

Appendix G

Calibration of Mass Balance Models for Partridge River Watershed

Partridge River Model - Calibration to Baseline Water Quality Data				
Parameter: Silver				
Input Flow Data	surface water flow into SW-001	Q s1 =	1.52	(cfs)
	surface water flow into SW-002	Q s2 =	1.76	(cfs)
	surface water flow into SW-003	Q s3 =	0.51	(cfs)
	surface water flow into SW-004	Q s4 =	2.17	(cfs)
	surface water flow into SW-004A	Q s4A =	7.85	(cfs)
	surface water flow into SW-005	Q s5 =	11.55	(cfs)
	surface water inflow from upstream of PM-1	Q sns =	0.00	(cfs)
	surface water flow from West Pit Overflow	Q sms =	0.00	(cfs)
	ground water flow into SW-001	Q g1 =	0.18	(cfs)
	ground water flow into SW-002	Q g2 =	0.38	(cfs)
	ground water flow into SW-003	Q g3 =	0.11	(cfs)
	ground water flow into SW-004	Q g4 =	0.32	(cfs)
	ground water flow into SW-004A	Q g4A =	1.39	(cfs)
	ground water flow into SW-005	Q g5 =	2.27	(cfs)
	ground water seepage from East Pit	Q gep =	0.00	(cfs)
	ground water seepage from West Pit	Q gwp =	0.00	(cfs)
	combined ground water liner leakage from stockpiles	Q gl4 =	0.00	(cfs)
	combined ground water liner leakage/seepage from other mine features	Q gl4a =	0.00	(cfs)
Input Concentration Data	concentration of surface water into SW-001	C s1 =	0	µg/L
	concentration of surface water into SW-002	C s2 =	0	µg/L
	concentration of surface water into SW-003	C s3 =	0	µg/L
	concentration of surface water into SW-004	C s4 =	0	µg/L
	concentration of surface water into SW-004A	C s4A =	0	µg/L
	concentration of surface water into SW-005	C s5 =	0	µg/L
	concentration of surface water inflow from upstream of PM-1	C sns =	0.12	µg/L
	concentration of surface water flow from West Pit Overflow	C sms =	0	µg/L
	concentration of ground water into SW-001	C g1 =	0.55	µg/L
	concentration of ground water into SW-002	C g2 =	0.55	µg/L
	concentration of ground water into SW-003	C g3 =	0.55	µg/L
	concentration of ground water into SW-004	C g4 =	0.55	µg/L
	concentration of ground water into SW-004A	C g4A =	0.55	µg/L
	concentration of ground water into SW-005	C g5 =	0.55	µg/L
	concentration of ground water seepage from East Pit	C gep =	0	µg/L
	concentration of ground water seepage from West Pit	C gwp =	0	µg/L
	concentration of combined ground water liner leakage from stockpiles	C gl4 =	0	µg/L
	concentration of combined ground water liner leakage/seepage from other mine features	C gl4a =	0	µg/L
Water Balance	flow in river at SW-001	Q r1 =	1.70	(cfs)
	flow in river at SW-002	Q r2 =	3.83	(cfs)
	flow in river at SW-003	Q r3 =	4.45	(cfs)
	flow in river at SW-004	Q r4 =	6.94	(cfs)
	flow in river at SW-004A	Q r4A =	16.18	(cfs)
	flow in river at SW-005	Q r5 =	30.00	(cfs)
	flow check	Q ck =	30.00	(cfs)
Calculation of Mass Flux	mass flux of surface water into SW-001	M s1 =	0	(µg/s)
	mass flux of surface water into SW-002	M s2 =	0	(µg/s)
	mass flux of surface water into SW-003	M s3 =	0	(µg/s)
	mass flux of surface water into SW-004	M s4 =	0	(µg/s)
	mass flux of surface water into SW-004A	M s4A =	0	(µg/s)
	mass flux of surface water into SW-005	M s5 =	0	(µg/s)
	mass flux of surface water inflow from upstream of PM-1	M sns =	0	(µg/s)
	mass flux of surface water flow from West Pit Overflow	M sms =	0	(µg/s)
	mass flux of ground water into SW-001	M g1 =	3	(µg/s)
	mass flux of ground water into SW-002	M g2 =	6	(µg/s)
	mass flux of ground water into SW-003	M g3 =	2	(µg/s)
	mass flux of ground water into SW-004	M g4 =	5	(µg/s)
	mass flux of ground water into SW-004A	M g4A =	22	(µg/s)
	mass flux of ground water into SW-005	M g5 =	35	(µg/s)
	mass flux of seepage from East Pit	M gep =	0	(µg/s)
	mass flux of seepage from West Pit	M gwp =	0	(µg/s)
	mass flux of combined ground water liner leakage from stockpiles	M gl4 =	0	(µg/s)
	mass flux of combined ground water liner leakage/seepage from other mine features	M gl4a =	0	(µg/s)
Mass Balance	mass flux in river at SW-001	M r1 =	3	(µg/s)
	mass flux in river at SW-002	M r2 =	9	(µg/s)
	mass flux in river at SW-003	M r3 =	10	(µg/s)
	mass flux in river at SW-004	M r4 =	15	(µg/s)
	mass flux in river at SW-004A	M r4A =	37	(µg/s)
	mass flux in river at SW-005	M r5 =	72	(µg/s)
Calculation of Concentration	concentration in river at SW-001	C r1 =	0.1	µg/L
	concentration in river at SW-002	C r2 =	0.1	µg/L
	concentration in river at SW-003	C r3 =	0.1	µg/L
	concentration in river at SW-004	C r4 =	0.1	µg/L
	concentration in river at SW-004A	C r4A =	0.1	µg/L
	concentration in river at SW-005	C r5 =	0.1	µg/L
Baseline Data	Observed concentration in river at SW-002		ND (0.2)	µg/L
	Observed concentration in river at SW-003		ND (0.2)	µg/L
	Observed concentration in river at SW-004		ND (0.2)	µg/L
	Observed concentration in river at SW-005		ND (0.2)	µg/L

Partridge River Model - Calibration to Baseline Water Quality Data			
Parameter: Aluminum			
Input Flow Data	surface water flow into SW-001	Q s1 =	4.34 (cfs)
	surface water flow into SW-002	Q s2 =	5.32 (cfs)
	surface water flow into SW-003	Q s3 =	1.53 (cfs)
	surface water flow into SW-004	Q s4 =	6.32 (cfs)
	surface water flow into SW-004A	Q s4A =	23.25 (cfs)
	surface water flow into SW-005	Q s5 =	34.59 (cfs)
	surface water inflow from upstream of PM-1	Q sns =	0.00 (cfs)
	surface water flow from West Pit Overflow	Q sms =	0.00 (cfs)
	ground water flow into SW-001	Q g1 =	0.18 (cfs)
	ground water flow into SW-002	Q g2 =	0.38 (cfs)
	ground water flow into SW-003	Q g3 =	0.11 (cfs)
	ground water flow into SW-004	Q g4 =	0.32 (cfs)
	ground water flow into SW-004A	Q g4A =	1.39 (cfs)
	ground water flow into SW-005	Q g5 =	2.27 (cfs)
	ground water seepage from East Pit	Q gep =	0.00 (cfs)
	ground water seepage from West Pit	Q gwp =	0.00 (cfs)
	combined ground water liner leakage from stockpiles	Q gl4 =	0.00 (cfs)
	combined ground water liner leakage/seepage from other mine features	Q gl4a =	0.00 (cfs)
Input Concentration Data	concentration of surface water into SW-001	C s1 =	70 µg/L
	concentration of surface water into SW-002	C s2 =	70 µg/L
	concentration of surface water into SW-003	C s3 =	70 µg/L
	concentration of surface water into SW-004	C s4 =	70 µg/L
	concentration of surface water into SW-004A	C s4A =	70 µg/L
	concentration of surface water into SW-005	C s5 =	70 µg/L
	concentration of surface water inflow from upstream of PM-1	C sns =	17.3 µg/L
	concentration of surface water flow from West Pit Overflow	C sms =	0 µg/L
	concentration of ground water into SW-001	C g1 =	125 µg/L
	concentration of ground water into SW-002	C g2 =	125 µg/L
	concentration of ground water into SW-003	C g3 =	125 µg/L
	concentration of ground water into SW-004	C g4 =	125 µg/L
	concentration of ground water into SW-004A	C g4A =	125 µg/L
	concentration of ground water into SW-005	C g5 =	125 µg/L
	concentration of ground water seepage from East Pit	C gep =	0 µg/L
	concentration of ground water seepage from West Pit	C gwp =	0 µg/L
	concentration of combined ground water liner leakage from stockpiles	C gl4 =	0 µg/L
	concentration of combined ground water liner leakage/seepage from other mine features	C gl4a =	0 µg/L
Water Balance	flow in river at SW-001	Q r1 =	4.52 (cfs)
	flow in river at SW-002	Q r2 =	10.22 (cfs)
	flow in river at SW-003	Q r3 =	11.86 (cfs)
	flow in river at SW-004	Q r4 =	18.50 (cfs)
	flow in river at SW-004A	Q r4A =	43.14 (cfs)
	flow in river at SW-005	Q r5 =	80.00 (cfs)
	flow check	Q ck =	80.00 (cfs)
Calculation of Mass Flux	mass flux of surface water into SW-001	M s1 =	8598 (µg/s)
	mass flux of surface water into SW-002	M s2 =	10547 (µg/s)
	mass flux of surface water into SW-003	M s3 =	3031 (µg/s)
	mass flux of surface water into SW-004	M s4 =	12520 (µg/s)
	mass flux of surface water into SW-004A	M s4A =	46058 (µg/s)
	mass flux of surface water into SW-005	M s5 =	68515 (µg/s)
	mass flux of surface water inflow from upstream of PM-1	M sns =	0 (µg/s)
	mass flux of surface water flow from West Pit Overflow	M sms =	0 (µg/s)
	mass flux of ground water into SW-001	M g1 =	637 (µg/s)
	mass flux of ground water into SW-002	M g2 =	1344 (µg/s)
	mass flux of ground water into SW-003	M g3 =	389 (µg/s)
	mass flux of ground water into SW-004	M g4 =	1132 (µg/s)
	mass flux of ground water into SW-004A	M g4A =	4917 (µg/s)
	mass flux of ground water into SW-005	M g5 =	8030 (µg/s)
	mass flux of seepage from East Pit	M gep =	0 (µg/s)
	mass flux of seepage from West Pit	M gwp =	0 (µg/s)
	mass flux of combined ground water liner leakage from stockpiles	M gl4 =	0 (µg/s)
	mass flux of combined ground water liner leakage/seepage from other mine features	M gl4a =	0 (µg/s)
Mass Balance	mass flux in river at SW-001	M r1 =	9234 (µg/s)
	mass flux in river at SW-002	M r2 =	21125 (µg/s)
	mass flux in river at SW-003	M r3 =	24545 (µg/s)
	mass flux in river at SW-004	M r4 =	38197 (µg/s)
	mass flux in river at SW-004A	M r4A =	89173 (µg/s)
	mass flux in river at SW-005	M r5 =	165718 (µg/s)
Calculation of Concentration	concentration in river at SW-001	C r1 =	72.2 µg/L
	concentration in river at SW-002	C r2 =	73.0 µg/L
	concentration in river at SW-003	C r3 =	73.1 µg/L
	concentration in river at SW-004	C r4 =	72.9 µg/L
	concentration in river at SW-004A	C r4A =	73.0 µg/L
	concentration in river at SW-005	C r5 =	73.2 µg/L
Baseline Data	Observed concentration in river at SW-002		45.9 µg/L
	Observed concentration in river at SW-003		60.3 µg/L
	Observed concentration in river at SW-004		71.3 µg/L
	Observed concentration in river at SW-005		116.2 µg/L

Partridge River Model - Calibration to Baseline Water Quality Data			
Parameter: Arsenic			
Input Flow Data	surface water flow into SW-001	Q s1 =	2.81 (cfs)
	surface water flow into SW-002	Q s2 =	3.40 (cfs)
	surface water flow into SW-003	Q s3 =	0.98 (cfs)
	surface water flow into SW-004	Q s4 =	4.08 (cfs)
	surface water flow into SW-004A	Q s4A =	14.93 (cfs)
	surface water flow into SW-005	Q s5 =	22.15 (cfs)
	surface water inflow from upstream of PM-1	Q sns =	1.00 (cfs)
	surface water flow from West Pit Overflow	Q sms =	0.00 (cfs)
	ground water flow into SW-001	Q g1 =	0.18 (cfs)
	ground water flow into SW-002	Q g2 =	0.38 (cfs)
	ground water flow into SW-003	Q g3 =	0.11 (cfs)
	ground water flow into SW-004	Q g4 =	0.32 (cfs)
	ground water flow into SW-004A	Q g4A =	1.39 (cfs)
	ground water flow into SW-005	Q g5 =	2.27 (cfs)
	ground water seepage from East Pit	Q gep =	0.00 (cfs)
	ground water seepage from West Pit	Q gwp =	0.00 (cfs)
	combined ground water liner leakage from stockpiles	Q gl4 =	0.00 (cfs)
	combined ground water liner leakage/seepage from other mine features	Q gl4a =	0.00 (cfs)
Input Concentration Data	concentration of surface water into SW-001	C s1 =	0 µg/L
	concentration of surface water into SW-002	C s2 =	0 µg/L
	concentration of surface water into SW-003	C s3 =	0 µg/L
	concentration of surface water into SW-004	C s4 =	0 µg/L
	concentration of surface water into SW-004A	C s4A =	0 µg/L
	concentration of surface water into SW-005	C s5 =	0 µg/L
	concentration of surface water inflow from upstream of PM-1	C sns =	6.5 µg/L
	concentration of surface water flow from West Pit Overflow	C sms =	0 µg/L
	concentration of ground water into SW-001	C g1 =	2.16 µg/L
	concentration of ground water into SW-002	C g2 =	2.16 µg/L
	concentration of ground water into SW-003	C g3 =	2.16 µg/L
	concentration of ground water into SW-004	C g4 =	2.16 µg/L
	concentration of ground water into SW-004A	C g4A =	2.16 µg/L
	concentration of ground water into SW-005	C g5 =	2.16 µg/L
	concentration of ground water seepage from East Pit	C gep =	0 µg/L
	concentration of ground water seepage from West Pit	C gwp =	0 µg/L
	concentration of combined ground water liner leakage from stockpiles	C gl4 =	0 µg/L
	concentration of combined ground water liner leakage/seepage from other mine features	C gl4a =	0 µg/L
Water Balance	flow in river at SW-001	Q r1 =	3.99 (cfs)
	flow in river at SW-002	Q r2 =	7.77 (cfs)
	flow in river at SW-003	Q r3 =	8.86 (cfs)
	flow in river at SW-004	Q r4 =	13.26 (cfs)
	flow in river at SW-004A	Q r4A =	29.58 (cfs)
	flow in river at SW-005	Q r5 =	54.00 (cfs)
	flow check	Q ck =	54.00 (cfs)
Calculation of Mass Flux	mass flux of surface water into SW-001	M s1 =	0 (µg/s)
	mass flux of surface water into SW-002	M s2 =	0 (µg/s)
	mass flux of surface water into SW-003	M s3 =	0 (µg/s)
	mass flux of surface water into SW-004	M s4 =	0 (µg/s)
	mass flux of surface water into SW-004A	M s4A =	0 (µg/s)
	mass flux of surface water into SW-005	M s5 =	0 (µg/s)
	mass flux of surface water inflow from upstream of PM-1	M sns =	184 (µg/s)
	mass flux of surface water flow from West Pit Overflow	M sms =	0 (µg/s)
	mass flux of ground water into SW-001	M g1 =	11 (µg/s)
	mass flux of ground water into SW-002	M g2 =	23 (µg/s)
	mass flux of ground water into SW-003	M g3 =	7 (µg/s)
	mass flux of ground water into SW-004	M g4 =	20 (µg/s)
	mass flux of ground water into SW-004A	M g4A =	85 (µg/s)
	mass flux of ground water into SW-005	M g5 =	139 (µg/s)
	mass flux of seepage from East Pit	M gep =	0 (µg/s)
	mass flux of seepage from West Pit	M gwp =	0 (µg/s)
	mass flux of combined ground water liner leakage from stockpiles	M gl4 =	0 (µg/s)
	mass flux of combined ground water liner leakage/seepage from other mine features	M gl4a =	0 (µg/s)
Mass Balance	mass flux in river at SW-001	M r1 =	195 (µg/s)
	mass flux in river at SW-002	M r2 =	218 (µg/s)
	mass flux in river at SW-003	M r3 =	225 (µg/s)
	mass flux in river at SW-004	M r4 =	244 (µg/s)
	mass flux in river at SW-004A	M r4A =	329 (µg/s)
	mass flux in river at SW-005	M r5 =	468 (µg/s)
Calculation of Concentration	concentration in river at SW-001	C r1 =	1.7 µg/L
	concentration in river at SW-002	C r2 =	1.0 µg/L
	concentration in river at SW-003	C r3 =	0.9 µg/L
	concentration in river at SW-004	C r4 =	0.7 µg/L
	concentration in river at SW-004A	C r4A =	0.4 µg/L
	concentration in river at SW-005	C r5 =	0.3 µg/L
Baseline Data	Observed concentration in river at SW-002		ND (2) µg/L
	Observed concentration in river at SW-003		ND (2) µg/L
	Observed concentration in river at SW-004		ND (2) µg/L
	Observed concentration in river at SW-005		ND (2) µg/L

Partridge River Model - Calibration to Baseline Water Quality Data			
Parameter: Boron			
Input Flow Data	surface water flow into SW-001	Q s1 =	4.71 (cfs)
	surface water flow into SW-002	Q s2 =	5.79 (cfs)
	surface water flow into SW-003	Q s3 =	1.66 (cfs)
	surface water flow into SW-004	Q s4 =	6.86 (cfs)
	surface water flow into SW-004A	Q s4A =	25.25 (cfs)
	surface water flow into SW-005	Q s5 =	37.58 (cfs)
	surface water inflow from upstream of PM-1	Q sns =	1.50 (cfs)
	surface water flow from West Pit Overflow	Q sms =	0.00 (cfs)
	ground water flow into SW-001	Q g1 =	0.18 (cfs)
	ground water flow into SW-002	Q g2 =	0.38 (cfs)
	ground water flow into SW-003	Q g3 =	0.11 (cfs)
	ground water flow into SW-004	Q g4 =	0.32 (cfs)
	ground water flow into SW-004A	Q g4A =	1.39 (cfs)
	ground water flow into SW-005	Q g5 =	2.27 (cfs)
	ground water seepage from East Pit	Q gep =	0.00 (cfs)
	ground water seepage from West Pit	Q gwp =	0.00 (cfs)
	combined ground water liner leakage from stockpiles	Q gl4 =	0.00 (cfs)
	combined ground water liner leakage/seepage from other mine features	Q gl4a =	0.00 (cfs)
Input Concentration Data	concentration of surface water into SW-001	C s1 =	45 µg/L
	concentration of surface water into SW-002	C s2 =	45 µg/L
	concentration of surface water into SW-003	C s3 =	45 µg/L
	concentration of surface water into SW-004	C s4 =	45 µg/L
	concentration of surface water into SW-004A	C s4A =	45 µg/L
	concentration of surface water into SW-005	C s5 =	45 µg/L
	concentration of surface water inflow from upstream of PM-1	C sns =	96 µg/L
	concentration of surface water flow from West Pit Overflow	C sms =	0 µg/L
	concentration of ground water into SW-001	C g1 =	87 µg/L
	concentration of ground water into SW-002	C g2 =	87 µg/L
	concentration of ground water into SW-003	C g3 =	87 µg/L
	concentration of ground water into SW-004	C g4 =	87 µg/L
	concentration of ground water into SW-004A	C g4A =	87 µg/L
	concentration of ground water into SW-005	C g5 =	87 µg/L
	concentration of ground water seepage from East Pit	C gep =	0 µg/L
	concentration of ground water seepage from West Pit	C gwp =	0 µg/L
	concentration of combined ground water liner leakage from stockpiles	C gl4 =	0 µg/L
	concentration of combined ground water liner leakage/seepage from other mine features	C gl4a =	0 µg/L
Water Balance	flow in river at SW-001	Q r1 =	6.39 (cfs)
	flow in river at SW-002	Q r2 =	12.55 (cfs)
	flow in river at SW-003	Q r3 =	14.33 (cfs)
	flow in river at SW-004	Q r4 =	21.51 (cfs)
	flow in river at SW-004A	Q r4A =	48.15 (cfs)
	flow in river at SW-005	Q r5 =	88.00 (cfs)
	flow check	Q ck =	88.00 (cfs)
Calculation of Mass Flux	mass flux of surface water into SW-001	M s1 =	5995 (µg/s)
	mass flux of surface water into SW-002	M s2 =	7370 (µg/s)
	mass flux of surface water into SW-003	M s3 =	2118 (µg/s)
	mass flux of surface water into SW-004	M s4 =	8736 (µg/s)
	mass flux of surface water into SW-004A	M s4A =	32158 (µg/s)
	mass flux of surface water into SW-005	M s5 =	47859 (µg/s)
	mass flux of surface water inflow from upstream of PM-1	M sns =	4075 (µg/s)
	mass flux of surface water flow from West Pit Overflow	M sms =	0 (µg/s)
	mass flux of ground water into SW-001	M g1 =	443 (µg/s)
	mass flux of ground water into SW-002	M g2 =	936 (µg/s)
	mass flux of ground water into SW-003	M g3 =	271 (µg/s)
	mass flux of ground water into SW-004	M g4 =	788 (µg/s)
	mass flux of ground water into SW-004A	M g4A =	3422 (µg/s)
	mass flux of ground water into SW-005	M g5 =	5589 (µg/s)
	mass flux of seepage from East Pit	M gep =	0 (µg/s)
	mass flux of seepage from West Pit	M gwp =	0 (µg/s)
	mass flux of combined ground water liner leakage from stockpiles	M gl4 =	0 (µg/s)
	mass flux of combined ground water liner leakage/seepage from other mine features	M gl4a =	0 (µg/s)
Mass Balance	mass flux in river at SW-001	M r1 =	10513 (µg/s)
	mass flux in river at SW-002	M r2 =	18819 (µg/s)
	mass flux in river at SW-003	M r3 =	21208 (µg/s)
	mass flux in river at SW-004	M r4 =	30731 (µg/s)
	mass flux in river at SW-004A	M r4A =	66312 (µg/s)
	mass flux in river at SW-005	M r5 =	119760 (µg/s)
Calculation of Concentration	concentration in river at SW-001	C r1 =	58.2 µg/L
	concentration in river at SW-002	C r2 =	53.0 µg/L
	concentration in river at SW-003	C r3 =	52.3 µg/L
	concentration in river at SW-004	C r4 =	50.5 µg/L
	concentration in river at SW-004A	C r4A =	48.7 µg/L
	concentration in river at SW-005	C r5 =	48.1 µg/L
Baseline Data	Observed concentration in river at SW-002		58.5 µg/L
	Observed concentration in river at SW-003		66.1 µg/L
	Observed concentration in river at SW-004		61.1 µg/L
	Observed concentration in river at SW-005		37.2 µg/L

Partridge River Model - Calibration to Baseline Water Quality Data			
Parameter: Barium			
Input Flow Data	surface water flow into SW-001	Q s1 =	0.39 (cfs)
	surface water flow into SW-002	Q s2 =	0.33 (cfs)
	surface water flow into SW-003	Q s3 =	0.09 (cfs)
	surface water flow into SW-004	Q s4 =	0.51 (cfs)
	surface water flow into SW-004A	Q s4A =	1.69 (cfs)
	surface water flow into SW-005	Q s5 =	2.34 (cfs)
	surface water inflow from upstream of PM-1	Q sns =	0.00 (cfs)
	surface water flow from West Pit Overflow	Q sms =	0.00 (cfs)
	ground water flow into SW-001	Q g1 =	0.18 (cfs)
	ground water flow into SW-002	Q g2 =	0.38 (cfs)
	ground water flow into SW-003	Q g3 =	0.11 (cfs)
	ground water flow into SW-004	Q g4 =	0.32 (cfs)
	ground water flow into SW-004A	Q g4A =	1.39 (cfs)
	ground water flow into SW-005	Q g5 =	2.27 (cfs)
	ground water seepage from East Pit	Q gep =	0.00 (cfs)
	ground water seepage from West Pit	Q gwp =	0.00 (cfs)
	combined ground water liner leakage from stockpiles	Q gl4 =	0.00 (cfs)
	combined ground water liner leakage/seepage from other mine features	Q gl4a =	0.00 (cfs)
Input Concentration Data	concentration of surface water into SW-001	C s1 =	0 µg/L
	concentration of surface water into SW-002	C s2 =	0 µg/L
	concentration of surface water into SW-003	C s3 =	0 µg/L
	concentration of surface water into SW-004	C s4 =	0 µg/L
	concentration of surface water into SW-004A	C s4A =	0 µg/L
	concentration of surface water into SW-005	C s5 =	0 µg/L
	concentration of surface water inflow from upstream of PM-1	C sns =	5 µg/L
	concentration of surface water flow from West Pit Overflow	C sms =	0 µg/L
	concentration of ground water into SW-001	C g1 =	21.92 µg/L
	concentration of ground water into SW-002	C g2 =	21.92 µg/L
	concentration of ground water into SW-003	C g3 =	21.92 µg/L
	concentration of ground water into SW-004	C g4 =	21.92 µg/L
	concentration of ground water into SW-004A	C g4A =	21.92 µg/L
	concentration of ground water into SW-005	C g5 =	21.92 µg/L
	concentration of ground water seepage from East Pit	C gep =	0 µg/L
	concentration of ground water seepage from West Pit	C gwp =	0 µg/L
	concentration of combined ground water liner leakage from stockpiles	C gl4 =	0 µg/L
	concentration of combined ground water liner leakage/seepage from other mine features	C gl4a =	0 µg/L
Water Balance	flow in river at SW-001	Q r1 =	0.57 (cfs)
	flow in river at SW-002	Q r2 =	1.28 (cfs)
	flow in river at SW-003	Q r3 =	1.48 (cfs)
	flow in river at SW-004	Q r4 =	2.31 (cfs)
	flow in river at SW-004A	Q r4A =	5.39 (cfs)
	flow in river at SW-005	Q r5 =	10.00 (cfs)
	flow check	Q ck =	10.00 (cfs)
Calculation of Mass Flux	mass flux of surface water into SW-001	M s1 =	0 (µg/s)
	mass flux of surface water into SW-002	M s2 =	0 (µg/s)
	mass flux of surface water into SW-003	M s3 =	0 (µg/s)
	mass flux of surface water into SW-004	M s4 =	0 (µg/s)
	mass flux of surface water into SW-004A	M s4A =	0 (µg/s)
	mass flux of surface water into SW-005	M s5 =	0 (µg/s)
	mass flux of surface water inflow from upstream of PM-1	M sns =	0 (µg/s)
	mass flux of surface water flow from West Pit Overflow	M sms =	0 (µg/s)
	mass flux of ground water into SW-001	M g1 =	112 (µg/s)
	mass flux of ground water into SW-002	M g2 =	236 (µg/s)
	mass flux of ground water into SW-003	M g3 =	68 (µg/s)
	mass flux of ground water into SW-004	M g4 =	199 (µg/s)
	mass flux of ground water into SW-004A	M g4A =	862 (µg/s)
	mass flux of ground water into SW-005	M g5 =	1408 (µg/s)
	mass flux of seepage from East Pit	M gep =	0 (µg/s)
	mass flux of seepage from West Pit	M gwp =	0 (µg/s)
	mass flux of combined ground water liner leakage from stockpiles	M gl4 =	0 (µg/s)
	mass flux of combined ground water liner leakage/seepage from other mine features	M gl4a =	0 (µg/s)
Mass Balance	mass flux in river at SW-001	M r1 =	112 (µg/s)
	mass flux in river at SW-002	M r2 =	347 (µg/s)
	mass flux in river at SW-003	M r3 =	416 (µg/s)
	mass flux in river at SW-004	M r4 =	614 (µg/s)
	mass flux in river at SW-004A	M r4A =	1476 (µg/s)
	mass flux in river at SW-005	M r5 =	2885 (µg/s)
Calculation of Concentration	concentration in river at SW-001	C r1 =	7.0 µg/L
	concentration in river at SW-002	C r2 =	9.6 µg/L
	concentration in river at SW-003	C r3 =	9.9 µg/L
	concentration in river at SW-004	C r4 =	9.4 µg/L
	concentration in river at SW-004A	C r4A =	9.7 µg/L
	concentration in river at SW-005	C r5 =	10.2 µg/L
Baseline Data	Observed concentration in river at SW-002		9.6 µg/L
	Observed concentration in river at SW-003		10 µg/L
	Observed concentration in river at SW-004		5 µg/L
	Observed concentration in river at SW-005		8.8 µg/L

Partridge River Model - Calibration to Baseline Water Quality Data			
Parameter: Beryllium			
Input Flow Data	surface water flow into SW-001	Q s1 =	0.39 (cfs)
	surface water flow into SW-002	Q s2 =	0.33 (cfs)
	surface water flow into SW-003	Q s3 =	0.09 (cfs)
	surface water flow into SW-004	Q s4 =	0.51 (cfs)
	surface water flow into SW-004A	Q s4A =	1.69 (cfs)
	surface water flow into SW-005	Q s5 =	2.34 (cfs)
	surface water inflow from upstream of PM-1	Q sns =	0.00 (cfs)
	surface water flow from West Pit Overflow	Q sms =	0.00 (cfs)
	ground water flow into SW-001	Q g1 =	0.18 (cfs)
	ground water flow into SW-002	Q g2 =	0.38 (cfs)
	ground water flow into SW-003	Q g3 =	0.11 (cfs)
	ground water flow into SW-004	Q g4 =	0.32 (cfs)
	ground water flow into SW-004A	Q g4A =	1.39 (cfs)
	ground water flow into SW-005	Q g5 =	2.27 (cfs)
	ground water seepage from East Pit	Q gep =	0.00 (cfs)
	ground water seepage from West Pit	Q gwp =	0.00 (cfs)
	combined ground water liner leakage from stockpiles	Q gl4 =	0.00 (cfs)
	combined ground water liner leakage/seepage from other mine features	Q gl4a =	0.00 (cfs)
Input Concentration Data	concentration of surface water into SW-001	C s1 =	0 µg/L
	concentration of surface water into SW-002	C s2 =	0 µg/L
	concentration of surface water into SW-003	C s3 =	0 µg/L
	concentration of surface water into SW-004	C s4 =	0 µg/L
	concentration of surface water into SW-004A	C s4A =	0 µg/L
	concentration of surface water into SW-005	C s5 =	0 µg/L
	concentration of surface water inflow from upstream of PM-1	C sns =	0.1 µg/L
	concentration of surface water flow from West Pit Overflow	C sms =	0 µg/L
	concentration of ground water into SW-001	C g1 =	0.145 µg/L
	concentration of ground water into SW-002	C g2 =	0.145 µg/L
	concentration of ground water into SW-003	C g3 =	0.145 µg/L
	concentration of ground water into SW-004	C g4 =	0.145 µg/L
	concentration of ground water into SW-004A	C g4A =	0.145 µg/L
	concentration of ground water into SW-005	C g5 =	0.145 µg/L
	concentration of ground water seepage from East Pit	C gep =	0 µg/L
	concentration of ground water seepage from West Pit	C gwp =	0 µg/L
	concentration of combined ground water liner leakage from stockpiles	C gl4 =	0 µg/L
	concentration of combined ground water liner leakage/seepage from other mine features	C gl4a =	0 µg/L
Water Balance	flow in river at SW-001	Q r1 =	0.57 (cfs)
	flow in river at SW-002	Q r2 =	1.28 (cfs)
	flow in river at SW-003	Q r3 =	1.48 (cfs)
	flow in river at SW-004	Q r4 =	2.31 (cfs)
	flow in river at SW-004A	Q r4A =	5.39 (cfs)
	flow in river at SW-005	Q r5 =	10.00 (cfs)
	flow check	Q ck =	10.00 (cfs)
Calculation of Mass Flux	mass flux of surface water into SW-001	M s1 =	0 (µg/s)
	mass flux of surface water into SW-002	M s2 =	0 (µg/s)
	mass flux of surface water into SW-003	M s3 =	0 (µg/s)
	mass flux of surface water into SW-004	M s4 =	0 (µg/s)
	mass flux of surface water into SW-004A	M s4A =	0 (µg/s)
	mass flux of surface water into SW-005	M s5 =	0 (µg/s)
	mass flux of surface water inflow from upstream of PM-1	M sns =	0 (µg/s)
	mass flux of surface water flow from West Pit Overflow	M sms =	0 (µg/s)
	mass flux of ground water into SW-001	M g1 =	1 (µg/s)
	mass flux of ground water into SW-002	M g2 =	2 (µg/s)
	mass flux of ground water into SW-003	M g3 =	0 (µg/s)
	mass flux of ground water into SW-004	M g4 =	1 (µg/s)
	mass flux of ground water into SW-004A	M g4A =	6 (µg/s)
	mass flux of ground water into SW-005	M g5 =	9 (µg/s)
	mass flux of seepage from East Pit	M gep =	0 (µg/s)
	mass flux of seepage from West Pit	M gwp =	0 (µg/s)
	mass flux of combined ground water liner leakage from stockpiles	M gl4 =	0 (µg/s)
	mass flux of combined ground water liner leakage/seepage from other mine features	M gl4a =	0 (µg/s)
Mass Balance	mass flux in river at SW-001	M r1 =	1 (µg/s)
	mass flux in river at SW-002	M r2 =	2 (µg/s)
	mass flux in river at SW-003	M r3 =	3 (µg/s)
	mass flux in river at SW-004	M r4 =	4 (µg/s)
	mass flux in river at SW-004A	M r4A =	10 (µg/s)
	mass flux in river at SW-005	M r5 =	19 (µg/s)
Calculation of Concentration	concentration in river at SW-001	C r1 =	0.0 µg/L
	concentration in river at SW-002	C r2 =	0.1 µg/L
	concentration in river at SW-003	C r3 =	0.1 µg/L
	concentration in river at SW-004	C r4 =	0.1 µg/L
	concentration in river at SW-004A	C r4A =	0.1 µg/L
	concentration in river at SW-005	C r5 =	0.1 µg/L
Baseline Data	Observed concentration in river at SW-002		ND (0.2) µg/L
	Observed concentration in river at SW-003		ND (0.2) µg/L
	Observed concentration in river at SW-004		ND (0.2) µg/L
	Observed concentration in river at SW-005		ND (0.2) µg/L

Partridge River Model - Calibration to Baseline Water Quality Data			
Parameter: Calcium			
Input Flow Data	surface water flow into SW-001	Q s1 =	2.79 (cfs)
	surface water flow into SW-002	Q s2 =	3.36 (cfs)
	surface water flow into SW-003	Q s3 =	0.97 (cfs)
	surface water flow into SW-004	Q s4 =	4.04 (cfs)
	surface water flow into SW-004A	Q s4A =	14.78 (cfs)
	surface water flow into SW-005	Q s5 =	21.92 (cfs)
	surface water inflow from upstream of PM-1	Q sns =	1.50 (cfs)
	surface water flow from West Pit Overflow	Q sms =	0.00 (cfs)
	ground water flow into SW-001	Q g1 =	0.18 (cfs)
	ground water flow into SW-002	Q g2 =	0.38 (cfs)
	ground water flow into SW-003	Q g3 =	0.11 (cfs)
	ground water flow into SW-004	Q g4 =	0.32 (cfs)
	ground water flow into SW-004A	Q g4A =	1.39 (cfs)
	ground water flow into SW-005	Q g5 =	2.27 (cfs)
	ground water seepage from East Pit	Q gep =	0.00 (cfs)
	ground water seepage from West Pit	Q gwp =	0.00 (cfs)
	combined ground water liner leakage from stockpiles	Q gl4 =	0.00 (cfs)
	combined ground water liner leakage/seepage from other mine features	Q gl4a =	0.00 (cfs)
Input Concentration Data	concentration of surface water into SW-001	C s1 =	17 (mg/l)
	concentration of surface water into SW-002	C s2 =	17 (mg/l)
	concentration of surface water into SW-003	C s3 =	17 (mg/l)
	concentration of surface water into SW-004	C s4 =	17 (mg/l)
	concentration of surface water into SW-004A	C s4A =	17 (mg/l)
	concentration of surface water into SW-005	C s5 =	17 (mg/l)
	concentration of surface water inflow from upstream of PM-1	C sns =	24.5 (mg/l)
	concentration of surface water flow from West Pit Overflow	C sms =	0 (mg/l)
	concentration of ground water into SW-001	C g1 =	14.79 (mg/l)
	concentration of ground water into SW-002	C g2 =	14.79 (mg/l)
	concentration of ground water into SW-003	C g3 =	14.79 (mg/l)
	concentration of ground water into SW-004	C g4 =	14.79 (mg/l)
	concentration of ground water into SW-004A	C g4A =	14.79 (mg/l)
	concentration of ground water into SW-005	C g5 =	14.79 (mg/l)
	concentration of ground water seepage from East Pit	C gep =	0 (mg/l)
	concentration of ground water seepage from West Pit	C gwp =	0 (mg/l)
	concentration of combined ground water liner leakage from stockpiles	C gl4 =	0 (mg/l)
	concentration of combined ground water liner leakage/seepage from other mine features	C gl4a =	0 (mg/l)
Water Balance	flow in river at SW-001	Q r1 =	4.47 (cfs)
	flow in river at SW-002	Q r2 =	8.21 (cfs)
	flow in river at SW-003	Q r3 =	9.29 (cfs)
	flow in river at SW-004	Q r4 =	13.64 (cfs)
	flow in river at SW-004A	Q r4A =	29.81 (cfs)
	flow in river at SW-005	Q r5 =	54.00 (cfs)
	flow check	Q ck =	54.00 (cfs)
Calculation of Mass Flux	mass flux of surface water into SW-001	M s1 =	1340 (mg/s)
	mass flux of surface water into SW-002	M s2 =	1618 (mg/s)
	mass flux of surface water into SW-003	M s3 =	465 (mg/s)
	mass flux of surface water into SW-004	M s4 =	1942 (mg/s)
	mass flux of surface water into SW-004A	M s4A =	7111 (mg/s)
	mass flux of surface water into SW-005	M s5 =	10544 (mg/s)
	mass flux of surface water inflow from upstream of PM-1	M sns =	1040 (mg/s)
	mass flux of surface water flow from West Pit Overflow	M sms =	0 (mg/s)
	mass flux of ground water into SW-001	M g1 =	75 (mg/s)
	mass flux of ground water into SW-002	M g2 =	159 (mg/s)
	mass flux of ground water into SW-003	M g3 =	46 (mg/s)
	mass flux of ground water into SW-004	M g4 =	134 (mg/s)
	mass flux of ground water into SW-004A	M g4A =	582 (mg/s)
	mass flux of ground water into SW-005	M g5 =	950 (mg/s)
	mass flux of seepage from East Pit	M gep =	0 (mg/s)
	mass flux of seepage from West Pit	M gwp =	0 (mg/s)
	mass flux of combined ground water liner leakage from stockpiles	M gl4 =	0 (mg/s)
	mass flux of combined ground water liner leakage/seepage from other mine features	M gl4a =	0 (mg/s)
Mass Balance	mass flux in river at SW-001	M r1 =	2456 (mg/s)
	mass flux in river at SW-002	M r2 =	4233 (mg/s)
	mass flux in river at SW-003	M r3 =	4744 (mg/s)
	mass flux in river at SW-004	M r4 =	6820 (mg/s)
	mass flux in river at SW-004A	M r4A =	14513 (mg/s)
	mass flux in river at SW-005	M r5 =	26007 (mg/s)
Calculation of Concentration	concentration in river at SW-001	C r1 =	19.4 (mg/l)
	concentration in river at SW-002	C r2 =	18.2 (mg/l)
	concentration in river at SW-003	C r3 =	18.1 (mg/l)
	concentration in river at SW-004	C r4 =	17.7 (mg/l)
	concentration in river at SW-004A	C r4A =	17.2 (mg/l)
	concentration in river at SW-005	C r5 =	17.0 (mg/l)
Baseline Data	Observed concentration in river at SW-002		20.7 (mg/l)
	Observed concentration in river at SW-003		20.7 (mg/l)
	Observed concentration in river at SW-004		18.6 (mg/l)
	Observed concentration in river at SW-005		14.5 (mg/l)

Partridge River Model - Calibration to Baseline Water Quality Data			
Parameter: Cadmium			
Input Flow Data	surface water flow into SW-001	Q s1 =	0.30 (cfs)
	surface water flow into SW-002	Q s2 =	0.23 (cfs)
	surface water flow into SW-003	Q s3 =	0.06 (cfs)
	surface water flow into SW-004	Q s4 =	0.39 (cfs)
	surface water flow into SW-004A	Q s4A =	1.23 (cfs)
	surface water flow into SW-005	Q s5 =	1.65 (cfs)
	surface water inflow from upstream of PM-1	Q sns =	1.50 (cfs)
	surface water flow from West Pit Overflow	Q sms =	0.00 (cfs)
	ground water flow into SW-001	Q g1 =	0.18 (cfs)
	ground water flow into SW-002	Q g2 =	0.38 (cfs)
	ground water flow into SW-003	Q g3 =	0.11 (cfs)
	ground water flow into SW-004	Q g4 =	0.32 (cfs)
	ground water flow into SW-004A	Q g4A =	1.39 (cfs)
	ground water flow into SW-005	Q g5 =	2.27 (cfs)
	ground water seepage from East Pit	Q gep =	0.00 (cfs)
	ground water seepage from West Pit	Q gwp =	0.00 (cfs)
Input Concentration Data	combined ground water liner leakage from stockpiles	Q gl4 =	0.00 (cfs)
	combined ground water liner leakage/seepage from other mine features	Q gl4a =	0.00 (cfs)
	concentration of surface water into SW-001	C s1 =	0 (µg/L)
	concentration of surface water into SW-002	C s2 =	0 (µg/L)
	concentration of surface water into SW-003	C s3 =	0 (µg/L)
	concentration of surface water into SW-004	C s4 =	0 (µg/L)
	concentration of surface water into SW-004A	C s4A =	0 (µg/L)
	concentration of surface water into SW-005	C s5 =	0 (µg/L)
	concentration of surface water inflow from upstream of PM-1	C sns =	0.1 (µg/L)
	concentration of surface water flow from West Pit Overflow	C sms =	0 (µg/L)
	concentration of ground water into SW-001	C g1 =	0.1 (µg/L)
	concentration of ground water into SW-002	C g2 =	0.1 (µg/L)
	concentration of ground water into SW-003	C g3 =	0.1 (µg/L)
	concentration of ground water into SW-004	C g4 =	0.1 (µg/L)
	concentration of ground water into SW-004A	C g4A =	0.1 (µg/L)
	concentration of ground water into SW-005	C g5 =	0.1 (µg/L)
Water Balance	concentration of ground water seepage from East Pit	C gep =	0 (µg/L)
	concentration of ground water seepage from West Pit	C gwp =	0 (µg/L)
	concentration of combined ground water liner leakage from stockpiles	C gl4 =	0 (µg/L)
	concentration of combined ground water liner leakage/seepage from other mine features	C gl4a =	0 (µg/L)
	flow in river at SW-001	Q r1 =	1.98 (cfs)
	flow in river at SW-002	Q r2 =	2.59 (cfs)
	flow in river at SW-003	Q r3 =	2.76 (cfs)
	flow in river at SW-004	Q r4 =	3.47 (cfs)
Calculation of Mass Flux	flow in river at SW-004A	Q r4A =	6.08 (cfs)
	flow in river at SW-005	Q r5 =	10.00 (cfs)
	flow check	Q ck =	10.00 (cfs)
	mass flux of surface water into SW-001	M s1 =	0 (µg/s)
	mass flux of surface water into SW-002	M s2 =	0 (µg/s)
	mass flux of surface water into SW-003	M s3 =	0 (µg/s)
	mass flux of surface water into SW-004	M s4 =	0 (µg/s)
	mass flux of surface water into SW-004A	M s4A =	0 (µg/s)
	mass flux of surface water into SW-005	M s5 =	0 (µg/s)
	mass flux of surface water inflow from upstream of PM-1	M sns =	4 (µg/s)
	mass flux of surface water flow from West Pit Overflow	M sms =	0 (µg/s)
	mass flux of ground water into SW-001	M g1 =	1 (µg/s)
	mass flux of ground water into SW-002	M g2 =	1 (µg/s)
	mass flux of ground water into SW-003	M g3 =	0 (µg/s)
	mass flux of ground water into SW-004	M g4 =	1 (µg/s)
	mass flux of ground water into SW-004A	M g4A =	4 (µg/s)
	mass flux of ground water into SW-005	M g5 =	6 (µg/s)
Mass Balance	mass flux of seepage from East Pit	M gep =	0 (µg/s)
	mass flux of seepage from West Pit	M gwp =	0 (µg/s)
	mass flux of combined ground water liner leakage from stockpiles	M gl4 =	0 (µg/s)
	mass flux of combined ground water liner leakage/seepage from other mine features	M gl4a =	0 (µg/s)
	mass flux in river at SW-001	M r1 =	5 (µg/s)
	mass flux in river at SW-002	M r2 =	6 (µg/s)
Calculation of Concentration	mass flux in river at SW-003	M r3 =	6 (µg/s)
	mass flux in river at SW-004	M r4 =	7 (µg/s)
	mass flux in river at SW-004A	M r4A =	11 (µg/s)
	mass flux in river at SW-005	M r5 =	17 (µg/s)
	concentration in river at SW-001	C r1 =	0.1 (µg/L)
	concentration in river at SW-002	C r2 =	0.1 (µg/L)
Baseline Data	concentration in river at SW-003	C r3 =	0.1 (µg/L)
	concentration in river at SW-004	C r4 =	0.1 (µg/L)
	concentration in river at SW-004A	C r4A =	0.1 (µg/L)
	concentration in river at SW-005	C r5 =	0.1 (µg/L)
	Observed concentration in river at SW-002		ND (0.2) (µg/L)
	Observed concentration in river at SW-003		ND (0.2) (µg/L)
	Observed concentration in river at SW-004		ND (0.2) (µg/L)
	Observed concentration in river at SW-005		ND (0.2) (µg/L)

Partridge River Model - Calibration to Baseline Water Quality Data			
Parameter: Chloride			
Input Flow Data	surface water flow into SW-001	Q s1 =	1.23 (cfs)
	surface water flow into SW-002	Q s2 =	1.40 (cfs)
	surface water flow into SW-003	Q s3 =	0.40 (cfs)
	surface water flow into SW-004	Q s4 =	1.76 (cfs)
	surface water flow into SW-004A	Q s4A =	6.31 (cfs)
	surface water flow into SW-005	Q s5 =	9.25 (cfs)
	surface water inflow from upstream of PM-1	Q sns =	0.00 (cfs)
	surface water flow from West Pit Overflow	Q sms =	0.00 (cfs)
	ground water flow into SW-001	Q g1 =	0.18 (cfs)
	ground water flow into SW-002	Q g2 =	0.38 (cfs)
	ground water flow into SW-003	Q g3 =	0.11 (cfs)
	ground water flow into SW-004	Q g4 =	0.32 (cfs)
	ground water flow into SW-004A	Q g4A =	1.39 (cfs)
	ground water flow into SW-005	Q g5 =	2.27 (cfs)
	ground water seepage from East Pit	Q gep =	0.00 (cfs)
	ground water seepage from West Pit	Q gwp =	0.00 (cfs)
	combined ground water liner leakage from stockpiles	Q gl4 =	0.00 (cfs)
	combined ground water liner leakage/seepage from other mine features	Q gl4a =	0.00 (cfs)
Input Concentration Data	concentration of surface water into SW-001	C s1 =	8 (mg/l)
	concentration of surface water into SW-002	C s2 =	8 (mg/l)
	concentration of surface water into SW-003	C s3 =	8 (mg/l)
	concentration of surface water into SW-004	C s4 =	8 (mg/l)
	concentration of surface water into SW-004A	C s4A =	8 (mg/l)
	concentration of surface water into SW-005	C s5 =	8 (mg/l)
	concentration of surface water inflow from upstream of PM-1	C sns =	1.6 (mg/l)
	concentration of surface water flow from West Pit Overflow	C sms =	0 (mg/l)
	concentration of ground water into SW-001	C g1 =	6.6 (mg/l)
	concentration of ground water into SW-002	C g2 =	6.6 (mg/l)
	concentration of ground water into SW-003	C g3 =	6.6 (mg/l)
	concentration of ground water into SW-004	C g4 =	6.6 (mg/l)
	concentration of ground water into SW-004A	C g4A =	6.6 (mg/l)
	concentration of ground water into SW-005	C g5 =	6.6 (mg/l)
	concentration of ground water seepage from East Pit	C gep =	0 (mg/l)
	concentration of ground water seepage from West Pit	C gwp =	0 (mg/l)
	concentration of combined ground water liner leakage from stockpiles	C gl4 =	0 (mg/l)
	concentration of combined ground water liner leakage/seepage from other mine features	C gl4a =	0 (mg/l)
Water Balance	flow in river at SW-001	Q r1 =	1.41 (cfs)
	flow in river at SW-002	Q r2 =	3.20 (cfs)
	flow in river at SW-003	Q r3 =	3.71 (cfs)
	flow in river at SW-004	Q r4 =	5.78 (cfs)
	flow in river at SW-004A	Q r4A =	13.48 (cfs)
	flow in river at SW-005	Q r5 =	25.00 (cfs)
	flow check	Q ck =	25.00 (cfs)
Calculation of Mass Flux	mass flux of surface water into SW-001	M s1 =	279 (mg/s)
	mass flux of surface water into SW-002	M s2 =	318 (mg/s)
	mass flux of surface water into SW-003	M s3 =	91 (mg/s)
	mass flux of surface water into SW-004	M s4 =	397 (mg/s)
	mass flux of surface water into SW-004A	M s4A =	1429 (mg/s)
	mass flux of surface water into SW-005	M s5 =	2094 (mg/s)
	mass flux of surface water inflow from upstream of PM-1	M sns =	0 (mg/s)
	mass flux of surface water flow from West Pit Overflow	M sms =	0 (mg/s)
	mass flux of ground water into SW-001	M g1 =	34 (mg/s)
	mass flux of ground water into SW-002	M g2 =	71 (mg/s)
	mass flux of ground water into SW-003	M g3 =	21 (mg/s)
	mass flux of ground water into SW-004	M g4 =	60 (mg/s)
	mass flux of ground water into SW-004A	M g4A =	260 (mg/s)
	mass flux of ground water into SW-005	M g5 =	424 (mg/s)
	mass flux of seepage from East Pit	M gep =	0 (mg/s)
	mass flux of seepage from West Pit	M gwp =	0 (mg/s)
	mass flux of combined ground water liner leakage from stockpiles	M gl4 =	0 (mg/s)
	mass flux of combined ground water liner leakage/seepage from other mine features	M gl4a =	0 (mg/s)
Mass Balance	mass flux in river at SW-001	M r1 =	313 (mg/s)
	mass flux in river at SW-002	M r2 =	701 (mg/s)
	mass flux in river at SW-003	M r3 =	813 (mg/s)
	mass flux in river at SW-004	M r4 =	1270 (mg/s)
	mass flux in river at SW-004A	M r4A =	2958 (mg/s)
	mass flux in river at SW-005	M r5 =	5476 (mg/s)
Calculation of Concentration	concentration in river at SW-001	C r1 =	7.8 (mg/l)
	concentration in river at SW-002	C r2 =	7.8 (mg/l)
	concentration in river at SW-003	C r3 =	7.7 (mg/l)
	concentration in river at SW-004	C r4 =	7.8 (mg/l)
	concentration in river at SW-004A	C r4A =	7.8 (mg/l)
	concentration in river at SW-005	C r5 =	7.7 (mg/l)
Baseline Data	Observed concentration in river at SW-002		1.8 (mg/l)
	Observed concentration in river at SW-003		10.5 (mg/l)
	Observed concentration in river at SW-004		9.1 (mg/l)
	Observed concentration in river at SW-005		6.2 (mg/l)

Partridge River Model - Calibration to Baseline Water Quality Data				
Parameter: Cobalt				
Input Flow Data	surface water flow into SW-001	Q s1 =	0.30	(cfs)
	surface water flow into SW-002	Q s2 =	0.23	(cfs)
	surface water flow into SW-003	Q s3 =	0.06	(cfs)
	surface water flow into SW-004	Q s4 =	0.39	(cfs)
	surface water flow into SW-004A	Q s4A =	1.23	(cfs)
	surface water flow into SW-005	Q s5 =	1.65	(cfs)
	surface water inflow from upstream of PM-1	Q sns =	1.50	(cfs)
	surface water flow from West Pit Overflow	Q sms =	0.00	(cfs)
	ground water flow into SW-001	Q g1 =	0.18	(cfs)
	ground water flow into SW-002	Q g2 =	0.38	(cfs)
	ground water flow into SW-003	Q g3 =	0.11	(cfs)
	ground water flow into SW-004	Q g4 =	0.32	(cfs)
	ground water flow into SW-004A	Q g4A =	1.39	(cfs)
	ground water flow into SW-005	Q g5 =	2.27	(cfs)
	ground water seepage from East Pit	Q gep =	0.00	(cfs)
	ground water seepage from West Pit	Q gwp =	0.00	(cfs)
	combined ground water liner leakage from stockpiles	Q gl4 =	0.00	(cfs)
	combined ground water liner leakage/seepage from other mine features	Q gl4a =	0.00	(cfs)
Input Concentration Data	concentration of surface water into SW-001	C s1 =	0	(µg/L)
	concentration of surface water into SW-002	C s2 =	0	(µg/L)
	concentration of surface water into SW-003	C s3 =	0	(µg/L)
	concentration of surface water into SW-004	C s4 =	0	(µg/L)
	concentration of surface water into SW-004A	C s4A =	0	(µg/L)
	concentration of surface water into SW-005	C s5 =	0	(µg/L)
	concentration of surface water inflow from upstream of PM-1	C sns =	0.5	(µg/L)
	concentration of surface water flow from West Pit Overflow	C sms =	0	(µg/L)
	concentration of ground water into SW-001	C g1 =	1.65	(µg/L)
	concentration of ground water into SW-002	C g2 =	1.65	(µg/L)
	concentration of ground water into SW-003	C g3 =	1.65	(µg/L)
	concentration of ground water into SW-004	C g4 =	1.65	(µg/L)
	concentration of ground water into SW-004A	C g4A =	1.65	(µg/L)
	concentration of ground water into SW-005	C g5 =	1.65	(µg/L)
	concentration of ground water seepage from East Pit	C gep =	0	(µg/L)
	concentration of ground water seepage from West Pit	C gwp =	0	(µg/L)
	concentration of combined ground water liner leakage from stockpiles	C gl4 =	0	(µg/L)
	concentration of combined ground water liner leakage/seepage from other mine features	C gl4a =	0	(µg/L)
Water Balance	flow in river at SW-001	Q r1 =	1.98	(cfs)
	flow in river at SW-002	Q r2 =	2.59	(cfs)
	flow in river at SW-003	Q r3 =	2.76	(cfs)
	flow in river at SW-004	Q r4 =	3.47	(cfs)
	flow in river at SW-004A	Q r4A =	6.08	(cfs)
	flow in river at SW-005	Q r5 =	10.00	(cfs)
	flow check	Q ck =	10.00	(cfs)
Calculation of Mass Flux	mass flux of surface water into SW-001	M s1 =	0	(µg/s)
	mass flux of surface water into SW-002	M s2 =	0	(µg/s)
	mass flux of surface water into SW-003	M s3 =	0	(µg/s)
	mass flux of surface water into SW-004	M s4 =	0	(µg/s)
	mass flux of surface water into SW-004A	M s4A =	0	(µg/s)
	mass flux of surface water into SW-005	M s5 =	0	(µg/s)
	mass flux of surface water inflow from upstream of PM-1	M sns =	21	(µg/s)
	mass flux of surface water flow from West Pit Overflow	M sms =	0	(µg/s)
	mass flux of ground water into SW-001	M g1 =	8	(µg/s)
	mass flux of ground water into SW-002	M g2 =	18	(µg/s)
	mass flux of ground water into SW-003	M g3 =	5	(µg/s)
	mass flux of ground water into SW-004	M g4 =	15	(µg/s)
	mass flux of ground water into SW-004A	M g4A =	65	(µg/s)
	mass flux of ground water into SW-005	M g5 =	106	(µg/s)
	mass flux of seepage from East Pit	M gep =	0	(µg/s)
	mass flux of seepage from West Pit	M gwp =	0	(µg/s)
	mass flux of combined ground water liner leakage from stockpiles	M gl4 =	0	(µg/s)
	mass flux of combined ground water liner leakage/seepage from other mine features	M gl4a =	0	(µg/s)
Mass Balance	mass flux in river at SW-001	M r1 =	30	(µg/s)
	mass flux in river at SW-002	M r2 =	47	(µg/s)
	mass flux in river at SW-003	M r3 =	53	(µg/s)
	mass flux in river at SW-004	M r4 =	67	(µg/s)
	mass flux in river at SW-004A	M r4A =	132	(µg/s)
	mass flux in river at SW-005	M r5 =	238	(µg/s)
Calculation of Concentration	concentration in river at SW-001	C r1 =	0.5	(µg/l)
	concentration in river at SW-002	C r2 =	0.6	(µg/l)
	concentration in river at SW-003	C r3 =	0.7	(µg/l)
	concentration in river at SW-004	C r4 =	0.7	(µg/l)
	concentration in river at SW-004A	C r4A =	0.8	(µg/l)
	concentration in river at SW-005	C r5 =	0.8	(µg/l)
Baseline Data	Observed concentration in river at SW-002		ND (1)	(µg/l)
	Observed concentration in river at SW-003		ND (1)	(µg/l)
	Observed concentration in river at SW-004		ND (1)	(µg/l)
	Observed concentration in river at SW-005		0.8	(µg/l)

Partridge River Model - Calibration to Baseline Water Quality Data			
Parameter: Copper			
Input Flow Data	surface water flow into SW-001	Q s1 =	1.52 (cfs)
	surface water flow into SW-002	Q s2 =	1.76 (cfs)
	surface water flow into SW-003	Q s3 =	0.51 (cfs)
	surface water flow into SW-004	Q s4 =	2.17 (cfs)
	surface water flow into SW-004A	Q s4A =	7.85 (cfs)
	surface water flow into SW-005	Q s5 =	11.55 (cfs)
	surface water inflow from upstream of PM-1	Q sns =	0.00 (cfs)
	surface water flow from West Pit Overflow	Q sms =	0.00 (cfs)
	ground water flow into SW-001	Q g1 =	0.18 (cfs)
	ground water flow into SW-002	Q g2 =	0.38 (cfs)
	ground water flow into SW-003	Q g3 =	0.11 (cfs)
	ground water flow into SW-004	Q g4 =	0.32 (cfs)
	ground water flow into SW-004A	Q g4A =	1.39 (cfs)
	ground water flow into SW-005	Q g5 =	2.27 (cfs)
	ground water seepage from East Pit	Q gep =	0.00 (cfs)
	ground water seepage from West Pit	Q gwp =	0.00 (cfs)
	combined ground water liner leakage from stockpiles	Q gl4 =	0.00 (cfs)
	combined ground water liner leakage/seepage from other mine features	Q gl4a =	0.00 (cfs)
Input Concentration Data	concentration of surface water into SW-001	C s1 =	1.7 µg/L
	concentration of surface water into SW-002	C s2 =	1.7 µg/L
	concentration of surface water into SW-003	C s3 =	1.7 µg/L
	concentration of surface water into SW-004	C s4 =	1.7 µg/L
	concentration of surface water into SW-004A	C s4A =	1.7 µg/L
	concentration of surface water into SW-005	C s5 =	1.7 µg/L
	concentration of surface water inflow from upstream of PM-1	C sns =	1.24 µg/L
	concentration of surface water flow from West Pit Overflow	C sms =	0 µg/L
	concentration of ground water into SW-001	C g1 =	2.95 µg/L
	concentration of ground water into SW-002	C g2 =	2.95 µg/L
	concentration of ground water into SW-003	C g3 =	2.95 µg/L
	concentration of ground water into SW-004	C g4 =	2.95 µg/L
	concentration of ground water into SW-004A	C g4A =	2.95 µg/L
	concentration of ground water into SW-005	C g5 =	2.95 µg/L
	concentration of ground water seepage from East Pit	C gep =	0 µg/L
	concentration of ground water seepage from West Pit	C gwp =	0 µg/L
	concentration of combined ground water liner leakage from stockpiles	C gl4 =	0 µg/L
	concentration of combined ground water liner leakage/seepage from other mine features	C gl4a =	0 µg/L
Water Balance	flow in river at SW-001	Q r1 =	1.70 (cfs)
	flow in river at SW-002	Q r2 =	3.83 (cfs)
	flow in river at SW-003	Q r3 =	4.45 (cfs)
	flow in river at SW-004	Q r4 =	6.94 (cfs)
	flow in river at SW-004A	Q r4A =	16.18 (cfs)
	flow in river at SW-005	Q r5 =	30.00 (cfs)
	flow check	Q ck =	30.00 (cfs)
Calculation of Mass Flux	mass flux of surface water into SW-001	M s1 =	73 (µg/s)
	mass flux of surface water into SW-002	M s2 =	85 (µg/s)
	mass flux of surface water into SW-003	M s3 =	24 (µg/s)
	mass flux of surface water into SW-004	M s4 =	104 (µg/s)
	mass flux of surface water into SW-004A	M s4A =	378 (µg/s)
	mass flux of surface water into SW-005	M s5 =	556 (µg/s)
	mass flux of surface water inflow from upstream of PM-1	M sns =	0 (µg/s)
	mass flux of surface water flow from West Pit Overflow	M sms =	0 (µg/s)
	mass flux of ground water into SW-001	M g1 =	15 (µg/s)
	mass flux of ground water into SW-002	M g2 =	32 (µg/s)
	mass flux of ground water into SW-003	M g3 =	9 (µg/s)
	mass flux of ground water into SW-004	M g4 =	27 (µg/s)
	mass flux of ground water into SW-004A	M g4A =	116 (µg/s)
	mass flux of ground water into SW-005	M g5 =	190 (µg/s)
	mass flux of seepage from East Pit	M gep =	0 (µg/s)
	mass flux of seepage from West Pit	M gwp =	0 (µg/s)
	mass flux of combined ground water liner leakage from stockpiles	M gl4 =	0 (µg/s)
	mass flux of combined ground water liner leakage/seepage from other mine features	M gl4a =	0 (µg/s)
Mass Balance	mass flux in river at SW-001	M r1 =	88 (µg/s)
	mass flux in river at SW-002	M r2 =	204 (µg/s)
	mass flux in river at SW-003	M r3 =	238 (µg/s)
	mass flux in river at SW-004	M r4 =	369 (µg/s)
	mass flux in river at SW-004A	M r4A =	863 (µg/s)
	mass flux in river at SW-005	M r5 =	1608 (µg/s)
Calculation of Concentration	concentration in river at SW-001	C r1 =	1.8 µg/L
	concentration in river at SW-002	C r2 =	1.9 µg/L
	concentration in river at SW-003	C r3 =	1.9 µg/L
	concentration in river at SW-004	C r4 =	1.9 µg/L
	concentration in river at SW-004A	C r4A =	1.9 µg/L
	concentration in river at SW-005	C r5 =	1.9 µg/L
Baseline Data	Observed concentration in river at SW-002		0.5 µg/L
	Observed concentration in river at SW-003		1.1 µg/L
	Observed concentration in river at SW-004		2.1 µg/L
	Observed concentration in river at SW-005		1.7 µg/L

Partridge River Model - Calibration to Baseline Water Quality Data			
Parameter: Fluoride			
Input Flow Data	surface water flow into SW-001	Q s1 =	2.79 (cfs)
	surface water flow into SW-002	Q s2 =	3.36 (cfs)
	surface water flow into SW-003	Q s3 =	0.97 (cfs)
	surface water flow into SW-004	Q s4 =	4.04 (cfs)
	surface water flow into SW-004A	Q s4A =	14.78 (cfs)
	surface water flow into SW-005	Q s5 =	21.92 (cfs)
	surface water inflow from upstream of PM-1	Q sns =	1.50 (cfs)
	surface water flow from West Pit Overflow	Q sms =	0.00 (cfs)
	ground water flow into SW-001	Q g1 =	0.18 (cfs)
	ground water flow into SW-002	Q g2 =	0.38 (cfs)
	ground water flow into SW-003	Q g3 =	0.11 (cfs)
	ground water flow into SW-004	Q g4 =	0.32 (cfs)
	ground water flow into SW-004A	Q g4A =	1.39 (cfs)
	ground water flow into SW-005	Q g5 =	2.27 (cfs)
	ground water seepage from East Pit	Q gep =	0.00 (cfs)
	ground water seepage from West Pit	Q gwp =	0.00 (cfs)
	combined ground water liner leakage from stockpiles	Q gl4 =	0.00 (cfs)
	combined ground water liner leakage/seepage from other mine features	Q gl4a =	0.00 (cfs)
Input Concentration Data	concentration of surface water into SW-001	C s1 =	0.07 (mg/l)
	concentration of surface water into SW-002	C s2 =	0.07 (mg/l)
	concentration of surface water into SW-003	C s3 =	0.07 (mg/l)
	concentration of surface water into SW-004	C s4 =	0.07 (mg/l)
	concentration of surface water into SW-004A	C s4A =	0.07 (mg/l)
	concentration of surface water into SW-005	C s5 =	0.07 (mg/l)
	concentration of surface water inflow from upstream of PM-1	C sns =	0.14 (mg/l)
	concentration of surface water flow from West Pit Overflow	C sms =	0 (mg/l)
	concentration of ground water into SW-001	C g1 =	0.28 (mg/l)
	concentration of ground water into SW-002	C g2 =	0.28 (mg/l)
	concentration of ground water into SW-003	C g3 =	0.28 (mg/l)
	concentration of ground water into SW-004	C g4 =	0.28 (mg/l)
	concentration of ground water into SW-004A	C g4A =	0.28 (mg/l)
	concentration of ground water into SW-005	C g5 =	0.28 (mg/l)
	concentration of ground water seepage from East Pit	C gep =	0 (mg/l)
	concentration of ground water seepage from West Pit	C gwp =	0 (mg/l)
	concentration of combined ground water liner leakage from stockpiles	C gl4 =	0 (mg/l)
	concentration of combined ground water liner leakage/seepage from other mine features	C gl4a =	0 (mg/l)
Water Balance	flow in river at SW-001	Q r1 =	4.47 (cfs)
	flow in river at SW-002	Q r2 =	8.21 (cfs)
	flow in river at SW-003	Q r3 =	9.29 (cfs)
	flow in river at SW-004	Q r4 =	13.64 (cfs)
	flow in river at SW-004A	Q r4A =	29.81 (cfs)
	flow in river at SW-005	Q r5 =	54.00 (cfs)
	flow check	Q ck =	54.00 (cfs)
Calculation of Mass Flux	mass flux of surface water into SW-001	M s1 =	6 (mg/s)
	mass flux of surface water into SW-002	M s2 =	7 (mg/s)
	mass flux of surface water into SW-003	M s3 =	2 (mg/s)
	mass flux of surface water into SW-004	M s4 =	8 (mg/s)
	mass flux of surface water into SW-004A	M s4A =	29 (mg/s)
	mass flux of surface water into SW-005	M s5 =	43 (mg/s)
	mass flux of surface water inflow from upstream of PM-1	M sns =	6 (mg/s)
	mass flux of surface water flow from West Pit Overflow	M sms =	0 (mg/s)
	mass flux of ground water into SW-001	M g1 =	1 (mg/s)
	mass flux of ground water into SW-002	M g2 =	3 (mg/s)
	mass flux of ground water into SW-003	M g3 =	1 (mg/s)
	mass flux of ground water into SW-004	M g4 =	3 (mg/s)
	mass flux of ground water into SW-004A	M g4A =	11 (mg/s)
	mass flux of ground water into SW-005	M g5 =	18 (mg/s)
	mass flux of seepage from East Pit	M gep =	0 (mg/s)
	mass flux of seepage from West Pit	M gwp =	0 (mg/s)
	mass flux of combined ground water liner leakage from stockpiles	M gl4 =	0 (mg/s)
	mass flux of combined ground water liner leakage/seepage from other mine features	M gl4a =	0 (mg/s)
Mass Balance	mass flux in river at SW-001	M r1 =	13 (mg/s)
	mass flux in river at SW-002	M r2 =	23 (mg/s)
	mass flux in river at SW-003	M r3 =	25 (mg/s)
	mass flux in river at SW-004	M r4 =	36 (mg/s)
	mass flux in river at SW-004A	M r4A =	76 (mg/s)
	mass flux in river at SW-005	M r5 =	138 (mg/s)
Calculation of Concentration	concentration in river at SW-001	C r1 =	0.10 (mg/l)
	concentration in river at SW-002	C r2 =	0.10 (mg/l)
	concentration in river at SW-003	C r3 =	0.10 (mg/l)
	concentration in river at SW-004	C r4 =	0.09 (mg/l)
	concentration in river at SW-004A	C r4A =	0.09 (mg/l)
	concentration in river at SW-005	C r5 =	0.09 (mg/l)
Baseline Data	Observed concentration in river at SW-002		0.11 (mg/l)
	Observed concentration in river at SW-003		0.09 (mg/l)
	Observed concentration in river at SW-004		0.09 (mg/l)
	Observed concentration in river at SW-005		0.09 (mg/l)

Partridge River Model - Calibration to Baseline Water Quality Data			
Parameter: Iron			
Input Flow Data	surface water flow into SW-001	Q s1 =	2.87 (cfs)
	surface water flow into SW-002	Q s2 =	3.47 (cfs)
	surface water flow into SW-003	Q s3 =	1.00 (cfs)
	surface water flow into SW-004	Q s4 =	4.16 (cfs)
	surface water flow into SW-004A	Q s4A =	15.24 (cfs)
	surface water flow into SW-005	Q s5 =	22.61 (cfs)
	surface water inflow from upstream of PM-1	Q sns =	0.00 (cfs)
	surface water flow from West Pit Overflow	Q sms =	0.00 (cfs)
	ground water flow into SW-001	Q g1 =	0.18 (cfs)
	ground water flow into SW-002	Q g2 =	0.38 (cfs)
	ground water flow into SW-003	Q g3 =	0.11 (cfs)
	ground water flow into SW-004	Q g4 =	0.32 (cfs)
	ground water flow into SW-004A	Q g4A =	1.39 (cfs)
	ground water flow into SW-005	Q g5 =	2.27 (cfs)
	ground water seepage from East Pit	Q gep =	0.00 (cfs)
	ground water seepage from West Pit	Q gwp =	0.00 (cfs)
	combined ground water liner leakage from stockpiles	Q gl4 =	0.00 (cfs)
	combined ground water liner leakage/seepage from other mine features	Q gl4a =	0.00 (cfs)
Input Concentration Data	concentration of surface water into SW-001	C s1 =	1.6 (mg/l)
	concentration of surface water into SW-002	C s2 =	1.6 (mg/l)
	concentration of surface water into SW-003	C s3 =	1.6 (mg/l)
	concentration of surface water into SW-004	C s4 =	1.6 (mg/l)
	concentration of surface water into SW-004A	C s4A =	1.6 (mg/l)
	concentration of surface water into SW-005	C s5 =	1.6 (mg/l)
	concentration of surface water inflow from upstream of PM-1	C sns =	0.03 (mg/l)
	concentration of surface water flow from West Pit Overflow	C sms =	0 (mg/l)
	concentration of ground water into SW-001	C g1 =	2.844 (mg/l)
	concentration of ground water into SW-002	C g2 =	2.844 (mg/l)
	concentration of ground water into SW-003	C g3 =	2.844 (mg/l)
	concentration of ground water into SW-004	C g4 =	2.844 (mg/l)
	concentration of ground water into SW-004A	C g4A =	2.844 (mg/l)
	concentration of ground water into SW-005	C g5 =	2.844 (mg/l)
	concentration of ground water seepage from East Pit	C gep =	0 (mg/l)
	concentration of ground water seepage from West Pit	C gwp =	0 (mg/l)
	concentration of combined ground water liner leakage from stockpiles	C gl4 =	0 (mg/l)
	concentration of combined ground water liner leakage/seepage from other mine features	C gl4a =	0 (mg/l)
Water Balance	flow in river at SW-001	Q r1 =	3.05 (cfs)
	flow in river at SW-002	Q r2 =	6.90 (cfs)
	flow in river at SW-003	Q r3 =	8.01 (cfs)
	flow in river at SW-004	Q r4 =	12.49 (cfs)
	flow in river at SW-004A	Q r4A =	29.12 (cfs)
	flow in river at SW-005	Q r5 =	54.00 (cfs)
	flow check	Q ck =	54.00 (cfs)
Calculation of Mass Flux	mass flux of surface water into SW-001	M s1 =	130 (mg/s)
	mass flux of surface water into SW-002	M s2 =	157 (mg/s)
	mass flux of surface water into SW-003	M s3 =	45 (mg/s)
	mass flux of surface water into SW-004	M s4 =	188 (mg/s)
	mass flux of surface water into SW-004A	M s4A =	690 (mg/s)
	mass flux of surface water into SW-005	M s5 =	1024 (mg/s)
	mass flux of surface water inflow from upstream of PM-1	M sns =	0 (mg/s)
	mass flux of surface water flow from West Pit Overflow	M sms =	0 (mg/s)
	mass flux of ground water into SW-001	M g1 =	14 (mg/s)
	mass flux of ground water into SW-002	M g2 =	31 (mg/s)
	mass flux of ground water into SW-003	M g3 =	9 (mg/s)
	mass flux of ground water into SW-004	M g4 =	26 (mg/s)
	mass flux of ground water into SW-004A	M g4A =	112 (mg/s)
	mass flux of ground water into SW-005	M g5 =	183 (mg/s)
	mass flux of seepage from East Pit	M gep =	0 (mg/s)
	mass flux of seepage from West Pit	M gwp =	0 (mg/s)
	mass flux of combined ground water liner leakage from stockpiles	M gl4 =	0 (mg/s)
	mass flux of combined ground water liner leakage/seepage from other mine features	M gl4a =	0 (mg/s)
Mass Balance	mass flux in river at SW-001	M r1 =	144 (mg/s)
	mass flux in river at SW-002	M r2 =	332 (mg/s)
	mass flux in river at SW-003	M r3 =	386 (mg/s)
	mass flux in river at SW-004	M r4 =	600 (mg/s)
	mass flux in river at SW-004A	M r4A =	1402 (mg/s)
	mass flux in river at SW-005	M r5 =	2609 (mg/s)
Calculation of Concentration	concentration in river at SW-001	C r1 =	1.7 (mg/l)
	concentration in river at SW-002	C r2 =	1.7 (mg/l)
	concentration in river at SW-003	C r3 =	1.7 (mg/l)
	concentration in river at SW-004	C r4 =	1.7 (mg/l)
	concentration in river at SW-004A	C r4A =	1.7 (mg/l)
	concentration in river at SW-005	C r5 =	1.7 (mg/l)
Baseline Data	Observed concentration in river at SW-002		1.21 (mg/l)
	Observed concentration in river at SW-003		1.63 (mg/l)
	Observed concentration in river at SW-004		1.34 (mg/l)
	Observed concentration in river at SW-005		1.99 (mg/l)

Partridge River Model - Calibration to Baseline Water Quality Data			
Parameter: Hardness			
Input Flow Data	surface water flow into SW-001	Q s1 =	0.87 (cfs)
	surface water flow into SW-002	Q s2 =	0.94 (cfs)
	surface water flow into SW-003	Q s3 =	0.27 (cfs)
	surface water flow into SW-004	Q s4 =	1.22 (cfs)
	surface water flow into SW-004A	Q s4A =	4.31 (cfs)
	surface water flow into SW-005	Q s5 =	6.25 (cfs)
	surface water inflow from upstream of PM-1	Q sns =	1.50 (cfs)
	surface water flow from West Pit Overflow	Q sms =	0.00 (cfs)
	ground water flow into SW-001	Q g1 =	0.18 (cfs)
	ground water flow into SW-002	Q g2 =	0.38 (cfs)
	ground water flow into SW-003	Q g3 =	0.11 (cfs)
	ground water flow into SW-004	Q g4 =	0.32 (cfs)
	ground water flow into SW-004A	Q g4A =	1.39 (cfs)
	ground water flow into SW-005	Q g5 =	2.27 (cfs)
	ground water seepage from East Pit	Q gep =	0.00 (cfs)
	ground water seepage from West Pit	Q gwp =	0.00 (cfs)
	combined ground water liner leakage from stockpiles	Q gl4 =	0.00 (cfs)
	combined ground water liner leakage/seepage from other mine features	Q gl4a =	0.00 (cfs)
Input Concentration Data	concentration of surface water into SW-001	C s1 =	110 (mg/l)
	concentration of surface water into SW-002	C s2 =	110 (mg/l)
	concentration of surface water into SW-003	C s3 =	110 (mg/l)
	concentration of surface water into SW-004	C s4 =	110 (mg/l)
	concentration of surface water into SW-004A	C s4A =	110 (mg/l)
	concentration of surface water into SW-005	C s5 =	110 (mg/l)
	concentration of surface water inflow from upstream of PM-1	C sns =	110 (mg/l)
	concentration of surface water flow from West Pit Overflow	C sms =	0 (mg/l)
	concentration of ground water into SW-001	C g1 =	66.42 (mg/l)
	concentration of ground water into SW-002	C g2 =	66.42 (mg/l)
	concentration of ground water into SW-003	C g3 =	66.42 (mg/l)
	concentration of ground water into SW-004	C g4 =	66.42 (mg/l)
	concentration of ground water into SW-004A	C g4A =	66.42 (mg/l)
	concentration of ground water into SW-005	C g5 =	66.42 (mg/l)
	concentration of ground water seepage from East Pit	C gep =	0 (mg/l)
	concentration of ground water seepage from West Pit	C gwp =	0 (mg/l)
	concentration of combined ground water liner leakage from stockpiles	C gl4 =	0 (mg/l)
	concentration of combined ground water liner leakage/seepage from other mine features	C gl4a =	0 (mg/l)
Water Balance	flow in river at SW-001	Q r1 =	2.55 (cfs)
	flow in river at SW-002	Q r2 =	3.86 (cfs)
	flow in river at SW-003	Q r3 =	4.24 (cfs)
	flow in river at SW-004	Q r4 =	5.78 (cfs)
	flow in river at SW-004A	Q r4A =	11.48 (cfs)
	flow in river at SW-005	Q r5 =	20.00 (cfs)
	flow check	Q ck =	20.00 (cfs)
Calculation of Mass Flux	mass flux of surface water into SW-001	M s1 =	2694 (mg/s)
	mass flux of surface water into SW-002	M s2 =	2923 (mg/s)
	mass flux of surface water into SW-003	M s3 =	838 (mg/s)
	mass flux of surface water into SW-004	M s4 =	3784 (mg/s)
	mass flux of surface water into SW-004A	M s4A =	13411 (mg/s)
	mass flux of surface water into SW-005	M s5 =	19465 (mg/s)
	mass flux of surface water inflow from upstream of PM-1	M sns =	4670 (mg/s)
	mass flux of surface water flow from West Pit Overflow	M sms =	0 (mg/s)
	mass flux of ground water into SW-001	M g1 =	338 (mg/s)
	mass flux of ground water into SW-002	M g2 =	714 (mg/s)
	mass flux of ground water into SW-003	M g3 =	207 (mg/s)
	mass flux of ground water into SW-004	M g4 =	601 (mg/s)
	mass flux of ground water into SW-004A	M g4A =	2613 (mg/s)
	mass flux of ground water into SW-005	M g5 =	4267 (mg/s)
	mass flux of seepage from East Pit	M gep =	0 (mg/s)
	mass flux of seepage from West Pit	M gwp =	0 (mg/s)
	mass flux of combined ground water liner leakage from stockpiles	M gl4 =	0 (mg/s)
	mass flux of combined ground water liner leakage/seepage from other mine features	M gl4a =	0 (mg/s)
Mass Balance	mass flux in river at SW-001	M r1 =	7701 (mg/s)
	mass flux in river at SW-002	M r2 =	11339 (mg/s)
	mass flux in river at SW-003	M r3 =	12384 (mg/s)
	mass flux in river at SW-004	M r4 =	16769 (mg/s)
	mass flux in river at SW-004A	M r4A =	32793 (mg/s)
	mass flux in river at SW-005	M r5 =	56525 (mg/s)
Calculation of Concentration	concentration in river at SW-001	C r1 =	106.9 (mg/l)
	concentration in river at SW-002	C r2 =	103.7 (mg/l)
	concentration in river at SW-003	C r3 =	103.1 (mg/l)
	concentration in river at SW-004	C r4 =	102.5 (mg/l)
	concentration in river at SW-004A	C r4A =	101.0 (mg/l)
	concentration in river at SW-005	C r5 =	99.9 (mg/l)
Baseline Data	Observed concentration in river at SW-002		112.0 (mg/l)
	Observed concentration in river at SW-003		108.8 (mg/l)
	Observed concentration in river at SW-004		108.4 (mg/l)
	Observed concentration in river at SW-005		98.0 (mg/l)

Partridge River Model - Calibration to Baseline Water Quality Data			
Parameter: Potassium			
Input Flow Data	surface water flow into SW-001	Q s1 =	4.71 (cfs)
	surface water flow into SW-002	Q s2 =	5.79 (cfs)
	surface water flow into SW-003	Q s3 =	1.66 (cfs)
	surface water flow into SW-004	Q s4 =	6.86 (cfs)
	surface water flow into SW-004A	Q s4A =	25.25 (cfs)
	surface water flow into SW-005	Q s5 =	37.58 (cfs)
	surface water inflow from upstream of PM-1	Q sns =	1.50 (cfs)
	surface water flow from West Pit Overflow	Q sms =	0.00 (cfs)
	ground water flow into SW-001	Q g1 =	0.18 (cfs)
	ground water flow into SW-002	Q g2 =	0.38 (cfs)
	ground water flow into SW-003	Q g3 =	0.11 (cfs)
	ground water flow into SW-004	Q g4 =	0.32 (cfs)
	ground water flow into SW-004A	Q g4A =	1.39 (cfs)
	ground water flow into SW-005	Q g5 =	2.27 (cfs)
	ground water seepage from East Pit	Q gep =	0.00 (cfs)
	ground water seepage from West Pit	Q gwp =	0.00 (cfs)
	combined ground water liner leakage from stockpiles	Q gl4 =	0.00 (cfs)
	combined ground water liner leakage/seepage from other mine features	Q gl4a =	0.00 (cfs)
Input Concentration Data	concentration of surface water into SW-001	C s1 =	1.3 (mg/l)
	concentration of surface water into SW-002	C s2 =	1.3 (mg/l)
	concentration of surface water into SW-003	C s3 =	1.3 (mg/l)
	concentration of surface water into SW-004	C s4 =	1.3 (mg/l)
	concentration of surface water into SW-004A	C s4A =	1.3 (mg/l)
	concentration of surface water into SW-005	C s5 =	1.3 (mg/l)
	concentration of surface water inflow from upstream of PM-1	C sns =	2.7 (mg/l)
	concentration of surface water flow from West Pit Overflow	C sms =	0 (mg/l)
	concentration of ground water into SW-001	C g1 =	1.75 (mg/l)
	concentration of ground water into SW-002	C g2 =	1.75 (mg/l)
	concentration of ground water into SW-003	C g3 =	1.75 (mg/l)
	concentration of ground water into SW-004	C g4 =	1.75 (mg/l)
	concentration of ground water into SW-004A	C g4A =	1.75 (mg/l)
	concentration of ground water into SW-005	C g5 =	1.75 (mg/l)
	concentration of ground water seepage from East Pit	C gep =	0 (mg/l)
	concentration of ground water seepage from West Pit	C gwp =	0 (mg/l)
	concentration of combined ground water liner leakage from stockpiles	C gl4 =	0 (mg/l)
	concentration of combined ground water liner leakage/seepage from other mine features	C gl4a =	0 (mg/l)
Water Balance	flow in river at SW-001	Q r1 =	6.39 (cfs)
	flow in river at SW-002	Q r2 =	12.55 (cfs)
	flow in river at SW-003	Q r3 =	14.33 (cfs)
	flow in river at SW-004	Q r4 =	21.51 (cfs)
	flow in river at SW-004A	Q r4A =	48.15 (cfs)
	flow in river at SW-005	Q r5 =	88.00 (cfs)
	flow check	Q ck =	88.00 (cfs)
Calculation of Mass Flux	mass flux of surface water into SW-001	M s1 =	173 (mg/s)
	mass flux of surface water into SW-002	M s2 =	213 (mg/s)
	mass flux of surface water into SW-003	M s3 =	61 (mg/s)
	mass flux of surface water into SW-004	M s4 =	252 (mg/s)
	mass flux of surface water into SW-004A	M s4A =	929 (mg/s)
	mass flux of surface water into SW-005	M s5 =	1383 (mg/s)
	mass flux of surface water inflow from upstream of PM-1	M sns =	115 (mg/s)
	mass flux of surface water flow from West Pit Overflow	M sms =	0 (mg/s)
	mass flux of ground water into SW-001	M g1 =	9 (mg/s)
	mass flux of ground water into SW-002	M g2 =	19 (mg/s)
	mass flux of ground water into SW-003	M g3 =	5 (mg/s)
	mass flux of ground water into SW-004	M g4 =	16 (mg/s)
	mass flux of ground water into SW-004A	M g4A =	69 (mg/s)
	mass flux of ground water into SW-005	M g5 =	112 (mg/s)
	mass flux of seepage from East Pit	M gep =	0 (mg/s)
	mass flux of seepage from West Pit	M gwp =	0 (mg/s)
	mass flux of combined ground water liner leakage from stockpiles	M gl4 =	0 (mg/s)
	mass flux of combined ground water liner leakage/seepage from other mine features	M gl4a =	0 (mg/s)
Mass Balance	mass flux in river at SW-001	M r1 =	297 (mg/s)
	mass flux in river at SW-002	M r2 =	528 (mg/s)
	mass flux in river at SW-003	M r3 =	595 (mg/s)
	mass flux in river at SW-004	M r4 =	863 (mg/s)
	mass flux in river at SW-004A	M r4A =	1861 (mg/s)
	mass flux in river at SW-005	M r5 =	3356 (mg/s)
Calculation of Concentration	concentration in river at SW-001	C r1 =	1.6 (mg/l)
	concentration in river at SW-002	C r2 =	1.5 (mg/l)
	concentration in river at SW-003	C r3 =	1.5 (mg/l)
	concentration in river at SW-004	C r4 =	1.4 (mg/l)
	concentration in river at SW-004A	C r4A =	1.4 (mg/l)
	concentration in river at SW-005	C r5 =	1.3 (mg/l)
Baseline Data	Observed concentration in river at SW-002		2.0 (mg/l)
	Observed concentration in river at SW-003		2.0 (mg/l)
	Observed concentration in river at SW-004		1.6 (mg/l)
	Observed concentration in river at SW-005		1.0 (mg/l)

Partridge River Model - Calibration to Baseline Water Quality Data			
Parameter: Magnesium			
Input Flow Data	surface water flow into SW-001	Q s1 =	2.73 (cfs)
	surface water flow into SW-002	Q s2 =	3.29 (cfs)
	surface water flow into SW-003	Q s3 =	0.95 (cfs)
	surface water flow into SW-004	Q s4 =	3.95 (cfs)
	surface water flow into SW-004A	Q s4A =	14.47 (cfs)
	surface water flow into SW-005	Q s5 =	21.46 (cfs)
	surface water inflow from upstream of PM-1	Q sns =	1.50 (cfs)
	surface water flow from West Pit Overflow	Q sms =	0.00 (cfs)
	ground water flow into SW-001	Q g1 =	0.18 (cfs)
	ground water flow into SW-002	Q g2 =	0.38 (cfs)
	ground water flow into SW-003	Q g3 =	0.11 (cfs)
	ground water flow into SW-004	Q g4 =	0.32 (cfs)
	ground water flow into SW-004A	Q g4A =	1.39 (cfs)
	ground water flow into SW-005	Q g5 =	2.27 (cfs)
	ground water seepage from East Pit	Q gep =	0.00 (cfs)
	ground water seepage from West Pit	Q gwp =	0.00 (cfs)
	combined ground water liner leakage from stockpiles	Q gl4 =	0.00 (cfs)
	combined ground water liner leakage/seepage from other mine features	Q gl4a =	0.00 (cfs)
Input Concentration Data	concentration of surface water into SW-001	C s1 =	8 (mg/l)
	concentration of surface water into SW-002	C s2 =	8 (mg/l)
	concentration of surface water into SW-003	C s3 =	8 (mg/l)
	concentration of surface water into SW-004	C s4 =	8 (mg/l)
	concentration of surface water into SW-004A	C s4A =	8 (mg/l)
	concentration of surface water into SW-005	C s5 =	8 (mg/l)
	concentration of surface water inflow from upstream of PM-1	C sns =	10.5 (mg/l)
	concentration of surface water flow from West Pit Overflow	C sms =	0 (mg/l)
	concentration of ground water into SW-001	C g1 =	8.02 (mg/l)
	concentration of ground water into SW-002	C g2 =	8.02 (mg/l)
	concentration of ground water into SW-003	C g3 =	8.02 (mg/l)
	concentration of ground water into SW-004	C g4 =	8.02 (mg/l)
	concentration of ground water into SW-004A	C g4A =	8.02 (mg/l)
	concentration of ground water into SW-005	C g5 =	8.02 (mg/l)
	concentration of ground water seepage from East Pit	C gep =	0 (mg/l)
	concentration of ground water seepage from West Pit	C gwp =	0 (mg/l)
	concentration of combined ground water liner leakage from stockpiles	C gl4 =	0 (mg/l)
	concentration of combined ground water liner leakage/seepage from other mine features	C gl4a =	0 (mg/l)
Water Balance	flow in river at SW-001	Q r1 =	4.41 (cfs)
	flow in river at SW-002	Q r2 =	8.08 (cfs)
	flow in river at SW-003	Q r3 =	9.14 (cfs)
	flow in river at SW-004	Q r4 =	13.41 (cfs)
	flow in river at SW-004A	Q r4A =	29.27 (cfs)
	flow in river at SW-005	Q r5 =	53.00 (cfs)
	flow check	Q ck =	53.00 (cfs)
Calculation of Mass Flux	mass flux of surface water into SW-001	M s1 =	618 (mg/s)
	mass flux of surface water into SW-002	M s2 =	745 (mg/s)
	mass flux of surface water into SW-003	M s3 =	214 (mg/s)
	mass flux of surface water into SW-004	M s4 =	895 (mg/s)
	mass flux of surface water into SW-004A	M s4A =	3276 (mg/s)
	mass flux of surface water into SW-005	M s5 =	4858 (mg/s)
	mass flux of surface water inflow from upstream of PM-1	M sns =	446 (mg/s)
	mass flux of surface water flow from West Pit Overflow	M sms =	0 (mg/s)
	mass flux of ground water into SW-001	M g1 =	41 (mg/s)
	mass flux of ground water into SW-002	M g2 =	86 (mg/s)
	mass flux of ground water into SW-003	M g3 =	25 (mg/s)
	mass flux of ground water into SW-004	M g4 =	73 (mg/s)
	mass flux of ground water into SW-004A	M g4A =	315 (mg/s)
	mass flux of ground water into SW-005	M g5 =	515 (mg/s)
	mass flux of seepage from East Pit	M gep =	0 (mg/s)
	mass flux of seepage from West Pit	M gwp =	0 (mg/s)
	mass flux of combined ground water liner leakage from stockpiles	M gl4 =	0 (mg/s)
	mass flux of combined ground water liner leakage/seepage from other mine features	M gl4a =	0 (mg/s)
Mass Balance	mass flux in river at SW-001	M r1 =	1105 (mg/s)
	mass flux in river at SW-002	M r2 =	1936 (mg/s)
	mass flux in river at SW-003	M r3 =	2175 (mg/s)
	mass flux in river at SW-004	M r4 =	3143 (mg/s)
	mass flux in river at SW-004A	M r4A =	6735 (mg/s)
	mass flux in river at SW-005	M r5 =	12108 (mg/s)
Calculation of Concentration	concentration in river at SW-001	C r1 =	8.9 (mg/l)
	concentration in river at SW-002	C r2 =	8.5 (mg/l)
	concentration in river at SW-003	C r3 =	8.4 (mg/l)
	concentration in river at SW-004	C r4 =	8.3 (mg/l)
	concentration in river at SW-004A	C r4A =	8.1 (mg/l)
	concentration in river at SW-005	C r5 =	8.1 (mg/l)
Baseline Data	Observed concentration in river at SW-002		7.5 (mg/l)
	Observed concentration in river at SW-003		9 (mg/l)
	Observed concentration in river at SW-004		8.3 (mg/l)
	Observed concentration in river at SW-005		7.5 (mg/l)

Partridge River Model - Calibration to Baseline Water Quality Data			
Parameter: Manganese			
Input Flow Data	surface water flow into SW-001	Q s1 =	2.87 (cfs)
	surface water flow into SW-002	Q s2 =	3.47 (cfs)
	surface water flow into SW-003	Q s3 =	1.00 (cfs)
	surface water flow into SW-004	Q s4 =	4.16 (cfs)
	surface water flow into SW-004A	Q s4A =	15.24 (cfs)
	surface water flow into SW-005	Q s5 =	22.61 (cfs)
	surface water inflow from upstream of PM-1	Q sns =	0.00 (cfs)
	surface water flow from West Pit Overflow	Q sms =	0.00 (cfs)
	ground water flow into SW-001	Q g1 =	0.18 (cfs)
	ground water flow into SW-002	Q g2 =	0.38 (cfs)
	ground water flow into SW-003	Q g3 =	0.11 (cfs)
	ground water flow into SW-004	Q g4 =	0.32 (cfs)
	ground water flow into SW-004A	Q g4A =	1.39 (cfs)
	ground water flow into SW-005	Q g5 =	2.27 (cfs)
	ground water seepage from East Pit	Q gep =	0.00 (cfs)
	ground water seepage from West Pit	Q gwp =	0.00 (cfs)
	combined ground water liner leakage from stockpiles	Q gl4 =	0.00 (cfs)
	combined ground water liner leakage/seepage from other mine features	Q gl4a =	0.00 (cfs)
Input Concentration Data	concentration of surface water into SW-001	C s1 =	0.15 (mg/l)
	concentration of surface water into SW-002	C s2 =	0.15 (mg/l)
	concentration of surface water into SW-003	C s3 =	0.15 (mg/l)
	concentration of surface water into SW-004	C s4 =	0.15 (mg/l)
	concentration of surface water into SW-004A	C s4A =	0.15 (mg/l)
	concentration of surface water into SW-005	C s5 =	0.15 (mg/l)
	concentration of surface water inflow from upstream of PM-1	C sns =	0.0086 (mg/l)
	concentration of surface water flow from West Pit Overflow	C sms =	0 (mg/l)
	concentration of ground water into SW-001	C g1 =	0.124 (mg/l)
	concentration of ground water into SW-002	C g2 =	0.124 (mg/l)
	concentration of ground water into SW-003	C g3 =	0.124 (mg/l)
	concentration of ground water into SW-004	C g4 =	0.124 (mg/l)
	concentration of ground water into SW-004A	C g4A =	0.124 (mg/l)
	concentration of ground water into SW-005	C g5 =	0.124 (mg/l)
	concentration of ground water seepage from East Pit	C gep =	0 (mg/l)
	concentration of ground water seepage from West Pit	C gwp =	0 (mg/l)
	concentration of combined ground water liner leakage from stockpiles	C gl4 =	0 (mg/l)
	concentration of combined ground water liner leakage/seepage from other mine features	C gl4a =	0 (mg/l)
Water Balance	flow in river at SW-001	Q r1 =	3.05 (cfs)
	flow in river at SW-002	Q r2 =	6.90 (cfs)
	flow in river at SW-003	Q r3 =	8.01 (cfs)
	flow in river at SW-004	Q r4 =	12.49 (cfs)
	flow in river at SW-004A	Q r4A =	29.12 (cfs)
	flow in river at SW-005	Q r5 =	54.00 (cfs)
	flow check	Q ck =	54.00 (cfs)
Calculation of Mass Flux	mass flux of surface water into SW-001	M s1 =	12 (mg/s)
	mass flux of surface water into SW-002	M s2 =	15 (mg/s)
	mass flux of surface water into SW-003	M s3 =	4 (mg/s)
	mass flux of surface water into SW-004	M s4 =	18 (mg/s)
	mass flux of surface water into SW-004A	M s4A =	65 (mg/s)
	mass flux of surface water into SW-005	M s5 =	96 (mg/s)
	mass flux of surface water inflow from upstream of PM-1	M sns =	0 (mg/s)
	mass flux of surface water flow from West Pit Overflow	M sms =	0 (mg/s)
	mass flux of ground water into SW-001	M g1 =	1 (mg/s)
	mass flux of ground water into SW-002	M g2 =	1 (mg/s)
	mass flux of ground water into SW-003	M g3 =	0 (mg/s)
	mass flux of ground water into SW-004	M g4 =	1 (mg/s)
	mass flux of ground water into SW-004A	M g4A =	5 (mg/s)
	mass flux of ground water into SW-005	M g5 =	8 (mg/s)
	mass flux of seepage from East Pit	M gep =	0 (mg/s)
	mass flux of seepage from West Pit	M gwp =	0 (mg/s)
	mass flux of combined ground water liner leakage from stockpiles	M gl4 =	0 (mg/s)
	mass flux of combined ground water liner leakage/seepage from other mine features	M gl4a =	0 (mg/s)
Mass Balance	mass flux in river at SW-001	M r1 =	13 (mg/s)
	mass flux in river at SW-002	M r2 =	29 (mg/s)
	mass flux in river at SW-003	M r3 =	34 (mg/s)
	mass flux in river at SW-004	M r4 =	52 (mg/s)
	mass flux in river at SW-004A	M r4A =	122 (mg/s)
	mass flux in river at SW-005	M r5 =	226 (mg/s)
Calculation of Concentration	concentration in river at SW-001	C r1 =	0.15 (mg/l)
	concentration in river at SW-002	C r2 =	0.15 (mg/l)
	concentration in river at SW-003	C r3 =	0.15 (mg/l)
	concentration in river at SW-004	C r4 =	0.15 (mg/l)
	concentration in river at SW-004A	C r4A =	0.15 (mg/l)
	concentration in river at SW-005	C r5 =	0.15 (mg/l)
Baseline Data	Observed concentration in river at SW-002		0.14 (mg/l)
	Observed concentration in river at SW-003		0.19 (mg/l)
	Observed concentration in river at SW-004		0.13 (mg/l)
	Observed concentration in river at SW-005		0.2 (mg/l)

Partridge River Model - Calibration to Baseline Water Quality Data			
Parameter: Sodium			
Input Flow Data	surface water flow into SW-001	Q s1 =	4.71 (cfs)
	surface water flow into SW-002	Q s2 =	5.79 (cfs)
	surface water flow into SW-003	Q s3 =	1.66 (cfs)
	surface water flow into SW-004	Q s4 =	6.86 (cfs)
	surface water flow into SW-004A	Q s4A =	25.25 (cfs)
	surface water flow into SW-005	Q s5 =	37.58 (cfs)
	surface water inflow from upstream of PM-1	Q sns =	1.50 (cfs)
	surface water flow from West Pit Overflow	Q sms =	0.00 (cfs)
	ground water flow into SW-001	Q g1 =	0.18 (cfs)
	ground water flow into SW-002	Q g2 =	0.38 (cfs)
	ground water flow into SW-003	Q g3 =	0.11 (cfs)
	ground water flow into SW-004	Q g4 =	0.32 (cfs)
	ground water flow into SW-004A	Q g4A =	1.39 (cfs)
	ground water flow into SW-005	Q g5 =	2.27 (cfs)
	ground water seepage from East Pit	Q gep =	0.00 (cfs)
	ground water seepage from West Pit	Q gwp =	0.00 (cfs)
	combined ground water liner leakage from stockpiles	Q gl4 =	0.00 (cfs)
	combined ground water liner leakage/seepage from other mine features	Q gl4a =	0.00 (cfs)
Input Concentration Data	concentration of surface water into SW-001	C s1 =	2.5 (mg/l)
	concentration of surface water into SW-002	C s2 =	2.5 (mg/l)
	concentration of surface water into SW-003	C s3 =	2.5 (mg/l)
	concentration of surface water into SW-004	C s4 =	2.5 (mg/l)
	concentration of surface water into SW-004A	C s4A =	2.5 (mg/l)
	concentration of surface water into SW-005	C s5 =	2.5 (mg/l)
	concentration of surface water inflow from upstream of PM-1	C sns =	4.8 (mg/l)
	concentration of surface water flow from West Pit Overflow	C sms =	0 (mg/l)
	concentration of ground water into SW-001	C g1 =	13.33 (mg/l)
	concentration of ground water into SW-002	C g2 =	13.33 (mg/l)
	concentration of ground water into SW-003	C g3 =	13.33 (mg/l)
	concentration of ground water into SW-004	C g4 =	13.33 (mg/l)
	concentration of ground water into SW-004A	C g4A =	13.33 (mg/l)
	concentration of ground water into SW-005	C g5 =	13.33 (mg/l)
	concentration of ground water seepage from East Pit	C gep =	0 (mg/l)
	concentration of ground water seepage from West Pit	C gwp =	0 (mg/l)
	concentration of combined ground water liner leakage from stockpiles	C gl4 =	0 (mg/l)
	concentration of combined ground water liner leakage/seepage from other mine features	C gl4a =	0 (mg/l)
Water Balance	flow in river at SW-001	Q r1 =	6.39 (cfs)
	flow in river at SW-002	Q r2 =	12.55 (cfs)
	flow in river at SW-003	Q r3 =	14.33 (cfs)
	flow in river at SW-004	Q r4 =	21.51 (cfs)
	flow in river at SW-004A	Q r4A =	48.15 (cfs)
	flow in river at SW-005	Q r5 =	88.00 (cfs)
	flow check	Q ck =	88.00 (cfs)
Calculation of Mass Flux	mass flux of surface water into SW-001	M s1 =	333 (mg/s)
	mass flux of surface water into SW-002	M s2 =	409 (mg/s)
	mass flux of surface water into SW-003	M s3 =	118 (mg/s)
	mass flux of surface water into SW-004	M s4 =	485 (mg/s)
	mass flux of surface water into SW-004A	M s4A =	1787 (mg/s)
	mass flux of surface water into SW-005	M s5 =	2659 (mg/s)
	mass flux of surface water inflow from upstream of PM-1	M sns =	204 (mg/s)
	mass flux of surface water flow from West Pit Overflow	M sms =	0 (mg/s)
	mass flux of ground water into SW-001	M g1 =	68 (mg/s)
	mass flux of ground water into SW-002	M g2 =	143 (mg/s)
	mass flux of ground water into SW-003	M g3 =	41 (mg/s)
	mass flux of ground water into SW-004	M g4 =	121 (mg/s)
	mass flux of ground water into SW-004A	M g4A =	524 (mg/s)
	mass flux of ground water into SW-005	M g5 =	856 (mg/s)
	mass flux of seepage from East Pit	M gep =	0 (mg/s)
	mass flux of seepage from West Pit	M gwp =	0 (mg/s)
	mass flux of combined ground water liner leakage from stockpiles	M gl4 =	0 (mg/s)
	mass flux of combined ground water liner leakage/seepage from other mine features	M gl4a =	0 (mg/s)
Mass Balance	mass flux in river at SW-001	M r1 =	605 (mg/s)
	mass flux in river at SW-002	M r2 =	1158 (mg/s)
	mass flux in river at SW-003	M r3 =	1317 (mg/s)
	mass flux in river at SW-004	M r4 =	1923 (mg/s)
	mass flux in river at SW-004A	M r4A =	4234 (mg/s)
	mass flux in river at SW-005	M r5 =	7749 (mg/s)
Calculation of Concentration	concentration in river at SW-001	C r1 =	3.3 (mg/l)
	concentration in river at SW-002	C r2 =	3.3 (mg/l)
	concentration in river at SW-003	C r3 =	3.2 (mg/l)
	concentration in river at SW-004	C r4 =	3.2 (mg/l)
	concentration in river at SW-004A	C r4A =	3.1 (mg/l)
	concentration in river at SW-005	C r5 =	3.1 (mg/l)
Baseline Data	Observed concentration in river at SW-002		3.2 (mg/l)
	Observed concentration in river at SW-003		3.8 (mg/l)
	Observed concentration in river at SW-004		3.5 (mg/l)
	Observed concentration in river at SW-005		2.9 (mg/l)

Partridge River Model - Calibration to Baseline Water Quality Data			
Parameter: Nickel			
Input Flow Data	surface water flow into SW-001	Q s1 =	2.08 (cfs)
	surface water flow into SW-002	Q s2 =	2.47 (cfs)
	surface water flow into SW-003	Q s3 =	0.71 (cfs)
	surface water flow into SW-004	Q s4 =	3.00 (cfs)
	surface water flow into SW-004A	Q s4A =	10.93 (cfs)
	surface water flow into SW-005	Q s5 =	16.16 (cfs)
	surface water inflow from upstream of PM-1	Q sns =	0.00 (cfs)
	surface water flow from West Pit Overflow	Q sms =	0.00 (cfs)
	ground water flow into SW-001	Q g1 =	0.18 (cfs)
	ground water flow into SW-002	Q g2 =	0.38 (cfs)
	ground water flow into SW-003	Q g3 =	0.11 (cfs)
	ground water flow into SW-004	Q g4 =	0.32 (cfs)
	ground water flow into SW-004A	Q g4A =	1.39 (cfs)
	ground water flow into SW-005	Q g5 =	2.27 (cfs)
	ground water seepage from East Pit	Q gep =	0.00 (cfs)
	ground water seepage from West Pit	Q gwp =	0.00 (cfs)
	combined ground water liner leakage from stockpiles	Q gl4 =	0.00 (cfs)
	combined ground water liner leakage/seepage from other mine features	Q gl4a =	0.00 (cfs)
Input Concentration Data	concentration of surface water into SW-001	C s1 =	0 (µg/L)
	concentration of surface water into SW-002	C s2 =	0 (µg/L)
	concentration of surface water into SW-003	C s3 =	0 (µg/L)
	concentration of surface water into SW-004	C s4 =	0 (µg/L)
	concentration of surface water into SW-004A	C s4A =	0 (µg/L)
	concentration of surface water into SW-005	C s5 =	0 (µg/L)
	concentration of surface water inflow from upstream of PM-1	C sns =	1.55 (µg/L)
	concentration of surface water flow from West Pit Overflow	C sms =	0 (µg/L)
	concentration of ground water into SW-001	C g1 =	16.28 (µg/L)
	concentration of ground water into SW-002	C g2 =	16.28 (µg/L)
	concentration of ground water into SW-003	C g3 =	16.28 (µg/L)
	concentration of ground water into SW-004	C g4 =	16.28 (µg/L)
	concentration of ground water into SW-004A	C g4A =	16.28 (µg/L)
	concentration of ground water into SW-005	C g5 =	16.28 (µg/L)
	concentration of ground water seepage from East Pit	C gep =	0 (µg/L)
	concentration of ground water seepage from West Pit	C gwp =	0 (µg/L)
	concentration of combined ground water liner leakage from stockpiles	C gl4 =	0 (µg/L)
	concentration of combined ground water liner leakage/seepage from other mine features	C gl4a =	0 (µg/L)
Water Balance	flow in river at SW-001	Q r1 =	2.26 (cfs)
	flow in river at SW-002	Q r2 =	5.11 (cfs)
	flow in river at SW-003	Q r3 =	5.93 (cfs)
	flow in river at SW-004	Q r4 =	9.25 (cfs)
	flow in river at SW-004A	Q r4A =	21.57 (cfs)
	flow in river at SW-005	Q r5 =	40.00 (cfs)
	flow check	Q ck =	40.00 (cfs)
Calculation of Mass Flux	mass flux of surface water into SW-001	M s1 =	0 (µg/s)
	mass flux of surface water into SW-002	M s2 =	0 (µg/s)
	mass flux of surface water into SW-003	M s3 =	0 (µg/s)
	mass flux of surface water into SW-004	M s4 =	0 (µg/s)
	mass flux of surface water into SW-004A	M s4A =	0 (µg/s)
	mass flux of surface water into SW-005	M s5 =	0 (µg/s)
	mass flux of surface water inflow from upstream of PM-1	M sns =	0 (µg/s)
	mass flux of surface water flow from West Pit Overflow	M sms =	0 (µg/s)
	mass flux of ground water into SW-001	M g1 =	83 (µg/s)
	mass flux of ground water into SW-002	M g2 =	175 (µg/s)
	mass flux of ground water into SW-003	M g3 =	51 (µg/s)
	mass flux of ground water into SW-004	M g4 =	147 (µg/s)
	mass flux of ground water into SW-004A	M g4A =	640 (µg/s)
	mass flux of ground water into SW-005	M g5 =	1046 (µg/s)
	mass flux of seepage from East Pit	M gep =	0 (µg/s)
	mass flux of seepage from West Pit	M gwp =	0 (µg/s)
	mass flux of combined ground water liner leakage from stockpiles	M gl4 =	0 (µg/s)
	mass flux of combined ground water liner leakage/seepage from other mine features	M gl4a =	0 (µg/s)
Mass Balance	mass flux in river at SW-001	M r1 =	83 (µg/s)
	mass flux in river at SW-002	M r2 =	258 (µg/s)
	mass flux in river at SW-003	M r3 =	309 (µg/s)
	mass flux in river at SW-004	M r4 =	456 (µg/s)
	mass flux in river at SW-004A	M r4A =	1097 (µg/s)
	mass flux in river at SW-005	M r5 =	2142 (µg/s)
Calculation of Concentration	concentration in river at SW-001	C r1 =	1.3 (µg/L)
	concentration in river at SW-002	C r2 =	1.8 (µg/L)
	concentration in river at SW-003	C r3 =	1.8 (µg/L)
	concentration in river at SW-004	C r4 =	1.7 (µg/L)
	concentration in river at SW-004A	C r4A =	1.8 (µg/L)
	concentration in river at SW-005	C r5 =	1.9 (µg/L)
Baseline Data	Observed concentration in river at SW-002		0.75 (µg/L)
	Observed concentration in river at SW-003		1.63 (µg/L)
	Observed concentration in river at SW-004		1.9 (µg/L)
	Observed concentration in river at SW-005		2.07 (µg/L)

Partridge River Model - Calibration to Baseline Water Quality Data			
Parameter: Lead			
Input Flow Data	surface water flow into SW-001	Q s1 =	1.23 (cfs)
	surface water flow into SW-002	Q s2 =	1.40 (cfs)
	surface water flow into SW-003	Q s3 =	0.40 (cfs)
	surface water flow into SW-004	Q s4 =	1.76 (cfs)
	surface water flow into SW-004A	Q s4A =	6.31 (cfs)
	surface water flow into SW-005	Q s5 =	9.25 (cfs)
	surface water inflow from upstream of PM-1	Q sns =	0.00 (cfs)
	surface water flow from West Pit Overflow	Q sms =	0.00 (cfs)
	ground water flow into SW-001	Q g1 =	0.18 (cfs)
	ground water flow into SW-002	Q g2 =	0.38 (cfs)
	ground water flow into SW-003	Q g3 =	0.11 (cfs)
	ground water flow into SW-004	Q g4 =	0.32 (cfs)
	ground water flow into SW-004A	Q g4A =	1.39 (cfs)
	ground water flow into SW-005	Q g5 =	2.27 (cfs)
	ground water seepage from East Pit	Q gep =	0.00 (cfs)
	ground water seepage from West Pit	Q gwp =	0.00 (cfs)
	combined ground water liner leakage from stockpiles	Q gl4 =	0.00 (cfs)
	combined ground water liner leakage/seepage from other mine features	Q gl4a =	0.00 (cfs)
Input Concentration Data	concentration of surface water into SW-001	C s1 =	0.5 µg/L
	concentration of surface water into SW-002	C s2 =	0.5 µg/L
	concentration of surface water into SW-003	C s3 =	0.5 µg/L
	concentration of surface water into SW-004	C s4 =	0.5 µg/L
	concentration of surface water into SW-004A	C s4A =	0.5 µg/L
	concentration of surface water into SW-005	C s5 =	0.5 µg/L
	concentration of surface water inflow from upstream of PM-1	C sns =	0.15 µg/L
	concentration of surface water flow from West Pit Overflow	C sms =	0 µg/L
	concentration of ground water into SW-001	C g1 =	1.12 µg/L
	concentration of ground water into SW-002	C g2 =	1.12 µg/L
	concentration of ground water into SW-003	C g3 =	1.12 µg/L
	concentration of ground water into SW-004	C g4 =	1.12 µg/L
	concentration of ground water into SW-004A	C g4A =	1.12 µg/L
	concentration of ground water into SW-005	C g5 =	1.12 µg/L
	concentration of ground water seepage from East Pit	C gep =	0 µg/L
	concentration of ground water seepage from West Pit	C gwp =	0 µg/L
	concentration of combined ground water liner leakage from stockpiles	C gl4 =	0 µg/L
	concentration of combined ground water liner leakage/seepage from other mine features	C gl4a =	0 µg/L
Water Balance	flow in river at SW-001	Q r1 =	1.41 (cfs)
	flow in river at SW-002	Q r2 =	3.20 (cfs)
	flow in river at SW-003	Q r3 =	3.71 (cfs)
	flow in river at SW-004	Q r4 =	5.78 (cfs)
	flow in river at SW-004A	Q r4A =	13.48 (cfs)
	flow in river at SW-005	Q r5 =	25.00 (cfs)
	flow check	Q ck =	25.00 (cfs)
Calculation of Mass Flux	mass flux of surface water into SW-001	M s1 =	17 (µg/s)
	mass flux of surface water into SW-002	M s2 =	20 (µg/s)
	mass flux of surface water into SW-003	M s3 =	6 (µg/s)
	mass flux of surface water into SW-004	M s4 =	25 (µg/s)
	mass flux of surface water into SW-004A	M s4A =	89 (µg/s)
	mass flux of surface water into SW-005	M s5 =	131 (µg/s)
	mass flux of surface water inflow from upstream of PM-1	M sns =	0 (µg/s)
	mass flux of surface water flow from West Pit Overflow	M sms =	0 (µg/s)
	mass flux of ground water into SW-001	M g1 =	6 (µg/s)
	mass flux of ground water into SW-002	M g2 =	12 (µg/s)
	mass flux of ground water into SW-003	M g3 =	3 (µg/s)
	mass flux of ground water into SW-004	M g4 =	10 (µg/s)
	mass flux of ground water into SW-004A	M g4A =	44 (µg/s)
	mass flux of ground water into SW-005	M g5 =	72 (µg/s)
	mass flux of seepage from East Pit	M gep =	0 (µg/s)
	mass flux of seepage from West Pit	M gwp =	0 (µg/s)
	mass flux of combined ground water liner leakage from stockpiles	M gl4 =	0 (µg/s)
	mass flux of combined ground water liner leakage/seepage from other mine features	M gl4a =	0 (µg/s)
Mass Balance	mass flux in river at SW-001	M r1 =	23 (µg/s)
	mass flux in river at SW-002	M r2 =	55 (µg/s)
	mass flux in river at SW-003	M r3 =	64 (µg/s)
	mass flux in river at SW-004	M r4 =	99 (µg/s)
	mass flux in river at SW-004A	M r4A =	233 (µg/s)
	mass flux in river at SW-005	M r5 =	435 (µg/s)
Calculation of Concentration	concentration in river at SW-001	C r1 =	0.6 µg/L
	concentration in river at SW-002	C r2 =	0.6 µg/L
	concentration in river at SW-003	C r3 =	0.6 µg/L
	concentration in river at SW-004	C r4 =	0.6 µg/L
	concentration in river at SW-004A	C r4A =	0.6 µg/L
	concentration in river at SW-005	C r5 =	0.6 µg/L
Baseline Data	Observed concentration in river at SW-002		0.3 µg/L
	Observed concentration in river at SW-003		0.2 µg/L
	Observed concentration in river at SW-004		ND (0.3) µg/L
	Observed concentration in river at SW-005		0.81 µg/L

Partridge River Model - Calibration to Baseline Water Quality Data			
Parameter: Antimony			
Input Flow Data	surface water flow into SW-001	Q s1 =	1.23 (cfs)
	surface water flow into SW-002	Q s2 =	1.40 (cfs)
	surface water flow into SW-003	Q s3 =	0.40 (cfs)
	surface water flow into SW-004	Q s4 =	1.76 (cfs)
	surface water flow into SW-004A	Q s4A =	6.31 (cfs)
	surface water flow into SW-005	Q s5 =	9.25 (cfs)
	surface water inflow from upstream of PM-1	Q sns =	0.00 (cfs)
	surface water flow from West Pit Overflow	Q sms =	0.00 (cfs)
	ground water flow into SW-001	Q g1 =	0.18 (cfs)
	ground water flow into SW-002	Q g2 =	0.38 (cfs)
	ground water flow into SW-003	Q g3 =	0.11 (cfs)
	ground water flow into SW-004	Q g4 =	0.32 (cfs)
	ground water flow into SW-004A	Q g4A =	1.39 (cfs)
	ground water flow into SW-005	Q g5 =	2.27 (cfs)
	ground water seepage from East Pit	Q gep =	0.00 (cfs)
	ground water seepage from West Pit	Q gwp =	0.00 (cfs)
	combined ground water liner leakage from stockpiles	Q gl4 =	0.00 (cfs)
	combined ground water liner leakage/seepage from other mine features	Q gl4a =	0.00 (cfs)
Input Concentration Data	concentration of surface water into SW-001	C s1 =	1.5 µg/L
	concentration of surface water into SW-002	C s2 =	1.5 µg/L
	concentration of surface water into SW-003	C s3 =	1.5 µg/L
	concentration of surface water into SW-004	C s4 =	1.5 µg/L
	concentration of surface water into SW-004A	C s4A =	1.5 µg/L
	concentration of surface water into SW-005	C s5 =	1.5 µg/L
	concentration of surface water inflow from upstream of PM-1	C sns =	1.5 µg/L
	concentration of surface water flow from West Pit Overflow	C sms =	0 µg/L
	concentration of ground water into SW-001	C g1 =	1.5 µg/L
	concentration of ground water into SW-002	C g2 =	1.5 µg/L
	concentration of ground water into SW-003	C g3 =	1.5 µg/L
	concentration of ground water into SW-004	C g4 =	1.5 µg/L
	concentration of ground water into SW-004A	C g4A =	1.5 µg/L
	concentration of ground water into SW-005	C g5 =	1.5 µg/L
	concentration of ground water seepage from East Pit	C gep =	0 µg/L
	concentration of ground water seepage from West Pit	C gwp =	0 µg/L
	concentration of combined ground water liner leakage from stockpiles	C gl4 =	0 µg/L
	concentration of combined ground water liner leakage/seepage from other mine features	C gl4a =	0 µg/L
Water Balance	flow in river at SW-001	Q r1 =	1.41 (cfs)
	flow in river at SW-002	Q r2 =	3.20 (cfs)
	flow in river at SW-003	Q r3 =	3.71 (cfs)
	flow in river at SW-004	Q r4 =	5.78 (cfs)
	flow in river at SW-004A	Q r4A =	13.48 (cfs)
	flow in river at SW-005	Q r5 =	25.00 (cfs)
	flow check	Q ck =	25.00 (cfs)
Calculation of Mass Flux	mass flux of surface water into SW-001	M s1 =	52 (µg/s)
	mass flux of surface water into SW-002	M s2 =	60 (µg/s)
	mass flux of surface water into SW-003	M s3 =	17 (µg/s)
	mass flux of surface water into SW-004	M s4 =	74 (µg/s)
	mass flux of surface water into SW-004A	M s4A =	268 (µg/s)
	mass flux of surface water into SW-005	M s5 =	393 (µg/s)
	mass flux of surface water inflow from upstream of PM-1	M sns =	0 (µg/s)
	mass flux of surface water flow from West Pit Overflow	M sms =	0 (µg/s)
	mass flux of ground water into SW-001	M g1 =	8 (µg/s)
	mass flux of ground water into SW-002	M g2 =	16 (µg/s)
	mass flux of ground water into SW-003	M g3 =	5 (µg/s)
	mass flux of ground water into SW-004	M g4 =	14 (µg/s)
	mass flux of ground water into SW-004A	M g4A =	59 (µg/s)
	mass flux of ground water into SW-005	M g5 =	96 (µg/s)
	mass flux of seepage from East Pit	M gep =	0 (µg/s)
	mass flux of seepage from West Pit	M gwp =	0 (µg/s)
	mass flux of combined ground water liner leakage from stockpiles	M gl4 =	0 (µg/s)
	mass flux of combined ground water liner leakage/seepage from other mine features	M gl4a =	0 (µg/s)
Mass Balance	mass flux in river at SW-001	M r1 =	60 (µg/s)
	mass flux in river at SW-002	M r2 =	136 (µg/s)
	mass flux in river at SW-003	M r3 =	157 (µg/s)
	mass flux in river at SW-004	M r4 =	245 (µg/s)
	mass flux in river at SW-004A	M r4A =	572 (µg/s)
	mass flux in river at SW-005	M r5 =	1061 (µg/s)
Calculation of Concentration	concentration in river at SW-001	C r1 =	1.5 µg/L
	concentration in river at SW-002	C r2 =	1.5 µg/L
	concentration in river at SW-003	C r3 =	1.5 µg/L
	concentration in river at SW-004	C r4 =	1.5 µg/L
	concentration in river at SW-004A	C r4A =	1.5 µg/L
	concentration in river at SW-005	C r5 =	1.5 µg/L
Baseline Data	Observed concentration in river at SW-002		ND (3) µg/L
	Observed concentration in river at SW-003		ND (3) µg/L
	Observed concentration in river at SW-004		ND (3) µg/L
	Observed concentration in river at SW-005		ND (3) µg/L

Partridge River Model - Calibration to Baseline Water Quality Data			
Parameter: Selenium			
Input Flow Data	surface water flow into SW-001	Q s1 =	0.39 (cfs)
	surface water flow into SW-002	Q s2 =	0.33 (cfs)
	surface water flow into SW-003	Q s3 =	0.09 (cfs)
	surface water flow into SW-004	Q s4 =	0.51 (cfs)
	surface water flow into SW-004A	Q s4A =	1.69 (cfs)
	surface water flow into SW-005	Q s5 =	2.34 (cfs)
	surface water inflow from upstream of PM-1	Q sns =	0.00 (cfs)
	surface water flow from West Pit Overflow	Q sms =	0.00 (cfs)
	ground water flow into SW-001	Q g1 =	0.18 (cfs)
	ground water flow into SW-002	Q g2 =	0.38 (cfs)
	ground water flow into SW-003	Q g3 =	0.11 (cfs)
	ground water flow into SW-004	Q g4 =	0.32 (cfs)
	ground water flow into SW-004A	Q g4A =	1.39 (cfs)
	ground water flow into SW-005	Q g5 =	2.27 (cfs)
	ground water seepage from East Pit	Q gep =	0.00 (cfs)
	ground water seepage from West Pit	Q gwp =	0.00 (cfs)
	combined ground water liner leakage from stockpiles	Q gl4 =	0.00 (cfs)
	combined ground water liner leakage/seepage from other mine features	Q gl4a =	0.00 (cfs)
Input Concentration Data	concentration of surface water into SW-001	C s1 =	0 µg/L
	concentration of surface water into SW-002	C s2 =	0 µg/L
	concentration of surface water into SW-003	C s3 =	0 µg/L
	concentration of surface water into SW-004	C s4 =	0 µg/L
	concentration of surface water into SW-004A	C s4A =	0 µg/L
	concentration of surface water into SW-005	C s5 =	0 µg/L
	concentration of surface water inflow from upstream of PM-1	C sns =	0.5 µg/L
	concentration of surface water flow from West Pit Overflow	C sms =	0 µg/L
	concentration of ground water into SW-001	C g1 =	1.91 µg/L
	concentration of ground water into SW-002	C g2 =	1.91 µg/L
	concentration of ground water into SW-003	C g3 =	1.91 µg/L
	concentration of ground water into SW-004	C g4 =	1.91 µg/L
	concentration of ground water into SW-004A	C g4A =	1.91 µg/L
	concentration of ground water into SW-005	C g5 =	1.91 µg/L
	concentration of ground water seepage from East Pit	C gep =	0 µg/L
	concentration of ground water seepage from West Pit	C gwp =	0 µg/L
	concentration of combined ground water liner leakage from stockpiles	C gl4 =	0 µg/L
	concentration of combined ground water liner leakage/seepage from other mine features	C gl4a =	0 µg/L
Water Balance	flow in river at SW-001	Q r1 =	0.57 (cfs)
	flow in river at SW-002	Q r2 =	1.28 (cfs)
	flow in river at SW-003	Q r3 =	1.48 (cfs)
	flow in river at SW-004	Q r4 =	2.31 (cfs)
	flow in river at SW-004A	Q r4A =	5.39 (cfs)
	flow in river at SW-005	Q r5 =	10.00 (cfs)
	flow check	Q ck =	10.00 (cfs)
Calculation of Mass Flux	mass flux of surface water into SW-001	M s1 =	0 (µg/s)
	mass flux of surface water into SW-002	M s2 =	0 (µg/s)
	mass flux of surface water into SW-003	M s3 =	0 (µg/s)
	mass flux of surface water into SW-004	M s4 =	0 (µg/s)
	mass flux of surface water into SW-004A	M s4A =	0 (µg/s)
	mass flux of surface water into SW-005	M s5 =	0 (µg/s)
	mass flux of surface water inflow from upstream of PM-1	M sns =	0 (µg/s)
	mass flux of surface water flow from West Pit Overflow	M sms =	0 (µg/s)
	mass flux of ground water into SW-001	M g1 =	10 (µg/s)
	mass flux of ground water into SW-002	M g2 =	21 (µg/s)
	mass flux of ground water into SW-003	M g3 =	6 (µg/s)
	mass flux of ground water into SW-004	M g4 =	17 (µg/s)
	mass flux of ground water into SW-004A	M g4A =	75 (µg/s)
	mass flux of ground water into SW-005	M g5 =	123 (µg/s)
	mass flux of seepage from East Pit	M gep =	0 (µg/s)
	mass flux of seepage from West Pit	M gwp =	0 (µg/s)
	mass flux of combined ground water liner leakage from stockpiles	M gl4 =	0 (µg/s)
	mass flux of combined ground water liner leakage/seepage from other mine features	M gl4a =	0 (µg/s)
Mass Balance	mass flux in river at SW-001	M r1 =	10 (µg/s)
	mass flux in river at SW-002	M r2 =	30 (µg/s)
	mass flux in river at SW-003	M r3 =	36 (µg/s)
	mass flux in river at SW-004	M r4 =	54 (µg/s)
	mass flux in river at SW-004A	M r4A =	129 (µg/s)
	mass flux in river at SW-005	M r5 =	251 (µg/s)
Calculation of Concentration	concentration in river at SW-001	C r1 =	0.6 µg/L
	concentration in river at SW-002	C r2 =	0.8 µg/L
	concentration in river at SW-003	C r3 =	0.9 µg/L
	concentration in river at SW-004	C r4 =	0.8 µg/L
	concentration in river at SW-004A	C r4A =	0.8 µg/L
	concentration in river at SW-005	C r5 =	0.9 µg/L
Baseline Data	Observed concentration in river at SW-002		ND (1) µg/L
	Observed concentration in river at SW-003		ND (1) µg/L
	Observed concentration in river at SW-004		ND (1) µg/L
	Observed concentration in river at SW-005		ND (1) µg/L

Partridge River Model - Calibration to Baseline Water Quality Data

Parameter: Sulfate

Input Flow Data	surface water flow into SW-001	Q s1 =	2.87 (cfs)
	surface water flow into SW-002	Q s2 =	3.47 (cfs)
	surface water flow into SW-003	Q s3 =	1.00 (cfs)
	surface water flow into SW-004	Q s4 =	4.16 (cfs)
	surface water flow into SW-004A	Q s4A =	15.24 (cfs)
	surface water flow into SW-005	Q s5 =	22.61 (cfs)
	surface water inflow from upstream of PM-1	Q sns =	0.00 (cfs)
	surface water flow from West Pit Overflow	Q sms =	0.00 (cfs)
	ground water flow into SW-001	Q g1 =	0.18 (cfs)
	ground water flow into SW-002	Q g2 =	0.38 (cfs)
	ground water flow into SW-003	Q g3 =	0.11 (cfs)
	ground water flow into SW-004	Q g4 =	0.32 (cfs)
	ground water flow into SW-004A	Q g4A =	1.39 (cfs)
	ground water flow into SW-005	Q g5 =	2.27 (cfs)
	ground water seepage from East Pit	Q gep =	0.00 (cfs)
	ground water seepage from West Pit	Q gwp =	0.00 (cfs)
	combined ground water liner leakage from stockpiles	Q gl4 =	0.00 (cfs)
	combined ground water liner leakage/seepage from other mine features	Q gl4a =	0.00 (cfs)

Input Concentration Data	concentration of surface water into SW-001	C s1 =	9 (mg/l)
	concentration of surface water into SW-002	C s2 =	9 (mg/l)
	concentration of surface water into SW-003	C s3 =	9 (mg/l)
	concentration of surface water into SW-004	C s4 =	9 (mg/l)
	concentration of surface water into SW-004A	C s4A =	9 (mg/l)
	concentration of surface water into SW-005	C s5 =	9 (mg/l)
	concentration of surface water inflow from upstream of PM-1	C sns =	22 (mg/l)
	concentration of surface water flow from West Pit Overflow	C sms =	158 (mg/l)
	concentration of ground water into SW-001	C g1 =	16.13 (mg/l)
	concentration of ground water into SW-002	C g2 =	16.13 (mg/l)
	concentration of ground water into SW-003	C g3 =	16.13 (mg/l)
	concentration of ground water into SW-004	C g4 =	16.13 (mg/l)
	concentration of ground water into SW-004A	C g4A =	16.13 (mg/l)
	concentration of ground water into SW-005	C g5 =	16.13 (mg/l)
	concentration of ground water seepage from East Pit	C gep =	370 (mg/l)
	concentration of ground water seepage from West Pit	C gwp =	158 (mg/l)
	concentration of combined ground water liner leakage from stockpiles	C gl4 =	0 (mg/l)
	concentration of combined ground water liner leakage/seepage from other mine features	C gl4a =	0 (mg/l)

Water Balance	flow in river at SW-001	Q r1 =	3.05 (cfs)
	flow in river at SW-002	Q r2 =	6.90 (cfs)
	flow in river at SW-003	Q r3 =	8.01 (cfs)
	flow in river at SW-004	Q r4 =	12.49 (cfs)
	flow in river at SW-004A	Q r4A =	29.12 (cfs)
	flow in river at SW-005	Q r5 =	54.00 (cfs)
	flow check	Q ck =	54.00 (cfs)

Calculation of Mass Flux	mass flux of surface water into SW-001	M s1 =	731 (mg/s)
	mass flux of surface water into SW-002	M s2 =	884 (mg/s)
	mass flux of surface water into SW-003	M s3 =	254 (mg/s)
	mass flux of surface water into SW-004	M s4 =	1060 (mg/s)
	mass flux of surface water into SW-004A	M s4A =	3882 (mg/s)
	mass flux of surface water into SW-005	M s5 =	5758 (mg/s)
	mass flux of surface water inflow from upstream of PM-1	M sns =	0 (mg/s)
	mass flux of surface water flow from West Pit Overflow	M sms =	0 (mg/s)
	mass flux of ground water into SW-001	M g1 =	82 (mg/s)
	mass flux of ground water into SW-002	M g2 =	173 (mg/s)
	mass flux of ground water into SW-003	M g3 =	50 (mg/s)
	mass flux of ground water into SW-004	M g4 =	146 (mg/s)
	mass flux of ground water into SW-004A	M g4A =	635 (mg/s)
	mass flux of ground water into SW-005	M g5 =	1036 (mg/s)
	mass flux of seepage from East Pit	M gep =	0 (mg/s)
	mass flux of seepage from West Pit	M gwp =	0 (mg/s)
	mass flux of combined ground water liner leakage from stockpiles	M gl4 =	0 (mg/s)
	mass flux of combined ground water liner leakage/seepage from other mine features	M gl4a =	0 (mg/s)

Mass Balance	mass flux in river at SW-001	M r1 =	813 (mg/s)
	mass flux in river at SW-002	M r2 =	1871 (mg/s)
	mass flux in river at SW-003	M r3 =	2175 (mg/s)
	mass flux in river at SW-004	M r4 =	3381 (mg/s)
	mass flux in river at SW-004A	M r4A =	7898 (mg/s)
	mass flux in river at SW-005	M r5 =	14692 (mg/s)

Calculation of Concentration	concentration in river at SW-001	C r1 =	9.4 (mg/l)
	concentration in river at SW-002	C r2 =	9.6 (mg/l)
	concentration in river at SW-003	C r3 =	9.6 (mg/l)
	concentration in river at SW-004	C r4 =	9.6 (mg/l)
	concentration in river at SW-004A	C r4A =	9.6 (mg/l)
	concentration in river at SW-005	C r5 =	9.6 (mg/l)

Baseline Data	Observed concentration in river at SW-002		6.3 (mg/l)
	Observed concentration in river at SW-003		10.9 (mg/l)
	Observed concentration in river at SW-004		10.0 (mg/l)
	Observed concentration in river at SW-005		9.0 (mg/l)

Partridge River Model - Calibration to Baseline Water Quality Data			
Parameter: Thallium			
Input Flow Data	surface water flow into SW-001	Q s1 =	0.39 (cfs)
	surface water flow into SW-002	Q s2 =	0.33 (cfs)
	surface water flow into SW-003	Q s3 =	0.09 (cfs)
	surface water flow into SW-004	Q s4 =	0.51 (cfs)
	surface water flow into SW-004A	Q s4A =	1.69 (cfs)
	surface water flow into SW-005	Q s5 =	2.34 (cfs)
	surface water inflow from upstream of PM-1	Q sns =	0.00 (cfs)
	surface water flow from West Pit Overflow	Q sms =	0.00 (cfs)
	ground water flow into SW-001	Q g1 =	0.18 (cfs)
	ground water flow into SW-002	Q g2 =	0.38 (cfs)
	ground water flow into SW-003	Q g3 =	0.11 (cfs)
	ground water flow into SW-004	Q g4 =	0.32 (cfs)
	ground water flow into SW-004A	Q g4A =	1.39 (cfs)
	ground water flow into SW-005	Q g5 =	2.27 (cfs)
	ground water seepage from East Pit	Q gep =	0.00 (cfs)
	ground water seepage from West Pit	Q gwp =	0.00 (cfs)
	combined ground water liner leakage from stockpiles	Q gl4 =	0.00 (cfs)
	combined ground water liner leakage/seepage from other mine features	Q gl4a =	0.00 (cfs)
Input Concentration Data	concentration of surface water into SW-001	C s1 =	0.4 µg/L
	concentration of surface water into SW-002	C s2 =	0.4 µg/L
	concentration of surface water into SW-003	C s3 =	0.4 µg/L
	concentration of surface water into SW-004	C s4 =	0.4 µg/L
	concentration of surface water into SW-004A	C s4A =	0.4 µg/L
	concentration of surface water into SW-005	C s5 =	0.4 µg/L
	concentration of surface water inflow from upstream of PM-1	C sns =	0.286 µg/L
	concentration of surface water flow from West Pit Overflow	C sms =	0 µg/L
	concentration of ground water into SW-001	C g1 =	0.004 µg/L
	concentration of ground water into SW-002	C g2 =	0.004 µg/L
	concentration of ground water into SW-003	C g3 =	0.004 µg/L
	concentration of ground water into SW-004	C g4 =	0.004 µg/L
	concentration of ground water into SW-004A	C g4A =	0.004 µg/L
	concentration of ground water into SW-005	C g5 =	0.004 µg/L
	concentration of ground water seepage from East Pit	C gep =	0 µg/L
	concentration of ground water seepage from West Pit	C gwp =	0 µg/L
	concentration of combined ground water liner leakage from stockpiles	C gl4 =	0 µg/L
	concentration of combined ground water liner leakage/seepage from other mine features	C gl4a =	0 µg/L
Water Balance	flow in river at SW-001	Q r1 =	0.57 (cfs)
	flow in river at SW-002	Q r2 =	1.28 (cfs)
	flow in river at SW-003	Q r3 =	1.48 (cfs)
	flow in river at SW-004	Q r4 =	2.31 (cfs)
	flow in river at SW-004A	Q r4A =	5.39 (cfs)
	flow in river at SW-005	Q r5 =	10.00 (cfs)
	flow check	Q ck =	10.00 (cfs)
Calculation of Mass Flux	mass flux of surface water into SW-001	M s1 =	4 (µg/s)
	mass flux of surface water into SW-002	M s2 =	4 (µg/s)
	mass flux of surface water into SW-003	M s3 =	1 (µg/s)
	mass flux of surface water into SW-004	M s4 =	6 (µg/s)
	mass flux of surface water into SW-004A	M s4A =	19 (µg/s)
	mass flux of surface water into SW-005	M s5 =	26 (µg/s)
	mass flux of surface water inflow from upstream of PM-1	M sns =	0 (µg/s)
	mass flux of surface water flow from West Pit Overflow	M sms =	0 (µg/s)
	mass flux of ground water into SW-001	M g1 =	0 (µg/s)
	mass flux of ground water into SW-002	M g2 =	0 (µg/s)
	mass flux of ground water into SW-003	M g3 =	0 (µg/s)
	mass flux of ground water into SW-004	M g4 =	0 (µg/s)
	mass flux of ground water into SW-004A	M g4A =	0 (µg/s)
	mass flux of ground water into SW-005	M g5 =	0 (µg/s)
	mass flux of seepage from East Pit	M gep =	0 (µg/s)
	mass flux of seepage from West Pit	M gwp =	0 (µg/s)
	mass flux of combined ground water liner leakage from stockpiles	M gl4 =	0 (µg/s)
	mass flux of combined ground water liner leakage/seepage from other mine features	M gl4a =	0 (µg/s)
Mass Balance	mass flux in river at SW-001	M r1 =	4 (µg/s)
	mass flux in river at SW-002	M r2 =	8 (µg/s)
	mass flux in river at SW-003	M r3 =	9 (µg/s)
	mass flux in river at SW-004	M r4 =	15 (µg/s)
	mass flux in river at SW-004A	M r4A =	34 (µg/s)
	mass flux in river at SW-005	M r5 =	61 (µg/s)
Calculation of Concentration	concentration in river at SW-001	C r1 =	0.3 µg/L
	concentration in river at SW-002	C r2 =	0.2 µg/L
	concentration in river at SW-003	C r3 =	0.2 µg/L
	concentration in river at SW-004	C r4 =	0.2 µg/L
	concentration in river at SW-004A	C r4A =	0.2 µg/L
	concentration in river at SW-005	C r5 =	0.2 µg/L
Baseline Data	Observed concentration in river at SW-002		ND (0.4) µg/L
	Observed concentration in river at SW-003		ND (0.4) µg/L
	Observed concentration in river at SW-004		ND (0.4) µg/L
	Observed concentration in river at SW-005		ND (0.4) µg/L

Partridge River Model - Calibration to Baseline Water Quality Data			
Parameter: Zinc			
Input Flow Data	surface water flow into SW-001	Q s1 =	4.71 (cfs)
	surface water flow into SW-002	Q s2 =	5.79 (cfs)
	surface water flow into SW-003	Q s3 =	1.66 (cfs)
	surface water flow into SW-004	Q s4 =	6.86 (cfs)
	surface water flow into SW-004A	Q s4A =	25.25 (cfs)
	surface water flow into SW-005	Q s5 =	37.58 (cfs)
	surface water inflow from upstream of PM-1	Q sns =	1.50 (cfs)
	surface water flow from West Pit Overflow	Q sms =	0.00 (cfs)
	ground water flow into SW-001	Q g1 =	0.18 (cfs)
	ground water flow into SW-002	Q g2 =	0.38 (cfs)
	ground water flow into SW-003	Q g3 =	0.11 (cfs)
	ground water flow into SW-004	Q g4 =	0.32 (cfs)
	ground water flow into SW-004A	Q g4A =	1.39 (cfs)
	ground water flow into SW-005	Q g5 =	2.27 (cfs)
	ground water seepage from East Pit	Q gep =	0.00 (cfs)
	ground water seepage from West Pit	Q gwp =	0.00 (cfs)
	combined ground water liner leakage from stockpiles	Q gl4 =	0.00 (cfs)
	combined ground water liner leakage/seepage from other mine features	Q gl4a =	0.00 (cfs)
Input Concentration Data	concentration of surface water into SW-001	C s1 =	16 µg/L
	concentration of surface water into SW-002	C s2 =	16 µg/L
	concentration of surface water into SW-003	C s3 =	16 µg/L
	concentration of surface water into SW-004	C s4 =	16 µg/L
	concentration of surface water into SW-004A	C s4A =	16 µg/L
	concentration of surface water into SW-005	C s5 =	16 µg/L
	concentration of surface water inflow from upstream of PM-1	C sns =	7.33 µg/L
	concentration of surface water flow from West Pit Overflow	C sms =	0 µg/L
	concentration of ground water into SW-001	C g1 =	27.5 µg/L
	concentration of ground water into SW-002	C g2 =	27.5 µg/L
	concentration of ground water into SW-003	C g3 =	27.5 µg/L
	concentration of ground water into SW-004	C g4 =	27.5 µg/L
	concentration of ground water into SW-004A	C g4A =	27.5 µg/L
	concentration of ground water into SW-005	C g5 =	27.5 µg/L
	concentration of ground water seepage from East Pit	C gep =	0 µg/L
	concentration of ground water seepage from West Pit	C gwp =	0 µg/L
	concentration of combined ground water liner leakage from stockpiles	C gl4 =	0 µg/L
	concentration of combined ground water liner leakage/seepage from other mine features	C gl4a =	0 µg/L
Water Balance	flow in river at SW-001	Q r1 =	6.39 (cfs)
	flow in river at SW-002	Q r2 =	12.55 (cfs)
	flow in river at SW-003	Q r3 =	14.33 (cfs)
	flow in river at SW-004	Q r4 =	21.51 (cfs)
	flow in river at SW-004A	Q r4A =	48.15 (cfs)
	flow in river at SW-005	Q r5 =	88.00 (cfs)
	flow check	Q ck =	88.00 (cfs)
Calculation of Mass Flux	mass flux of surface water into SW-001	M s1 =	2131 (µg/s)
	mass flux of surface water into SW-002	M s2 =	2621 (µg/s)
	mass flux of surface water into SW-003	M s3 =	753 (µg/s)
	mass flux of surface water into SW-004	M s4 =	3106 (µg/s)
	mass flux of surface water into SW-004A	M s4A =	11434 (µg/s)
	mass flux of surface water into SW-005	M s5 =	17016 (µg/s)
	mass flux of surface water inflow from upstream of PM-1	M sns =	311 (µg/s)
	mass flux of surface water flow from West Pit Overflow	M sms =	0 (µg/s)
	mass flux of ground water into SW-001	M g1 =	140 (µg/s)
	mass flux of ground water into SW-002	M g2 =	296 (µg/s)
	mass flux of ground water into SW-003	M g3 =	86 (µg/s)
	mass flux of ground water into SW-004	M g4 =	249 (µg/s)
	mass flux of ground water into SW-004A	M g4A =	1082 (µg/s)
	mass flux of ground water into SW-005	M g5 =	1767 (µg/s)
	mass flux of seepage from East Pit	M gep =	0 (µg/s)
Mass Balance	mass flux of seepage from West Pit	M gwp =	0 (µg/s)
	mass flux of combined ground water liner leakage from stockpiles	M gl4 =	0 (µg/s)
	mass flux of combined ground water liner leakage/seepage from other mine features	M gl4a =	0 (µg/s)
	mass flux in river at SW-001	M r1 =	2583 (µg/s)
	mass flux in river at SW-002	M r2 =	5499 (µg/s)
Calculation of Concentration	mass flux in river at SW-003	M r3 =	6338 (µg/s)
	mass flux in river at SW-004	M r4 =	9693 (µg/s)
	mass flux in river at SW-004A	M r4A =	22209 (µg/s)
	mass flux in river at SW-005	M r5 =	40992 (µg/s)
	concentration in river at SW-001	C r1 =	14.3 µg/L
Baseline Data	concentration in river at SW-002	C r2 =	15.5 µg/L
	concentration in river at SW-003	C r3 =	15.6 µg/L
	concentration in river at SW-004	C r4 =	15.9 µg/L
	concentration in river at SW-004A	C r4A =	16.3 µg/L
	concentration in river at SW-005	C r5 =	16.5 µg/L
Observed Data	Observed concentration in river at SW-002		10.1 µg/L
	Observed concentration in river at SW-003		6.4 µg/L
	Observed concentration in river at SW-004		19.2 µg/L
	Observed concentration in river at SW-005		16.7 µg/L