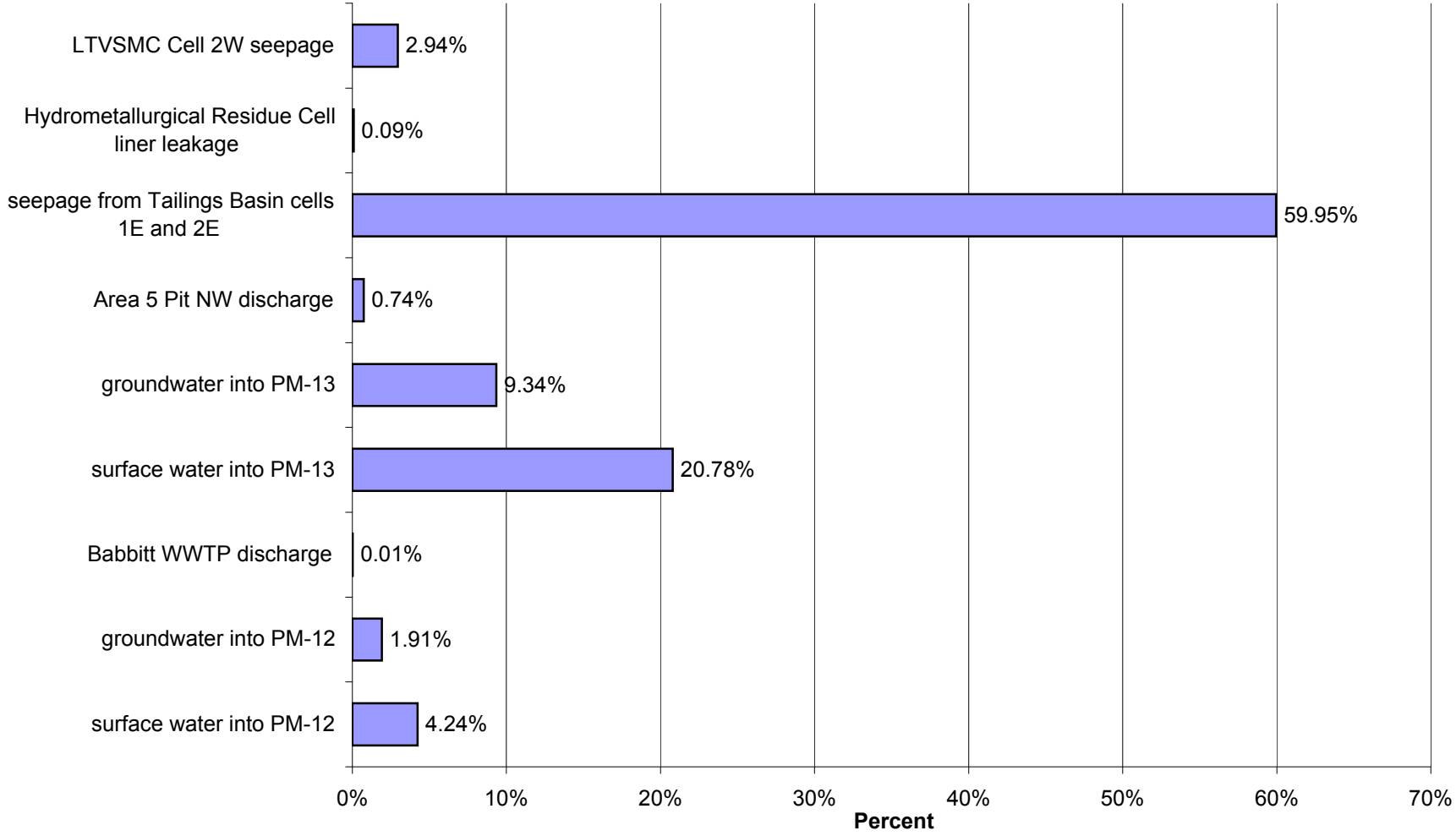
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 5 for Average Flow for Antimony (Sb)



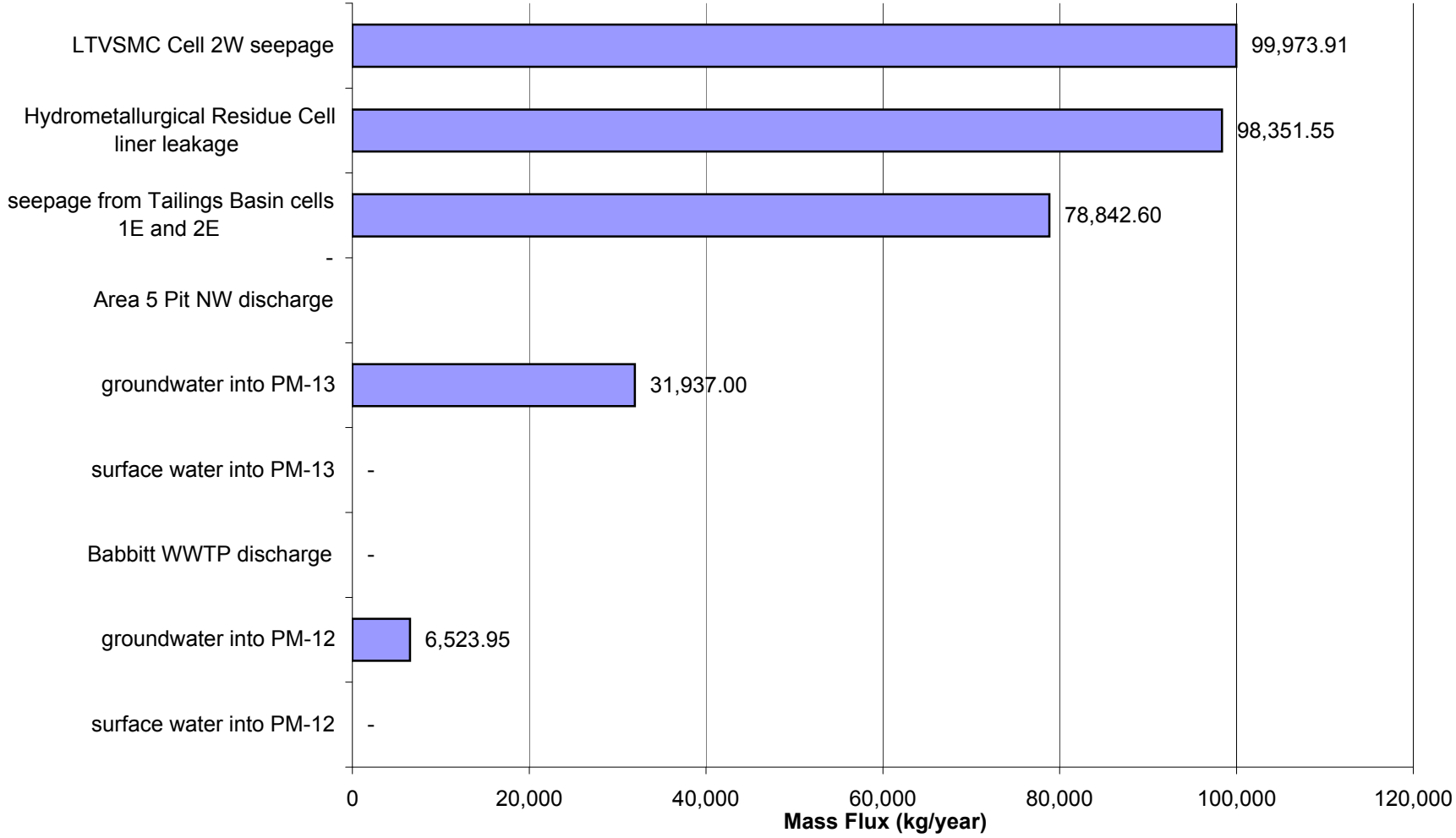
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 5 for High Flow for Antimony (Sb)



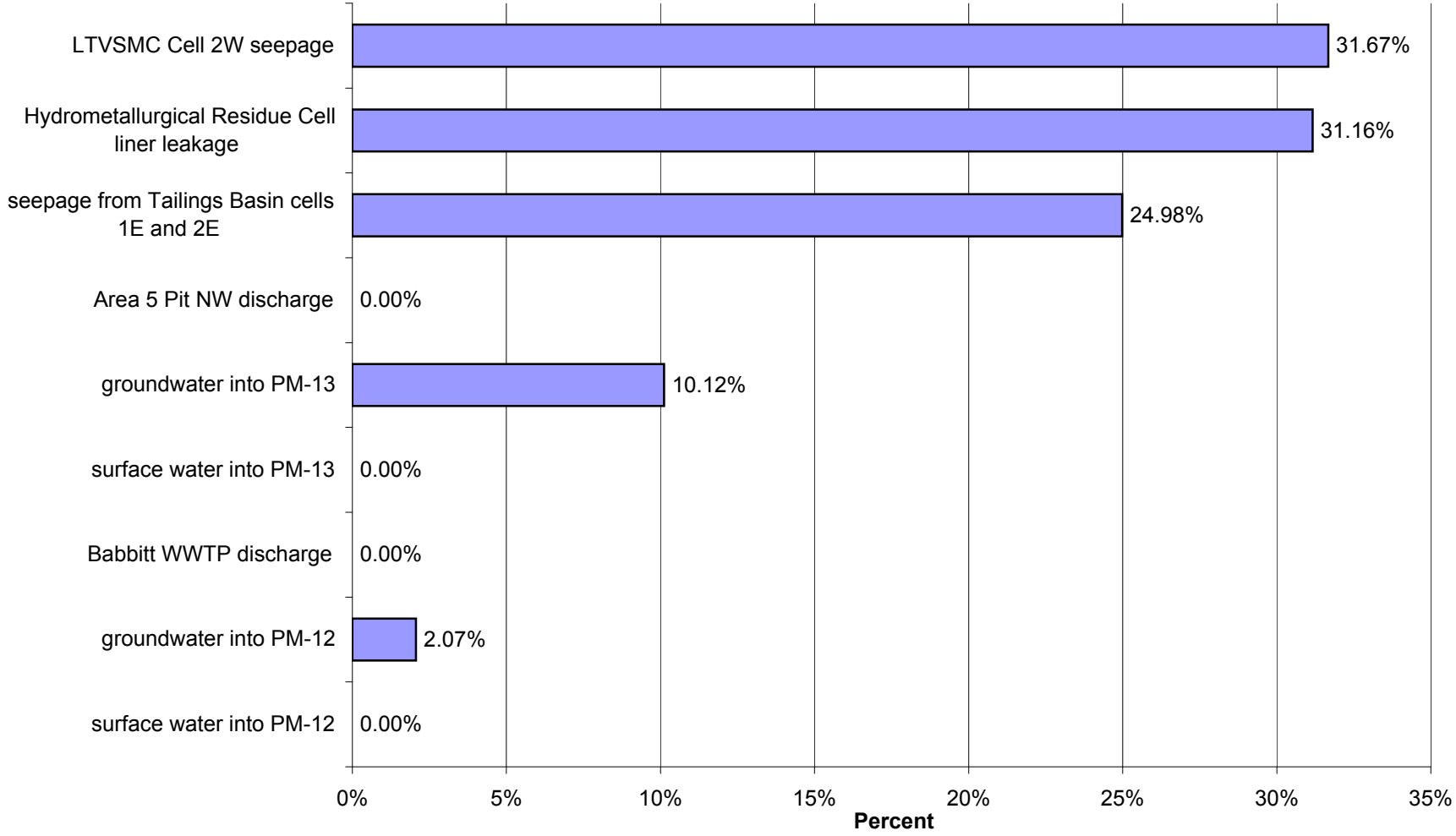
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 5 for High Flow for Antimony (Sb)



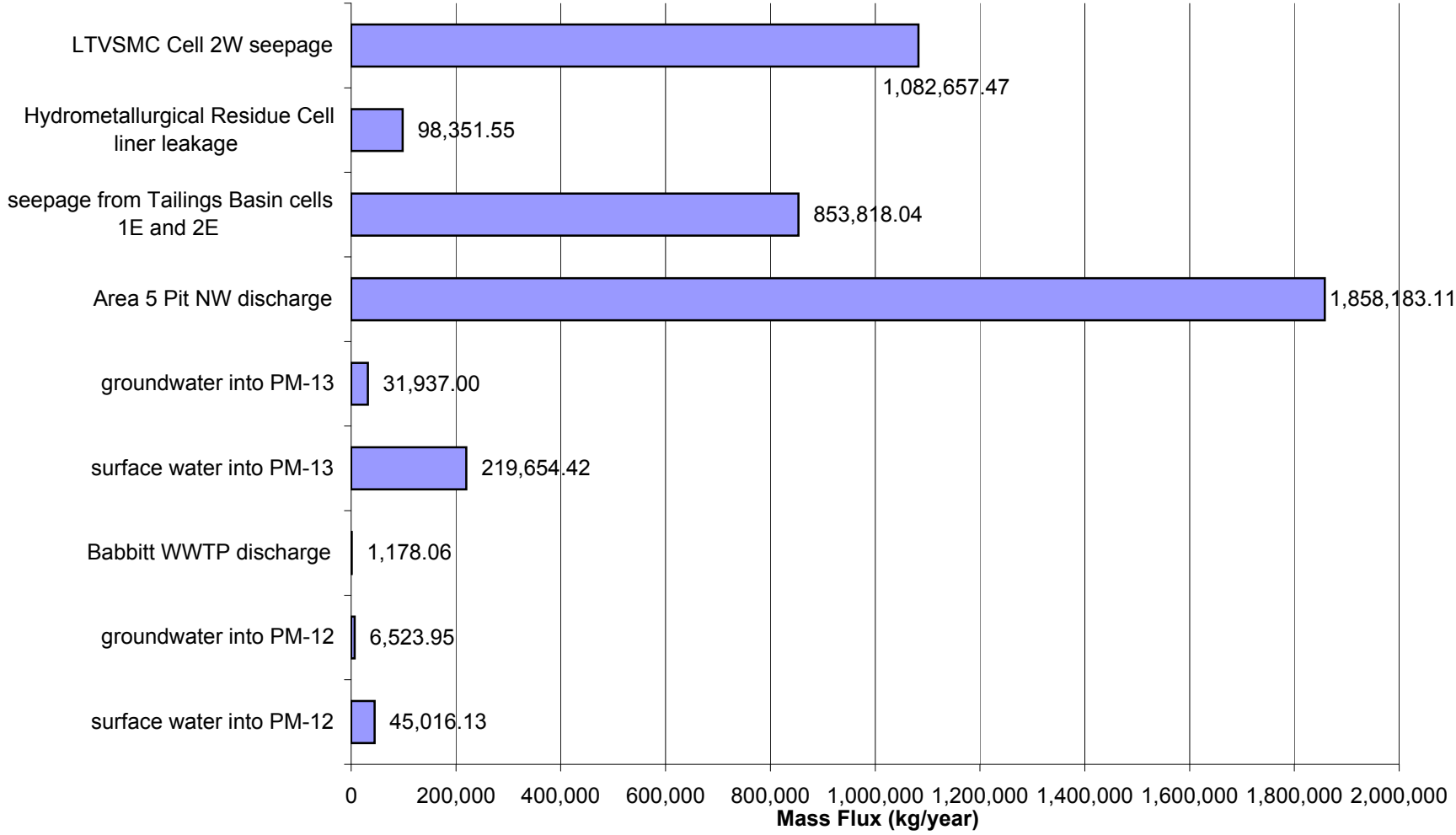
Geotechnical Mitigation: Mass Flux (kg/year) of Impacts at PM-13 in Year 5 for Low Flow for Sulfate (SO_4)



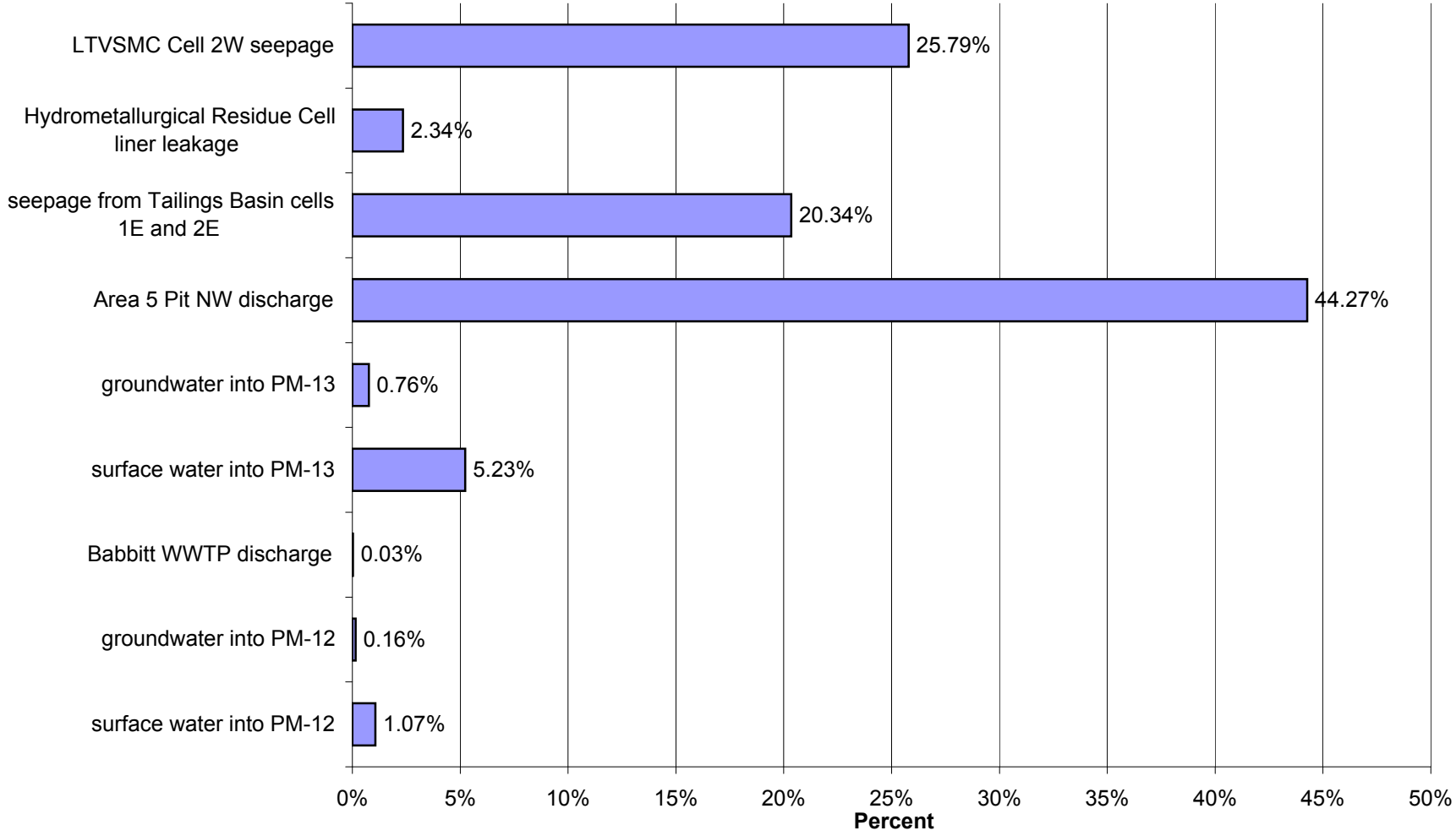
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 5 for Low Flow for Sulfate (SO_4)



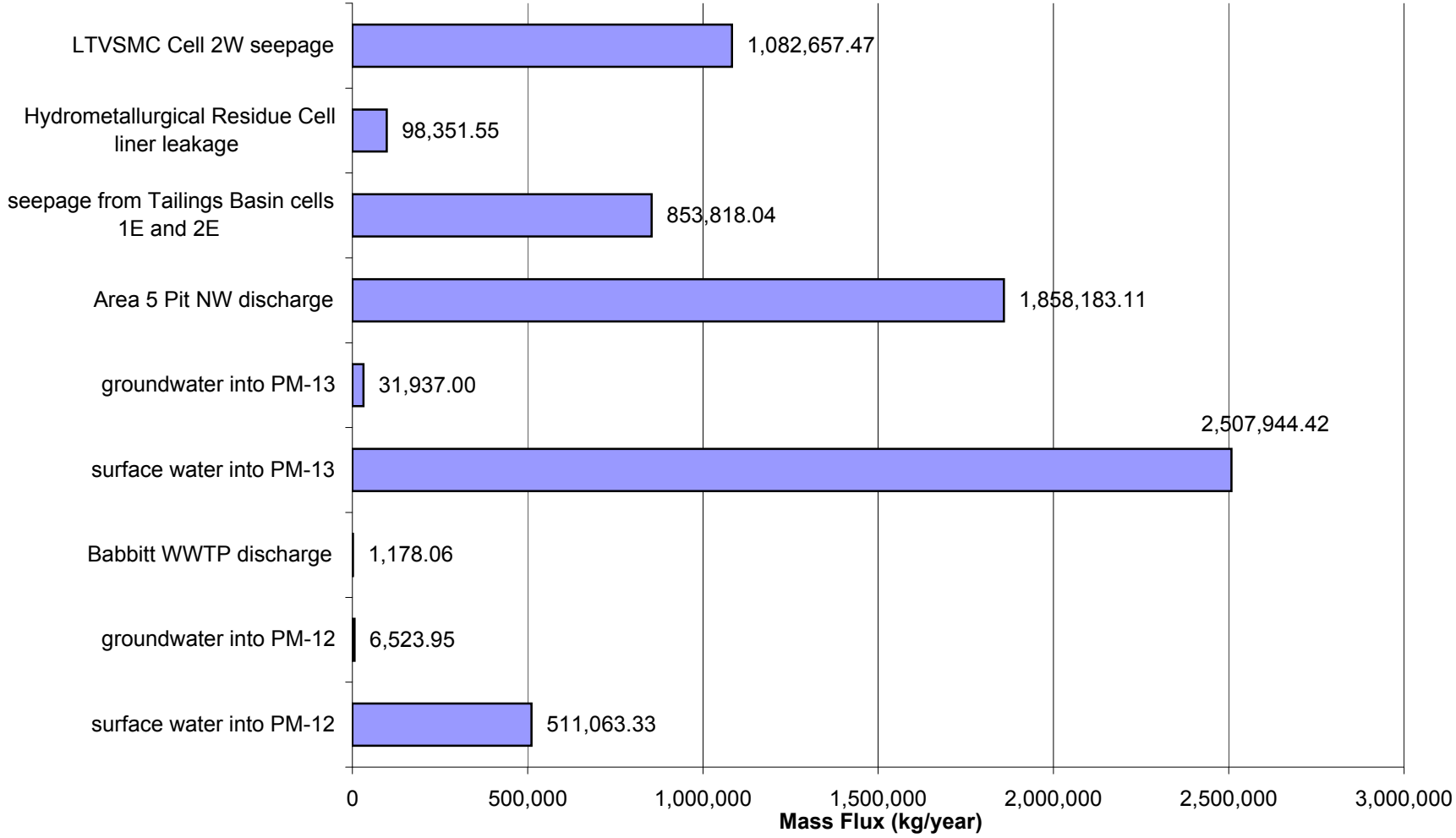
Geotechnical Mitigation: Mass Flux (kg/year) of Impacts at PM-13 in Year 5 for Average Flow for Sulfate (SO_4)



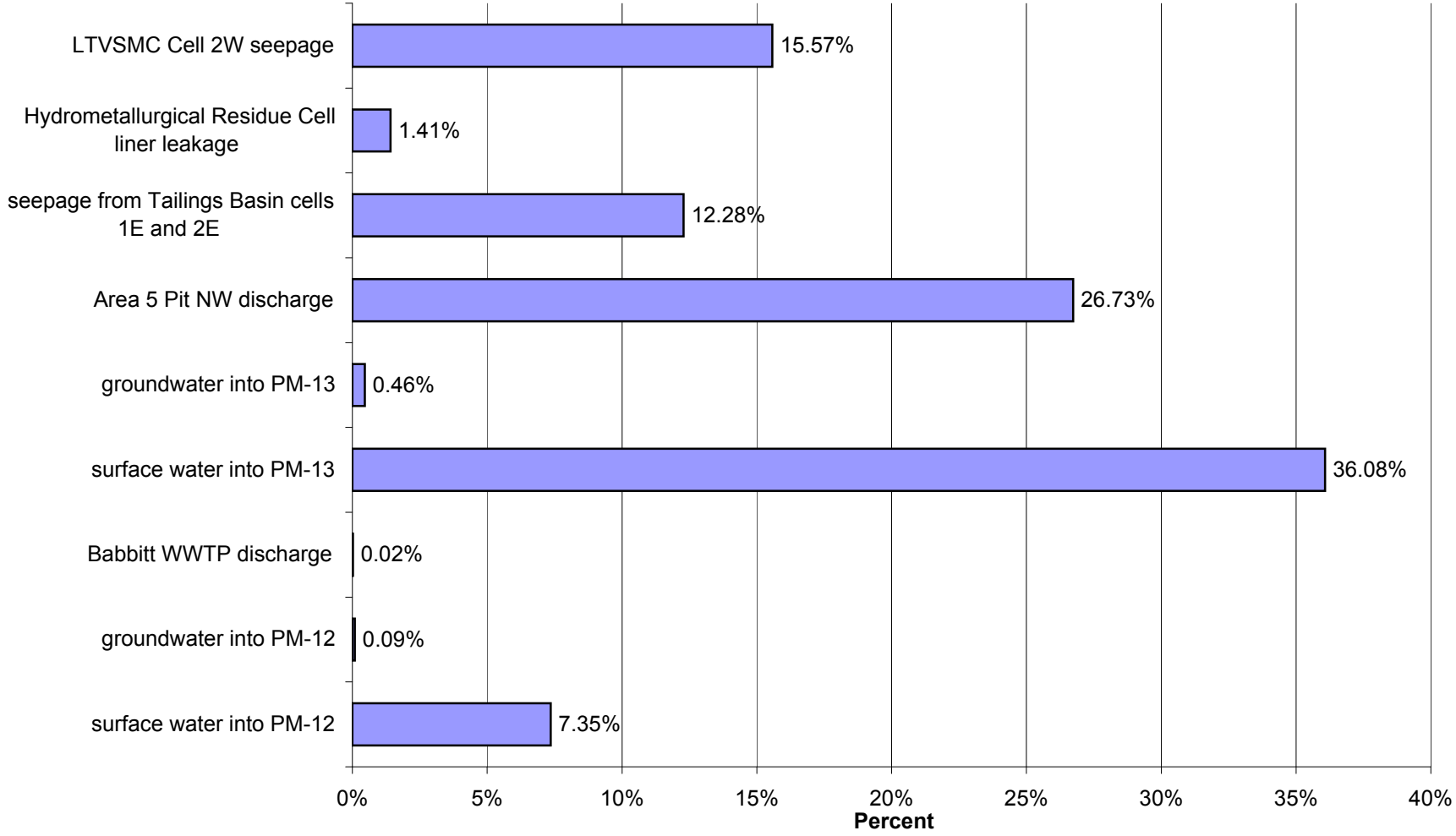
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 5 for Average Flow for Sulfate (SO_4)



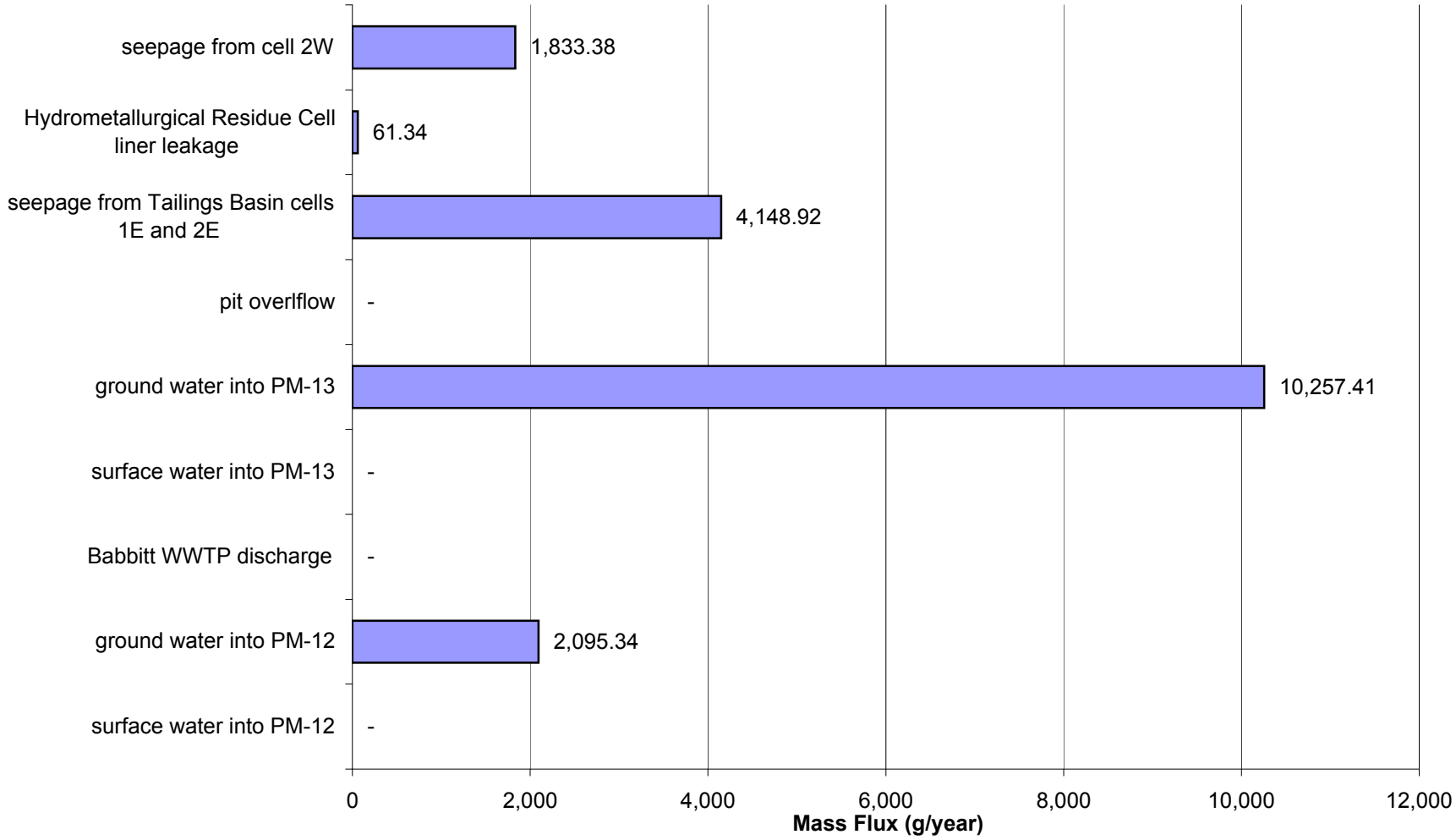
Geotechnical Mitigation: Mass Flux (kg/year) of Impacts at PM-13 in Year 5 for High Flow for Sulfate (SO_4)



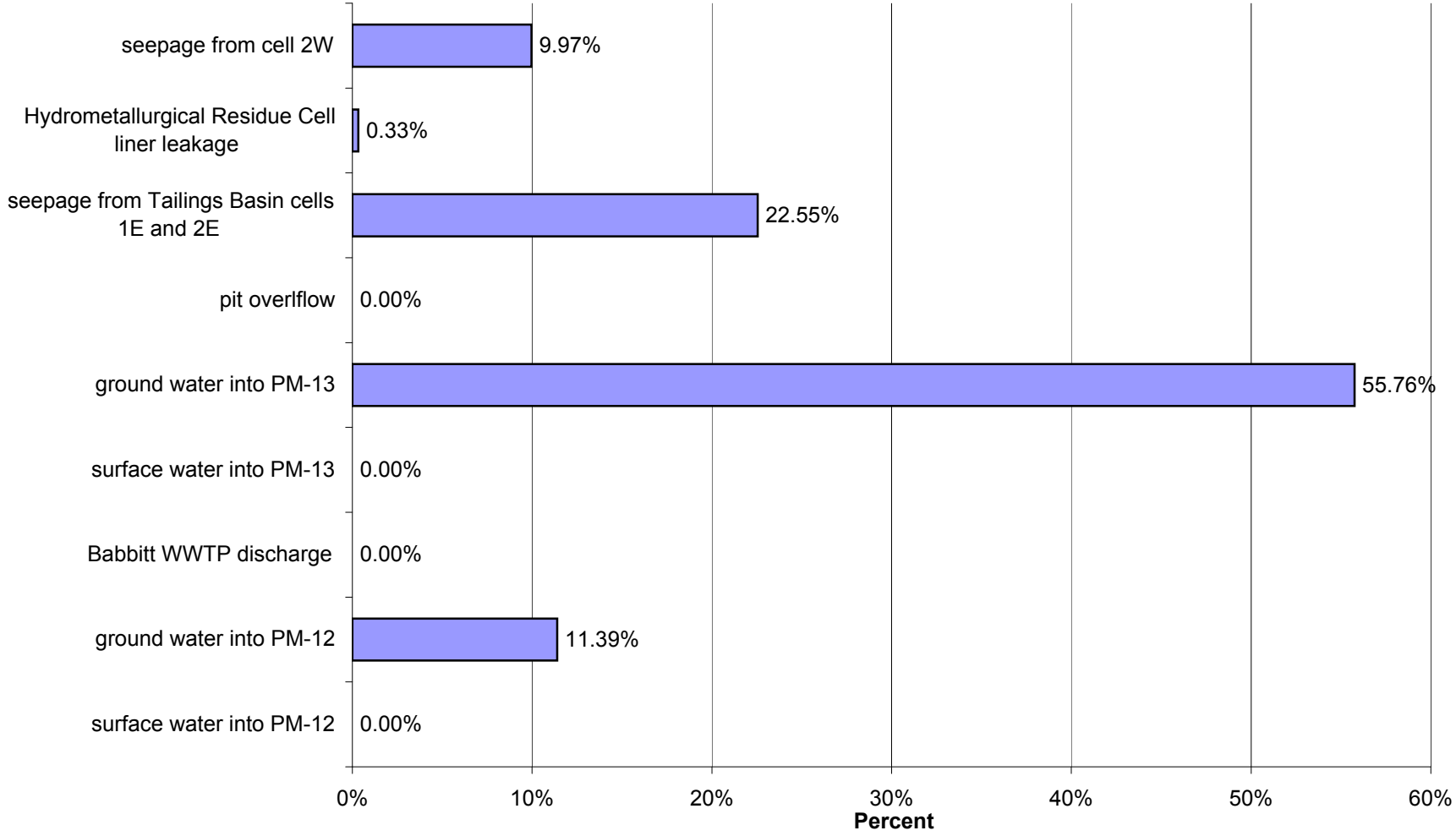
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 5 for High Flow for Sulfate (SO_4)



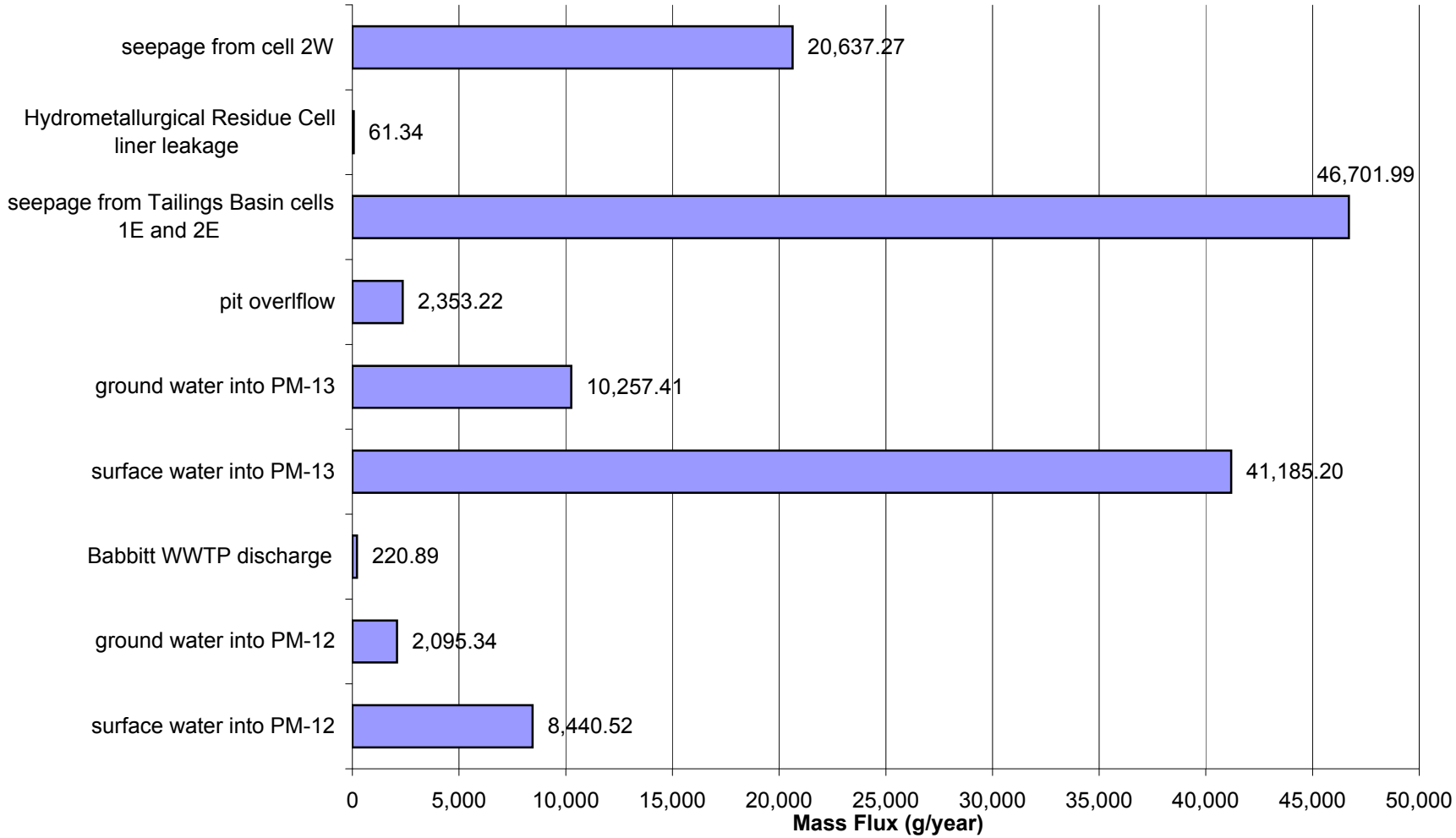
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 10 for Low Flow for Arsenic (As)



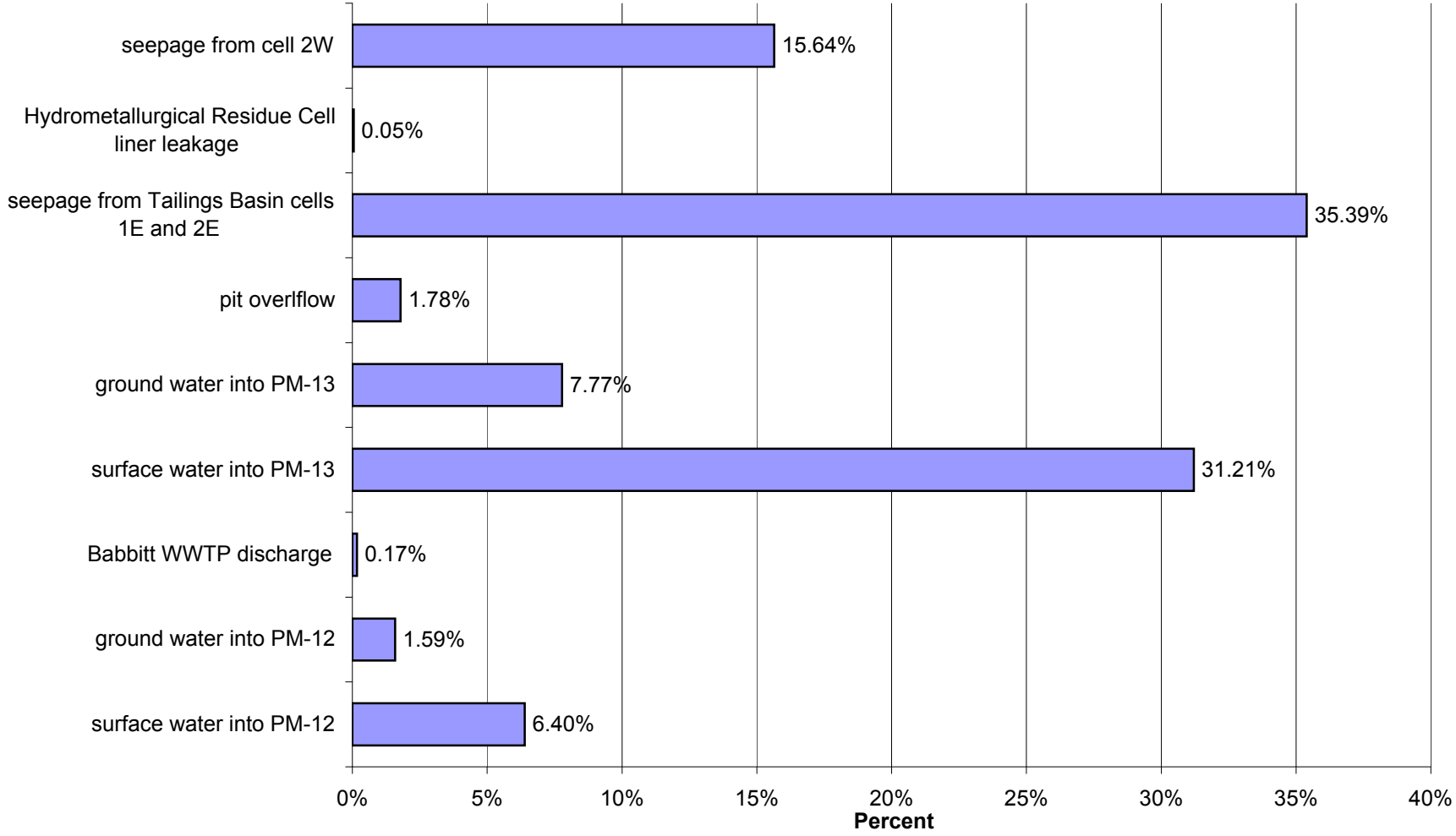
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 10 for Low Flow for Arsenic (As)



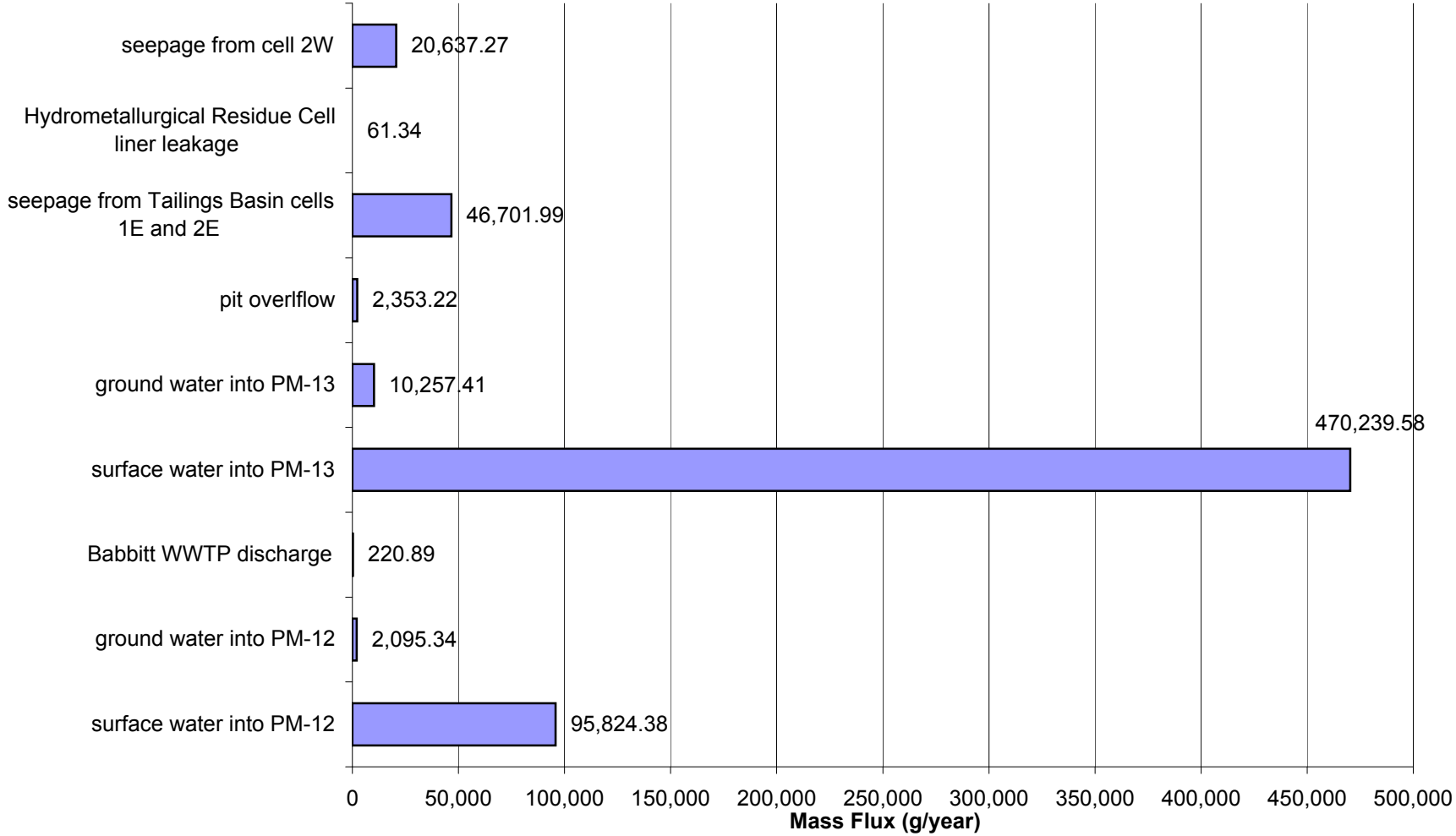
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 10 for Average Flow for Arsenic (As)



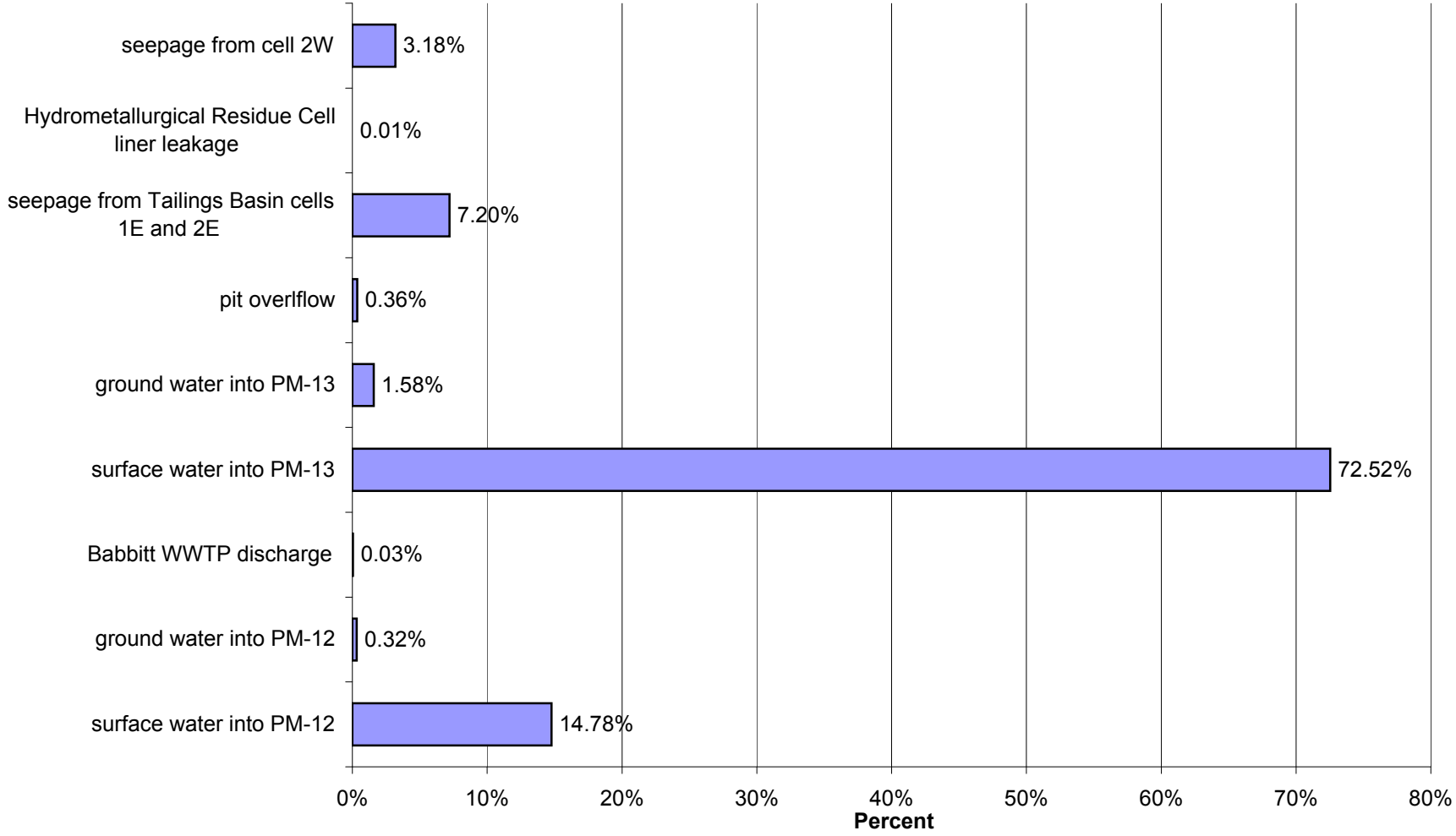
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 10 for Average Flow for Arsenic (As)



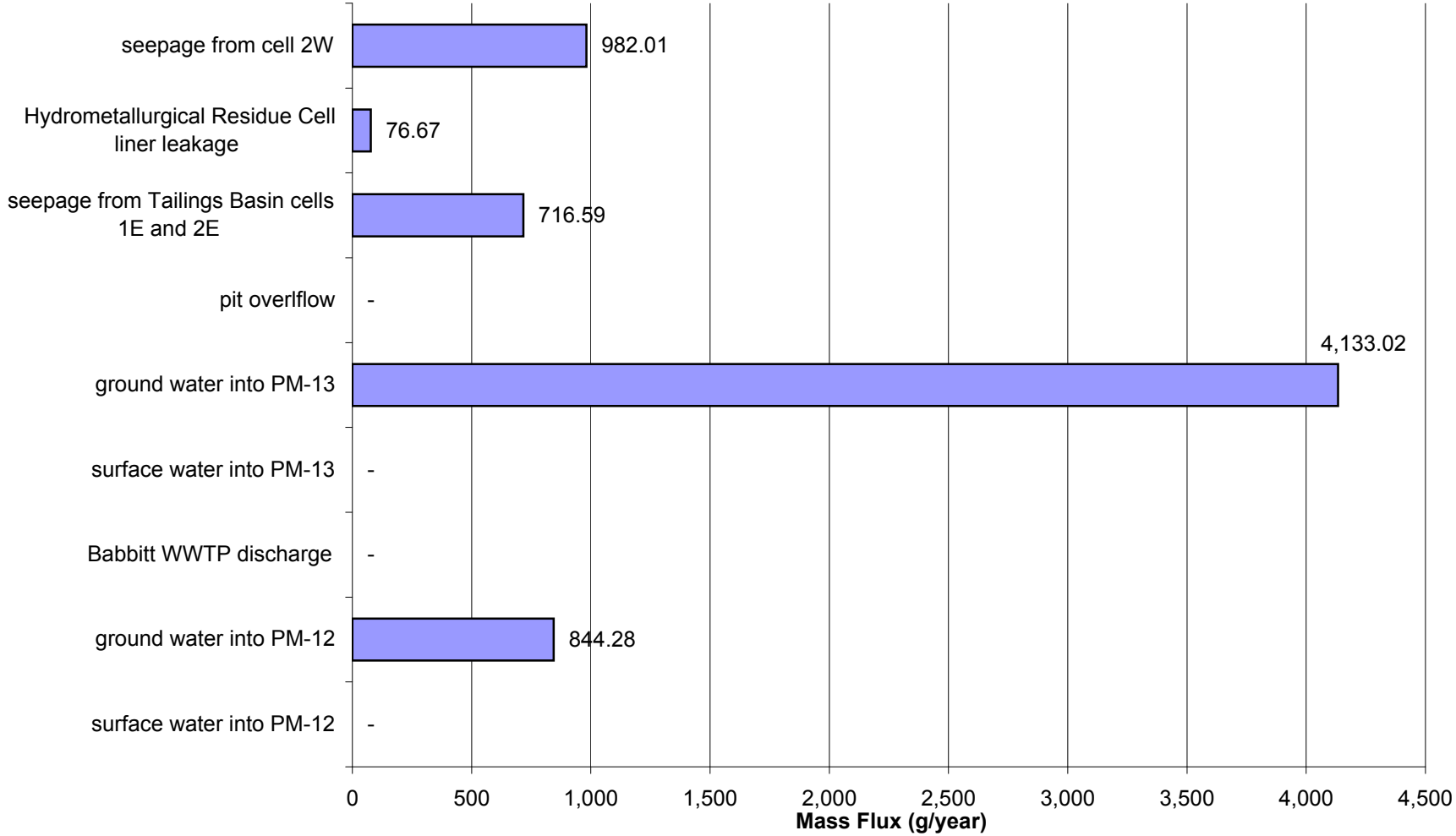
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 10 for High Flow for Arsenic (As)



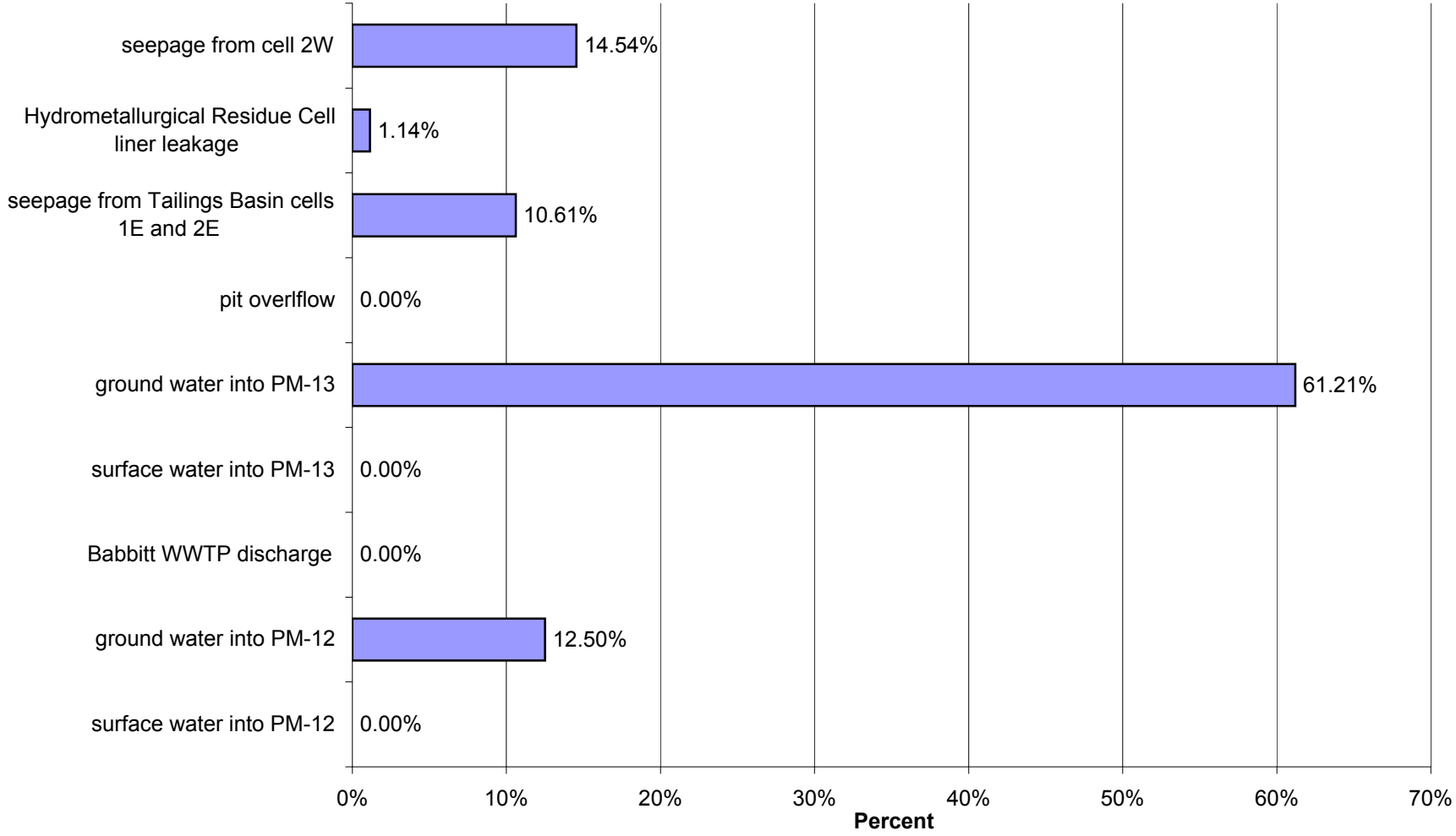
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 10 for High Flow for Arsenic (As)



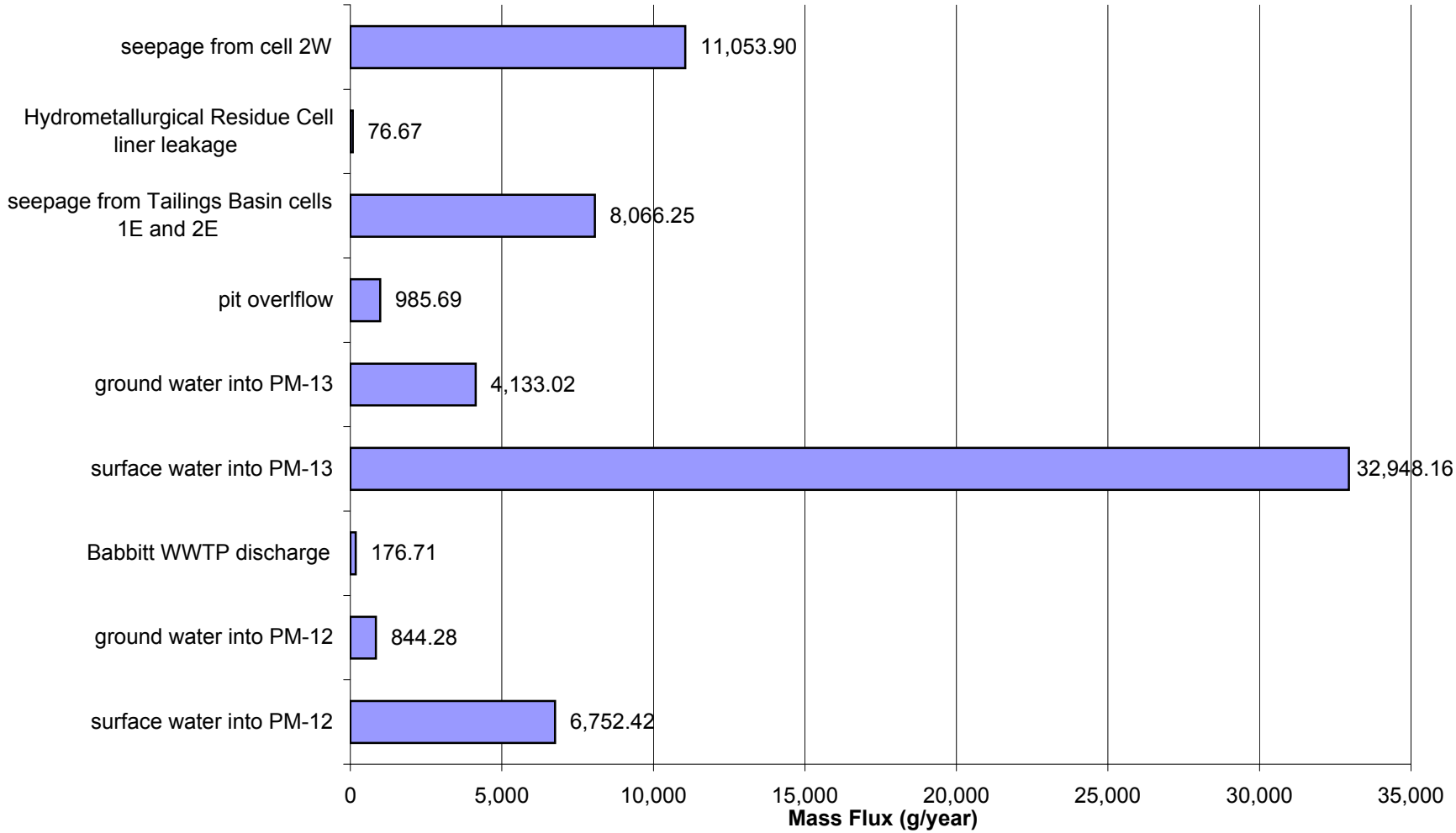
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 10 for Low Flow for Cobalt (Co)



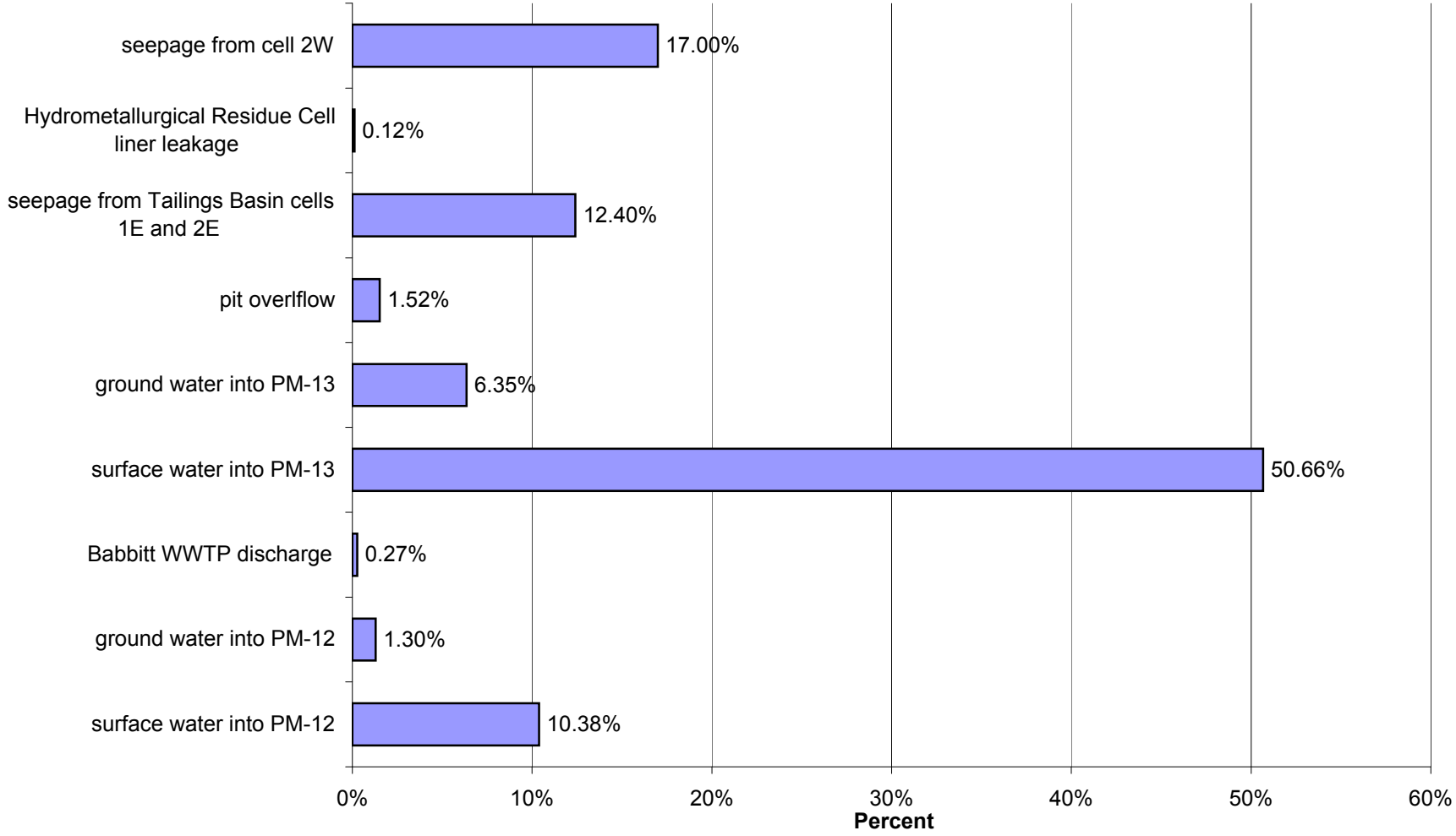
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 10 for Low Flow for Cobalt (Co)



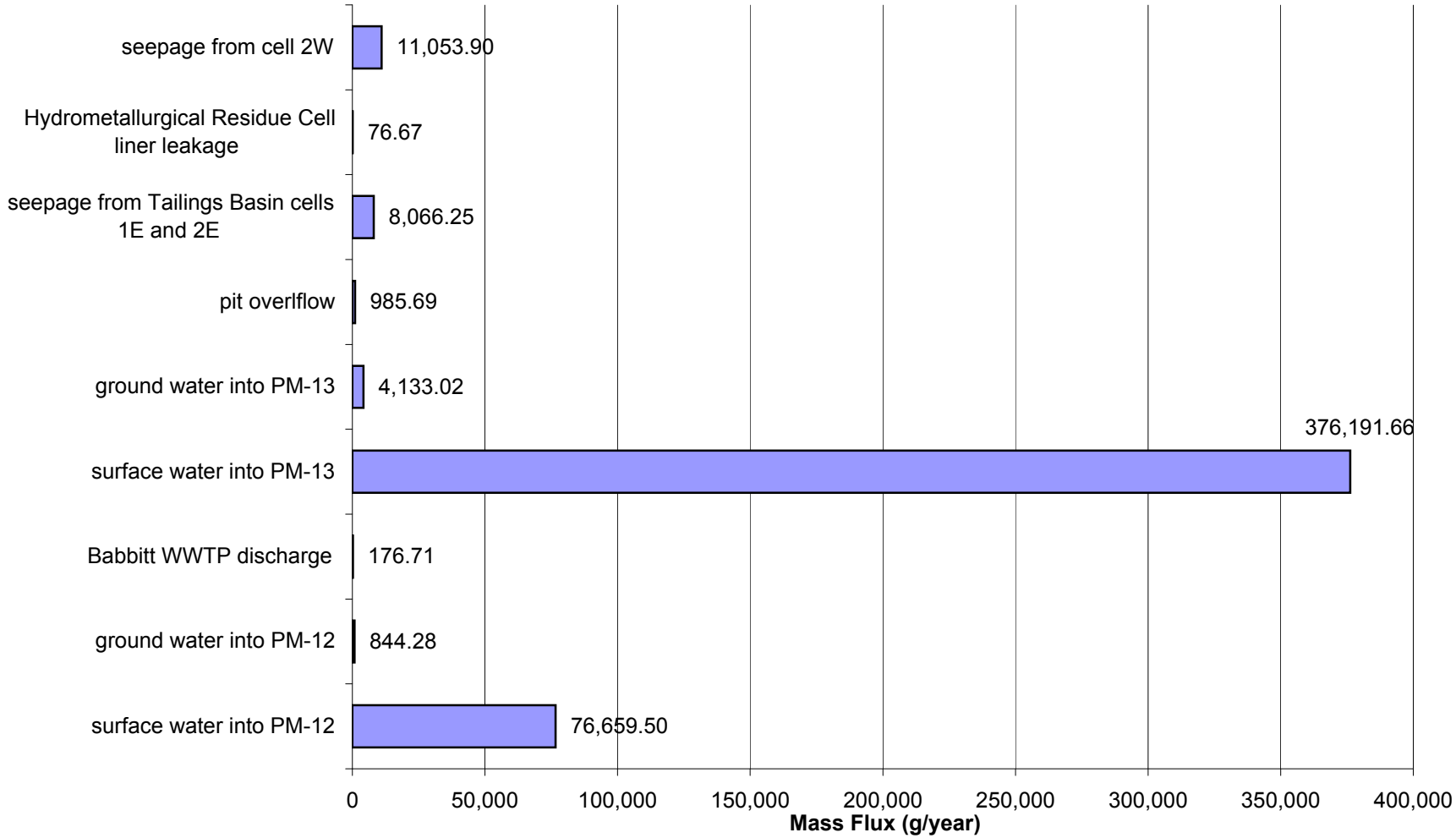
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 10 for Average Flow for Cobalt (Co)



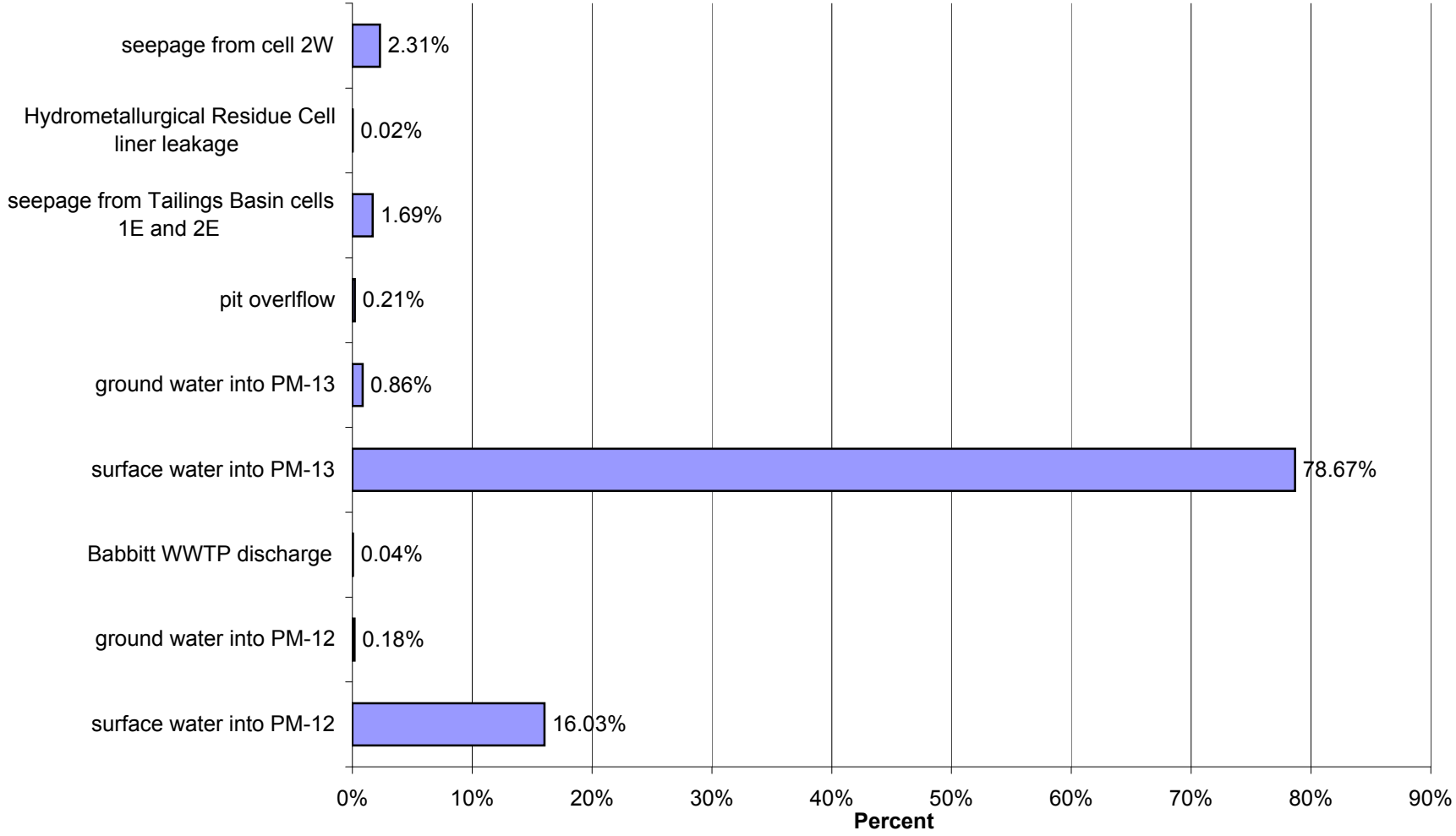
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 10 for Average Flow for Cobalt (Co)



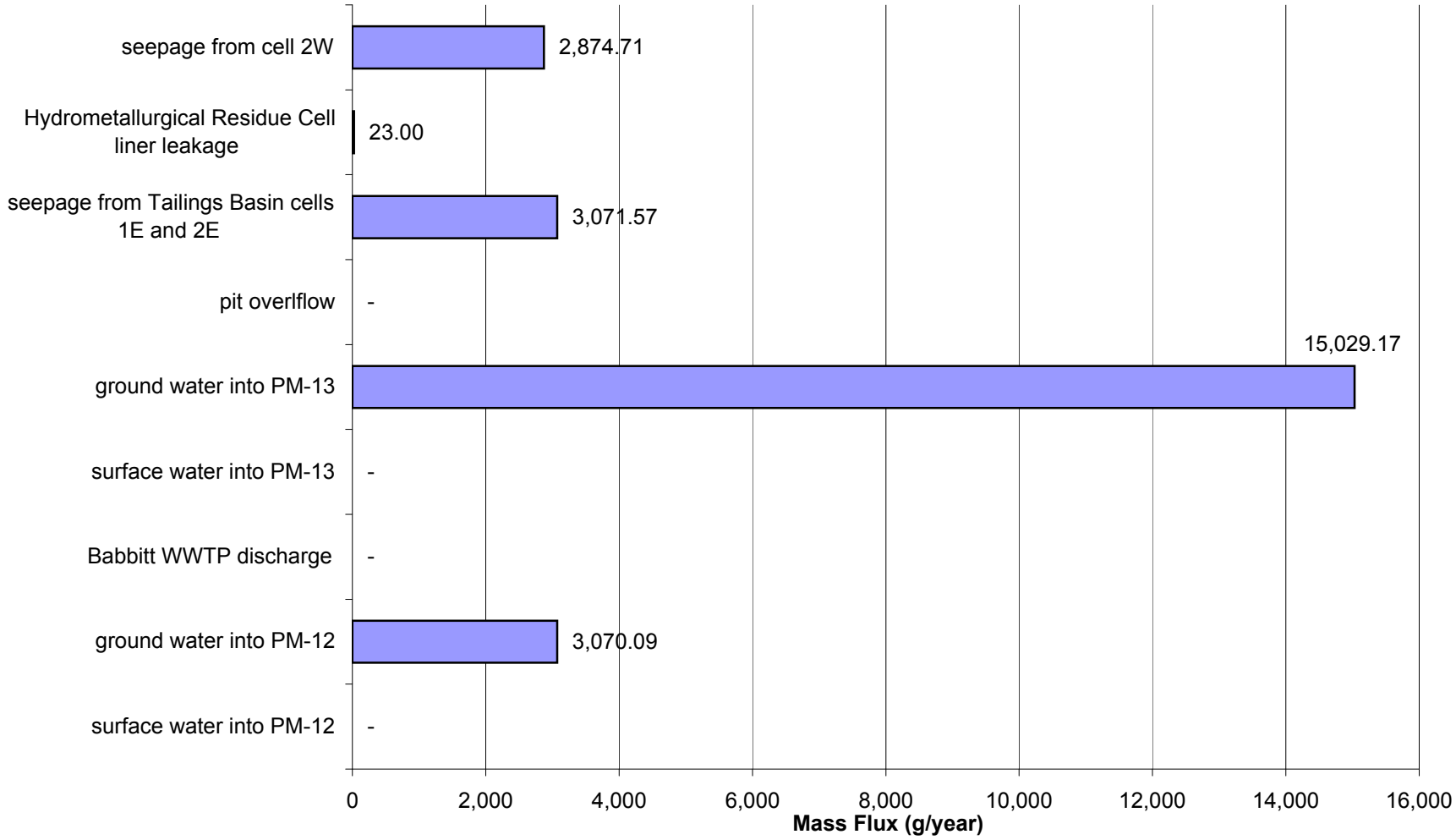
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 10 for High Flow for Cobalt (Co)



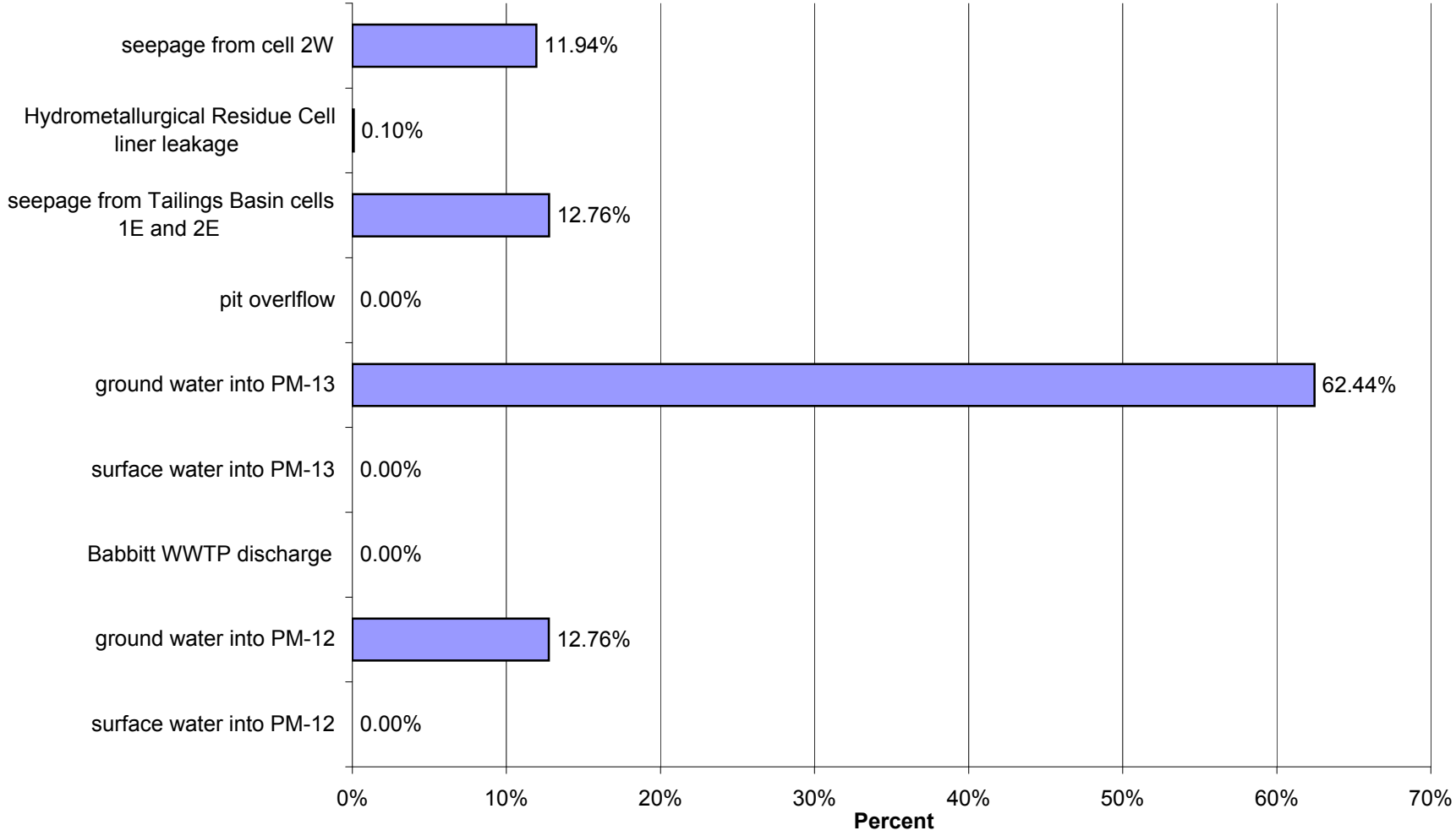
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 10 for High Flow for Cobalt (Co)



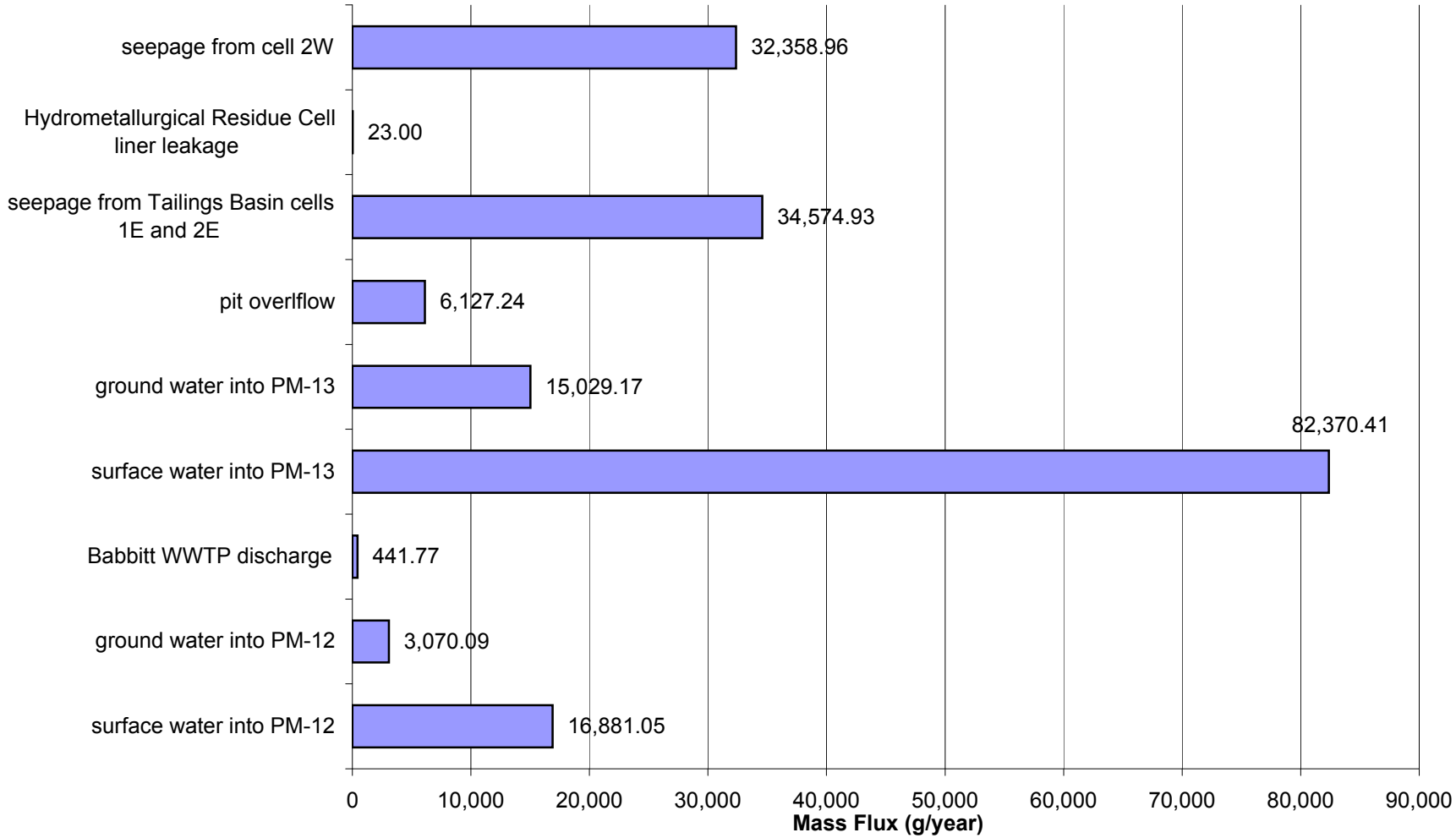
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 10 for Low Flow for Copper (Cu)



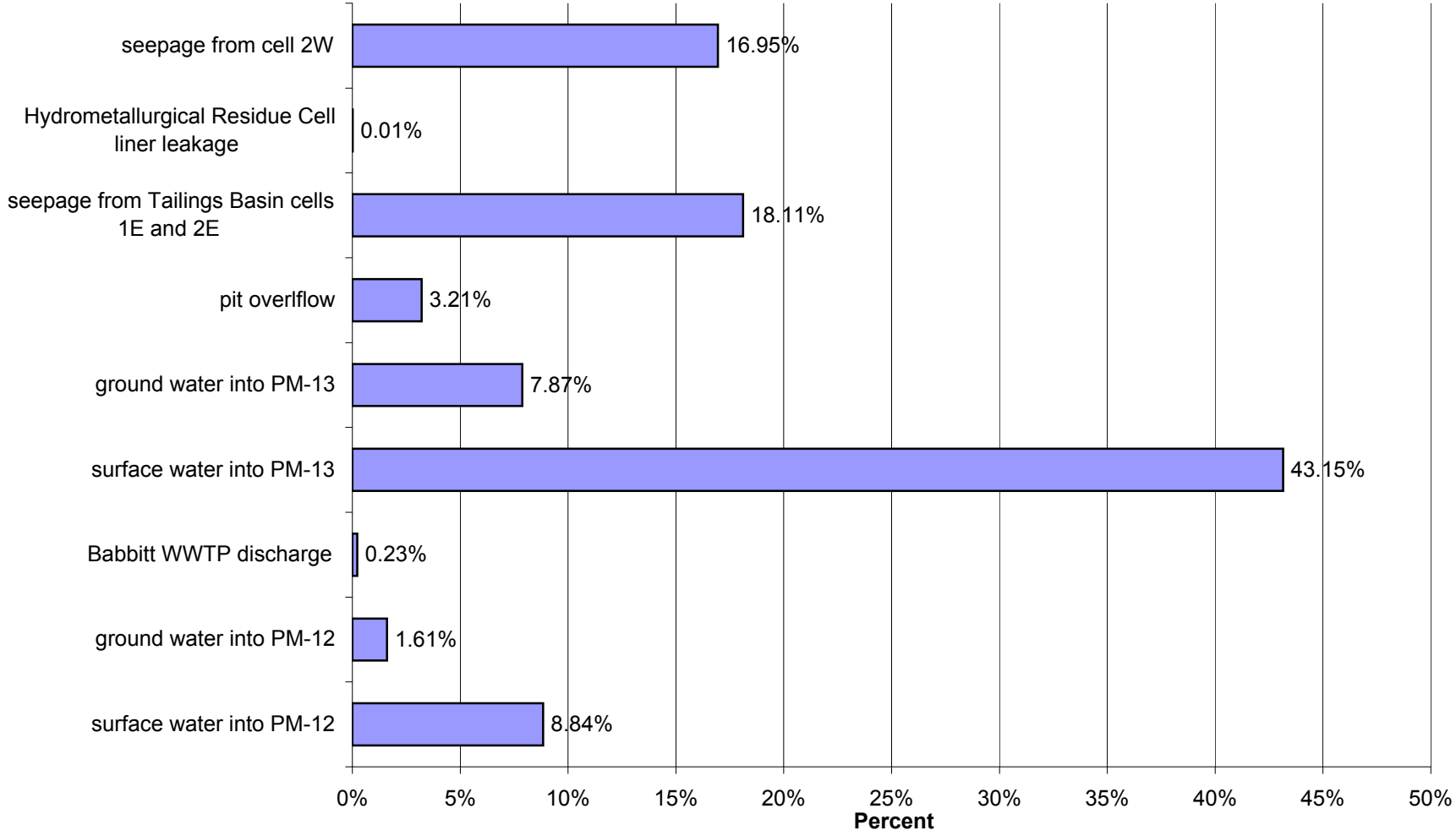
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 10 for Low Flow for Copper (Cu)



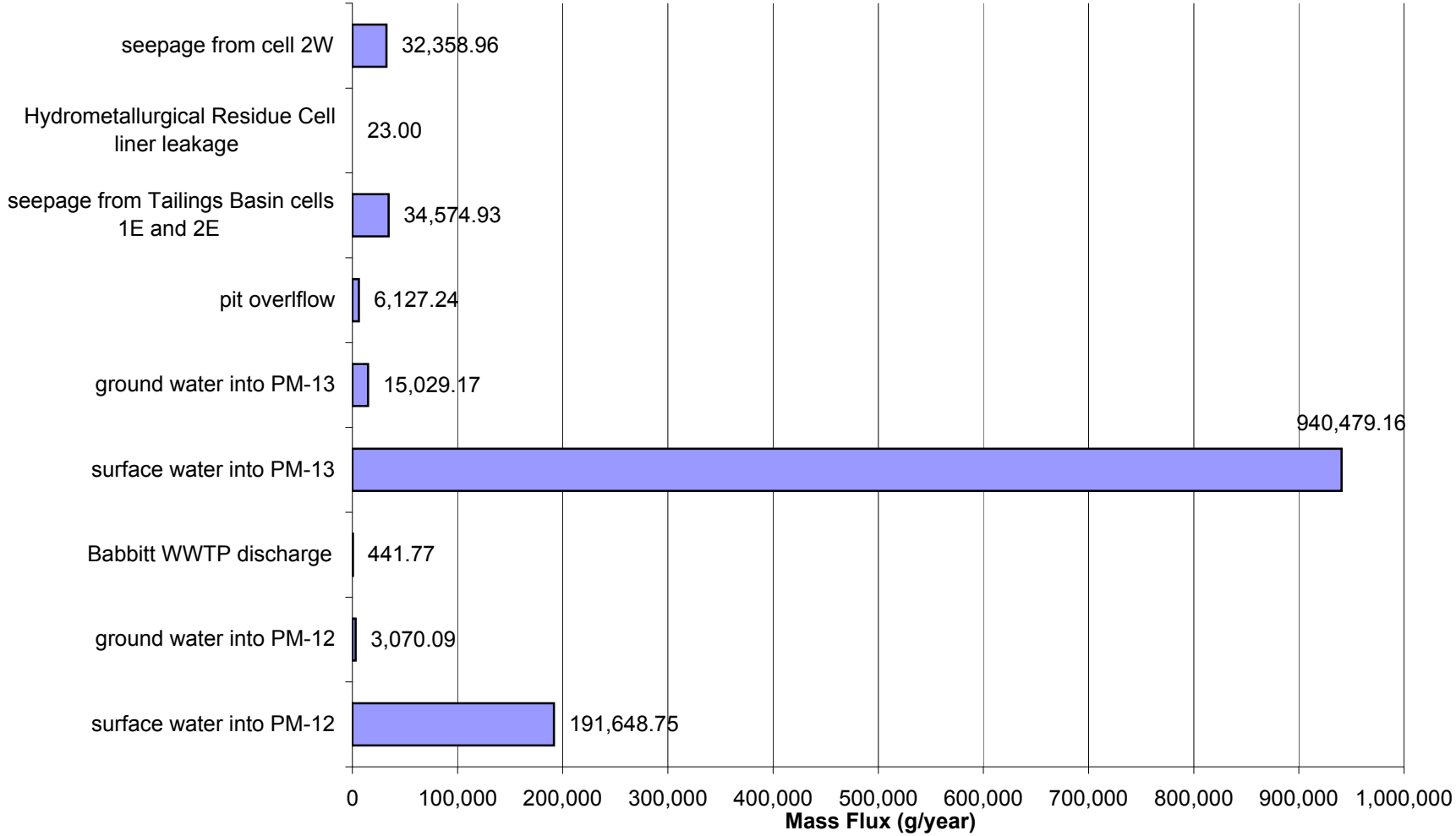
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 10 for Average Flow for Copper (Cu)



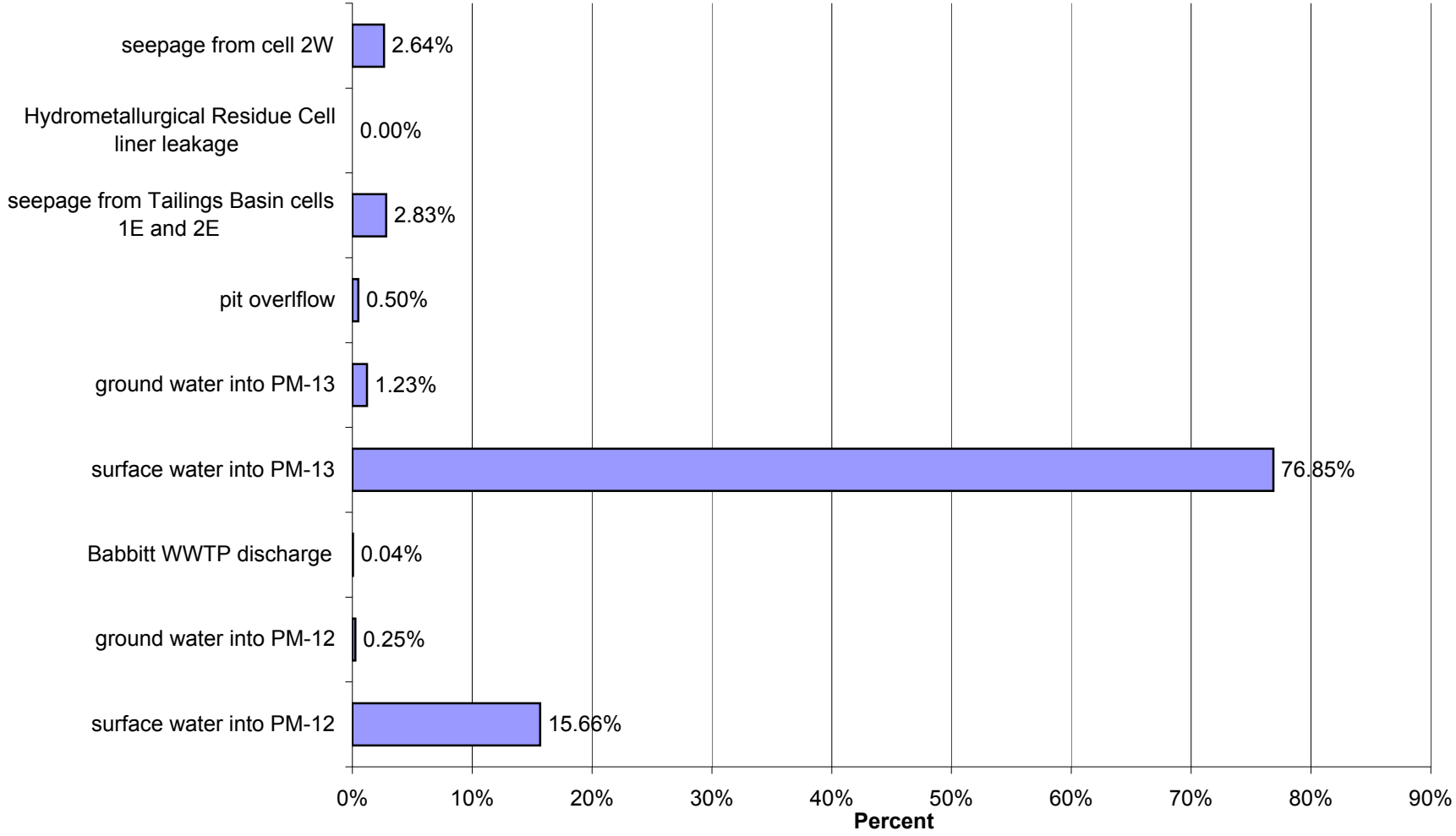
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 10 for Average Flow for Copper (Cu)



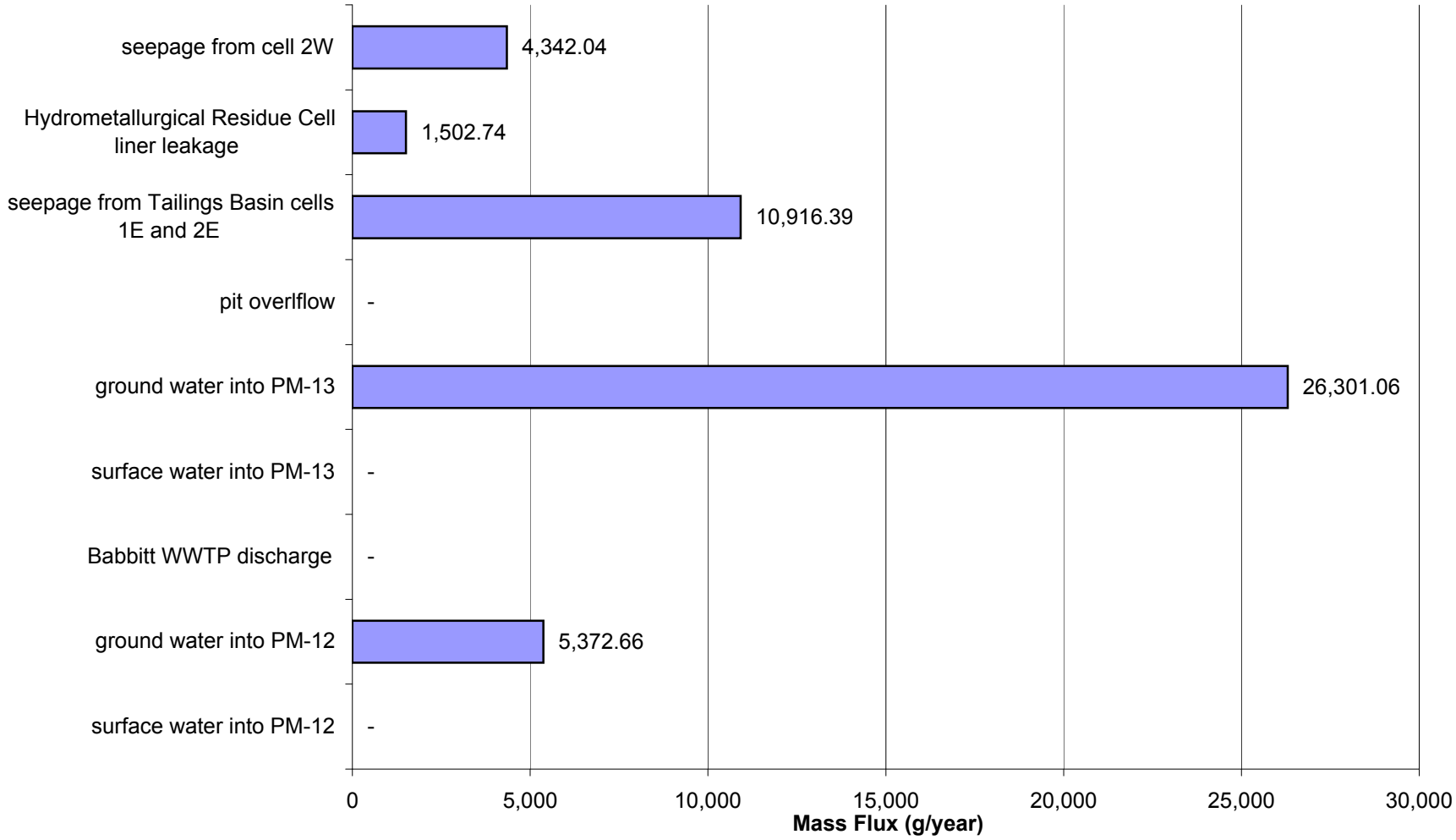
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 10 for High Flow for Copper (Cu)



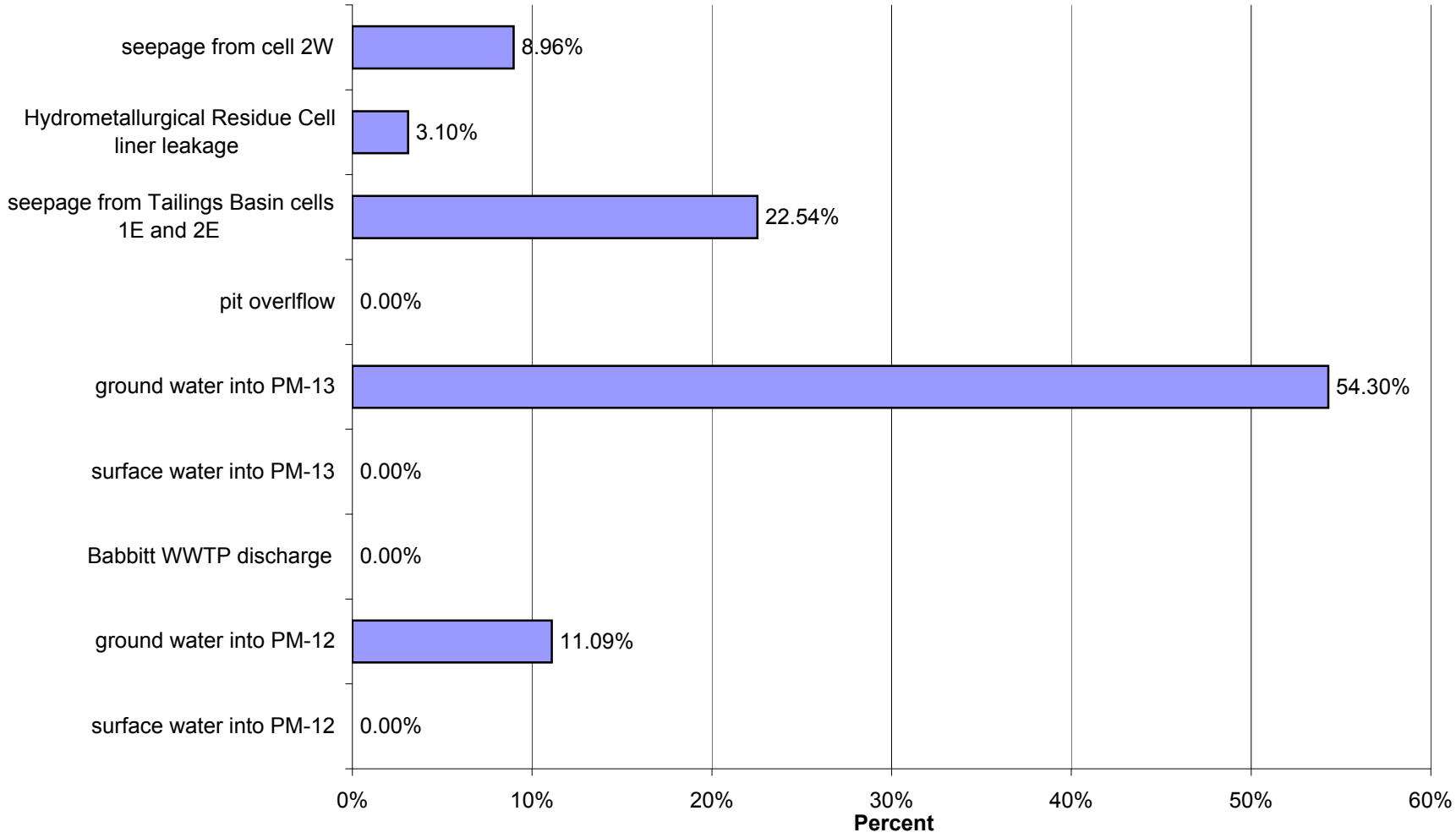
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 10 for High Flow for Copper (Cu)



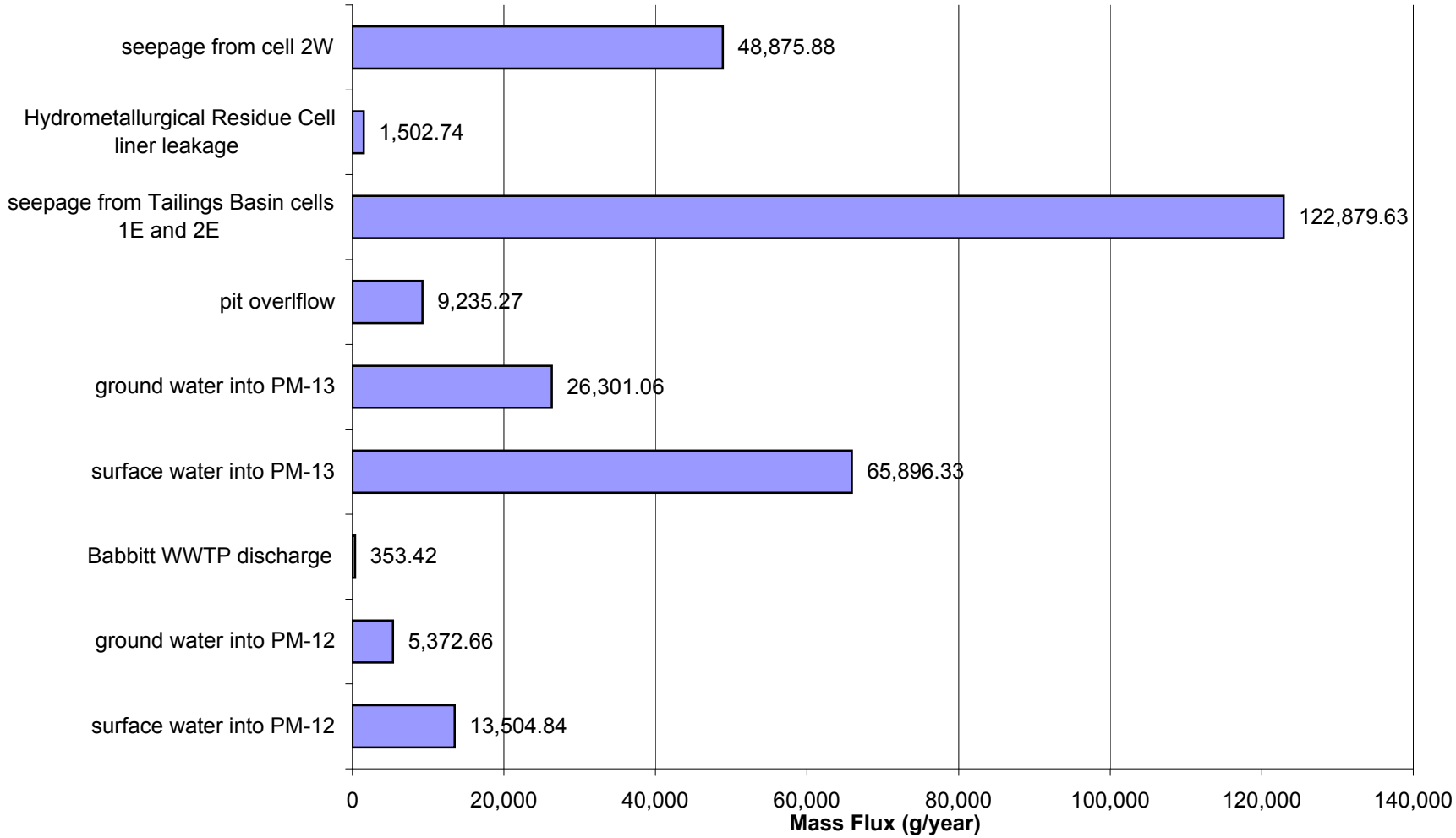
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 10 for Low Flow for Nickel (Ni)



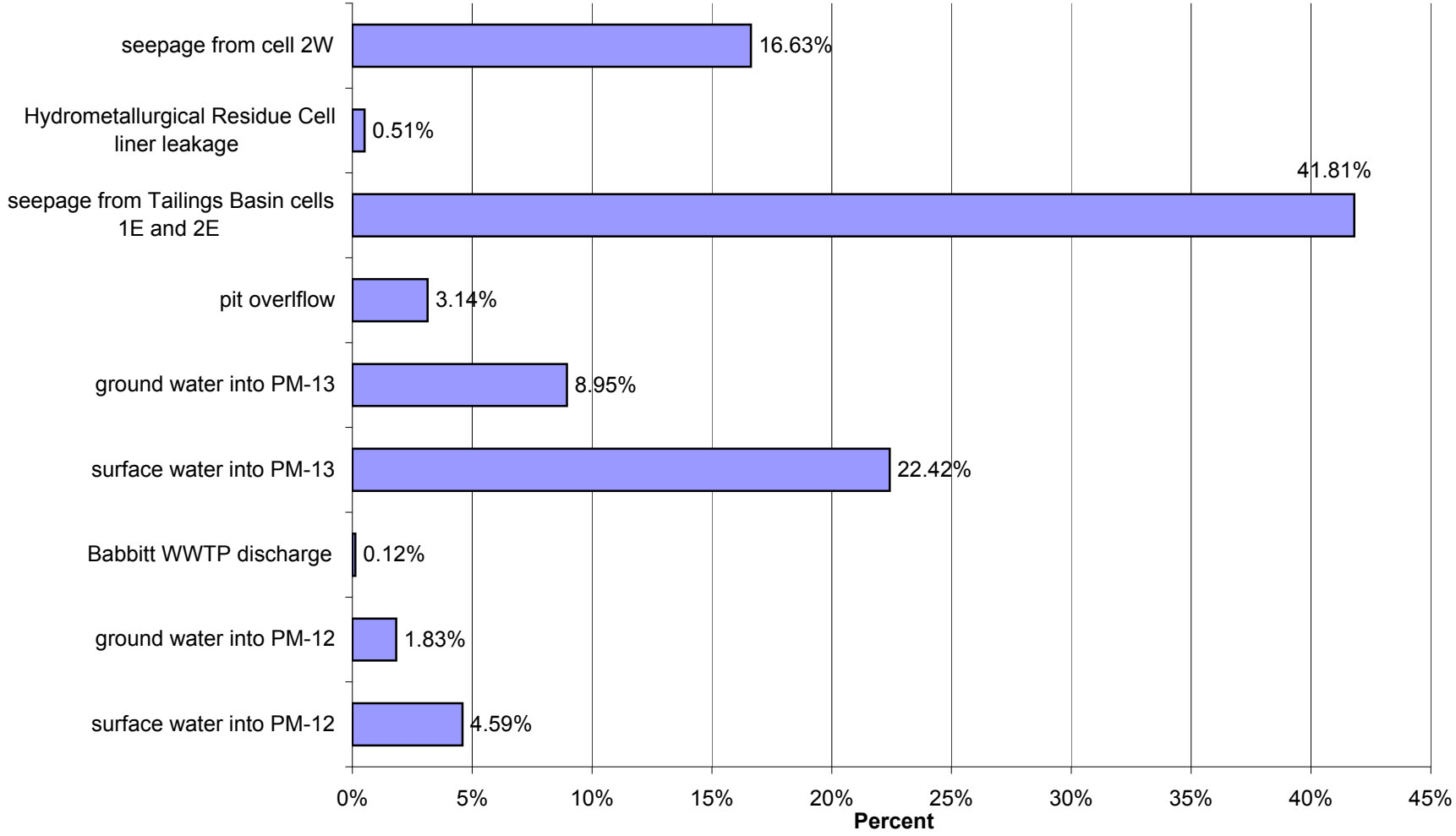
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 10 for Low Flow for Nickel (Ni)



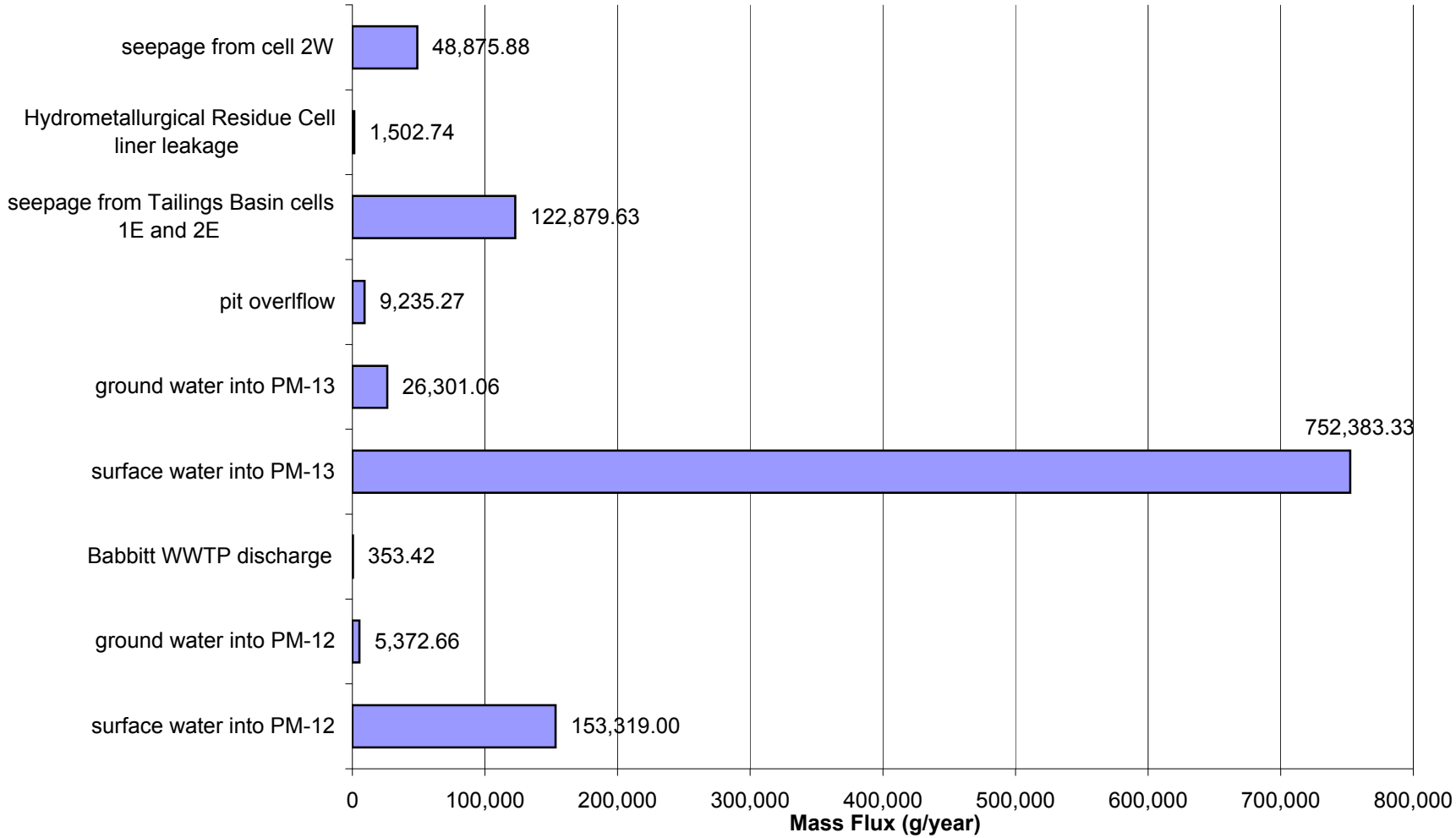
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 10 for Average Flow for Nickel (Ni)



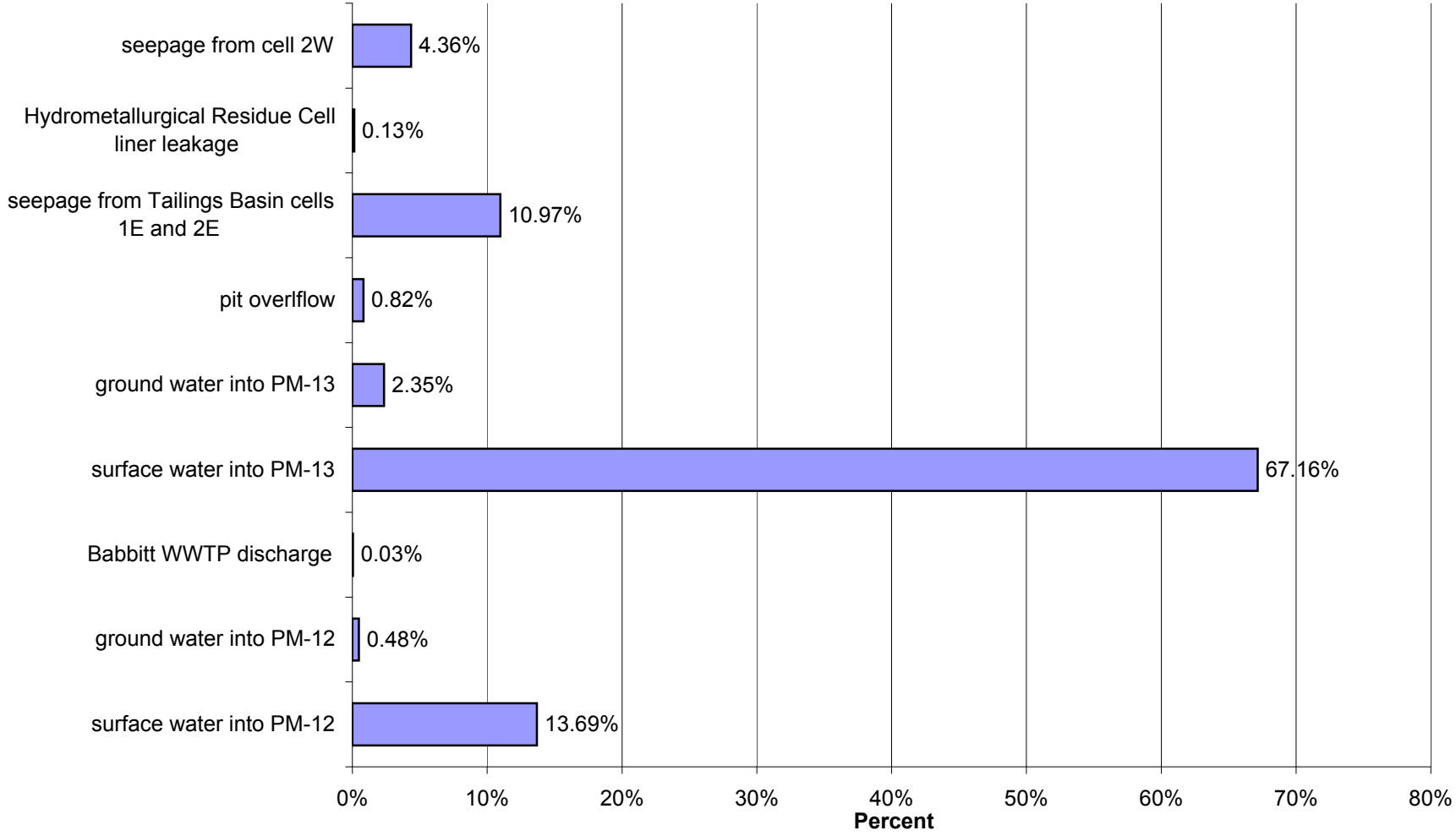
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 10 for Average Flow for Nickel (Ni)



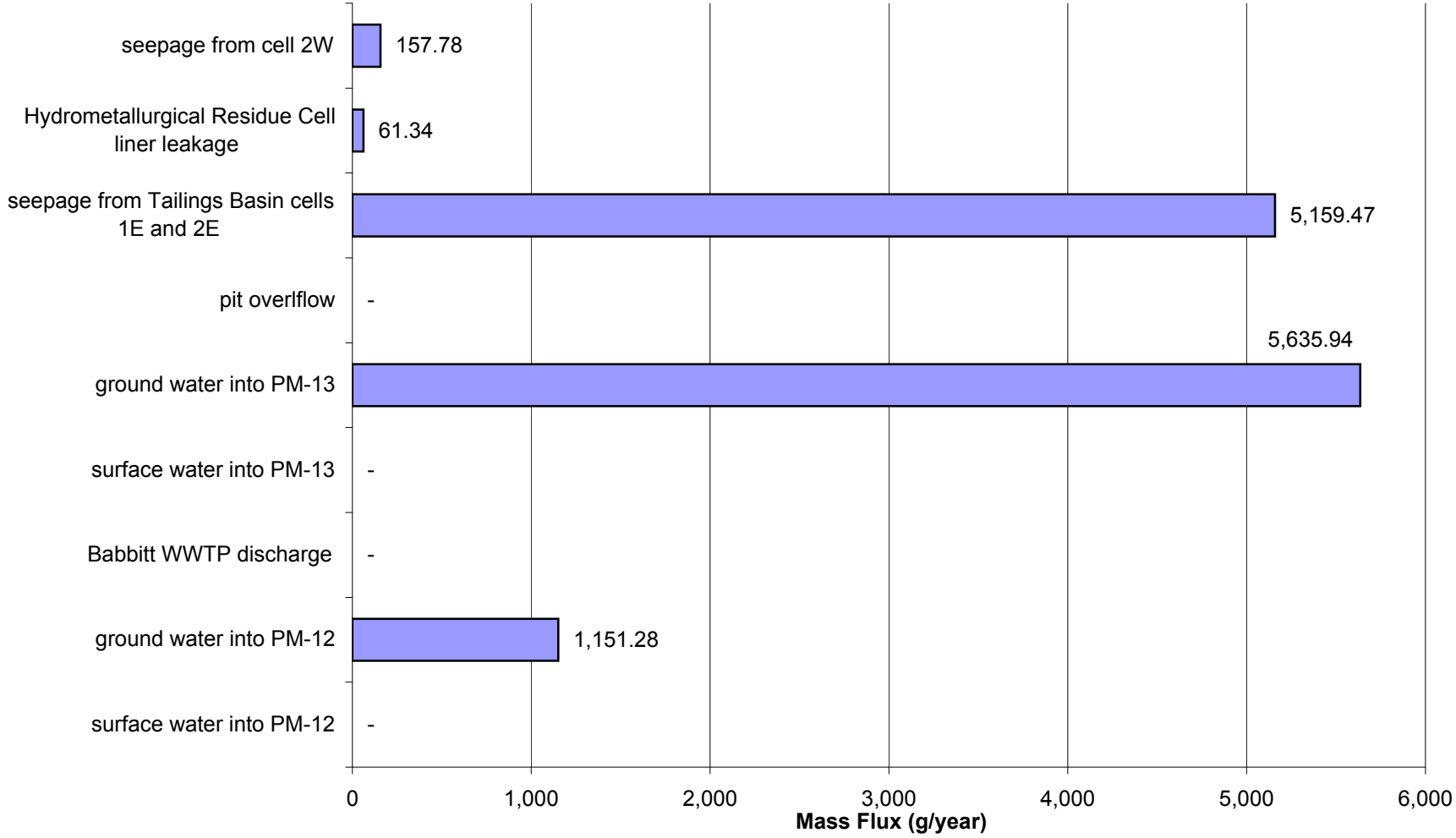
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 10 for High Flow for Nickel (Ni)



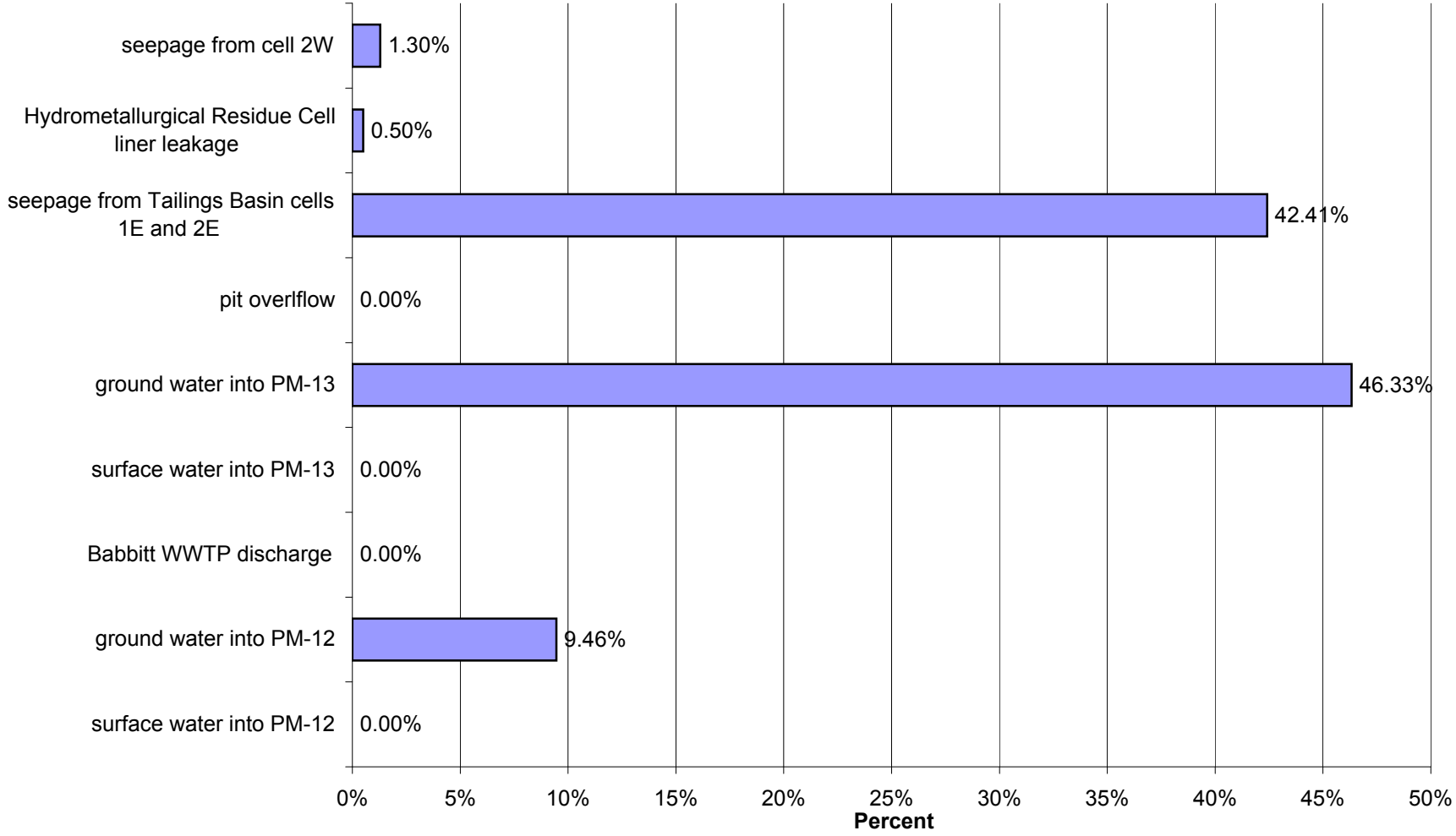
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 10 for High Flow for Nickel (Ni)



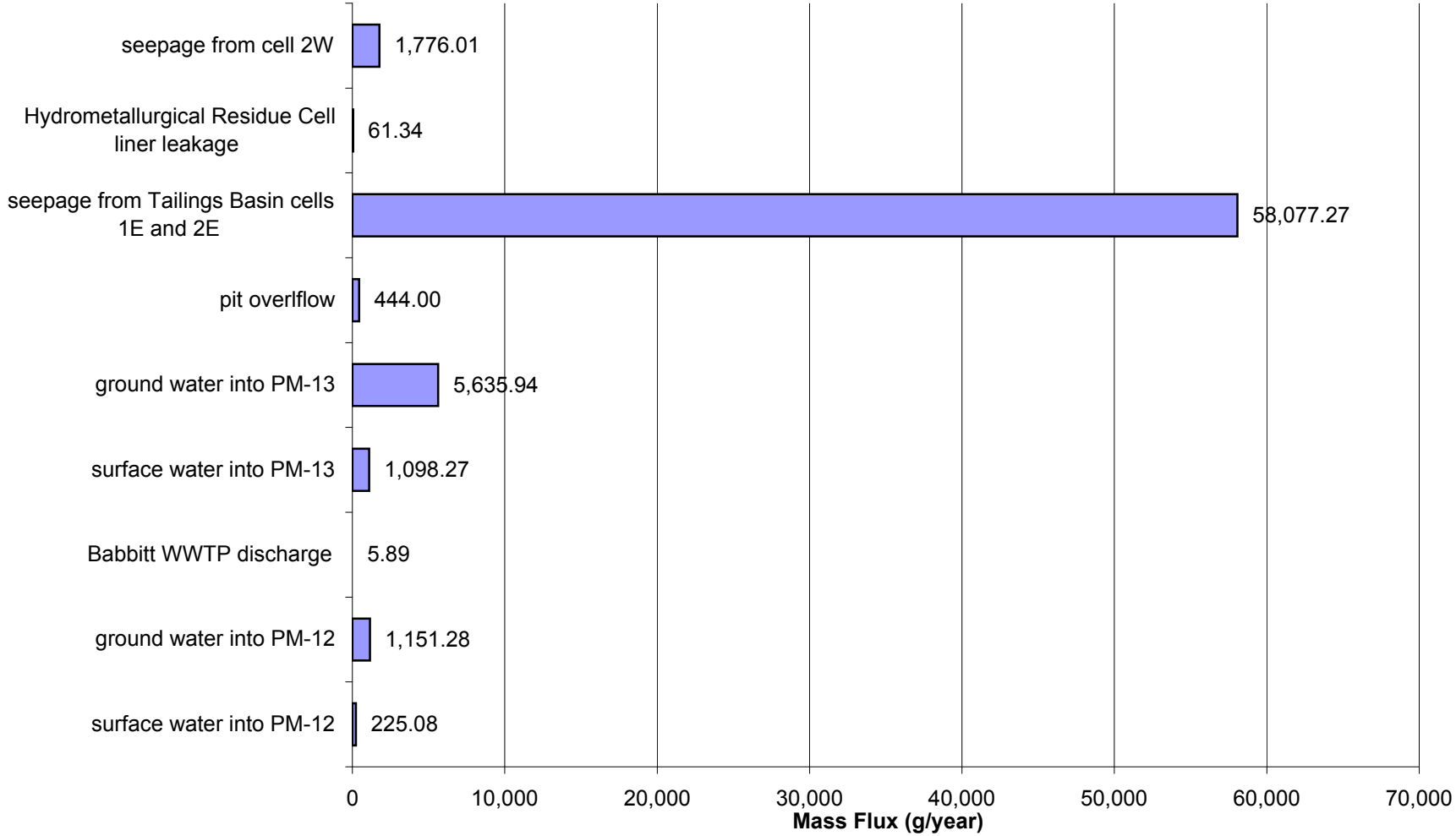
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 10 for Low Flow for Antimony (Sb)



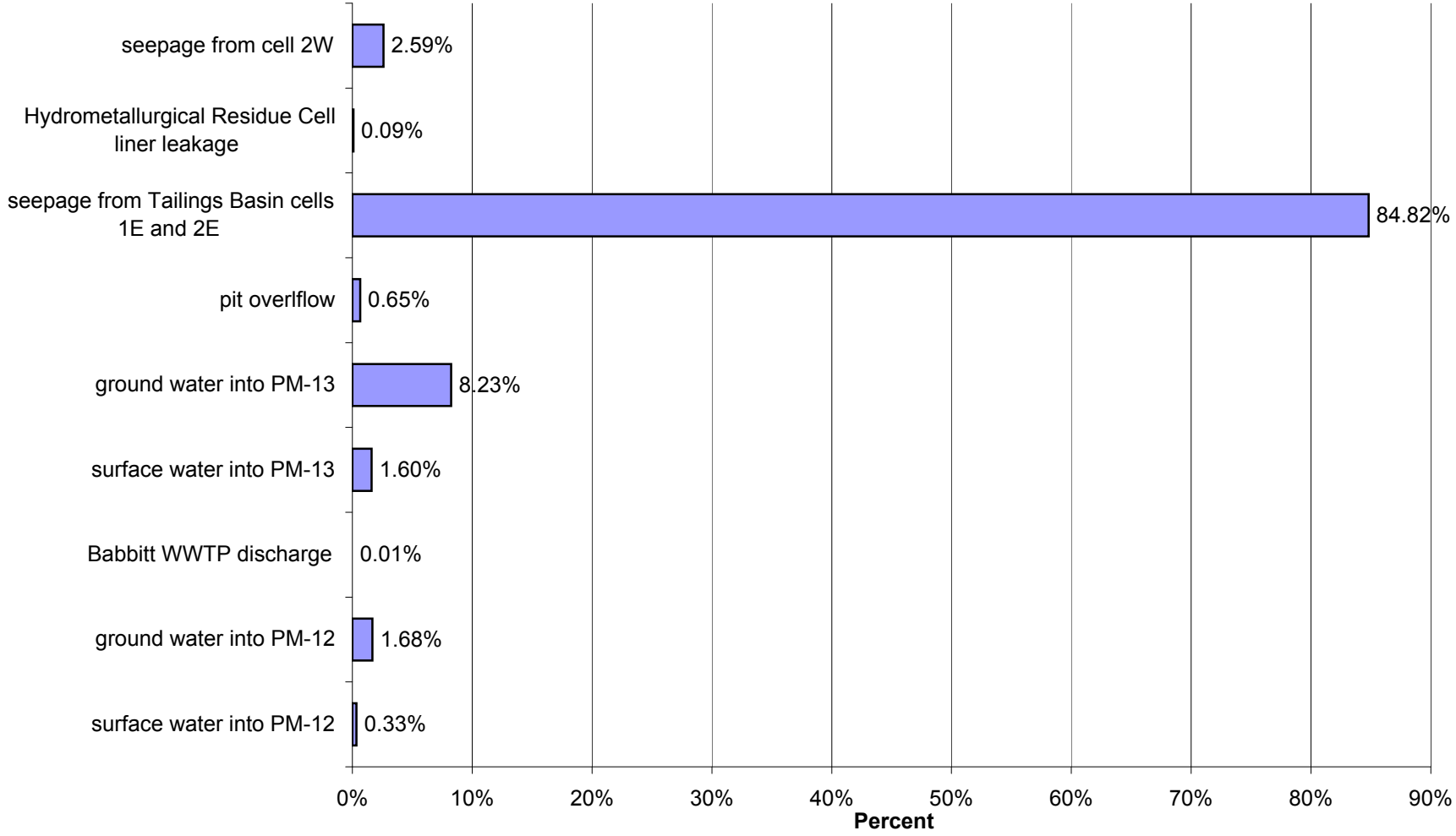
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 10 for Low Flow for Antimony (Sb)



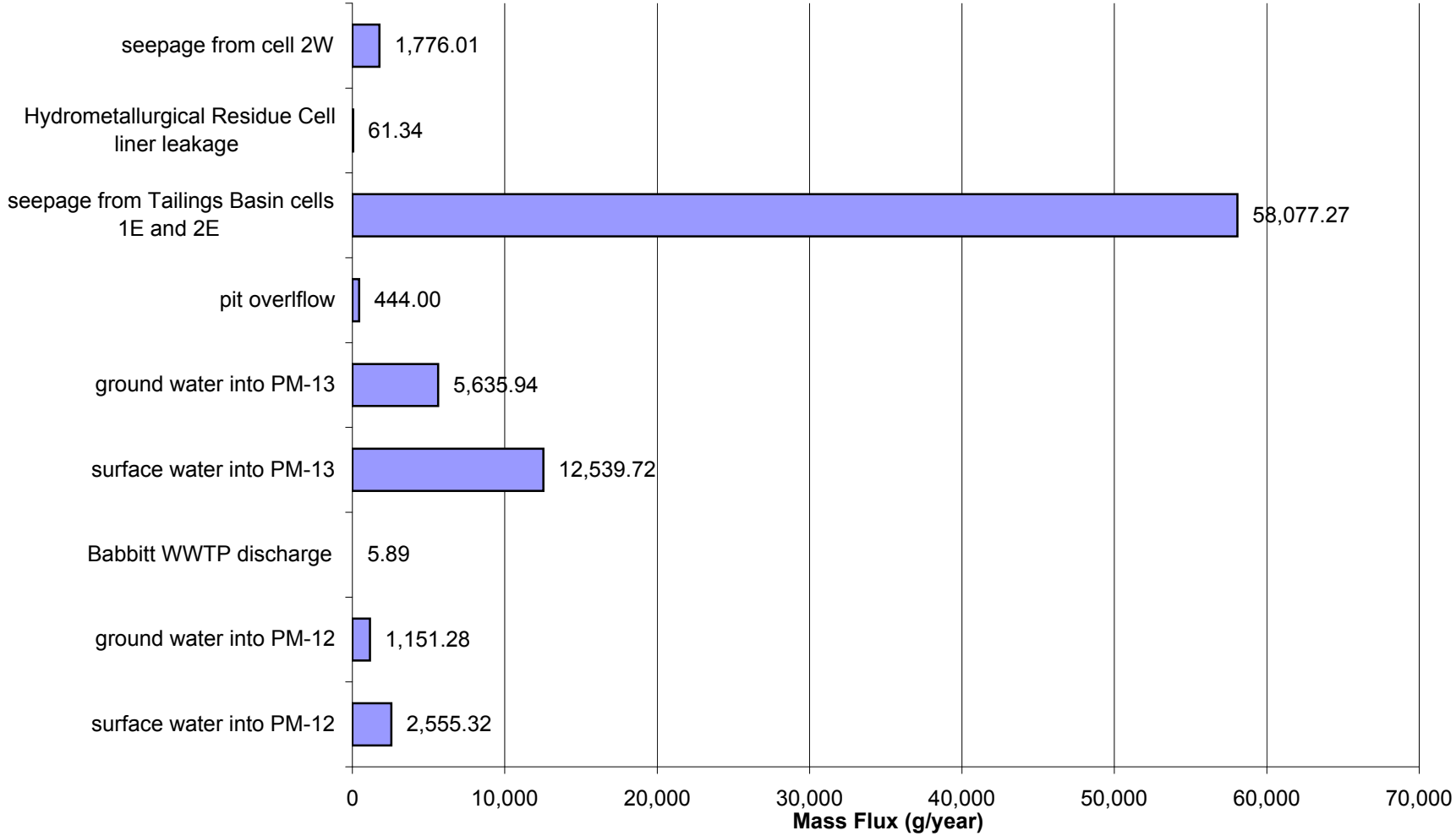
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 10 for Average Flow for Antimony (Sb)



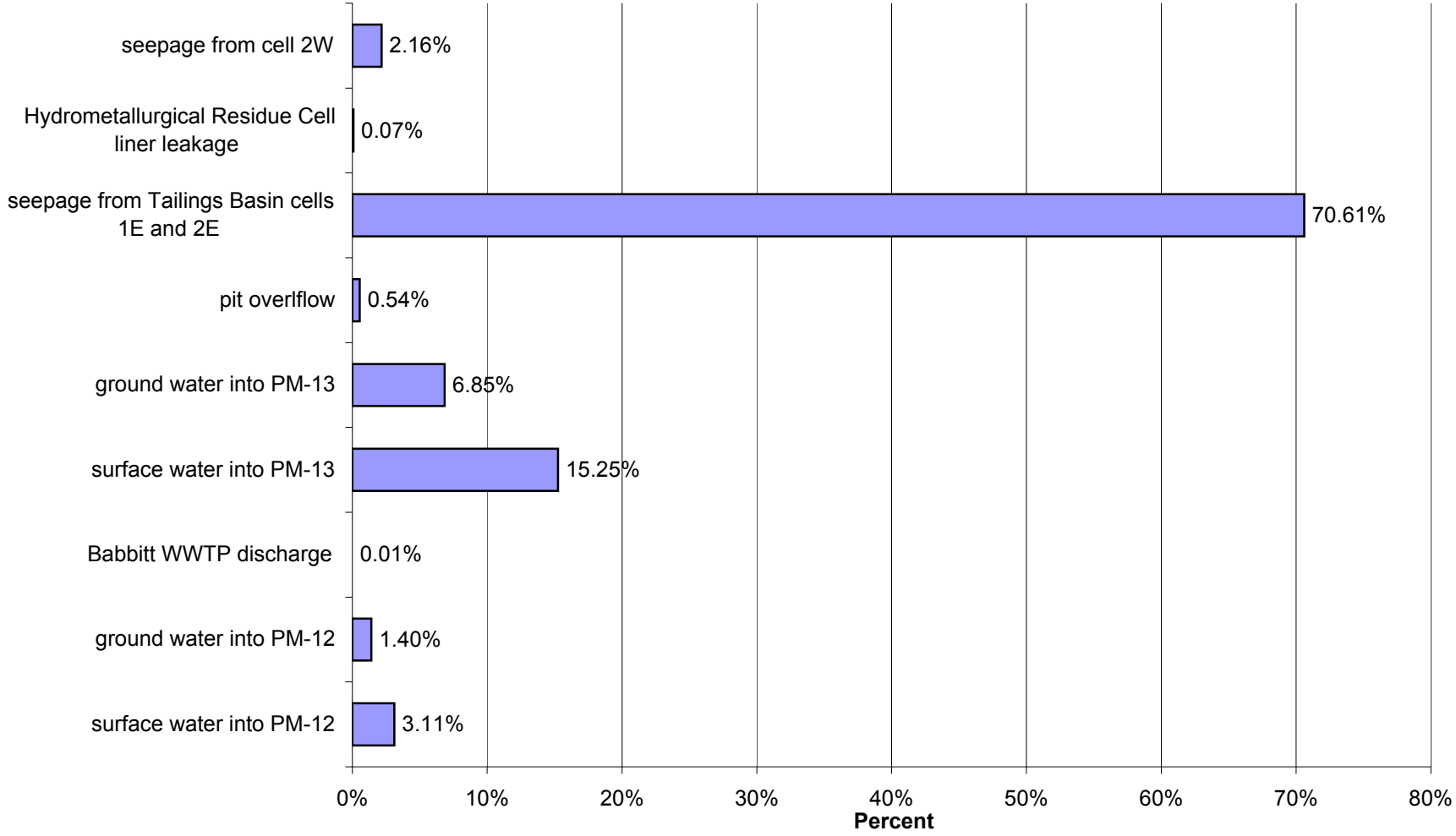
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 10 for Average Flow for Antimony (Sb)



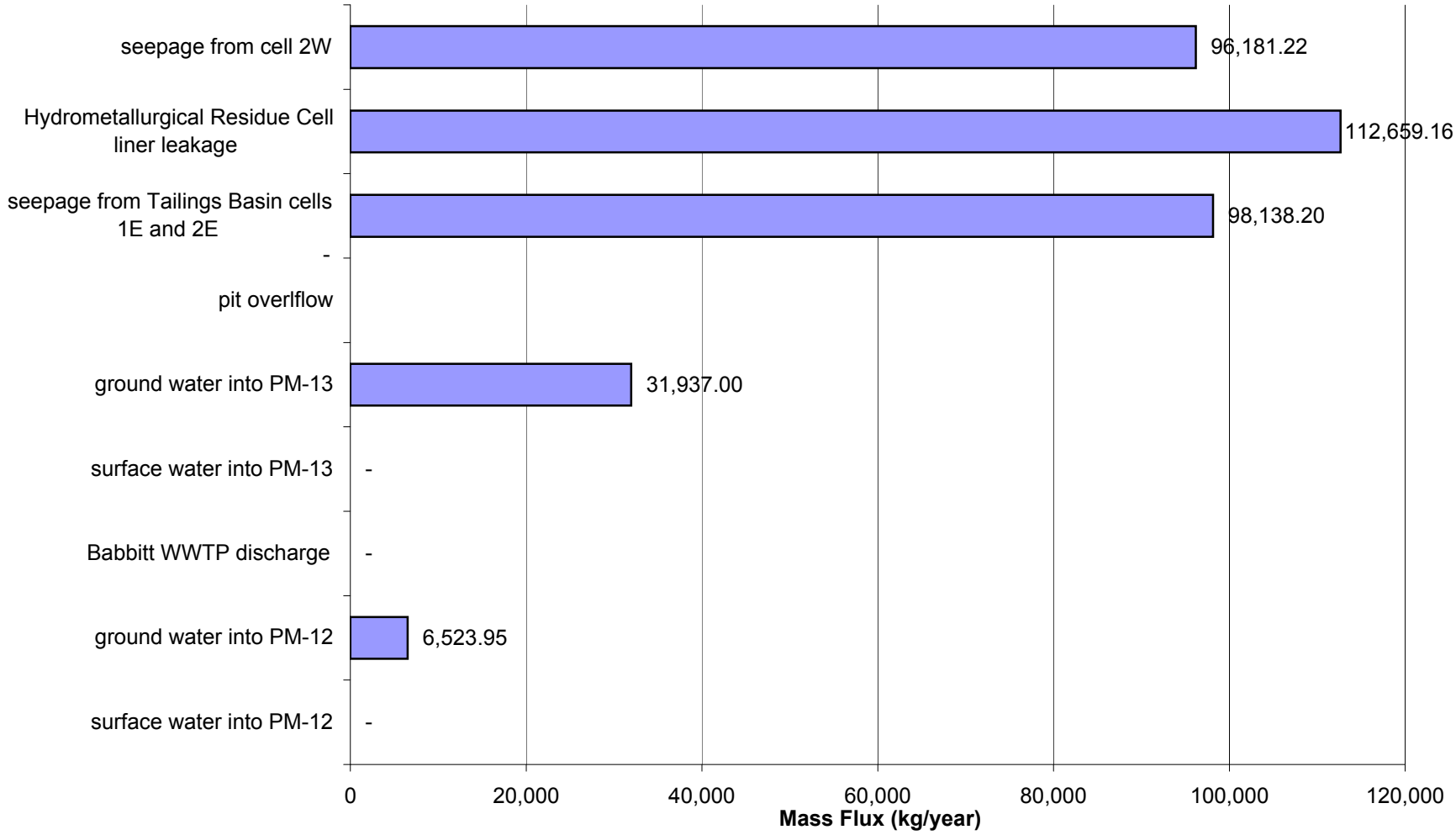
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 10 for High Flow for Antimony (Sb)



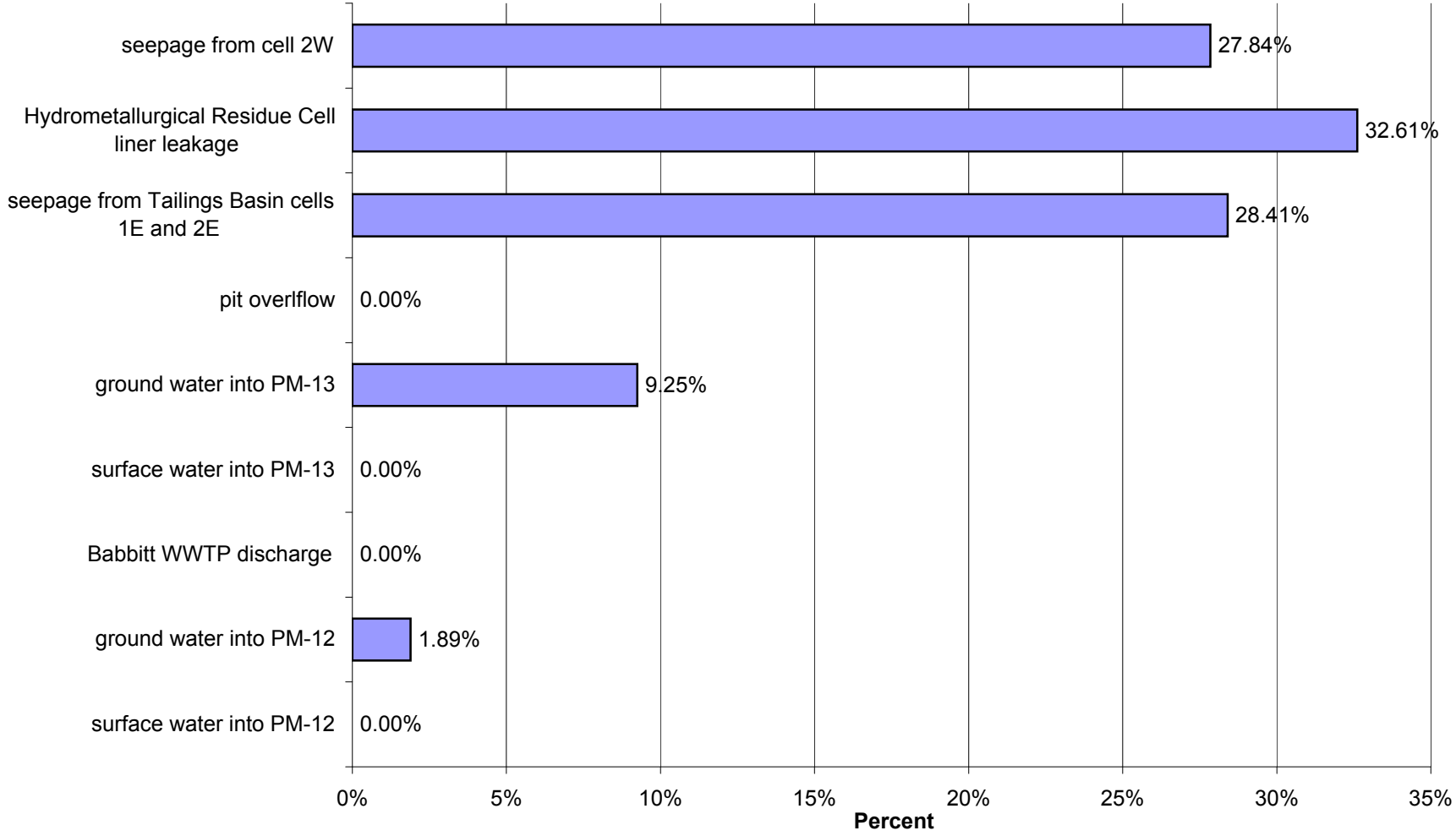
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 10 for High Flow for Antimony (Sb)



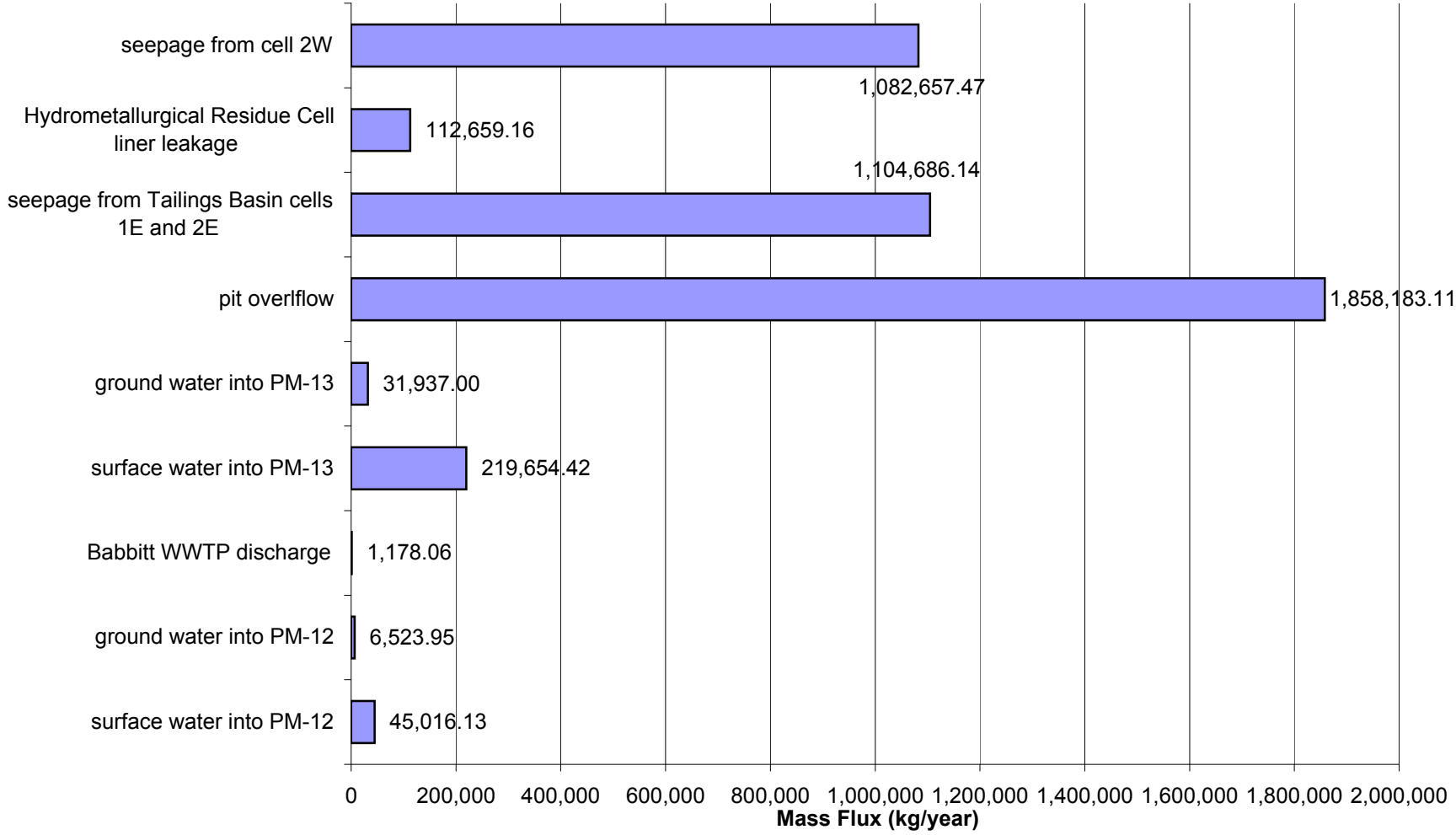
Geotechnical Mitigation: Mass Flux (kg/year) of Impacts at PM-13 in Year 10 for Low Flow for Sulfate (SO_4)



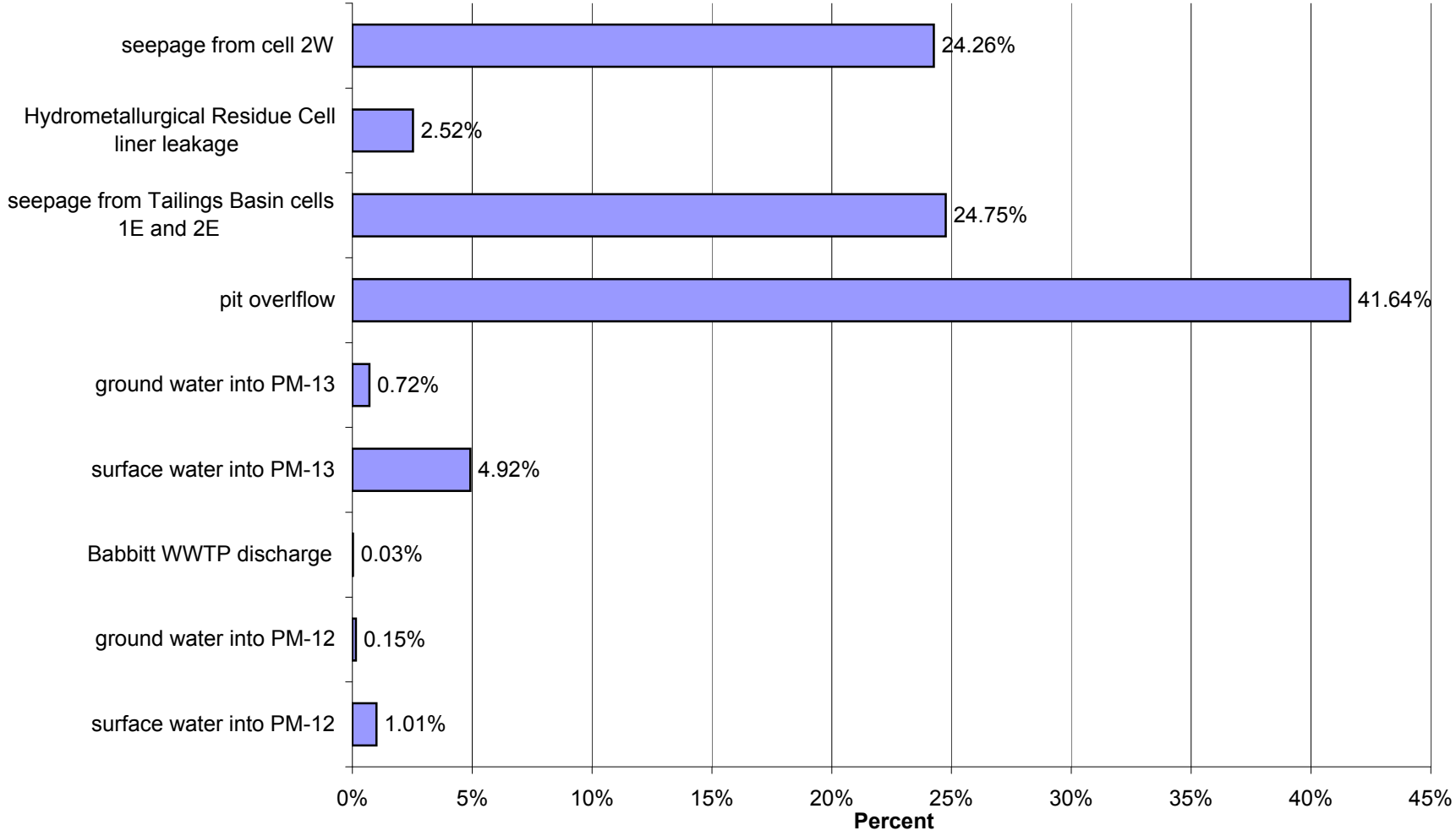
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 10 for Low Flow for Sulfate (SO_4)



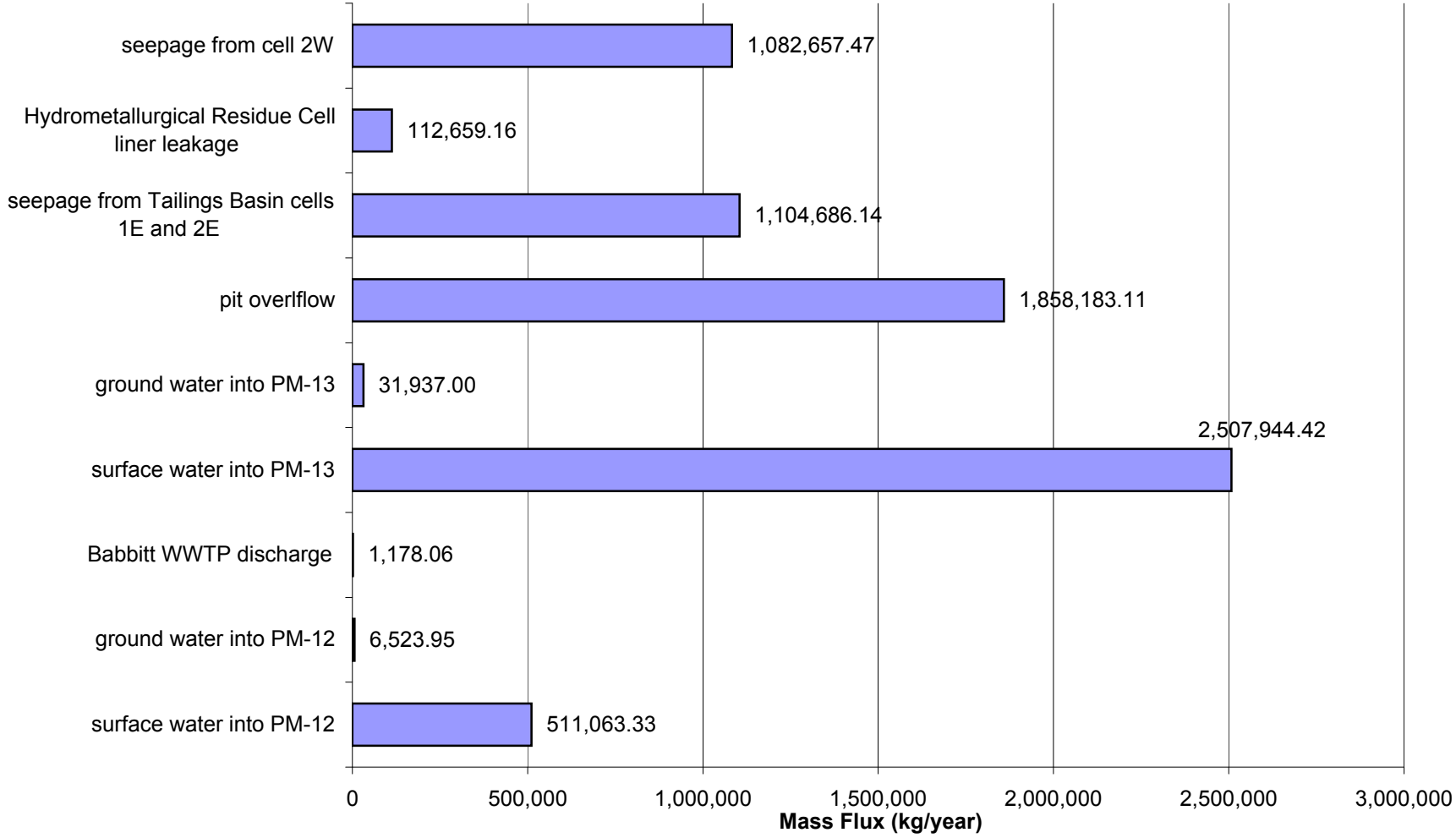
Geotechnical Mitigation: Mass Flux (kg/year) of Impacts at PM-13 in Year 10 for Average Flow for Sulfate (SO_4)



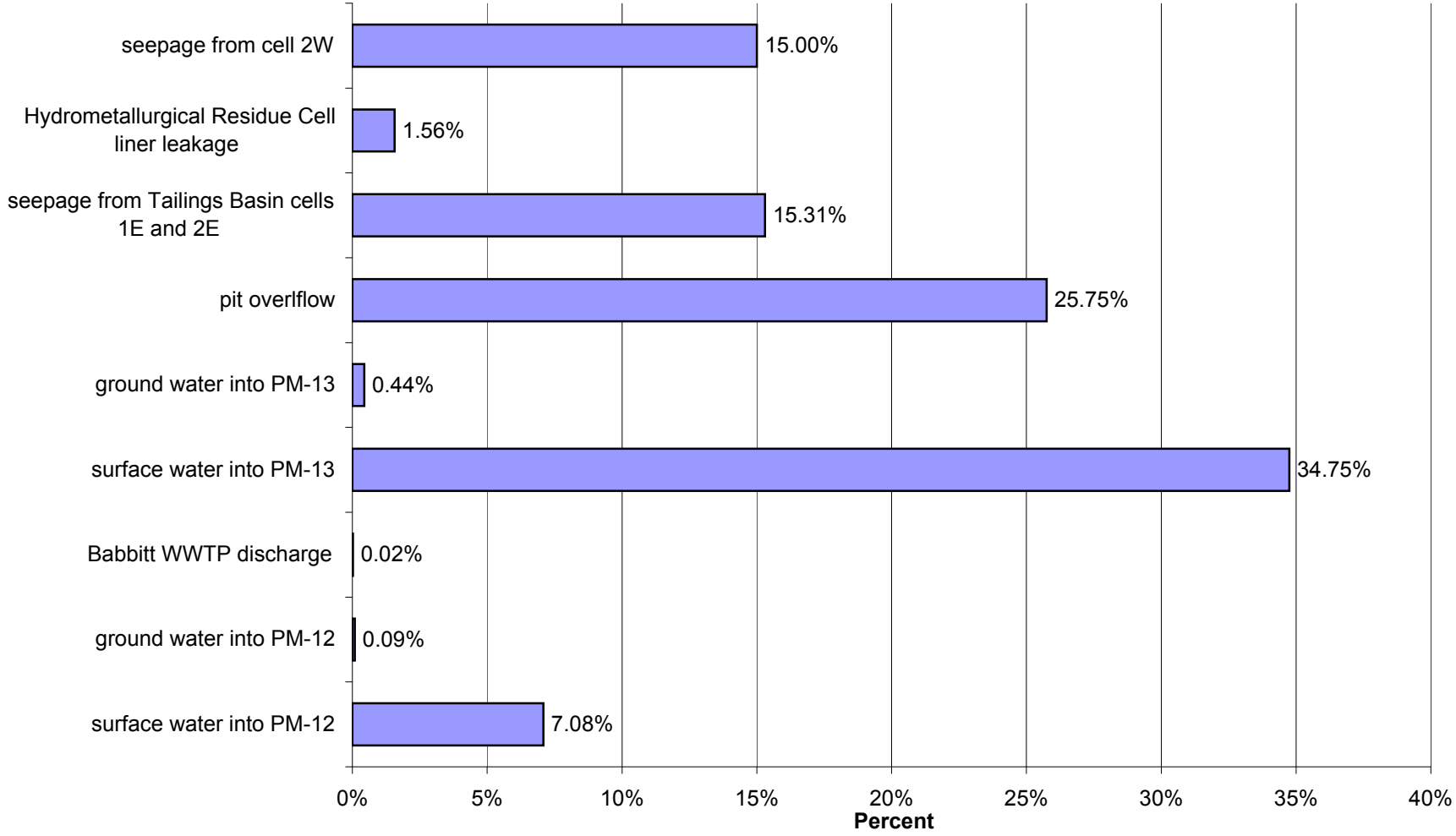
GeotechnicalMitigation: Percent of Impacts at PM-13 in Year 10 for Average Flow for Sulfate (SO_4)



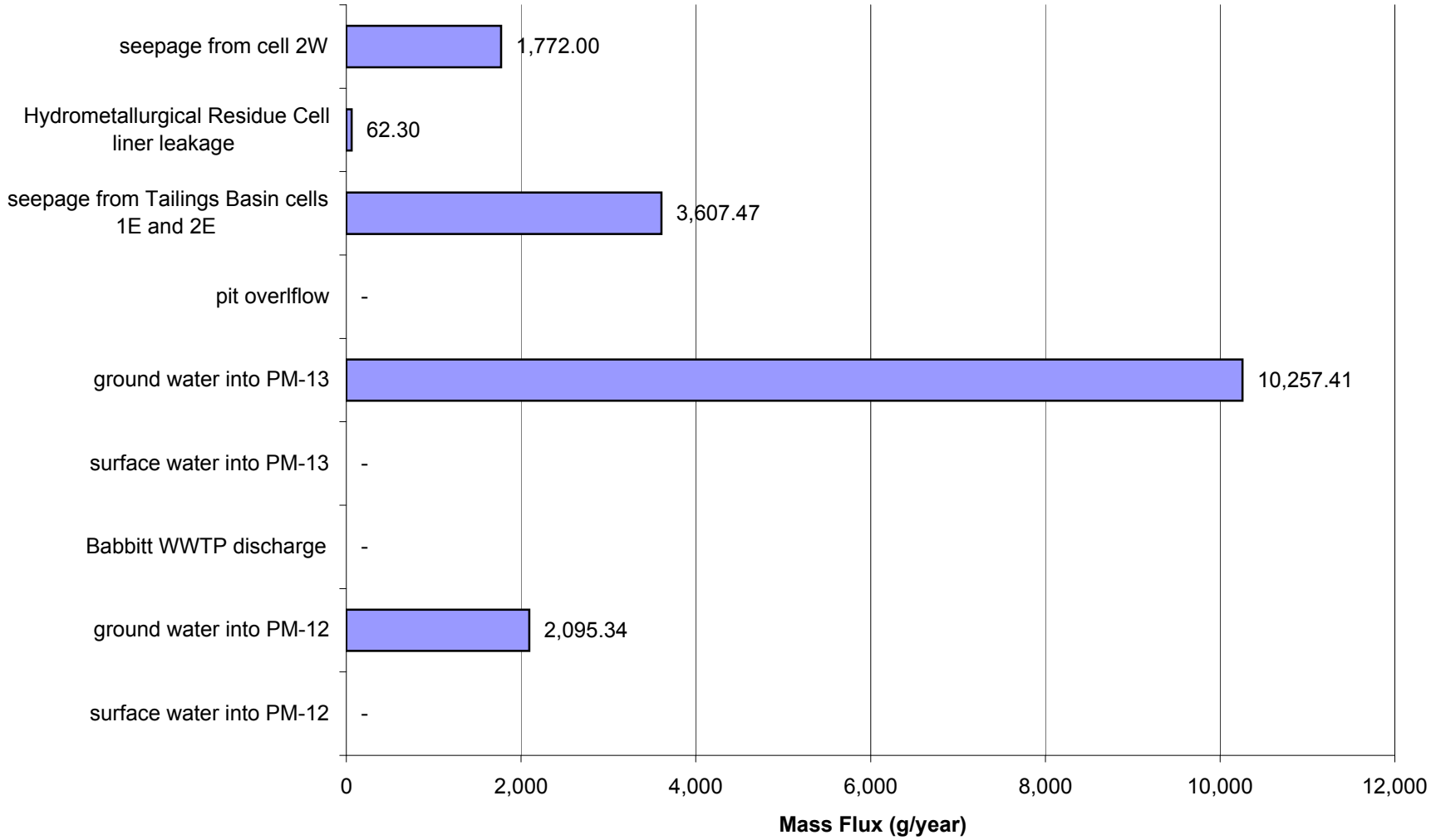
Geotechnical Mitigation: Mass Flux (kg/year) of Impacts at PM-13 in Year 10 for High Flow for Sulfate (SO_4)



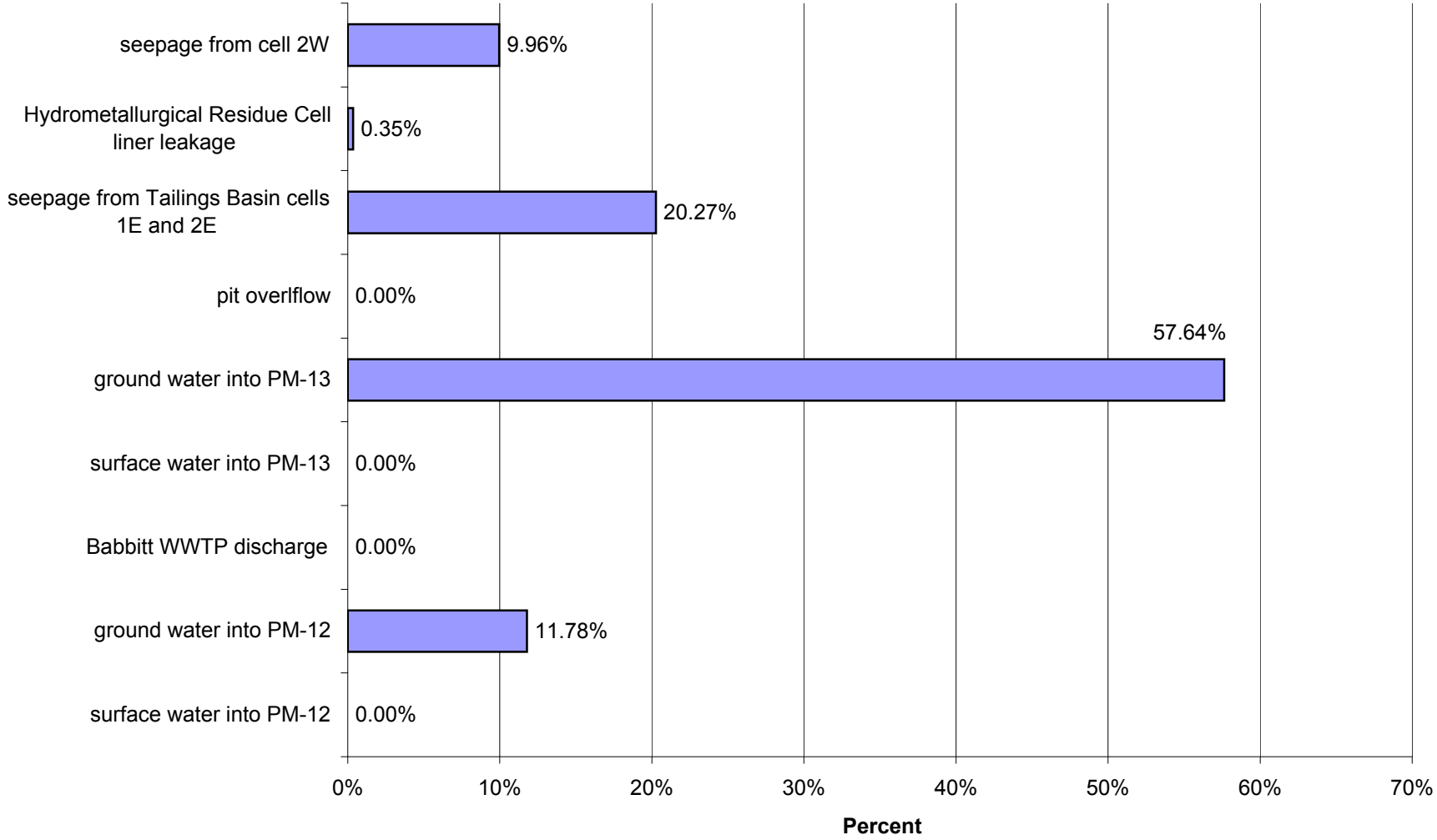
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 10 for High Flow for Sulfate (SO_4)



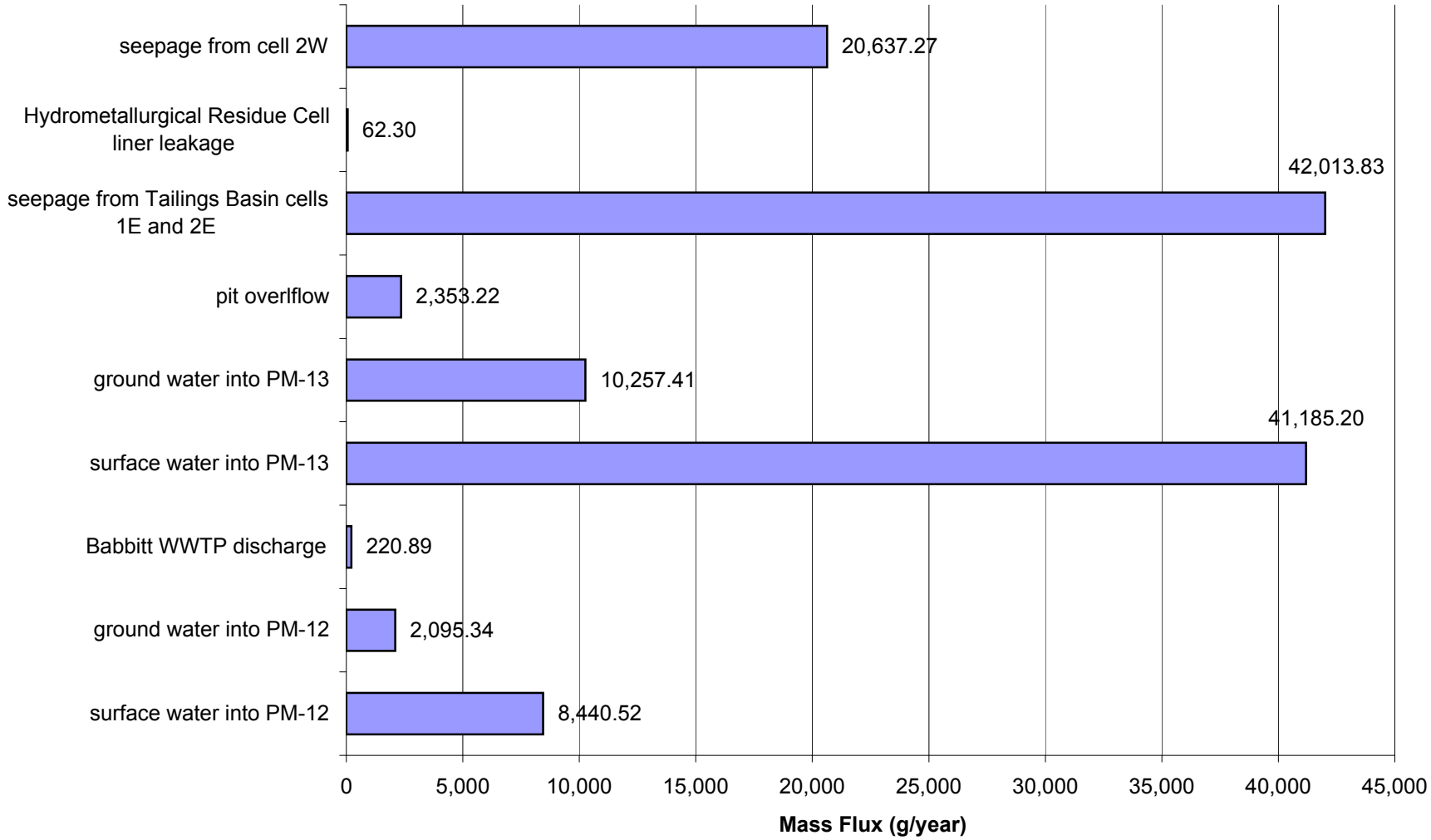
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for Low Flow for Arsenic (As)



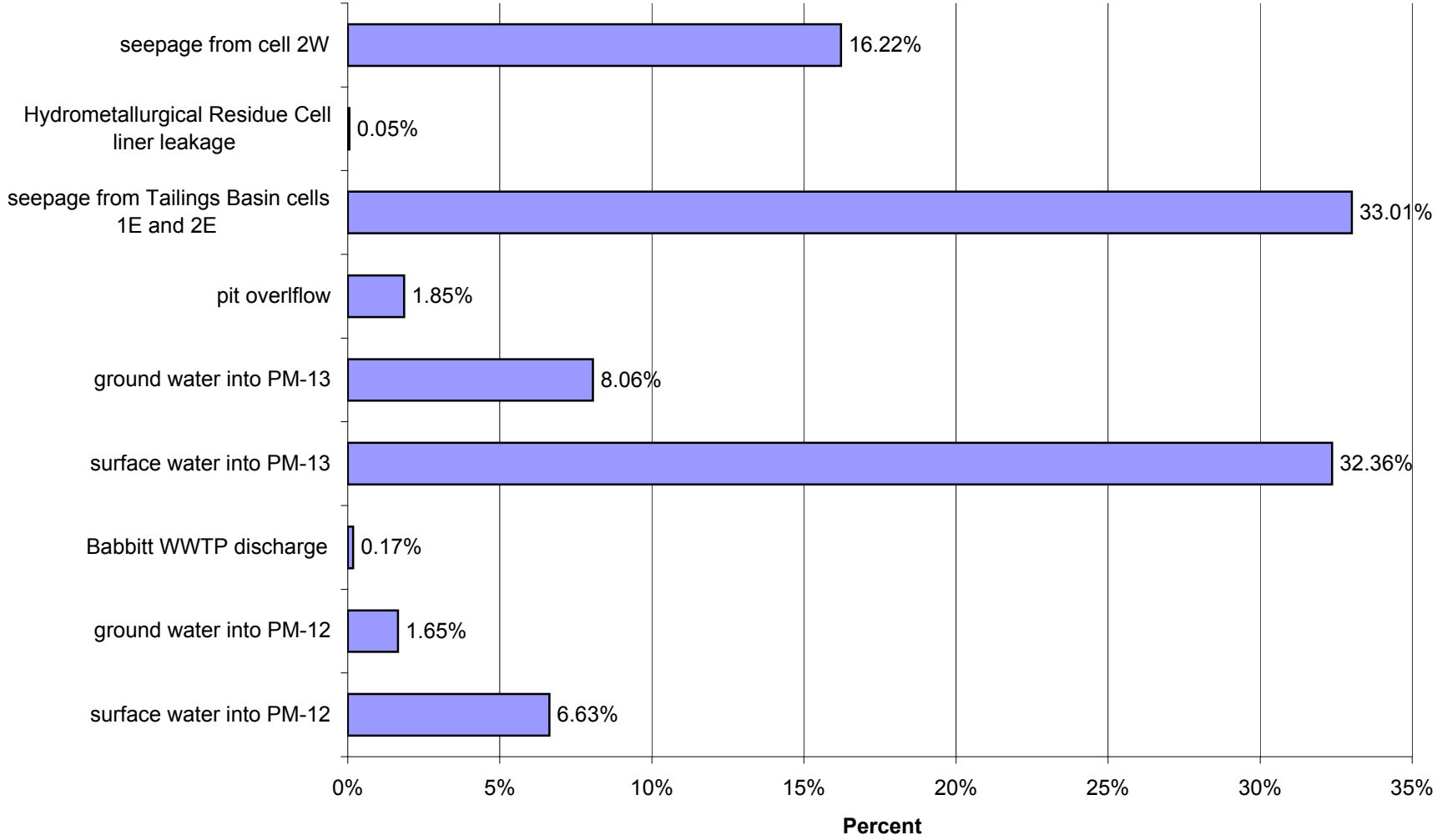
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 15 for Low Flow for Arsenic (As)



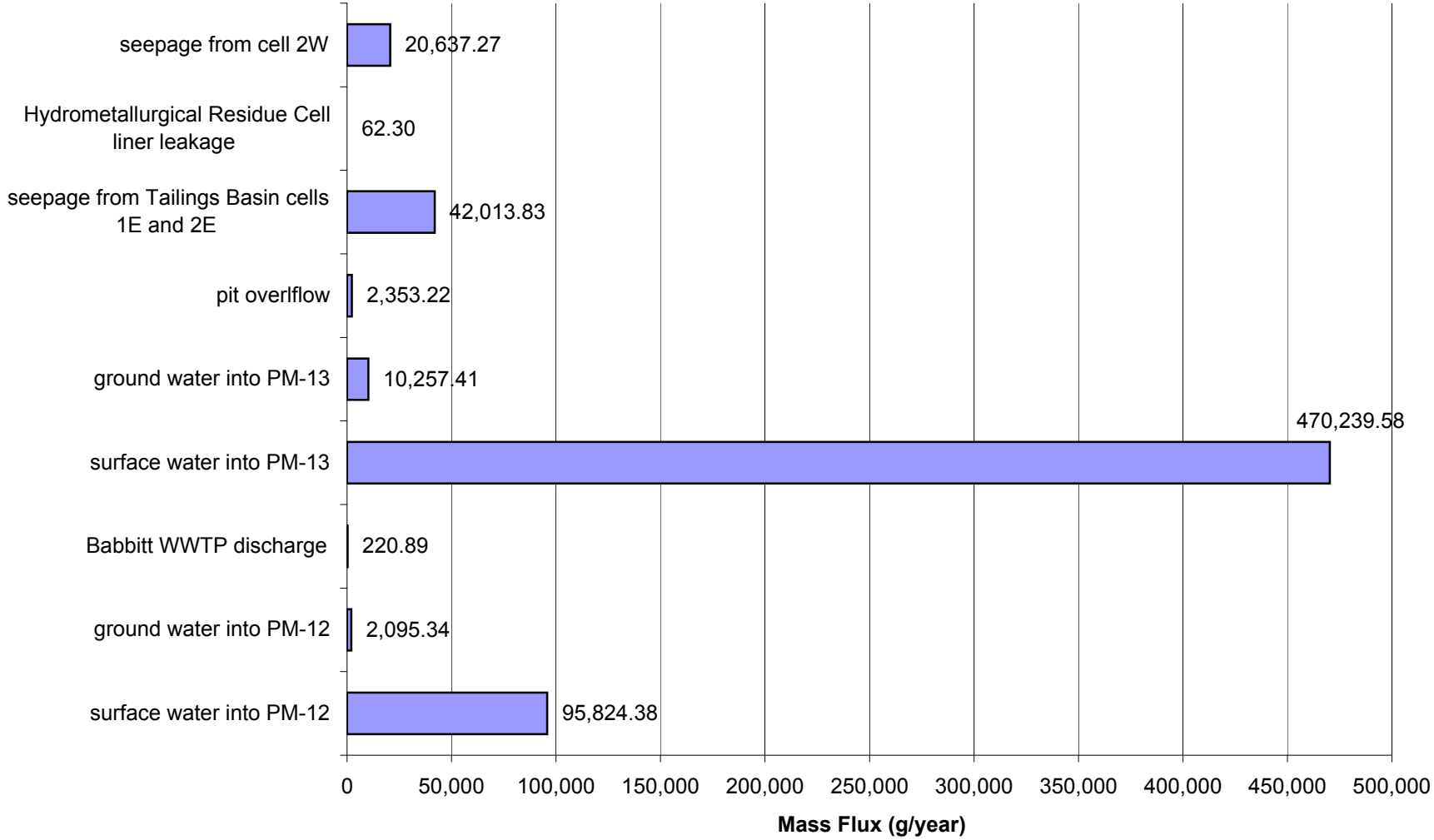
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for Average Flow for Arsenic (As)



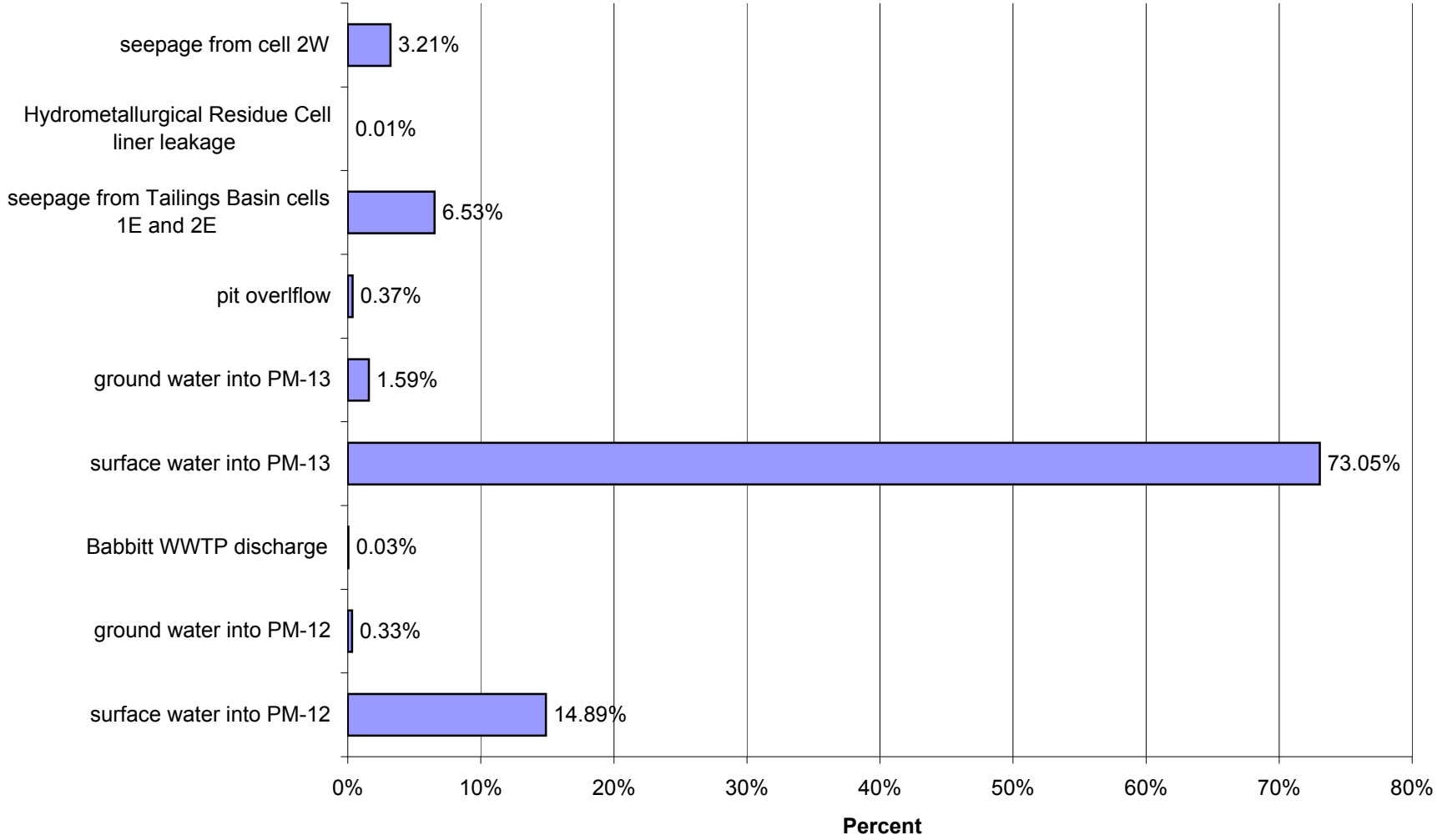
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 15 for Average Flow for Arsenic (As)



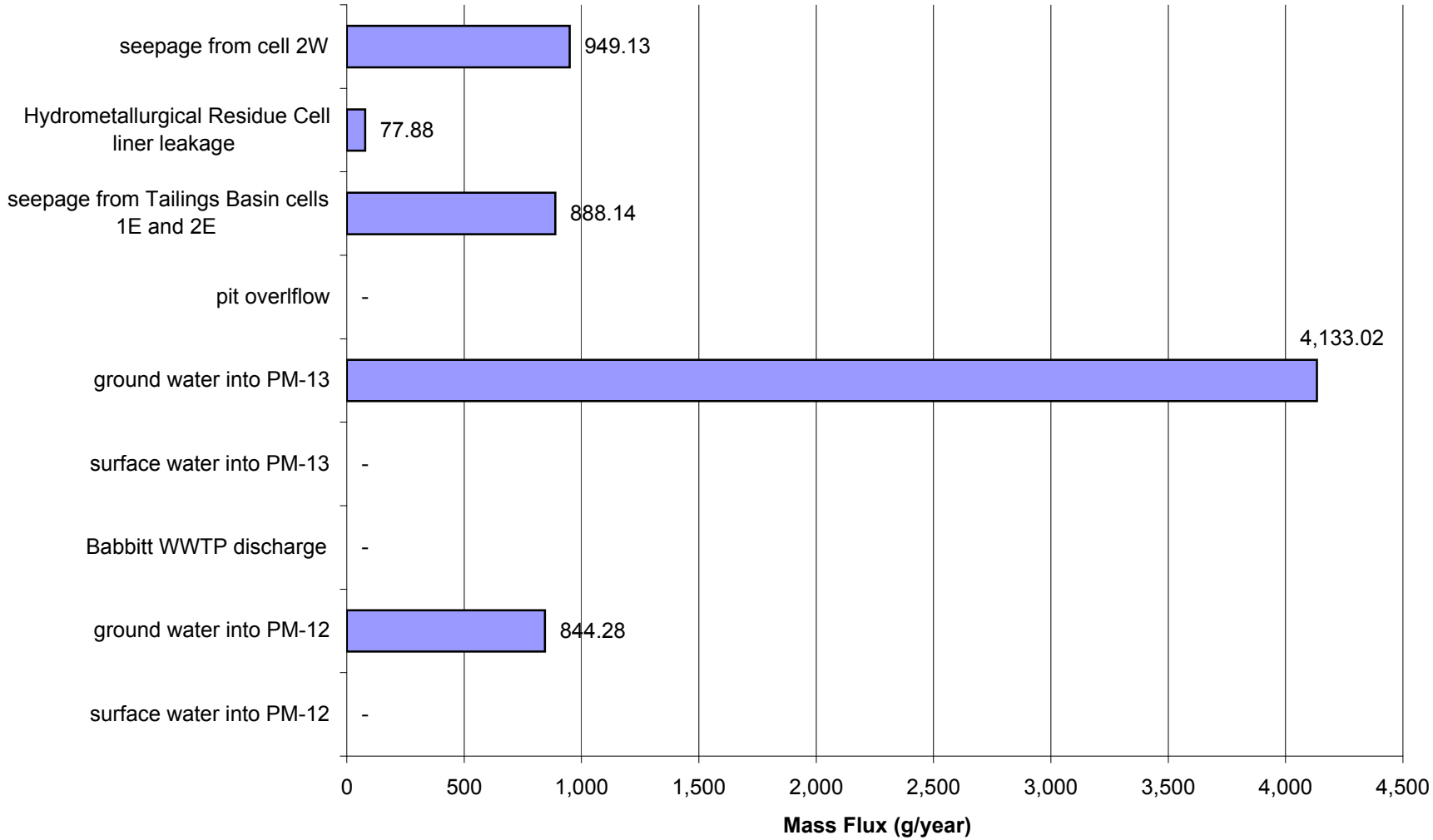
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for High Flow for Arsenic (As)



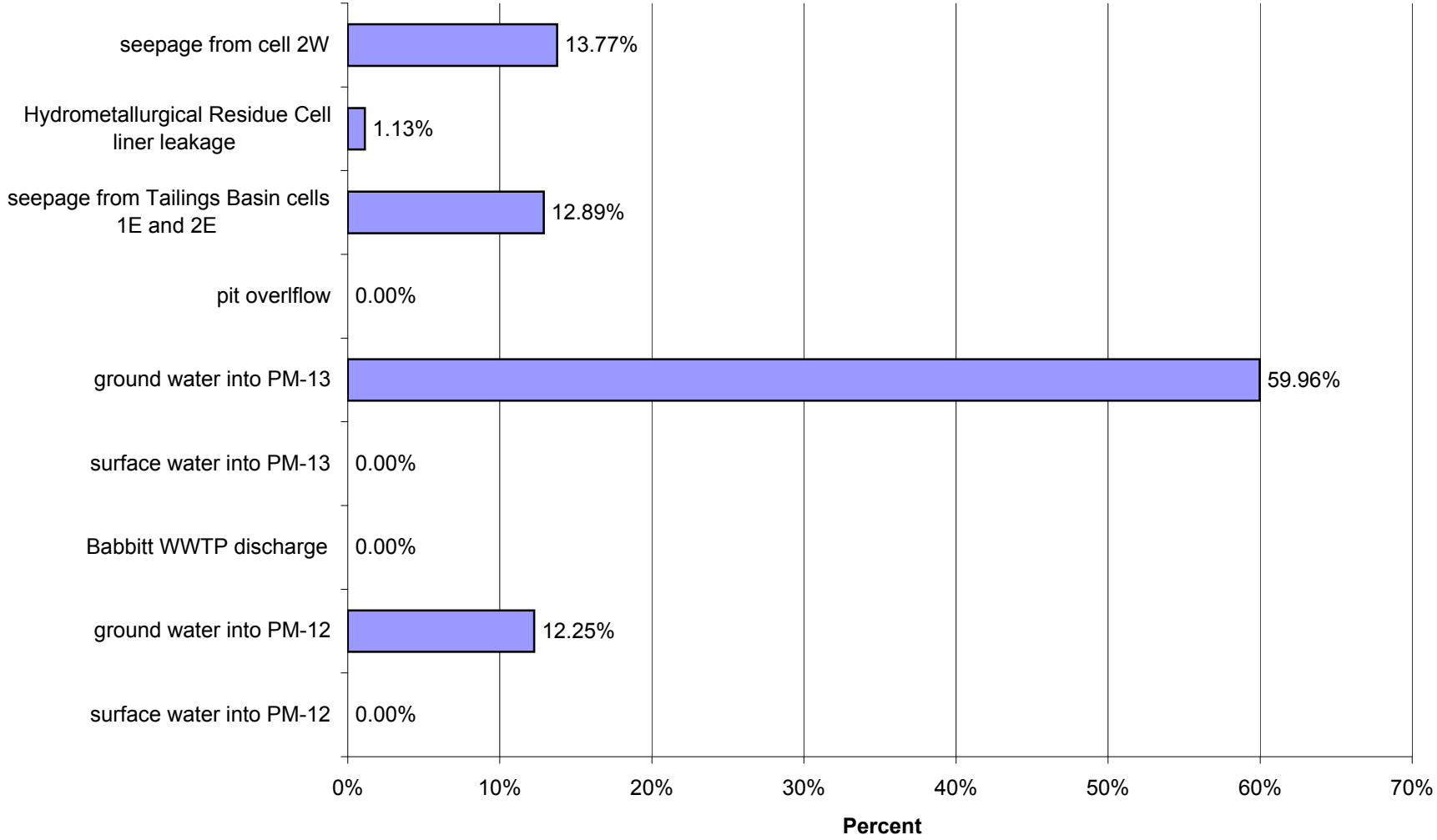
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 15 for High Flow for Arsenic (As)



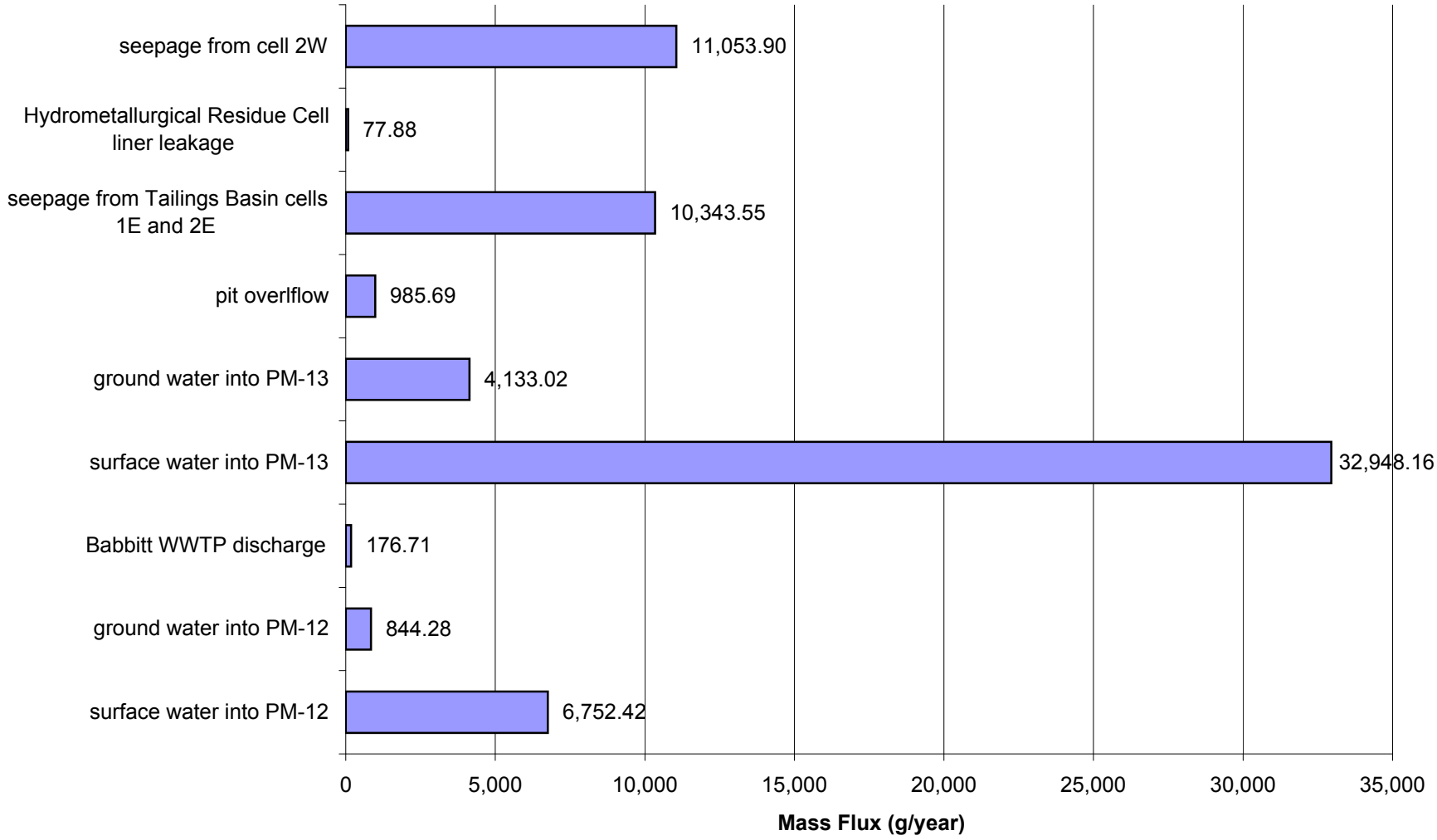
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for Low Flow for Cobalt (Co)



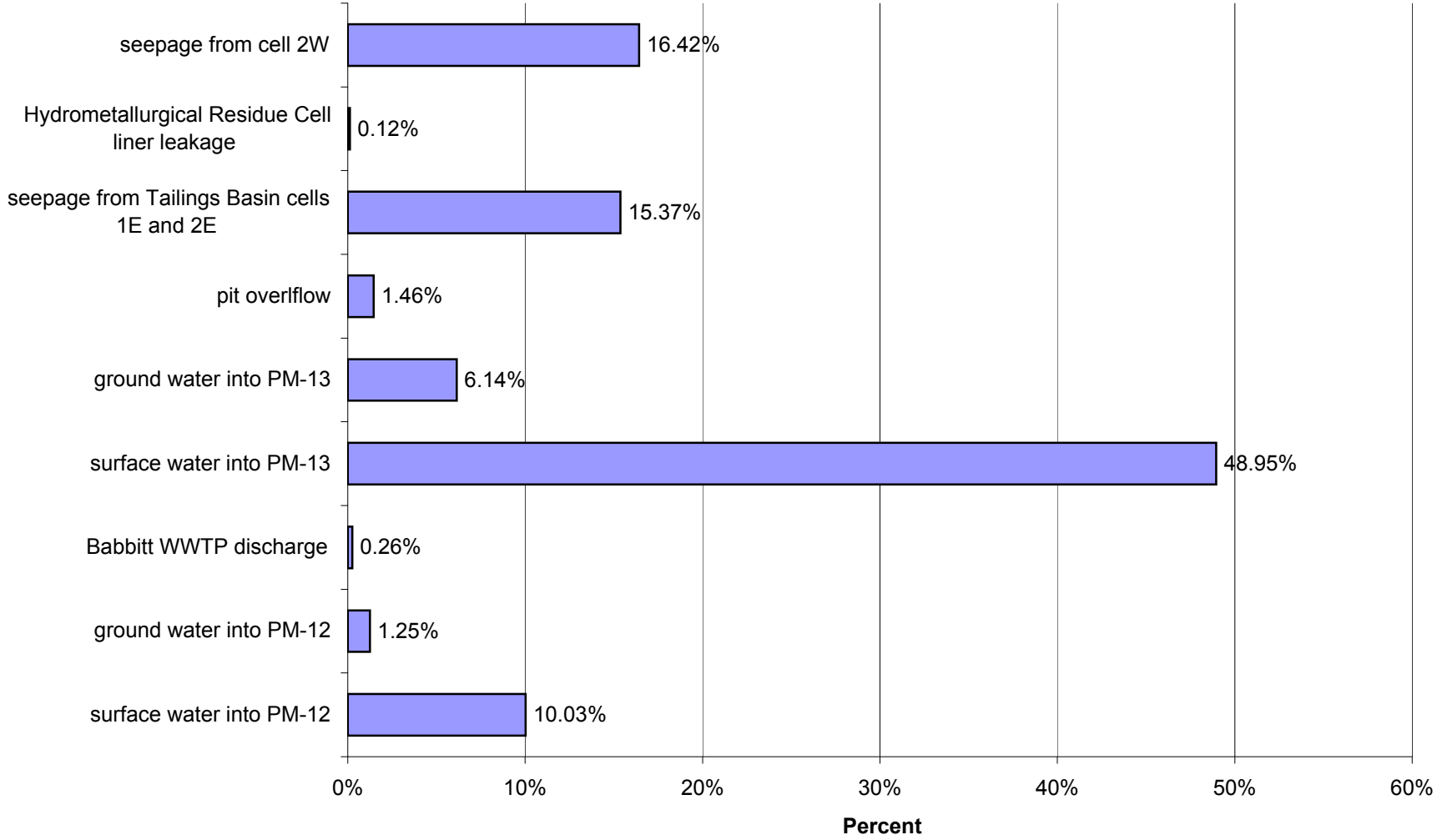
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 15 for Low Flow for Cobalt (Co)



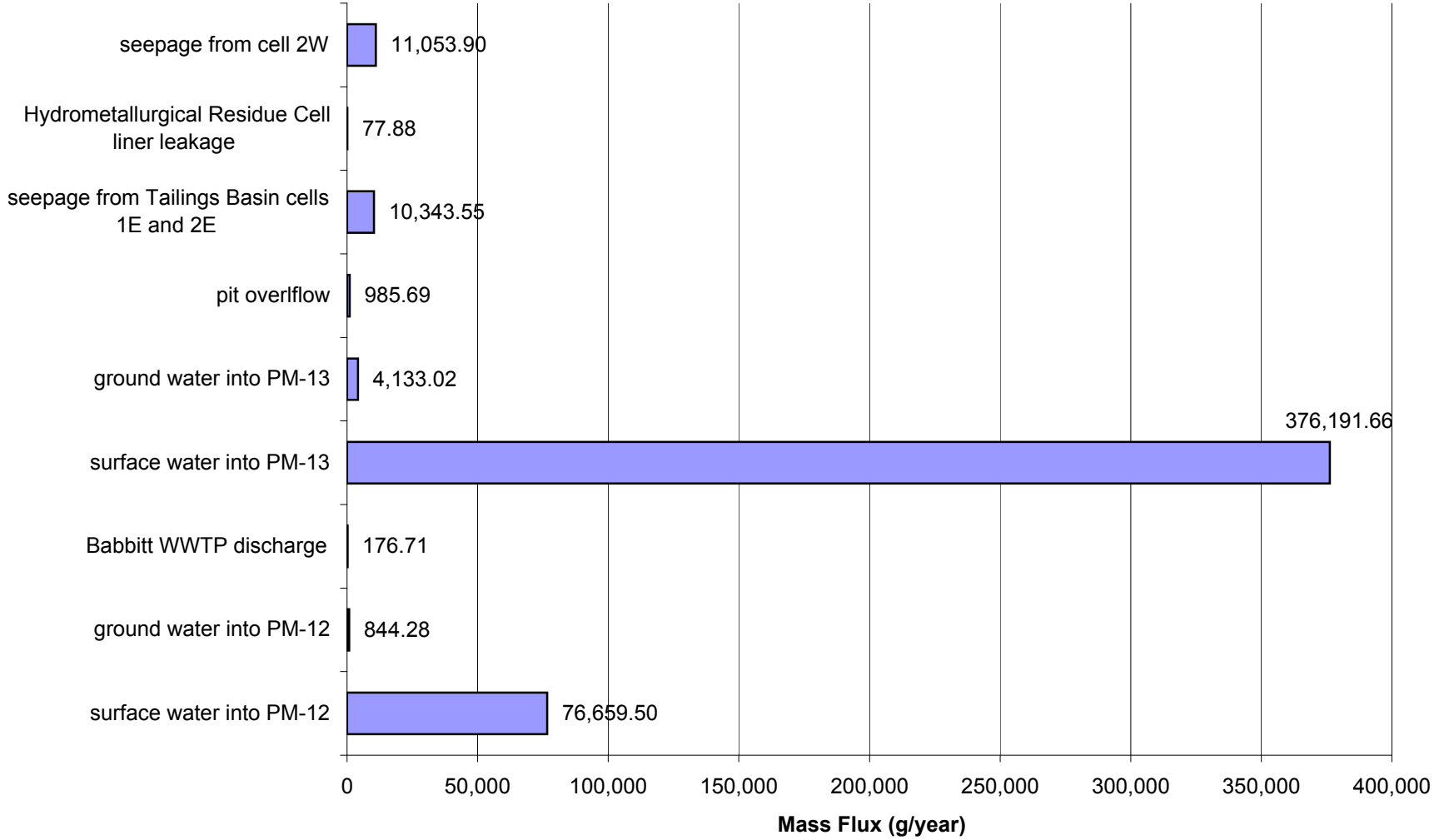
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for Average Flow for Cobalt (Co)



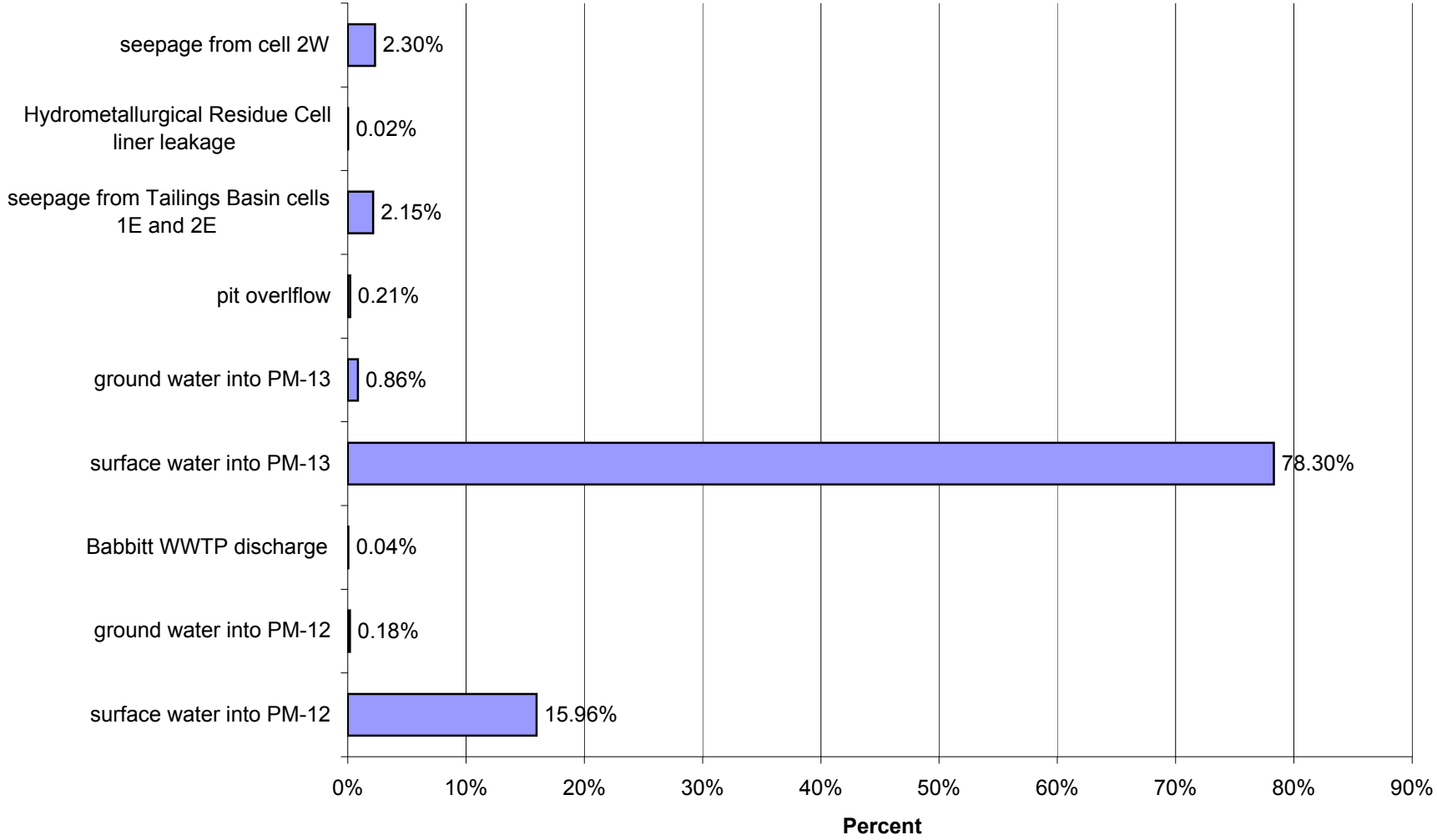
GeotechnicalMitigation: Percent of Impacts at PM-13 in Year 15 for Average Flow for Cobalt (Co)



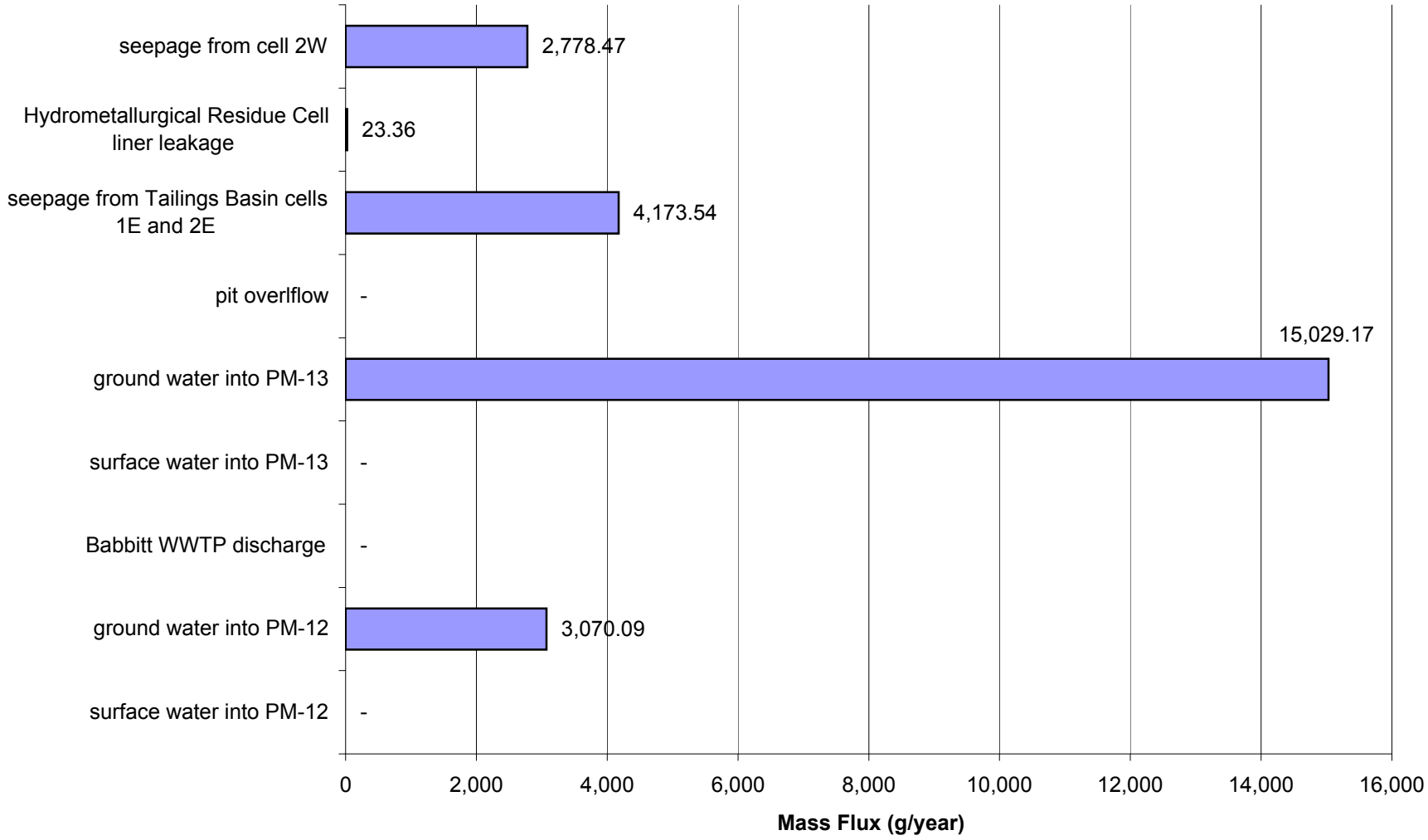
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for High Flow for Cobalt (Co)



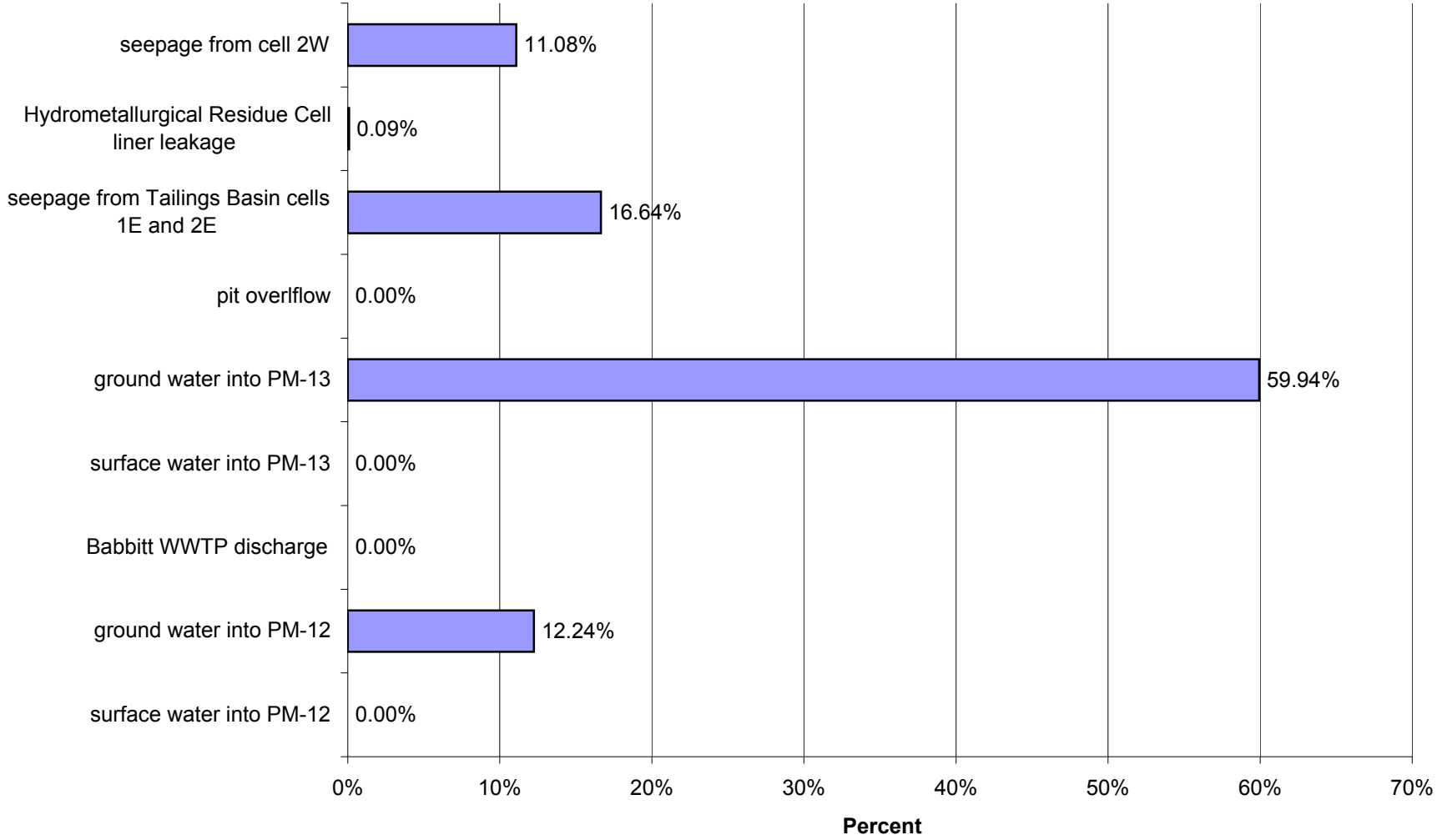
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 15 for High Flow for Cobalt (Co)



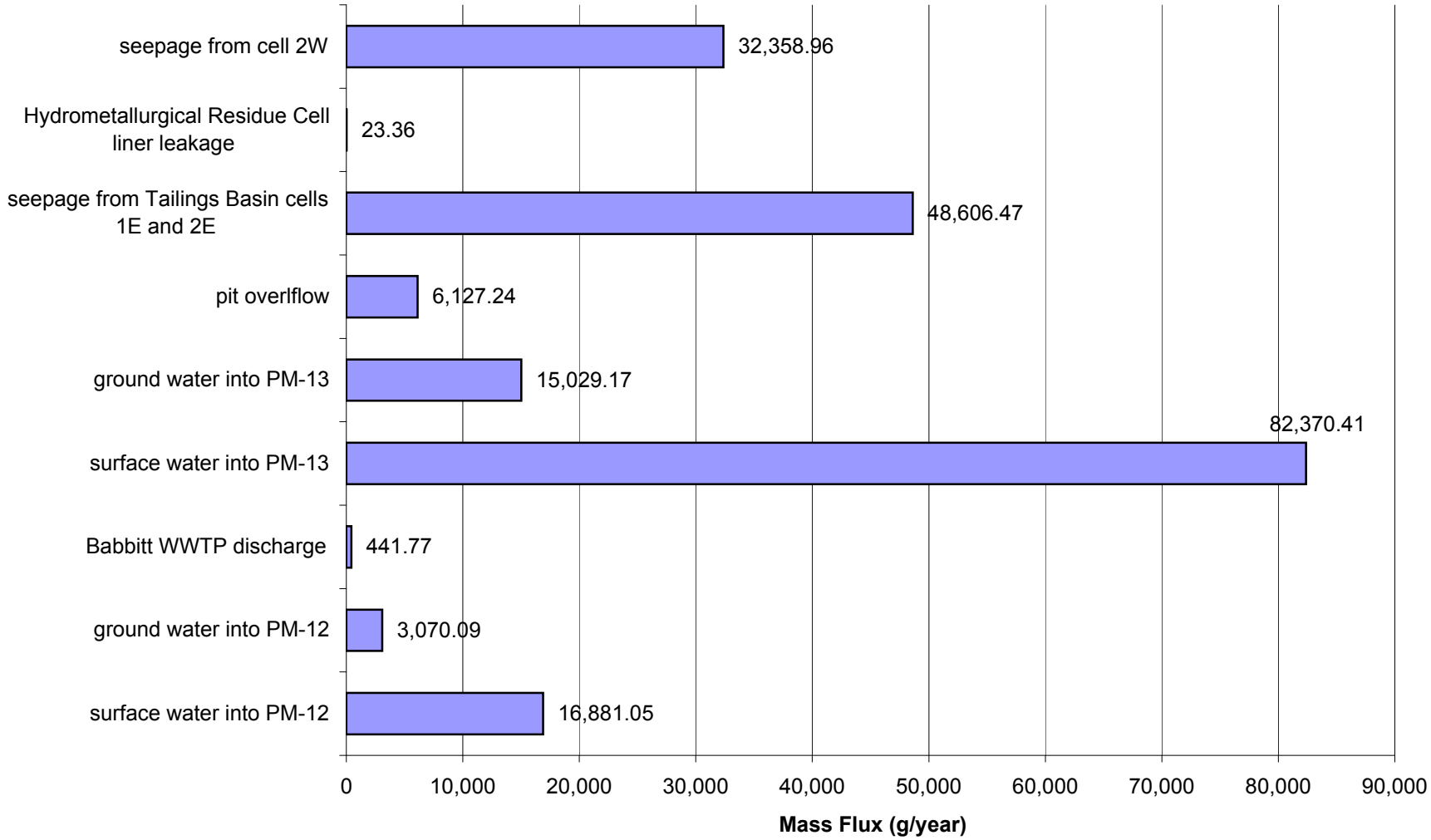
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for Low Flow for Copper (Cu)



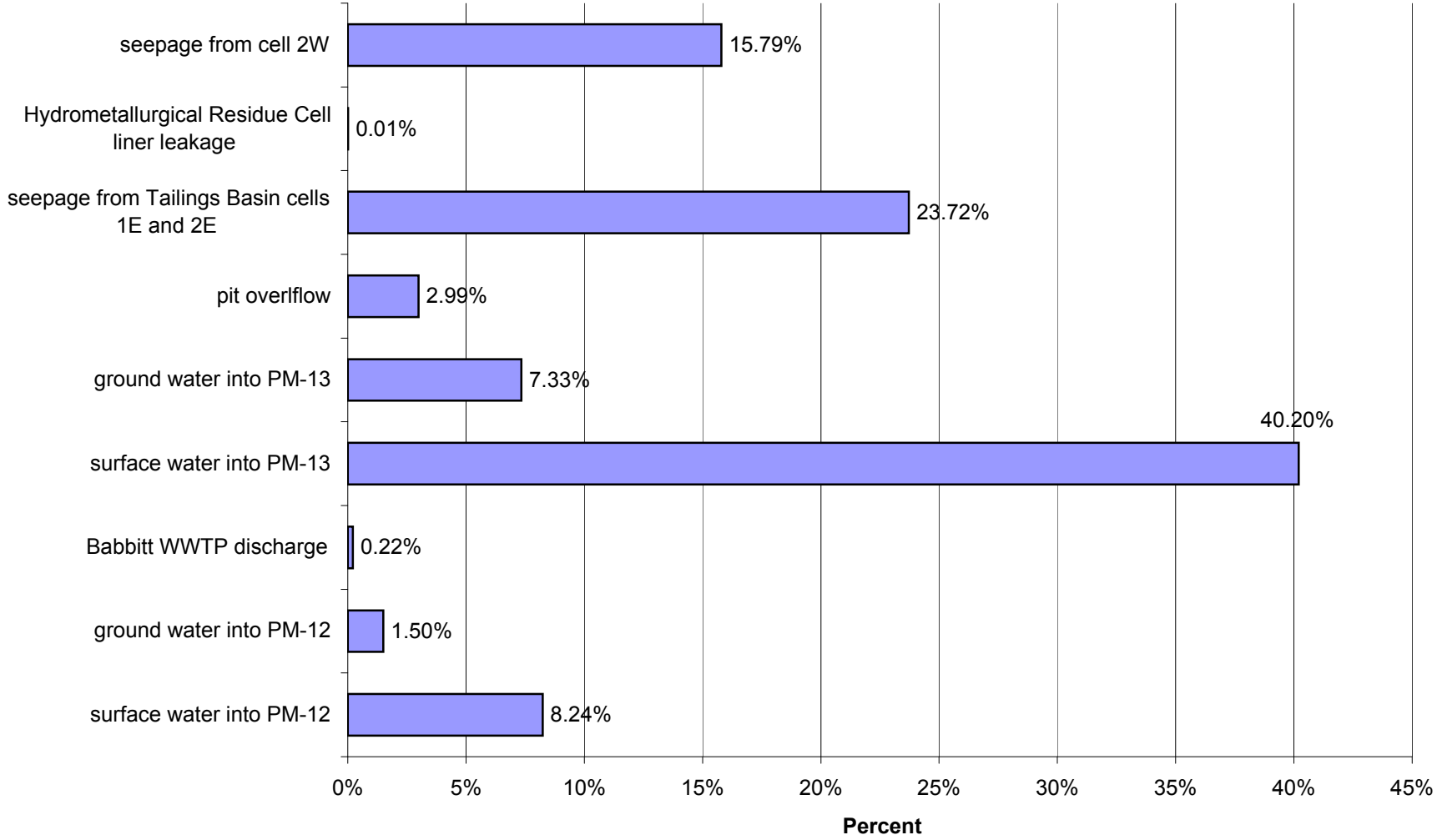
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 15 for Low Flow for Copper (Cu)



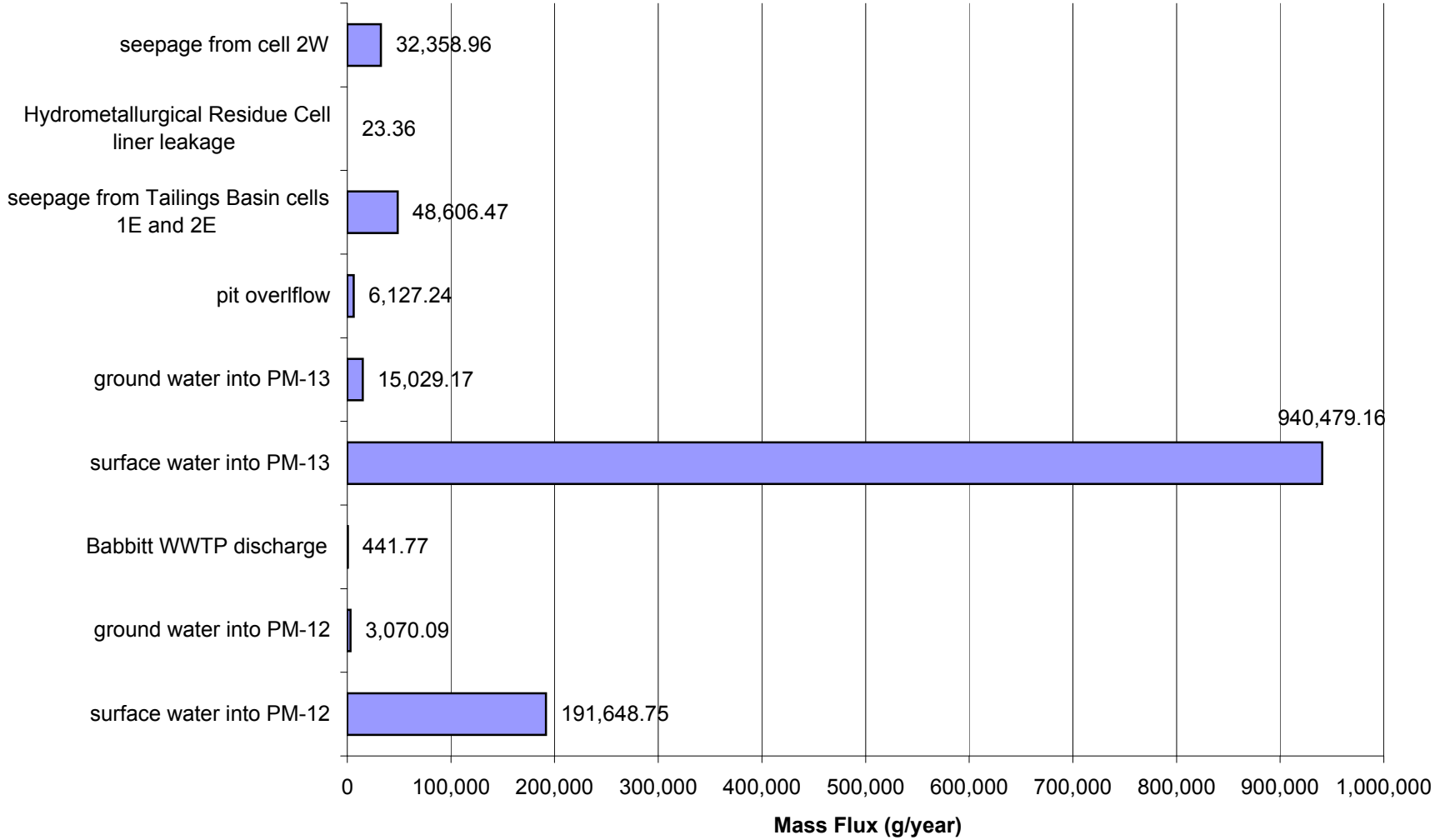
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for Average Flow for Copper (Cu)



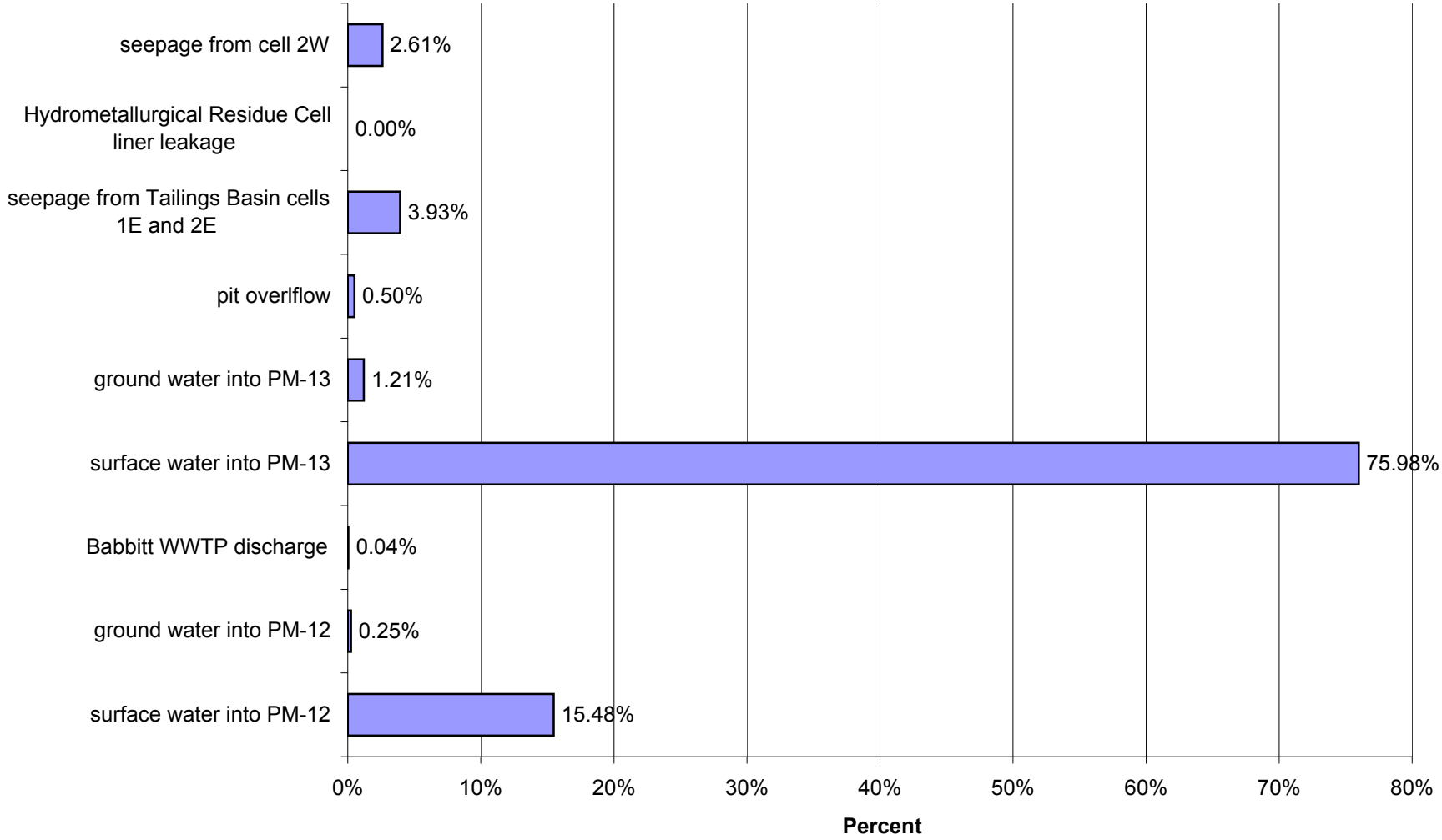
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 15 for Average Flow for Copper (Cu)



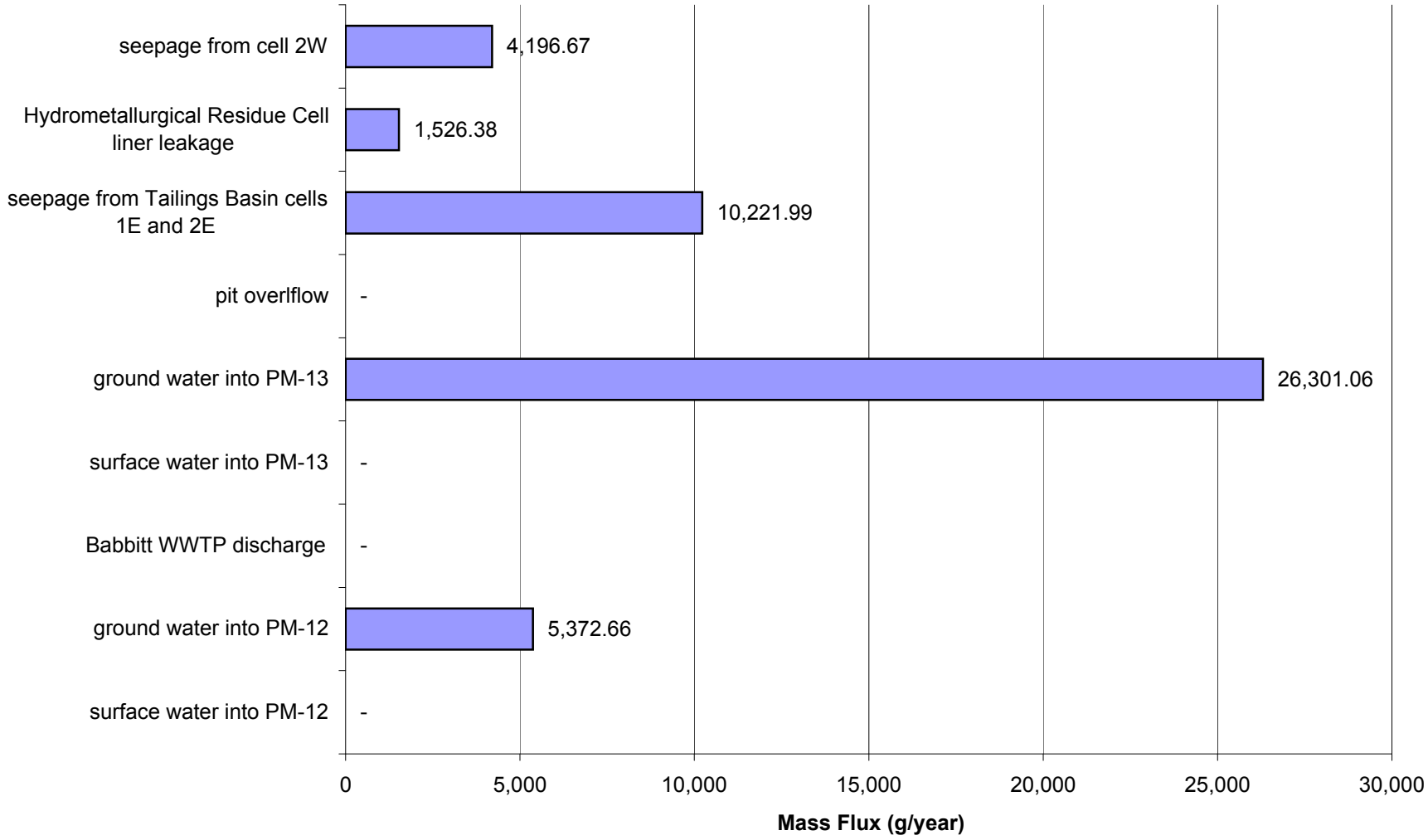
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for High Flow for Copper (Cu)



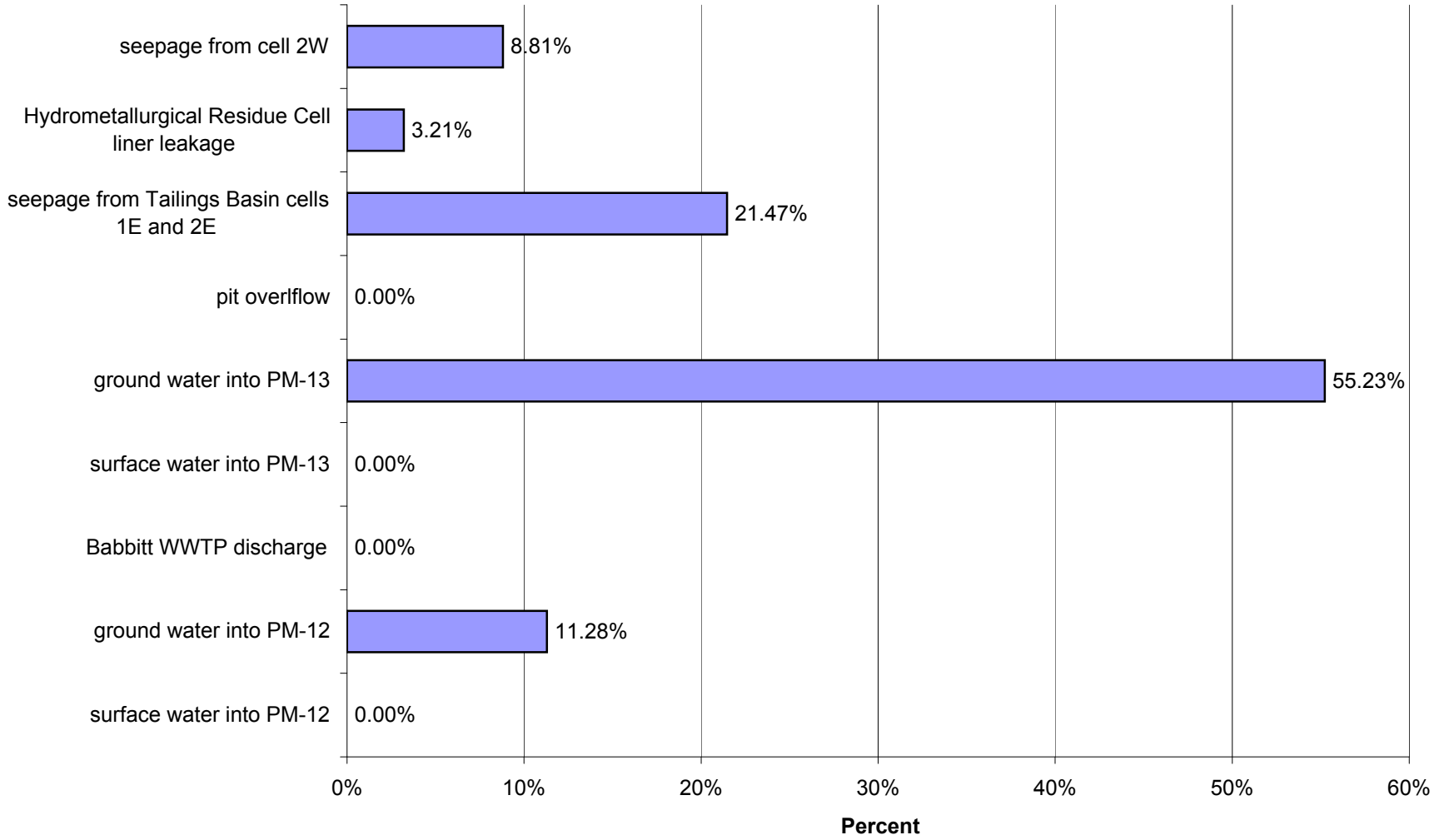
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 15 for High Flow for Copper (Cu)



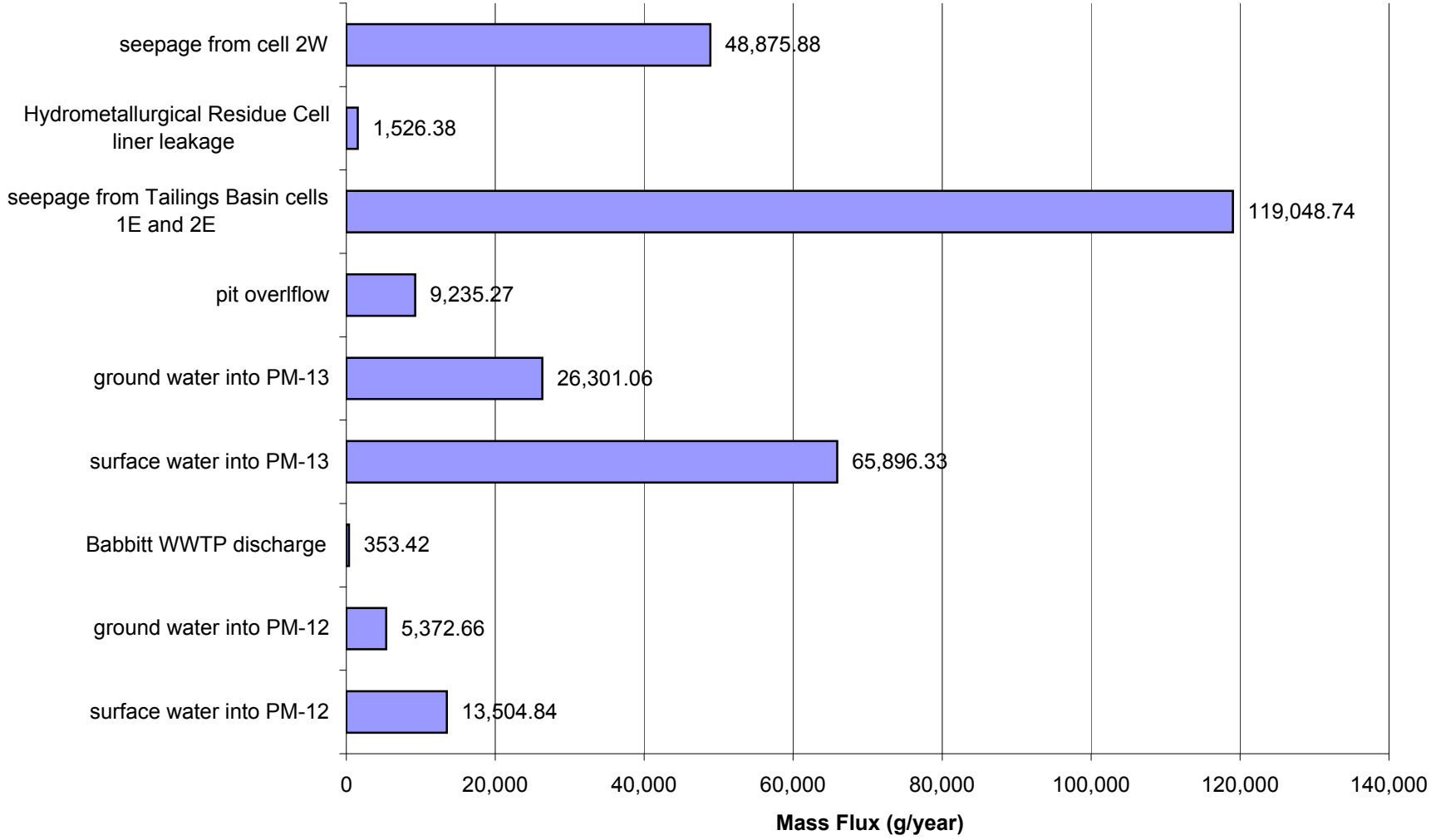
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for Low Flow for Nickel (Ni)



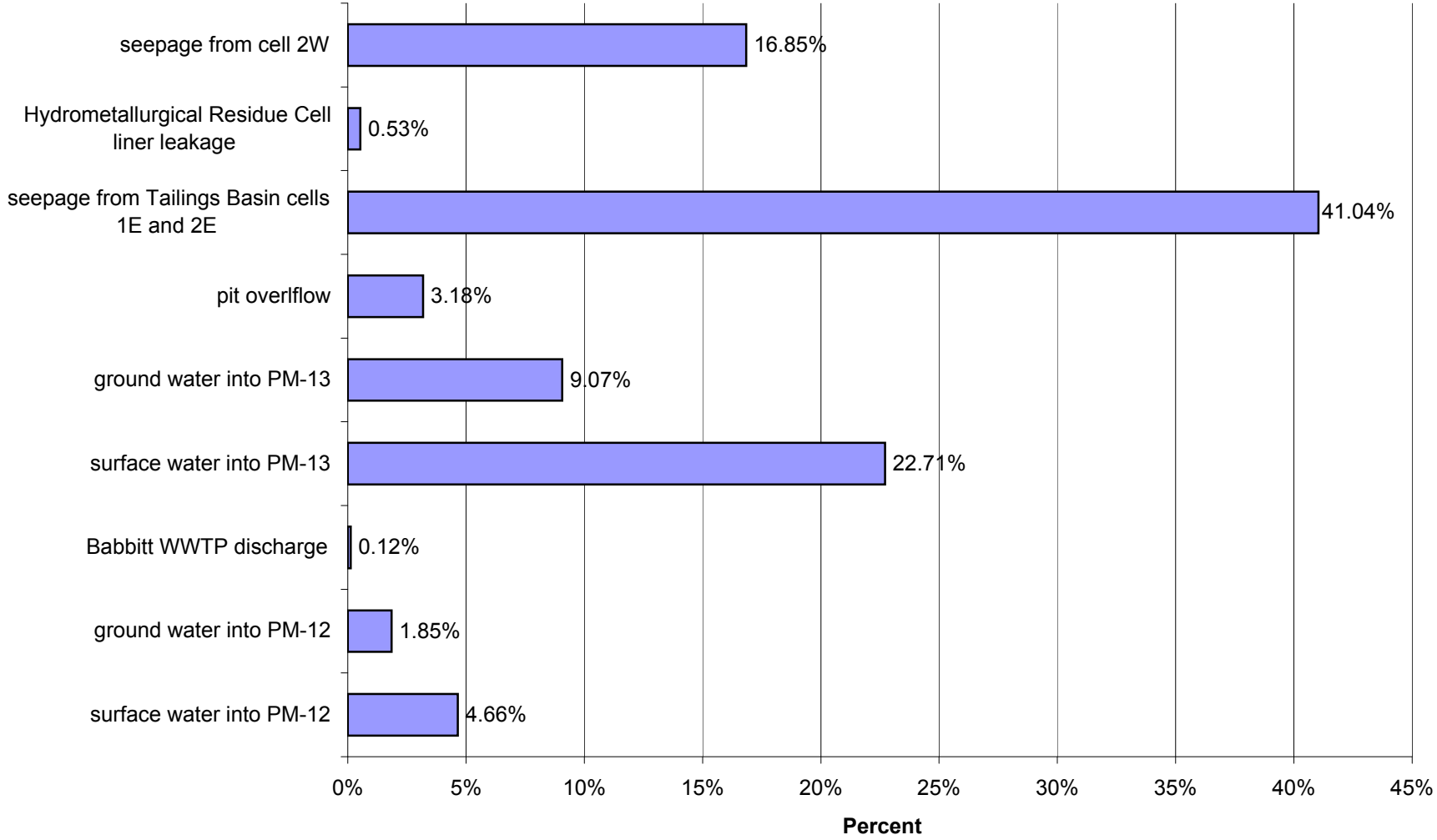
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 15 for Low Flow for Nickel (Ni)



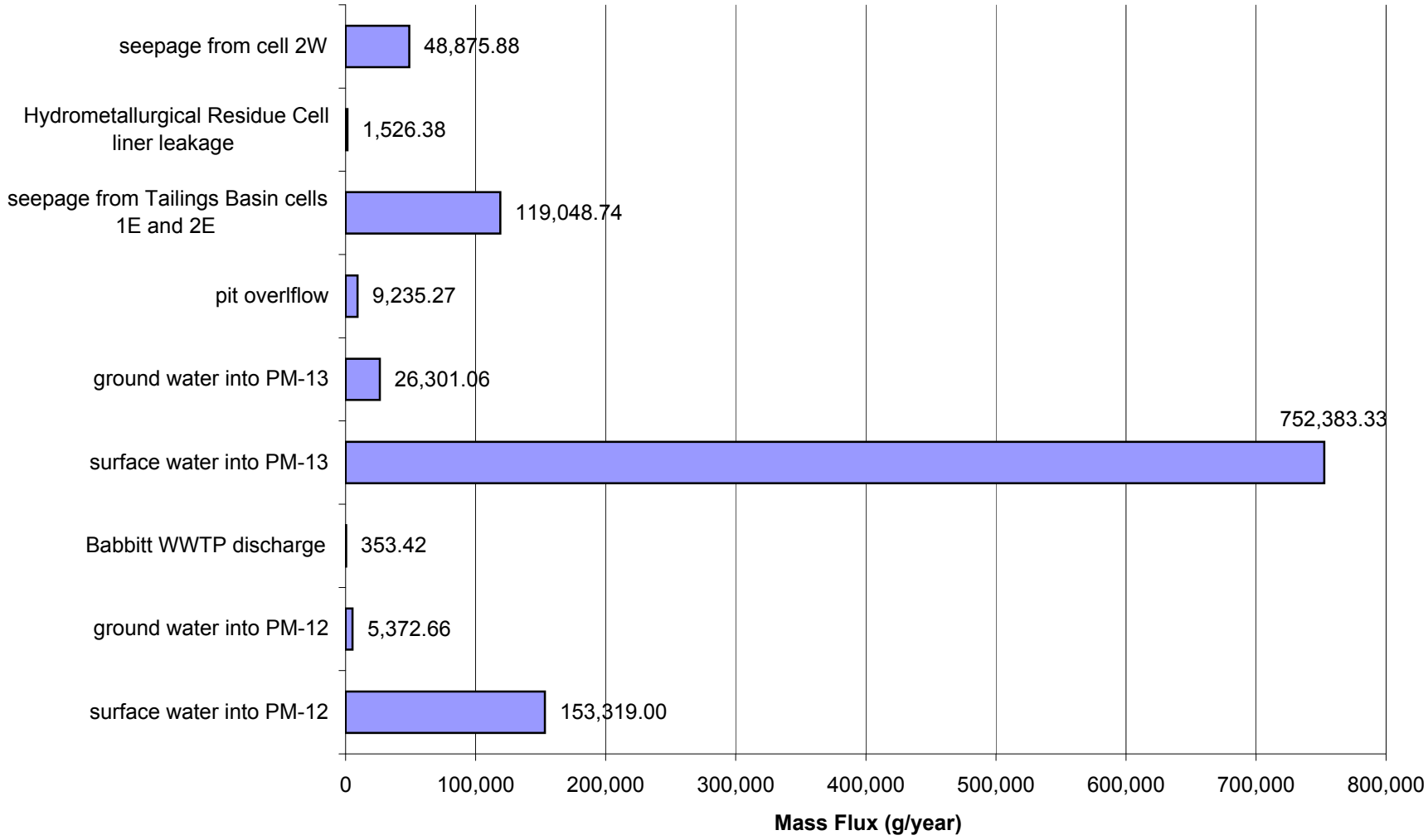
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for Average Flow for Nickel (Ni)



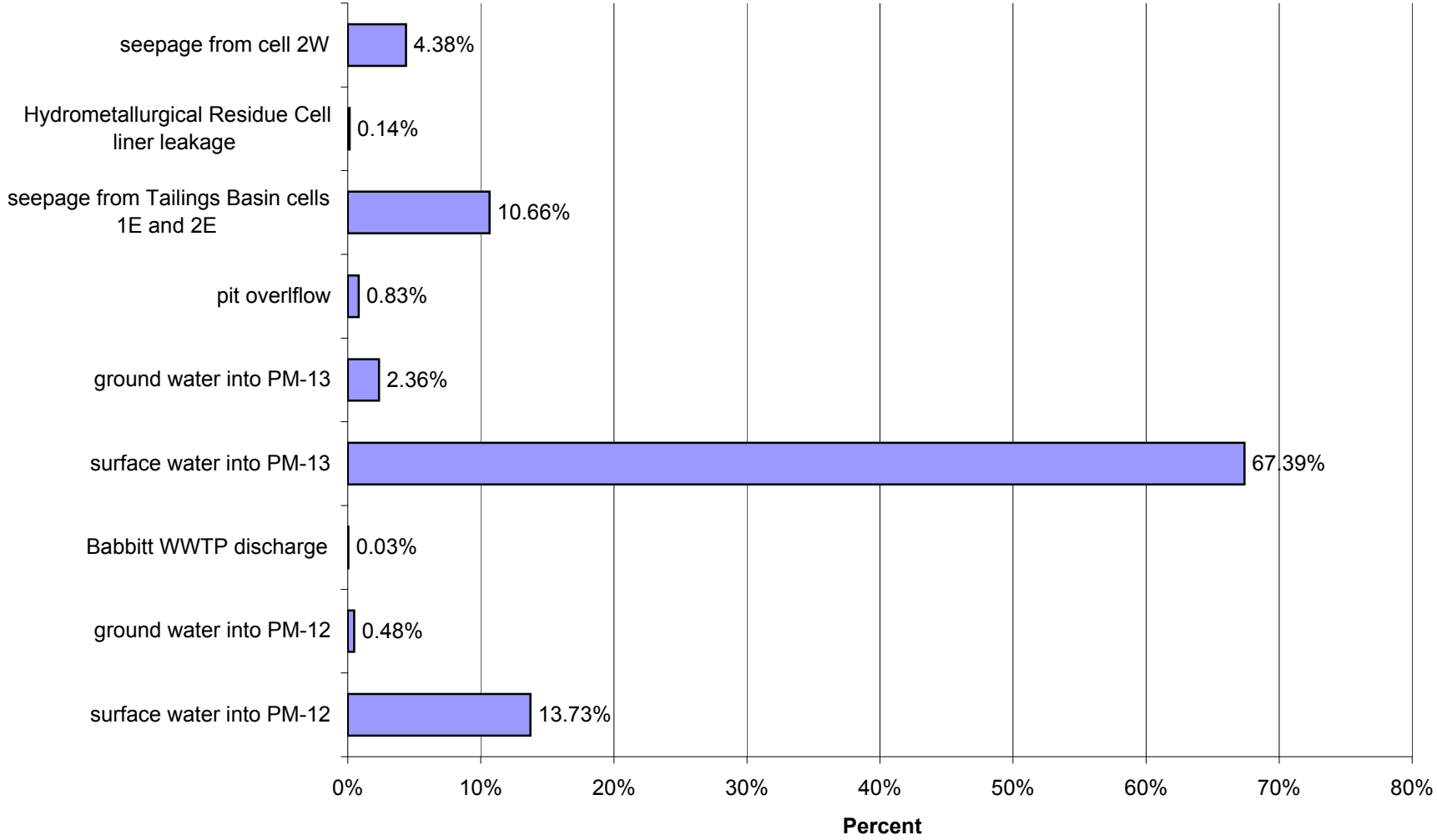
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 15 for Average Flow for Nickel (Ni)



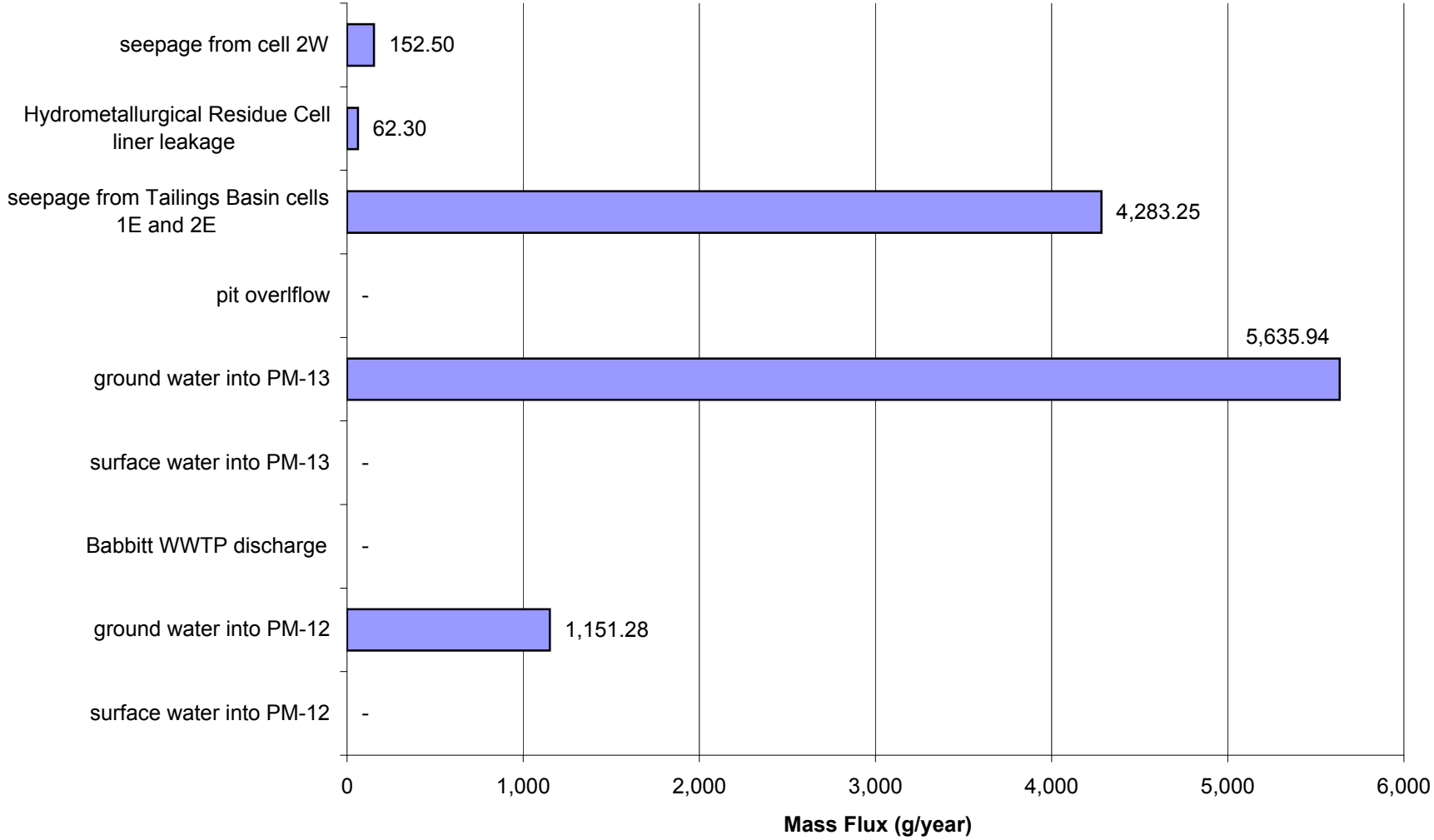
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for High Flow for Nickel (Ni)



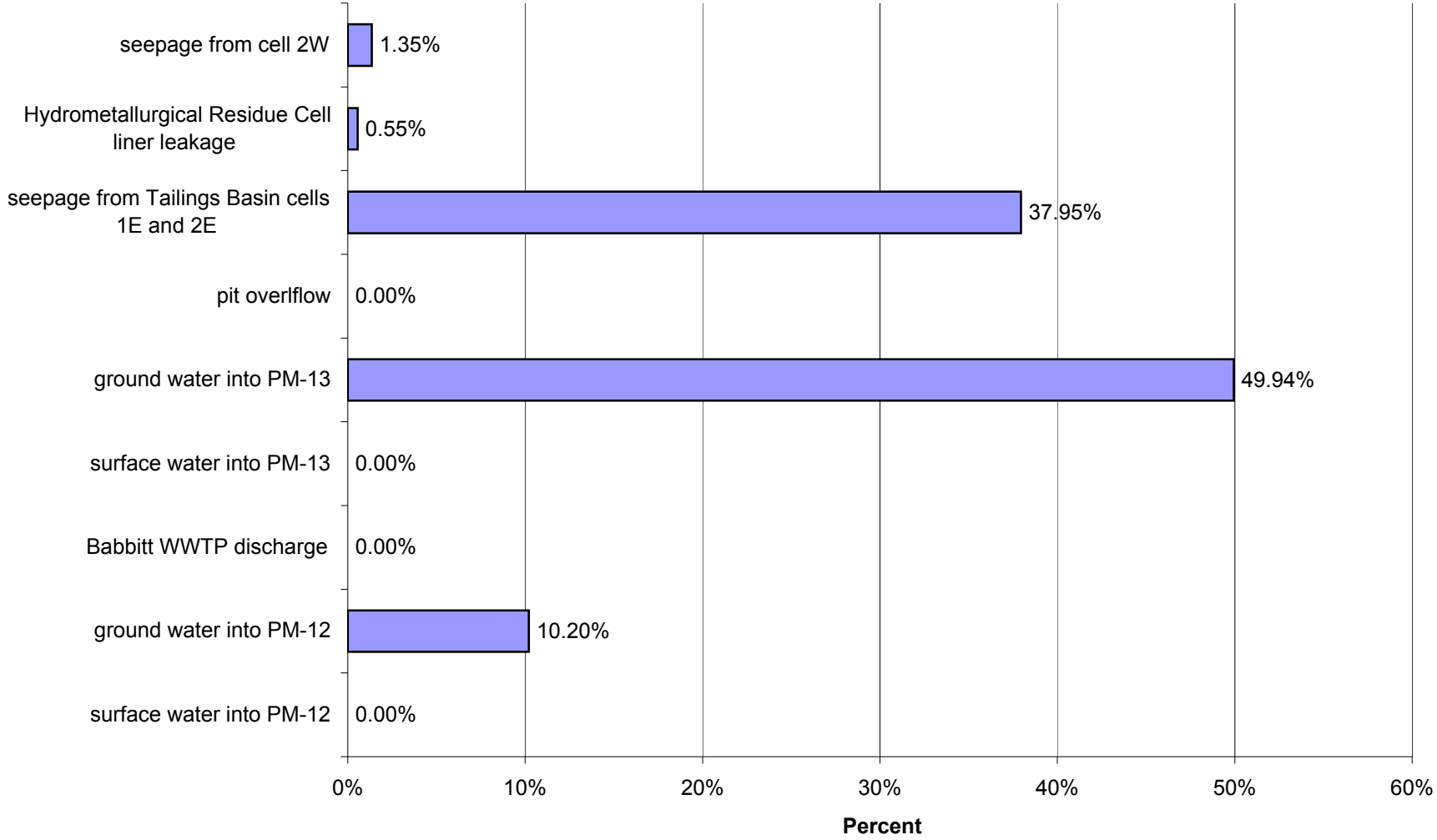
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 15 for High Flow for Nickel (Ni)



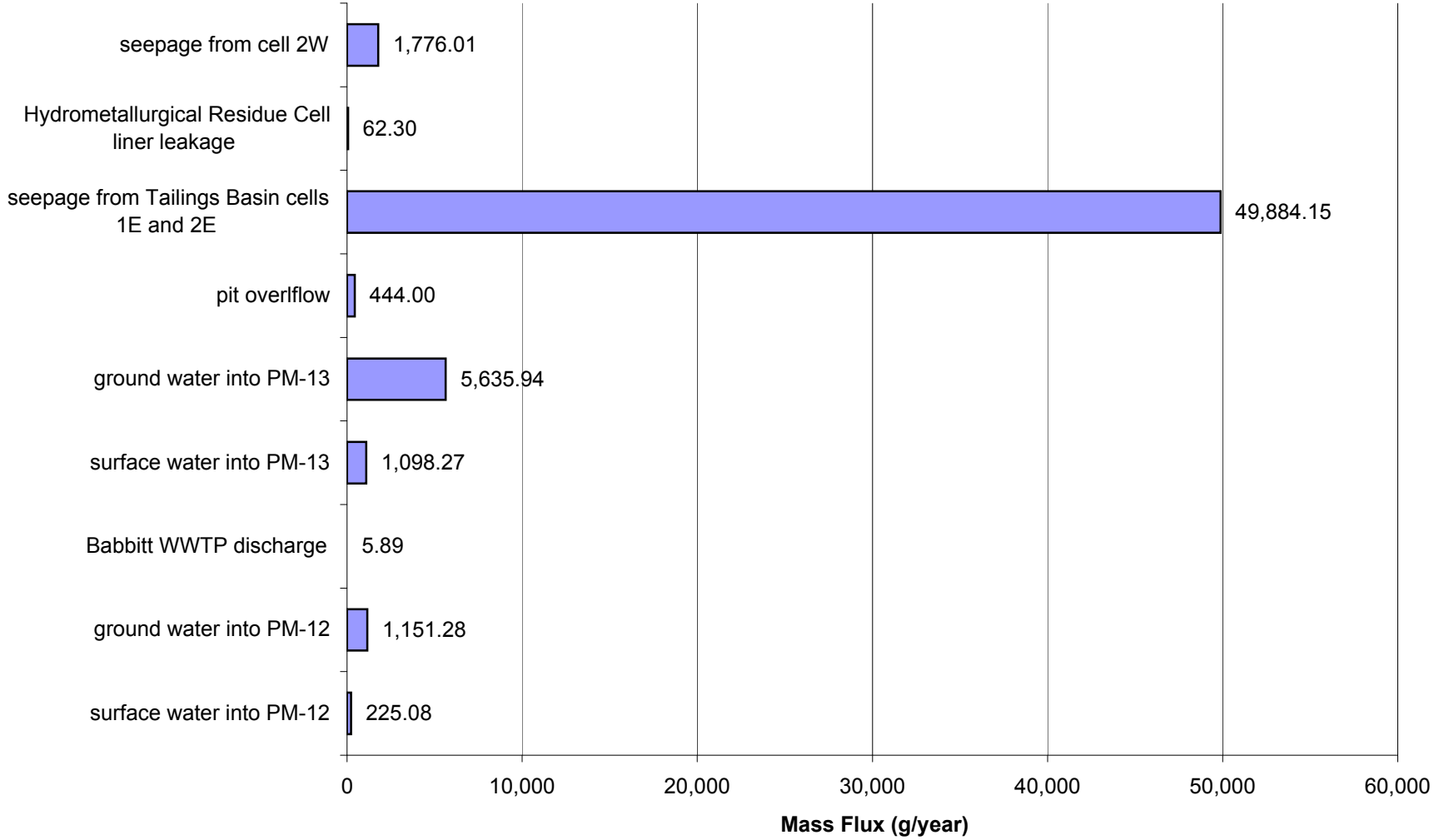
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for Low Flow for Antimony (Sb)



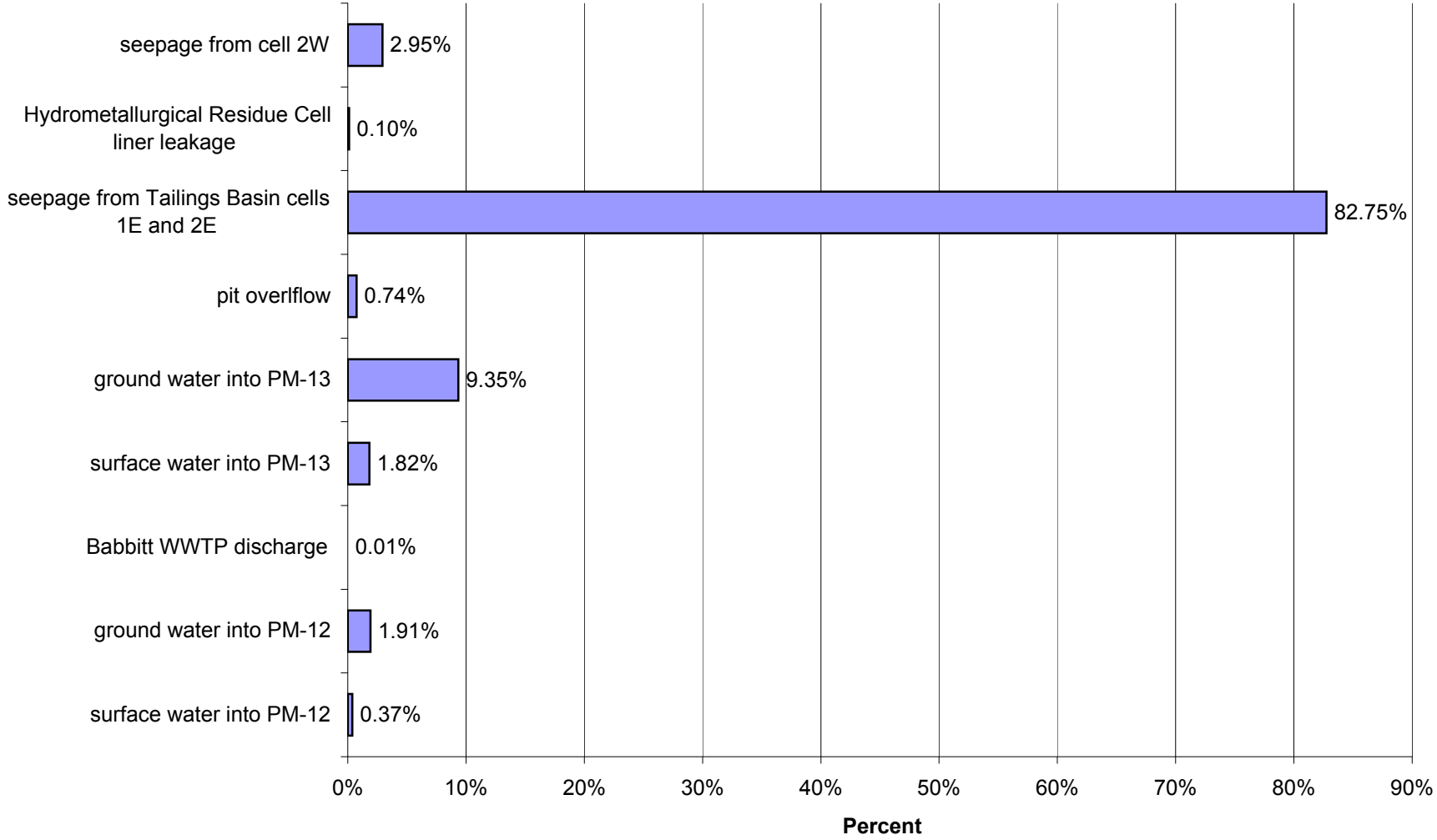
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 15 for Low Flow for Antimony (Sb)



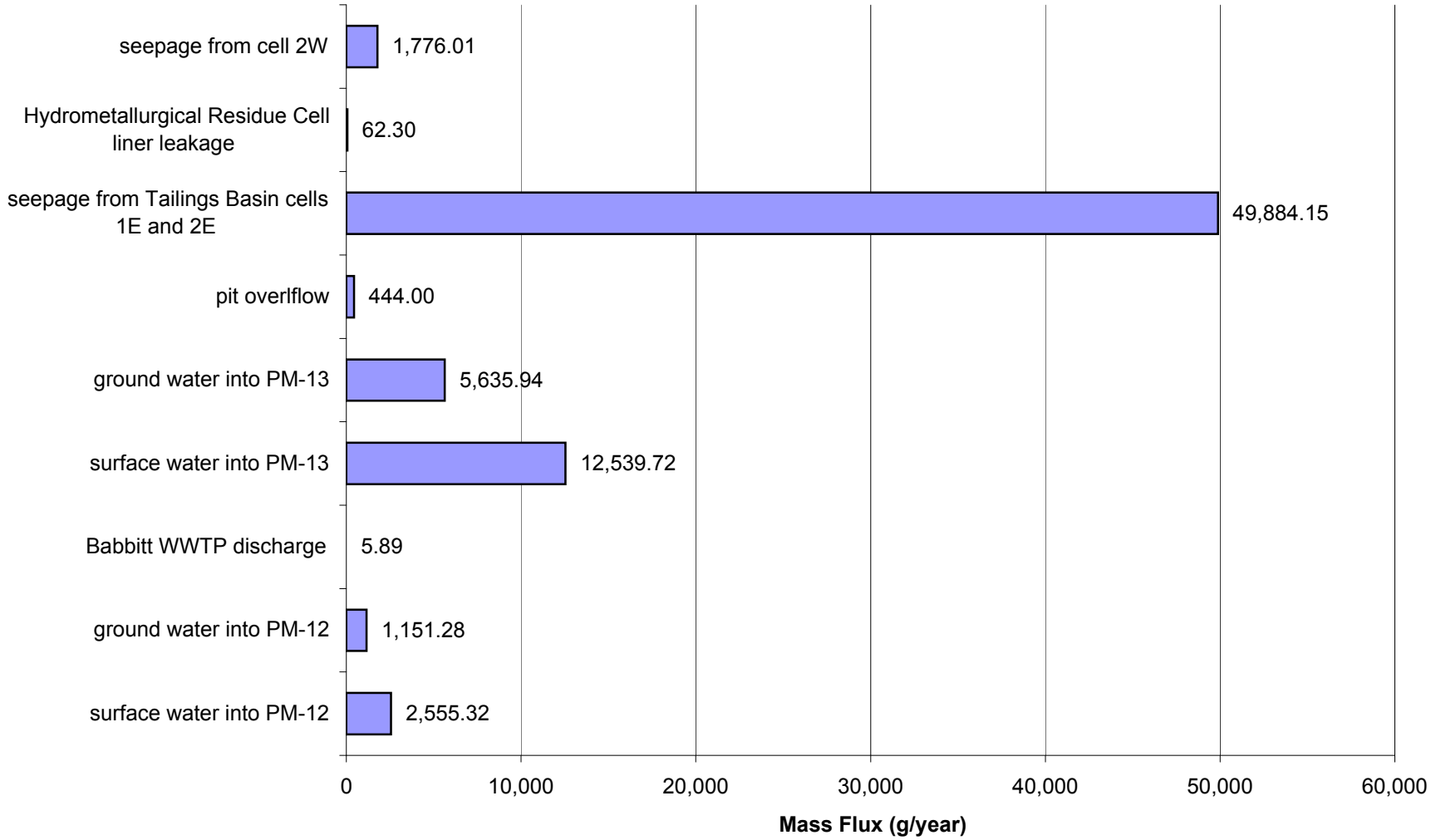
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for Average Flow for Antimony (Sb)



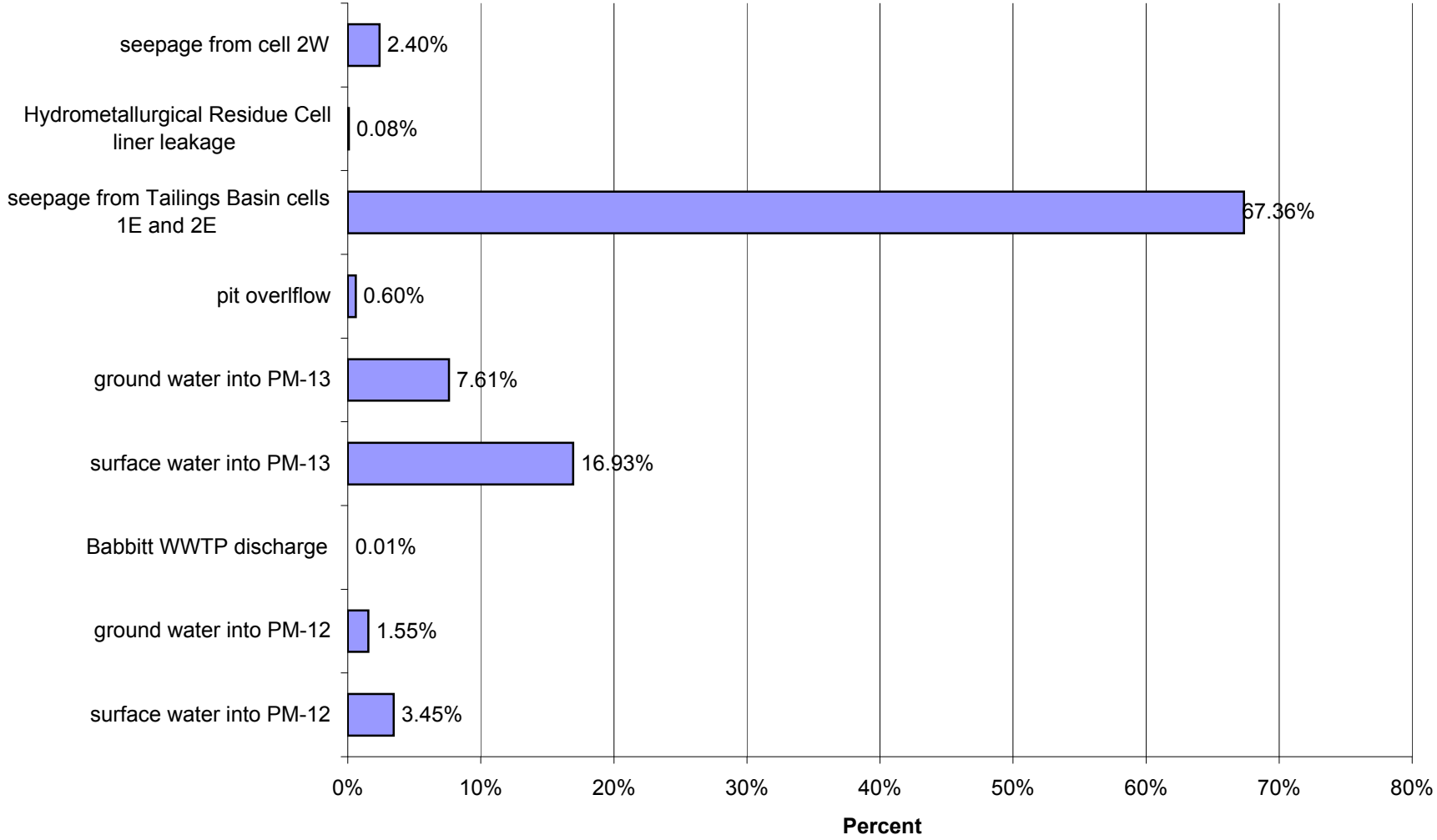
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 15 for Average Flow for Antimony (Sb)



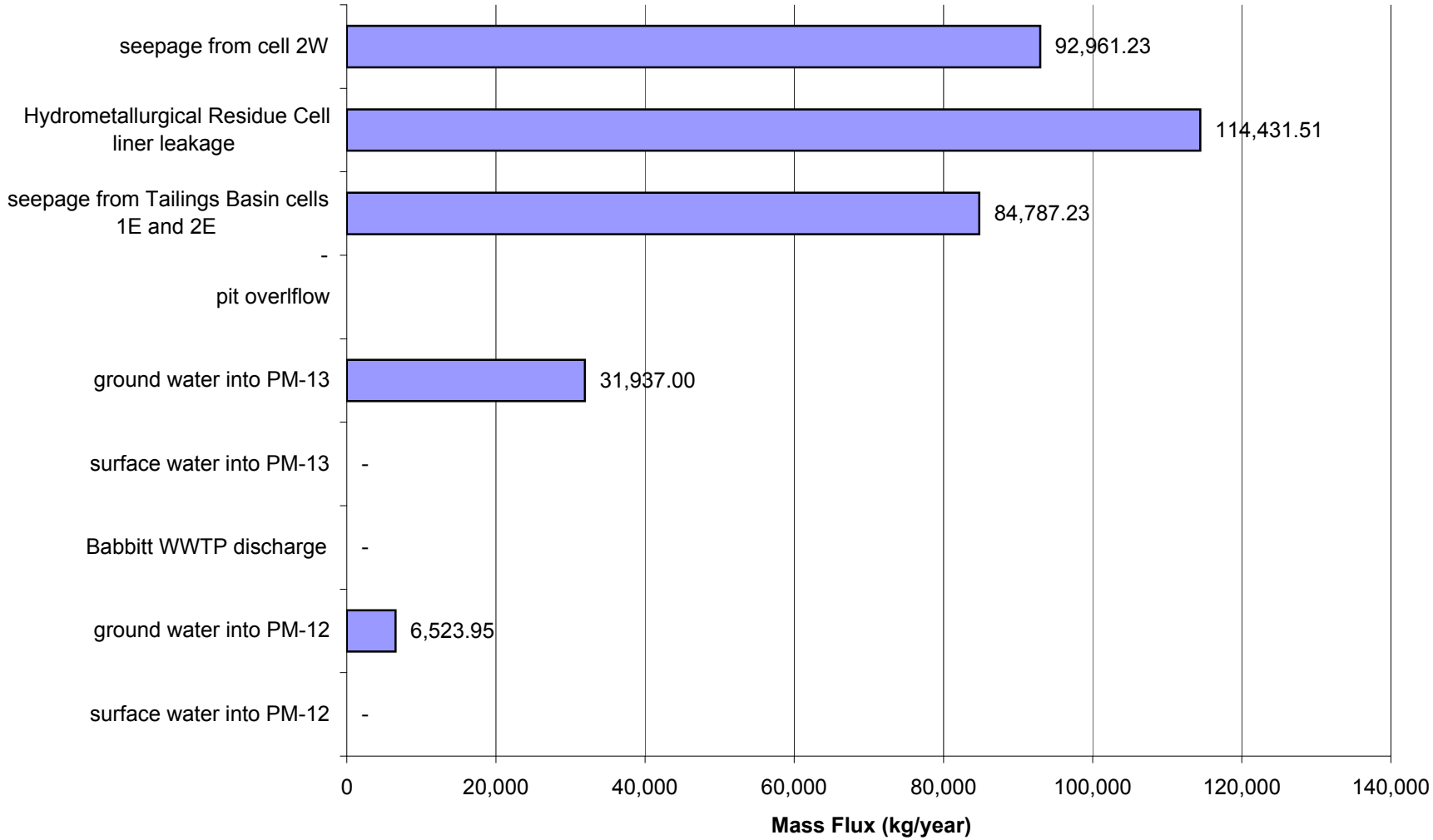
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 15 for High Flow for Antimony (Sb)



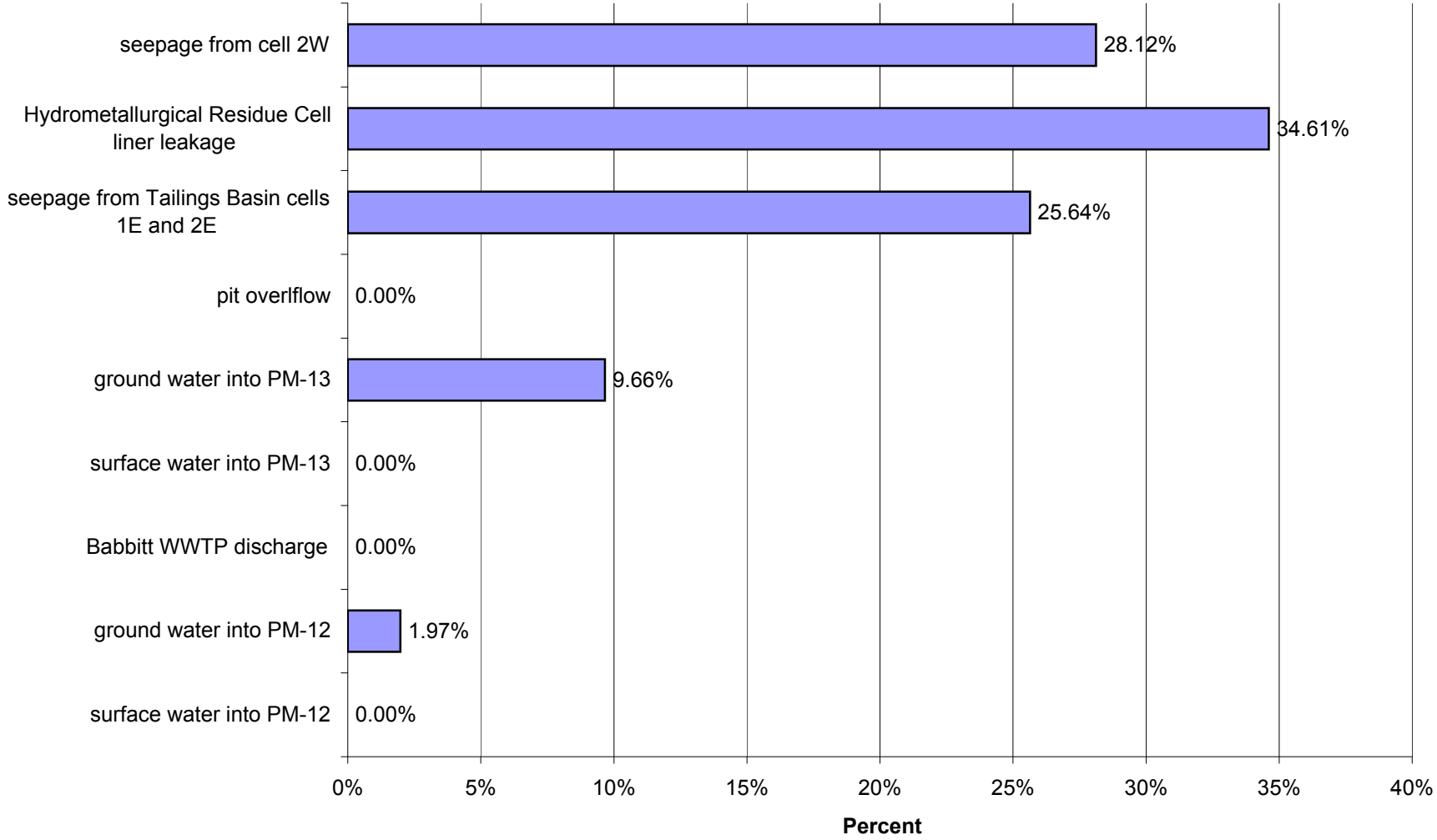
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 15 for High Flow for Antimony (Sb)



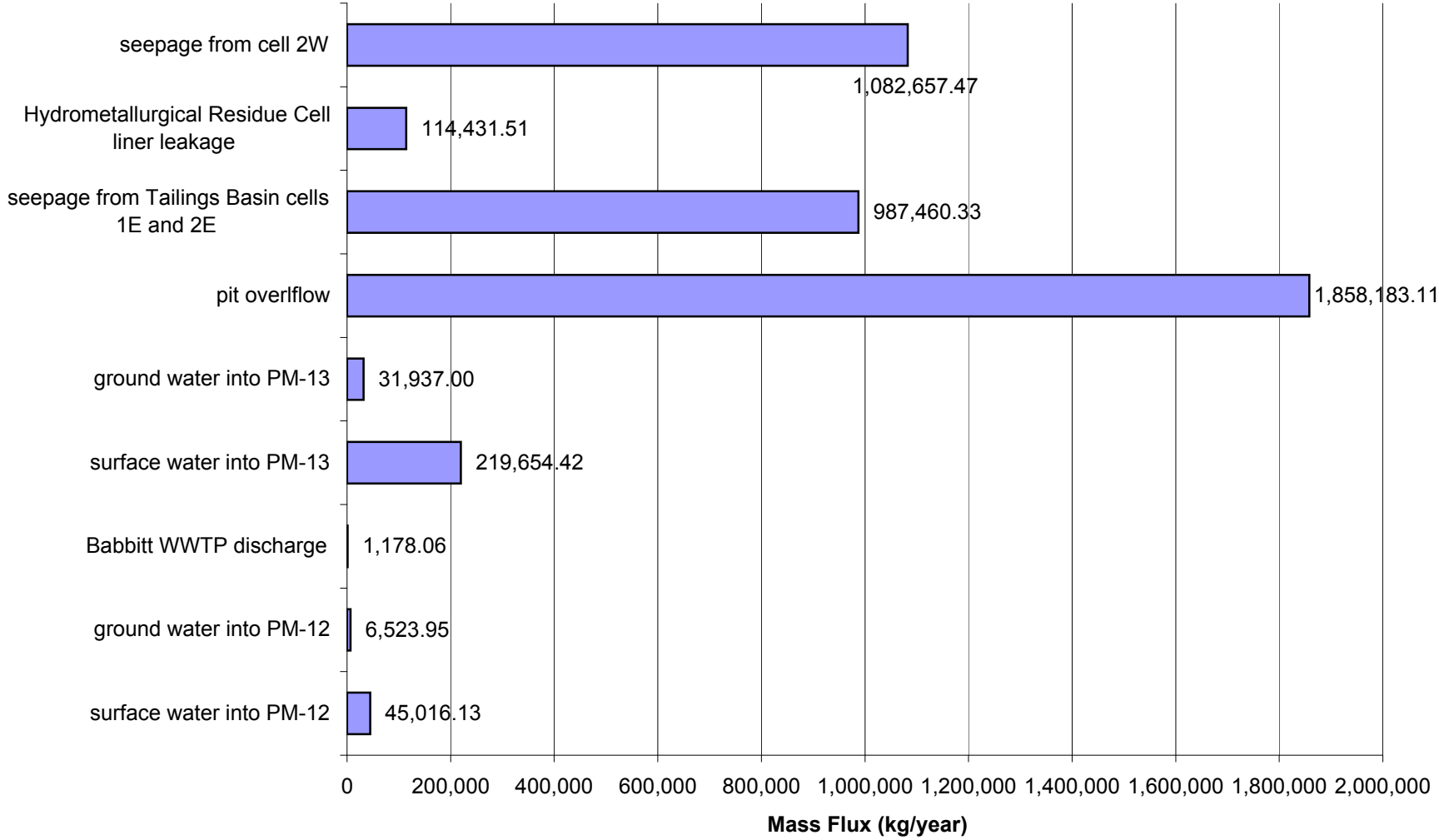
Geotechnical Mitigation: Mass Flux (kg/year) of Impacts at PM-13 in Year 15 for Low Flow for Sulfate (SO_4)



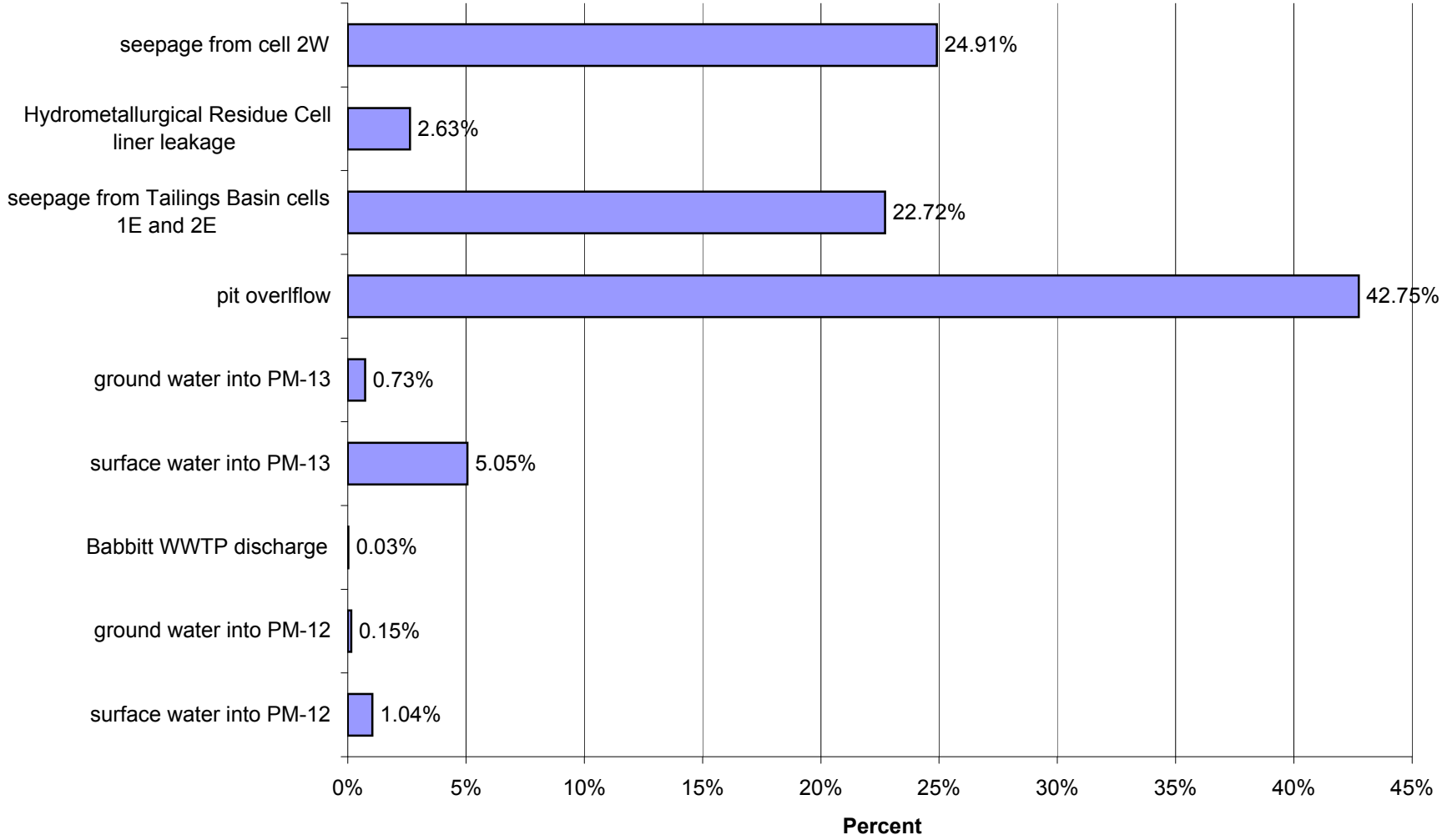
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 15 for Low Flow for Sulfate (SO_4)



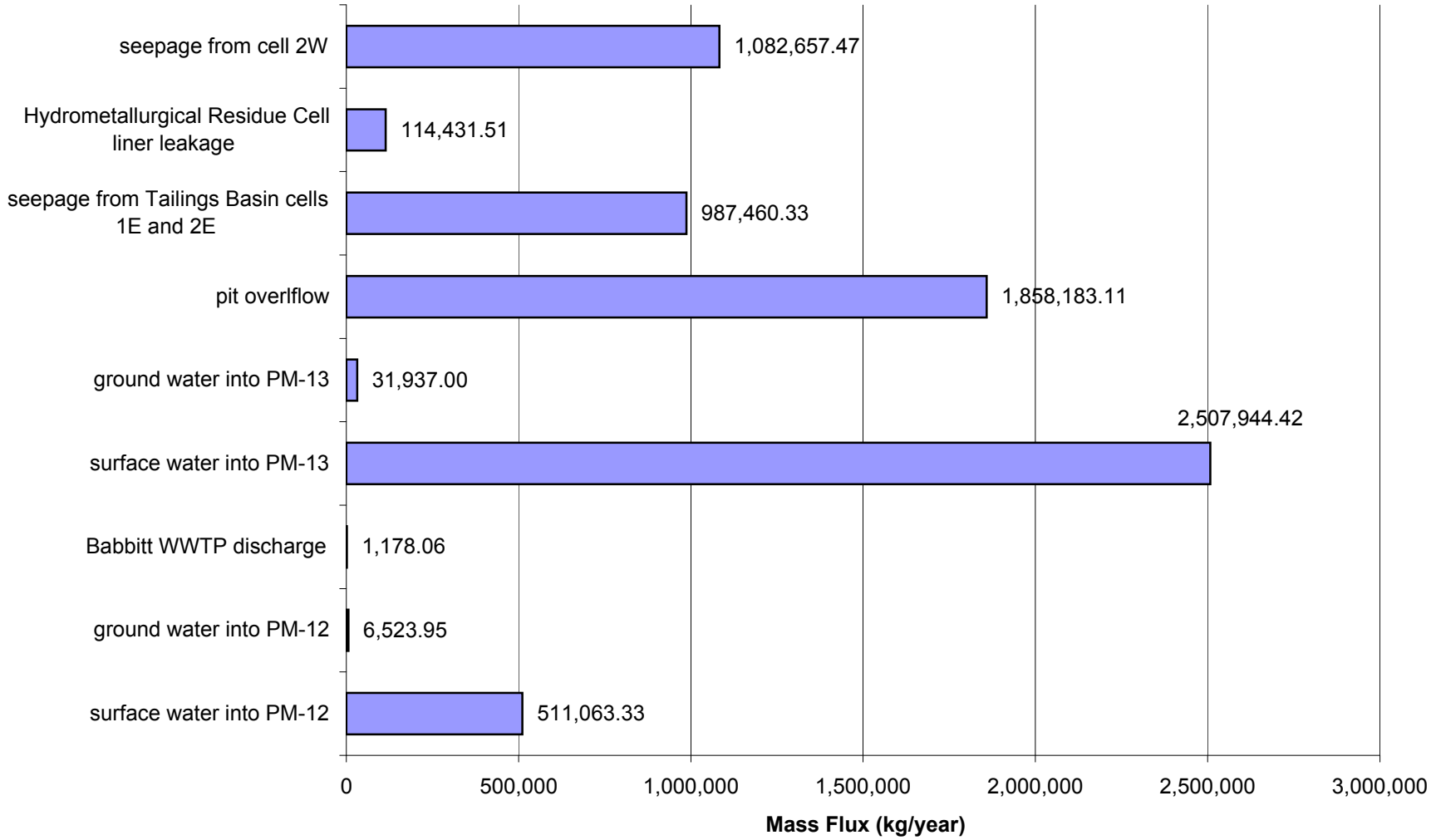
Geotechnical Mitigation: Mass Flux (kg/year) of Impacts at PM-13 in Year 15 for Average Flow for Sulfate (SO_4)



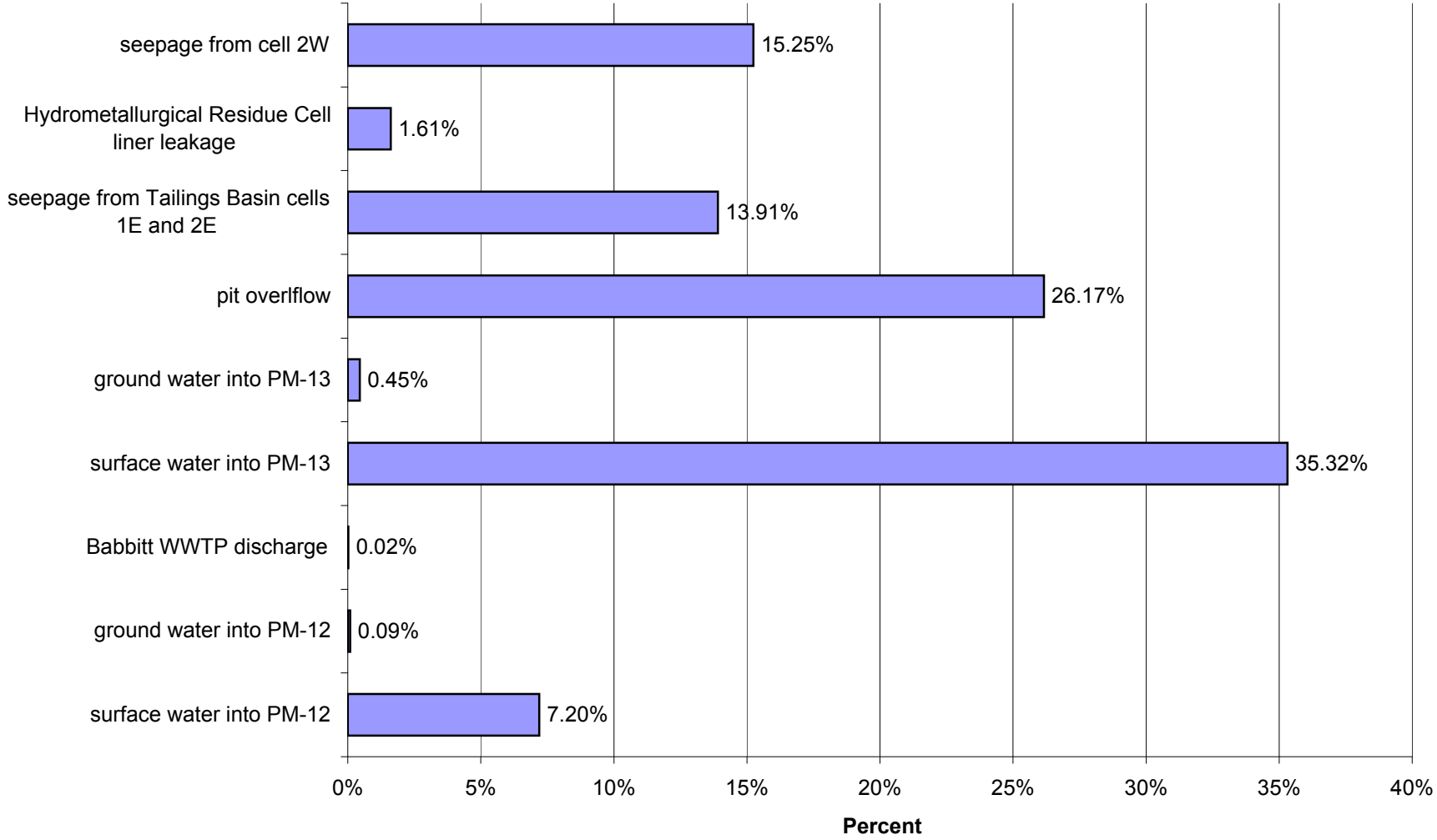
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 15 for Average Flow for Sulfate (SO_4)



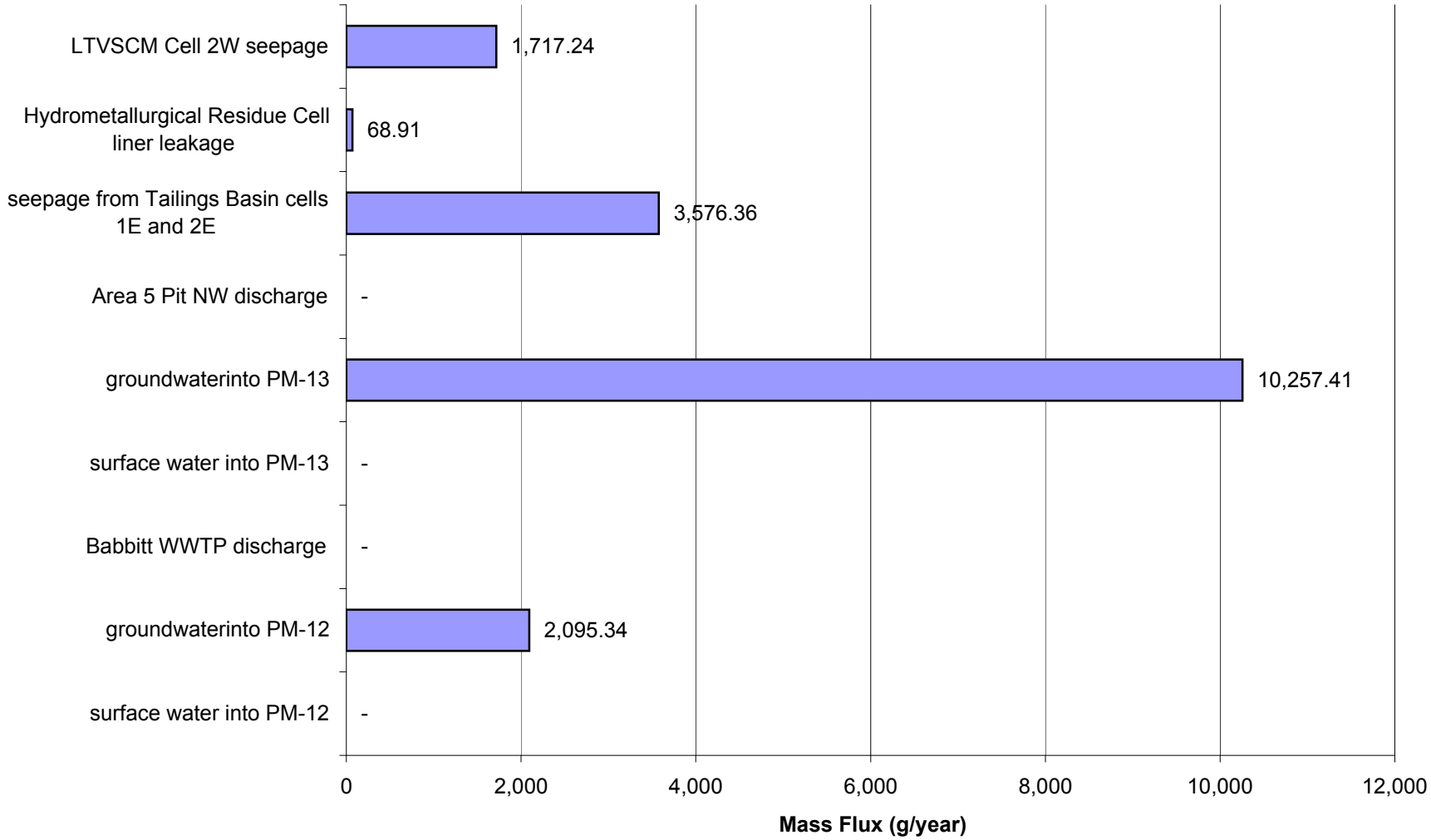
Geotechnical Mitigation: Mass Flux (kg/year) of Impacts at PM-13 in Year 15 for High Flow for Sulfate (SO_4)



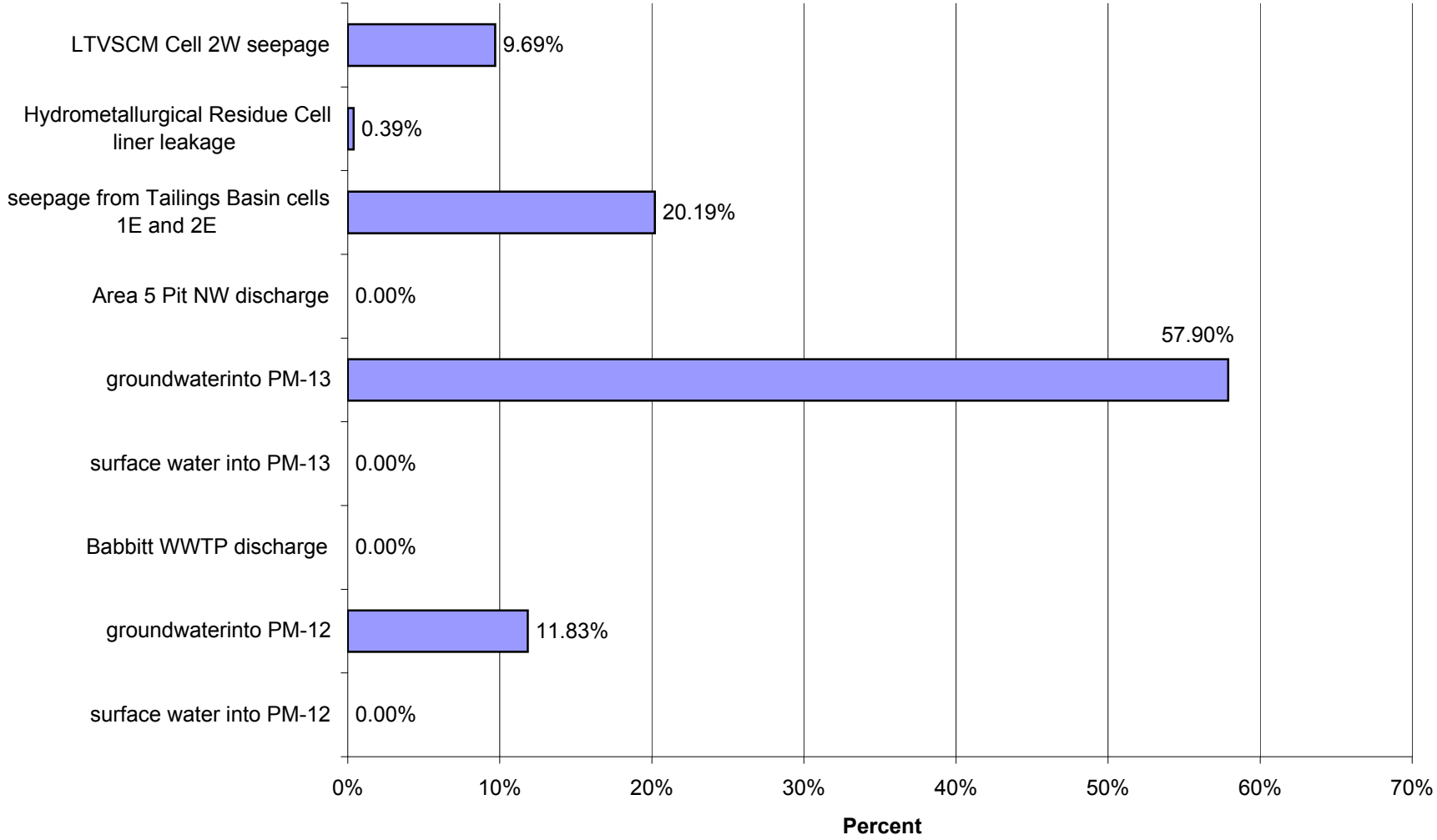
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 15 for High Flow for Sulfate (SO_4)



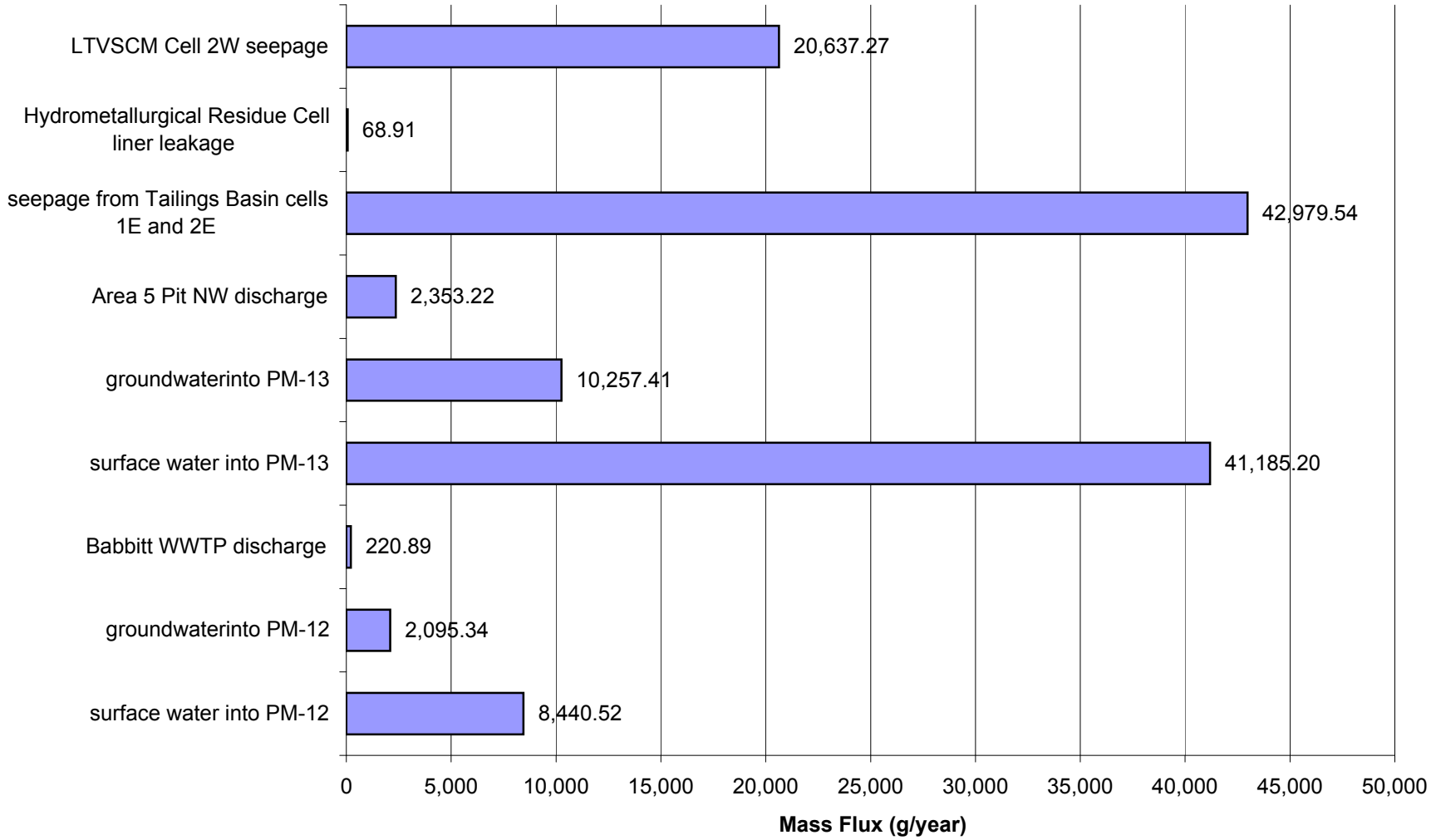
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for Low Flow for Arsenic (As)



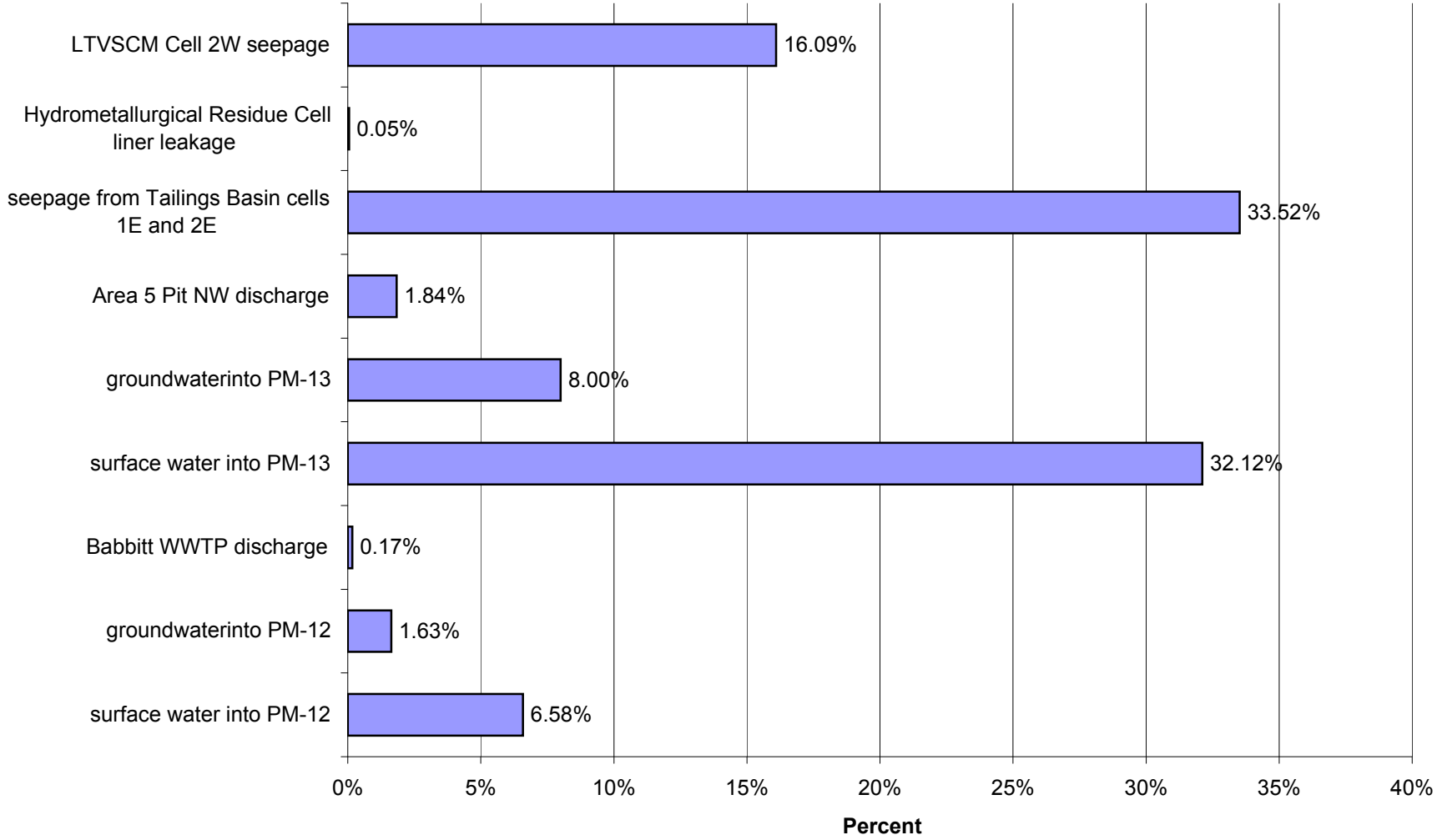
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 20 for Low Flow for Arsenic (As)



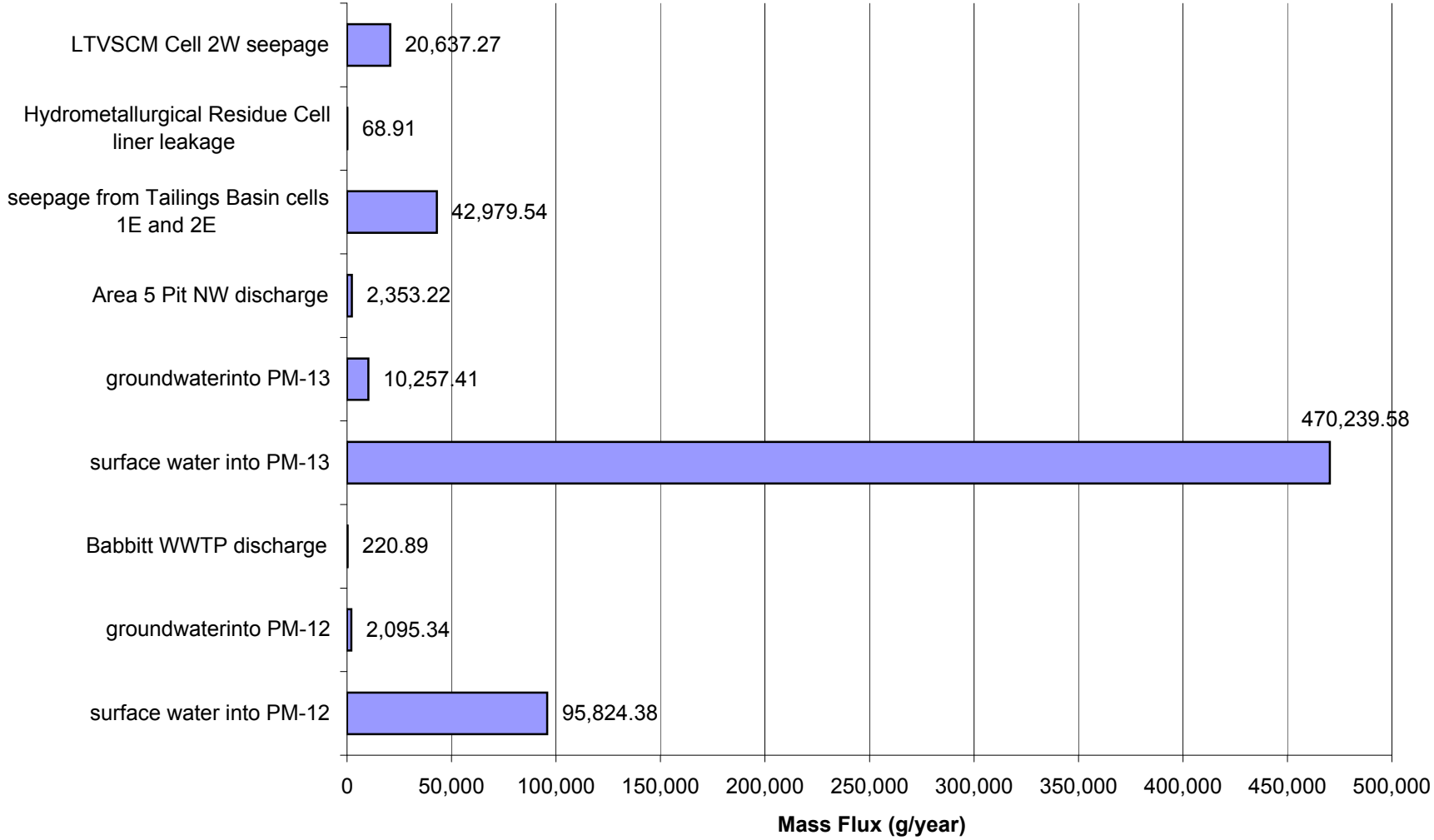
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for Average Flow for Arsenic (As)



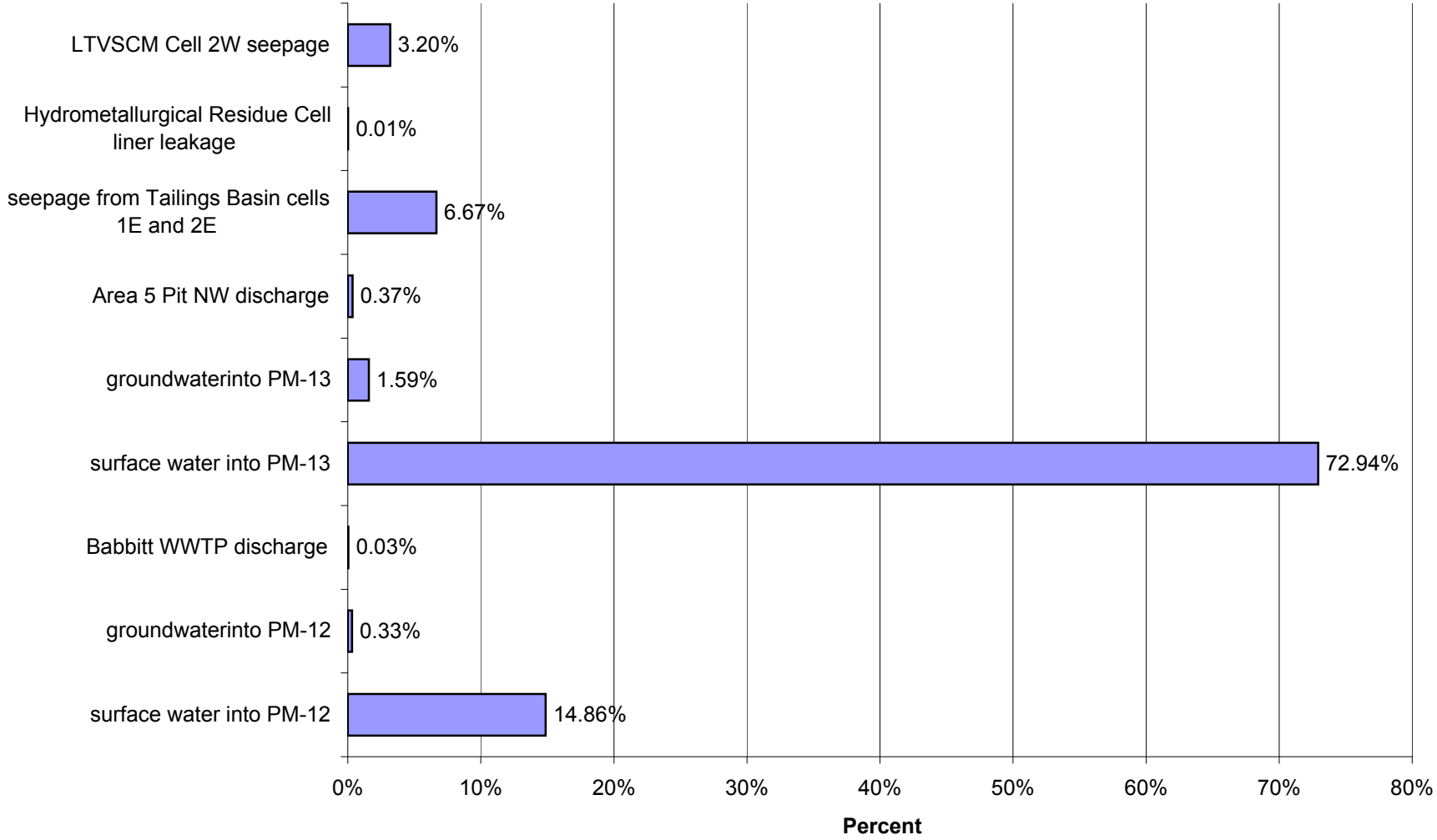
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 20 for Average Flow for Arsenic (As)



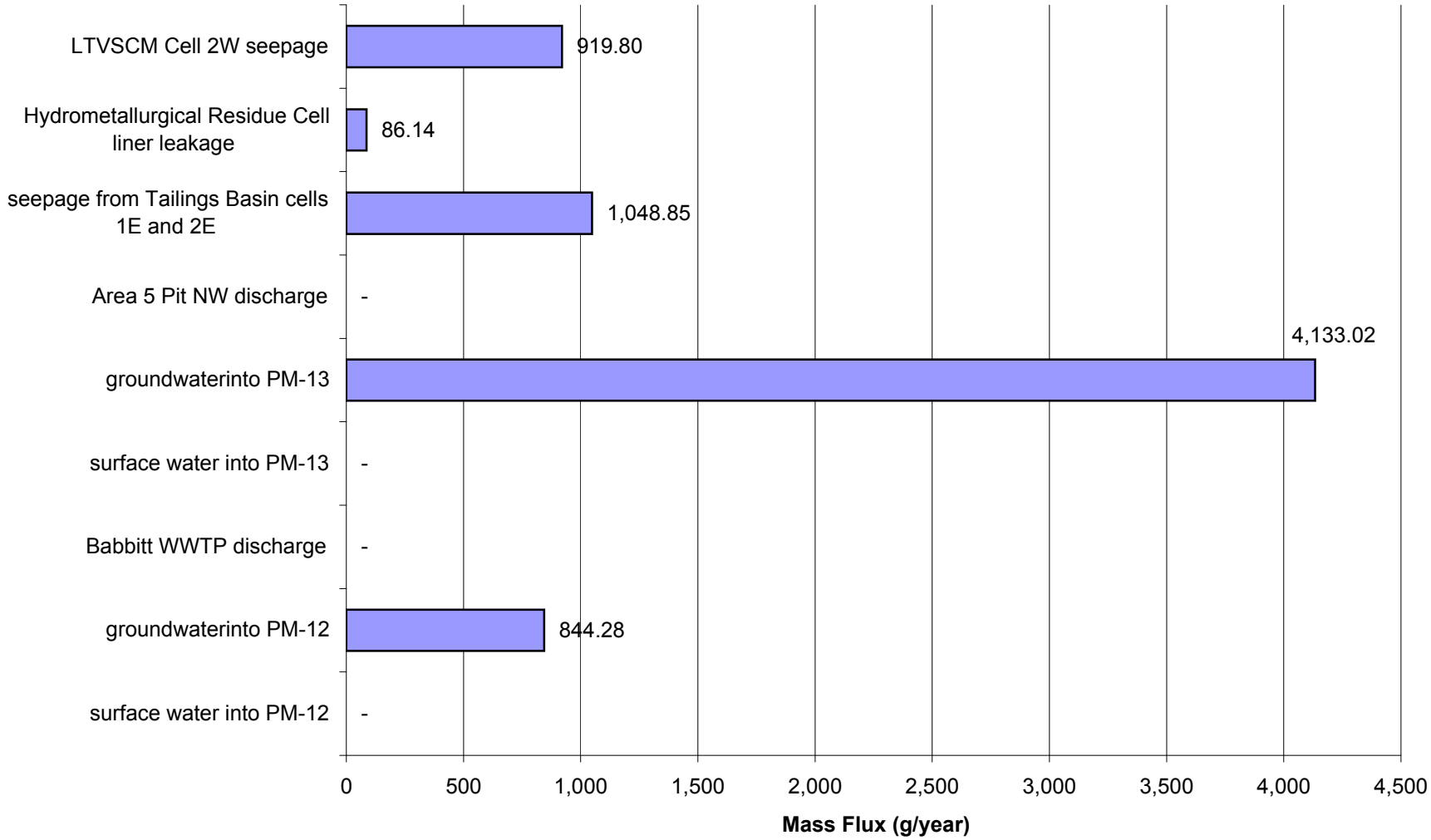
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for High Flow for Arsenic (As)



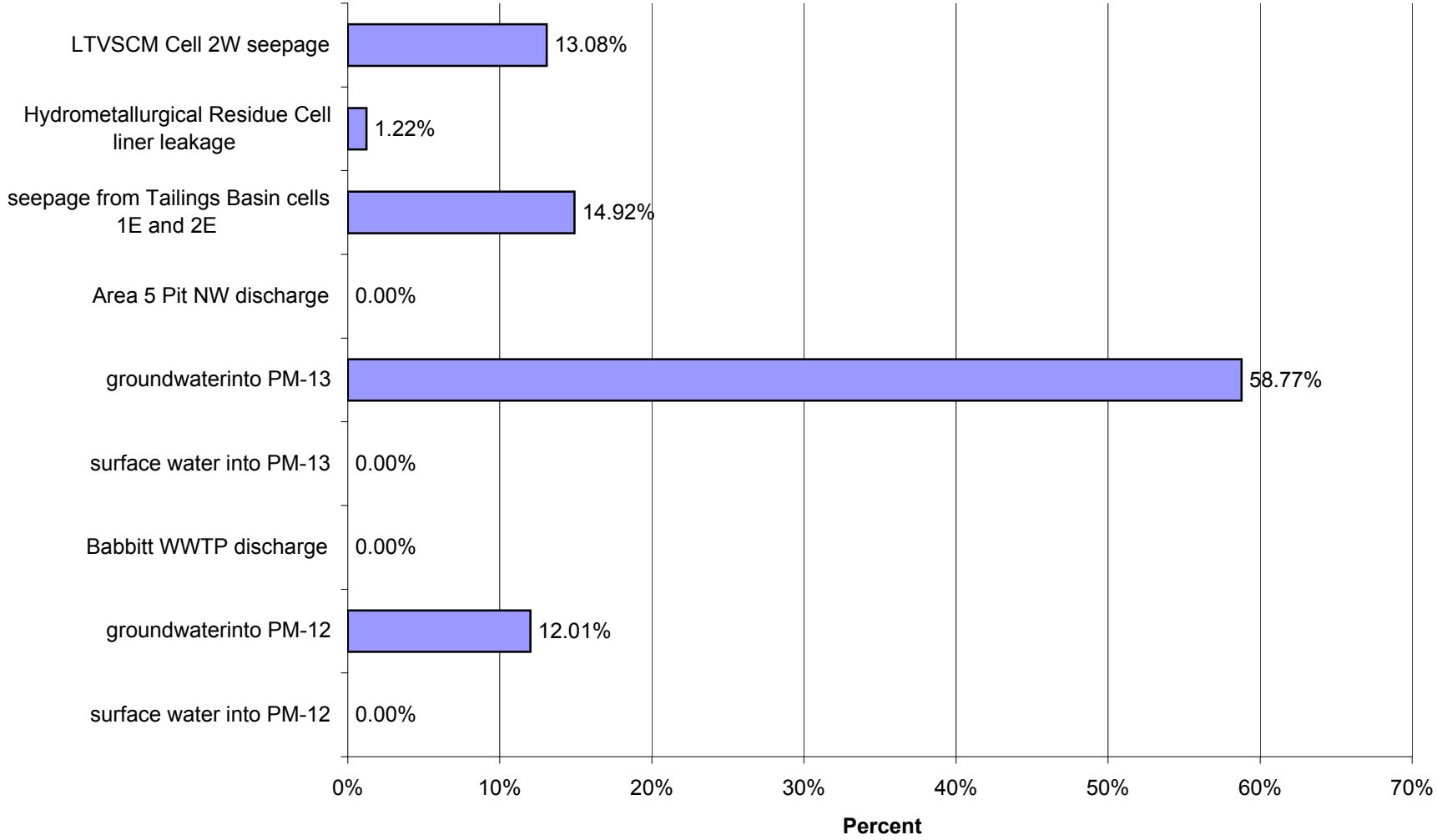
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 20 for High Flow for Arsenic (As)



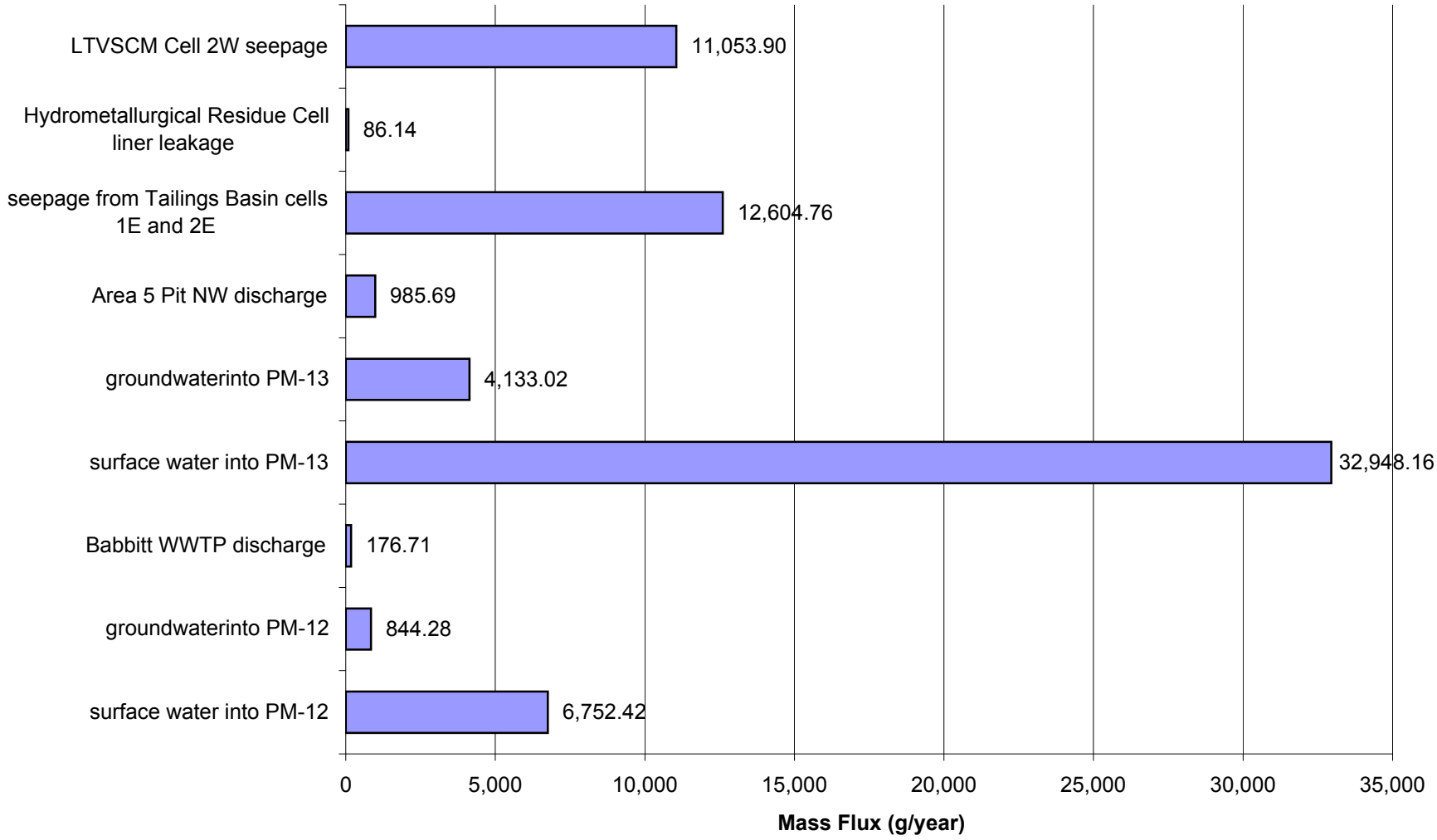
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for Low Flow for Cobalt (Co)



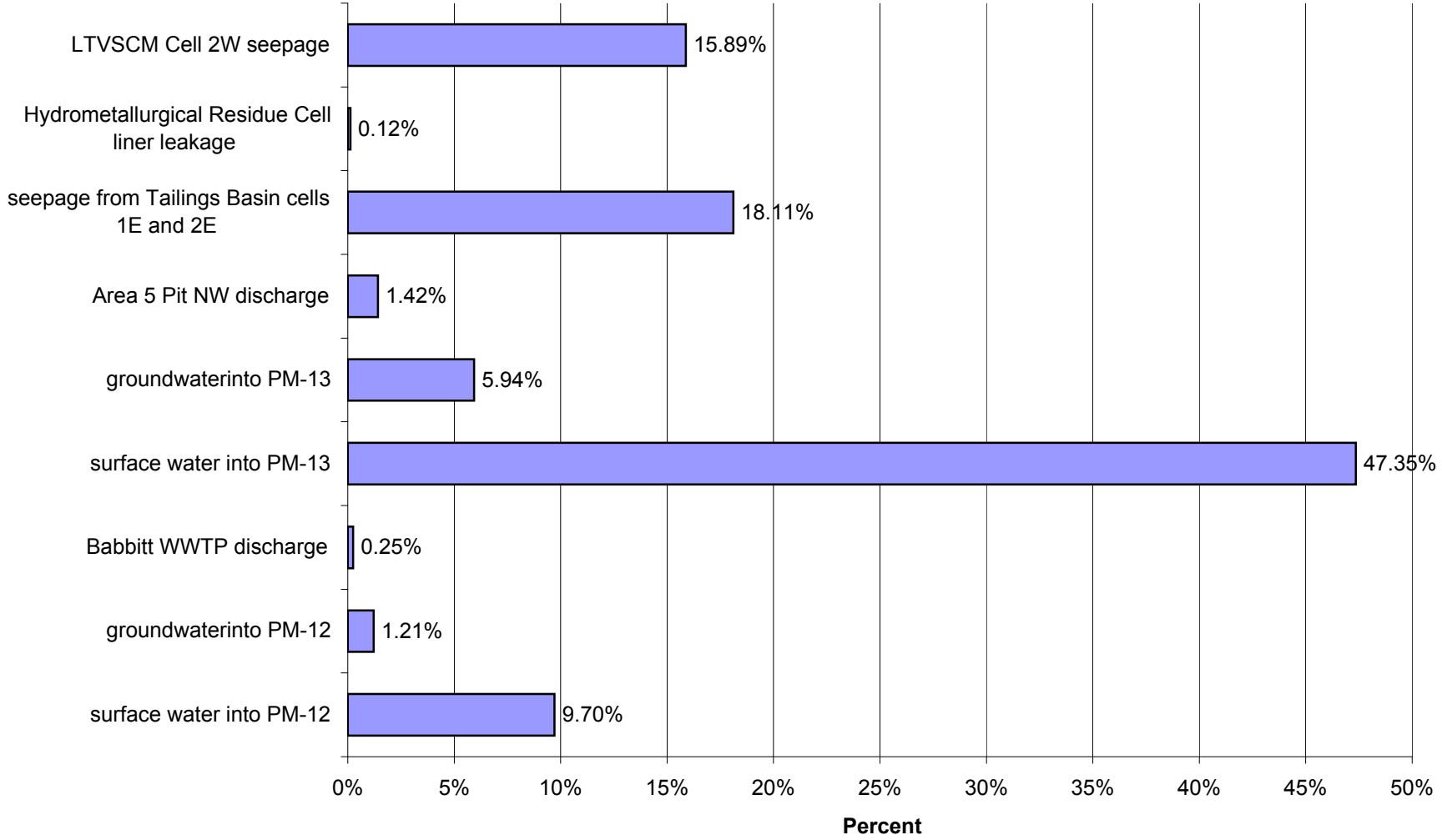
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 20 for Low Flow for Cobalt (Co)



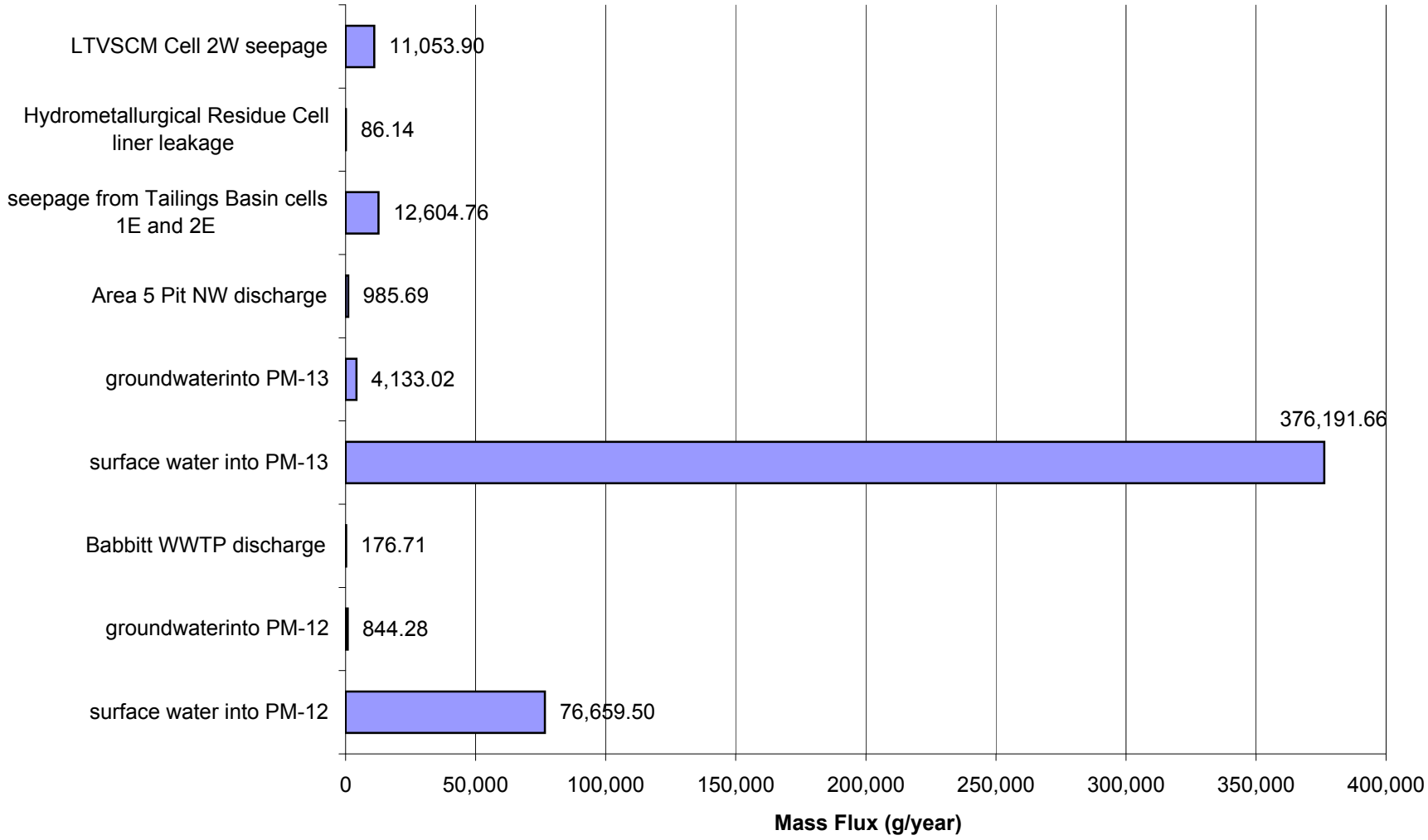
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for Average Flow for Cobalt (Co)



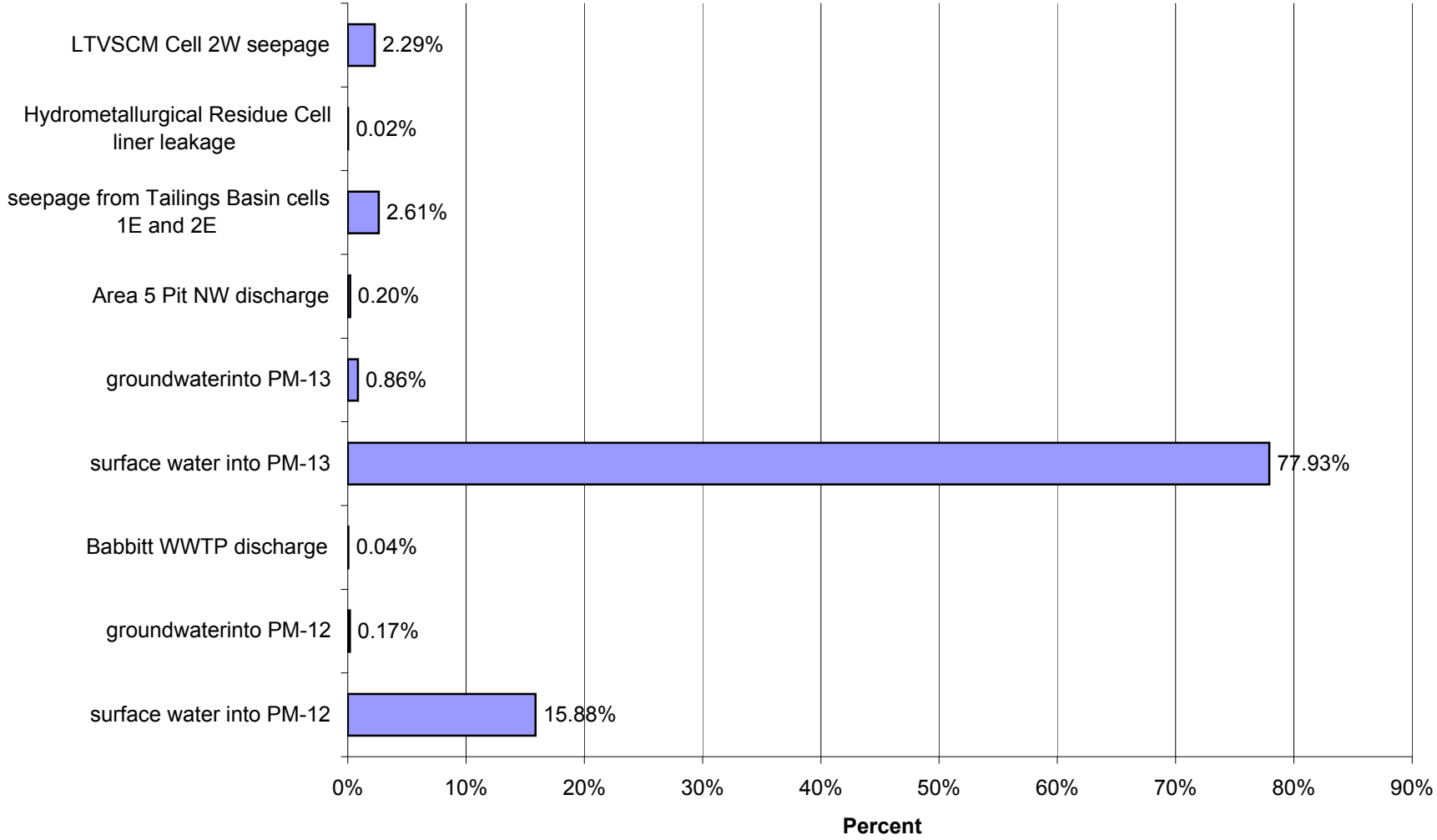
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 20 for Average Flow for Cobalt (Co)



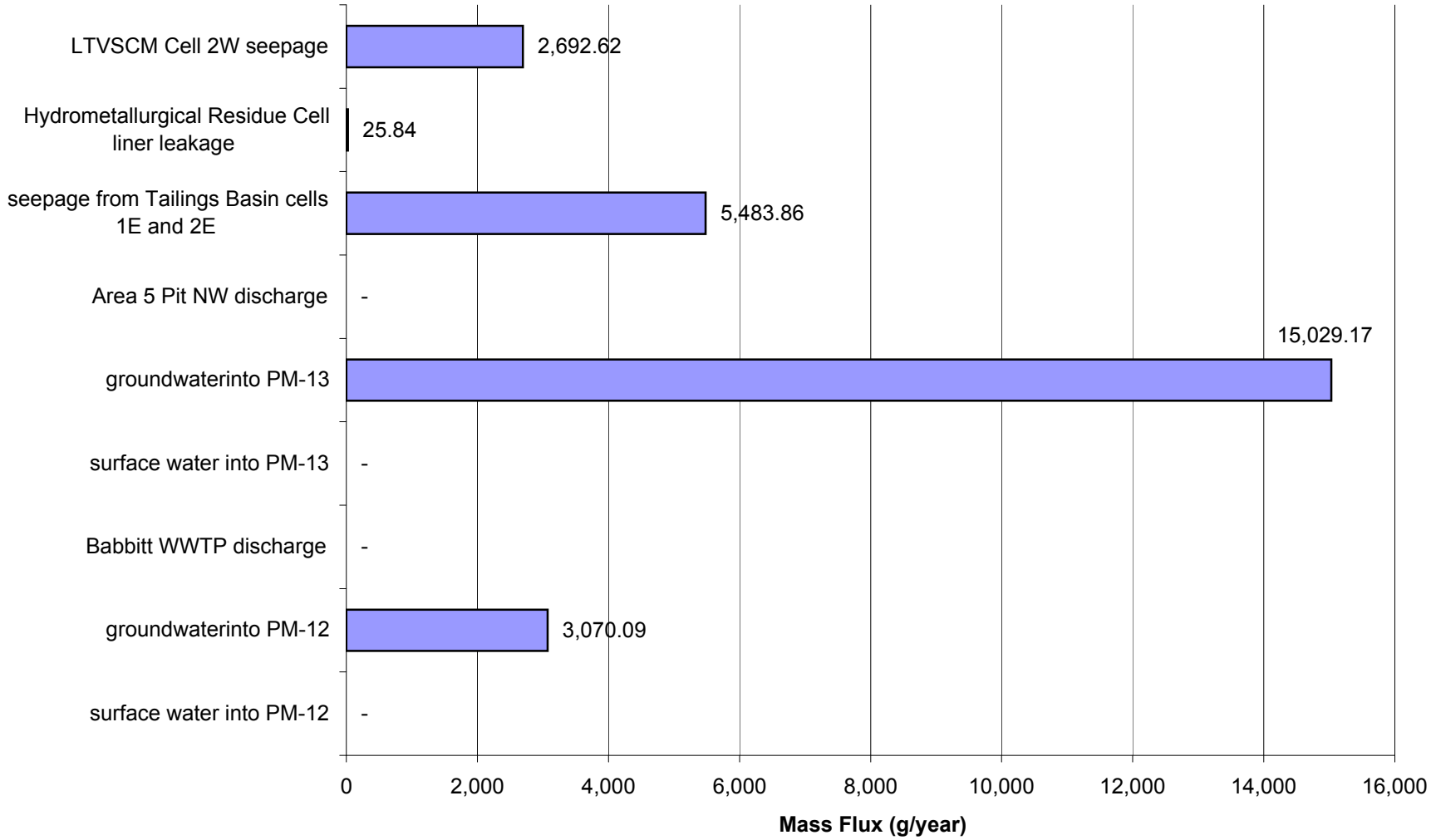
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for High Flow for Cobalt (Co)



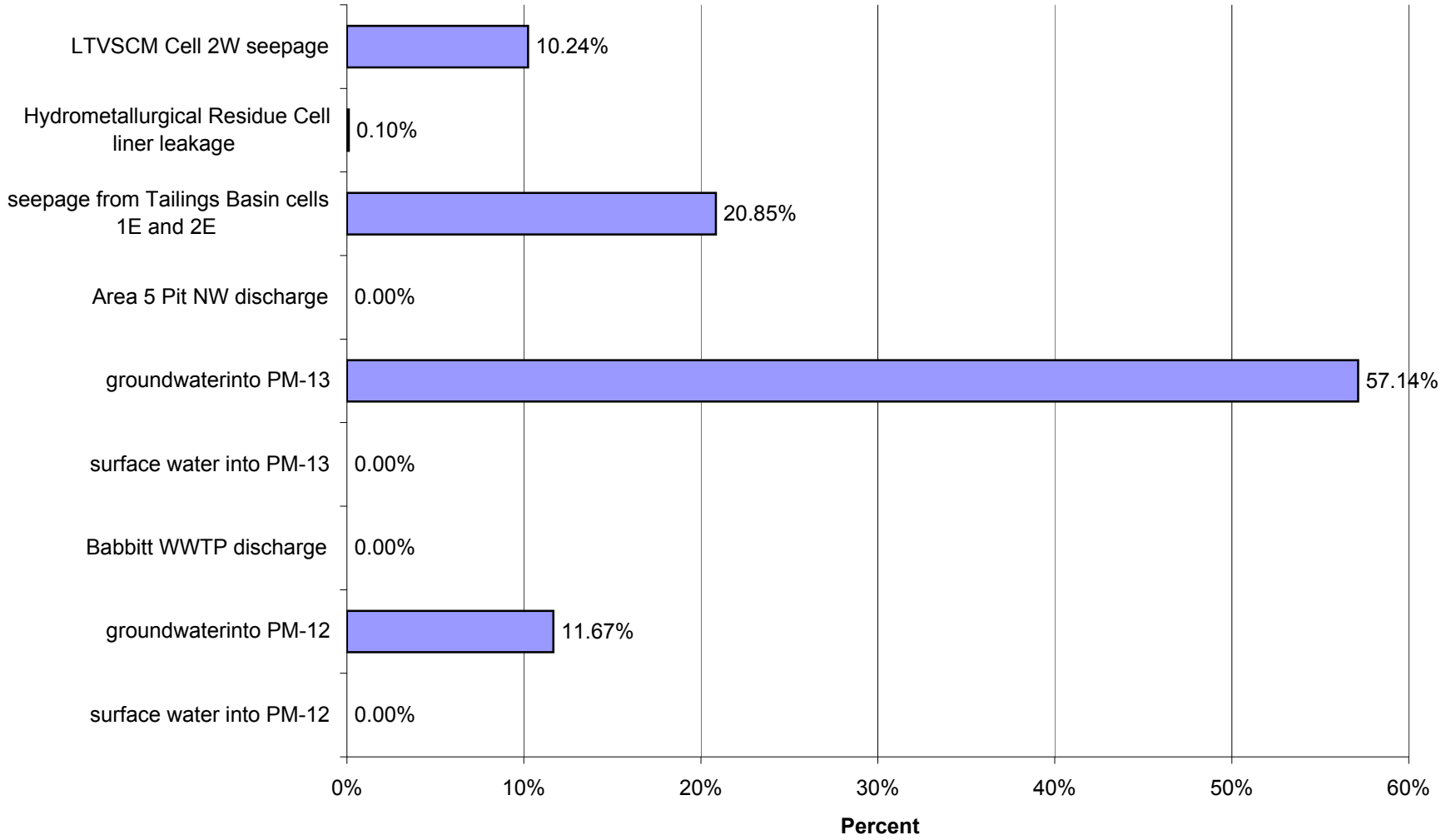
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 20 for High Flow for Cobalt (Co)



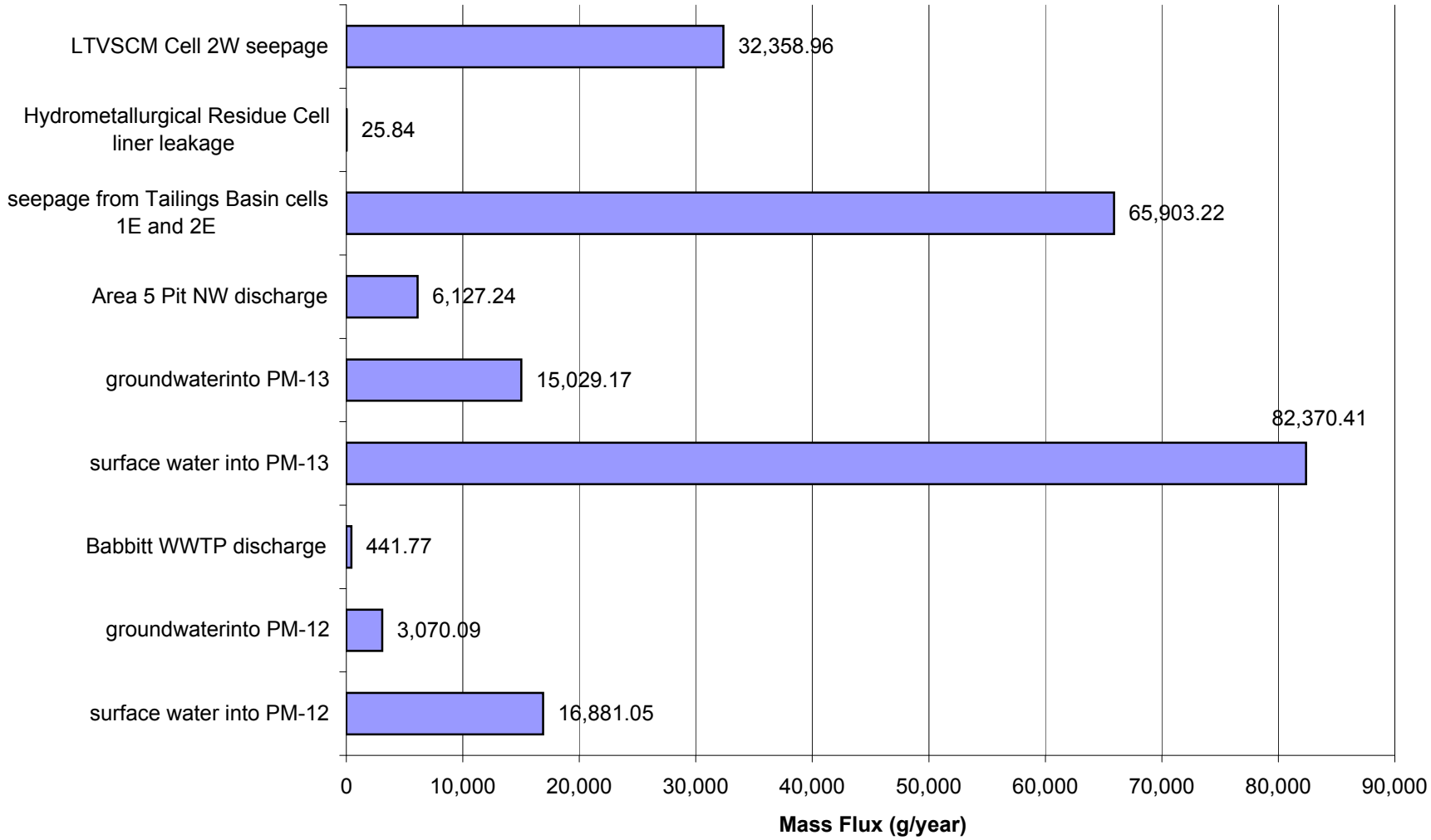
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for Low Flow for Copper (Cu)



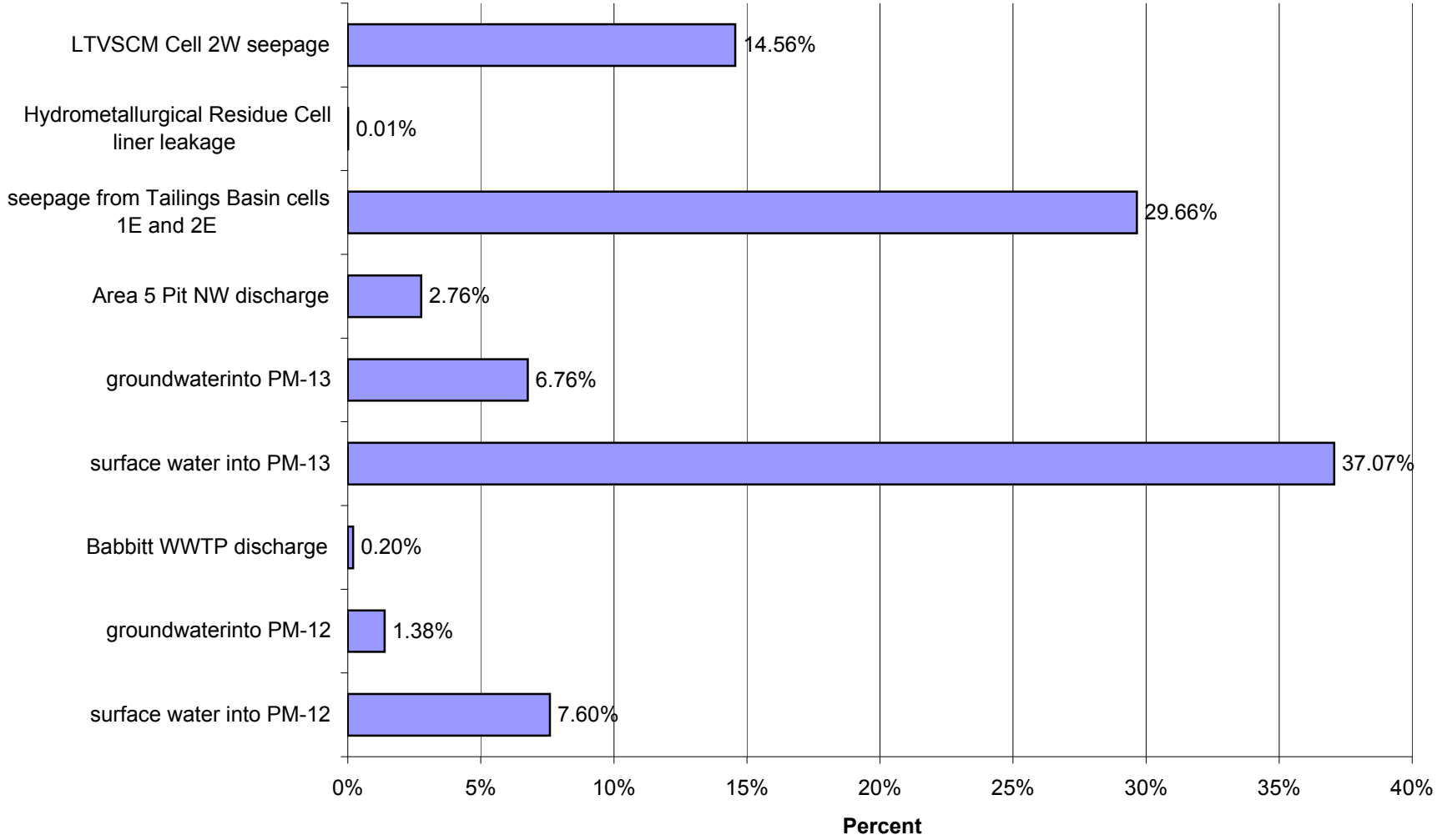
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 20 for Low Flow for Copper (Cu)



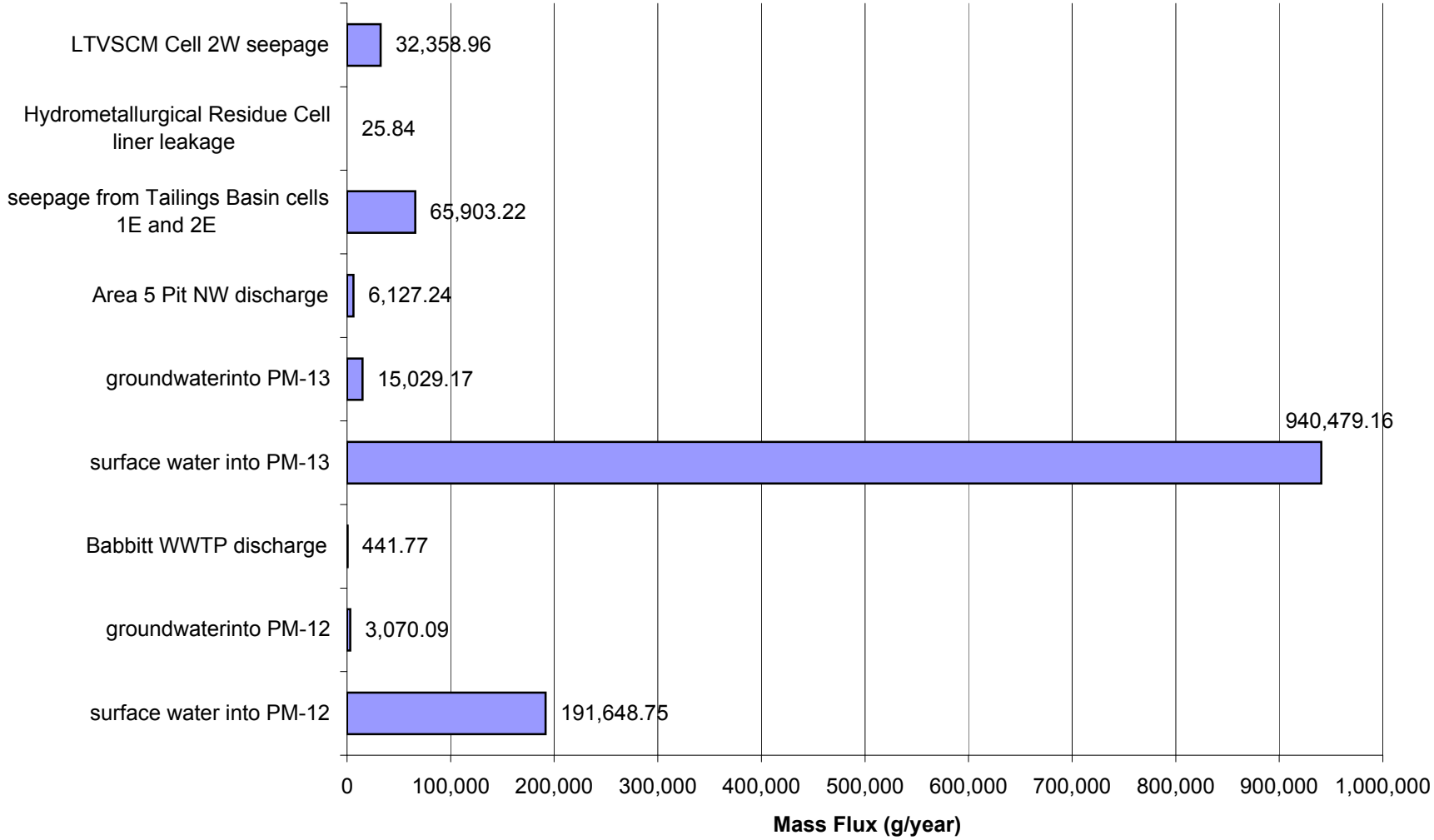
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for Average Flow for Copper (Cu)



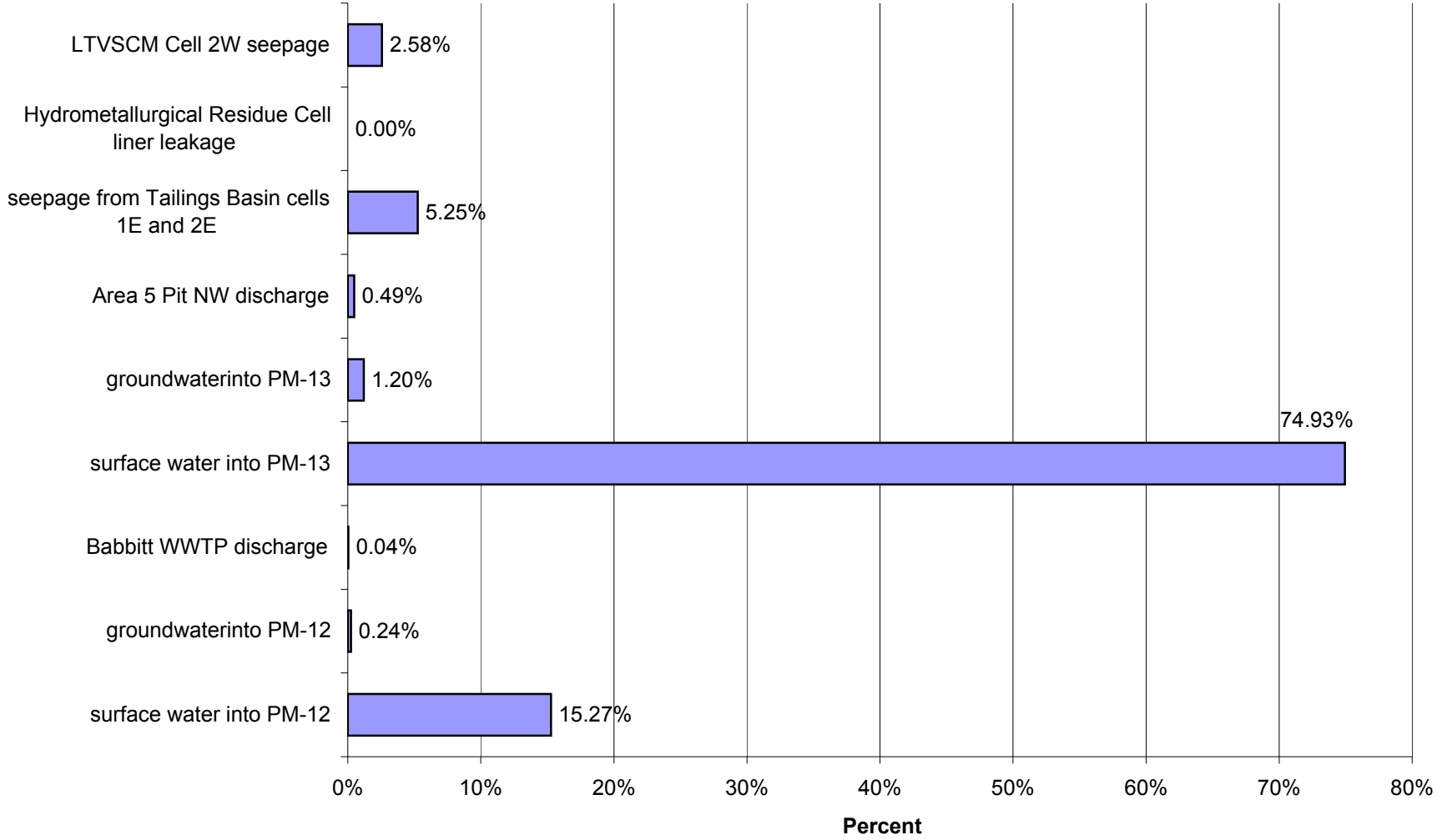
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 20 for Average Flow for Copper (Cu)



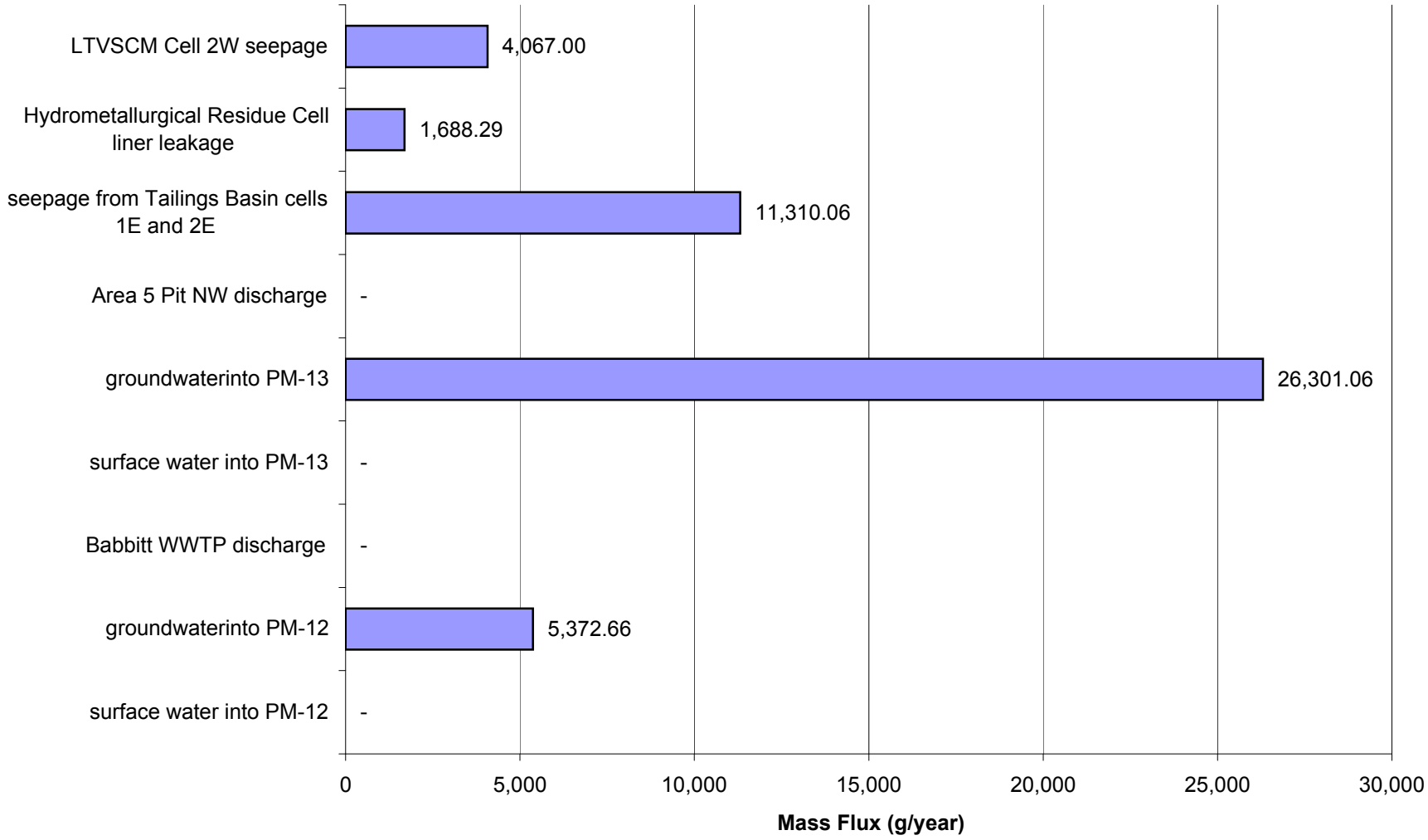
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for High Flow for Copper (Cu)



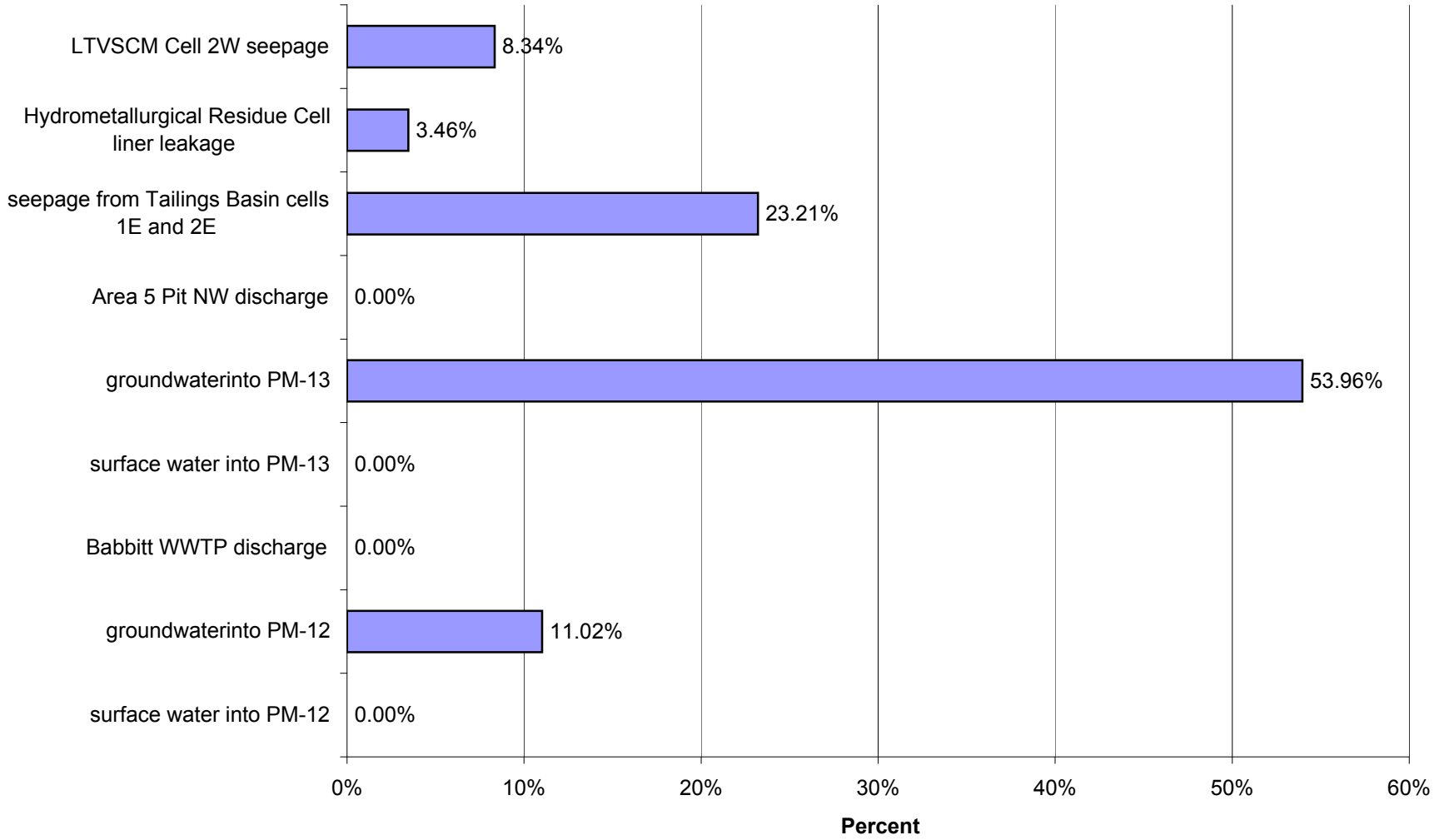
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 20 for High Flow for Copper (Cu)



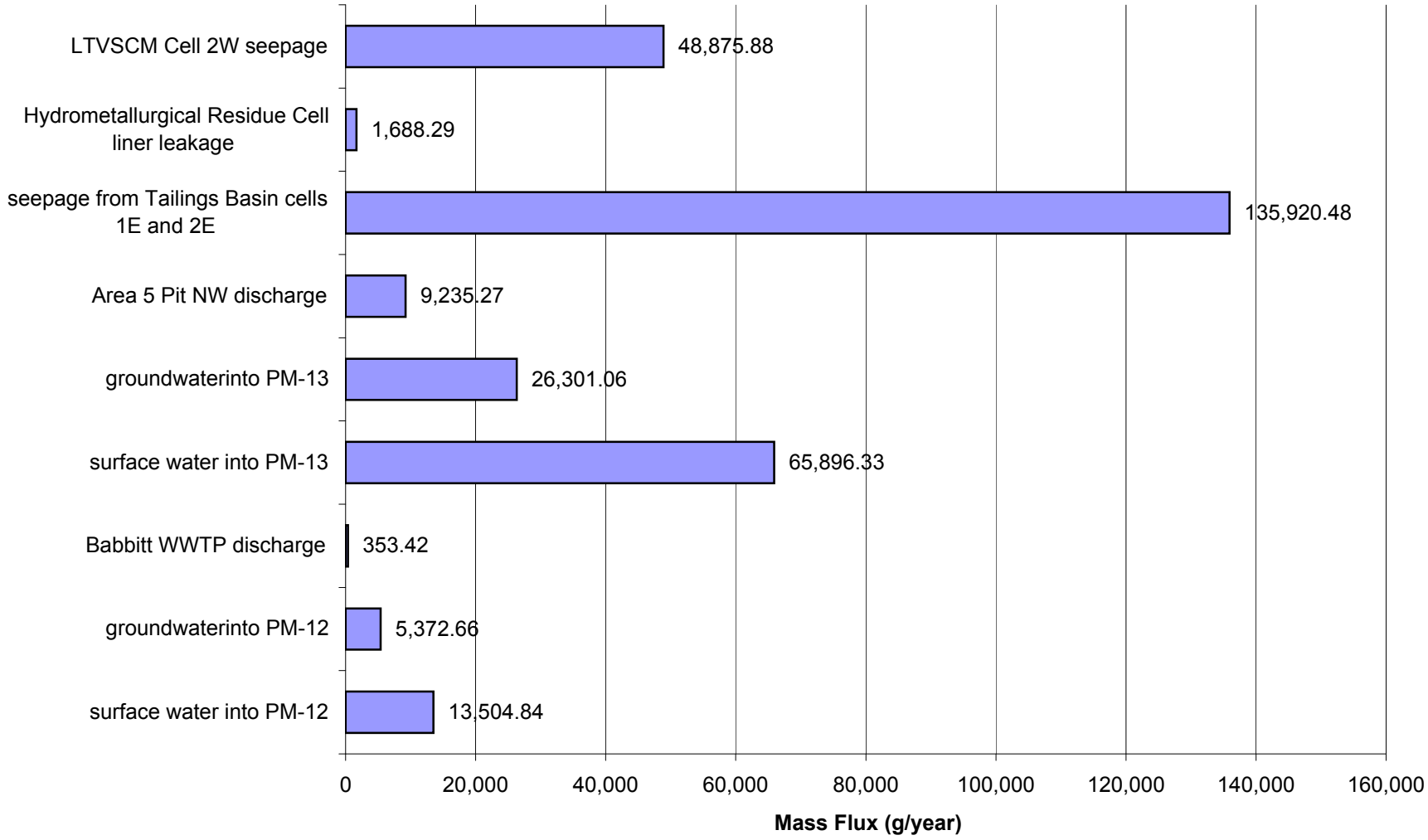
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for Low Flow for Nickel (Ni)



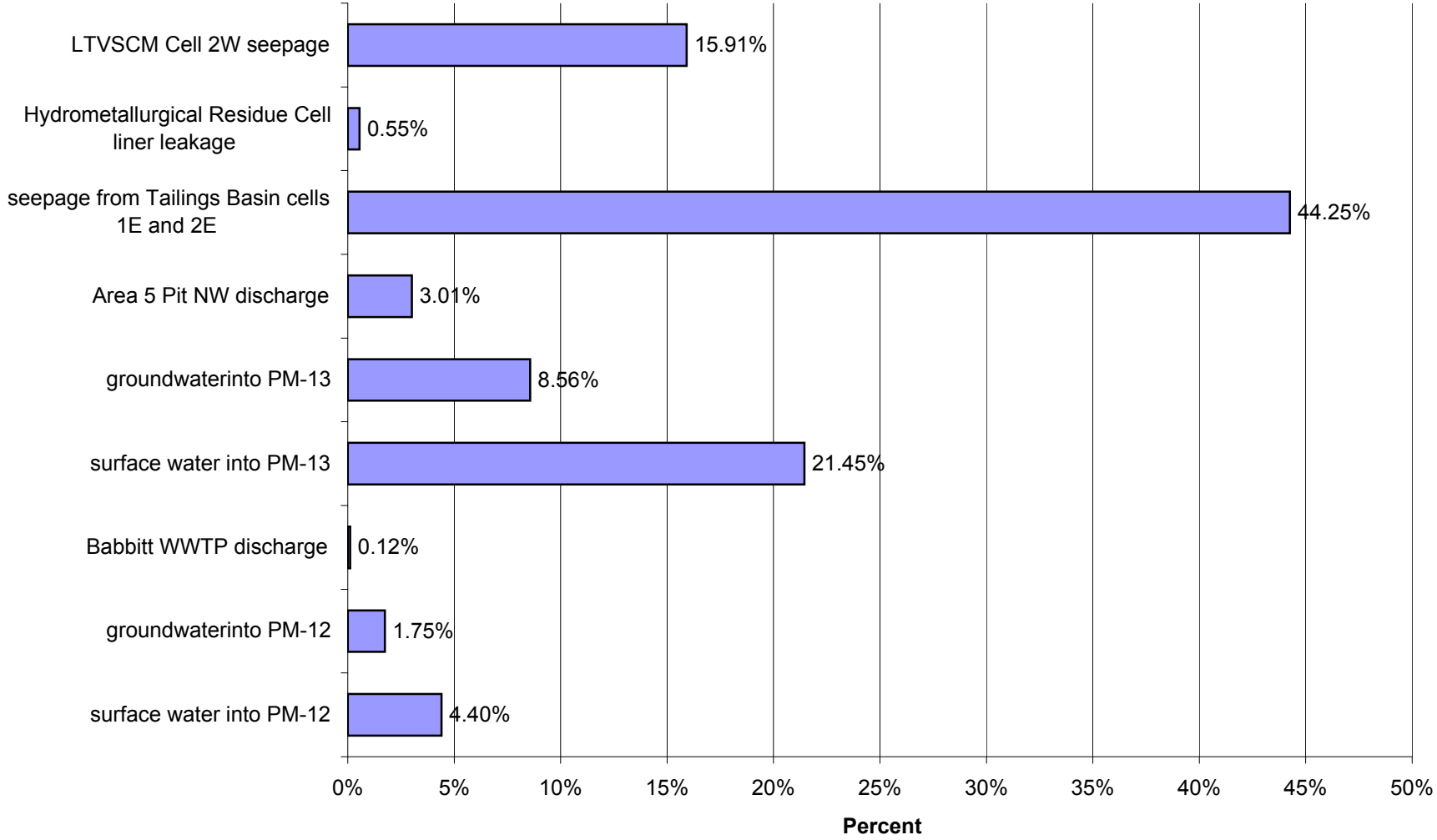
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 20 for Low Flow for Nickel (Ni)



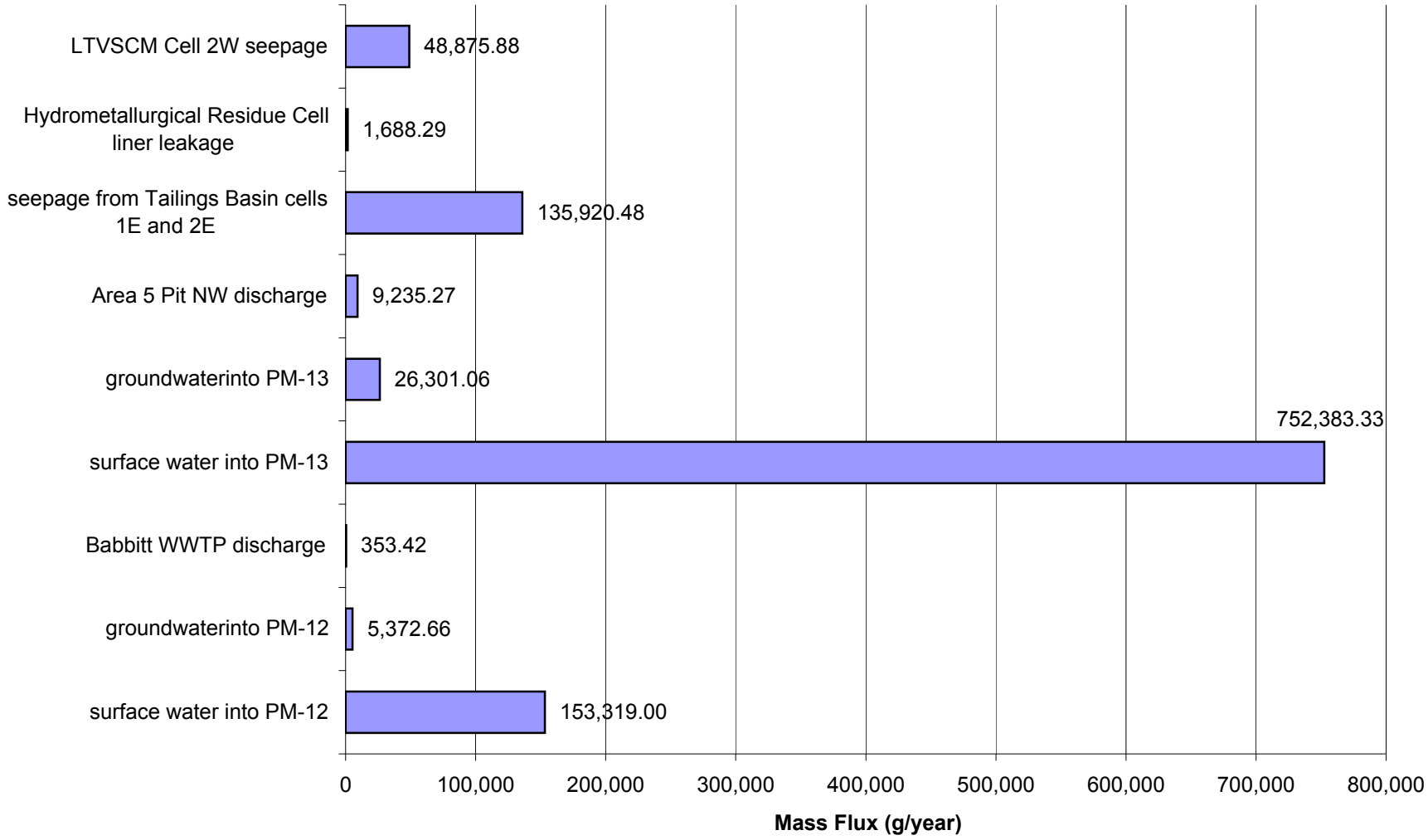
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for Average Flow for Nickel (Ni)



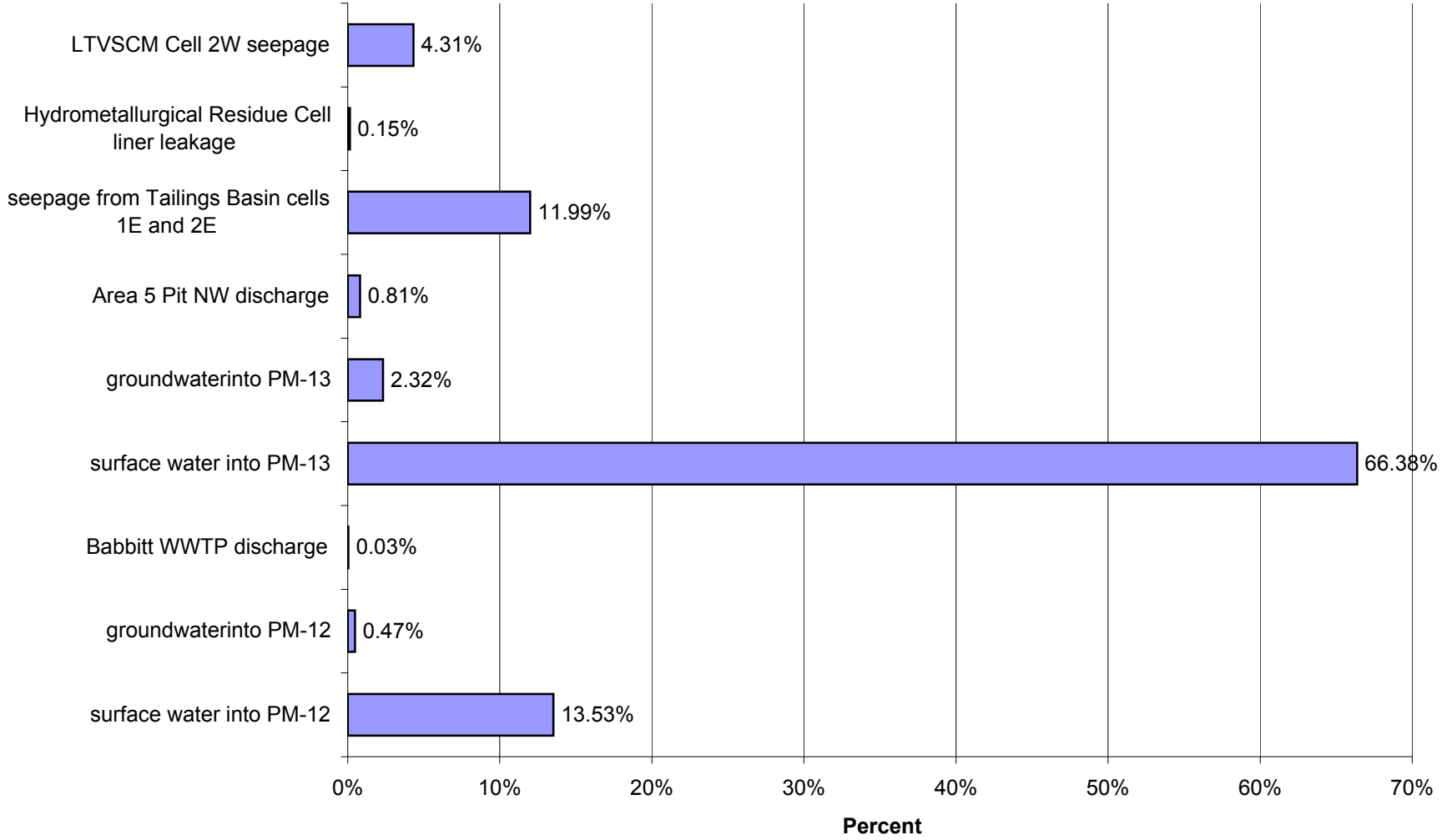
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 20 for Average Flow for Nickel (Ni)



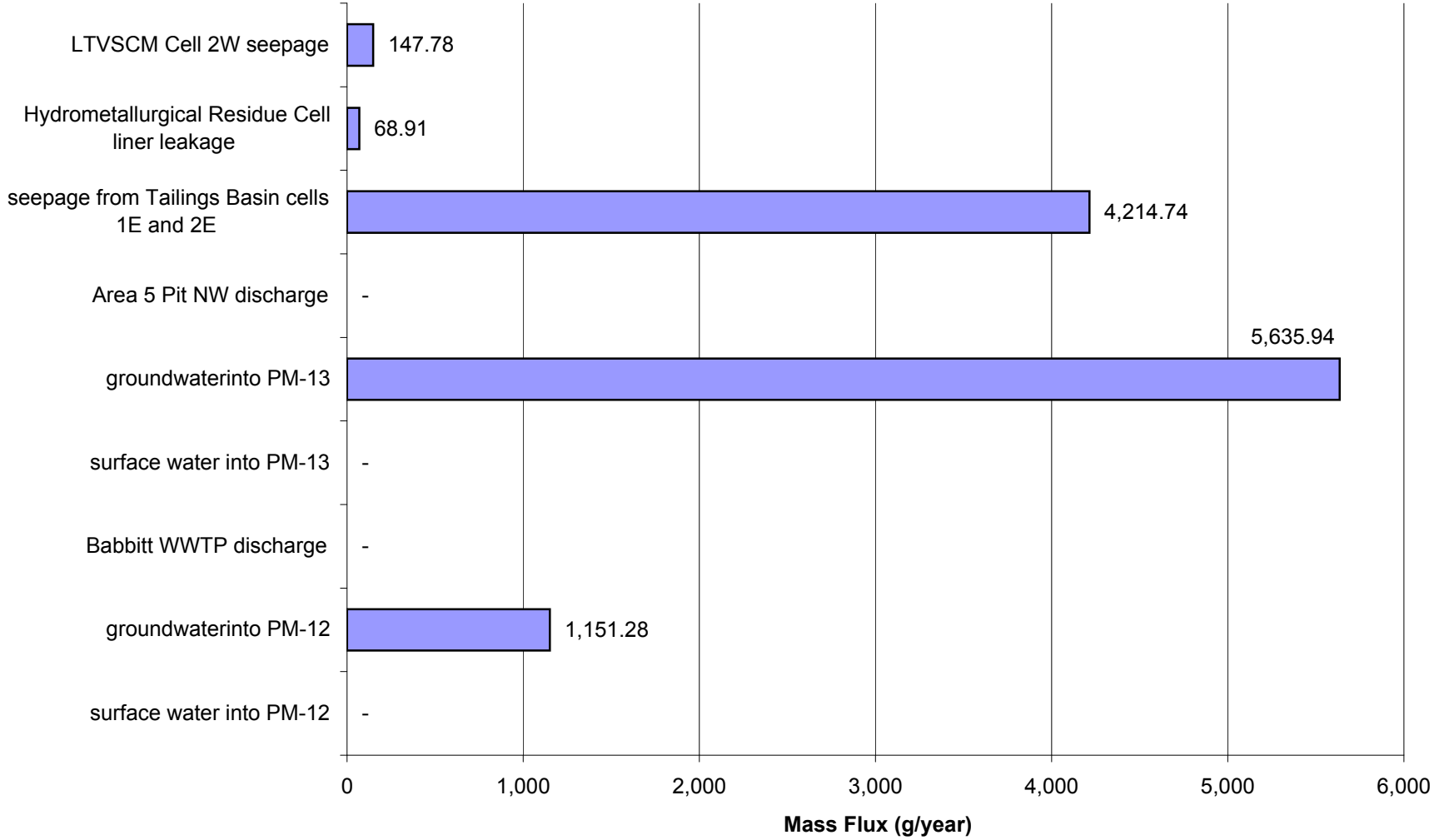
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for High Flow for Nickel (Ni)



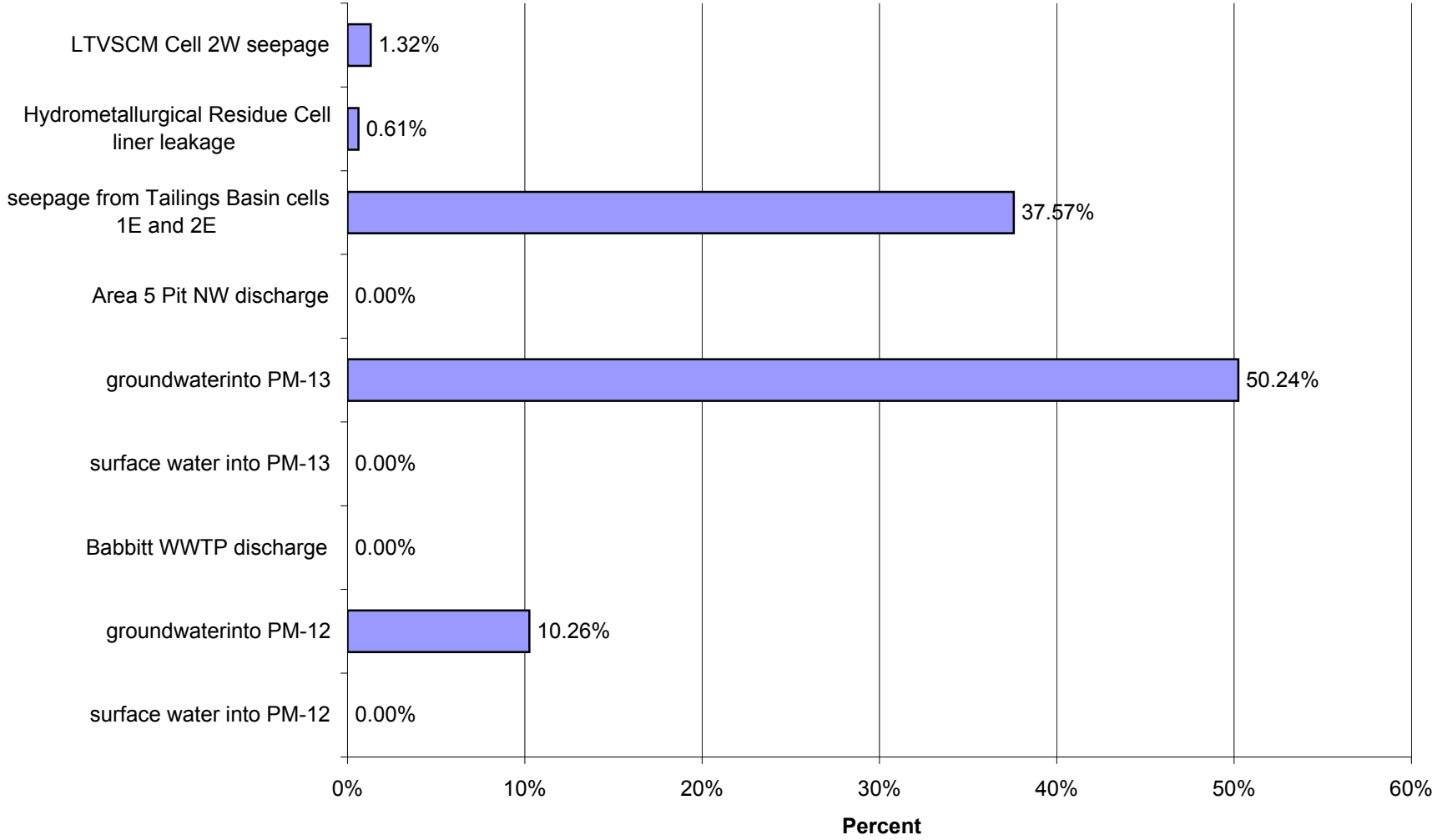
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 20 for High Flow for Nickel (Ni)



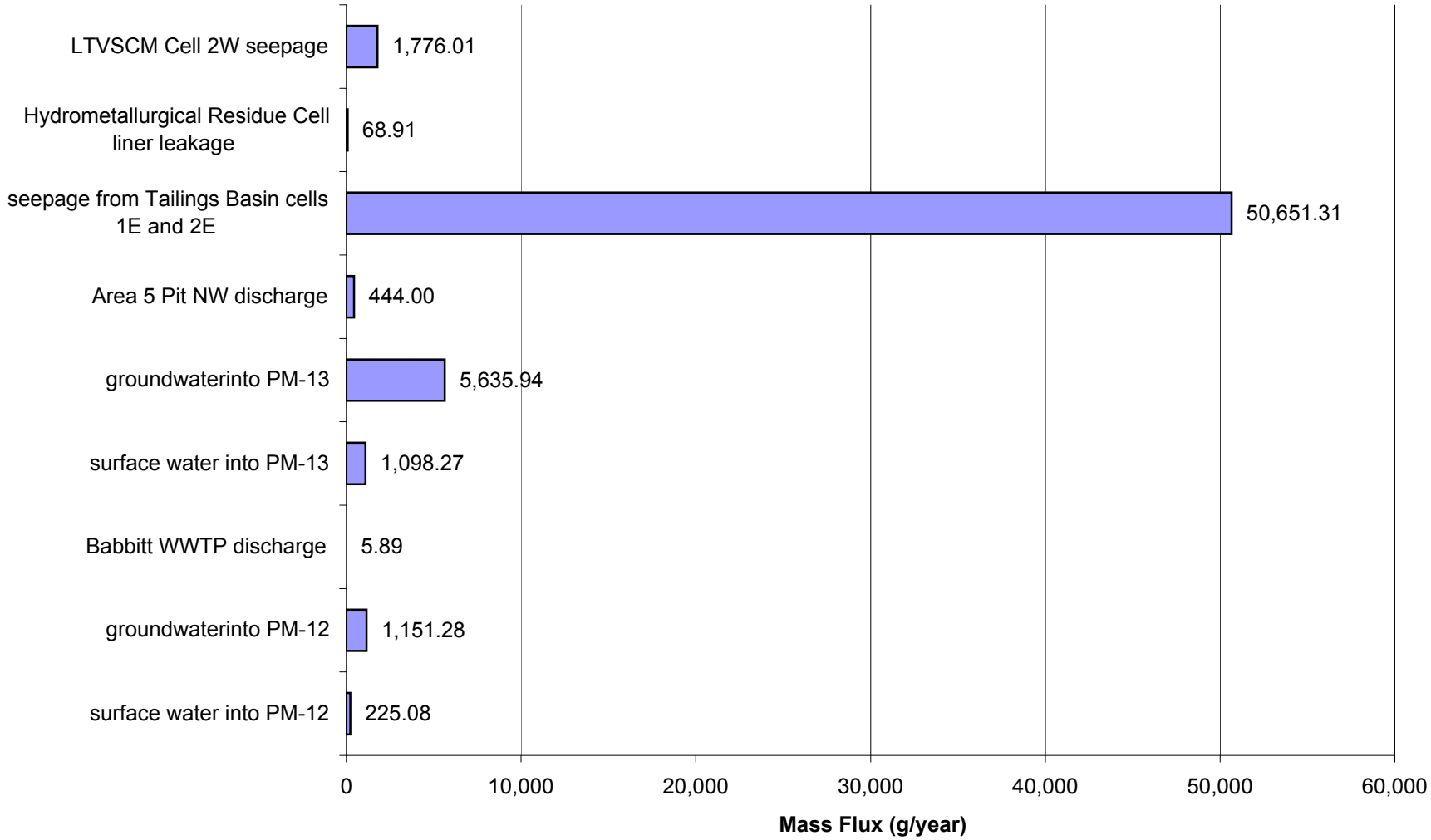
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for Low Flow for Antimony (Sb)



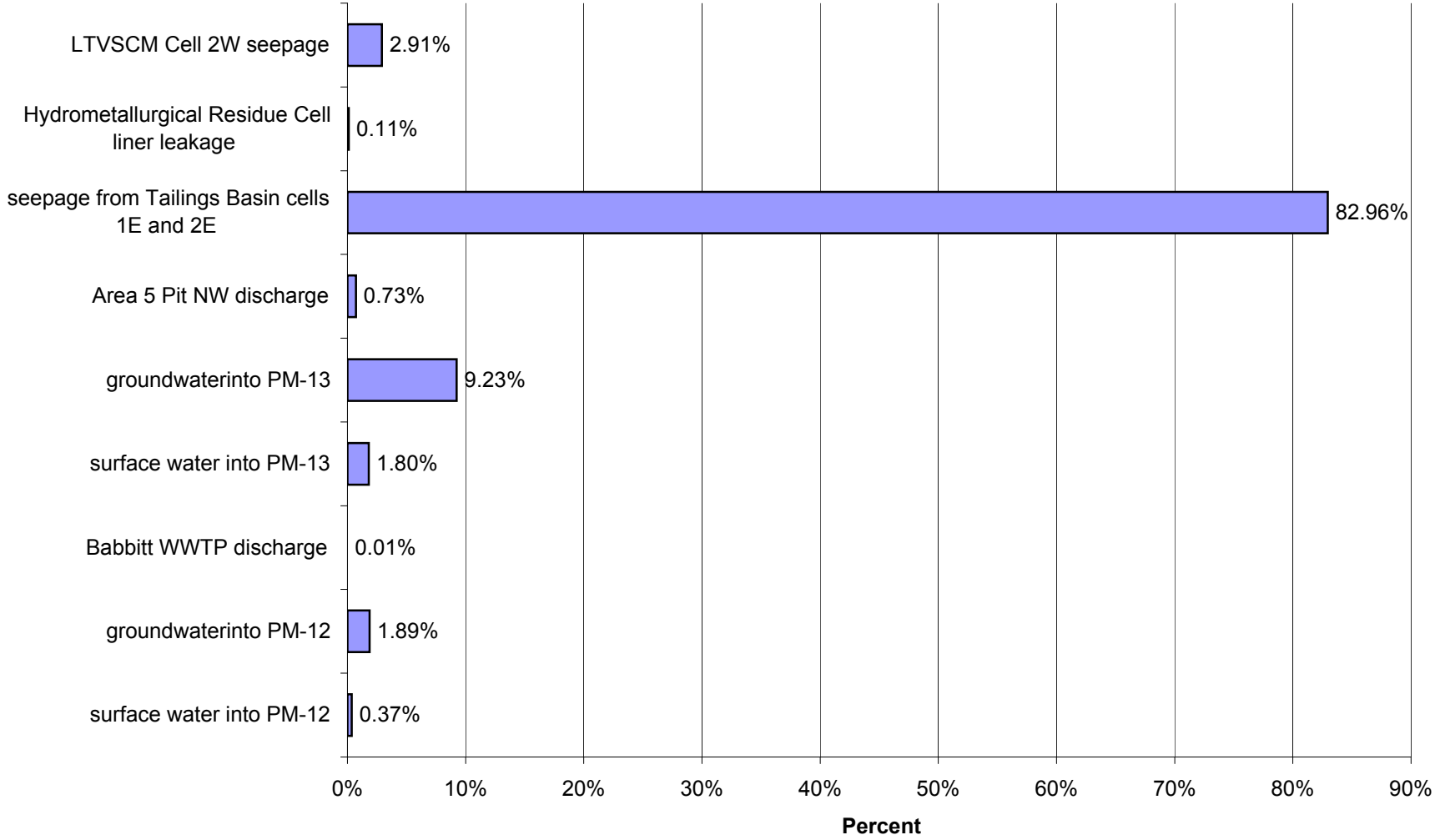
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 20 for Low Flow for Antimony (Sb)



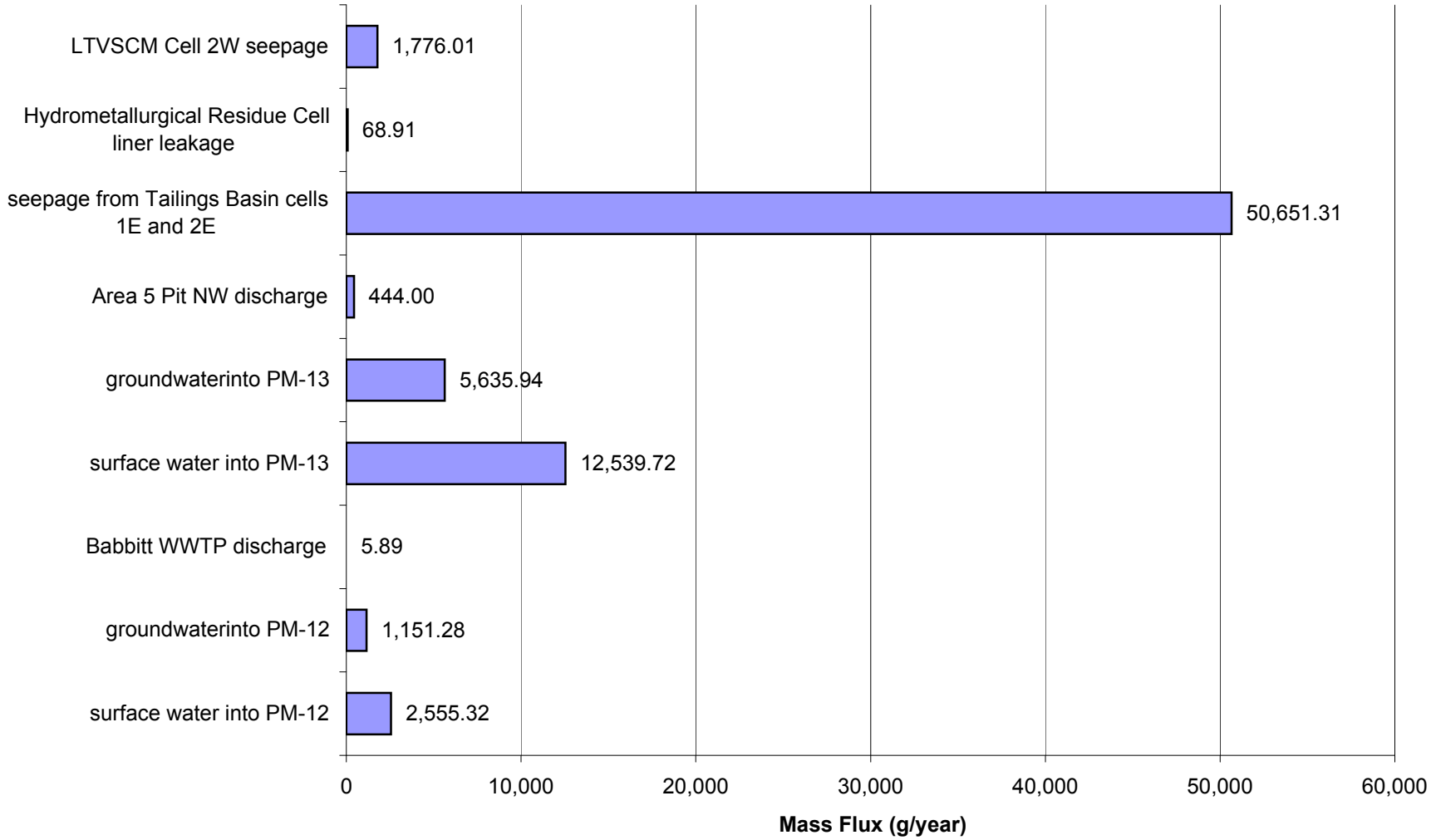
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for Average Flow for Antimony (Sb)



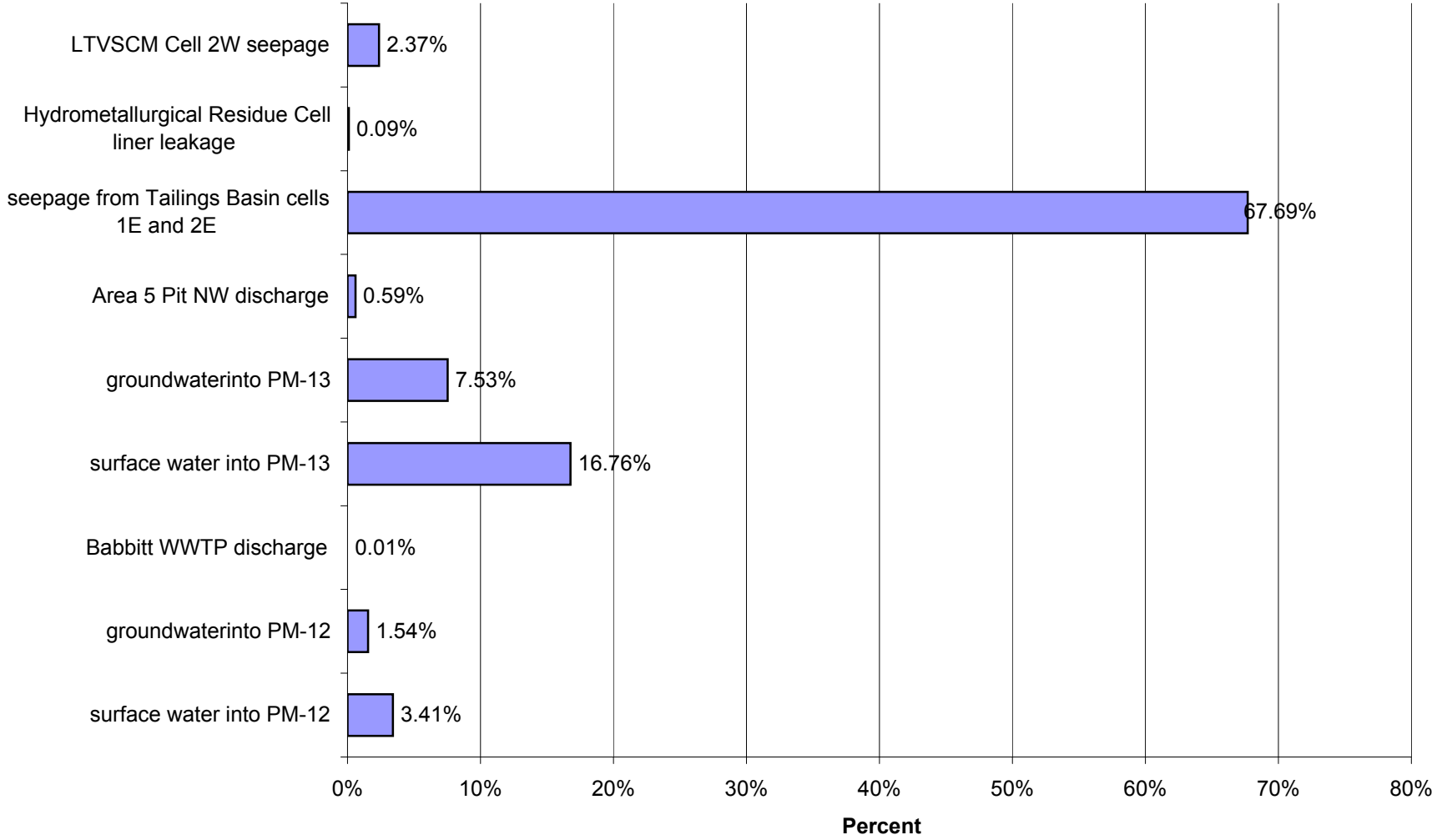
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 20 for Average Flow for Antimony (Sb)



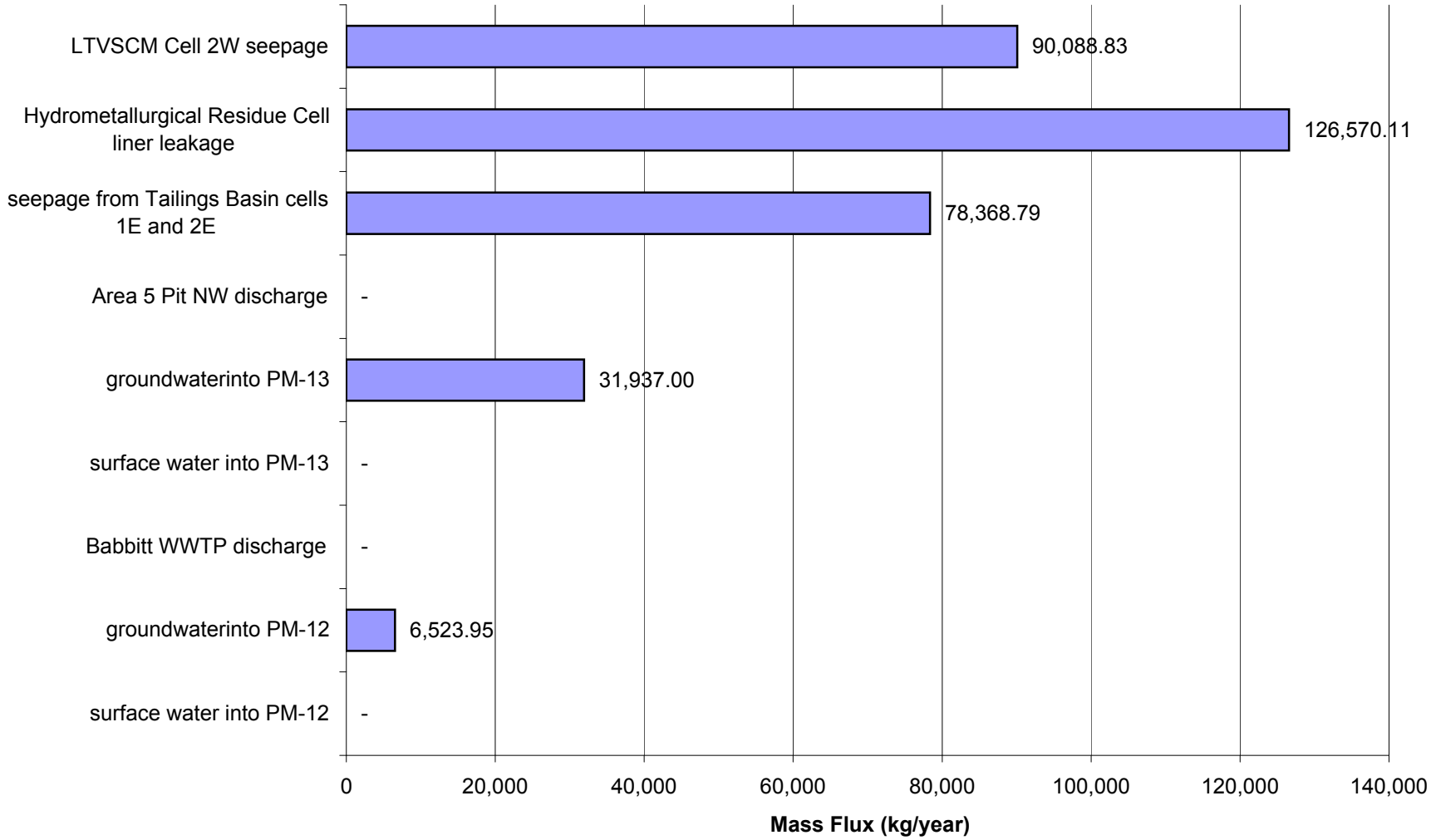
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Year 20 for High Flow for Antimony (Sb)



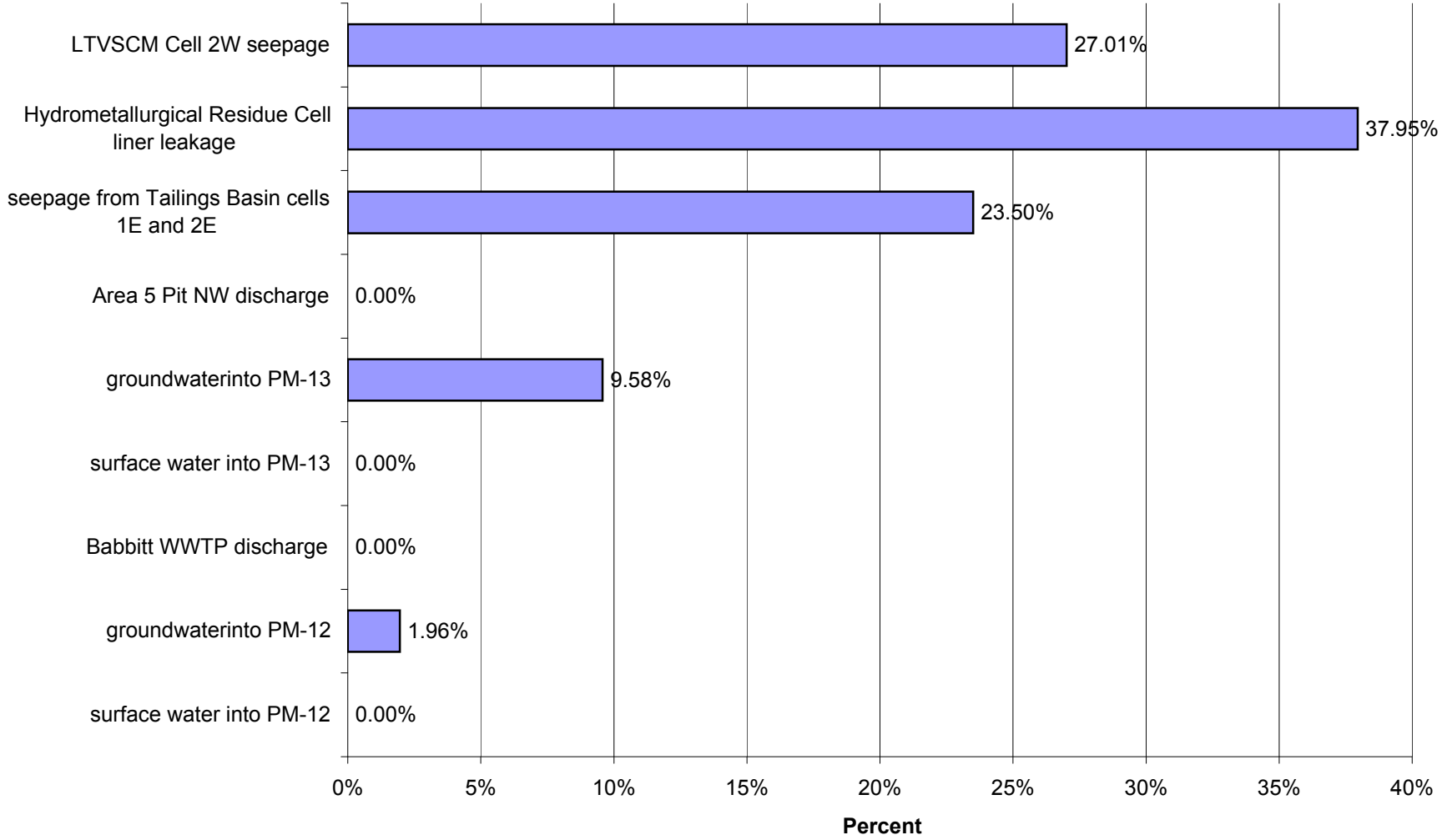
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 20 for High Flow for Antimony (Sb)



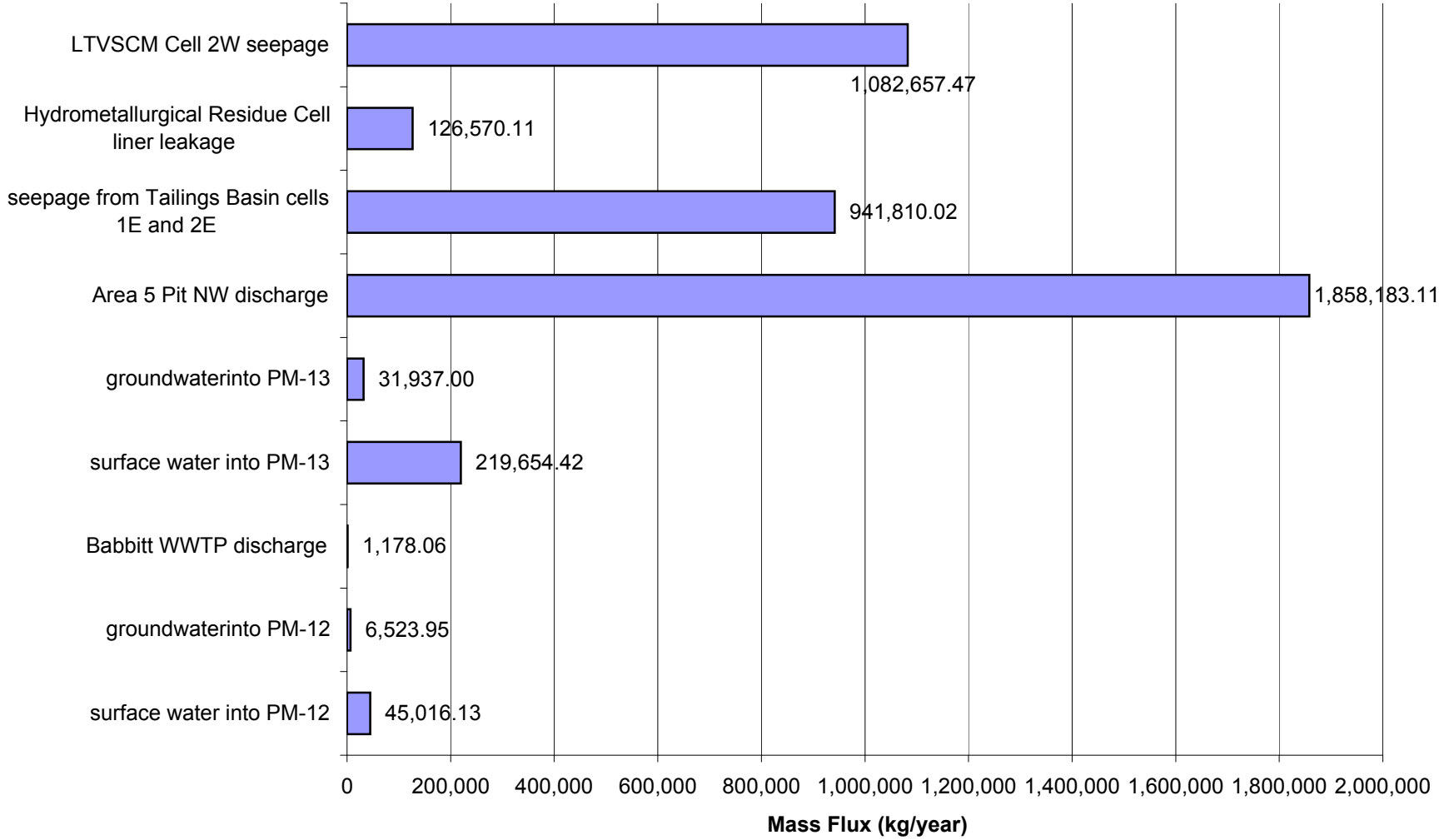
Geotechnical Mitigation: Mass Flux (kg/year) of Impacts at PM-13 in Year 20 for Low Flow for Sulfate (SO_4)



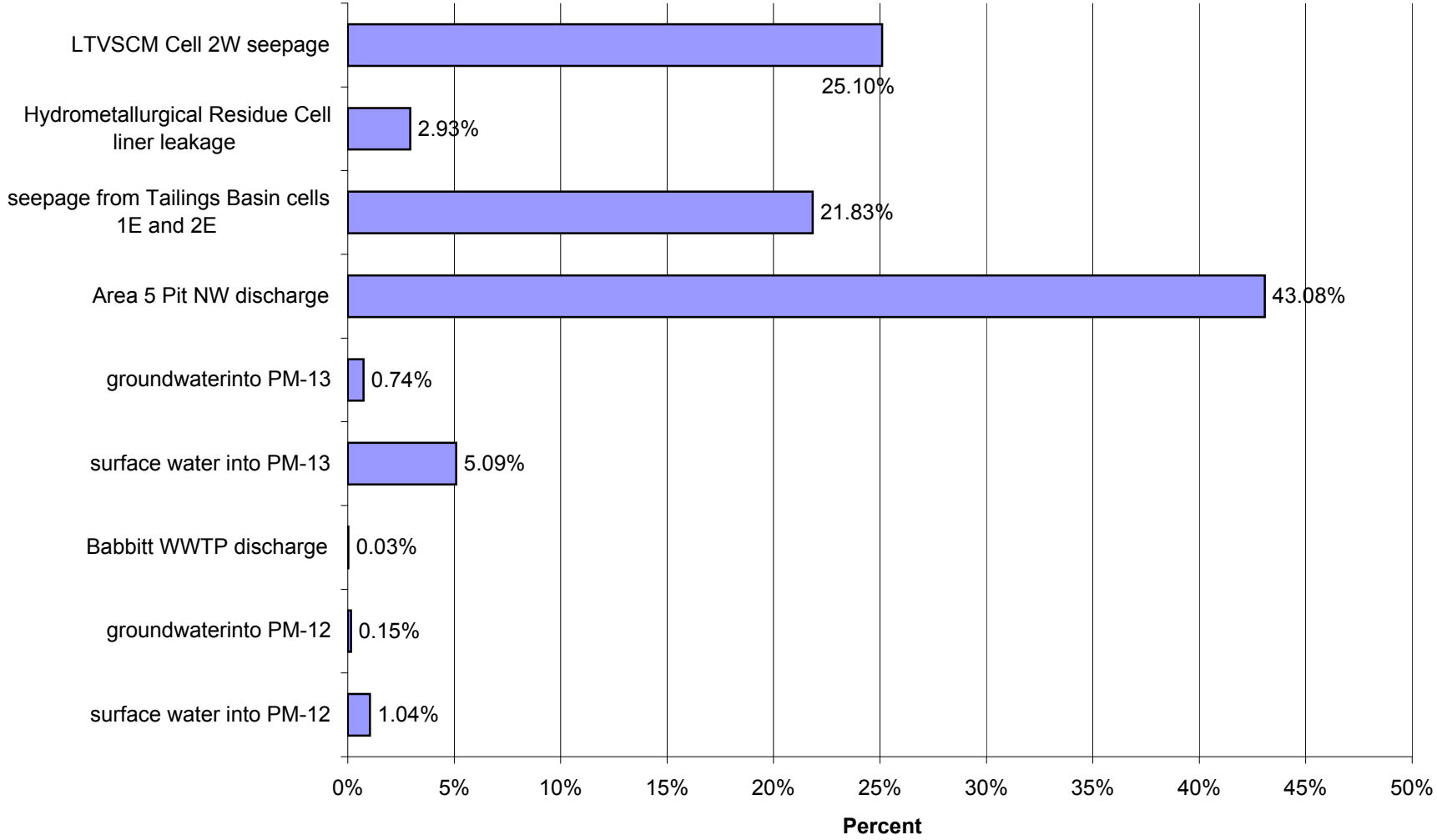
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 20 for Low Flow for Sulfate (SO_4)



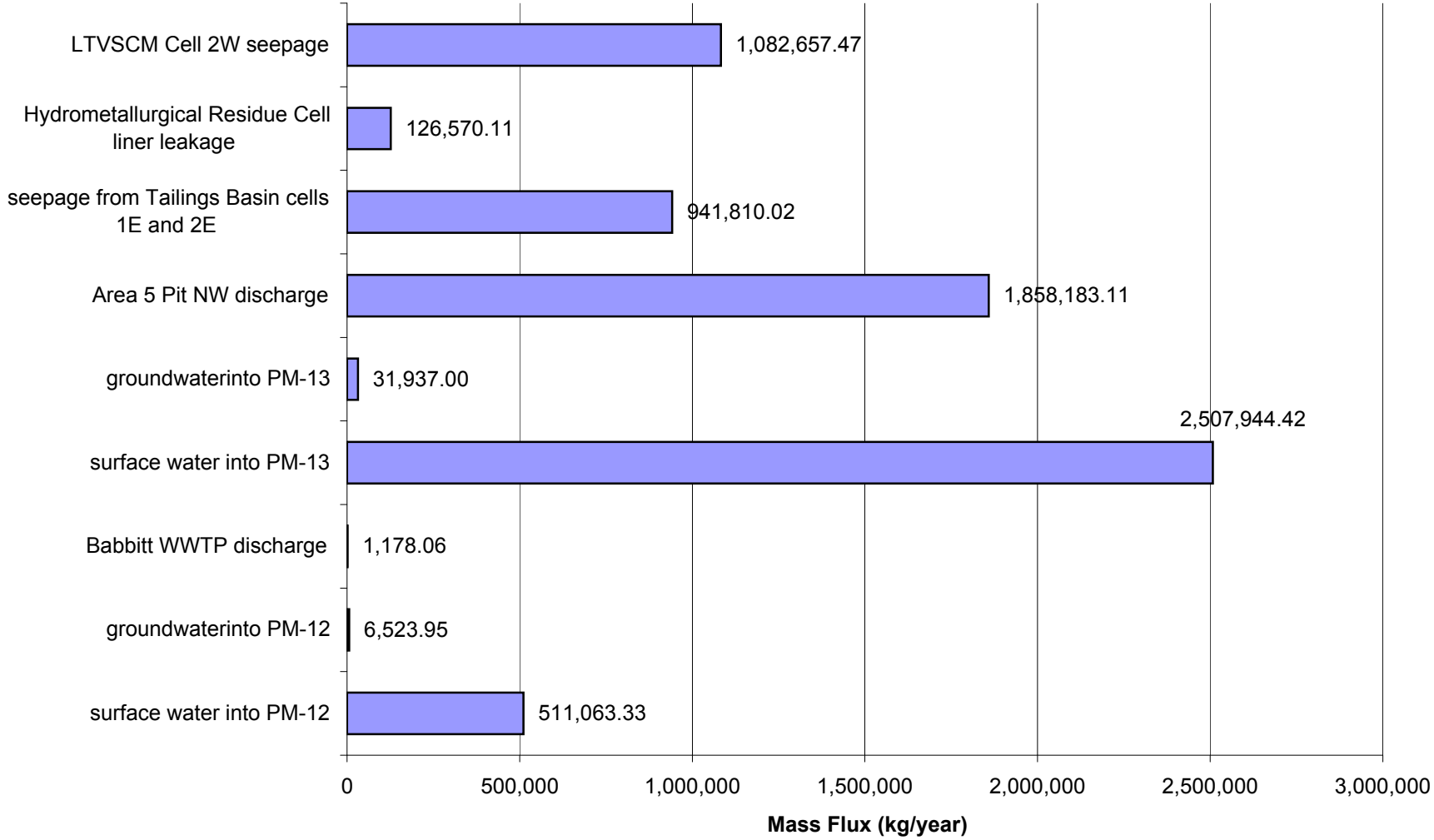
Geotechnical Mitigation: Mass Flux (kg/year) of Impacts at PM-13 in Year 20 for Average Flow for Sulfate (SO4)



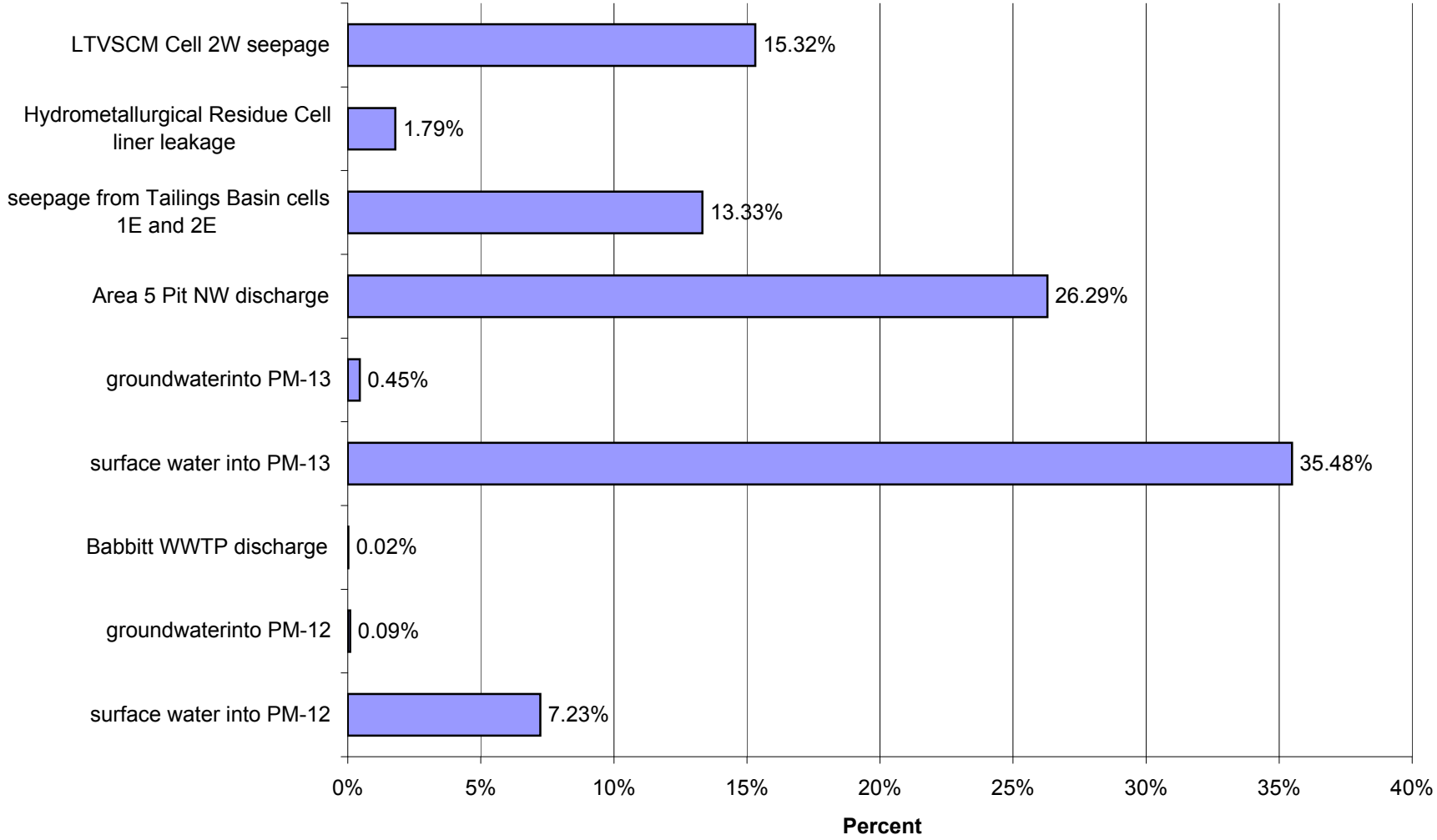
Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 20 for Average Flow for Sulfate (SO_4)



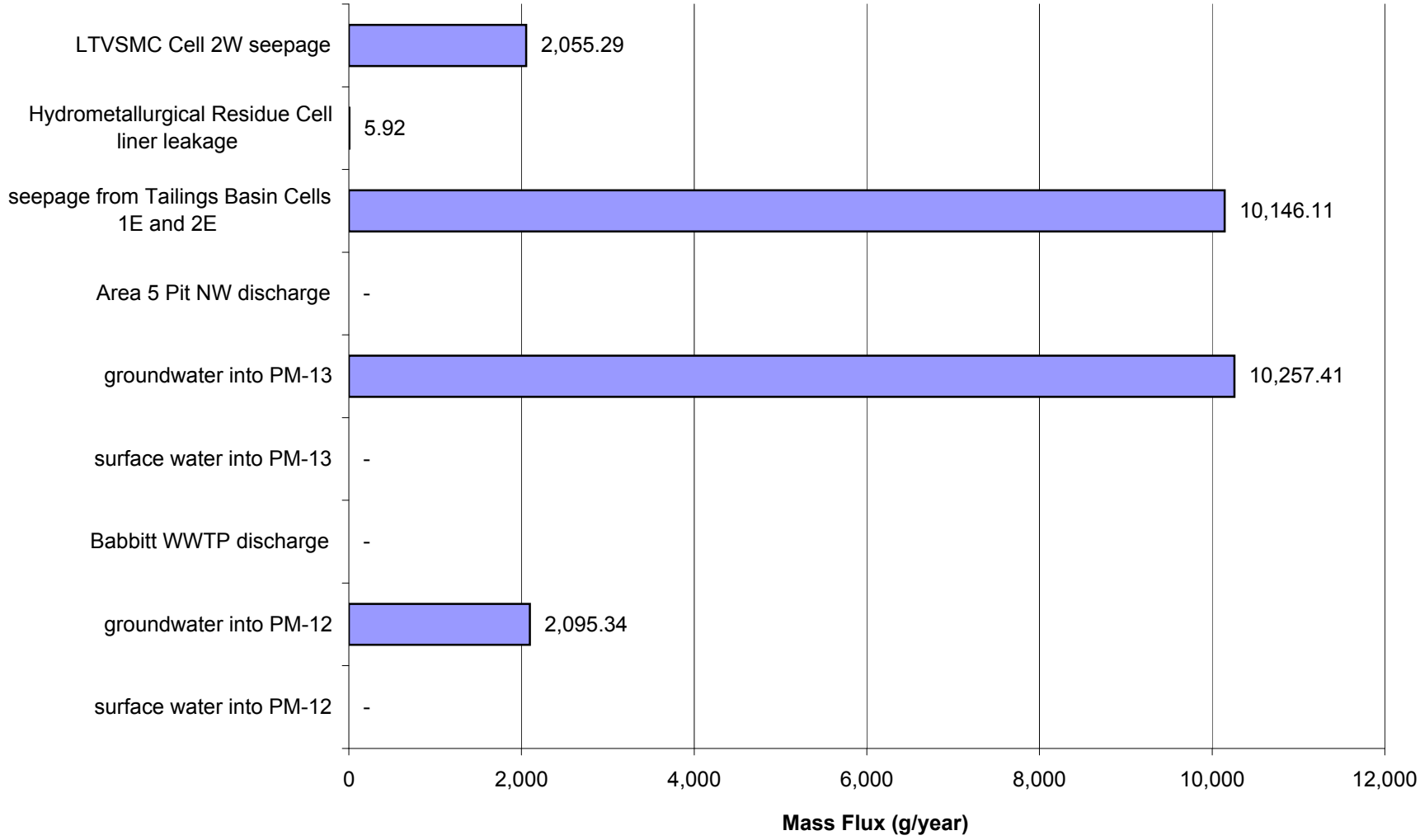
Geotechnical Mitigation: Mass Flux (kg/year) of Impacts at PM-13 in Year 20 for High Flow for Sulfate (SO_4)

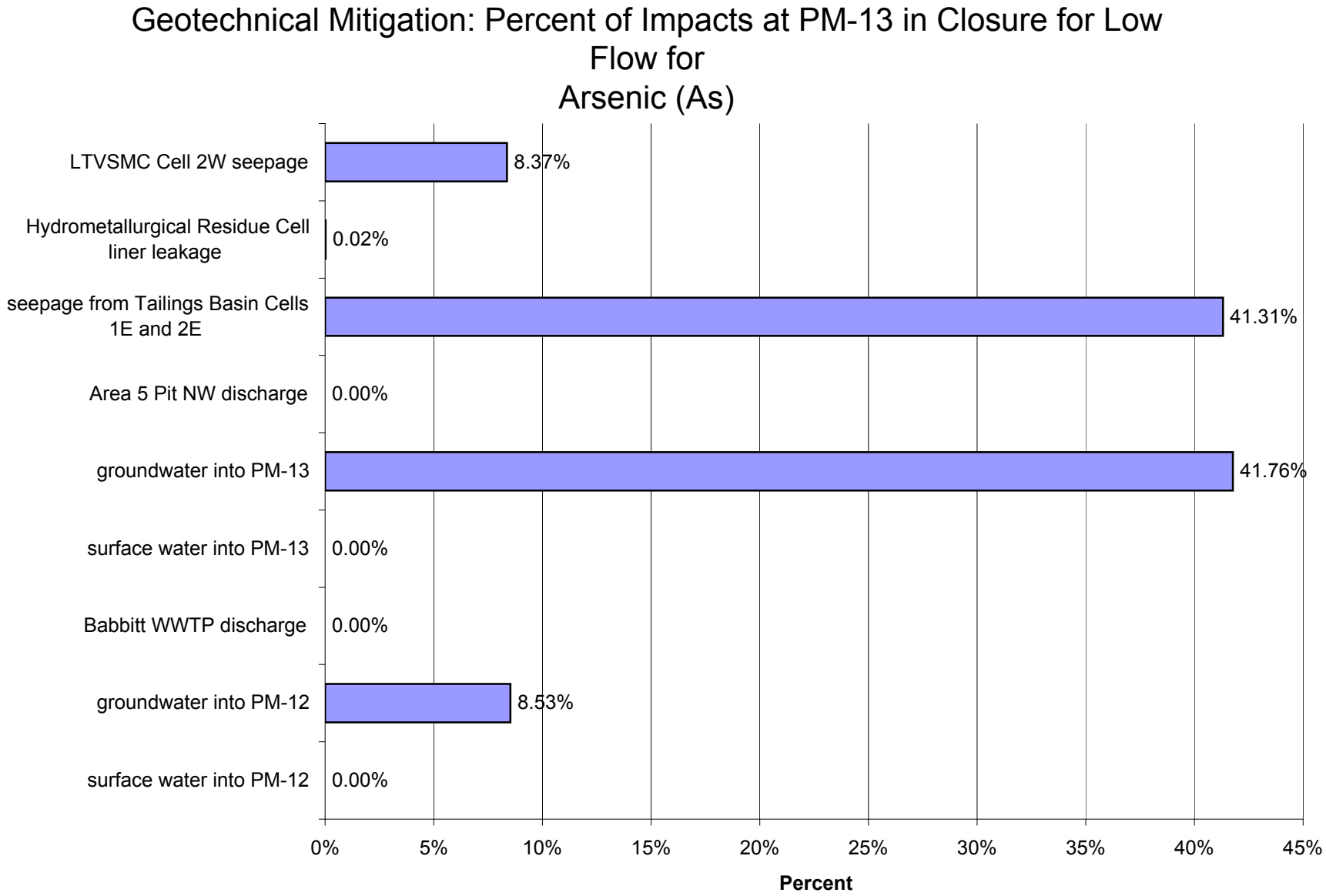


Geotechnical Mitigation: Percent of Impacts at PM-13 in Year 20 for High Flow for Sulfate (SO_4)

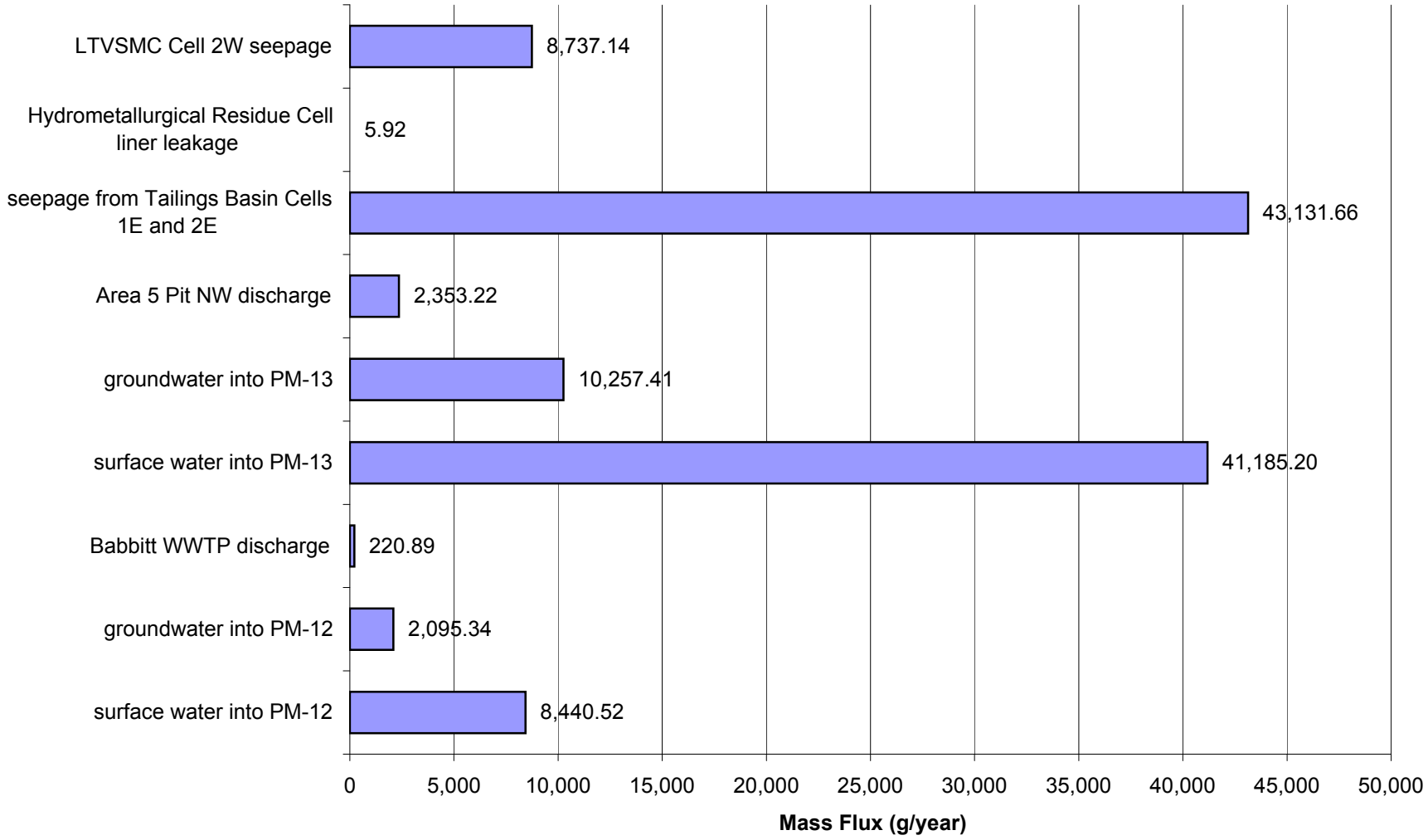


Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Closure for Low Flow for Arsenic (As)

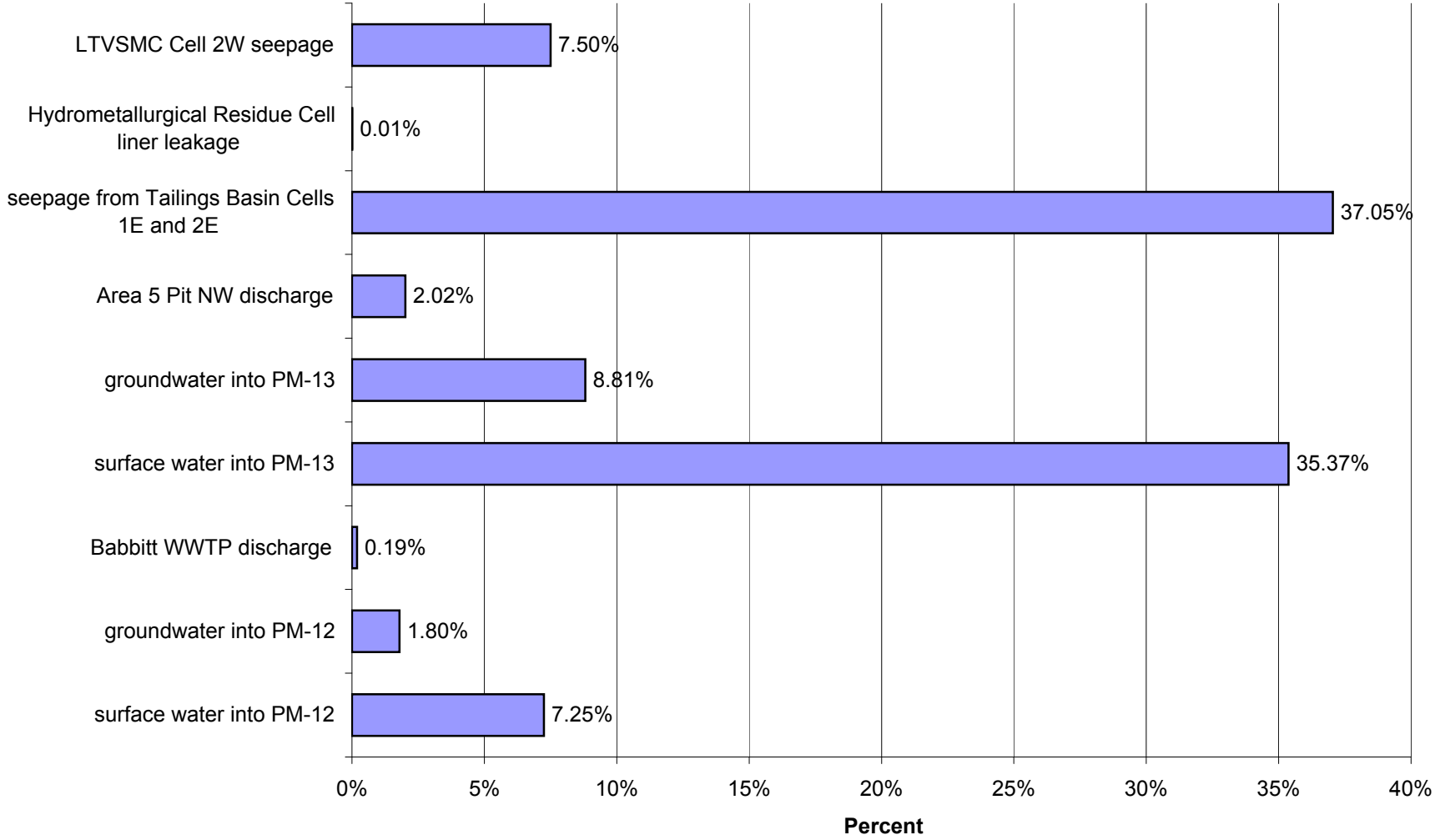



Geotechnical Mitigation: Percent of Impacts at PM-13 in Closure for Low Flow for
Arsenic (As)
LTVSMC Cell 2W seepage
8.37%
Hydrometallurgical Residue Cell liner leakage
0.02%
seepage from Tailings Basin Cells 1E and 2E
41.31%
Area 5 Pit NW discharge
0.00%
groundwater into PM-13
41.76%
surface water into PM-13
0.00%
Babbitt WWTP discharge
0.00%
groundwater into PM-12
8.53%
surface water into PM-12
0.00%
0%
5%
10%
15%
20%
25%
30%
35%
40%
45%
Percent

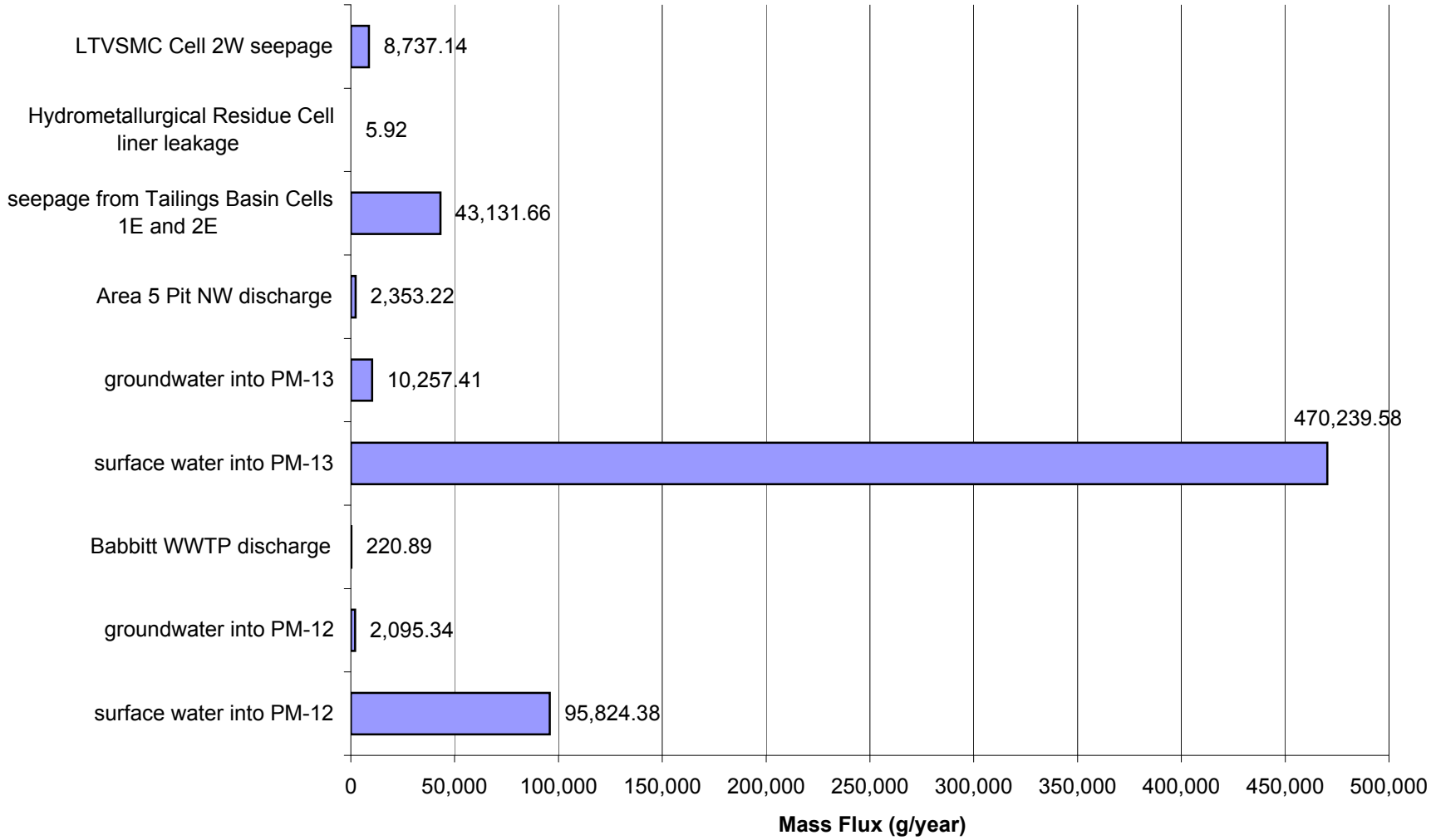
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Closure for Average Flow for Arsenic (As)



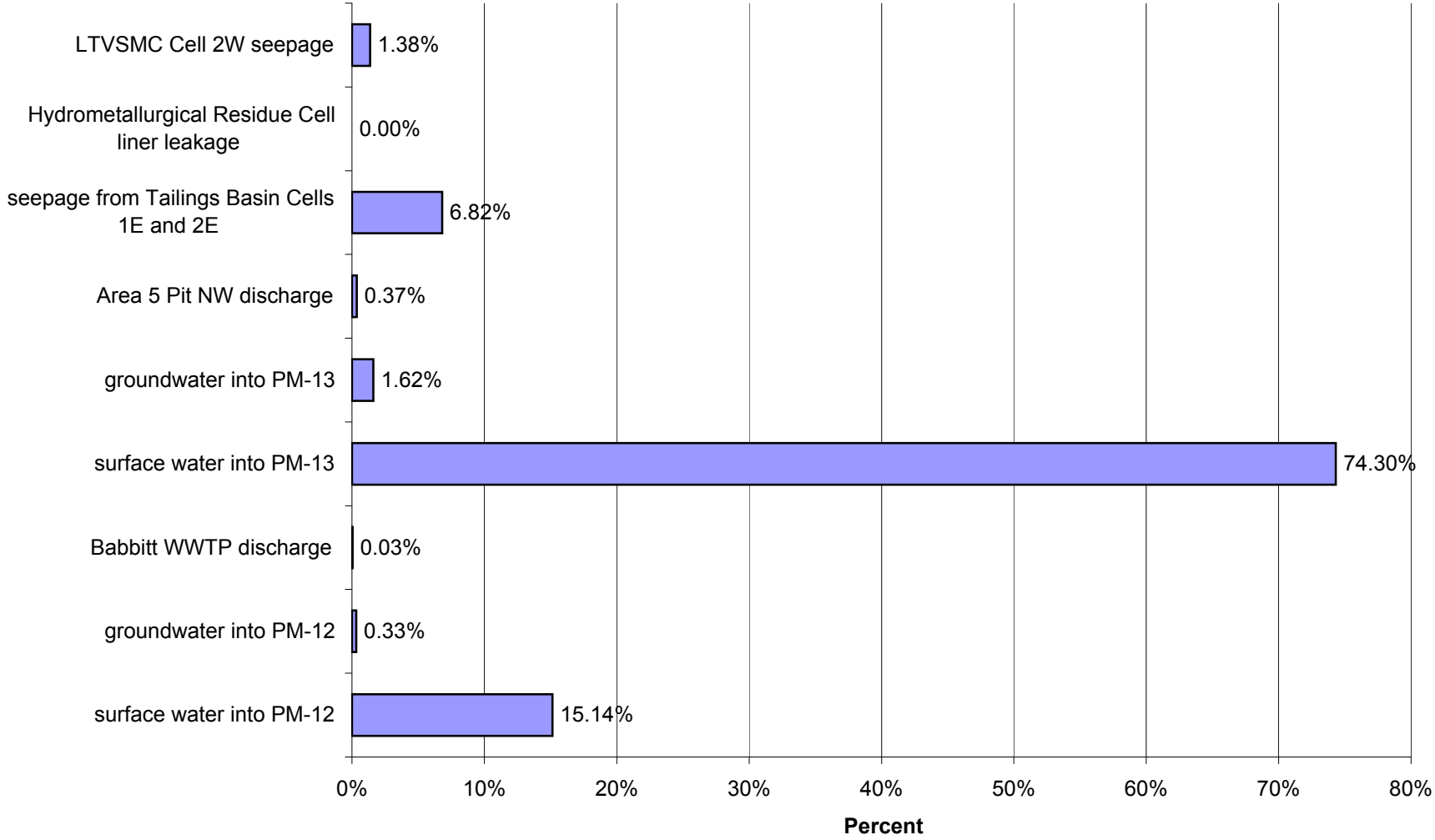
Geotechnical Mitigation: Percent of Impacts at PM-13 in Closure for Average Flow for Arsenic (As)



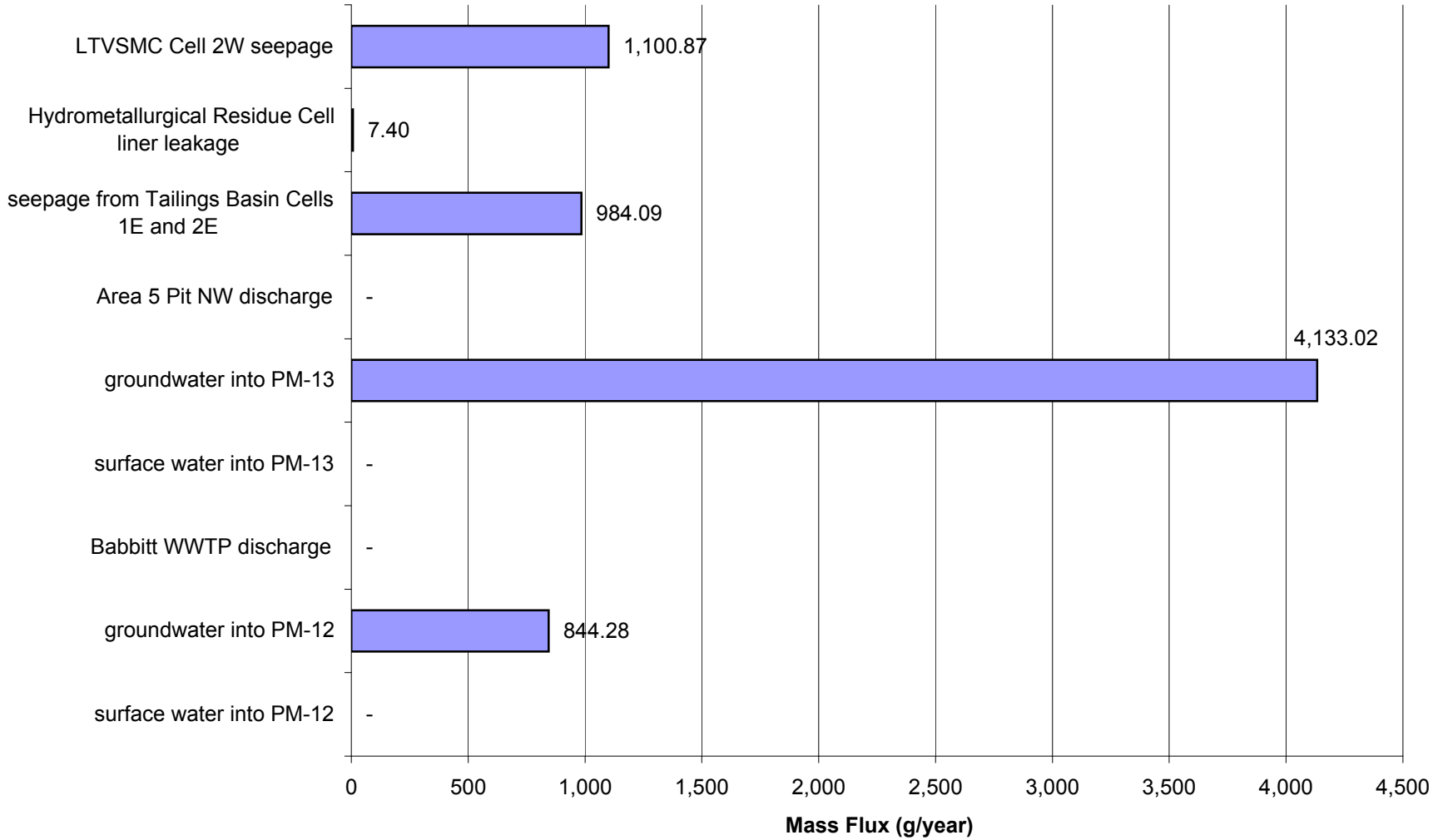
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Closure for High Flow for Arsenic (As)



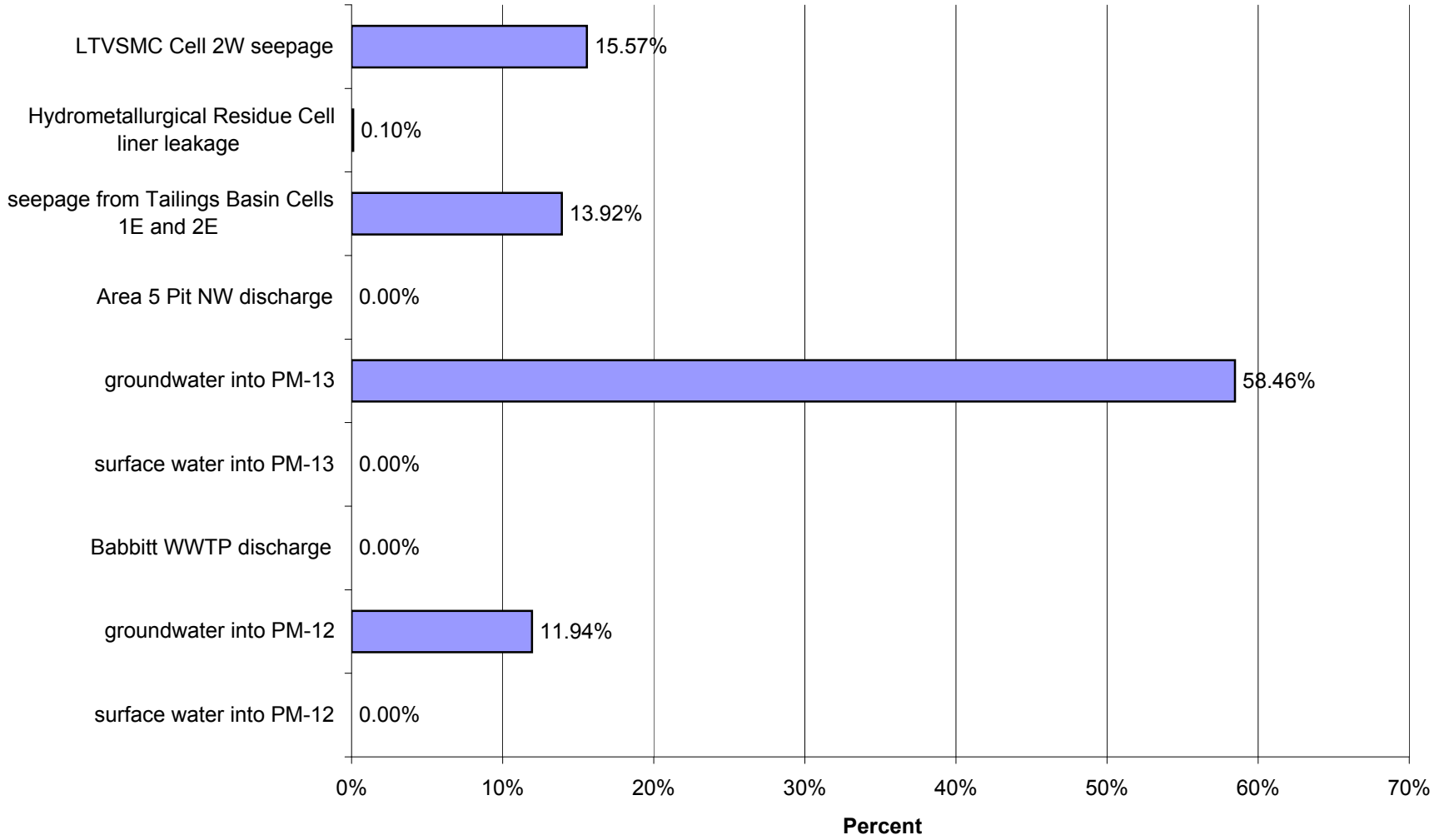
Geotechnical Mitigation: Percent of Impacts at PM-13 in Closure for High Flow for Arsenic (As)



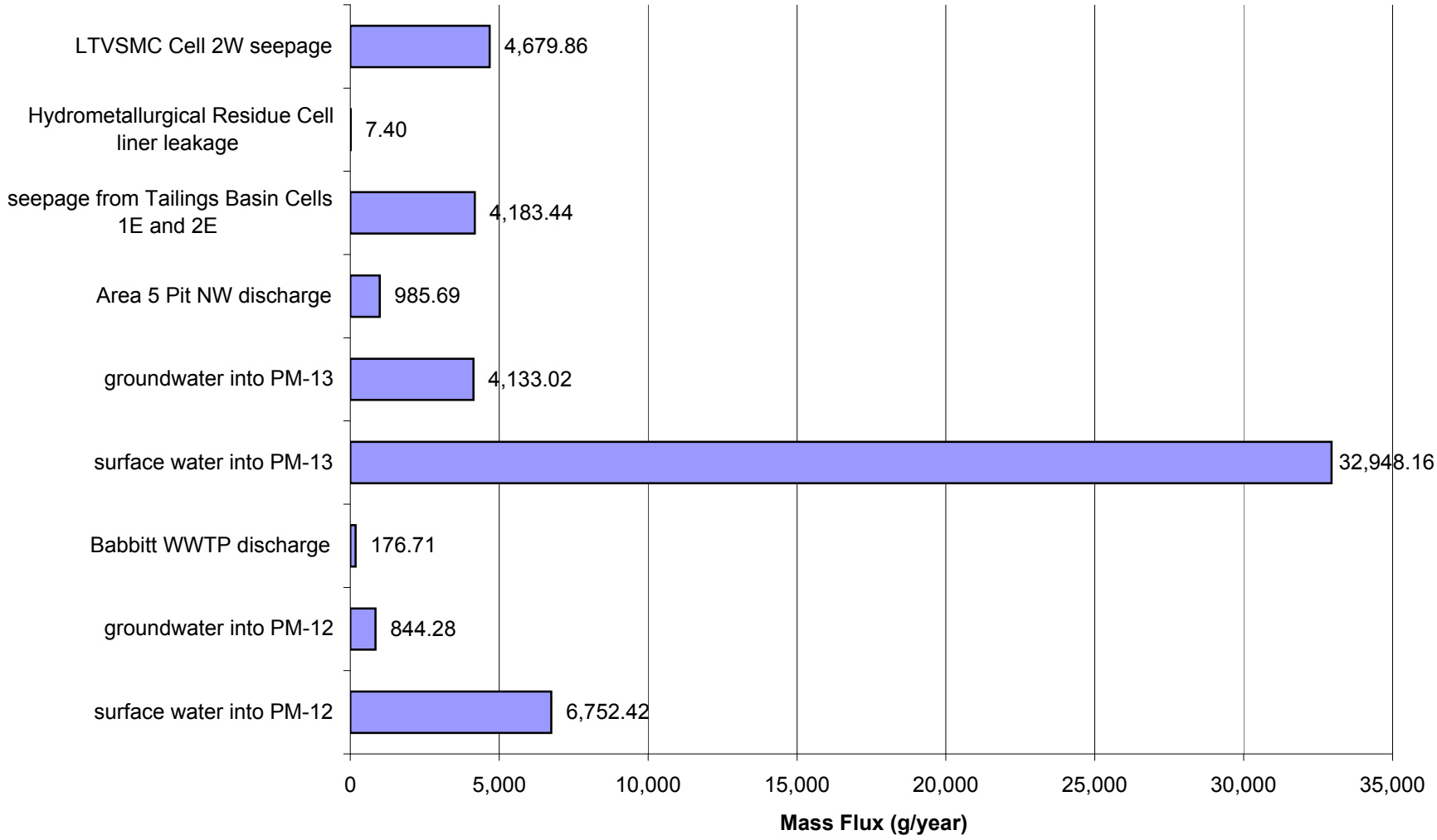
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Closure for Low Flow for Cobalt (Co)



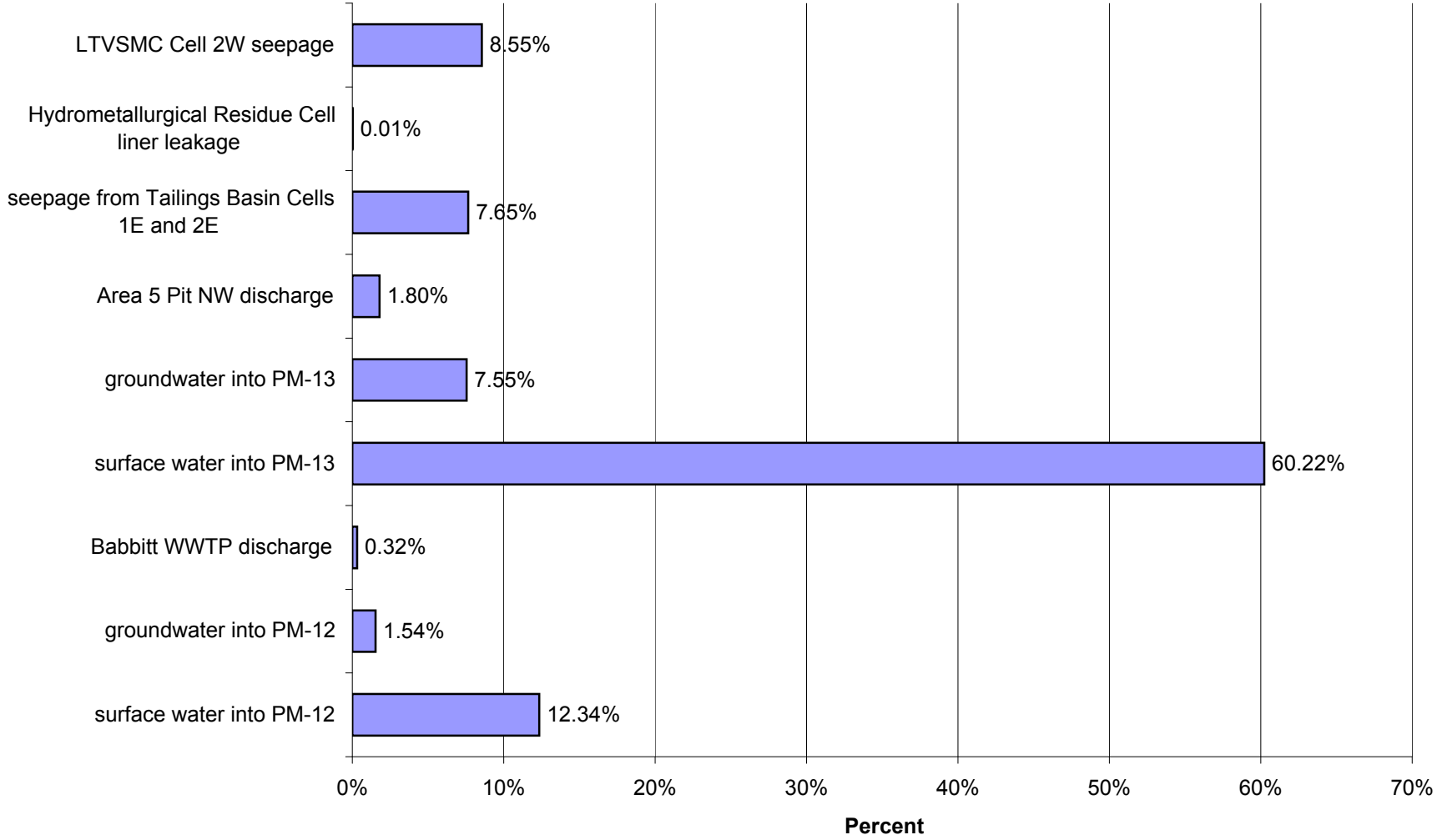
Geotechnical Mitigation: Percent of Impacts at PM-13 in Closure for Low Flow for Cobalt (Co)



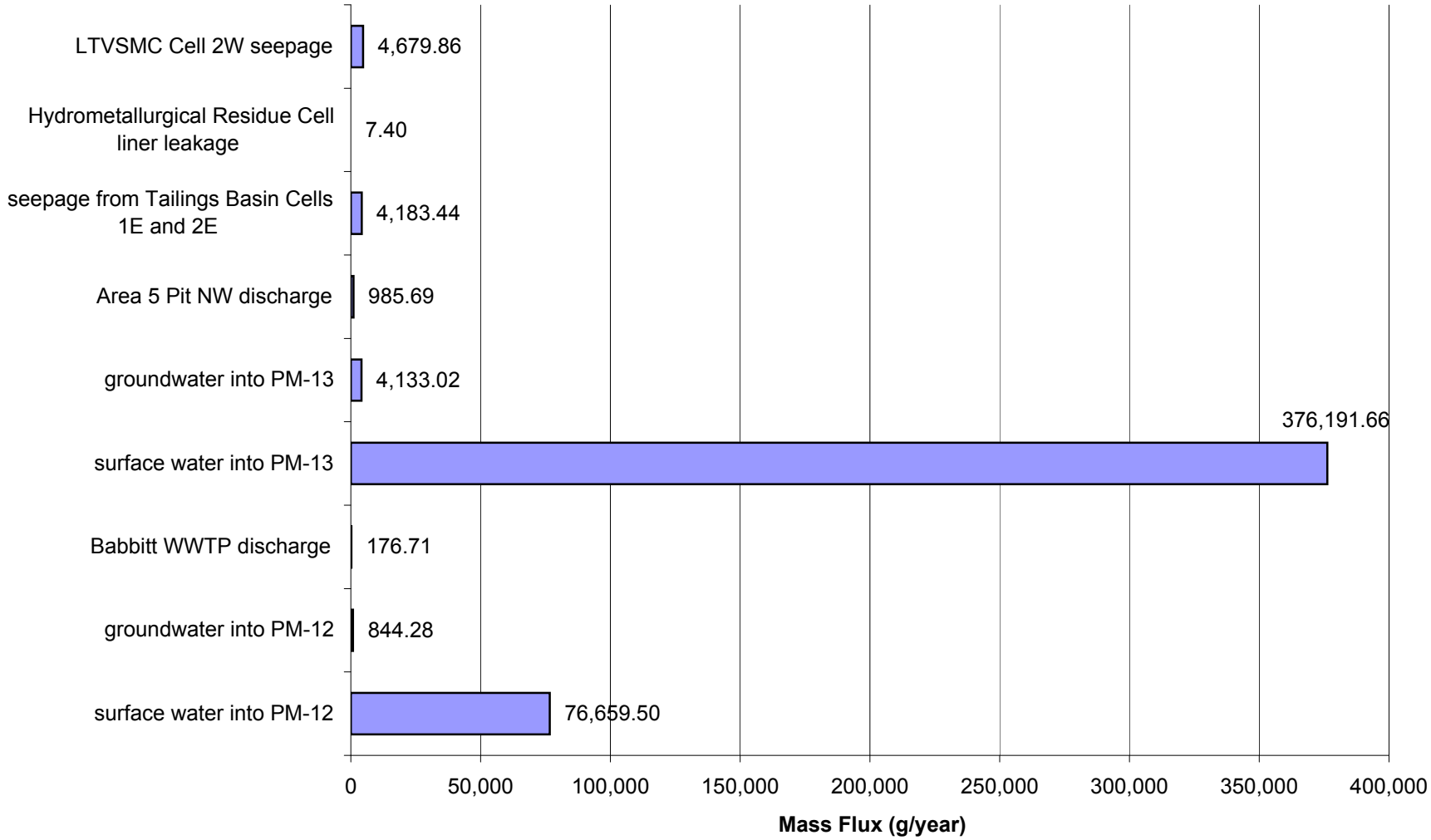
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Closure for Average Flow for Cobalt (Co)



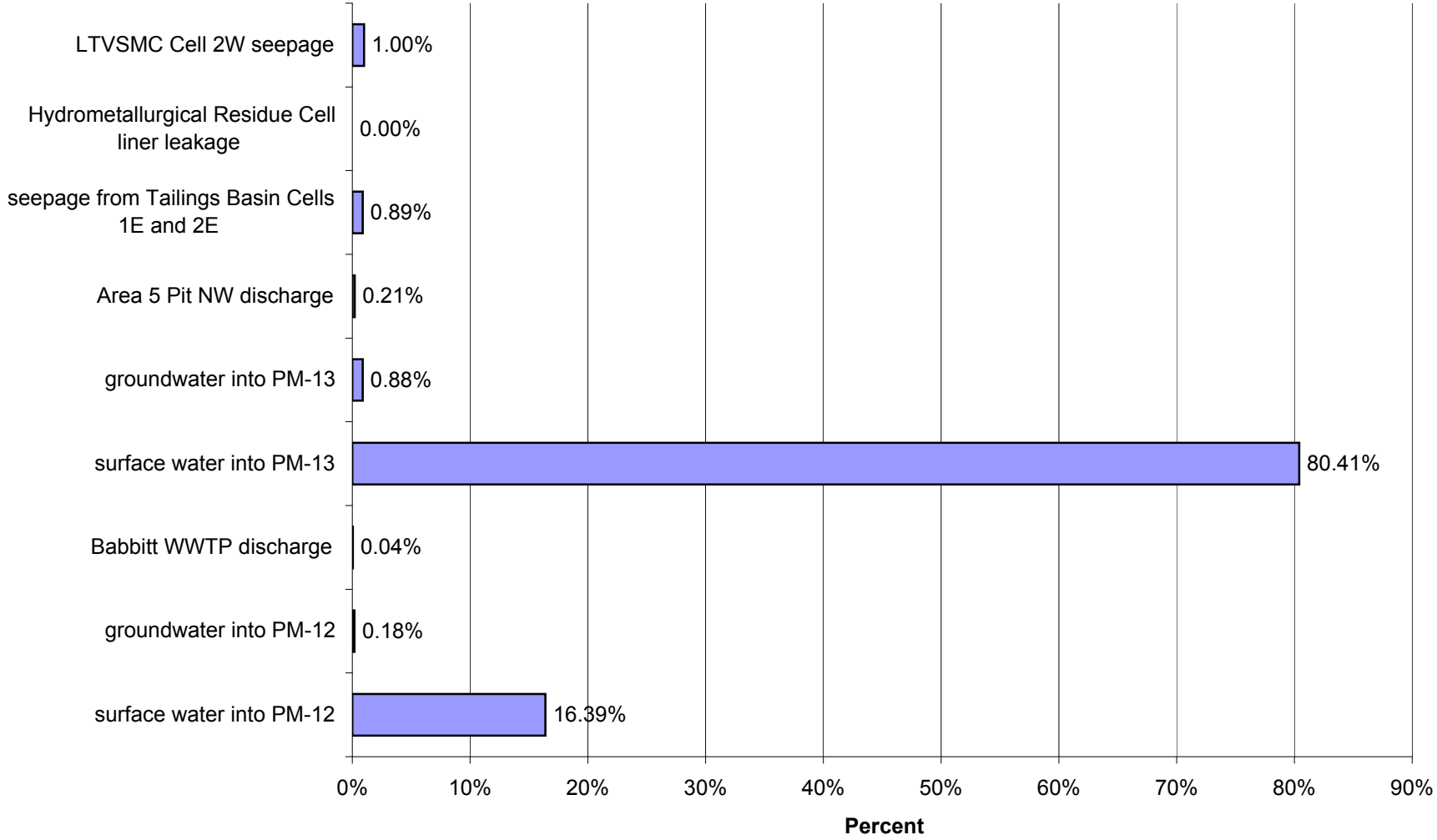
Geotechnical Mitigation: Percent of Impacts at PM-13 in Closure for Average Flow for Cobalt (Co)



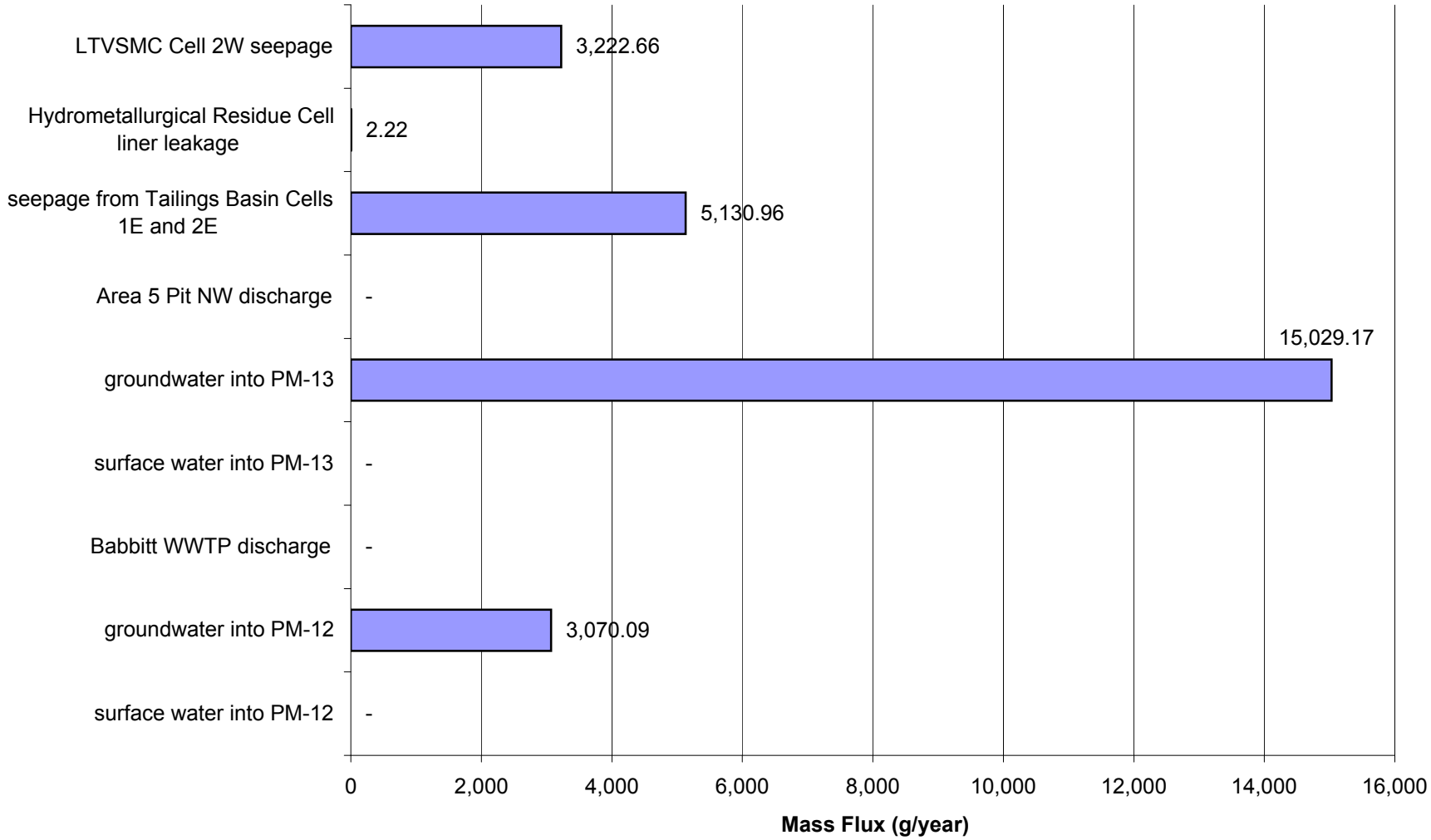
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Closure for High Flow for Cobalt (Co)



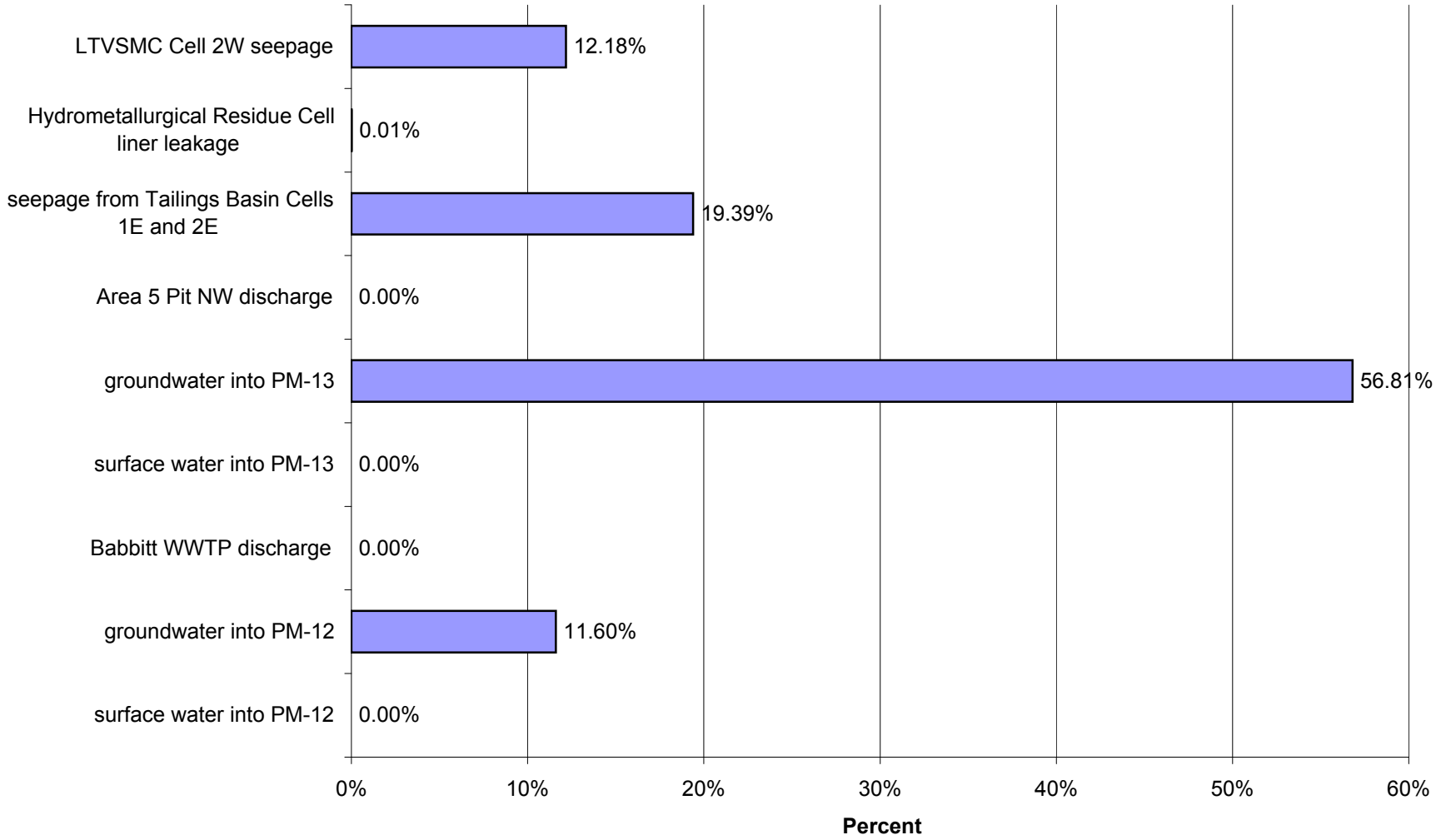
Geotechnical Mitigation: Percent of Impacts at PM-13 in Closure for High Flow for Cobalt (Co)



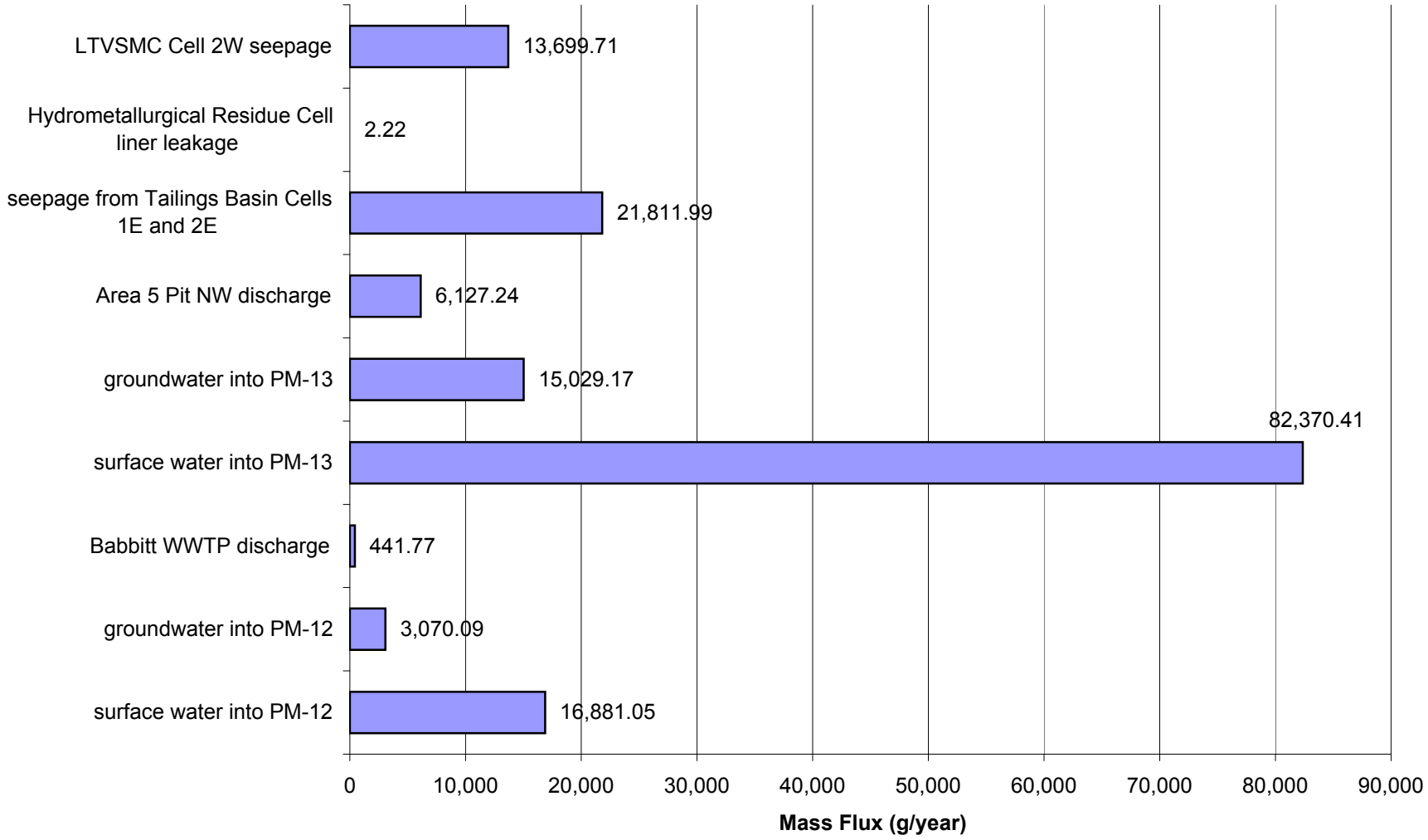
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Closure for Low Flow for Copper (Cu)



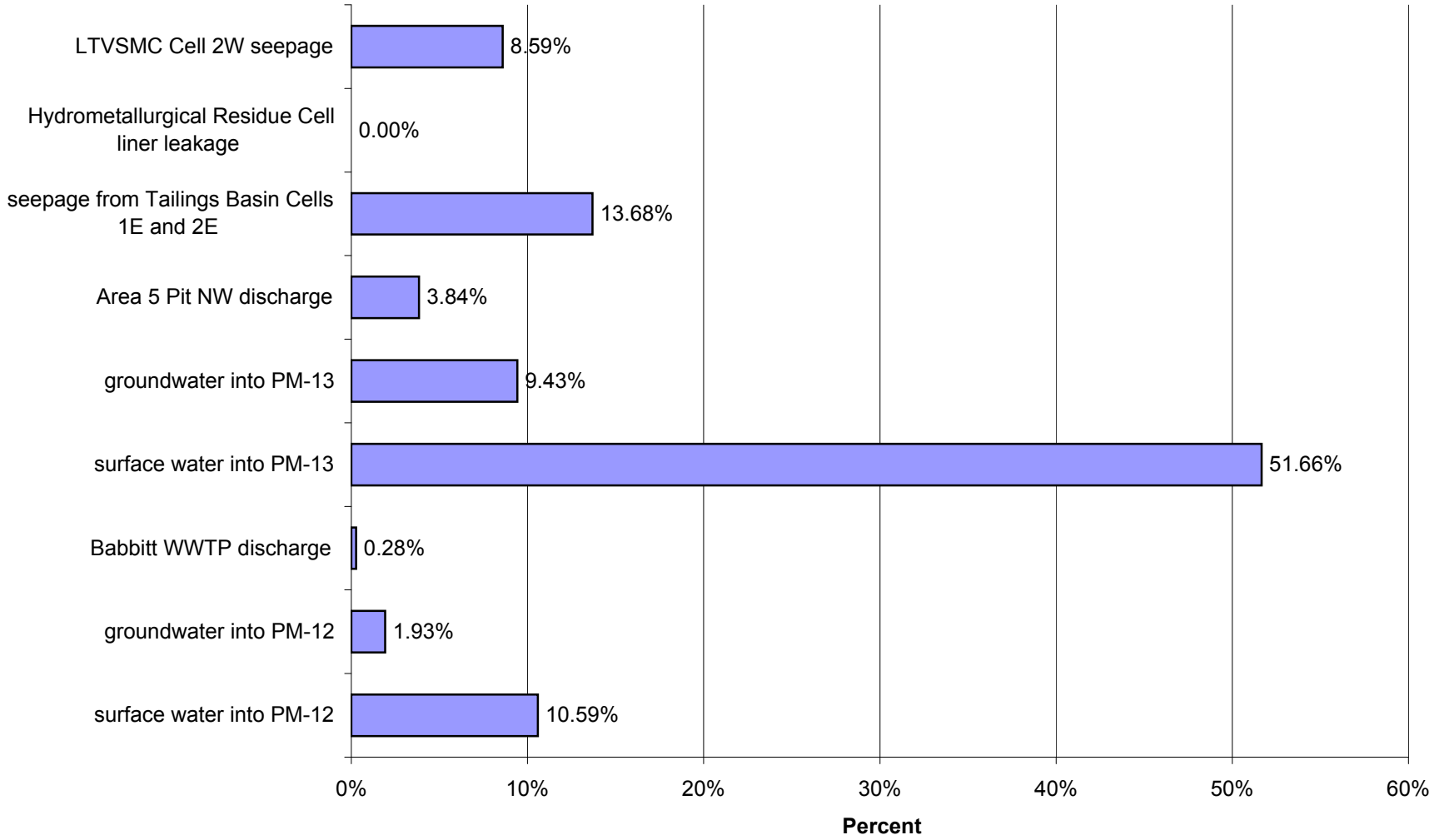
Geotechnical Mitigation: Percent of Impacts at PM-13 in Closure for Low Flow for Copper (Cu)



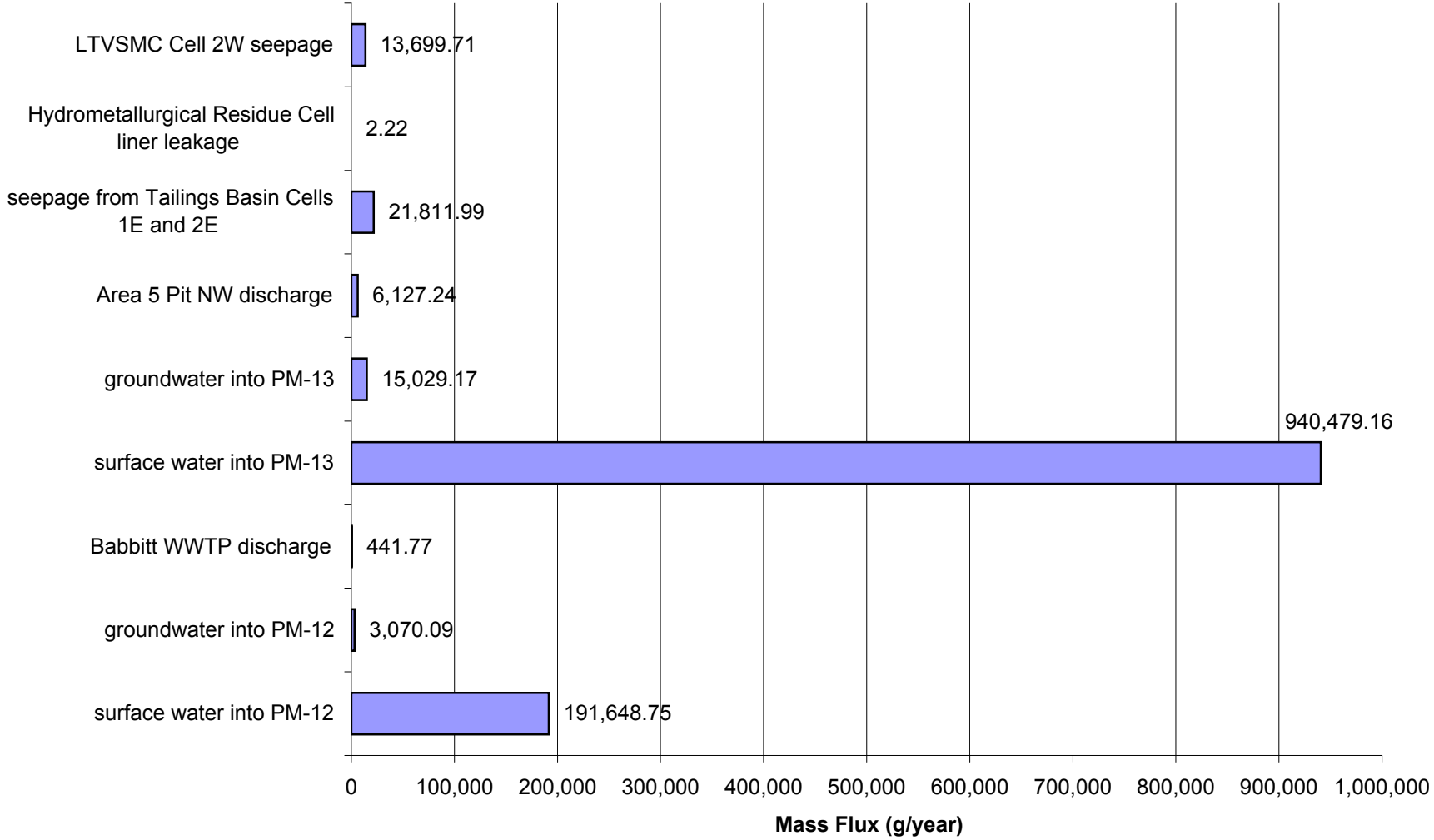
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Closure for Average Flow for Copper (Cu)



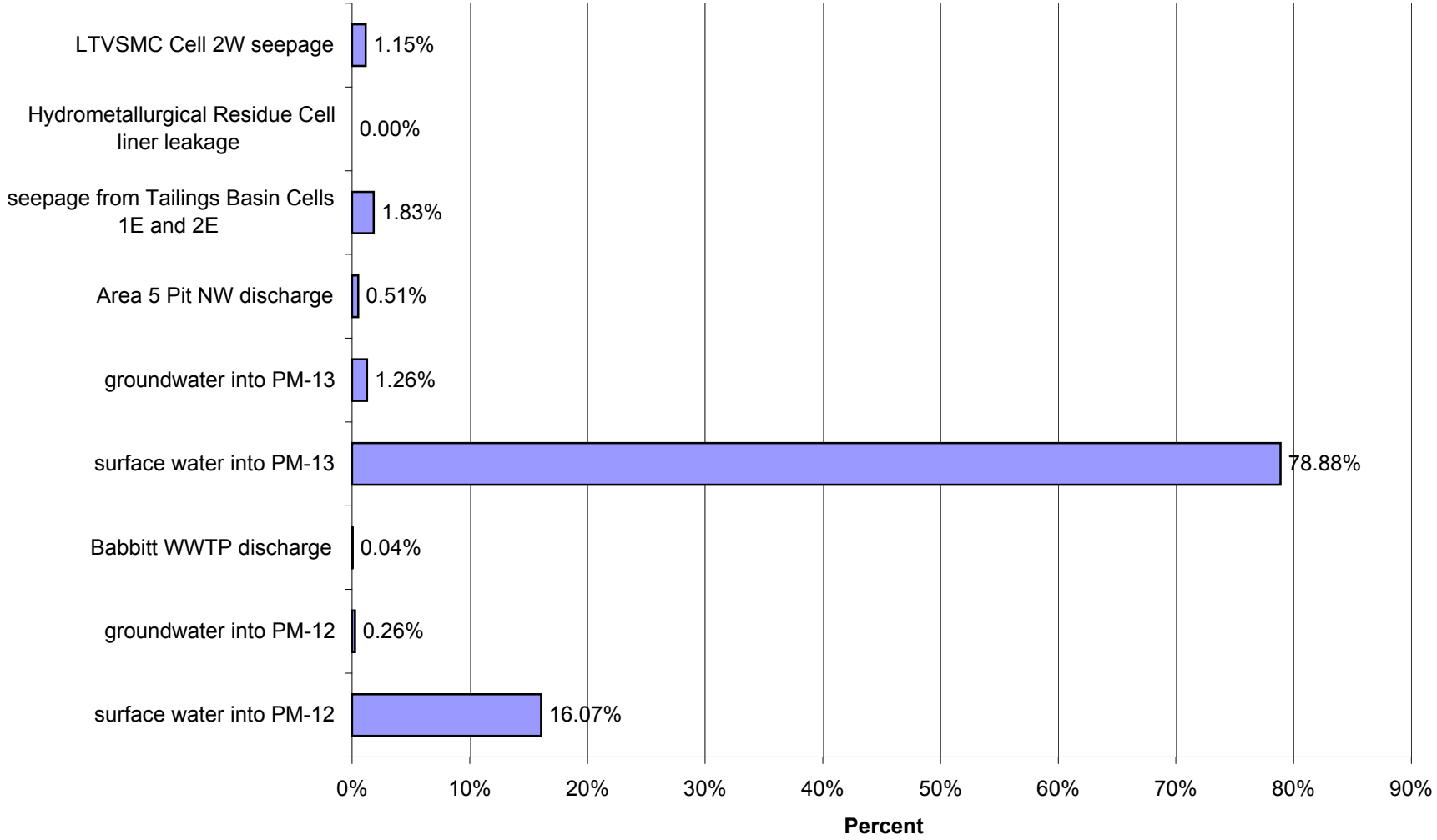
Geotechnical Mitigation: Percent of Impacts at PM-13 in Closure for Average Flow for Copper (Cu)



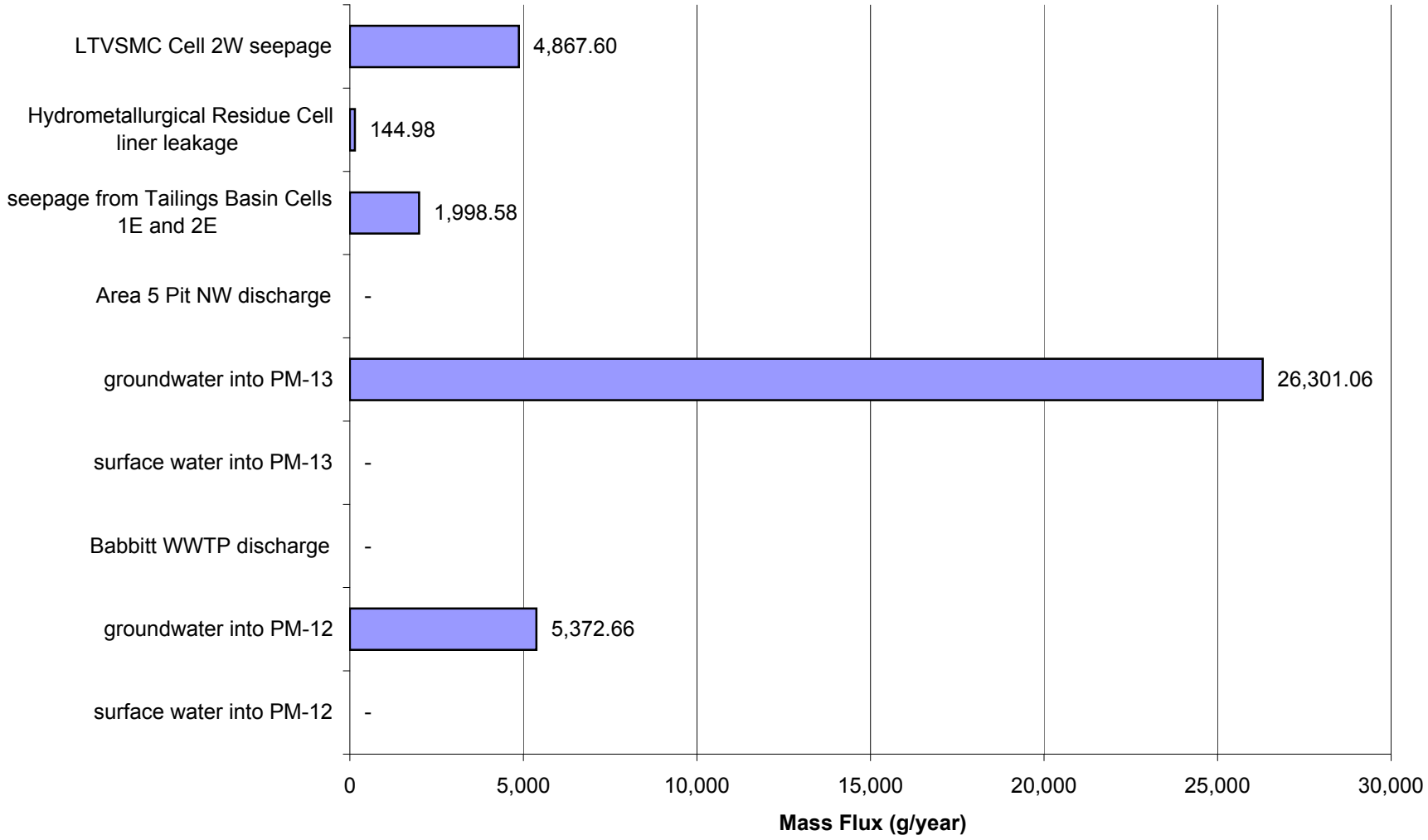
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Closure for High Flow for Copper (Cu)



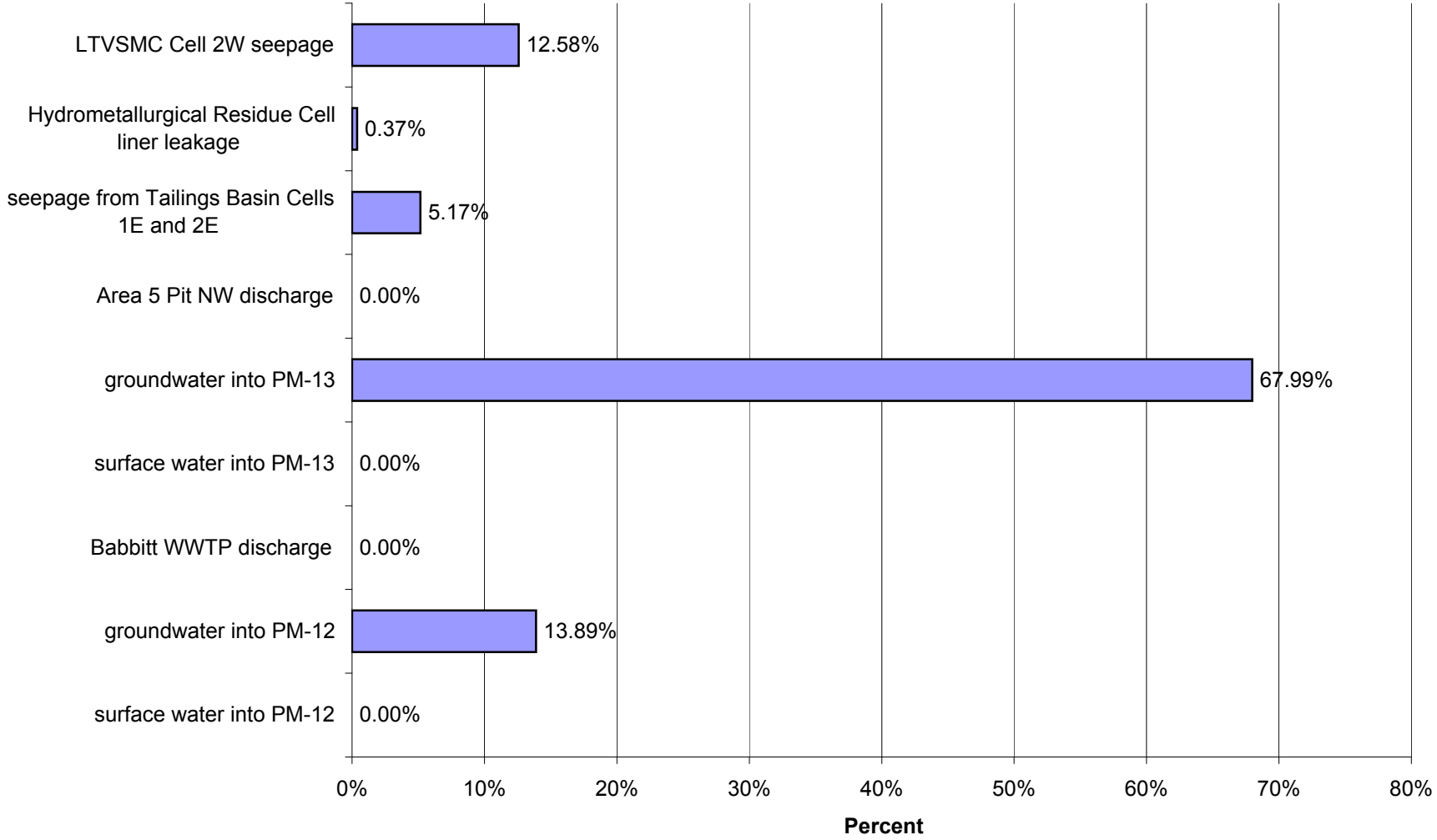
Geotechnical Mitigation: Percent of Impacts at PM-13 in Closure for High Flow for Copper (Cu)



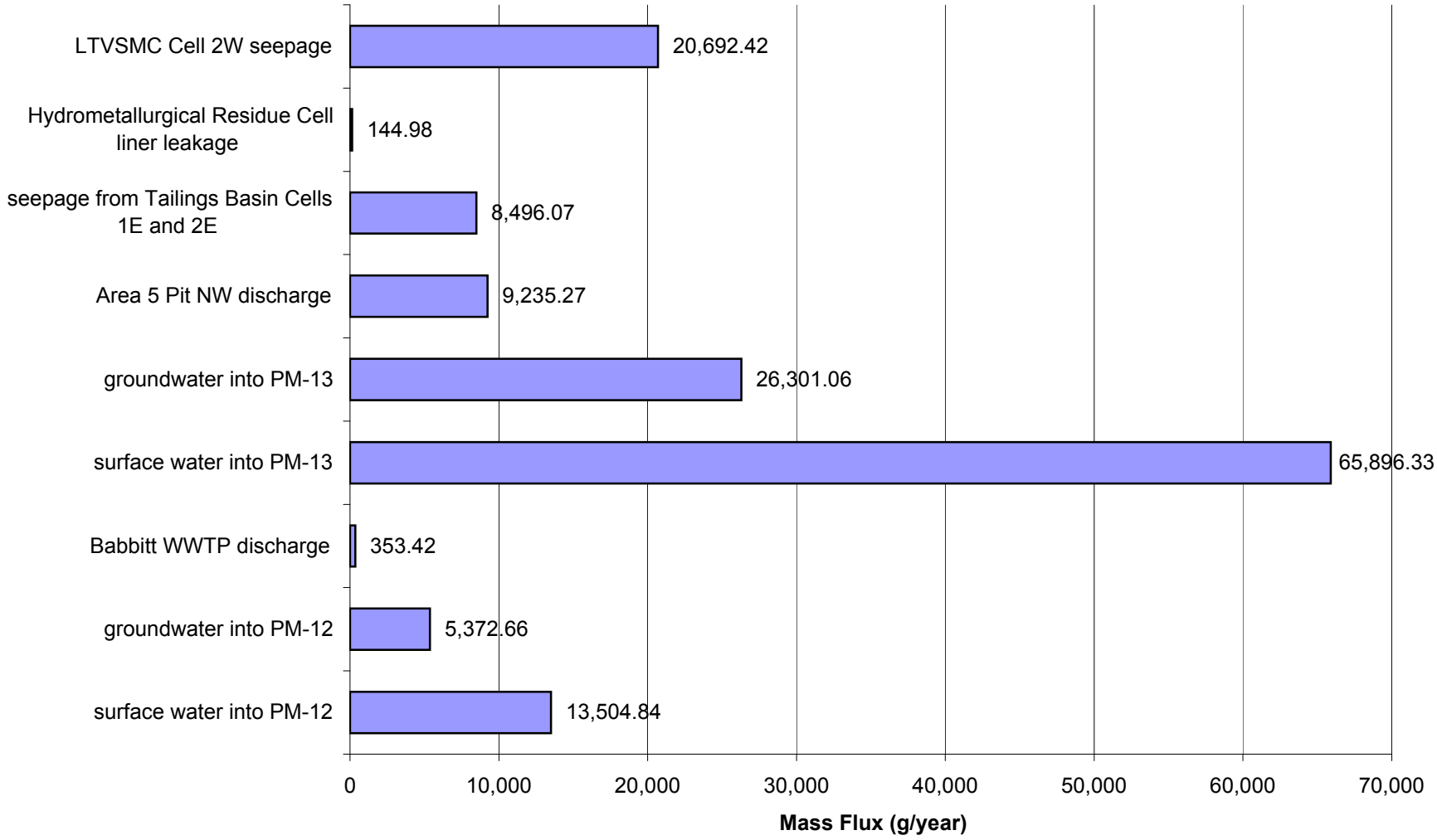
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Closure for Low Flow for Nickel (Ni)



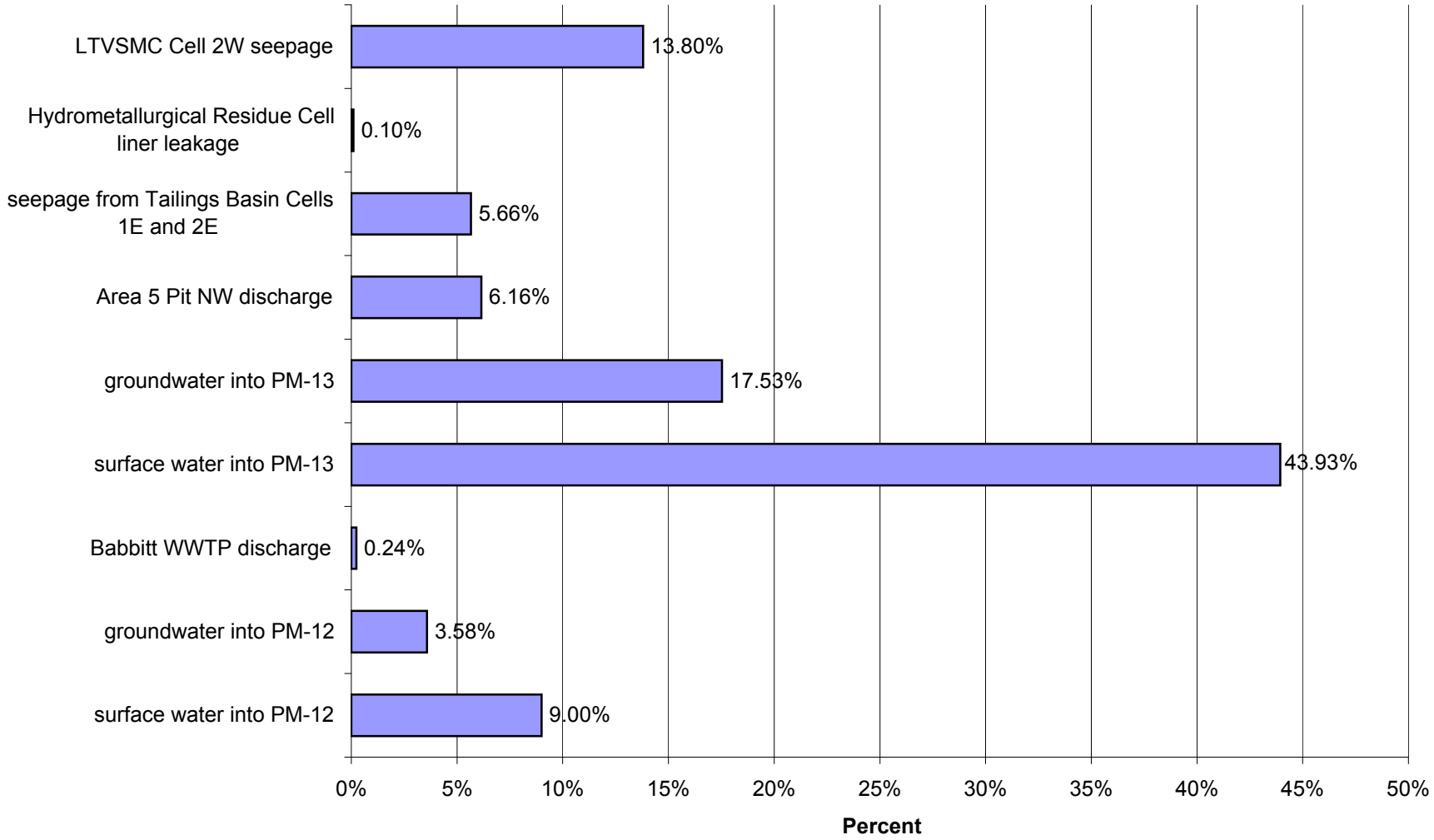
Geotechnical Mitigation: Percent of Impacts at PM-13 in Closure for Low Flow for Nickel (Ni)



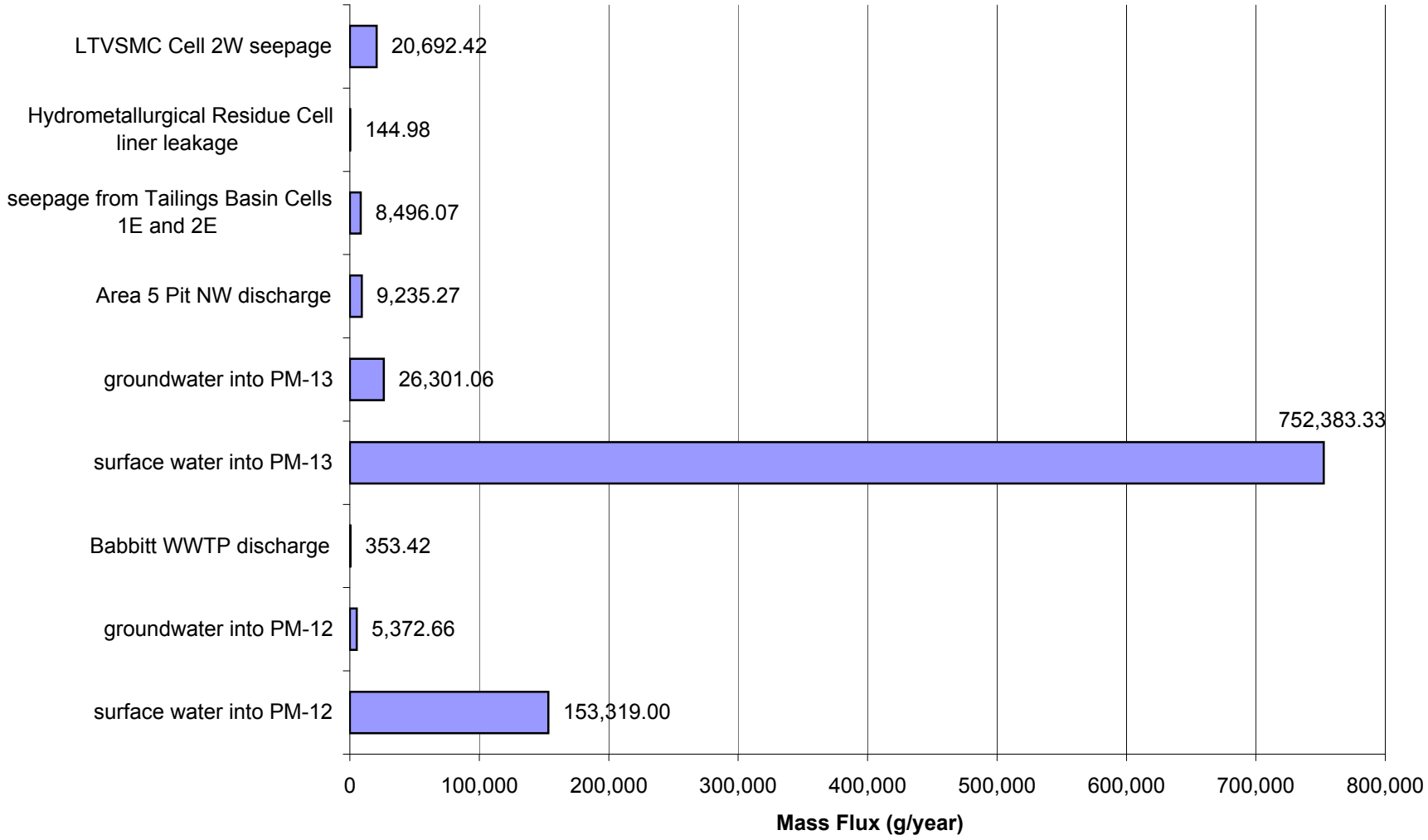
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Closure for Average Flow for Nickel (Ni)



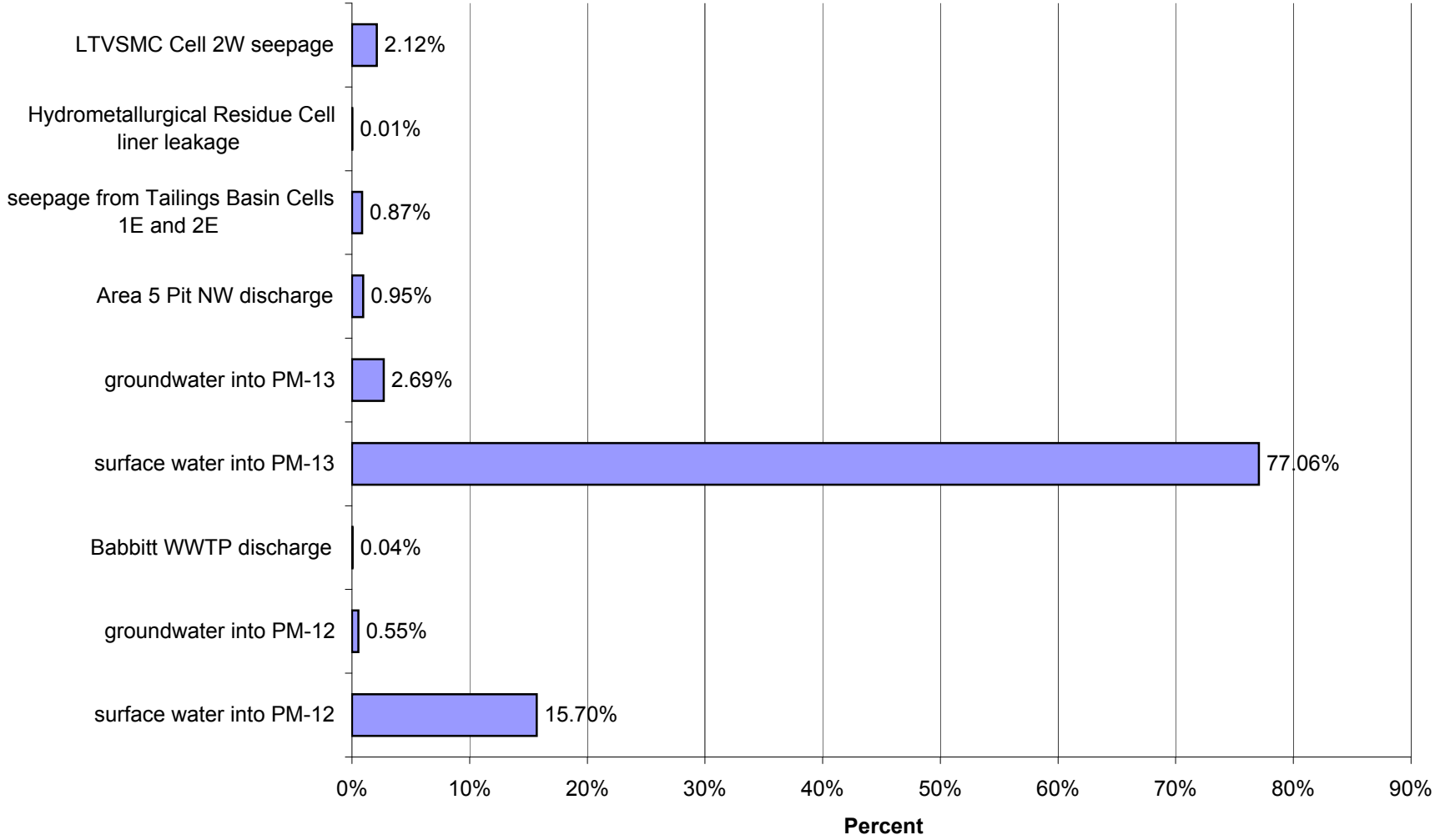
Geotechnical Mitigation: Percent of Impacts at PM-13 in Closure for Average Flow for Nickel (Ni)



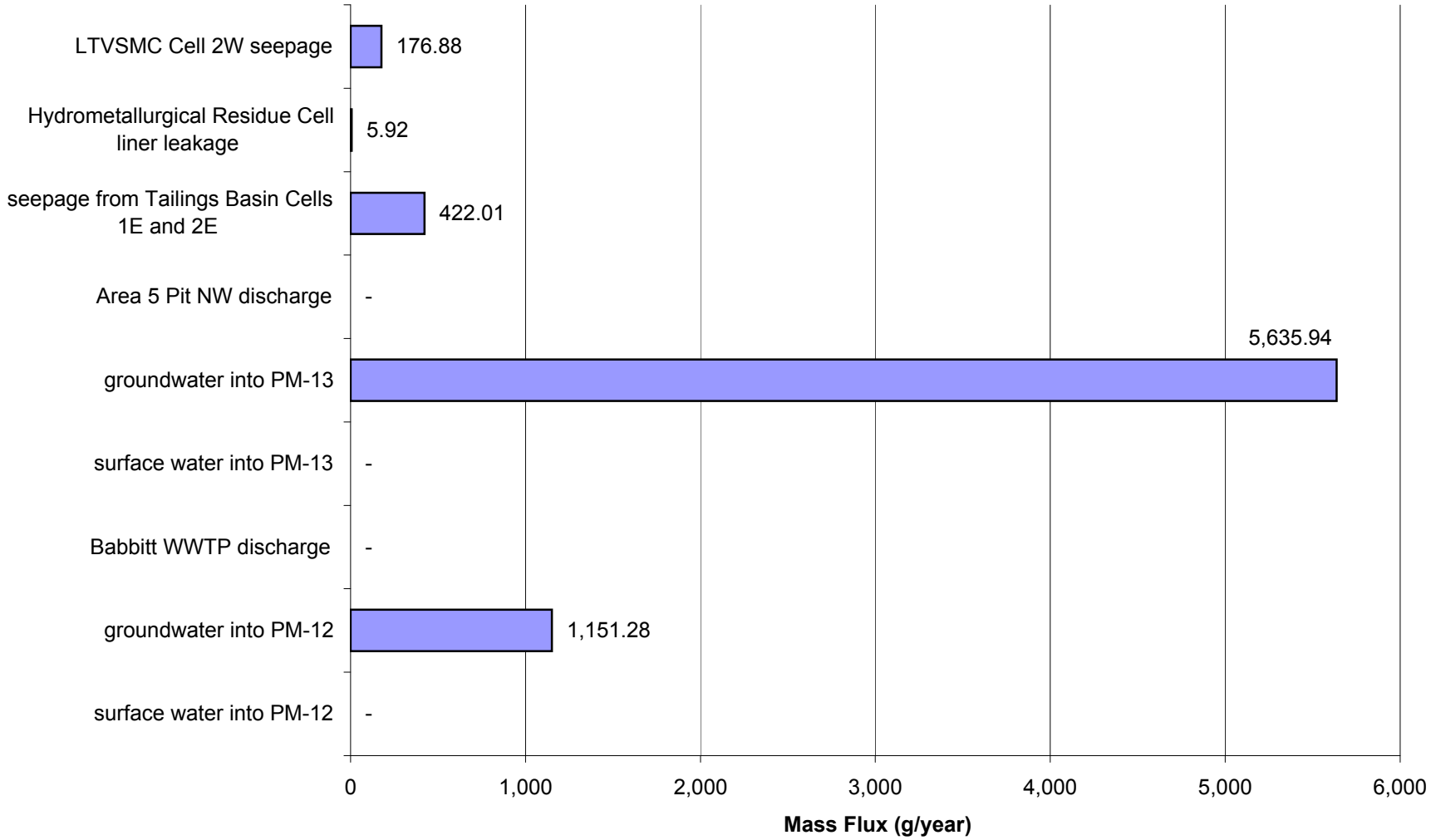
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Closure for High Flow for Nickel (Ni)



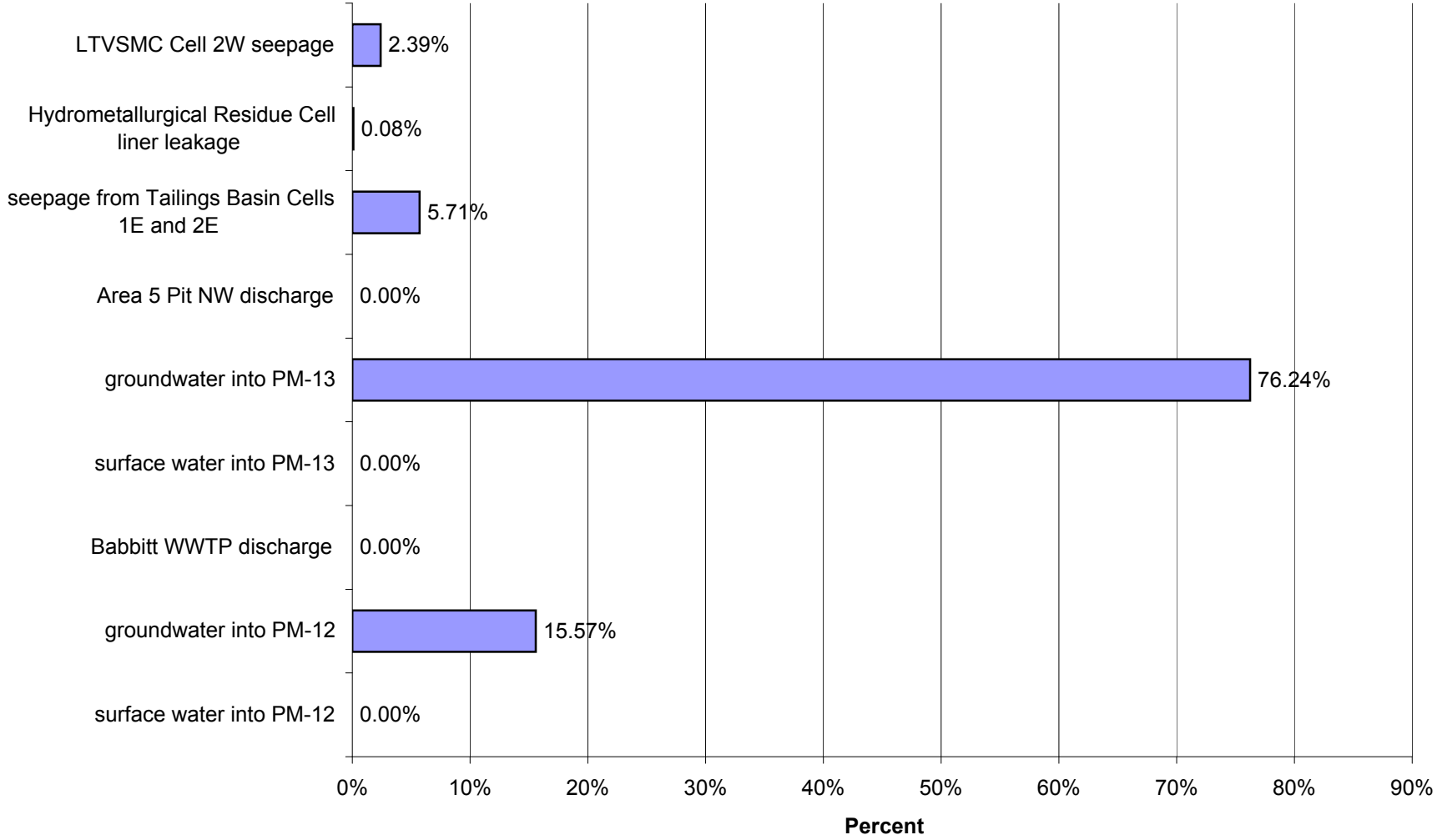
Geotechnical Mitigation: Percent of Impacts at PM-13 in Closure for High Flow for Nickel (Ni)



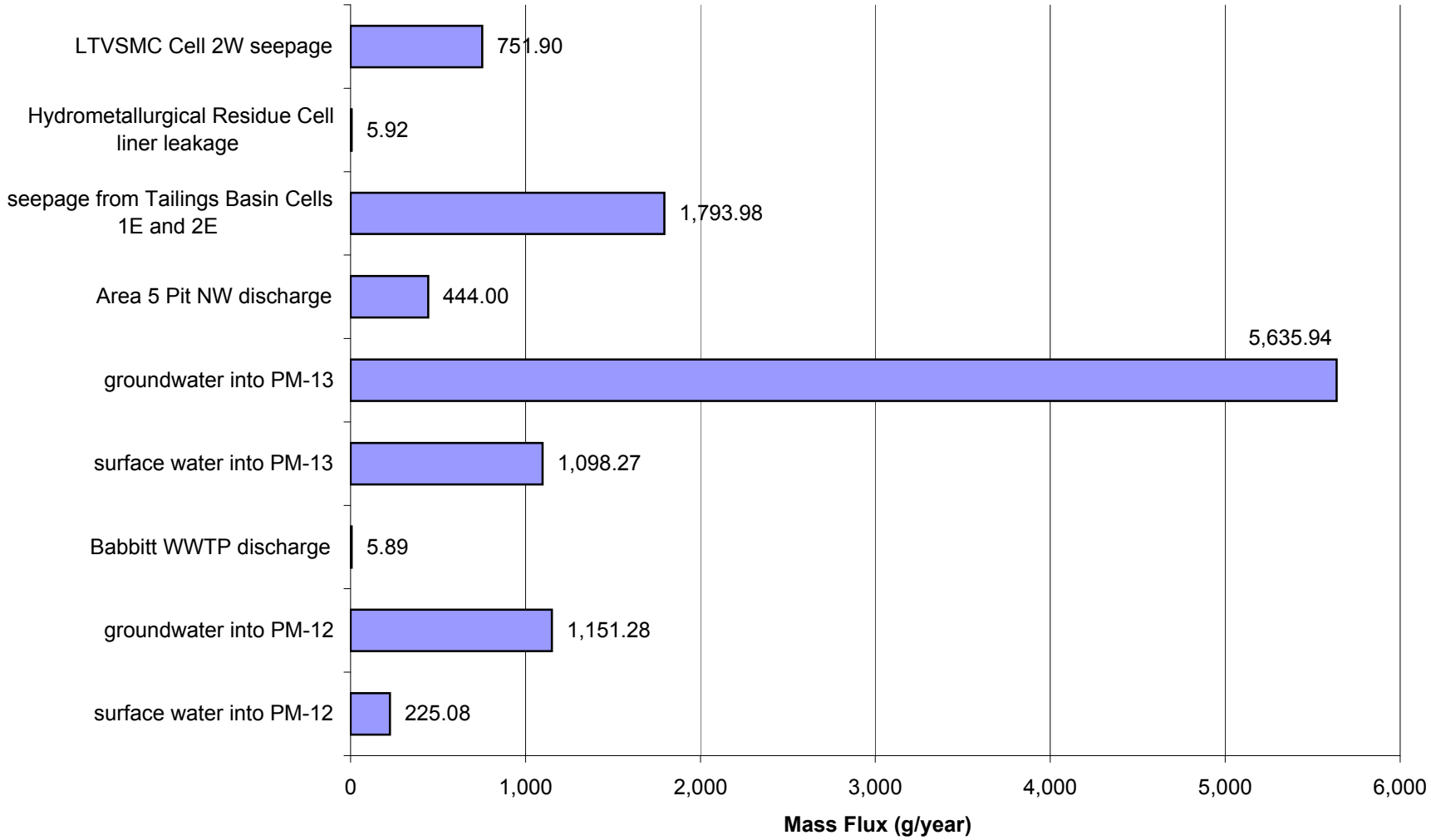
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Closure for Low Flow for Antimony (Sb)



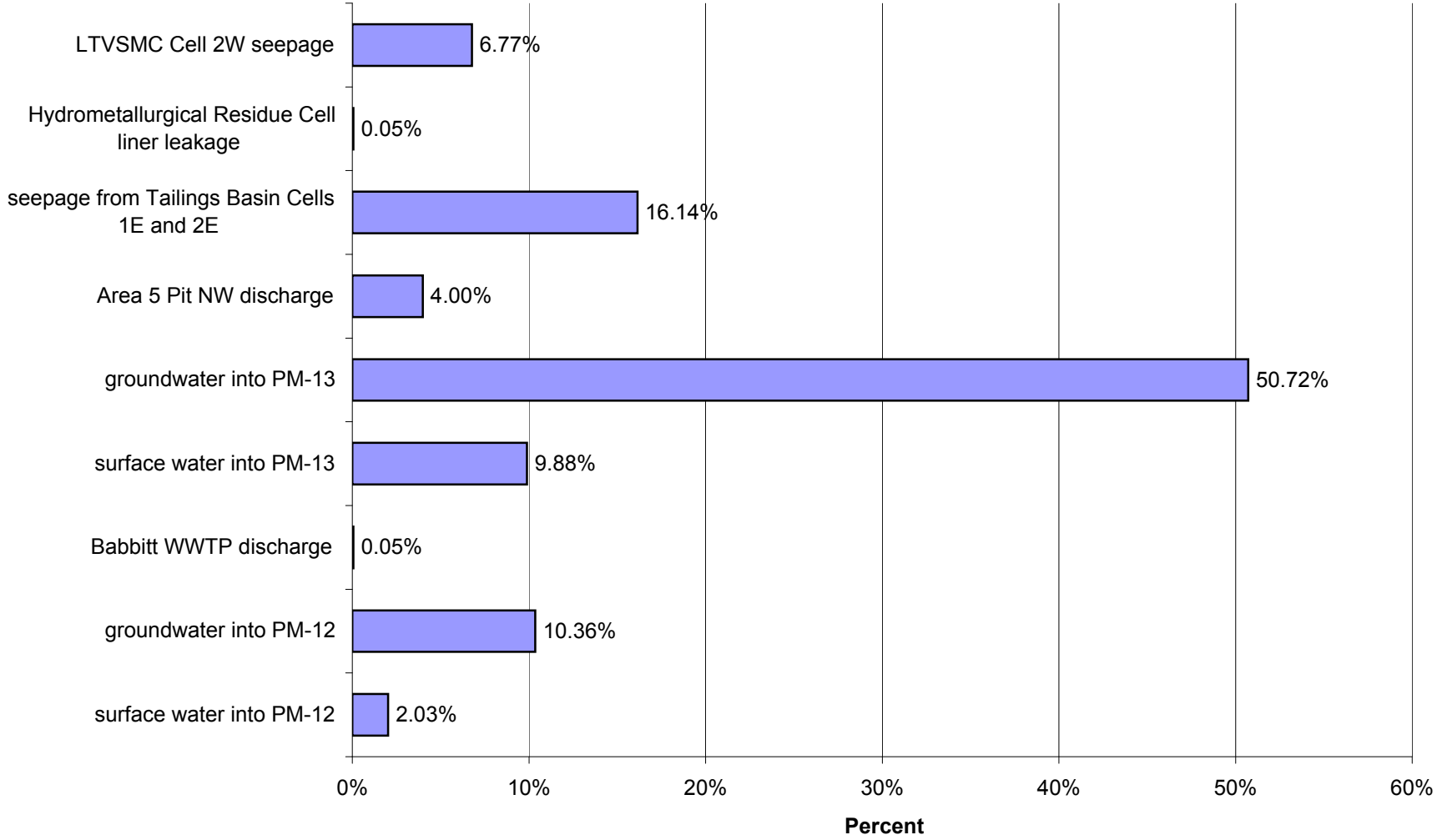
Geotechnical Mitigation: Percent of Impacts at PM-13 in Closure for Low Flow for Antimony (Sb)



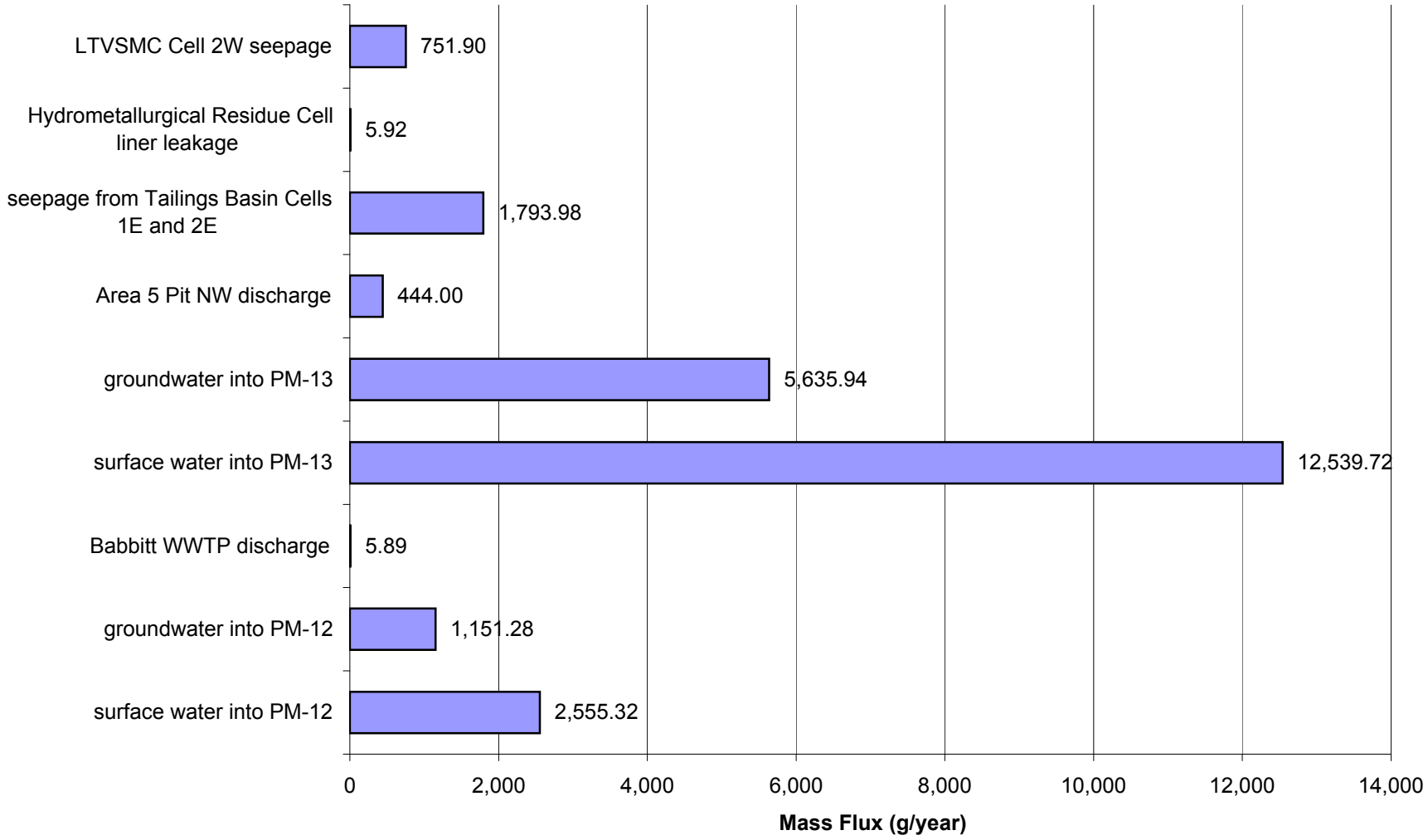
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Closure for Average Flow for Antimony (Sb)



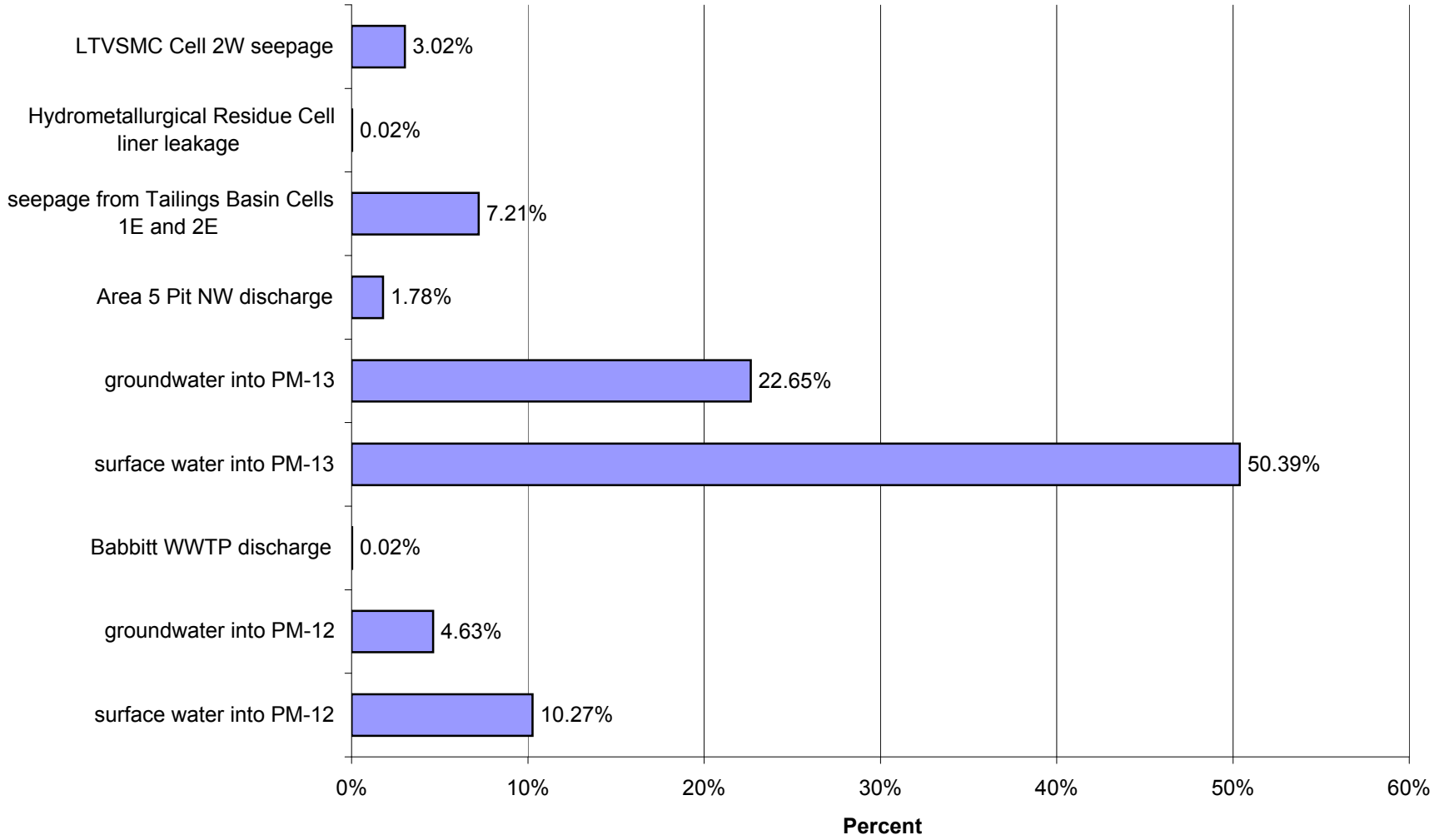
Geotechnical Mitigation: Percent of Impacts at PM-13 in Closure for Average Flow for Antimony (Sb)



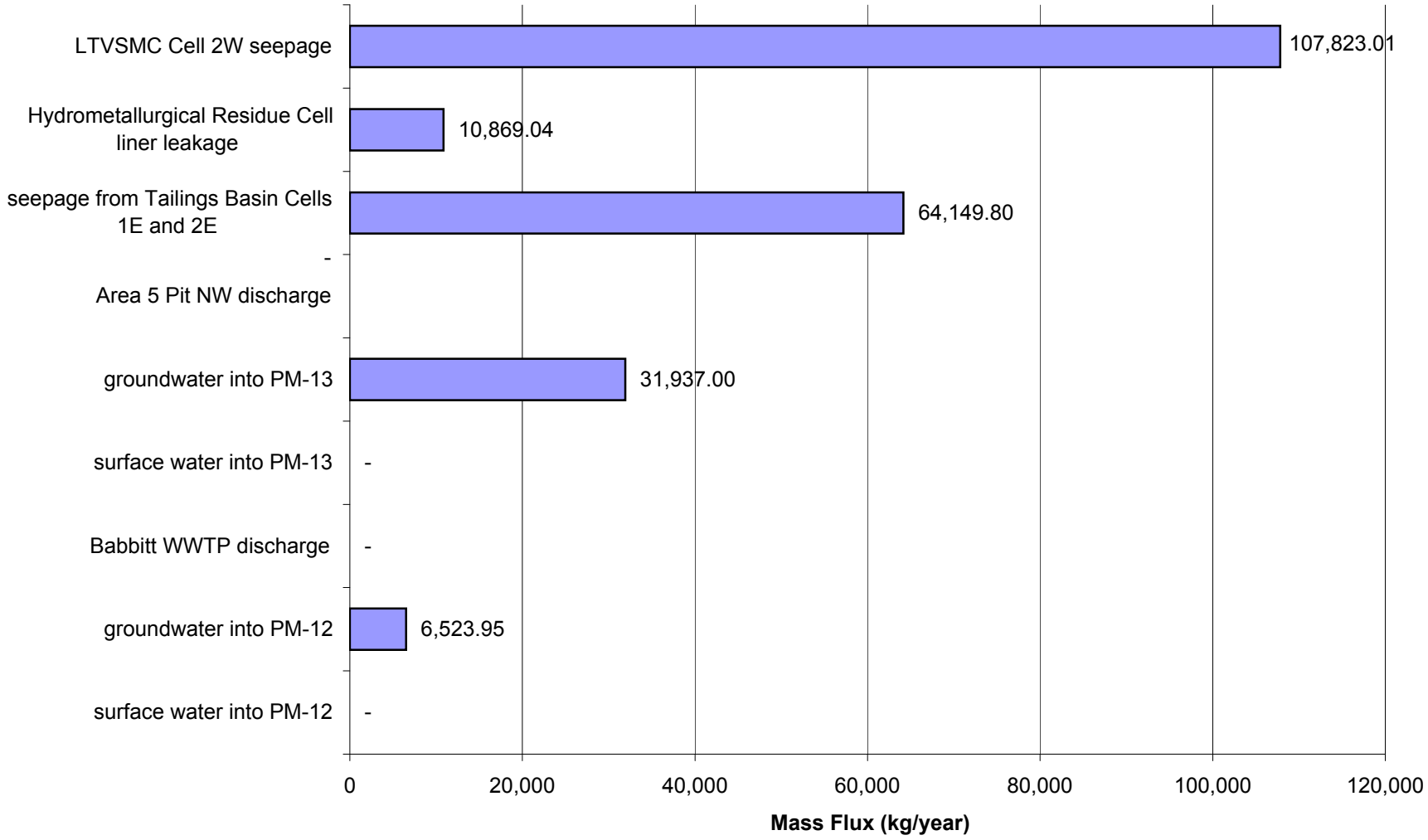
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Closure for High Flow for Antimony (Sb)



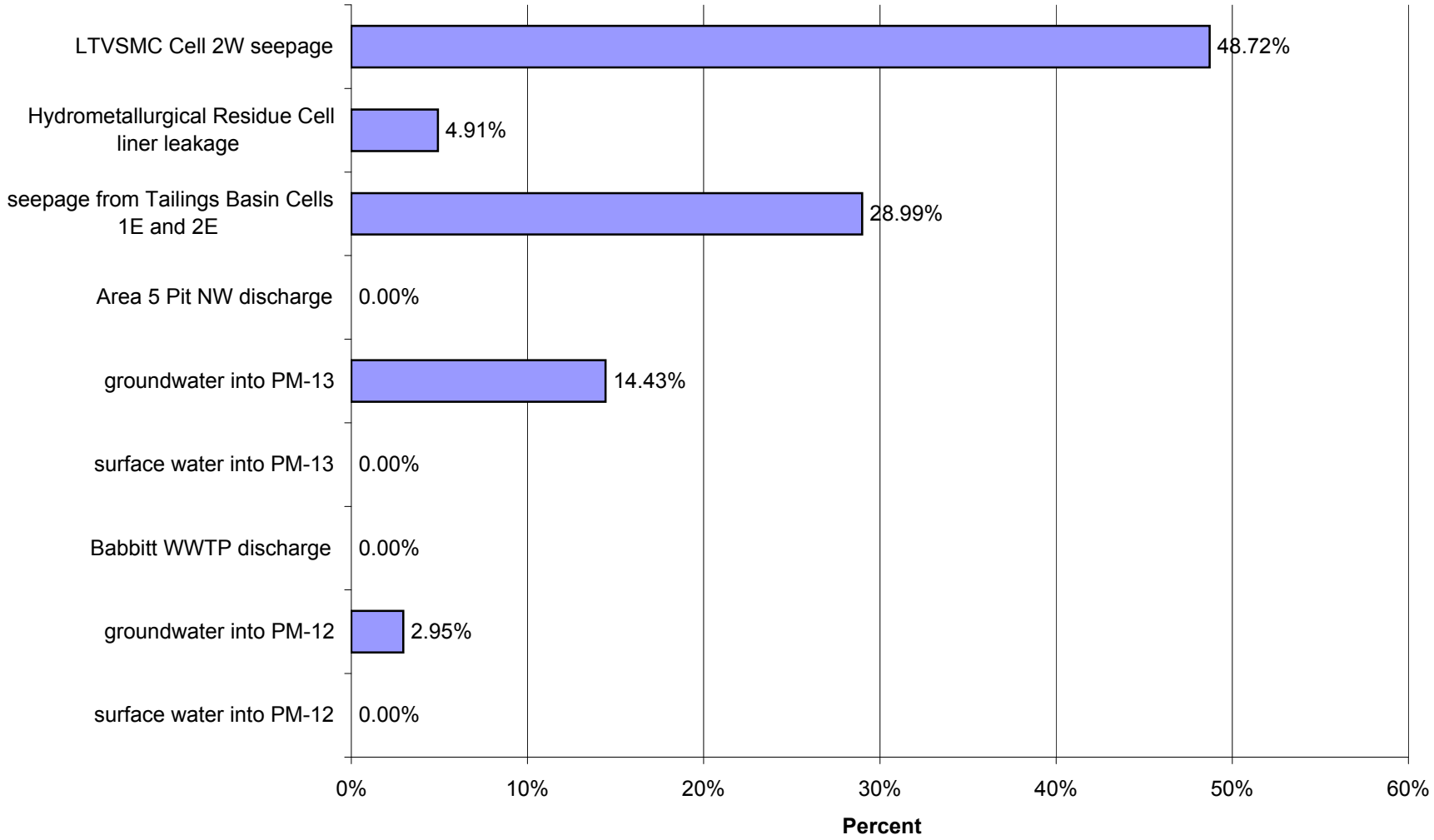
Geotechnical Mitigation: Percent of Impacts at PM-13 in Closure for High Flow for Antimony (Sb)



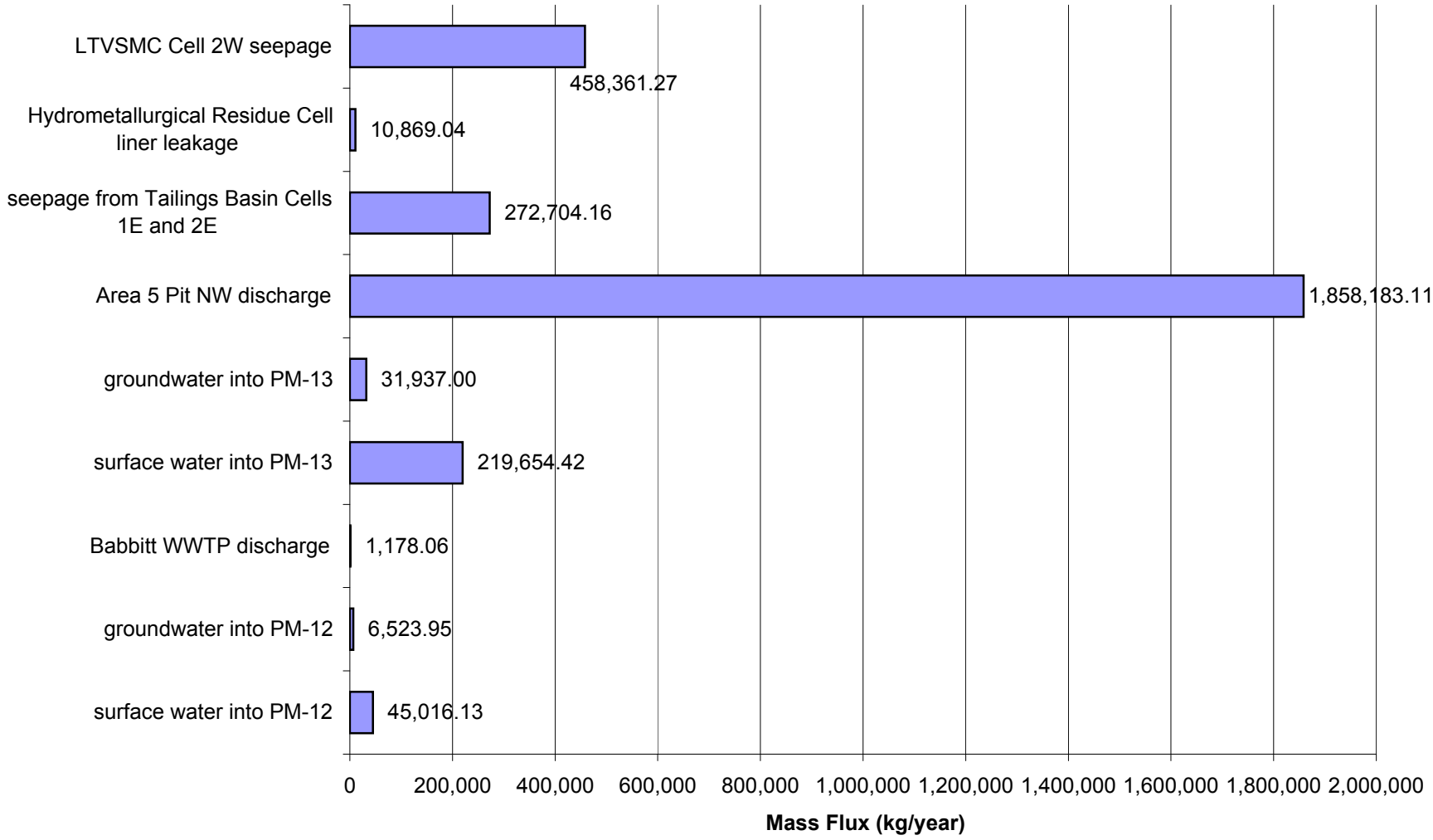
Geotechnical Mitigation: Mass Flux (kg/year) of Impacts at PM-13 in Closure for Low Flow for Sulfate (SO_4)



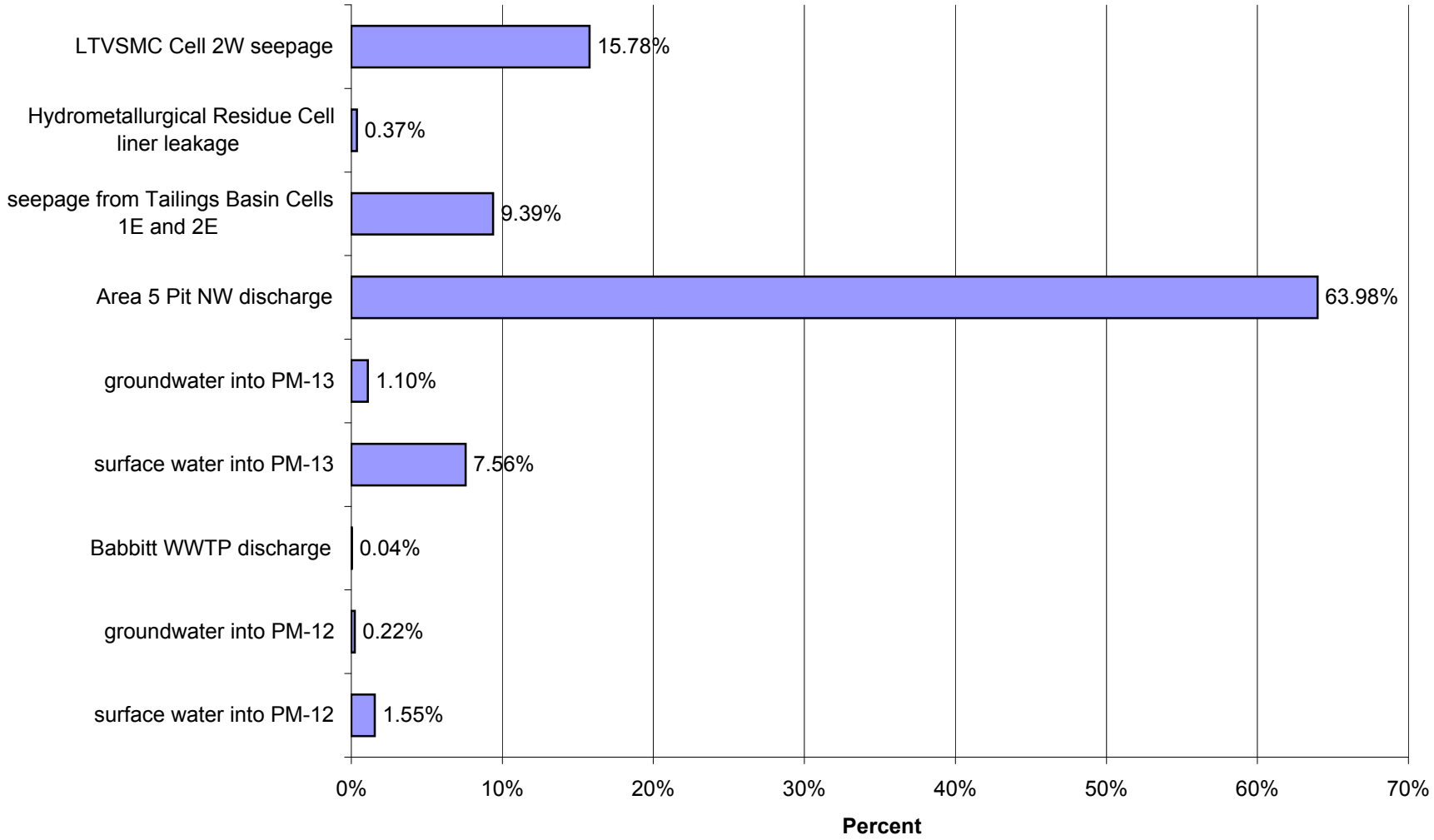
Geotechnical Mitigation: Percent of Impacts at PM-13 in Closure for Low Flow for Sulfate (SO_4)



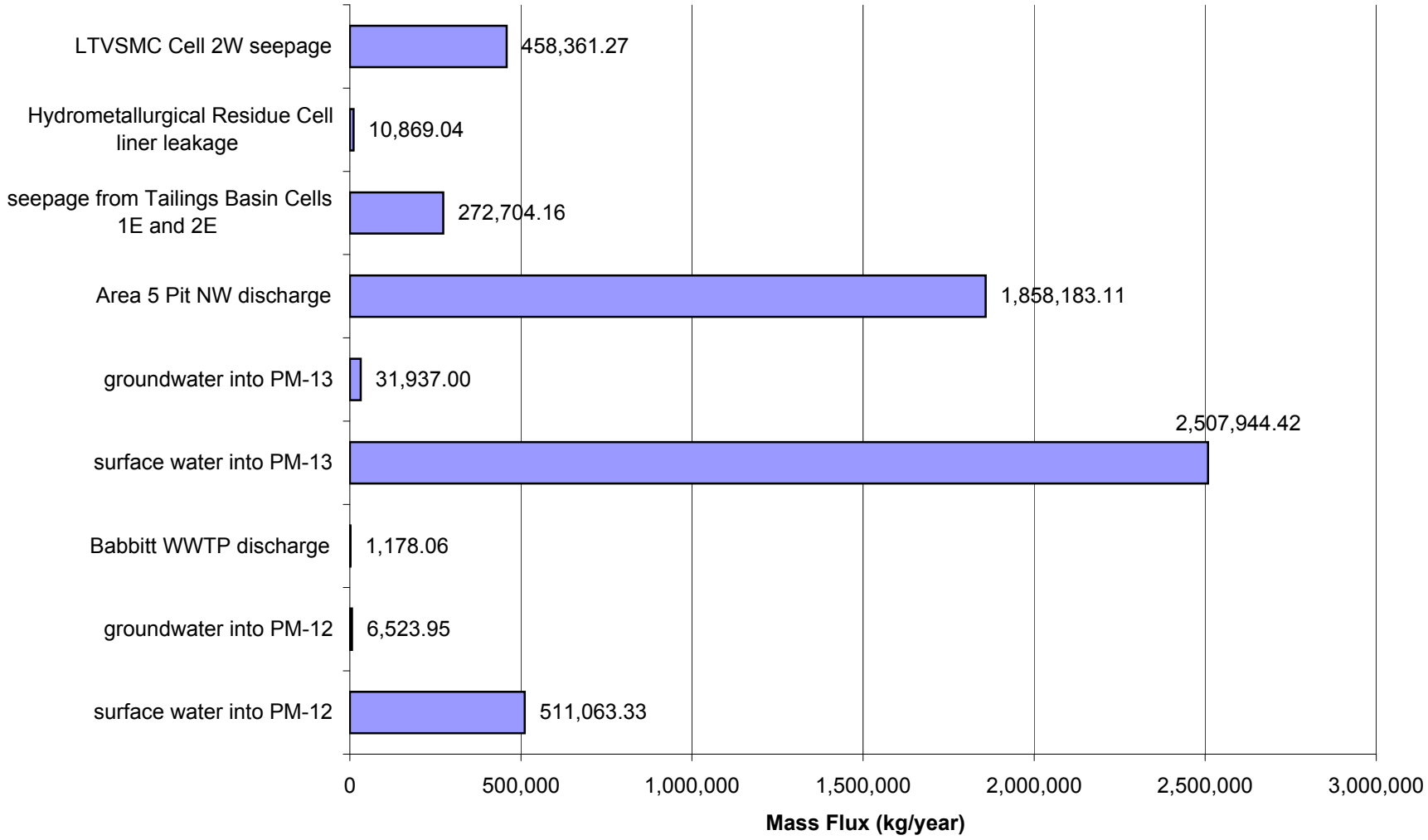
Geotechnical Mitigation: Mass Flux (kg/year) of Impacts at PM-13 in Closure for Average Flow for Sulfate (SO_4)



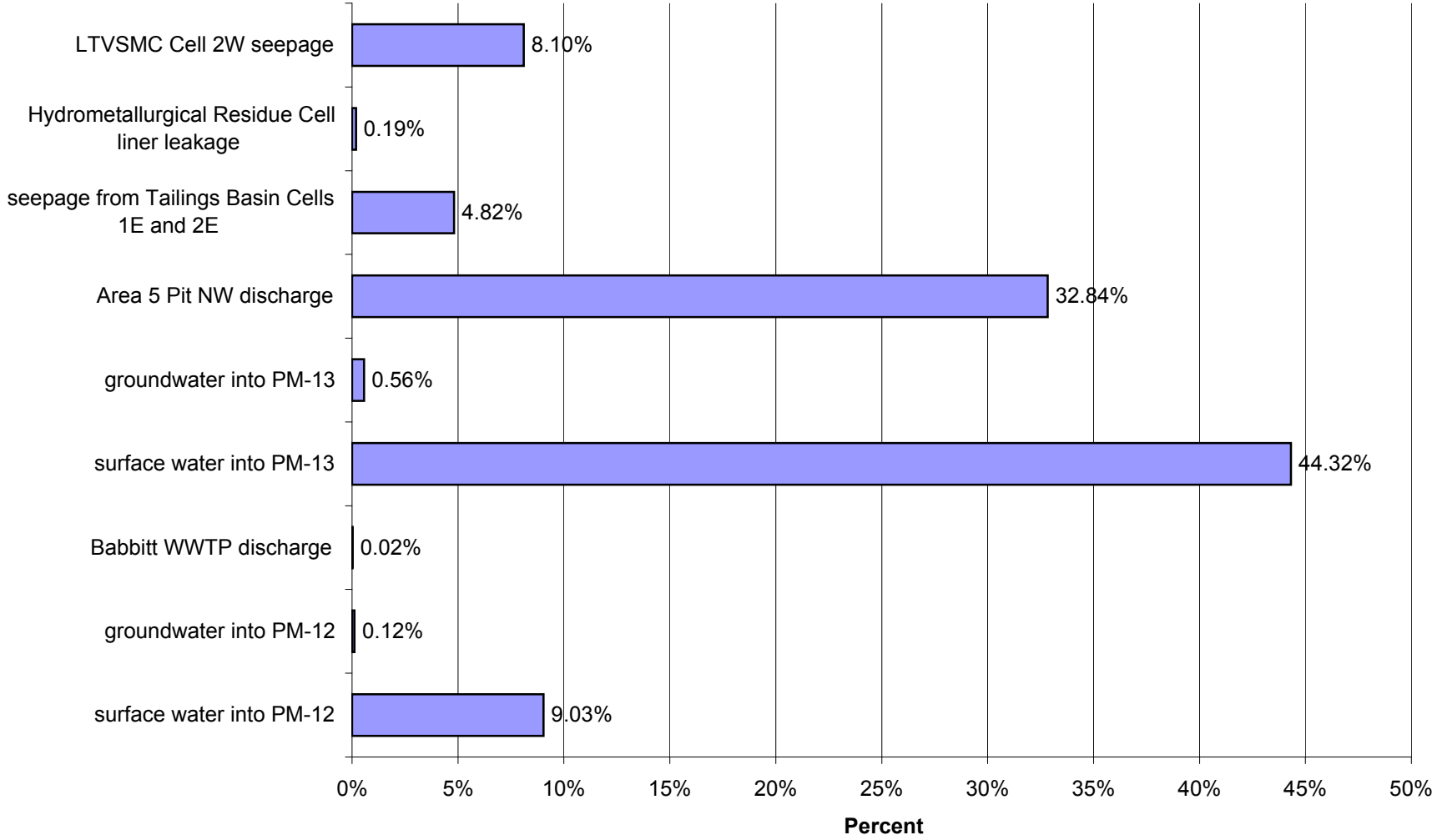
Geotechnical Mitigation: Percent of Impacts at PM-13 in Closure for Average Flow for Sulfate (SO_4)



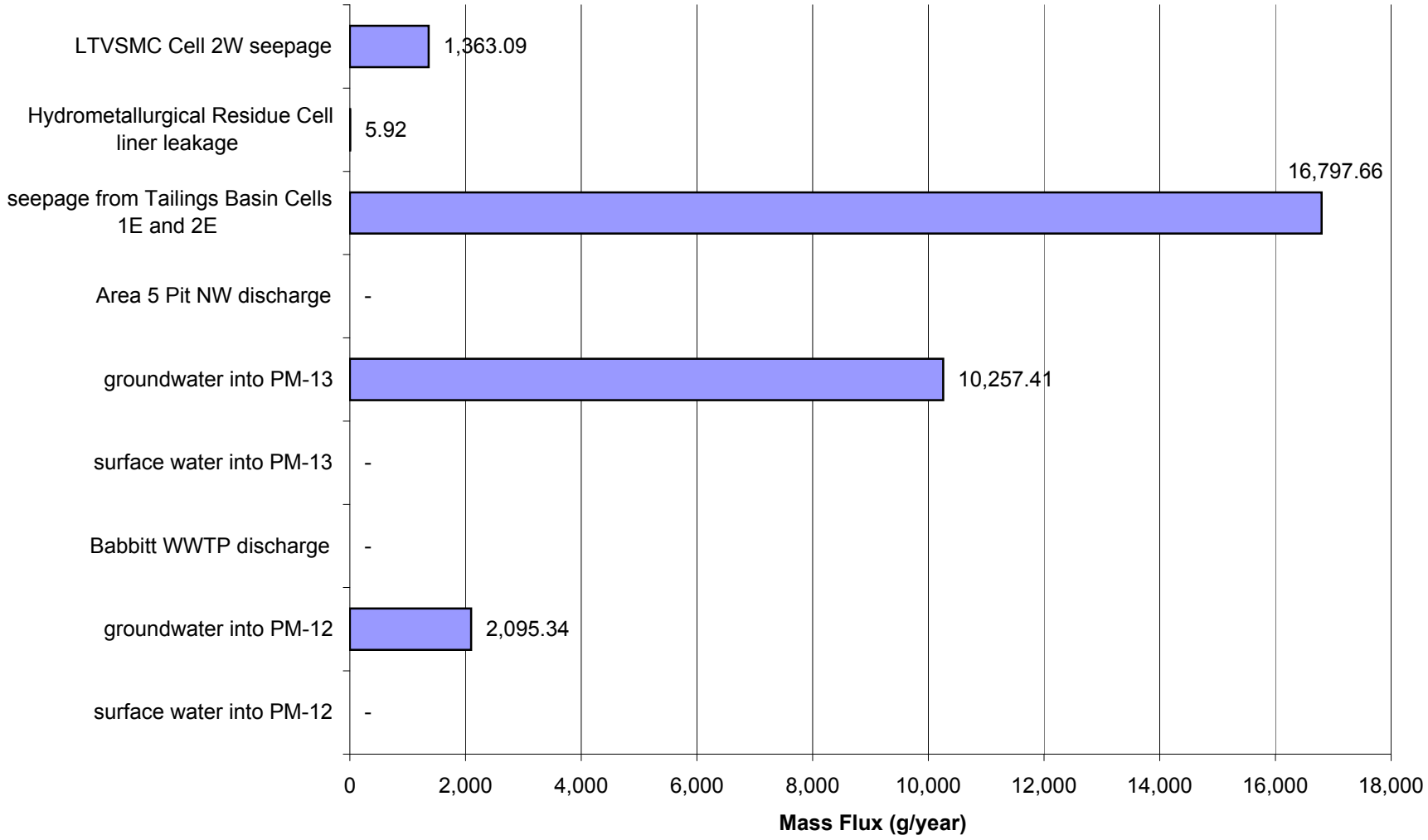
Geotechnical Mitigation: Mass Flux (kg/year) of Impacts at PM-13 in Closure for High Flow for Sulfate (SO_4)



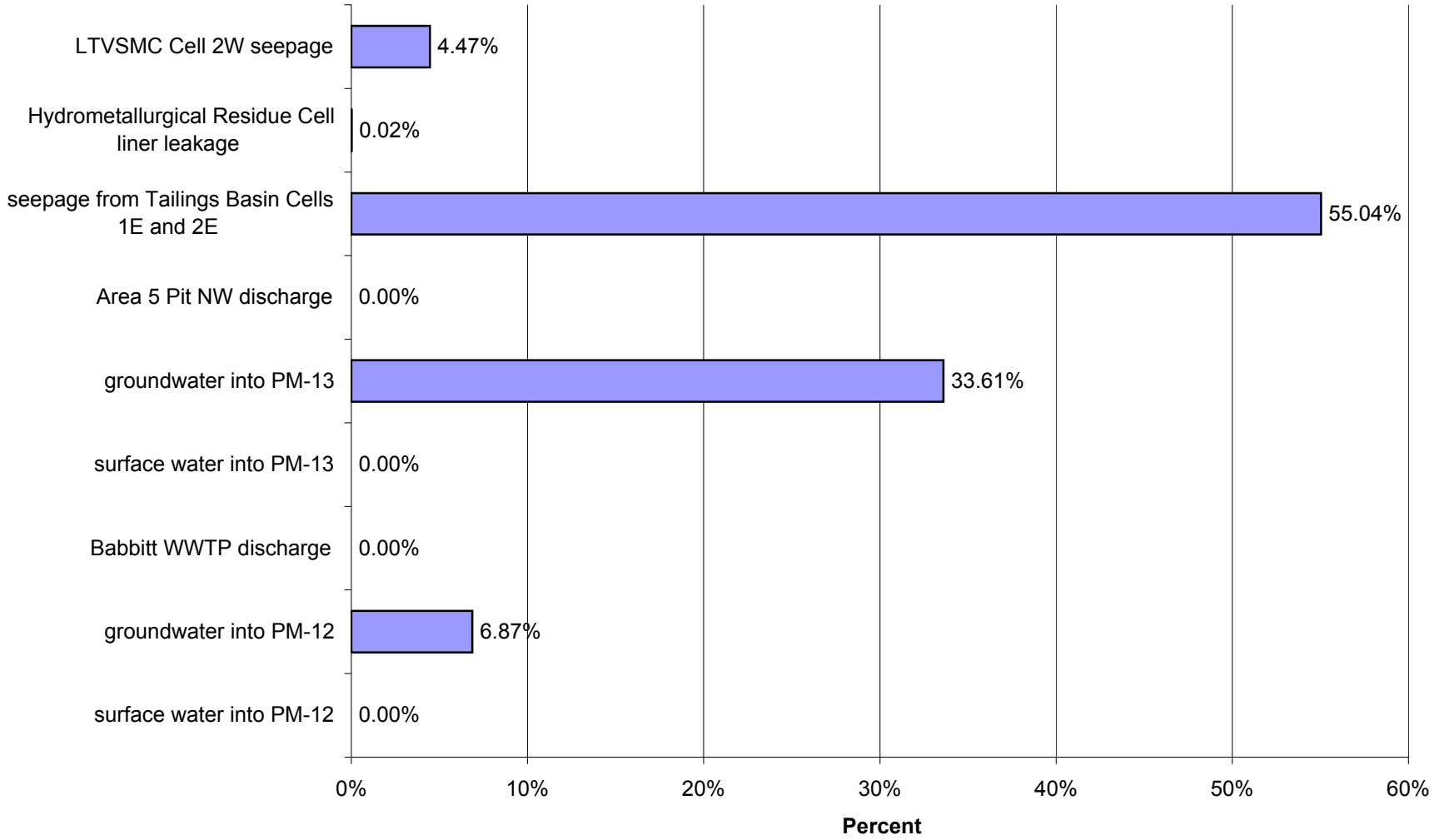
Geotechnical Mitigation: Percent of Impacts at PM-13 in Closure for High Flow for Sulfate (SO_4)



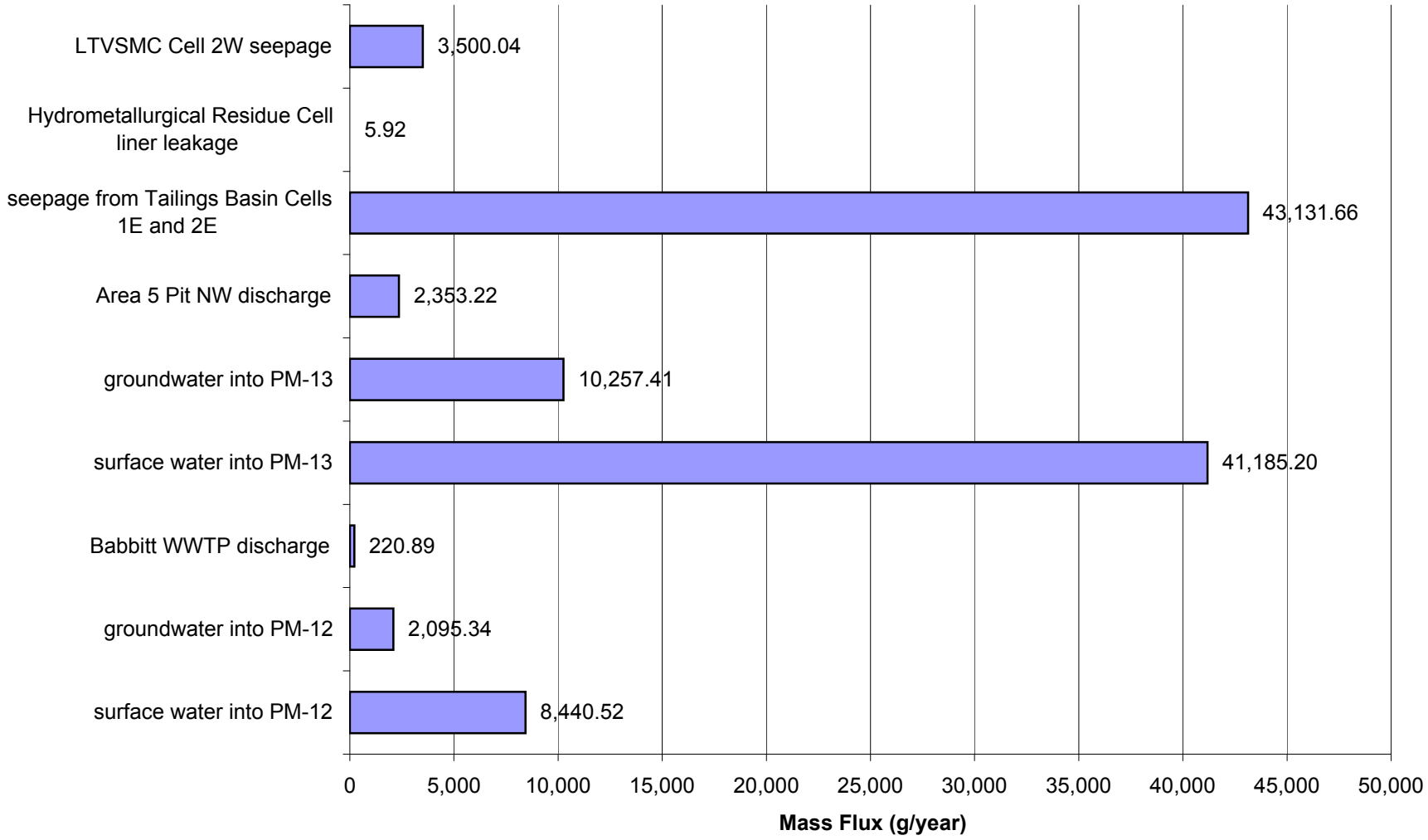
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for Low Flow for Arsenic (As)



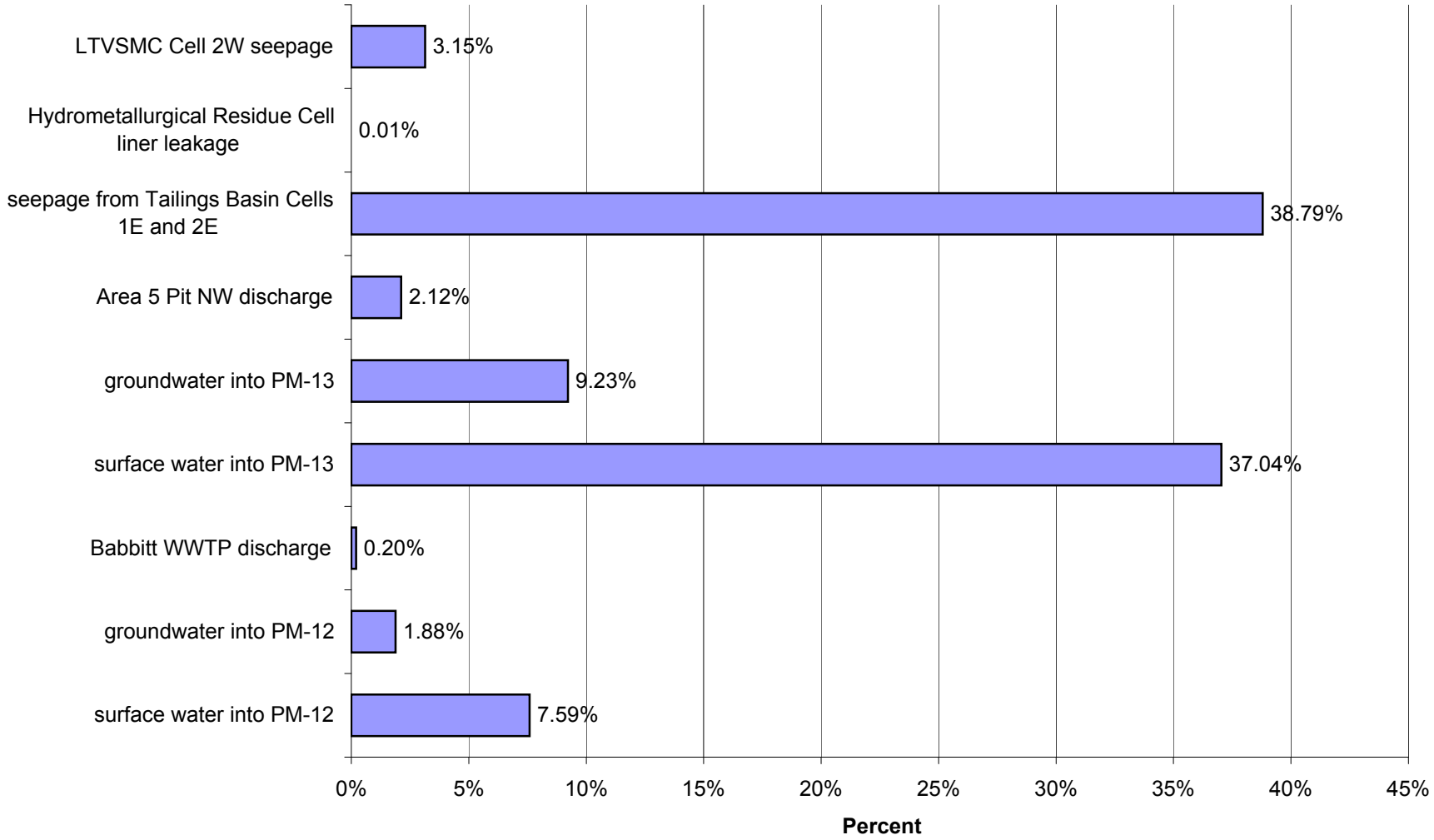
Geotechnical Mitigation: Percent of Impacts at PM-13 in Post - Closure for Low Flow for Arsenic (As)



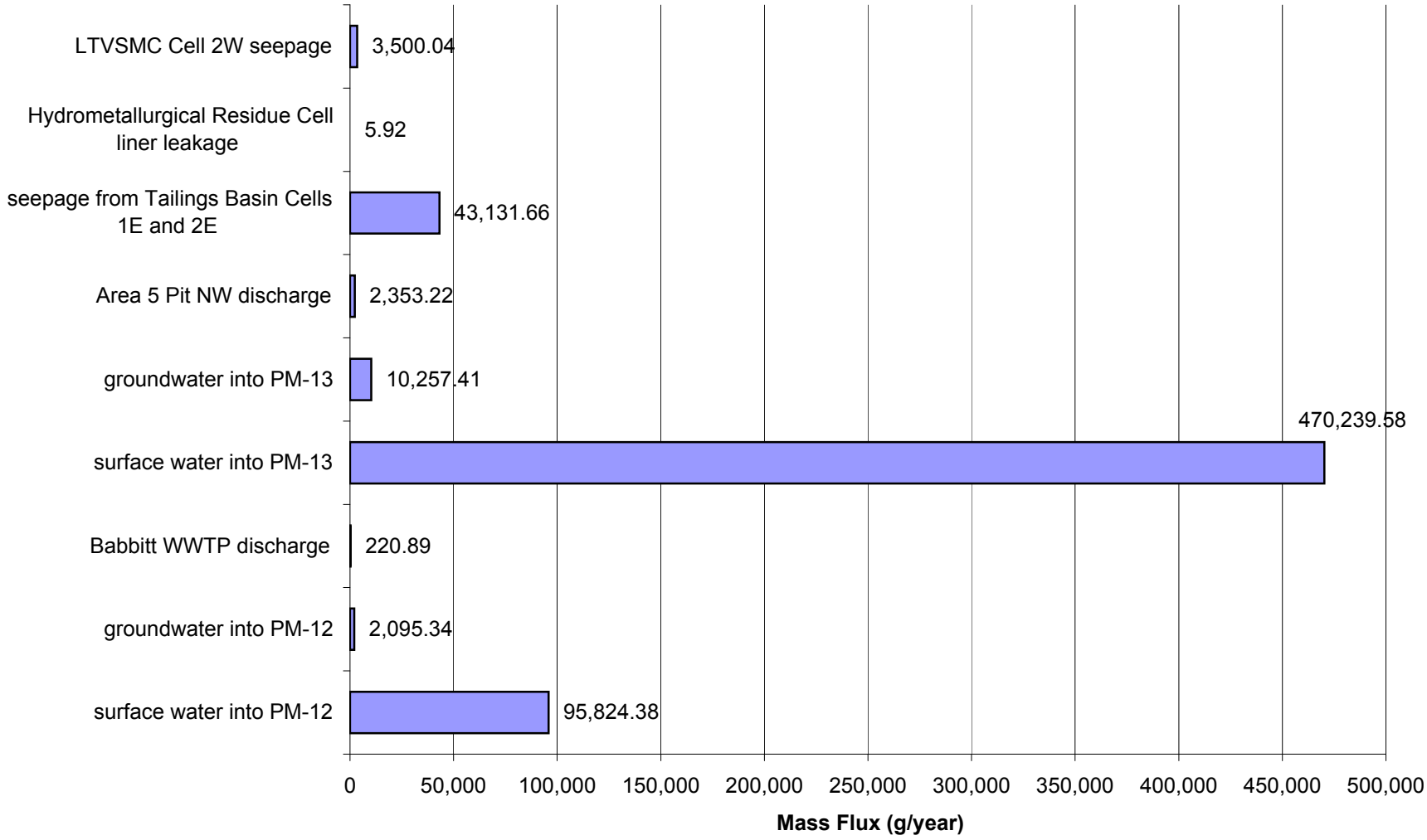
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for Average Flow for Arsenic (As)



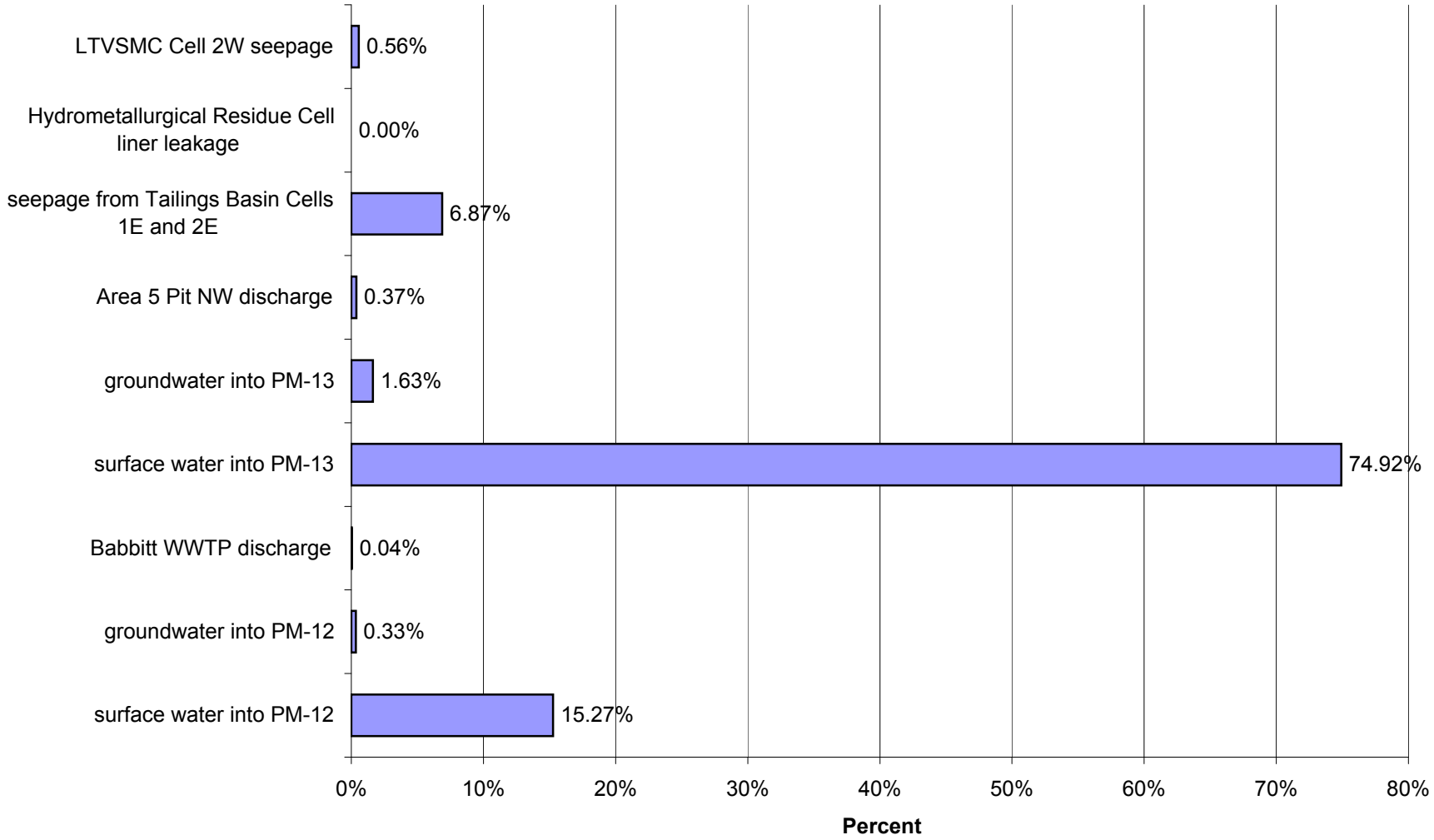
Geotechnical Mitigation: Percent of Impacts at PM-13 in Post - Closure for Average Flow for Arsenic (As)



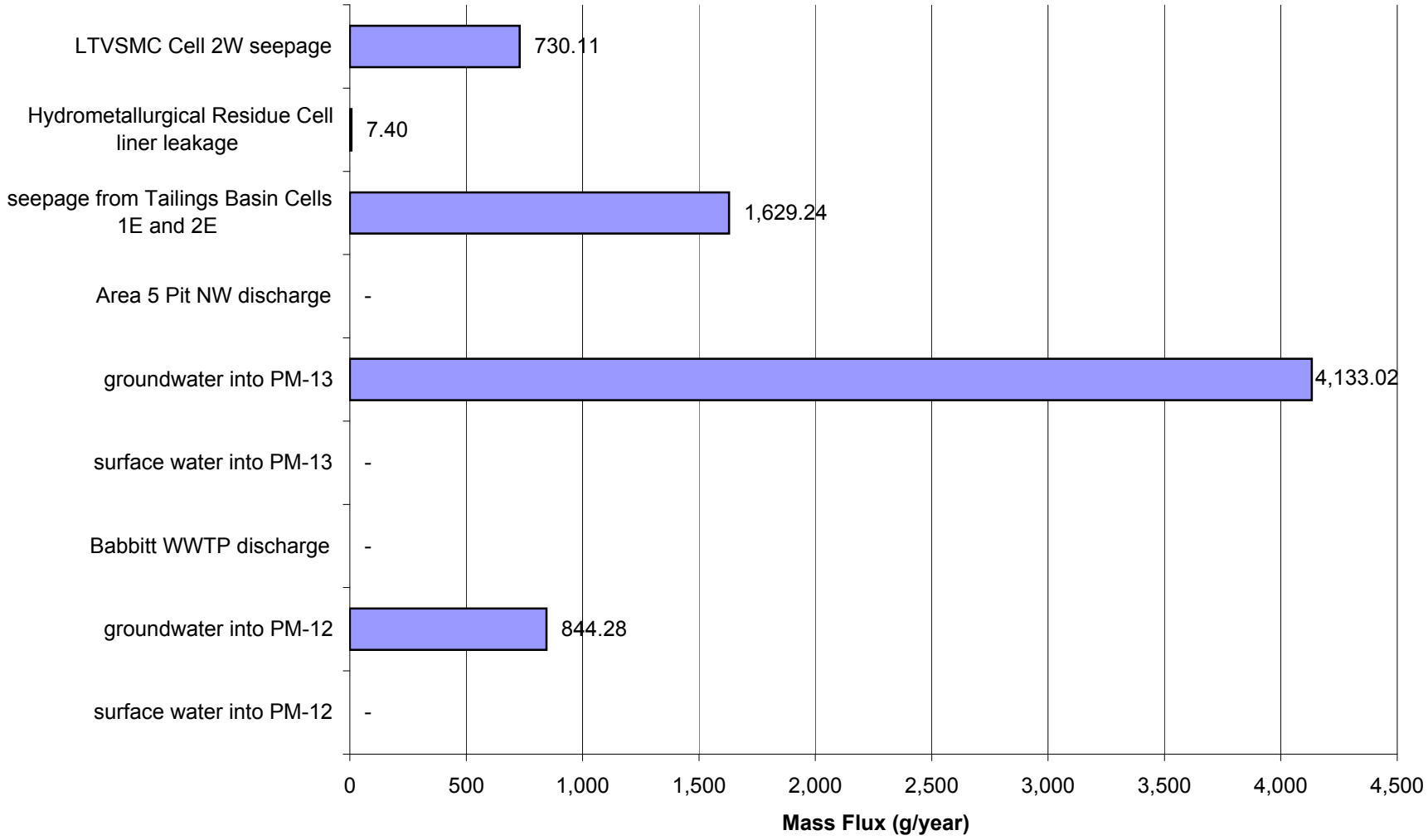
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for High Flow for Arsenic (As)



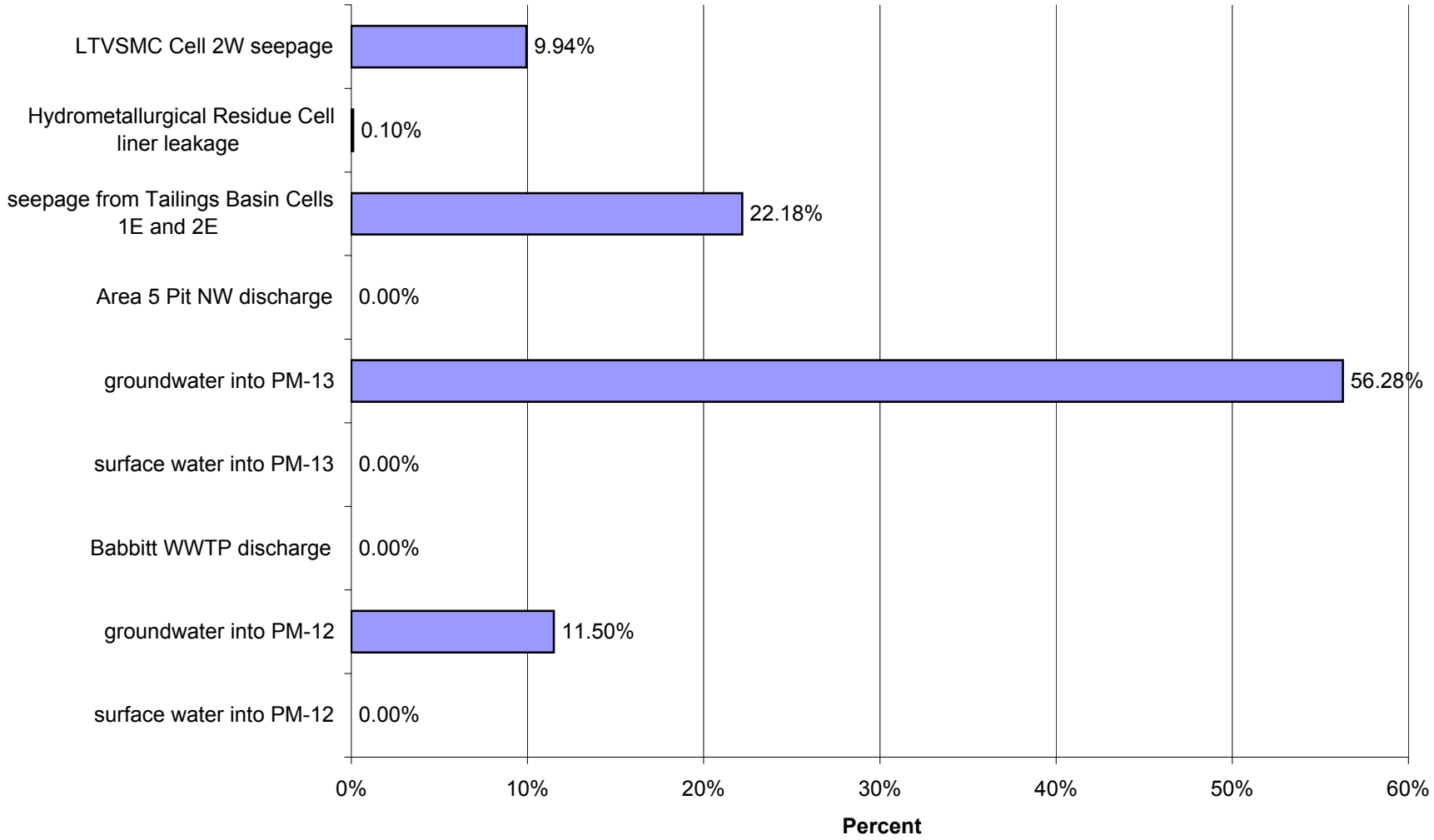
Geotechnical Mitigation: Percent of Impacts at PM-13 in Post - Closure for High Flow for Arsenic (As)



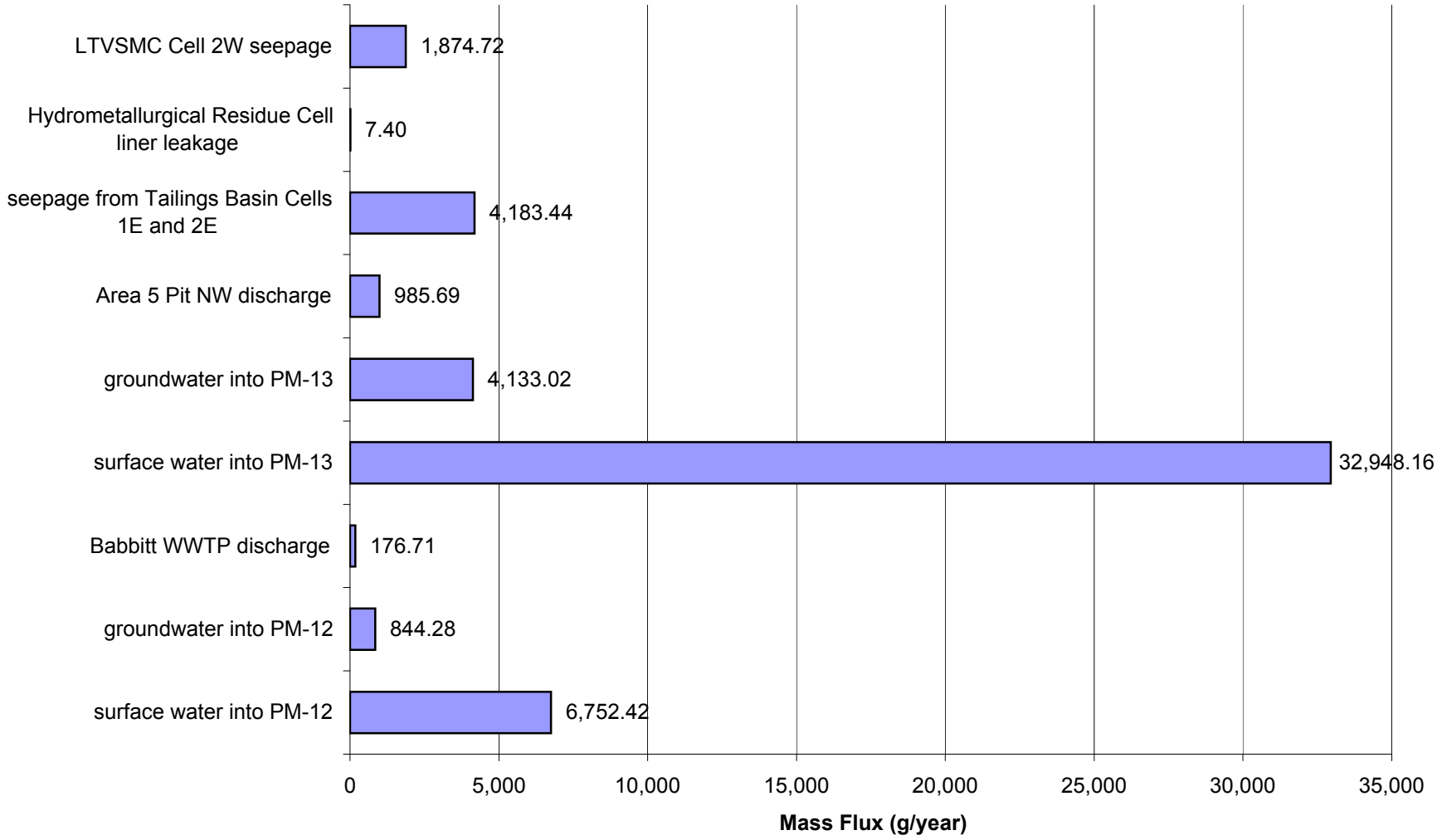
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for Low Flow for Cobalt (Co)



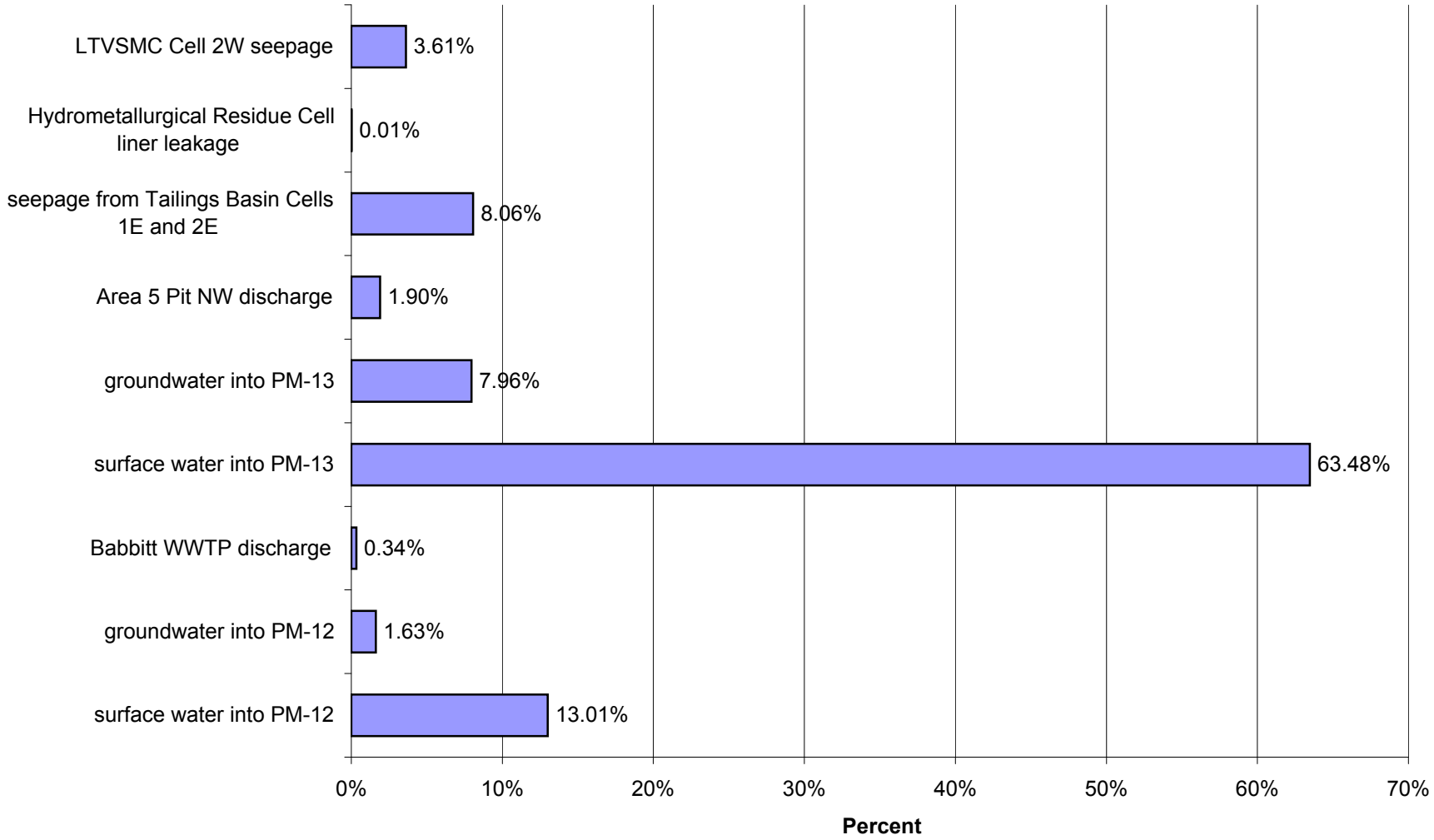
Geotechnical Mitigation: Percent of Impacts at PM-13 in Post - Closure for Low Flow for Cobalt (Co)



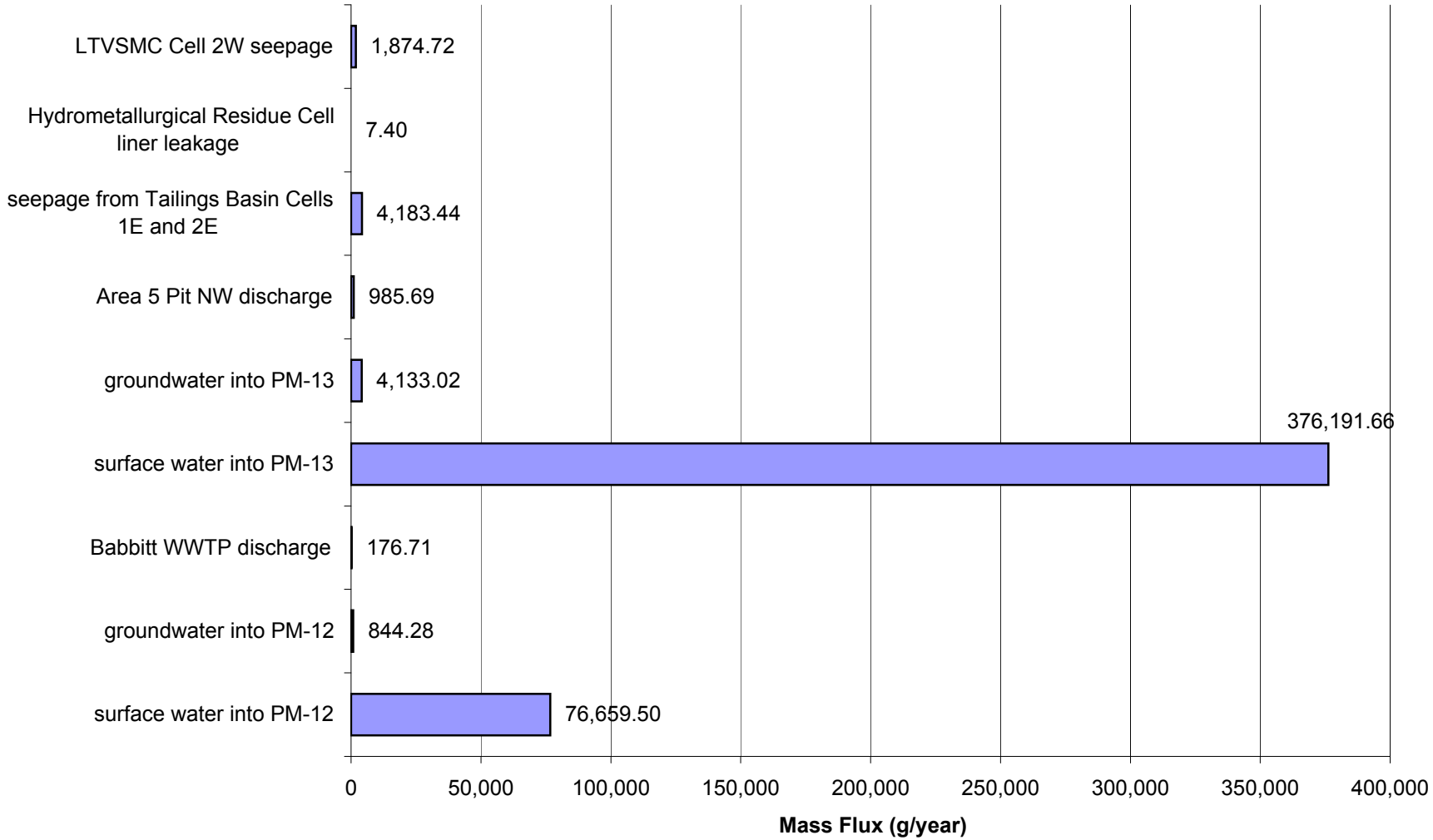
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for Average Flow for Cobalt (Co)



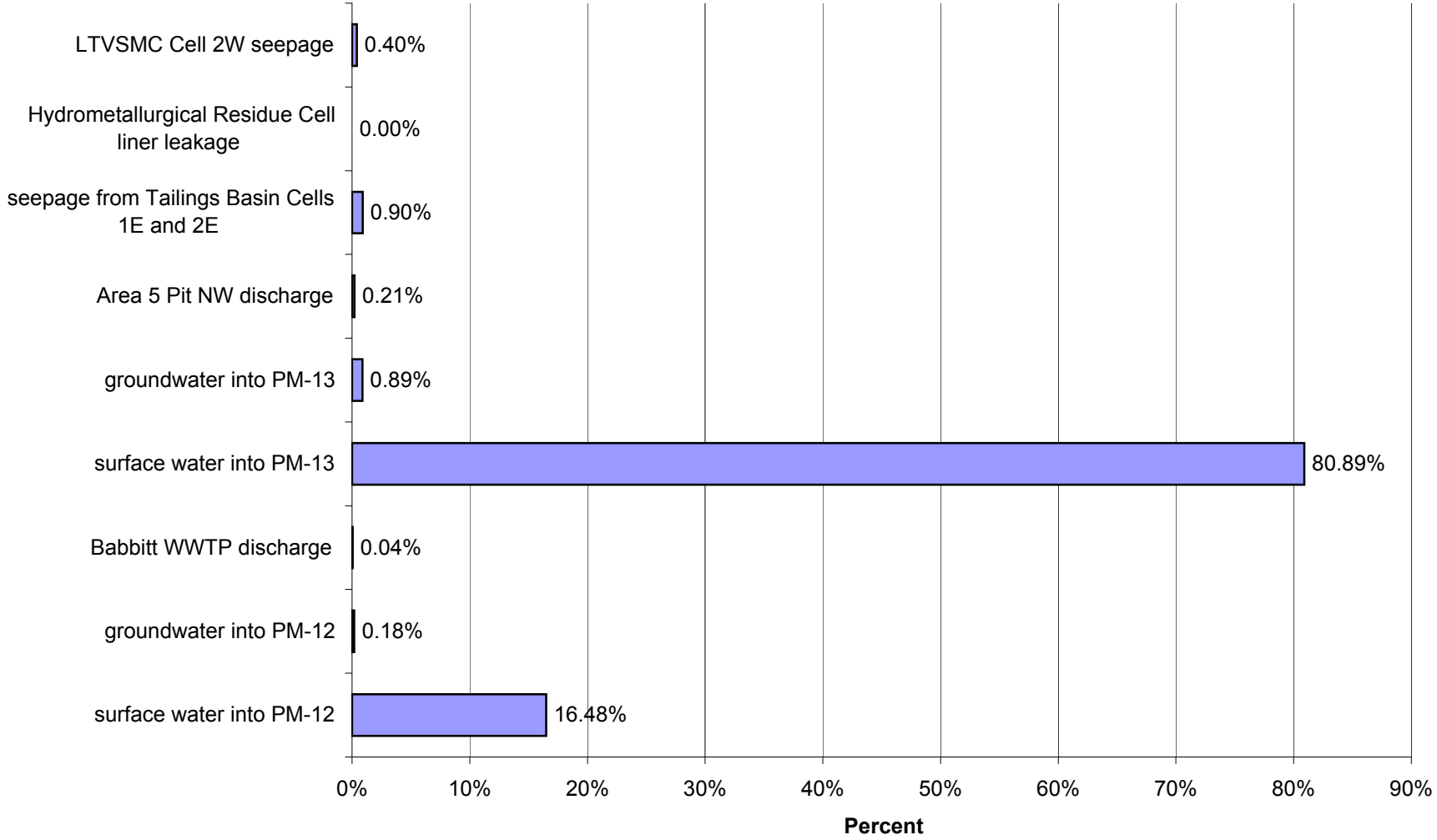
Geotechnical Mitigation: Percent of Impacts at PM-13 in Post - Closure for Average Flow for Cobalt (Co)



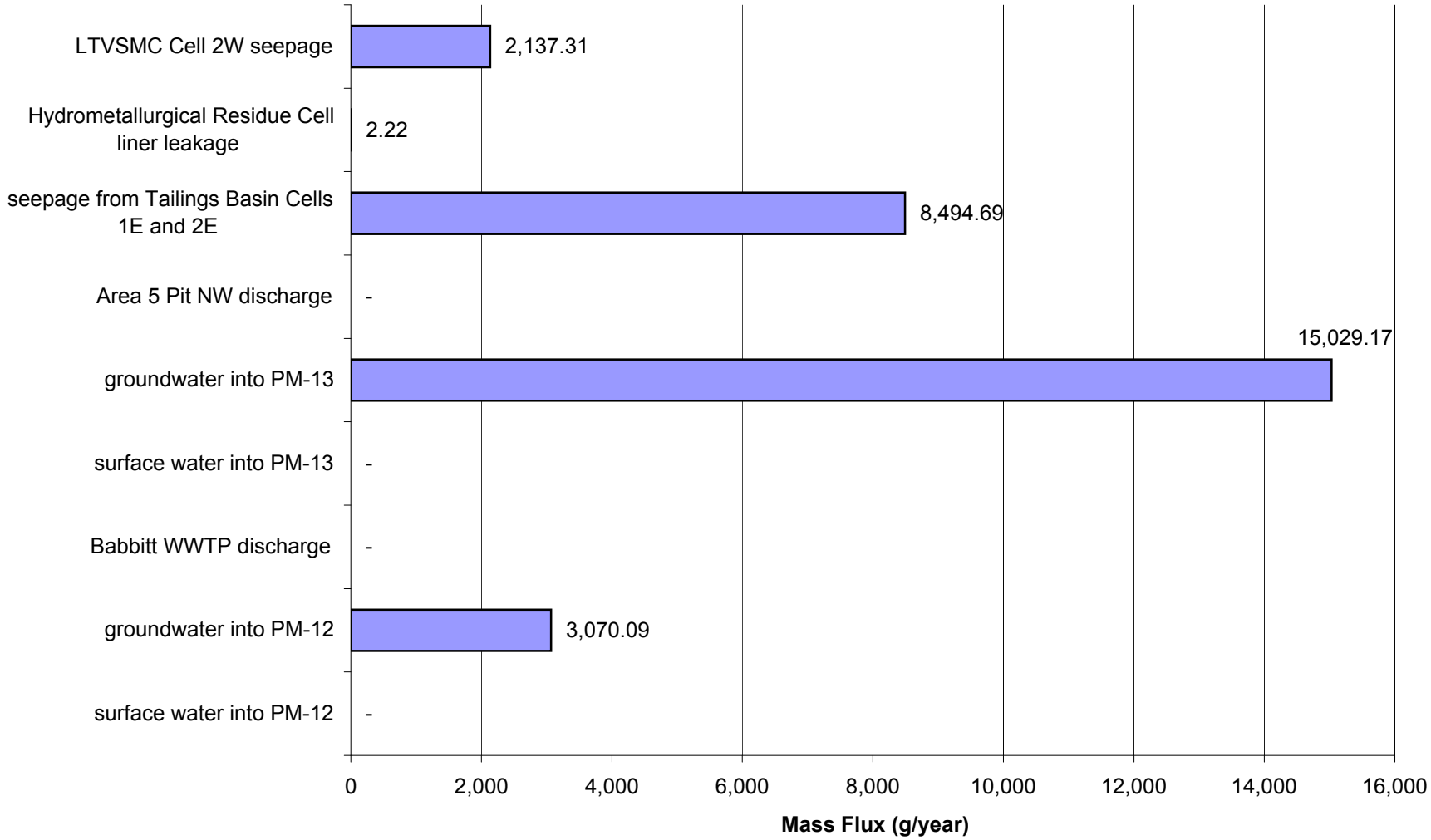
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for High Flow for Cobalt (Co)



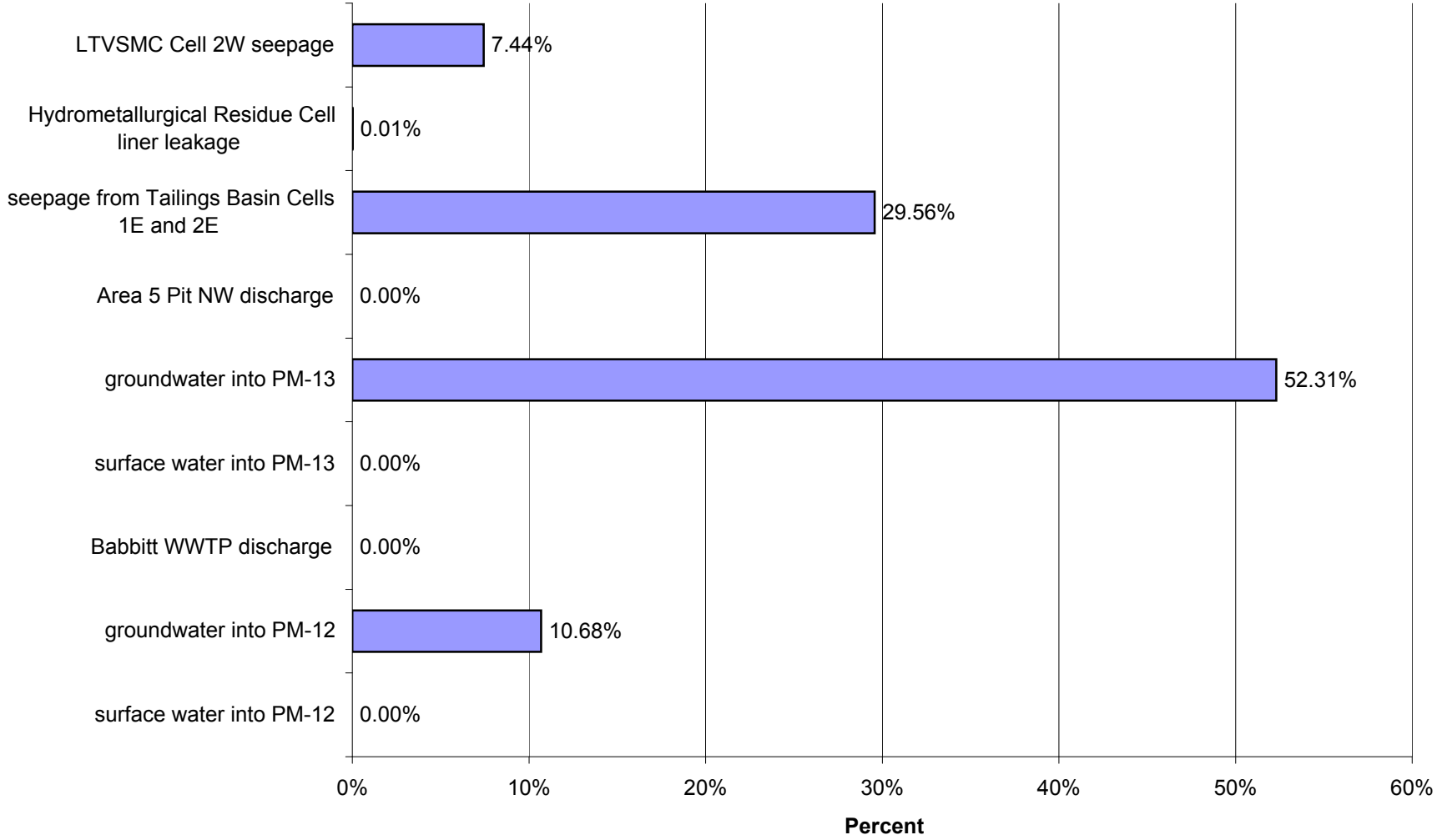
Geotechnical Mitigation: Percent of Impacts at PM-13 in Post - Closure for High Flow for Cobalt (Co)



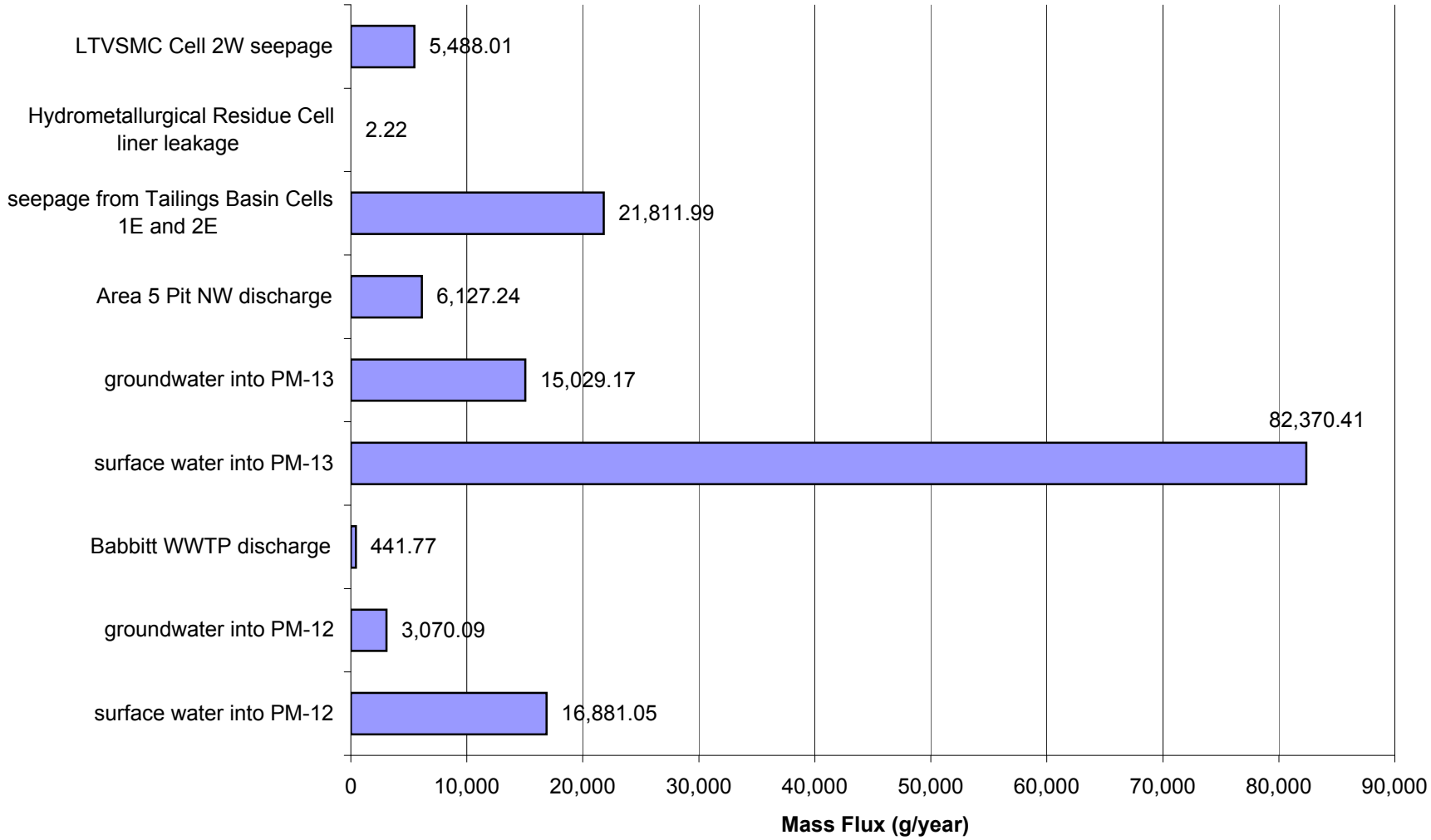
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for Low Flow for Copper (Cu)



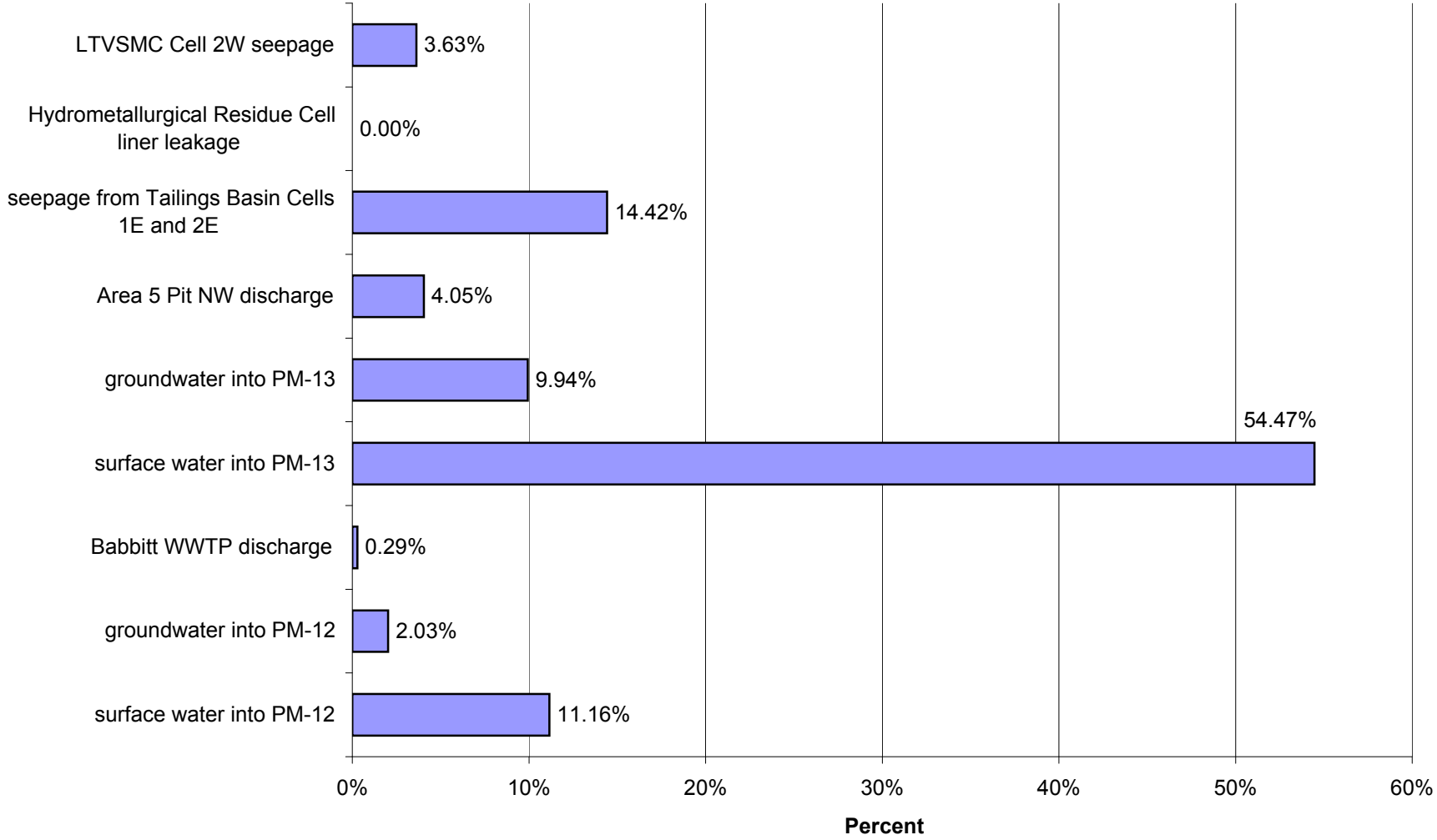
Geotechnical Mitigation: Percent of Impacts at PM-13 in Post - Closure for Low Flow for Copper (Cu)



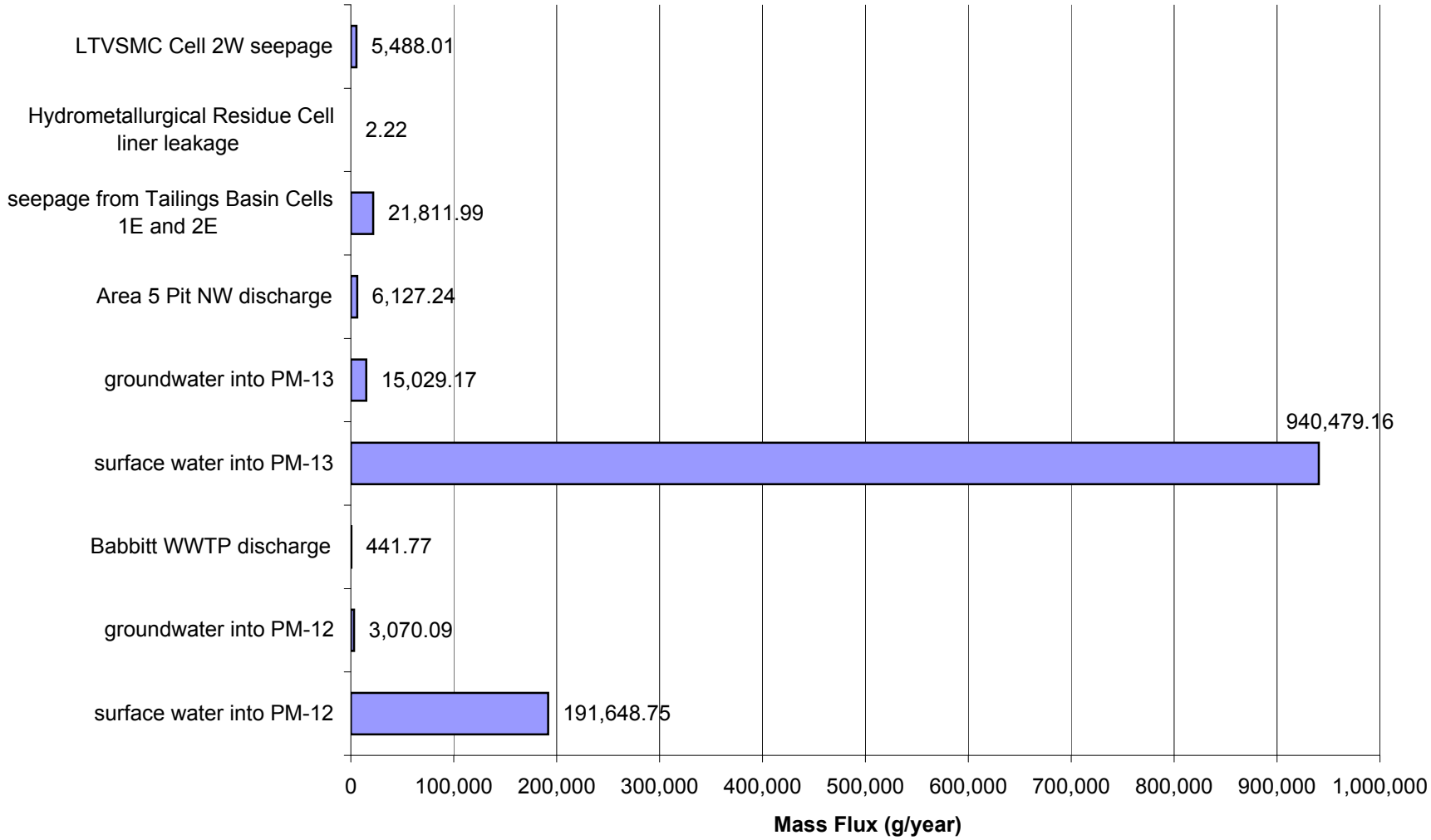
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for Average Flow for Copper (Cu)



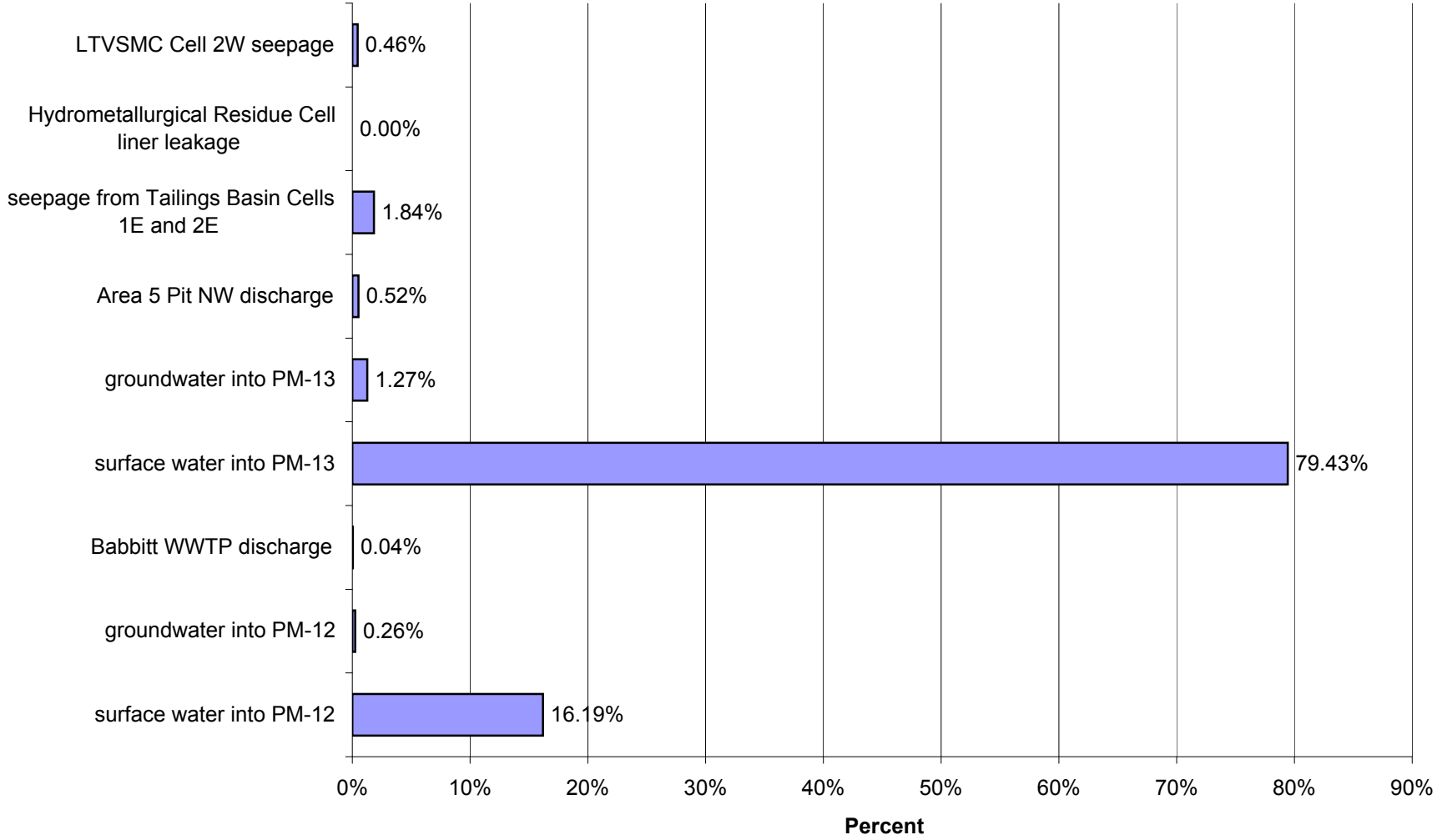
Geotechnical Mitigation: Percent of Impacts at PM-13 in Post - Closure for Average Flow for Copper (Cu)



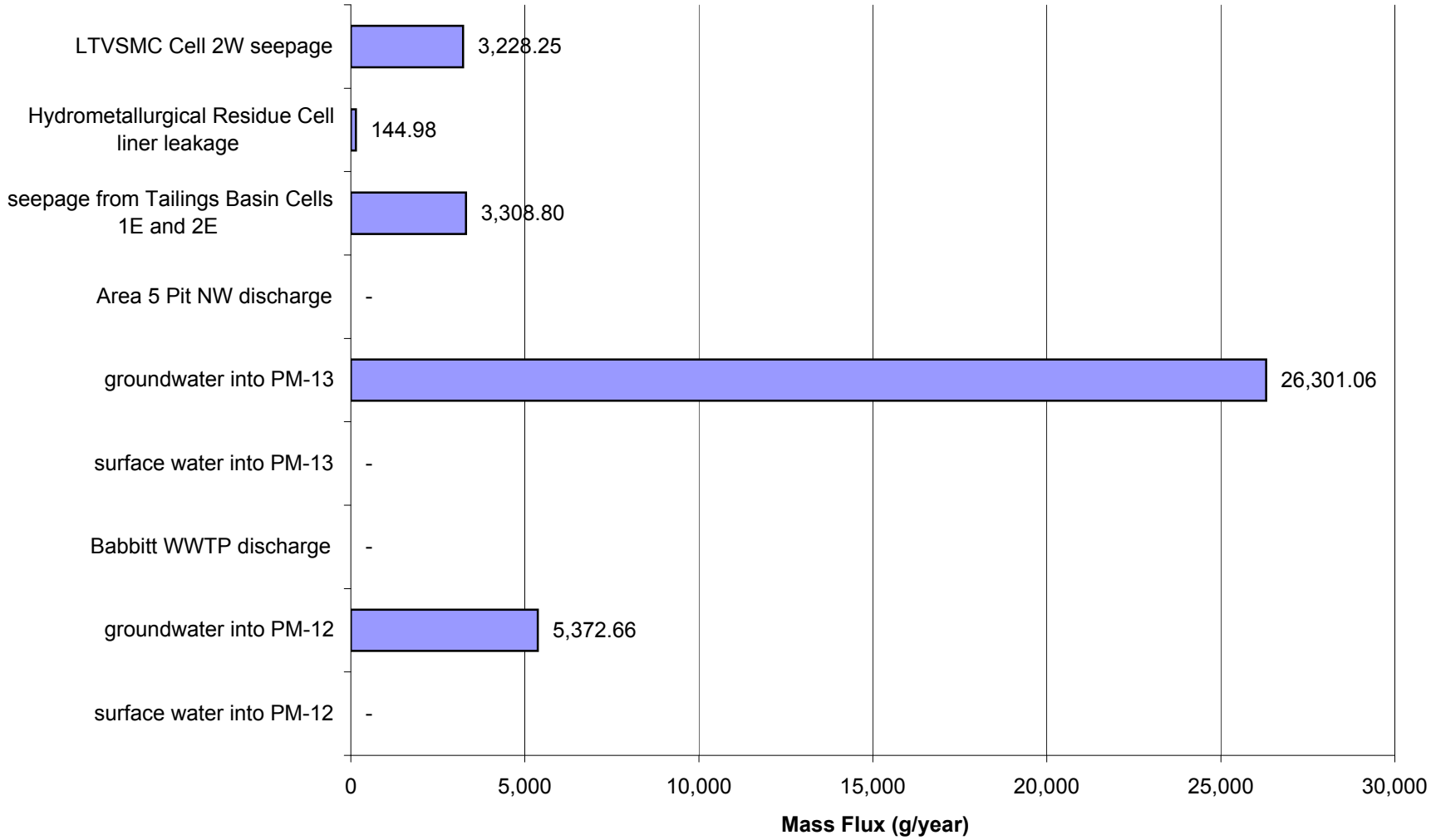
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for High Flow for Copper (Cu)



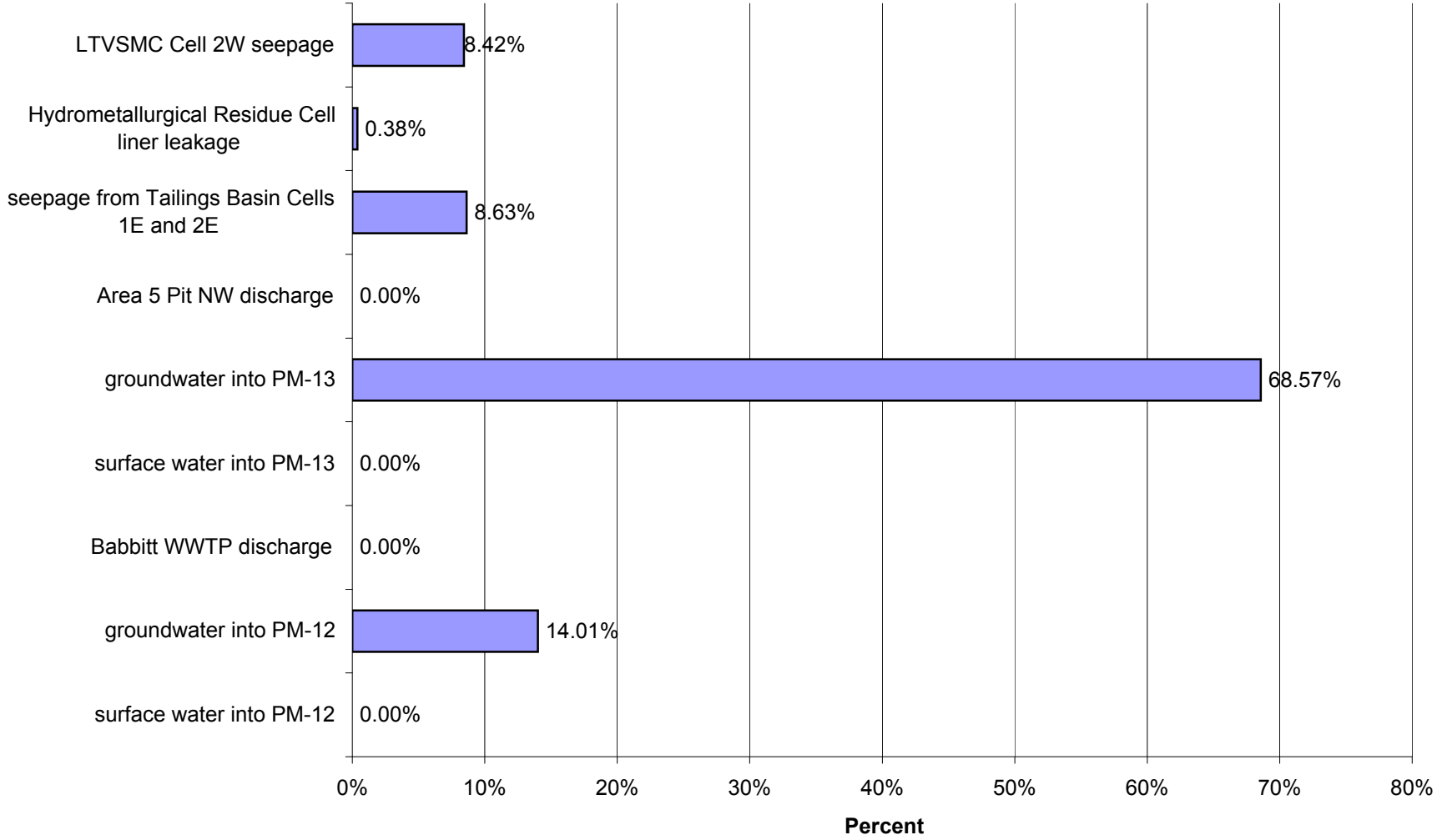
Geotechnical Mitigation: Percent of Impacts at PM-13 in Post - Closure for High Flow for Copper (Cu)



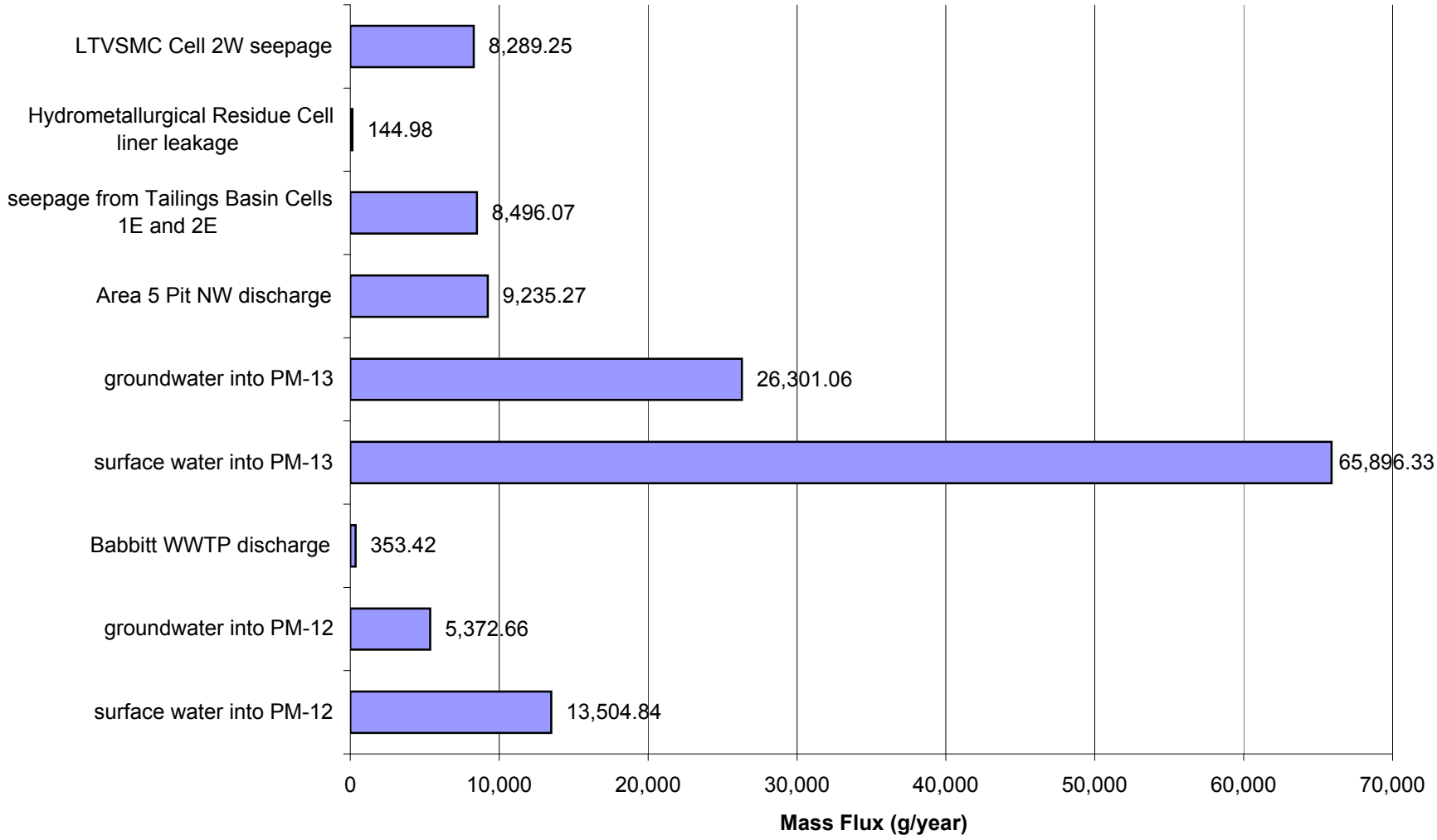
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for Low Flow for Nickel (Ni)



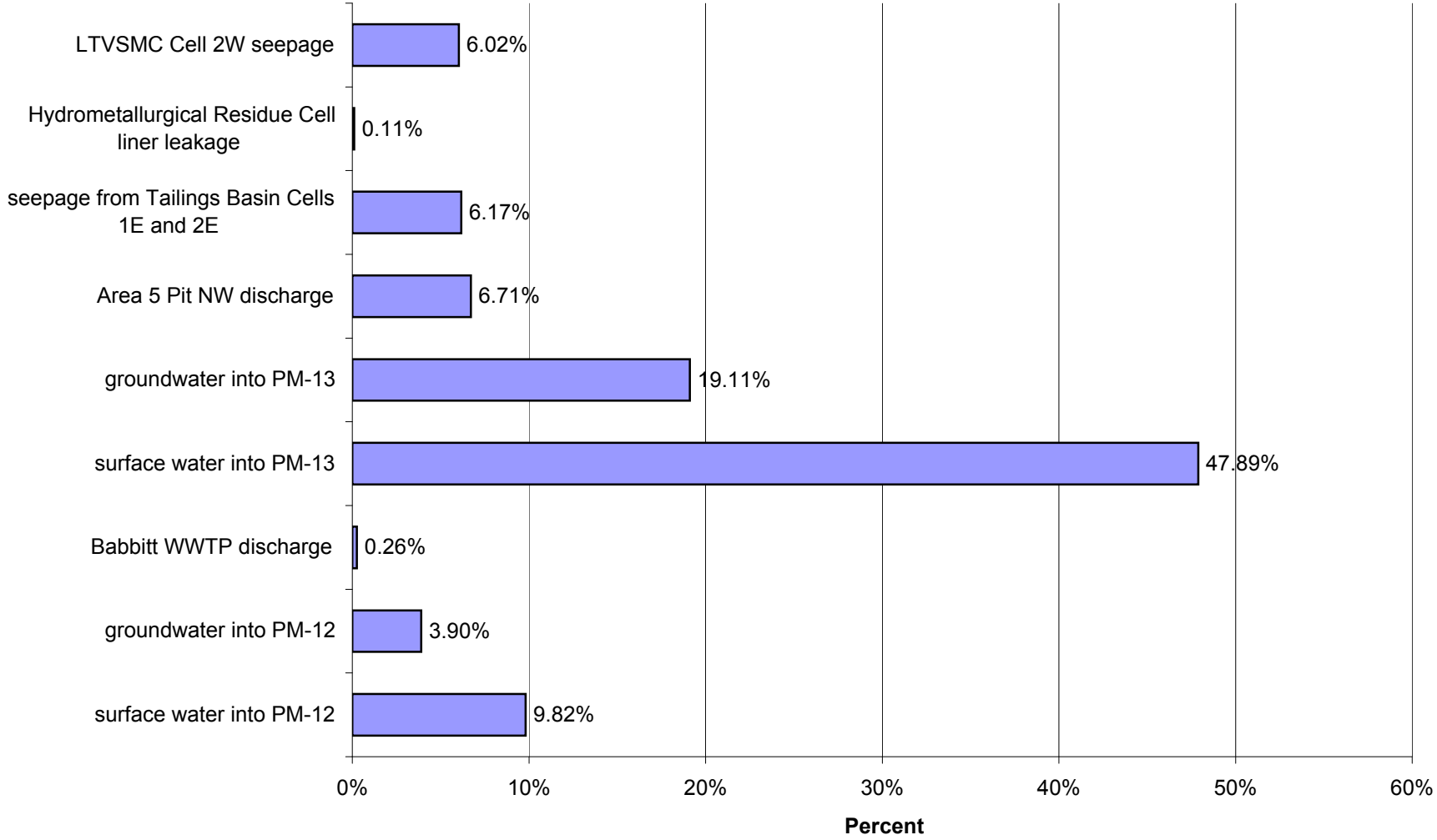
Geotechnical Mitigation: Percent of Impacts at PM-13 in Post - Closure for Low Flow for Nickel (Ni)



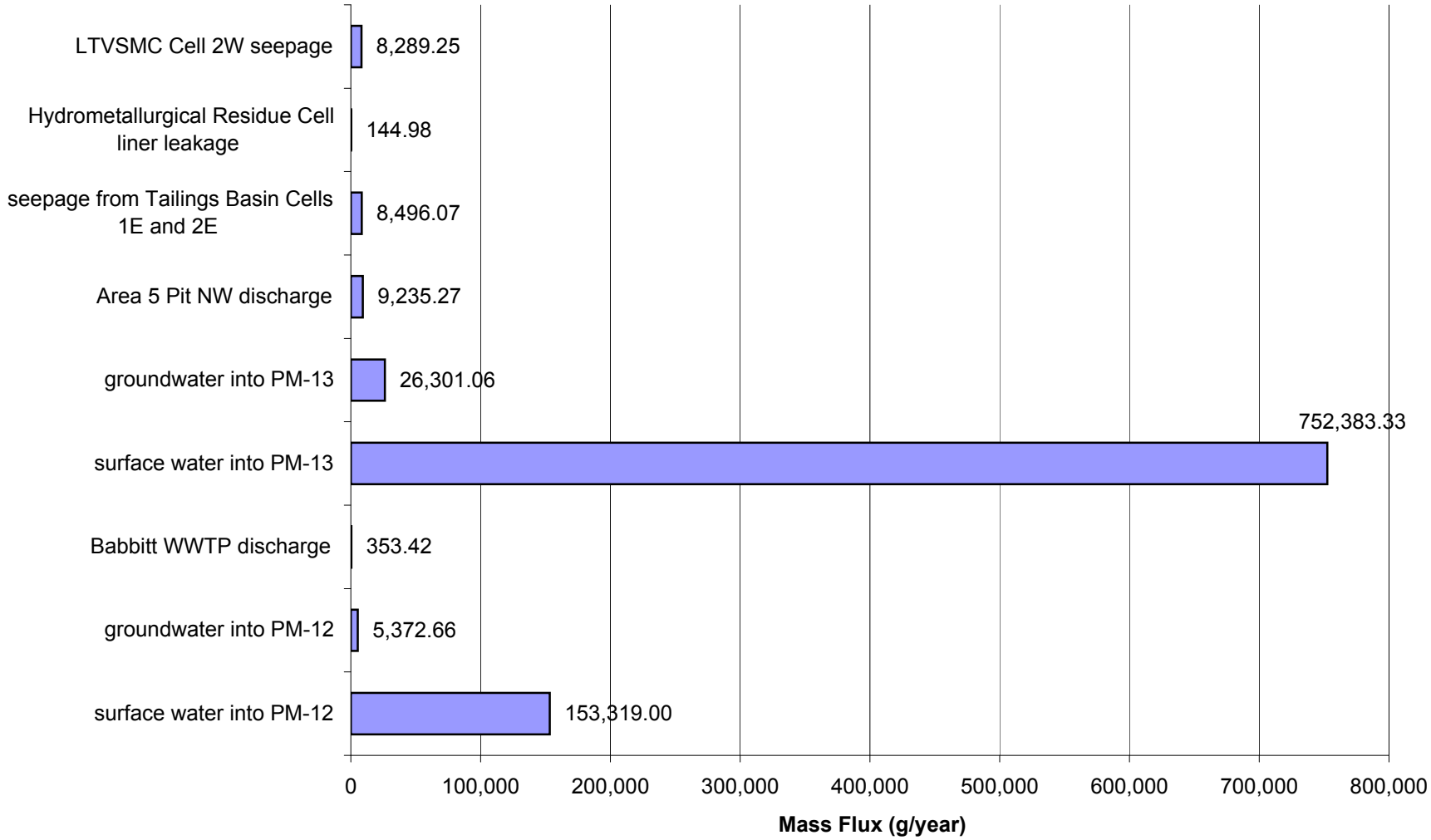
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for Average Flow for Nickel (Ni)



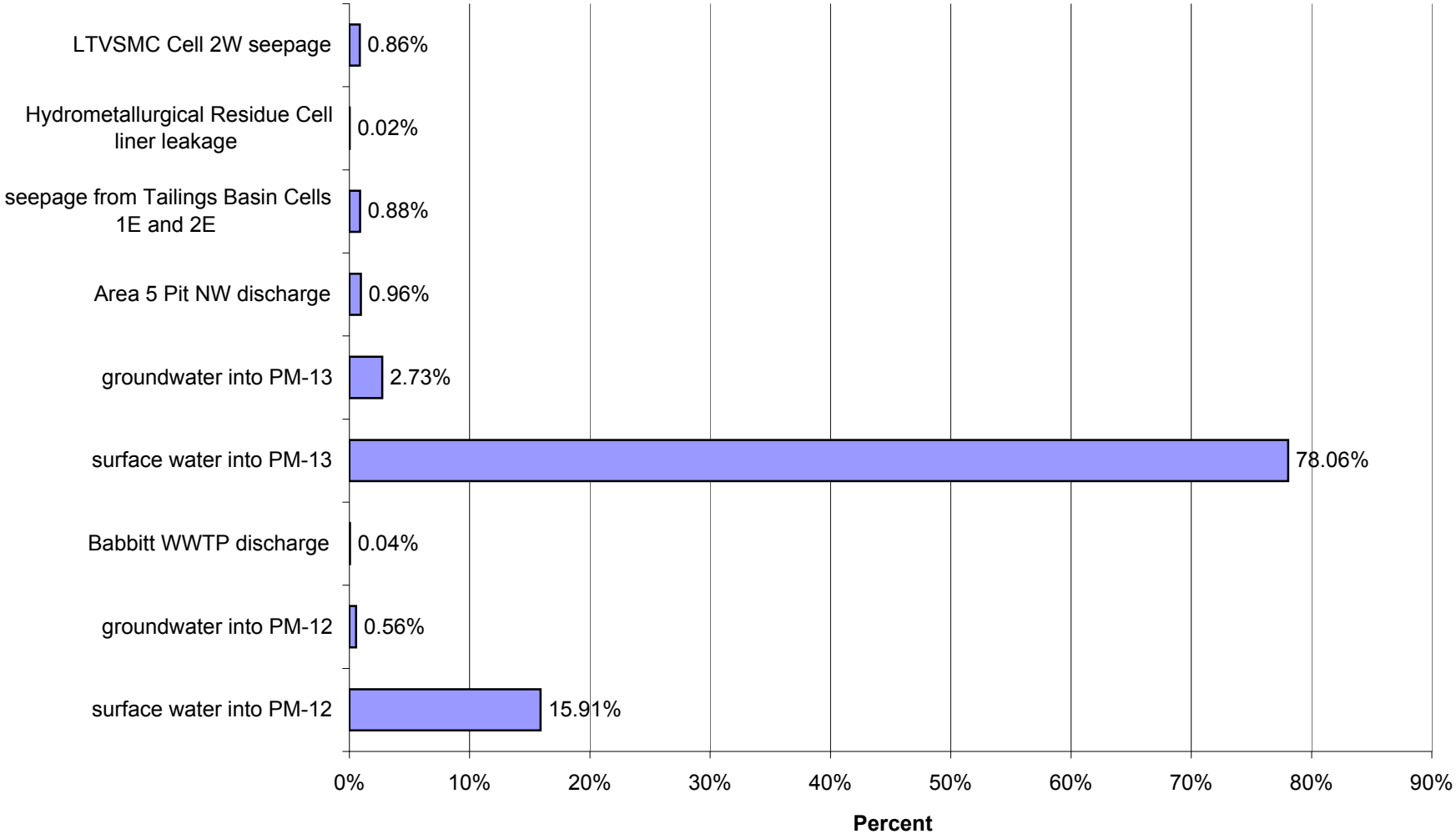
Geotechnical Mitigation: Percent of Impacts at PM-13 in Post - Closure for Average Flow for Nickel (Ni)



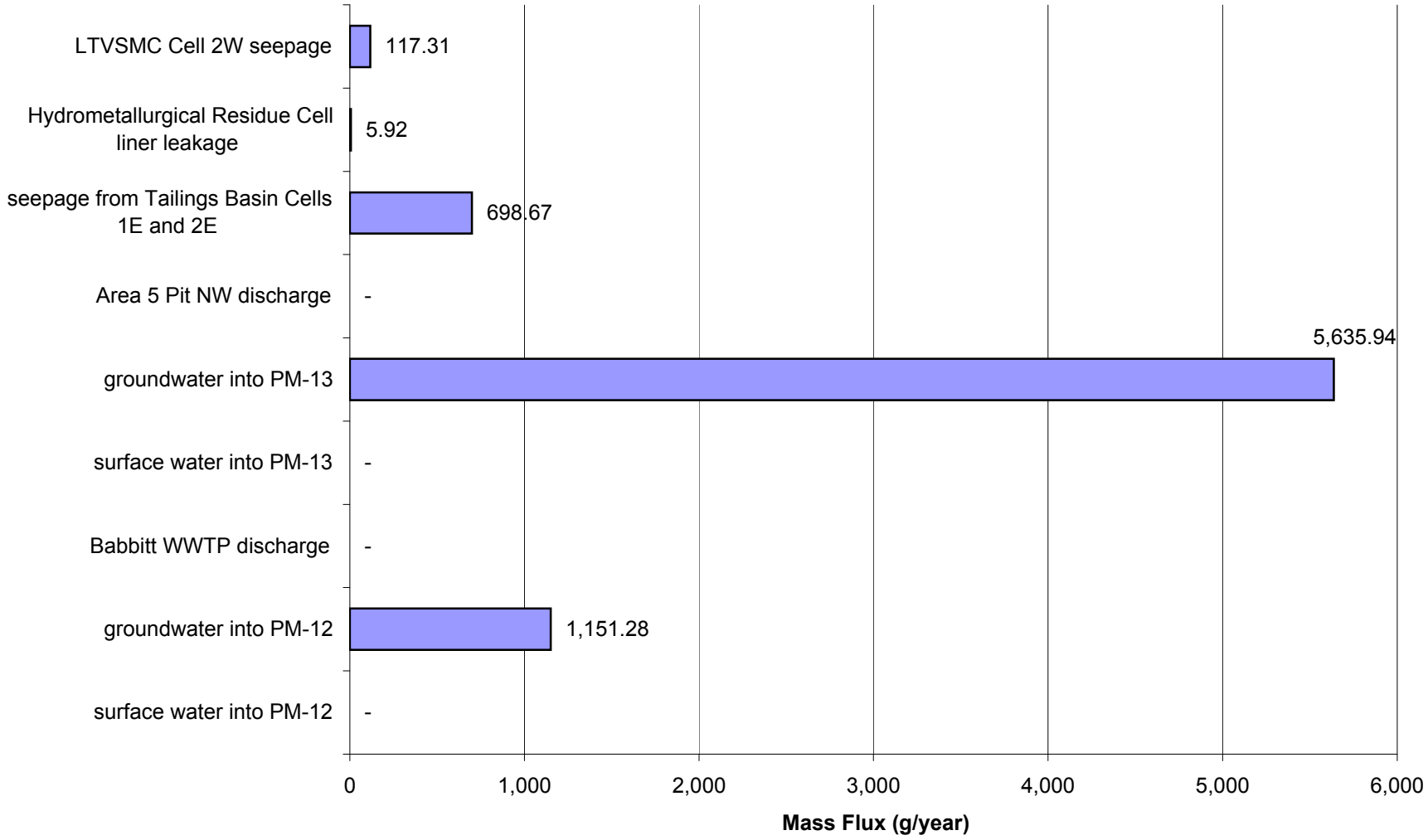
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for High Flow for Nickel (Ni)



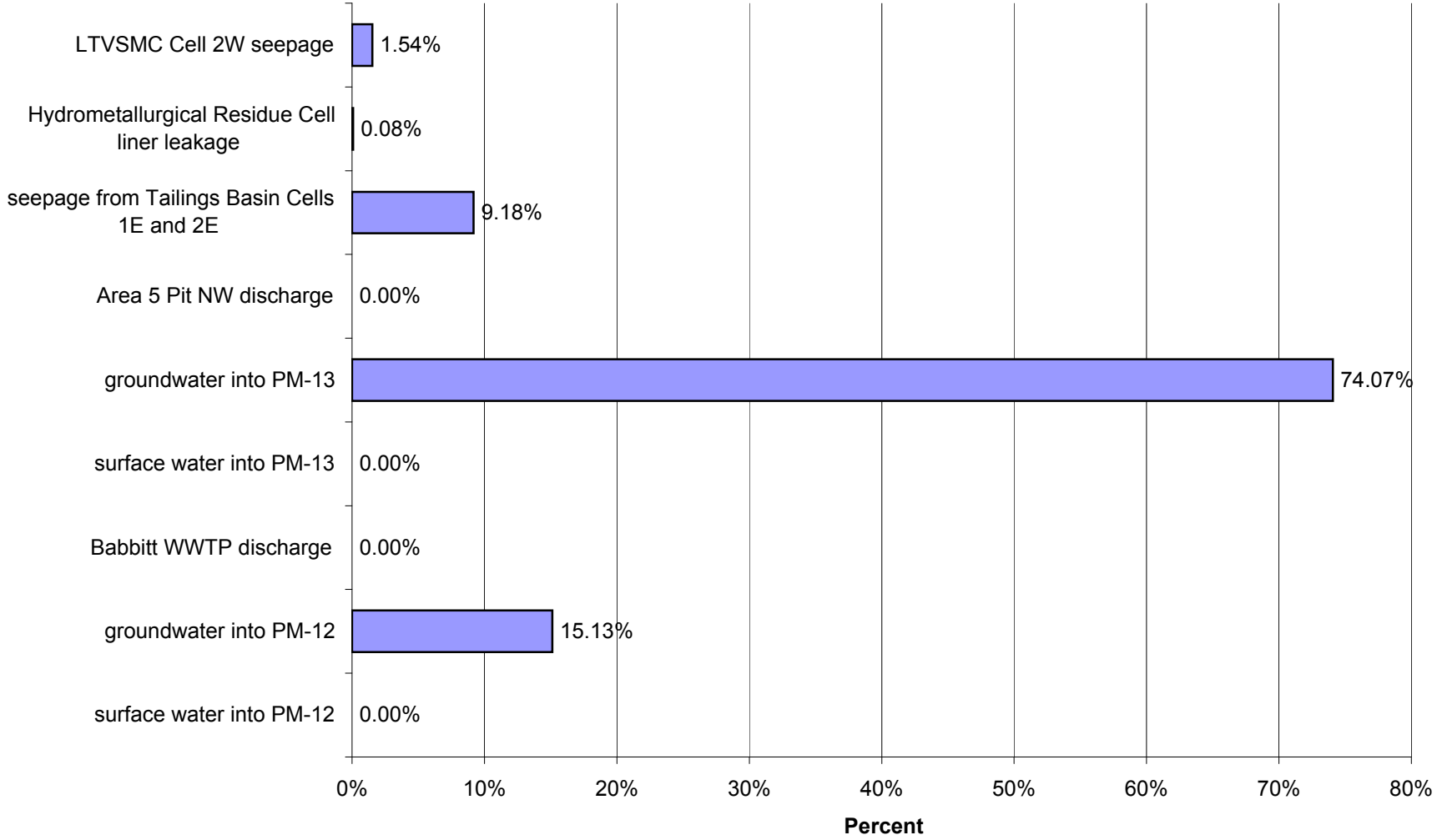
Geotechnical Mitigation: Percent of Impacts at PM-13 in Post - Closure for High Flow for Nickel (Ni)



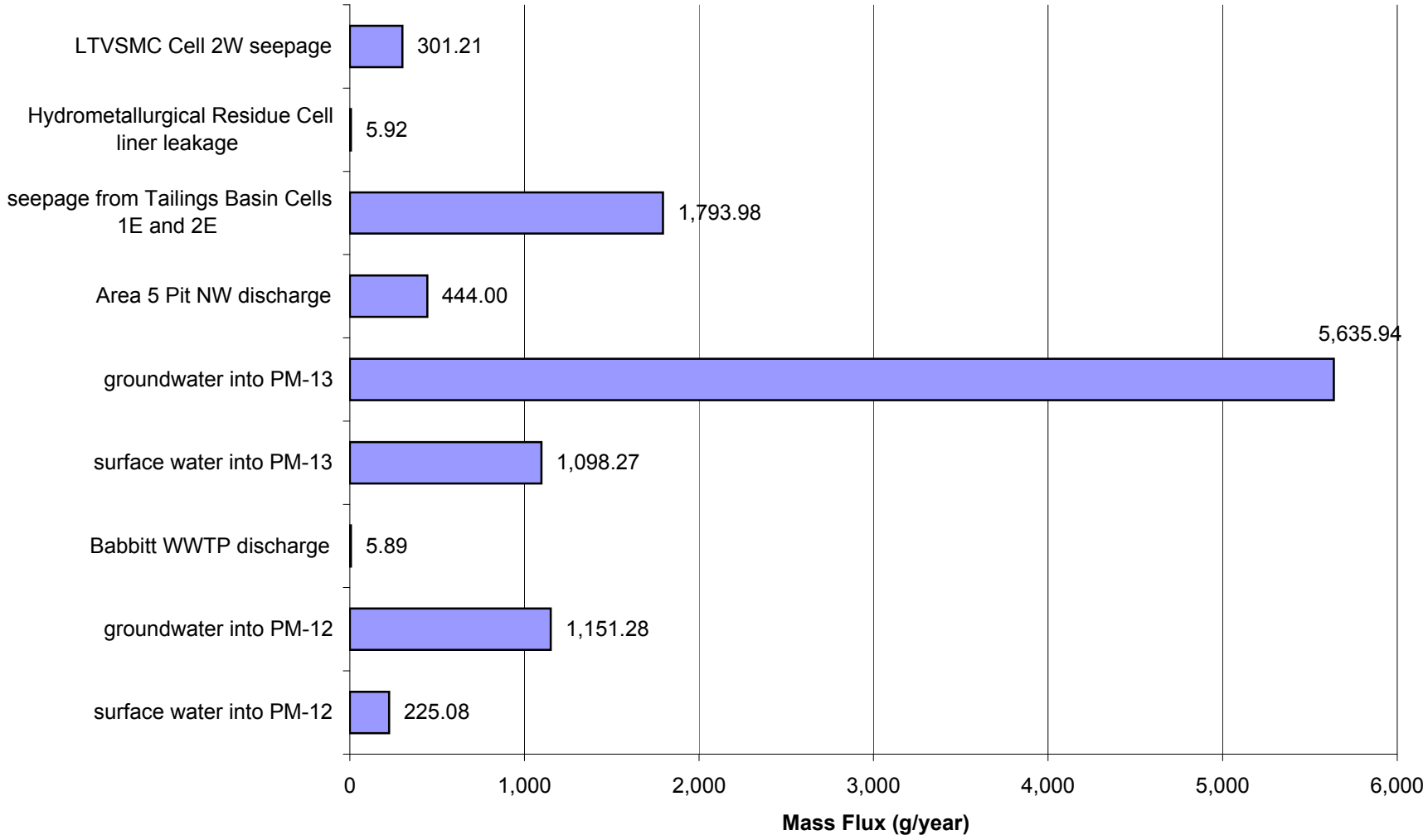
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for Low Flow for Antimony (Sb)



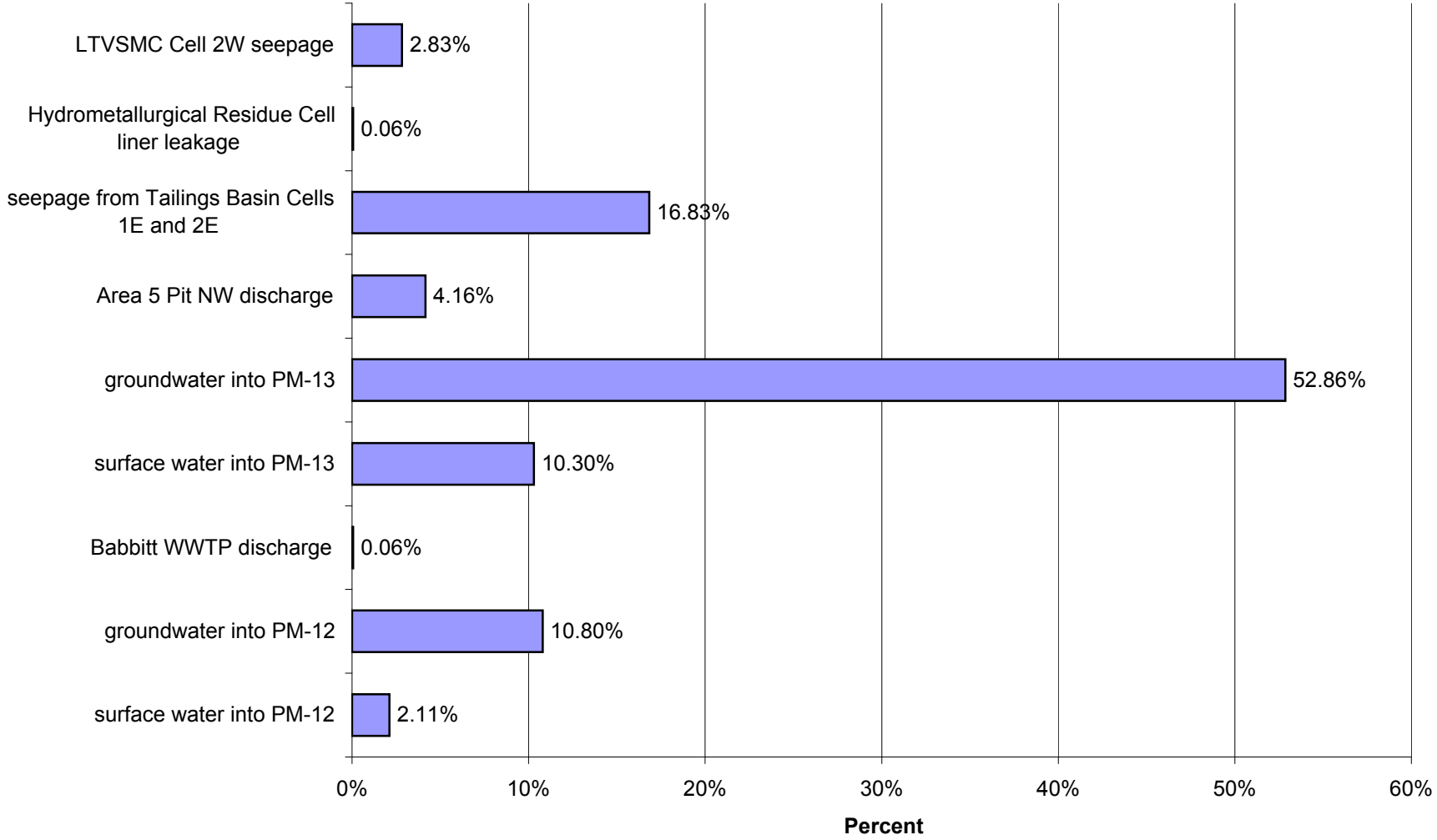
Geotechnical Mitigation: Percent of Impacts at PM-13 in Post - Closure for Low Flow for Antimony (Sb)



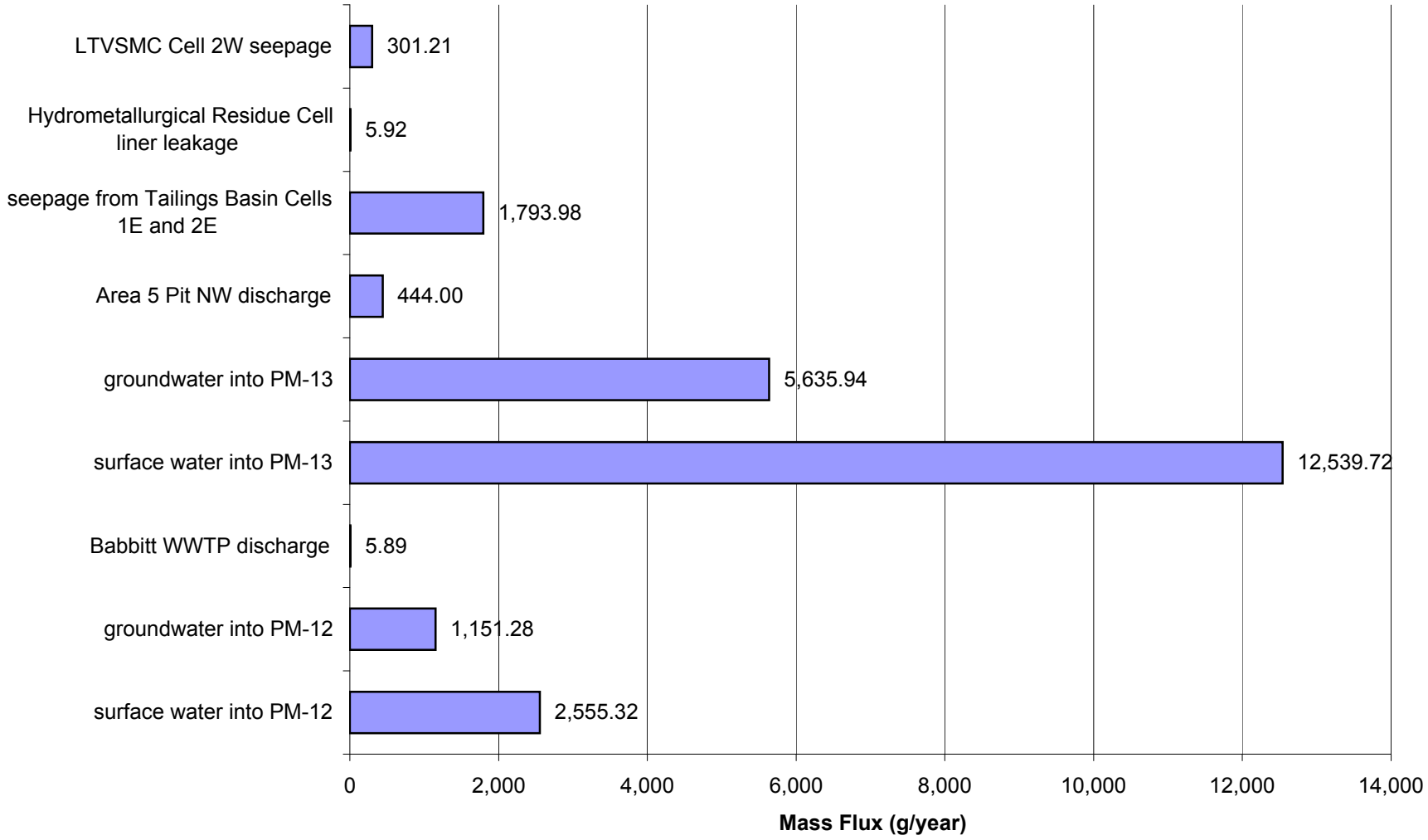
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for Average Flow for Antimony (Sb)



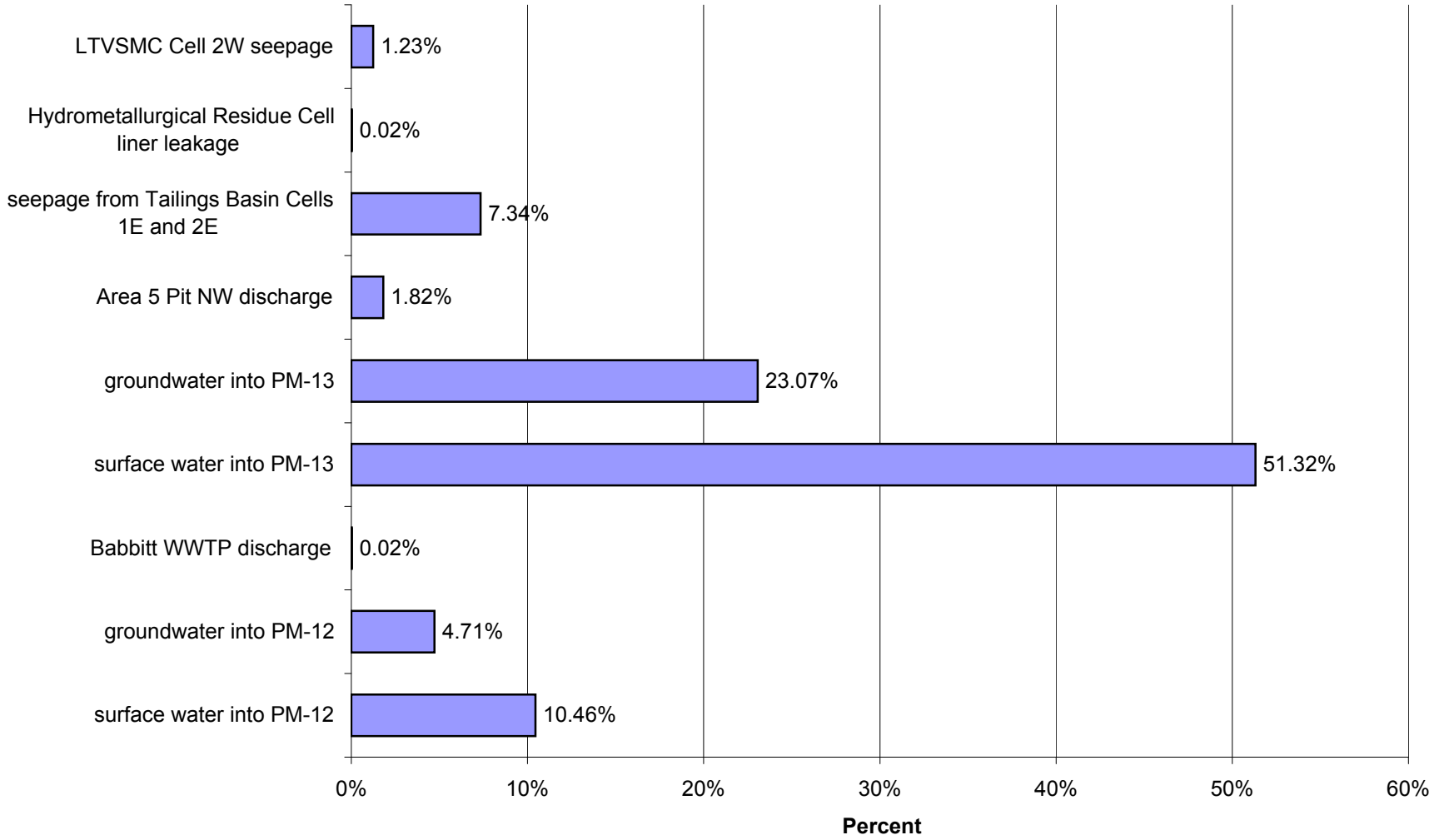
Geotechnical Mitigation: Percent of Impacts at PM-13 in Post - Closure for Average Flow for Antimony (Sb)



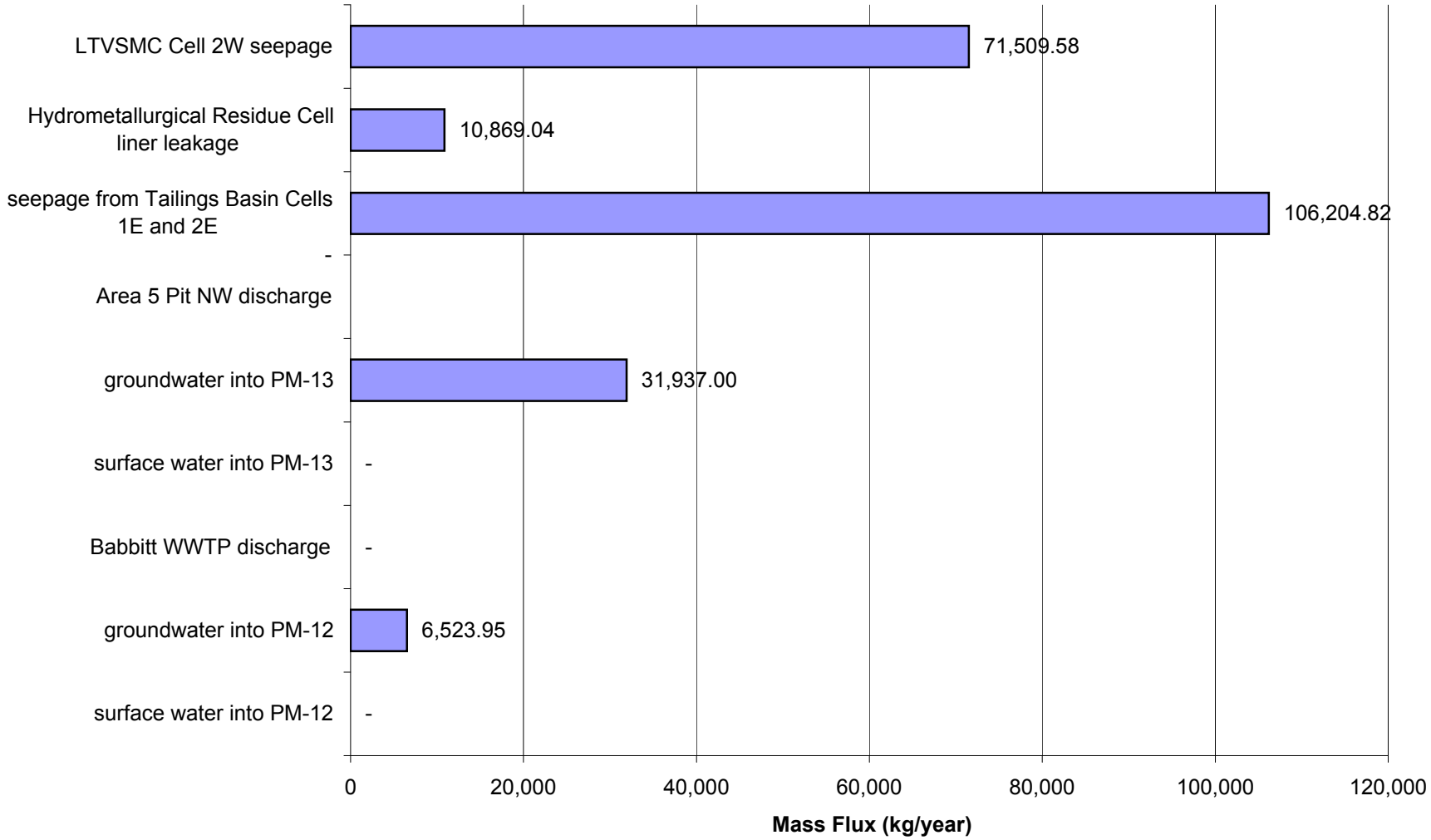
Geotechnical Mitigation: Mass Flux (g/year) of Impacts at PM-13 in Post - Closure for High Flow for Antimony (Sb)



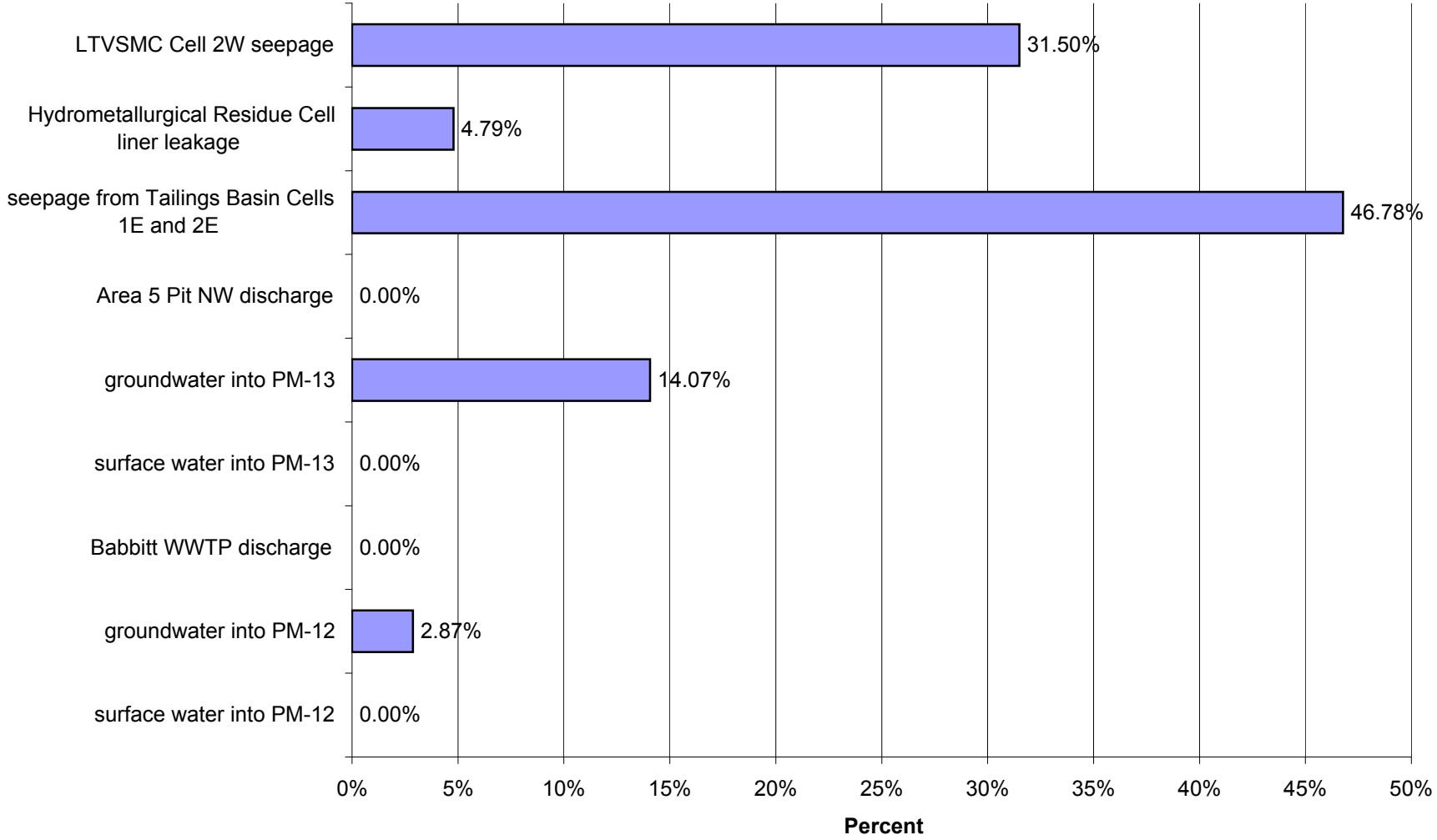
Geotechnical Mitigation: Percent of Impacts at PM-13 in Post - Closure for High Flow for Antimony (Sb)



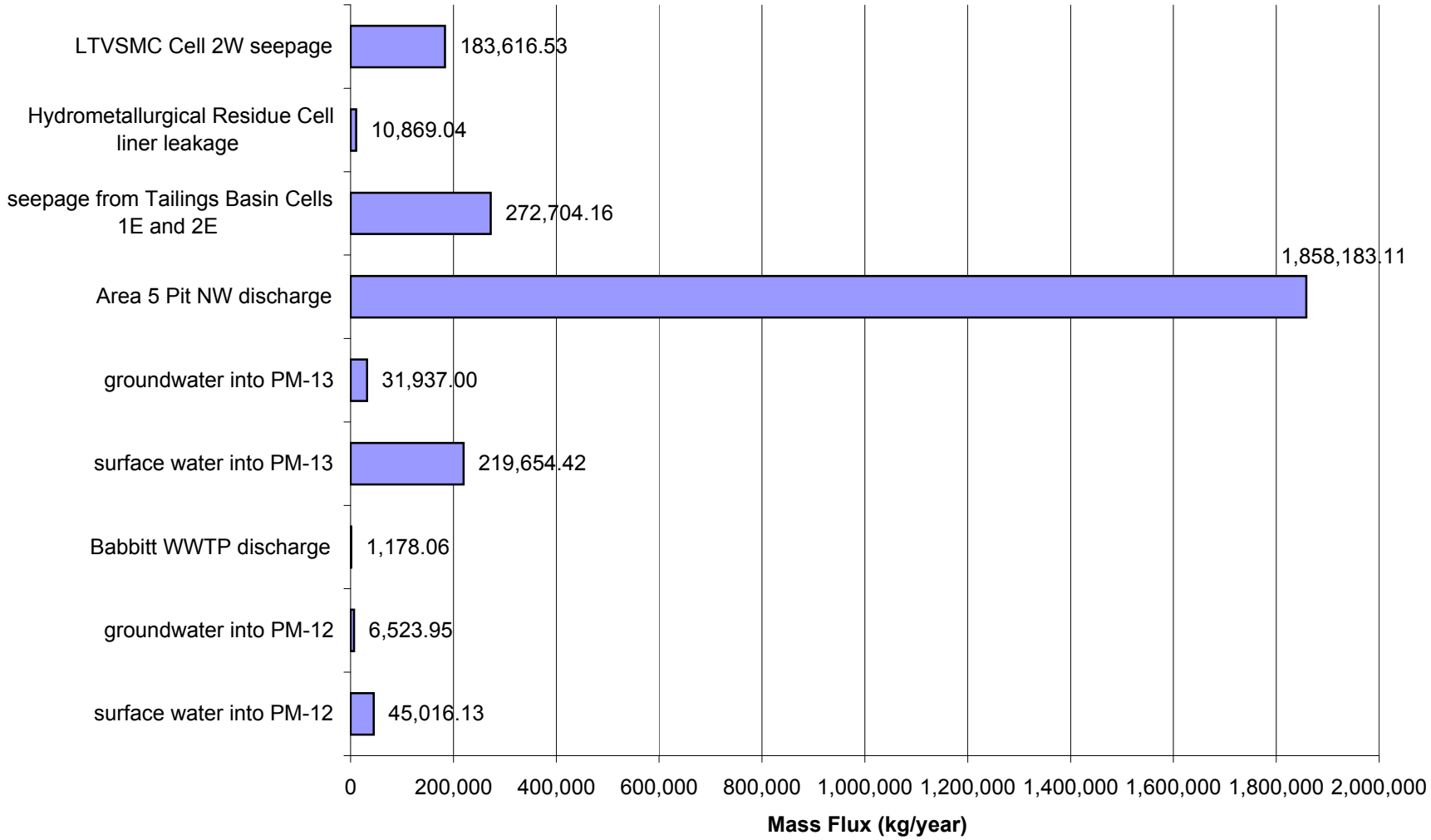
Geotechnical Mitigation: Mass Flux (kg/year) of Impacts at PM-13 in Post - Closure for Low Flow for Sulfate (SO_4)



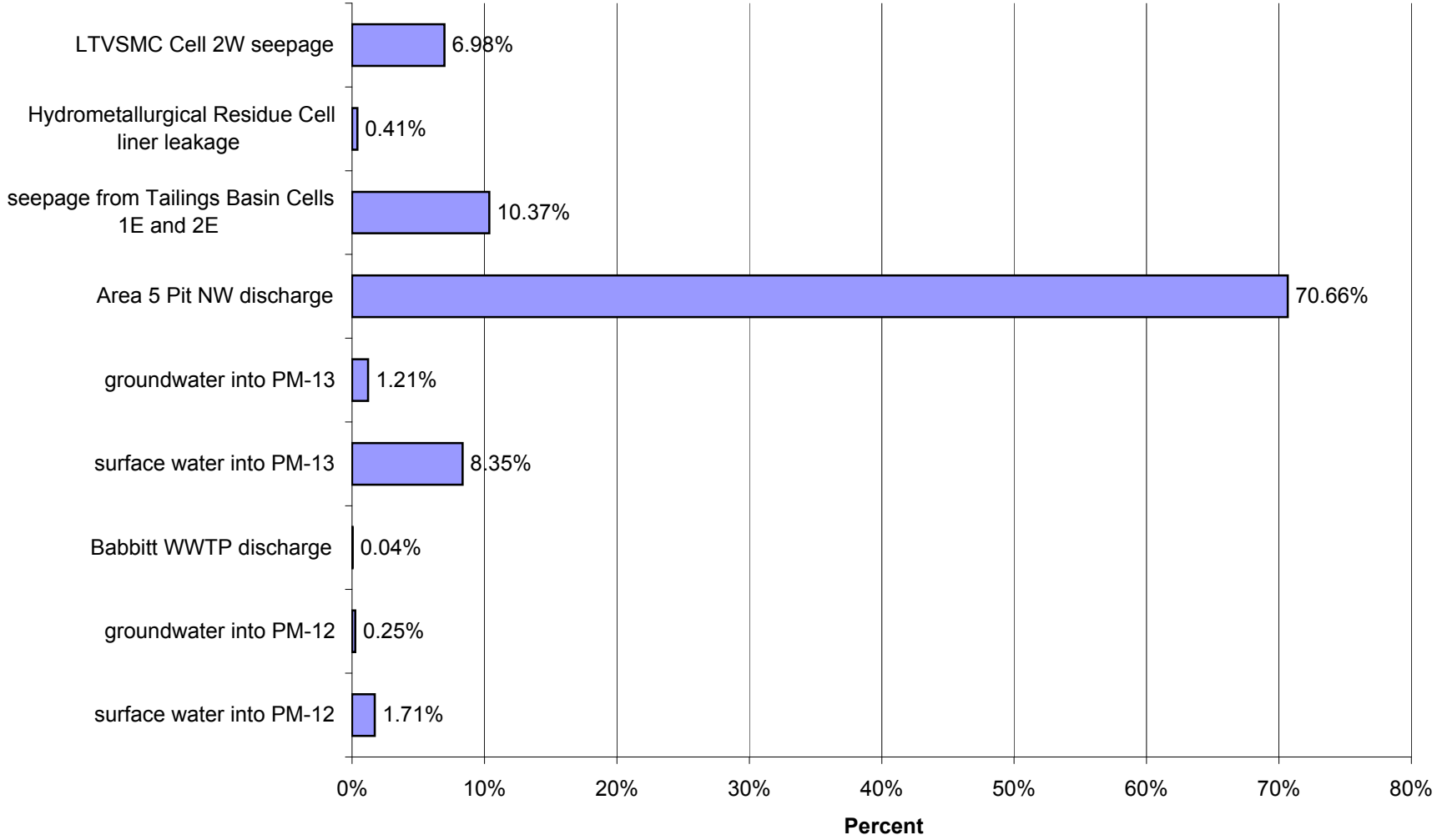
Geotechnical Mitigation: Percent of Impacts at PM-13 in Post - Closure for Low Flow for Sulfate (SO_4)



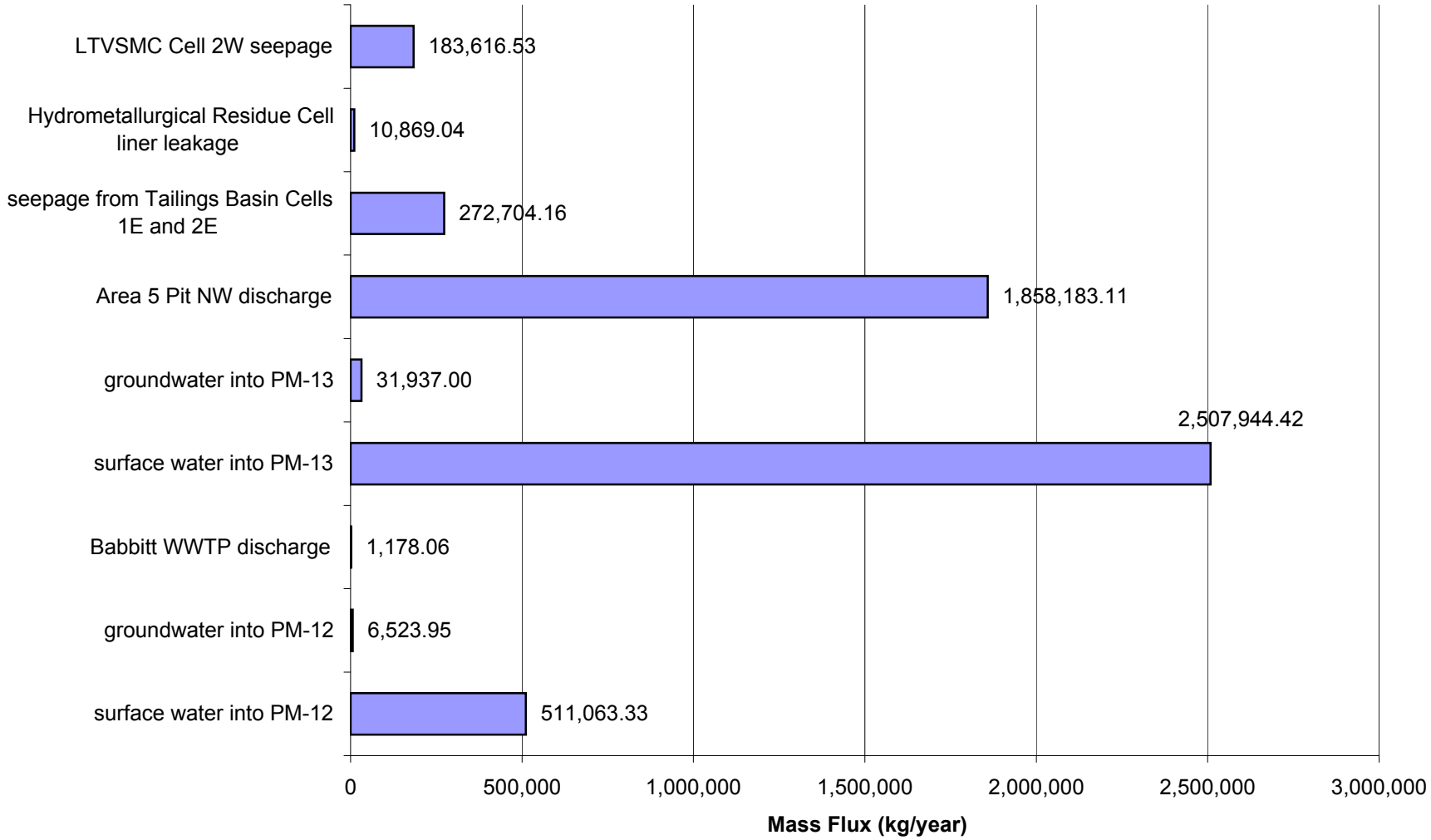
Geotechnical Mitigation: Mass Flux (kg/year) of Impacts at PM-13 in Post - Closure for Average Flow for Sulfate (SO_4)



Geotechnical Mitigation: Percent of Impacts at PM-13 in Post - Closure for Average Flow for Sulfate (SO_4)



Geotechnical Mitigation: Mass Flux (kg/year) of Impacts at PM-13 in Post - Closure for High Flow for Sulfate (SO_4)



Geotechnical Mitigation: Percent of Impacts at PM-13 in Post - Closure for High Flow for Sulfate (SO_4)