WHARF MINE
LEAD, SOUTH DAKOTA
NIRATE/ARSENIC GEOCHEMICAL MIXING CELL MODEL
Area - Cleopatra Creek Rock Facility

INPUT BLOCK

CHEMICAL	Nitrate	

INFILTRATION	Total Drainage Area:	1,604,315	ft^2
	Unreclaimned Infiltration Rate:	9	in/yr
	Reclaimed Infilgration Rate:	4.5	in/yr

SPENT ORE/BARREN ROCK	Porewater Concentration:	35.6	ppm
	Moisture at Offload:	0.04	wt %

CELLS	Cell No.	Material	Mass (tons)	Kd (L/kg)	Moisture (wt%)	GW Inflow (tons)	GW Conc. (ppm)
	1	Barren Rock	Time Dependent	0.000	0.04	0	0
	2	Unsaturated Bedrock	25,238,837	0.000	0.01	0	0
	3	Unused	0	0.000	0.01	0	0
	4	Unused	0	0.000	0	0	0
	5	Unused	0	0.000	0	0	0
	6	Unused	0	0.000	0	0	0
	7	Unused	0	0.000	0	0	0

TIME	Start Time		yrs	0.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00
	Time Step		yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	End Time		yrs	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00
	Calendar Year		year	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
TIME DEPENDENT DATA	Infiltration Rate		in/yr	9	9	9	9	9	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
	Chemicals in Infiltration		ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Backfill Added		tons	2,321,800	2,321,800	2,321,800	2,321,800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

CALCULATION BLOCK

CELL 1 - Barren Rock

DATA	VARIABLE		FORMULA	UNITS	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
ROCK	Initial Solids in Cell	A1	C1 from previous year	tons	0	2,321,800	4,643,600	6,965,400	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200
	Material Added	B1		tons	2,321,800	2,321,800	2,321,800	2,321,800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total Solids in Cell	C1	A1 + B1	tons	2,321,800	4,643,600	6,965,400	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200
WATER	Initial Mass Water in Cell	D1	V1 from previous year	tons	0	92,872	185,744	278,616	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488
	Inflow from Infiltration	E1	infiltration rate x area x conversion factor	tons	37,553	37,553	37,553	37,553	37,553	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777
	Inflow from Groundwater	F1		tons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	New ore Moisture	G1	B1 x % moisture at offload	tons	92,872	92,872	92,872	92,872	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total Water in Cell	H1	D1 + E1 + F1 + G1	tons	130,425	223,297	316,169	409,041	409,041	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265
CHEMICALS	Initial Chemicals	I1	Z1 from previous year	tons	0.000	2.354	4.709	7.063	9.417	8.553	8.141	7.749	7.377	7.022	6.684	6.362	6.056	5.765	5.487	5.223	4.972	4.733	4.505	4.288	4.082
	Chemicals from Above	J1	E1 x infiltration chemical concentration	tons	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Chemicals from Groundwater	K1	F1 x groundwater chemical concentration	tons	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Chemicals in New Porewater	L1	G1 x porewater chemical concentration	tons	3.306	3.306	3.306	3.306	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Adsorbed Chemicals in Ore	M1	B1 x Q1 x porewater chemical concentration	tons	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Total Chemicals in Liquid	N1	J1 + K1 + L1	tons	3.306	3.306	3.306	3.306	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Total Chemicals on Solids	O1	I1 + M1	tons	0.000	2.354	4.709	7.063	9.417	8.553	8.141	7.749	7.377	7.022	6.684	6.362	6.056	5.765	5.487	5.223	4.972	4.733	4.505	4.288	4.082
	Total Chemicals in Cell	P1	O1 + N1	tons	3.306	5.661	8.015	10.369	9.417	8.553	8.141	7.749	7.377	7.022	6.684	6.362	6.056	5.765	5.487	5.223	4.972	4.733	4.505	4.288	4.082
PARTITION CHEMICALS	Kd	Q1		L/kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Adsorbed Chemicals	R1	(Q1 x C1 x P1) / (Q1 x C1 + H1)	tons	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Solid Concentration	S1	R1 / C1 x 10e6	ppm	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Dissolved Chemicals	T1	P1 - R1	tons	3.306	5.661	8.015	10.369	9.417	8.553	8.141	7.749	7.377	7.022	6.684	6.362	6.056	5.765	5.487	5.223	4.972	4.733	4.505	4.288	4.082
	Liquid Concentration	U1	T1 / H1 x 10e6	ppm	25.350	25.350	25.350	25.350	23.022	21.915	20.860	19.857	18.901	17.992	17.126	16.302	15.518	14.771	14.061	13.384	12.740	12.127	11.544	10.988	10.460
OUTFLOW	Water Remaining	V1	C1 x % moisture	tons	92,872	185,744	278,616	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488
	Water Out	W1	H1 - V1	tons	37,553	37,553	37,553	37,553	37,553	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777
	Chemicals Out in Water	X1	W1 x U1 / 10e6	tons	0.952	0.952	0.952	0.952	0.865	0.411	0.392	0.373	0.355	0.338	0.322	0.306	0.291	0.277	0.264	0.251	0.239	0.228	0.217	0.206	0.196
	Chemicals Remaining in Water	Y1	T1 - X1	tons	2.354	4.709	7.063	9.417	8.553	8.141	7.749	7.377	7.022	6.684	6.362	6.056	5.765	5.487	5.223	4.972	4.733	4.505	4.288	4.082	3.886
	Total Chemicals Remaining	Z1	R1 + Y1	tons	2.354	4.709	7.063	9.417	8.553	8.141	7.749	7.377	7.022	6.684	6.362	6.056	5.765	5.487	5.223	4.972	4.733	4.505	4.288	4.082	3.886

CELL 2 - Unsaturated Bedrock

DATA	VARIABLE		FORMULA	UNITS	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
ROCK	Total Solids in Cell	C2		tons	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837
WATER	Initial Mass Water in Cell	D2	V2 from previous year	tons	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388
	Inflow from Cell Above	E2	W1 x 10%	tons	3,755	3,755	3,755	3,755	3,755	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878
	Inflow from Groundwater	F2		tons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total Water in Cell	H2	D2 + E2 + F2	tons	256,144	256,144	256,144	256,144	256,144	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266
CHEMICALS	Initial Chemicals	I2	Z2 from previous year	tons	0.000	0.094	0.186	0.277	0.367	0.447	0.484	0.520	0.553	0.584	0.613	0.641	0.666	0.690	0.713	0.734	0.753	0.771	0.788	0.804	0.819
	Chemicals from Above	J2	X1 x 10%	tons	0.095	0.095	0.095	0.095	0.086	0.041	0.039	0.037	0.035	0.034	0.032	0.031	0.029	0.028	0.026	0.025	0.024	0.023	0.022	0.021	0.020
	Chemicals from Groundwater	K2	F2 x groundwater chemical concentration	tons	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Total Chemicals in Cell	P2	I2 + J2 + K2	tons	0.095	0.189	0.281	0.372	0.453	0.488	0.524	0.557	0.588	0.618	0.645	0.671	0.695	0.718	0.739	0.759	0.777	0.794	0.810	0.825	0.838
PARTITION CHEMICALS	Kd	Q2		L/kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Adsorbed Chemicals	R2	(Q2 x C2 x P2) / (Q2 x C2 + H2)	tons	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Solid Concentration	S2	R2 / C2 x 10e6	ppm	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Dissolved Chemicals	T2	P2 - R2	tons	0.095	0.189	0.281	0.372	0.453	0.488	0.524	0.557	0.588	0.618	0.645	0.671	0.695	0.718	0.739	0.759	0.777	0.794	0.810	0.825	0.838
	Liquid Concentration	U2	T2 / H2 x 10e6	ppm	0.372	0.738	1.099	1.454	1.770	1.919	2.059	2.190	2.314	2.430	2.538	2.640	2.735	2.824	2.907	2.984	3.056	3.123	3.185	3.243	3.296
OUTFLOW	Water Remaining	V2	D2	tons	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388
	Water Out	W2	H2 - V2	tons	3,755	3,755	3,755	3,755	3,755	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878
	Chemicals Out in Water	X2	W2 x U2 / 10e6	tons	0.001	0.003	0.004	0.005	0.007	0.004	0.004	0.004	0.004	0.005	0.005	0.005	0.005	0.005	0.005	0.006	0.006	0.006	0.006	0.006	0.006
	Chemicals Remaining in Water	Y2	T2 - X2	tons	0.094	0.186	0.277	0.367	0.447	0.484	0.520	0.553	0.584	0.613	0.641	0.666	0.690	0.713	0.734	0.753	0.771	0.788	0.804	0.819	0.832
	Total Chemicals Remaining	Z2	R2 + Y2	tons	0.094	0.186	0.277	0.367	0.447	0.484	0.520	0.553	0.584	0.613	0.641	0.666	0.690	0.713	0.734	0.753	0.771	0.788	0.804	0.819	0.832

21.00	22.00	23.00	24.00	25.00	26.00	27.00	28.00	29.00	30.00	31.00	32.00	33.00	34.00	35.00	36.00	37.00	38.00	39.00	40.00	41.00	42.00	43.00	44.00	45.00	46.00	47.00	48.00
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
22.00	23.00	24.00	25.00	26.00	27.00	28.00	29.00	30.00	31.00	32.00	33.00	34.00	35.00	36.00	37.00	38.00	39.00	40.00	41.00	42.00	43.00	44.00	45.00	46.00	47.00	48.00	49.00
2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035

4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200

371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488
18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265

3.886	3.699	3.521	3.351	3.190	3.037	2.891	2.751	2.619	2.493	2.373	2.259	2.150	2.047	1.948	1.855	1.765	1.680	1.600	1.523	1.449	1.380	1.313	1.250	1.190	1.133	1.078	1.026
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3.886	3.699	3.521	3.351	3.190	3.037	2.891	2.751	2.619	2.493	2.373	2.259	2.150	2.047	1.948	1.855	1.765	1.680	1.600	1.523	1.449	1.380	1.313	1.250	1.190	1.133	1.078	1.026
3.886	3.699	3.521	3.351	3.190	3.037	2.891	2.751	2.619	2.493	2.373	2.259	2.150	2.047	1.948	1.855	1.765	1.680	1.600	1.523	1.449	1.380	1.313	1.250	1.190	1.133	1.078	1.026

0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3.886	3.699	3.521	3.351	3.190	3.037	2.891	2.751	2.619	2.493	2.373	2.259	2.150	2.047	1.948	1.855	1.765	1.680	1.600	1.523	1.449	1.380	1.313	1.250	1.190	1.133	1.078	1.026
9.957	9.478	9.022	8.587	8.174	7.781	7.407	7.050	6.711	6.388	6.081	5.788	5.510	5.245	4.992	4.752	4.524	4.306	4.099	3.902	3.714	3.535	3.365	3.203	3.049	2.902	2.763	2.630

371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488
18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777
0.187	0.178	0.169	0.161	0.153	0.146	0.139	0.132	0.126	0.120	0.114	0.109	0.103	0.098	0.094	0.089	0.085	0.081	0.077	0.073	0.070	0.066	0.063	0.060	0.057	0.054	0.052	0.049
3.699	3.521	3.351	3.190	3.037	2.891	2.751	2.619	2.493	2.373	2.259	2.150	2.047	1.948	1.855	1.765	1.680	1.600	1.523	1.449	1.380	1.313	1.250	1.190	1.133	1.078	1.026	0.977
3.699	3.521	3.351	3.190	3.037	2.891	2.751	2.619	2.493	2.373	2.259	2.150	2.047	1.948	1.855	1.765	1.680	1.600	1.523	1.449	1.380	1.313	1.250	1.190	1.133	1.078	1.026	0.977

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837

252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388
1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266

0.832	0.844	0.856	0.866	0.876	0.885	0.893	0.900	0.906	0.912	0.917	0.922	0.926	0.929	0.932	0.935	0.937	0.938	0.939	0.940	0.940	0.940	0.940	0.939	0.938	0.937	0.935	0.934
0.019	0.018	0.017	0.016	0.015	0.015	0.014	0.013	0.013	0.012	0.011	0.011	0.010	0.010	0.009	0.009	0.008	0.008	0.008	0.007	0.007	0.007	0.006	0.006	0.006	0.005	0.005	0.005
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.851	0.862	0.873	0.882	0.891	0.899	0.907	0.913	0.919	0.924	0.929	0.933	0.936	0.939	0.942	0.944	0.945	0.946	0.947	0.947	0.947	0.947	0.946	0.945	0.944	0.942	0.941	0.939

0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.851	0.862	0.873	0.882	0.891	0.899	0.907	0.913	0.919	0.924	0.929	0.933	0.936	0.939	0.942	0.944	0.945	0.946	0.947	0.947	0.947	0.947	0.946	0.945	0.944	0.942	0.941	0.939
3.346	3.391	3.432	3.470	3.505	3.537	3.565	3.591	3.614	3.635	3.653	3.668	3.682	3.694	3.703	3.711	3.717	3.721	3.724	3.725	3.725	3.724	3.721	3.717	3.712	3.706	3.699	3.692

252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388
1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878
0.006	0.006	0.006	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007
0.844	0.856	0.866	0.876	0.885	0.893	0.900	0.906	0.912	0.917	0.922	0.926	0.929	0.932	0.935	0.937	0.938	0.939	0.940	0.940	0.940	0.940	0.939	0.938	0.937	0.935	0.934	0.932
0.844	0.856	0.866	0.876	0.885	0.893	0.900	0.906	0.912	0.917	0.922	0.926	0.929	0.932	0.935	0.937	0.938	0.939	0.940	0.940	0.940	0.940	0.939	0.938	0.937	0.935	0.934	0.932

49.00	50.00	51.00	52.00	53.00	54.00	55.00	56.00	57.00	58.00	59.00	60.00	61.00	62.00	63.00	64.00	65.00	66.00	67.00	68.00	69.00	70.00	71.00	72.00	73.00
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
50.00	51.00	52.00	53.00	54.00	55.00	56.00	57.00	58.00	59.00	60.00	61.00	62.00	63.00	64.00	65.00	66.00	67.00	68.00	69.00	70.00	71.00	72.00	73.00	74.00
2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060

4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060
9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200	9,287,200

371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488
18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265	390,265

0.977	0.930	0.885	0.843	0.802	0.763	0.727	0.692	0.658	0.627	0.597	0.568	0.541	0.515	0.490	0.466	0.444	0.423	0.402	0.383	0.364	0.347	0.330	0.314	0.299
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.977	0.930	0.885	0.843	0.802	0.763	0.727	0.692	0.658	0.627	0.597	0.568	0.541	0.515	0.490	0.466	0.444	0.423	0.402	0.383	0.364	0.347	0.330	0.314	0.299
0.977	0.930	0.885	0.843	0.802	0.763	0.727	0.692	0.658	0.627	0.597	0.568	0.541	0.515	0.490	0.466	0.444	0.423	0.402	0.383	0.364	0.347	0.330	0.314	0.299

0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.977	0.930	0.885	0.843	0.802	0.763	0.727	0.692	0.658	0.627	0.597	0.568	0.541	0.515	0.490	0.466	0.444	0.423	0.402	0.383	0.364	0.347	0.330	0.314	0.299
2.503	2.383	2.268	2.159	2.055	1.956	1.862	1.773	1.687	1.606	1.529	1.455	1.385	1.319	1.255	1.195	1.137	1.083	1.031	0.981	0.934	0.889	0.846	0.805	0.767

371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488	371,488
18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777	18,777
0.047	0.045	0.043	0.041	0.039	0.037	0.035	0.033	0.032	0.030	0.029	0.027	0.026	0.025	0.024	0.022	0.021	0.020	0.019	0.018	0.018	0.017	0.016	0.015	0.014
0.930	0.885	0.843	0.802	0.763	0.727	0.692	0.658	0.627	0.597	0.568	0.541	0.515	0.490	0.466	0.444	0.423	0.402	0.383	0.364	0.347	0.330	0.314	0.299	0.285
0.930	0.885	0.843	0.802	0.763	0.727	0.692	0.658	0.627	0.597	0.568	0.541	0.515	0.490	0.466	0.444	0.423	0.402	0.383	0.364	0.347	0.330	0.314	0.299	0.285

2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060
25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837	25,238,837

252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388
1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266	254,266

0.932	0.930	0.927	0.924	0.922	0.919	0.916	0.912	0.909	0.905	0.902	0.898	0.894	0.890	0.886	0.882	0.877	0.873	0.868	0.864	0.859	0.855	0.850	0.845	0.841
0.005	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.936	0.934	0.931	0.929	0.926	0.922	0.919	0.916	0.912	0.908	0.904	0.900	0.896	0.892	0.888	0.884	0.879	0.875	0.870	0.866	0.861	0.856	0.852	0.847	0.842

0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.936	0.934	0.931	0.929	0.926	0.922	0.919	0.916	0.912	0.908	0.904	0.900	0.896	0.892	0.888	0.884	0.879	0.875	0.870	0.866	0.861	0.856	0.852	0.847	0.842
3.683	3.673	3.663	3.652	3.640	3.628	3.614	3.601	3.587	3.572	3.557	3.542	3.526	3.509	3.493	3.476	3.458	3.441	3.423	3.405	3.387	3.368	3.350	3.331	3.312

252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388	252,388
1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878	1,878
0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
0.930	0.927	0.924	0.922	0.919	0.916	0.912	0.909	0.905	0.902	0.898	0.894	0.890	0.886	0.882	0.877	0.873	0.868	0.864	0.859	0.855	0.850	0.845	0.841	0.836
0.930	0.927	0.924	0.922	0.919	0.916	0.912	0.909	0.905	0.902	0.898	0.894	0.890	0.886	0.882	0.877	0.873	0.868	0.864	0.859	0.855	0.850	0.845	0.841	0.836