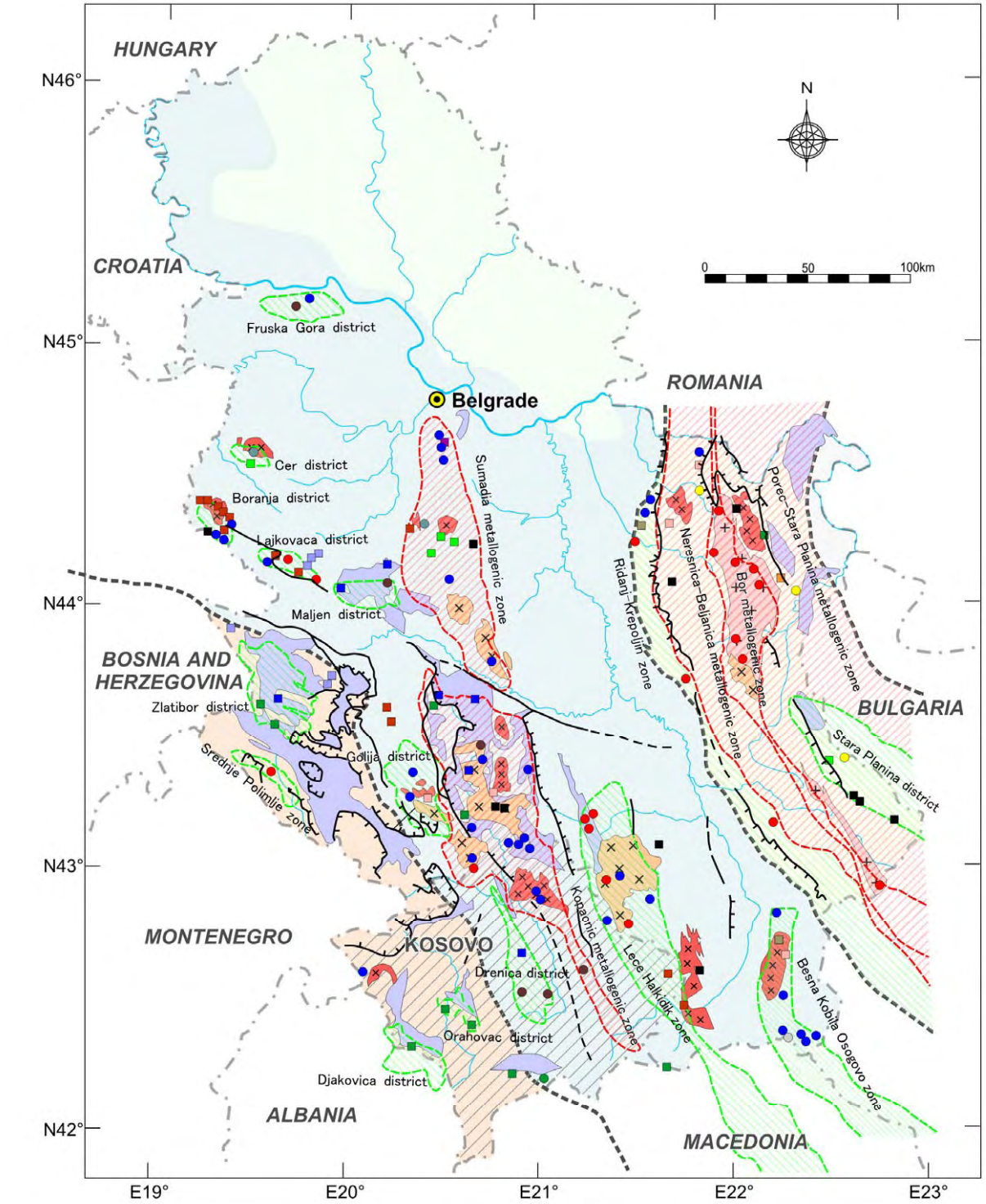
Appendix Ⅰ

1. Metallogenic province of the Republic of Serbia



(Modified Geological Atlas of Serbia 1:2,000,000 No14-Metallogenic map and map of ore formations, 2002)

2. List of Ore Production results from

2-1 Bor

2-1-1 Bor Underground Mine Production (1902-2006)

yr.	high grade ore-body			low grade ore-body			total		
	mined ore(t)	Cu %	Cu (t)	mined ore(t)	Cu %	Cu (t)	mined ore(t)	Cu %	Cu (t)
1902	129						129	0	0
1903	680						680	0	0
1904	5,500	9.000	495				5,500	9.000	495
1905	12,000	9.000	1,080				12,000	9.000	1,080
1906	10,000	9.000	900				10,000	9.000	900
1907	33,887	7.749	2,626				33,887	7.749	2,626
1908	75,873	6.919	5,250				75,873	6.919	5,250
1909	90,313	6.970	6,295				90,313	6.970	6,295
1910	107,871	6.810	7,346				107,871	6.810	7,346
1911	126,937	6.200	7,870				126,937	6.200	7,870
1912	97,634	5.380	5,253				97,634	5.380	5,253
1913	142,546	5.890	8,396				142,546	5.890	8,396
1914	8,750	6.423	562				8,750	6.423	562
1915	1,000	6.400	64				1,000	6.400	64
1916	376,160	6.370	23,961				376,160	6.370	23,961
1917									
1918									
1919	16,016	6.812	1,091				16,016	6.812	1,091
1920	49,080	5.300	2,601				49,080	5.300	2,601
1921	75,567	5.870	4,436				75,567	5.870	4,436
1922	100,884	5.690	5,740				100,884	5.690	5,740
1923	123,060	5.900	7,261				123,060	5.900	7,261
1924	121,419	5.950	7,224				121,419	5.950	7,224
1925	126,768	4.440	5,628				126,768	4.440	5,628
1926	125,867	4.700	5,916				125,867	4.700	5,916
1927	90,345	4.779	4,318				90,345	4.779	4,318
1928	87,239	4.920	4,292				87,239	4.920	4,292
1929	84,987	6.720	5,711				84,987	6.720	5,711
1930	102,125	6.060	6,189				102,125	6.060	6,189
1931	114,030	6.930	7,902				114,030	6.930	7,902
1932	189,448	7.360	13,943	3,283	5.483	180	192,731	7.328	14,123
1933	367,210	7.247	26,612	9,719	3.951	384	376,929	7.162	26,996
1934	476,180	7.459	35,518	96,041	3.830	3,678	572,221	6.850	39,196
1935	489,280	7.199	35,223	107,850	3.589	3,871	597,130	6.547	39,094
1936	482,217	7.602	36,658	122,920	3.668	4,509	605,137	6.803	41,167
1937	500,351	7.390	36,976	150,048	3.229	4,845	650,399	6.430	41,821
1938	484,537	7.649	37,062	243,377	3.258	7,930	727,914	6.181	44,992
1939	375,512	7.238	27,180	480,287	3.705	17,795	855,799	5.255	44,975
1940	233,426	7.183	16,767	541,350	3.571	19,330	774,776	4.659	36,097
1941	103,011	6.964	7,174	134,101	3.620	4,855	237,112	5.073	12,029
1942	178,527	6.429	11,478	122,729	3.891	4,775	301,256	5.395	16,253
1943	111,768	5.778	6,458	223,649	3.540	7,918	335,417	4.286	14,376
1944	31,034	5.881	1,825	138,776	3.670	5,093	169,810	4.074	6,918
1945	64,711	4.491	2,906	104,022	2.979	3,099	168,733	3.559	6,005
1946	54,887	5.038	2,765	317,397	3.419	10,853	372,284	3.658	13,618
1947	106,366	5.600	5,956	351,163	3.560	12,501	457,529	4.034	18,457
1948	67,997	5.728	3,895	388,069	3.280	12,729	456,066	3.645	16,624
1949	67,838	6.681	4,532	355,230	2.850	10,123	423,068	3.464	14,655
1950	88,821	7.095	6,302	372,283	2.900	10,796	461,104	3.708	17,098
1951	138,659	5.679	7,874	302,081	2.611	7,887	440,740	3.576	15,761
1952	123,137	4.468	5,502	315,983	2.531	7,997	439,120	3.074	13,499

yr.	high grade ore-body			low grade ore-body			total		
	mined ore(t)	Cu %	Cu (t)	mined ore(t)	Cu %	Cu (t)	mined ore(t)	Cu %	Cu (t)
1953	115,730	4.494	5,201	348,299	2.300	8,010	464,029	2.847	13,211
1954	115,971	4.856	5,632	381,138	2.000	7,621	497,109	2.666	13,253
1955	98,191	4.533	4,451	432,287	1.511	6,530	530,478	2.070	10,981
1956	96,133	3.525	3,389	408,466	1.459	5,961	504,599	1.853	9,350
1957	98,189	3.944	3,873	468,929	1.420	6,658	567,118	1.857	10,531
1958	104,895	4.098	4,299	863,876	1.231	10,630	968,771	1.541	14,929
1959	78,758	4.984	3,925	729,078	1.250	9,113	807,836	1.614	13,038
1960	60,835	4.146	2,522	675,400	1.130	7,631	736,235	1.379	10,153
1961	40,740	3.446	1,404	544,587	1.150	6,264	585,327	1.310	7,668
1962	6,339	3.628	230	469,084	1.160	5,442	475,423	1.193	5,672
1963				470,804	1.200	5,650	470,804	1.200	5,650
1964	6,365	5.326	339	517,244	1.230	6,363	523,609	1.280	6,702
1965				573,472	1.100	6,308	573,472	1.100	6,308
1966	41,154	7.931	3,264	330,779	1.180	3,903	371,933	1.927	7,167
1967	39,899	7.023	2,802	342,571	1.100	3,769	382,470	1.718	6,571
1968	65,648	7.440	4,884	438,287	1.040	4,560	503,935	1.874	9,444
1969	46,925	6.706	3,147	435,033	1.090	4,743	481,958	1.637	7,890
1970				561,729	1.110	6,235	561,729	1.110	6,235
1971	10,200	7.784	794	532,024	1.150	6,119	542,224	1.275	6,913
1972				501,914	1.286	6,455	501,914	1.286	6,455
1973				602,338	1.320	7,951	602,338	1.320	7,951
1974	62,464	5.253	3,281	651,404	1.173	7,641	713,868	1.530	10,922
1975				755,053	1.302	9,831	755,053	1.302	9,831
1976				625,616	1.249	7,814	625,616	1.249	7,814
1977				354,914	2.039	7,237	354,914	2.039	7,237
1978				496,208	1.550	7,691	496,208	1.550	7,691
1979				277,304	1.998	5,540	277,304	1.998	5,540
1980	23,680	8.117	1,922	353,983	1.329	4,706	377,663	1.755	6,628
1981	14,657	8.931	1,309	320,852	2.640	8,471	335,509	2.915	9,780
1982	32,693	5.610	1,834	500,151	1.480	7,400	532,844	1.733	9,234
1983	81,654	4.559	3,723	476,054	1.190	5,663	557,708	1.683	9,386
1984	117,767	3.190	3,757	304,587	1.060	3,229	422,354	1.654	6,986
1985	107,600	2.540	2,733	540,686	0.890	4,813	648,286	1.164	7,546
1986	127,493	2.720	3,468	771,773	0.980	7,566	899,266	1.227	11,034
1987	116,304	2.960	3,443	733,501	0.970	7,112	849,805	1.242	10,555
1988	118,814	3.660	4,349	730,923	1.020	7,454	849,737	1.389	11,803
1989	106,687	3.630	3,873	739,387	0.969	7,168	846,074	1.305	11,041
1990	93,688	4.630	4,338	787,753	0.920	7,244	881,441	1.314	11,582
1991	44,226	4.590	2,030	1,146,471	0.880	10,091	1,190,697	1.018	12,121
1992				1,364,854	0.780	10,646	1,364,854	0.780	10,646
1993				1,216,161	0.732	8,900	1,216,161	0.732	8,900
1994				1,169,034	0.731	8,541	1,169,034	0.731	8,541
1995				1,744,044	0.709	12,359	1,744,044	0.709	12,359
1996				1,933,909	0.677	13,092	1,933,909	0.677	13,092
1997				1,847,240	0.711	13,135	1,847,240	0.711	13,135
1998				1,904,063	0.704	13,400	1,904,063	0.704	13,400
1999				1,309,698	0.756	9,896	1,309,698	0.756	9,896
2000				1,030,439	0.687	7,078	1,030,439	0.687	7,078
2001				471,959	0.679	3,204	471,959	0.679	3,204
2002				495,290	0.717	3,554	495,290	0.717	3,554
2003				323,785	0.628	2,033	323,785	0.628	2,033
2004				445,983	0.847	3,777	445,983	0.847	3,777
2005				432,382	0.748	3,236	432,382	0.748	3,236
2006				281,358	0.756	2,127	281,358	0.756	2,127

2-1 Bor
2-1-2 Bor Open pit (1924-1993)

yr.	Bor Open Pit				
	mined ore(t)	waste(t)	W/O	Cu (%)	Cu (t)
1924	21,840	ND	–	5.95	1,299
1925	49,290	ND	–	4.43	2,184
1926	96,138	ND	–	4.70	4,518
1927	197,595	ND	–	4.78	9,445
1928	240,509	235,689	0.98	4.92	11,833
1929	244,265	347,203	1.42	6.72	16,414
1930	391,225	392,340	1.00	6.06	23,708
1931	342,750	367,803	1.07	6.93	23,752
1932	113,692	58,192	0.51	7.36	8,367
1933	199,628	67,270	0.34	7.18	14,333
1934	89,794	6,072	0.07	7.31	6,560
1935	51,420	0	0.00	6.53	3,357
1936	4,353	8,196	1.88	7.40	322
1937	0	219,739	–	0.00	0
1938	31,597	131,142	4.15	3.26	1,030
1939	125,104	88,592	0.71	5.20	6,505
1940	154,400	178,075	1.15	4.74	7,318
1941	57,887	196,322	3.39	5.23	3,027
1942	232,395	240,951	1.04	5.75	13,362
1943	231,405	2,560,675	11.07	4.52	10,459
1944	51,347	1,666,750	32.46	4.13	2,120
1945	81,913	56,202	0.69	3.64	2,982
1946	268,021	1,059,487	3.95	3.75	10,050
1947	354,139	2,118,785	5.98	4.11	14,555
1948	593,656	1,982,731	3.34	3.91	23,211
1949	536,351	1,815,342	3.38	3.89	20,854
1950	654,675	1,848,535	2.82	3.88	25,401
1951	732,459	2,097,404	2.86	3.21	23,520
1952	827,216	2,385,707	2.88	2.85	23,576
1953	879,534	2,227,637	2.53	2.63	23,132
1954	801,751	1,769,159	2.21	2.48	19,883
1955	945,385	1,747,080	1.85	1.97	18,624
1956	1,335,255	1,527,707	1.14	1.83	24,453
1957	1,090,180	1,613,143	1.48	1.84	20,107
1958	1,299,175	1,667,449	1.28	1.55	20,137
1959	1,225,914	1,370,159	1.12	1.71	20,963
1960	1,634,103	1,199,683	0.73	1.40	22,879
1961	1,779,312	1,459,636	0.82	1.28	22,775
1962	1,683,769	1,992,010	1.18	1.27	21,384
1963	1,662,644	2,695,691	1.62	1.40	23,277
1964	1,757,669	3,302,300	1.88	1.38	24,255
1965	1,749,813	3,204,960	1.83	1.35	23,622
1966	1,686,457	2,874,718	1.70	1.54	25,971
1967	1,809,530	3,254,376	1.80	1.47	26,600
1968	1,843,588	3,958,041	2.15	1.50	27,654
1969	1,934,284	4,215,550	2.18	1.54	29,788
1970	1,916,127	4,854,162	2.53	1.57	30,104
1971	1,979,013	5,052,536	2.55	1.58	31,268
1972	1,904,355	4,676,317	2.46	1.56	29,708
1973	2,373,469	5,857,846	2.47	1.32	31,330
1974	3,112,861	5,164,592	1.66	1.21	37,664

yr.	Bor Open Pit				
	mined ore(t)	waste(t)	W/O	Cu (%)	Cu (t)
1975	3,431,014	6,907,747	2.01	1.11	38,031
1976	3,590,856	6,554,387	1.83	1.10	39,576
1977	3,723,548	8,730,016	2.34	0.96	35,597
1978	3,701,584	9,486,893	2.56	1.16	42,904
1979	3,169,132	7,559,920	2.39	1.07	33,982
1980	3,162,752	6,928,604	2.19	1.16	36,540
1981	3,300,602	7,658,461	2.32	0.94	31,096
1982	3,157,571	7,658,461	2.43	0.98	30,951
1983	3,326,608	5,512,802	1.66	0.77	25,764
1984	3,154,962	4,663,161	1.48	0.58	18,252
1985	2,645,510	3,690,148	1.39	0.82	21,795
1986	2,662,075	2,508,648	0.94	0.77	20,385
1987	1,602,505	3,811,429	2.38	0.72	11,492
1988	2,416,500	2,533,913	1.05	0.76	18,430
1989	2,964,948	436,706	0.15	0.85	25,083
1990	2,812,616	117,270	0.04	0.82	23,108
1991	2,102,045	50,874	0.02	0.69	14,584
1992	1,293,036	553,530	0.43	0.39	5,017
1993	202,511	0	0.00	0.24	489
	95,799,627	171,176,926			1,342,716

2-1 Bor
2-1-3 Veliki Krivelj (1979-2006)

yr.	Veliki Krivelj					
	mined ore(t)	waste(t)	total(t)	W/O	Cu (%)	Cu (t)
1979	0	7,254,353	7,254,353	–	–	–
1980	0	8,849,739	8,849,739	–	–	–
1981	0	7,884,029	7,884,029	–	–	–
1982	0	8,027,705	8,027,705	–	–	–
1983	3,213,810	10,169,425	13,383,235	3.16	0.49	15,907
1984	6,308,419	7,466,902	13,775,321	1.18	0.51	32,005
1985	8,263,650	9,273,885	17,537,535	1.12	0.47	39,131
1986	9,624,429	6,018,224	15,642,653	0.63	0.43	41,084
1987	9,406,675	4,200,333	13,607,008	0.45	0.43	40,409
1988	9,717,400	4,721,870	14,439,270	0.49	0.38	37,202
1989	9,699,150	9,062,545	18,761,695	0.93	0.33	32,382
1990	9,648,300	10,721,854	20,370,154	1.11	0.35	33,305
1991	9,779,930	6,237,895	16,017,825	0.64	0.38	37,538
1992	9,190,242	5,467,768	14,658,010	0.59	0.35	32,476
1993	8,596,350	2,668,889	11,265,239	0.31	0.35	29,947
1994	8,811,150	5,297,167	14,108,317	0.60	0.35	31,024
1995	8,861,545	6,562,810	15,424,355	0.74	0.36	31,573
1996	9,144,475	7,324,543	16,469,018	0.80	0.35	31,923
1997	9,261,700	8,103,328	17,365,028	0.87	0.36	33,109
1998	8,943,400	7,956,840	16,900,240	0.89	0.35	31,715
1999	8,434,950	3,362,231	11,797,181	0.40	0.34	28,734
2000	7,688,012	4,673,388	12,361,400	0.61	0.31	23,589
2001	4,673,839	3,424,041	8,097,880	0.73	0.32	15,096
2002	5,400,451	4,293,195	9,693,646	0.79	0.33	17,767
2003	4,198,147	1,511,911	5,710,058	0.36	0.30	12,678
2004	4,345,200	1,059,157	5,404,357	0.24	0.24	10,428
2005	4,328,697	928,775	5,257,472	0.21	0.24	10,389
2006	3,859,435	2,393,285	6,252,720	0.62	0.28	10,806

2-1 Bor

2-1-4 Majdanpek (1959-2006)

yr.	South Pit					North Pit					Total				miners	difference
	mined ore(t)	waste(t)	total (t)	W/O	Cu(%)	mined ore(t)	waste(t)	total (t)	W/O	Cu(%)	mined ore(t)	waste(t)	total (t)	W/O		
1959	ND	2,949,809	2,949,809	–	–	–	–	–	–	–	–	2,949,809	2,949,809	–		
1960	ND	7,300,695	7,300,695	–	–	–	–	–	–	–	–	7,300,695	7,300,695	–		
1961	938,965	7,803,469	8,742,434	8.31	0.81	–	–	–	–	–	938,965	7,803,469	8,742,434	8.31	ND	
1962	2,971,277	6,447,732	9,419,009	2.17	0.90	–	–	–	–	–	2,971,277	6,447,732	9,419,009	2.17	ND	
1963	3,494,579	6,556,729	10,051,308	1.88	0.92	–	–	–	–	–	3,494,579	6,556,729	10,051,308	1.88	ND	
1964	3,646,990	6,562,733	10,209,723	1.80	0.87	–	–	–	–	–	3,646,990	6,562,733	10,209,723	1.80	ND	
1965	3,679,796	7,666,915	11,346,711	2.08	0.84	–	–	–	–	–	3,679,796	7,666,915	11,346,711	2.08	ND	
1966	3,565,835	12,262,588	15,828,423	3.44	0.84	–	–	–	–	–	3,565,835	12,262,588	15,828,423	3.44	ND	
1967	3,681,292	22,019,243	25,700,535	5.98	0.83	–	–	–	–	–	3,681,292	22,019,243	25,700,535	5.98	ND	
1968	4,652,209	17,234,737	21,886,946	3.70	0.75	–	–	–	–	–	4,652,209	17,234,737	21,886,946	3.70	ND	
1969	6,238,145	19,347,315	25,585,460	3.10	0.72	–	–	–	–	–	6,238,145	19,347,315	25,585,460	3.10	ND	
1970	6,942,712	16,071,031	23,013,743	2.31	0.73	–	–	–	–	–	6,942,712	16,071,031	23,013,743	2.31	ND	
1971	7,793,138	18,301,380	26,094,518	2.35	0.70	–	–	–	–	–	7,793,138	18,301,380	26,094,518	2.35	ND	
1972	9,511,418	20,746,275	30,257,693	2.18	0.69	–	–	–	–	–	9,511,418	20,746,275	30,257,693	2.18	ND	
1973	11,230,138	25,196,514	36,426,652	2.24	0.63	–	–	–	–	–	11,230,138	25,196,514	36,426,652	2.24	ND	
1974	11,009,553	23,661,014	34,670,567	2.15	0.58	–	–	–	–	–	11,009,553	23,661,014	34,670,567	2.15	ND	
1975	11,815,386	31,216,072	43,031,458	2.64	0.57	–	–	–	–	–	11,815,386	31,216,072	43,031,458	2.64	ND	
1976	13,101,484	31,037,561	44,139,045	2.37	0.55	–	–	–	–	–	13,101,484	31,037,561	44,139,045	2.37	ND	
1977	13,486,749	31,012,503	44,499,252	2.30	0.56	–	562,753	562,753	–	–	13,486,749	31,575,256	45,062,005	2.34	ND	
1978	12,898,130	25,703,937	38,602,067	1.99	0.57	–	1,883,661	1,883,661	–	–	12,898,130	27,587,598	40,485,728	2.14	ND	
1979	12,999,553	17,465,671	30,465,224	1.34	0.55	–	53,345	53,345	–	–	12,999,553	17,519,016	30,518,569	1.35	2,761	
1980	13,392,955	21,550,148	34,943,103	1.61	0.48	–	0	0	–	–	13,392,955	21,550,148	34,943,103	1.61	2,913	152
1981	12,400,427	27,848,904	40,249,331	2.25	0.50	–	0	0	–	–	12,400,427	27,848,904	40,249,331	2.25	3,032	119
1982	12,601,465	29,641,565	42,243,030	2.35	0.54	–	0	0	–	–	12,601,465	29,641,565	42,243,030	2.35	3,232	200
1983	12,860,316	29,850,452	42,710,768	2.32	0.54	–	797,070	797,070	–	–	12,860,316	30,647,522	43,507,838	2.38	3,511	279
1984	12,663,150	26,076,336	38,739,486	2.06	0.56	–	3,361,237	3,361,237	–	–	12,663,150	29,437,573	42,100,723	2.32	3,631	120
1985	11,805,960	30,513,946	42,319,906	2.58	0.56	–	6,253,861	6,253,861	–	–	11,805,960	36,767,807	48,573,767	3.11	3,882	251
1986	11,302,800	31,699,374	43,002,174	2.80	0.51	–	4,828,226	4,828,226	–	–	11,302,800	36,527,600	47,830,400	3.23	3,928	46
1987	12,452,970	32,039,778	44,492,748	2.57	0.48	–	2,797,172	2,797,172	–	–	12,452,970	34,836,950	47,289,920	2.80	3,992	64
1988	13,277,000	26,868,464	40,145,464	2.02	0.47	–	2,661,536	2,661,536	–	–	13,277,000	29,530,000	42,807,000	2.22	4,007	15
1989	12,792,337	28,413,217	41,205,554	2.22	0.49	148,543	3,671,764	3,820,307	24.72	0.63	12,940,880	32,084,981	45,025,861	2.48		
1990	10,739,670	31,868,833	42,608,503	2.97	0.48	2,474,090	5,864,357	8,338,447	2.37	0.54	13,213,760	37,733,190	50,946,950	2.86		
1991	9,673,640	25,392,362	35,066,002	2.62	0.40	3,326,360	6,368,058	9,694,418	1.91	0.62	13,000,000	31,760,420	44,760,420	2.44		
1992	6,656,619	17,826,228	24,482,847	2.68	0.43	4,578,401	14,584,552	19,162,953	3.19	0.48	11,235,020	32,410,780	43,645,800	2.88	3,556	−451
1993	6,166,384	9,324,081	15,490,465	1.51	0.31	1,849,206	4,942,179	6,791,385	2.67	0.49	8,015,590	14,266,260	22,281,850	1.78	3,521	−35
1994	5,611,259	1,634,393	7,245,652	0.29	0.44	570,741	7,033,607	7,604,348	12.32	0.38	6,182,000	8,668,000	14,850,000	1.40	3,280	−241
1995	4,771,170	1,901,103	6,672,273	0.40	0.37	2,407,076	13,880,651	16,287,727	5.77	0.45	7,178,246	15,781,754	22,960,000	2.20	3,199	−81
1996	4,197,100	1,991,526	6,188,626	0.47	0.34	2,356,490	13,028,174	15,384,664	5.53	0.34	6,553,590	15,019,700	21,573,290	2.29	3,165	−34
1997	1,454,539	6,438,952	7,893,491	4.43	0.28	5,309,571	13,645,048	18,954,619	2.57	0.41	6,764,110	20,084,000	26,848,110	2.97	3,162	−3
1998	2,170,920	8,381,220	10,552,140	3.86	0.32	4,590,800	11,937,090	16,527,890	2.60	0.39	6,761,720	20,318,310	27,080,030	3.00	3,111	−51
1999	2,393,729	9,884,996	12,278,725	4.13	0.34	1,905,861	3,205,559	5,111,420	1.68	0.37	4,299,590	13,090,555	17,390,145	3.04	3,020	−91
2000	0	10,552,573	10,552,573	–	–	2,240,590	4,498,417	6,739,007	2.01	0.24	2,240,590	15,050,990	17,291,580	6.72	2,918	−102
2001	0	1,047,700	1,047,700	–	–	544,200	1,310,430	1,854,630	2.41	0.26	544,200	2,358,130	2,902,330	4.33	2,767	−151
2002	517,900	2,727,300	3,245,200	5.27	0.61	352,100	280,700	632,800	0.80	0.28	870,000	3,008,000	3,878,000	3.46	1,397	−1,370
2003	676,700	918,000	1,594,700	1.36	0.34	171,300	113,000	284,300	0.66	0.24	848,000	1,031,000	1,879,000	1.22	1,345	−52
2004	770,000	595,000	1,365,000	0.77	0.35	205,000	479,000	684,000	2.34	0.24	975,000	1,074,000	2,049,000	1.10	1,324	−21
2005	944,000	535,000	1,479,000	0.57	0.38	156,000	322,000	478,000	2.06	0.30	1,100,000	857,000	1,957,000	0.78	1,279	−45
2006	1,109,500	619,000	1,728,500	0.56	0.38	220,500	252,000	472,500	1.14	0.31	1,330,000	871,000	2,201,000	0.65	1,220	−59

2-1 Bor

2-1-5 Cerovo (1991-2002)

年	Cerovo								
	mined ore(t)	waste (t)	W/O	Cu (%)	Cu(t)	Au(g/t)	Au(kg)	Ag(g/t)	Ag(kg)
1991	0	1,605,164	–	–	–	–	–	–	–
1992	0	3,966,536	–	–	–	–	–	–	–
1993	938,965	4,533,922	4.83	0.24	2,216	0.06	59	0.33	314
1994	2,971,277	3,447,255	1.16	0.76	22,727	0.20	580	1.34	3,982
1995	3,494,579	4,511,833	1.29	0.53	18,479	0.12	431	1.28	4,478
1996	3,646,990	2,867,828	0.79	0.48	17,482	0.11	416	1.67	6,081
1997	3,679,796	1,745,832	0.47	0.47	17,411	0.09	334	1.32	4,871
1998	3,565,835	843,606	0.24	0.45	15,991	0.11	392	1.43	5,106
1999	3,681,292	345,560	0.09	0.31	11,342	0.11	395	1.31	4,807
2000	4,652,209	320,380	0.07	0.16	7,325	0.06	293	1.01	4,694
2001	1,429,828	338,150	0.24	0.32	4,615	0.12	176	1.80	2,569
2002	1,202,230	252,440	0.21	0.34	4,125	0.16	192	1.93	2,317

2-2 Lece

yr.	mined ore	ore grade				metal in ore			
	(t)	Pb(%)	Zn(%)	Au(g/t)	Ag(g/t)	Pb(t)	Zn(t)	Au(kg)	Ag(kg)
1938-1941	58,822	3.60	6.30	4.7-7.4	-	2,118	3,706	-	-
1953	26,723	2.16	4.18	5.80	16.00	577	1,117	155	428
1954	61,264	1.78	4.25	5.96	15.90	1,090	2,604	365	974
1955	71,218	1.98	4.39	7.23	19.80	1,410	3,126	515	1,410
1956	65,344	2.13	4.81	5.37	19.50	1,392	3,143	351	1,274
1957	79,138	2.05	4.61	5.32	19.60	1,622	3,648	421	1,551
1958	84,609	2.04	4.88	6.30	19.33	1,726	4,129	533	1,635
1959	84,370	1.78	4.69	5.60	17.50	1,502	3,957	472	1,476
1960	101,514	1.75	4.68	5.16	15.90	1,776	4,751	524	1,614
1961	98,539	2.03	5.20	4.63	17.07	2,000	5,124	456	1,682
1962	96,019	1.98	5.02	4.65	16.92	1,901	4,820	446	1,625
1963	95,970	1.94	4.27	5.87	17.55	1,862	4,098	563	1,684
1964	97,255	1.78	3.90	4.96	14.67	1,731	3,793	482	1,427
1965	93,841	1.47	3.41	3.85	12.15	1,379	3,200	361	1,140
1966	97,364	1.81	3.94	5.18	15.29	1,762	3,836	504	1,489
1967	81,235	1.78	3.89	4.75	15.70	1,446	3,160	386	1,275
1968	35,344	1.78	3.56	6.19	26.70	629	1,258	219	944
1969	50,702	1.68	3.52	3.21	13.75	852	1,785	163	697
1970	94,404	1.81	3.85	2.83	15.04	1,709	3,635	267	1,420
1971	94,350	1.64	3.50	2.78	15.34	1,547	3,302	262	1,447
1972	99,454	1.69	3.55	2.79	16.41	1,681	3,531	277	1,632
1973	94,579	1.42	2.98	2.40	15.07	1,343	2,818	227	1,425
1974	85,530	1.45	3.07	2.42	13.69	1,240	2,626	207	1,171
1975	70,589	1.45	3.19	2.62	16.25	1,024	2,252	185	1,147
1976	51,715	1.16	2.22	3.12	19.84	600	1,148	161	1,026
1977	81,615	1.20	2.47	3.85	20.09	979	2,016	314	1,640
1978	65,151	0.85	2.10	3.03	22.92	554	1,368	197	1,493
1979	50,467	1.00	2.16	2.58	18.92	505	1,090	130	955
1980	63,633	1.24	2.64	2.29	13.98	789	1,680	146	890
1981	65,678	0.96	1.92	1.80	13.27	631	1,261	118	872
1982	62,144	1.01	2.46	1.81	13.35	628	1,529	112	830
1983	53,279	1.20	2.27	1.92	13.52	639	1,209	102	720
1984	74,895	1.14	2.23	1.90	15.50	854	1,670	142	1,161
1985	85,498	1.04	2.07	2.65	17.33	889	1,770	227	1,482
1986	76,820								
1987	84,050								
1988	92,530								
1989	85,864								
1990	74,573								
1991	56,791								
1992	40,067								
1993	5,902								
1994	5,960								
1995	10,793								
1996	43,500								
1997	55,602								
1998	60,000								
1999	23,000								
2000	7,800								
2001	12,431								

2-3 Rudnik (1988-2006)

yr.	mined ore	ore grade				metal in ore				Pb-conc	Pb grade	Ag grade	Pb in conc	Ag in conc	Zn-conc	Zn grade	Zn in conc	Cu-conc	Cu grade	Cu in conc
	(t)	Pb(%)	Zn(%)	Cu(%)	Ag(g/t)	Pb(t)	Zn(t)	Cu(t)	Ag(kg)	(t)	(%)	(g/t)	(t)	(kg)	(t)	(%)	(t)	(t)	(%)	(t)
1988	240,300	1.95	2.00	0.23	53	4,686	4,806	553	12,736	5,910	73.15	1,697	4,323	10,029	8,180	46.96	3,841	ND	19.50	ND
1989	231,030	2.12	2.07	0.26	53	4,898	4,782	601	12,245	6,350	74.35	1,607	4,721	10,204	7,635	48.41	3,696	ND	16.06	ND
1990	213,000	2.06	1.84	0.24	68	4,388	3,919	511	14,484	5,570	75.15	2,174	4,186	12,109	6,650	48.48	3,224	ND	16.54	ND
1991	225,000	1.99	1.89	0.25	54	4,478	4,253	563	12,150	5,269	75.44	1,863	3,975	9,816	6,650	48.95	3,255	ND	17.36	ND
1992	92,069	2.23	2.25	0.26	49	2,053	2,072	239	4,511	2,243	75.21	1,424	1,687	3,194	3,305	46.58	1,539	ND	16.34	ND
1993	29,210	2.40	2.54	0.21	53	701	742	61	1,548	815	72.42	1,731	590	1,411	1,145	44.63	511	ND	11.93	ND
1994	0									0					0			0		ND
1995	105,913	2.15	1.99	0.18	50	2,277	2,108	191	5,296	2,735	74.25	1,684	2,031	4,606	3,665	46.79	1,715	ND	ND	ND
1996	208,901	1.93	1.72	0.28	60	4,032	3,593	585	12,534	5,025	ND	ND	ND	ND	5,780	ND	ND	1,485	ND	ND
1997	207,146	1.80	1.73	0.34	70	3,729	3,584	704	14,500	4,460	74.07	ND	3,304	ND	6,040	46.97	2,837	1,920	19.39	372
1998	211,085	1.61	1.60	0.31	62	3,398	3,377	654	13,087	4,185	73.46	ND	3,074	ND	5,785	46.56	2,693	1,605	18.50	297
1999	173,235	1.58	1.66	0.30	60	2,737	2,876	520	10,394	3,402	72.90	ND	2,480	ND	5,015	46.75	2,345	1,245	19.74	246
2000	192,897	1.48	1.59	0.25	63	2,855	3,067	482	12,153	3,535	72.96	ND	2,579	ND	5,205	47.91	2,494	1,175	21.28	250
2001	195,906	1.46	1.63	0.34	80	2,860	3,193	666	15,672	3,561	73.02	ND	2,600	ND	5,581	46.31	2,585	2,005	21.45	430
2002	181,089	1.42	1.53	0.24	ND	2,571	2,771	435	ND	3,246	73.76	ND	2,394	ND	4,690	48.06	2,254	1,208	22.49	272
2003	104,980	1.46	1.50	0.16	ND	1,533	1,575	168	ND	1,855	75.98	ND	1,409	ND	2,490	47.99	1,195	415	20.58	85
2004	111,240	1.45	1.65	0.17	ND	1,613	1,835	189	ND	1,935	75.22	ND	1,456	ND	3,205	47.47	1,521	459	18.88	87
2005	162,481	1.62	1.76	0.26	ND	2,632	2,860	422	ND	3140	74.59	ND	2,342	ND	4870	46.73	2,276	1,040	19.99	208
2006	171,769	1.60	1.62	0.32	ND	2,748	2,783	550	ND	3333	73.74	ND	2,458	ND	4446	47.47	2,111	1,550	19.56	303

2-4 Grot (1974-2006)

yr.	mined ore	ore grade		metal in ore		Pb-conc.	Pb grade	Pb in conc.	Zn-conc.	Zn grade	Zn in conc.
	(t)	Pb(%)	Zn(%)	Pb(t)	Zn(t)	(t)	(%)	(t)	(t)	(%)	(t)
1974	26,300	2.03	2.96	534	778	652	67.50	440	1,075	54.50	586
1975	125,550	2.57	2.95	3,227	3,704	4,050	67.40	2,730	5,300	54.49	2,888
1976	179,208	2.32	2.65	4,158	4,749	4,200	71.53	3,004	6,170	53.10	3,276
1977	252,362	2.32	2.67	5,855	6,738	6,000	73.23	4,394	9,170	50.68	4,647
1978	254,148	2.42	2.67	6,150	6,786	6,792	72.77	4,943	10,600	51.98	5,510
1979	273,119	2.86	2.75	7,811	7,511	8,437	72.91	6,151	11,076	52.61	5,827
1980	291,375	2.57	2.33	7,488	6,789	7,769	71.52	5,556	9,103	52.89	4,815
1981	258,161	2.87	2.51	7,409	6,480	8,200	71.31	5,847	9,254	53.77	4,976
1982	272,636	3.02	2.61	8,234	7,116	9,993	69.94	6,989	10,596	52.22	5,533
1983	273,508	2.91	2.39	7,959	6,537	9,437	69.19	6,529	9,922	51.00	5,060
1984	273,555	2.64	2.31	7,222	6,319	8,658	70.77	6,127	10,161	50.08	5,089
1985	271,324	2.78	1.97	7,543	5,345	9,186	70.28	6,456	8,326	50.27	4,185
1986	281,109	3.01	2.22	8,701	6,241	10,625	71.27	7,572	9,868	50.98	5,031
1987	265,183	3.00	2.51	7,955	6,656	10,159	69.64	7,075	10,460	50.02	5,232
1988	258,480	3.00	2.64	7,754	6,824	9,892	68.26	6,752	10,916	49.23	5,374
1989	259,353	2.94	2.90	7,625	7,521	9,240	69.93	6,462	12,085	48.48	5,859
1990	253,644	3.13	2.40	7,939	6,087	9,359	70.76	6,622	10,068	48.39	4,872
1991	211,539	3.70	2.72	7,827	5,754	9,400	70.80	6,655	9,939	47.41	4,712
1992	172,984	3.15	2.19	5,449	3,788	6,643	69.23	4,599	6,134	47.40	2,908
1993	64,968	3.88	2.49	2,521	1,618	3,074	70.67	2,172	2,488	48.41	1,204
1994	78,992	2.92	1.67	2,307	1,319	2,571	70.87	1,822	2,009	47.09	946
1995	29,208	2.30	1.49	672	435	746	69.91	522	579	48.39	280
1996	61,368	3.49	1.94	2,142	1,191	2,635	69.92	1,842	1,800	46.53	838
1997	56,505	2.72	2.80	1,537	1,582	1,931	67.60	1,305	2,800	47.00	1,316
1998	87,400	2.25	2.37	1,967	2,071	2,272	69.59	1,581	3,428	48.22	1,653
1999	34,000	3.52	2.46	1,197	836	1,505	68.80	1,035	1,280	46.92	601
2000	28,000	2.25	2.37	630	664	785	69.10	542	1,111	47.50	528
2001	75,816	2.10	3.00	1,592	2,274	1,823	71.00	1,294	3,144	51.84	1,630
2002	82,821	2.03	2.71	1,681	2,244	1,851	75.68	1,401	3,672	51.84	1,904
2003	81,412	4.49	4.72	3,655	3,843	4,095	75.08	3,075	6,440	50.27	3,237
2004	104,880	3.94	5.30	4,132	5,559	4,716	75.99	3,584	9,388	50.27	4,719
2005	85,500	3.69	5.00	3,155	4,275	3,510	76.50	2,685	7,040	51.51	3,626
2006	94,938	2.46	3.16	2,335	3,000	2,525	74.51	1,881	4,876	50.82	2,478

2-5 Suva Ruda (1984-2001)

yr.	mined ore	ore grade		metal in ore		Pb-conc	Pb grade	Pb in conc	Zn-conc	Zn grade	Zn in conc
	(t)	Pb(%)	Zn(%)	Pb(t)	Zn(t)	(t)	(%)	(t)	(t)	(%)	(t)
1984	17,309	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1985	12,185	ND	ND	ND	ND	160	22.64	36	265	36.10	96
1986	52,428	1.28	3.01	671	1,578	560	51.28	287	1,536	44.85	689
1987	133,356	1.68	3.39	2,240	4,521	1,666	63.29	1,054	5,832	47.78	2,787
1988	175,152	1.59	3.40	2,785	5,955	2,598	67.77	1,761	9,315	51.83	4,828
1989	176,792	2.01	3.99	3,554	7,054	2,516	67.71	1,704	8,639	53.05	4,583
1990	109,248	1.64	3.20	1,792	3,496	2,285	67.13	1,534	6,060	53.22	3,225
1991	155,903	1.81	3.35	2,822	5,223	3,262	68.37	2,230	8,761	54.58	4,782
1992	171,085	1.89	3.17	3,234	5,423	4,151	66.89	2,777	9,378	53.05	4,975
1993	137,785	1.77	3.11	2,439	4,285	3,167	62.49	1,979	7,360	50.39	3,709
1994	103,470	1.72	2.99	1,780	3,094	1,339	52.47	703	3,844	47.33	1,819
1995	100,246	1.57	3.05	1,574	3,058	1,744	58.25	1,016	4,641	48.48	2,250
1996	112,876	1.78	3.18	2,009	3,589	2,565	64.13	1,645	6,187	50.84	3,145
1997	108,635	1.87	3.25	2,031	3,531	2,518	67.92	1,710	586	51.15	300
1998	140,820	1.50	2.96	2,112	4,168	2,693	64.13	1,727	6,905	50.18	3,465
1999	62,308	1.41	2.98	879	1,857	2,693	64.13	1,727	6,905	50.18	3,465
2000	78,783	1.21	2.68	953	2,111	2,693	64.13	1,727	6,905	50.18	3,465
2001	93,616	1.29	2.77	1,208	2,593	2,693	64.13	1,727	6,905	50.18	3,465

N.B. Data of 1984 to 1987 were attained from the Suva Ruda Mining Co. Ltd., others were data from Trepca, ND means

2-6 Veliki Majdan (1953-2001)

yr.	mined ore	ore grade		metal in ore		Pb-conc	Pb grade	Pb in conc	Zn-conc	Zn grade	Zn in conc
	(t)	Pb(%)	Zn(%)	Pb(t)	Zn(t)	(t)	(%)	(t)	(t)	(%)	(t)
1953	18,884	9.83	7.95	1,856	1,510	1,672	65.49	1,095	1,185	47.43	562
1954	26,582	7.19	6.99	1,911	1,858	2,460	66.71	1,641	1,965	48.19	947
1955	27,336	6.87	5.23	1,877	1,429	2,620	64.73	1,696	2,087	46.67	974
1956	26,147	5.97	5.23	1,562	1,386	2,156	64.24	1,385	2,134	48.31	1,031
1957	28,817	6.52	4.46	1,878	1,286	2,729	66.21	1,807	2,068	46.81	968
1958	32,970	6.17	5.40	2,034	1,781	2,780	68.71	1,910	2,422	47.81	1,158
1959	33,139	5.57	5.65	1,845	1,871	2,432	69.61	1,693	2,371	48.38	1,147
1960	34,465	5.81	4.65	2,003	1,602	2,634	70.65	1,861	2,094	48.09	1,007
1961	30,203	5.65	5.75	1,707	1,736	2,163	70.87	1,533	2,179	48.42	1,055
1962	43,170	5.85	5.38	2,524	2,324	3,205	70.51	2,260	3,194	48.34	1,544
1963	41,204	5.92	5.56	2,439	2,290	3,074	73.32	2,254	3,374	48.90	1,650
1964	41,631	6.11	5.45	2,545	2,270	3,090	75.02	2,318	3,476	50.12	1,742
1965	40,197	5.50	4.97	2,211	1,996	2,657	73.88	1,963	2,795	49.52	1,384
1966	40,013	5.95	5.01	2,381	2,003	2,619	74.46	1,950	2,733	51.34	1,403
1967	44,401	5.01	3.36	2,224	1,490	2,816	70.67	1,990	2,140	50.28	1,076
1968	50,520	4.73	3.12	2,390	1,576	3,448	65.81	2,269	2,170	48.29	1,048
1969	56,160	4.82	3.02	2,707	1,696	3,804	65.62	2,496	2,305	51.41	1,185
1970	55,275	4.51	2.52	2,493	1,393	3,375	58.99	1,991	1,658	48.37	802
1971	51,890	4.26	3.02	2,211	1,567	2,894	62.92	1,821	2,291	46.62	1,068
1972	37,622	4.40	3.36	1,655	1,264	2,089	64.53	1,348	1,942	47.12	915
1973	52,614	4.72	4.12	2,483	2,168	3,412	55.13	1,881	3,259	43.48	1,417
1974	49,459	4.63	4.64	2,290	2,295	3,531	53.58	1,892	3,576	41.78	1,494
1975	54,111	3.93	3.73	2,127	2,018	3,427	49.40	1,693	2,891	63.61	1,839
1976	55,245	3.71	2.81	2,049	1,554	3,084	56.87	1,754	2,282	43.82	1,000
1977	46,413	3.78	3.48	1,756	1,614	2,488	56.47	1,405	2,400	46.08	1,106
1978	53,162	3.46	3.27	1,838	1,740	2,598	57.93	1,505	2,636	46.17	1,217
1979	52,114	2.63	1.87	1,373	972	1,810	60.44	1,094	1,370	45.26	620
1980	45,200	2.97	2.37	1,342	1,071	1,720	61.45	1,057	1,395	45.45	634
1981	44,880	2.73	2.34	1,225	1,050	1,679	61.17	1,027	1,762	48.35	852
1982	45,200	2.86	2.79	1,293	1,261	ND	ND	ND	ND	ND	ND
1983	46,970	3.13	3.09	1,470	1,451	ND	ND	ND	ND	ND	ND
1984	46,190	3.04	2.33	1,404	1,076	ND	ND	ND	ND	ND	ND
1985	49,170	3.42	2.72	1,682	1,337	ND	ND	ND	ND	ND	ND
1986	42,230	3.82	3.04	1,613	1,284	ND	ND	ND	ND	ND	ND
1987	40,240	4.37	3.32	1,758	1,336	ND	ND	ND	ND	ND	ND
1988	43,790	3.61	2.78	1,581	1,217	2,120	67.36	1,428	2,029	49.73	1,009
1989	44,250	3.74	2.64	1,655	1,168	2,246	66.34	1,490	1,982	49.50	981
1990	33,680	4.00	2.89	1,347	973	1,769	69.02	1,221	1,667	48.89	815
1991	30,958	3.85	3.22	1,192	997	1,634	67.14	1,097	1,659	49.31	818
1992	32,851	4.53	3.71	1,488	1,219	1,932	70.19	1,356	1,966	49.95	982
1993	19,356	4.00	4.00	774	774	921	65.15	600	919	47.55	437
1994	11,672	4.99	3.70	583	432	711	67.93	483	700	53.00	371
1995	31,420	4.99	4.10	1,568	1,288	2,083	68.31	1,423	2,148	50.93	1,094
1996	28,360	4.72	3.43	1,339	973	1,480	72.97	1,080	1,544	49.81	769
1997	22,377	4.31	3.68	964	823	1,118	71.29	797	1,204	49.58	597
1998	30,315	3.70	3.27	1,122	991	1,368	71.35	976	1,554	48.65	756
1999	11,102	3.48	2.74	386	304	518	ND	ND	469	ND	ND
2000	6,170					233	ND	ND	111	ND	ND
2001	4,888					326	ND	ND	245	ND	ND

註)精鉱の1987年までのデータは鉱山で入手、1988年以降のデータはMEMから入手

2-7 Kostolac (1976-2006)

year	Drmno	Cirikivac etc.	total
1976		31,601	31,601
1977		211,041	211,041
1978		146,903	146,903
1979		133,831	133,831
1980		1,024,364	1,024,364
1981		1,885,205	1,885,205
1982		2,286,832	2,286,832
1983		2,514,391	2,514,391
1984		2,461,630	2,461,630
1985		2,234,209	2,234,209
1986		1,964,949	1,964,949
1987	47,150	2,375,511	2,422,661
1988	1,452,319	2,218,462	3,670,781
1989	2,288,585	2,114,923	4,403,508
1990	2,913,295	1,745,796	4,659,091
1991	869,216	1,898,107	2,767,323
1992	3,061,195	1,140,931	4,202,126
1993	3,072,126	1,236,678	4,308,804
1994	3,642,992	1,486,933	5,129,925
1995	3,724,909	1,298,362	5,023,271
1996	3,488,059	1,386,178	4,874,237
1997	4,458,529	1,182,889	5,641,418
1998	5,468,650	1,037,594	6,506,244
1999	4,413,033	1,184,669	5,597,702
2000	4,783,071	458,161	5,241,232
2001	4,285,541	824,130	5,109,671
2002	4,285,131	1,108,890	5,394,021
2003	5,238,354	955,377	6,193,731
2004	5,635,761	686,483	6,322,244
2005	6,044,144	705,829	6,749,973
2006	6,306,125	490,787	6,796,912

3(1) Table structures for mineral deposit database

1 Table name: COMPAGNIE

Field Name	Data Type	Length	Content	Examples
ID	long interger		ID for company	9
Ceased	YES/NO	150	0: -1:	0
Name	text	50	Name	Rio Tinto Zimbabwe Ltd
Business	text	50	Business	PROD
Fax	text	50	Fax	263 4 746228
Phone	text	50	Phone	263 4 746 089
Email	text	50	Email	
WWW	text	50	WWW	
Country	text	50	Country	Zimbabwe
State	text	50	State	
Town	text	50	Town	Harare
Date	Date/Time		Date	8/18/1999
Remarks	Memo		Remarks	Part of: Zimbabwe Mining Development…
Memo	Memo		Memo	ok - rec'd fax from Chamber of Mines

2 Table name: ADRESSES_COMPAGNIE

Field Name	Data Type	Length	Content	Examples
ID_Compagnie	long integer		Company ID	1
Address	text	200	Address	Redcliff Office

3 Table name: NATURE_MINERAI

Field Name	Data Type	Length	Content	Examples
IDENTIFIANT	text	50	Identifying features of the deposit	YUG-00023
SUBSTANCE	text	50	Name of the material	Ag
ID_MINERAI	text	50	Ore ID	B
PRODUCTION_PASSEE	double		Total of all past production of metal content or oxide	2569
RESSOURCE	double		Reserve expressed as metal content or oxide in the deposit	495
QUALIFICATIF_RESERVE	text	50	Quality of the reserve in ONU terms	
RESSOURCE	double		Resource expressed as metal content or oxide in the deposit	0
QUALIFICATIF_RESSOURCE	text	50	Quality of the resource in ONU terms	
TENEUR_MOYENNE_PRODUCTION	double		Average grade in the bibliographic about past production	75
TENEUR_MOYENNE_RESERVE	double		Minimum grade in the bibliographie about past production	90
TENEUR_MOYENNE_RESSOURCE	double		Maximum grade in the bibliographie about past production	0
UNITE_TENEUR	text	50	Unit by which the grades are expressed	g/t

4 Table name: MINERALOGIE_GANGUE

Field Name	Data Type	Length	Content	Examples
IDENTIFIANT	text	50	Identifying features of the deposit	YUG-00023
MINERALOGIE	text	50	Gangue mineralogy	M003
ORDRE	long integer		Order of importance of the mineralogy	523

5 Table name: MINERALOGIE_MINERAI

Field Name	Data Type	Length	Content	Examples
IDENTIFIANT	text	50	Identifying features of the deposit	YUG-00023
MINERALOGIE	text	50	Mineralogy of the ore	M061
ORDRE	long integer		Order of importance of the mineralogy	1202

6 Table name: ECONOMIE

Field Name	Data Type	Length	Content	Examples
IDENTIFIANT	text	50	Identifying features of the deposit	YUG-00023
SUBSTANCE	text	50	Name of material occurring in the deposit	Ag
ORDRE	long integer		Order of importance of the material	8852

7 Table name: REFERENCE_BIBLIOGRAPHIE

Field Name	Data Type	Length	Content	Examples
ID_TEXTO	text	10	ID for bibliography	126
TYPE	text	50	Type of bibliography	Journal.
AUTEUR	text	255	Author	Popovic R.
TITRE	text	255	Title	Pojava sulfidne mineralizacije …
DATE	text	10	Date of publishing	1991
SOURCE	text	255	Name of journal	Glasnik Prirodnjackog Muzeja u …
RESUME	Memo		Resume	occurrence; sulfides; mineralization;…

8 Table name: AUTRES_SOURCES

Field Name	Data Type	Length	Content	Examples
IDENTIFIANT	text	50	ID for author	
URL	text	150	URL	
SOURCE	text	50		
ORDRE	long integer			

9 Table name: AUTRES_IDENTIFIANTS

Field Name	Data Type	Length	Content	Examples
IDENTIFIANT	text	50		YUG-00023
BASE	text	50	Name of the database	Carte Métallogénique de l'Europe
AUTRE_ID	text	50	Identifier in this database	26-105

10 Table name: PAYS

Field Name	Data Type	Length	Content	Examples
IDENTIFIANT	text	50	Identifying features of the deposit	YUG-00023
ID_PAYS	text	50	Name of country where deposit occurs	891
ORDRE	long integer		Order which allows the country with the largest portion of the deposit to be defined	4465

11 Table name: BIBLIO_ECONOMIQUE

Field Name	Data Type	Length	Content	Examples
IDENTIFIANT	text	50	Identifying features of the deposit	YUG-00023
ID_BIBLIO	text	50	Bibligrophical reference in the Bibliographie du SIG domain	1591

12 Table name: BIBLIO_GEOLOGIE

Field Name	Data Type	Length	Content	Examples
IDENTIFIANT	text	50	Identifying features of the deposit	YUG-00023
ID_BIBLIO	text	50	Bibligrophical reference in the Bibliographie du SIG domain	1593

13 Table name: GISEMENT

Field Name	Data Type	Length	Content	Examples
IDENTIFIANT	text	50	Identifying features of the deposit	YUG-00023
COMPAGNIE	text	50	Name of the titleholder of the permit or mine	Falcon Gold Zimbabwe Ltd
ID_COMPAGNIE	long integer			6
PROVINCE	text	80	Mineral province or district of the deposit	Kosovo
STATUT	text	50	State of the deposit (under development, etc.)	B30
LONGITUDE	double		Longitude of a point of the deposit in decimal degrees	20.9167
LATITUDE	double		Latitude of a point of the deposit in decimal degrees	42.9383
SUB-PRINCIPALE	text	10	Principle material	PbZn
VERIF_COORDONNEES	YES/NO		Key words for signifying whether or not the coordinates of the deposit have been verified	
REDACTEUR	text	50	Name of the person providing information on the deposit	J.Monthel
DATE_REDACTION	Date/Time		Data automatically provided by the system when the name of the user is given	2000/6/20
VERIFICATEUR	text	50	Name of person verifying information about the deposit	J.Monthel
DATE_VERIFICATION	Date/Time		Date automatically given by the system when the name of the verifier is given.	2001/11/9
ADMINISTRATEUR	text	50	Name of the person in charge of the database	
DATE_DECLANCHEMENT	Date/Time		Date when the administrator of the base declares transparency of the data	
LIBERTE	Memo		Free area for writing comments	"In 1982 : reserves of at least 50 Mt…
CommentaireEnviron	Memo		Free area for writing comments	The primary mineralization is mainly…

14 Table name: MORPHOLOGIE

Field Name	Data Type	Length	Content	Examples
IDENTIFIANT	text	50	Identifying features of the deposit	YUG-00023
MORPHOLOGIE	text	50	Morphology of the deposit	B10
ORDRE	long integer		Order of importance of the morphology	4068

15 Table name: EXPLOITATION

Field Name	Data Type	Length	Content	Examples
IDENTIFIANT	text	50	Identifying features of the deposit	YUG-00023
TYPE	text	50	Type of development of the deposit	UG
ORDRE	long integer		Order that allows the determination of the most commonly used name	3995

16 Table name: GITOLOGIE

Field Name	Data Type	Length	Content	Examples
IDENTIFIANT	text	50	Identifying features of the deposit	YUG-00023
TYPE	text	50	Family, type or sub-type	C73
ORDRE	long integer		Order which allows the determination of the order within the type	4126

17 Table name: NOMS

Field Name	Data Type	Length	Content	Examples
IDENTIFIANT	text	50	Identifying features of the deposit	YUG-00023
ORDRE	long integer		Order that allows the most commonly used name to be determined	5230
NOM	text	100	Name by which the deposit is known	Stari Trg

18 Table name: ALTERATIONS_HYDROTHERMALES

Field Name	Data Type	Length	Content	Examples
IDENTIFIANT	text	50	Identifying features of the deposit	YUG-00023
ALTERATIONS_HYDROTHERMALES	text	50	Hydrothermal alteration	A04
ORDRE	long integer		Order of importance of the hydrothermal alteration	455

19 Table name: GEOLOGIE

Field Name	Data Type	Length	Content	Examples
IDENTIFIANT	text	50	Identifying features of the deposit	YUG-00023
AGE_STRATI_MINERALISATION	text	50	Stratigraphic age of the mineralization	N1
AGE_ABSOLU_MINERALISATION	single		This is the absolute age of the mineralization obtained with a dating method	0
METHODE_DATATION_MINE	text	50	Method used to determine absolute age	
ERREUR_MINERALISATION	double		Error committed during the determination of the absolute age	0
UNITE_DATATION_MINE	text	50	Unit with which the absolute age or the age bracket is expressed	
AGE_STRATI_ENCAISSANT	text	50	Stratigraphic age of the outcrop	PZ
AGE_ABSOLU_ENCAISSANT	double		This is the absolute age of the outcrop, obtained with a dating method	0
METHODE_DATATION_ENCA	text	50	Method used to determine absolute age	
ERREUR_ENCAISSANT	double		Error committed during the determination of the absolute age	0
UNITE_DATATION_ENCA	text	50	Unit with which the absolute age or the age bracket is expressed	
AGE_STRATI_USGS	text	100	Stratigraphic age of the outcrop (according to USGS)	
AGE_MINE_USGS	text	100	Stratigraphic age of the mineralization (according to USGS)	

20 Table name: NOMS_UNITES_ENCAISSANTES

Field Name	Data Type	Length	Content	Examples
IDENTIFIANT	text	50	Identifying feature of the deposit	YUG-00023
NOMS	text	50	Name of the outcrop unit	Ordovician to Silurian marble
ORDRE	long integer		Order of imporance of the name	421

21 Table name: NATURE_ENCAISSANT

Field Name	Data Type	Length	Content	Examples
IDENTIFIANT	text	50	Identifying features of the deposit	YUG-00023
LITHOLOGIE	text	50	Lithology of the deposit outcrop	MDET97
ORDRE	long integer		Order of importance of the lithology	637

22 Table name: Gisem_Statut

Field Name	Data Type	Length	Content	Examples
IDENTIFIANT	text	50	Identifying features of the deposit	YUG-00023
STATUT	text	50		B30
ORDRE	long integer			1

23 Table name: REFERENCE_ALTERATION_HYDRO

Field Name	Data Type	Length	Content	Examples
ID	text	50	ID for hydrothermal alteration	A01
FRANCAIS	text	50	Hydrothermal alteration in French	Altération argileuse
ANGLAIS	text	50	Hydrothermal alteration in English	Argillic alteration
ESPAGNOL	text	50	Hydrothermal alteration in Spanish	Alteración argílica

24 Table name: REFERENCE_CLASSE

Field Name	Data Type	Length	Content	Examples
ID	text	50	ID for class	A
FRANCAIS	text	50	Class in French	Classe A
ANGLAIS	text	50	Class in English	Class A

ESPAGNOL	text	50	Class in Spanish	Clase A
DEF_FRANCAIS	text	50	Description of the class in French	Très grand gisement
DEF_ANGLAIS	text	50	Description of the class in English	Very large deposit
DEF_ESPAGNOL	text	50	Description of the class in Spanish	Yacimiento muy grande

25 Table name: REFERENCE_CLASSIFICATION_RESSOURCE

Field Name	Data Type	Length	Content	Examples
ID	text	50	ID for classification of resource	111
FRANCAIS	text	100	Classification of resource in French	Réserve minérale prouvée par l'étude …
ANGLAIS	text	100	Classification of resource in English	Proved mineral reserve determined by …
ESPAGNOL	text	100	Classification of resource in Spanish	Reserva mineral probada por el estudio…

26 Subject: REFERENCE_GITOLOGIE same as the table used in "District database"

27 Subject: REFERENCE_LITHOLOGIE same as the table used in "District database"

28 Table name: REFERENCE_METHODE_DATATION

Field Name	Data Type	Length	Content	Examples
ID	text	255	ID for dating method	A10
PERE	text	255		A
FRANCAIS	text	255	Dating method in French	Datation directe par géochronologie
ANGLAIS	text	255	Dating method in English	Direct dating by geochronology
ESPAGNOL	text	255	Dating method in Spanish	Datación directa por geocronología

29 Table name: REFERENCE_MINERALOGIE

Field Name	Data Type	Length	Content	Examples
ID	text	50	ID for mineral	M003
PERE	text	50		M027
FRANCAIS	text	50	Mineral in French	Actinote
ANGLAIS	text	50	Mineral in English	Actinolite
ESPAGNOL	text	50	Mineral in Spanish	Actinota
FORMULE	text	100	Chemical formula of mineral	Ca2(Mg,Fe)5Si8O22(OH)2

30 Table name: REFERENCE_MINERALOGIE

Field Name	Data Type	Length	Content	Examples
ID	text	50	ID for morphology	A11
PERE	text	50		A10
FRANCAIS	text	150	Morphology in French	Couche stratoïde (mono ou multi-couches)
ANGLAIS	text	150	Morphology in English	Stratabound bed (single or multi-layered)
ESPAGNOL	text	150	Morphology in Spanish	Capa estratoligada (uno o varios niveles)

31 Table name: REFERENCE_NATURE_MINERAI

Field Name	Data Type	Length	Content	Examples
ID	text	50	ID for feature of deposit	A10
PERE	text	50		A
FRANCAIS	text	100	Feature of deposit in French	Minerai à élément natif
ANGLAIS	text	100	Feature of deposit in English	Native-element ore
ESPAGNOL	text	100	Feature of deposit in Spanish	Mena con mineral nativo

32 Subject: REFERENCE_PAYS same as the table used in "District database"

Table name: REFERENCE_STATUT

Field Name	Data Type	Length	Content	Examples
ID	text	50	ID for status of deposit A: provinces, B: deposit, C: prospect, D: primary occurence, E: anomalies, F: unknown status	B10
PERE	text	50		B
FRANCAIS	text	100	Status of deposit in French	Gisement en activit
ANGLAIS	text	100	Status of deposit in English	Producing deposit
ESPAGNOL	text	100	Status of deposit in Spanish	Yacimiento en produccion

34 Subject: REFERENCE_STRATIGRAPHIE same as the table used in "District database"

35 Subject: REFERENCE_SUBSTANCE same as the table used in "District database"

36 Table name: REFERENCE_TYPE_EXPLOITATION

Field Name	Data Type	Length	Content	Examples
ID	text	50	ID for exploitation type	SSDB
PERE	text	50		SS
FRANCAIS	text	100	Exploitation type in French	Dragage par roue à godets, roue-pelle
ANGLAIS	text	100	Exploitation type in English	Bucket wheel dredging
ESPAGNOL	text	100	Exploitation type in Spanish	Dragado de rueda de corbos

37 Table name: REFERENCE_UNITE_DATATION

Field Name	Data Type	Length	Content	Examples
ID	text	50	ID for unit of dating	Ma
FRANCAIS	text	50	Unit of dating in French	Million d'années
ANGLAIS	text	50	Unit of dating in English	Million Year
ESPAGNOL	text	50	Unit of dating in Spanish	Millón de Años

38 Table name: REFERENCE_UNITE_PRODUCTION

Field Name	Data Type	Length	Content	Examples
ID	text	50	ID for unit of production	PRO001
FRANCAIS	text	50	Unit of production in French	km3
ANGLAIS	text	50	Unit of production in English	km3
ESPAGNOL	text	50	Unit of production in Spanish	km3

39 Table name: REFERENCE_UNITE_TENEUR

Field Name	Data Type	Length	Content	Examples
ID	text	50	ID for grade	%
FRANCAIS	text	50	Grade in French	pour cent (en poids)
ANGLAIS	text	50	Grade in English	per cent (in weight)
ESPAGNOL	text	50	Grade in Spanish	por ciento (en peso)

3(2) Table structures for mining district database

1 Table name: Districts

Field Name	Data Type	Length	Content	Examples
Compteur	long integer		No	5
Numero	text	10	It is formatted in the following way: Pays.CodeIso+"-"+ Compteur+"-D" (Country code Iso+"-"Control+"-D")	YUG-005-D
Belt	text	150	Modifiable terminology from REFERENCE_BELT	Serbo-Macedonian Metallogenic Province
S_Belt	text	150	Terminology from REFERENCE_S_BELT	
pays	text	50	Terminology from REFERENCE PAYS	SERBIA
Nom	text	80	Name of the district	Drina or Podrinje district
S1	text	5	Terminology from REFERENCE_STRATIGRAPHIE, primary material	Sb
S2	text	5	Terminology from REFERENCE_STRATIGRAPHIE, primary material	PbZn
S3	text	5	Terminology from REFERENCE_STRATIGRAPHIE, primary material	Fe
S4	text	5	Terminology from REFERENCE_STRATIGRAPHIE, secondary material	Fl
S5	text	5	Terminology from REFERENCE_STRATIGRAPHIE, secondary material	Cu
S6	text	5	Terminology from REFERENCE_STRATIGRAPHIE, secondary material	Au
S7	text	5	Terminology from REFERENCE_STRATIGRAPHIE, secondary material	
Contenu_metal1	double		Metal content of zone S1 of the district	90000
Contenu_metal2	double		Metal content of zone S2 of the district	0
Contenu_metal3	double		Metal content of zone S3 of the district	0
Contenu_metal4	double		Metal content of zone S4 of the district	66250
Contenu_metal5	double		Metal content of zone S5 of the district	0
Contenu_metal6	double		Metal content of zone S6 of the district	0
gito_ligne	text	50	Primary deposit line, from LEXIQUE GITOLOGIE	C
gito_type	text	50	Primary deposit type, from LEXIQUE GITOLOGIE	C70
Contenu_metal7	double		Metal content of zone S7 of the district	0
LithoAge_inf	text	50	Terminology from REFERENCE_STRATIGRAPHIE	
LithoAge_sup	text	50	Terminology from REFERENCE_STRATIGRAPHIE	
Litho_Age_BorneInf	single		Lower limit of the lithologic age of the outcrop	0
Litho_Age_BorneSup	single		Lower limit of the lithologic age of the outcrop	0
MineAge_inf	text	50	Terminology from REFERENCE_STRATIGRAPHIE	Tert1
MineAge_sup	text	50	Terminology from REFERENCE_STRATIGRAPHIE	Tert2
Mine_Age_BorneInf	single		Lower limit of the Mineralisation age	65
Mine_Age_BorneSup	single		Upper limit of the Mineralisation age	1.75
ContLithForm	text	50	Formation	
ContLithEnc	text	50	Terminology	
ContStruct	text	50	Terminology from FORME TECTONIQUE	
Hydrothermalisme	text	60	Terminology from ALTERATION HYDROTHERMALE	
Description	Memo		Open field for description in French	The mineralization of this district is ...
DesAnglias	Memo		Open field for description in English	
DesEspagnol	Memo		Open field for description in Spanish	The existence of sulfidic mineralization...
REDACTEUR	text	50	Name of the author of the file	J.Monthel
DATE_DE_REDACTION	Date/Time		Date drafted	2002/1/29

2 Table name: Gisement_District

Field Name	Data Type	Length	Content	Examples
IDENTIFIANT	text	50	Identifying features of the district	YUG-0004-D
NOMdeGISEMENT	text	100	Name by which the deposit is known	Rudnik
ORDRE	long integer		Order which allows the most commonly used name to be determined	39

3 Table name: District_Typo

Field Name	Data Type	Length	Content	Examples
IDENTIFIANT	text	50	Identifying features of the district	YUG-0005-D100
ID_Typo	text	50	Name by which the deposit is known	C73
ORDRE	long integer		Order which allows the most commonly used name to be determined	13

4 Table name: BIBLIO_DISTRICT

Field Name	Data Type	Length	Content	Examples
IDENTIFIANT	text	50	Identifying features of the deposit	YUG-0001-D
ID_TEXTO	text	50	Name of the country where the deposit occurs	1583.

5 Table name: REFERENCE_BELT

Field Name	Data Type	Length	Content	Examples
Nom	text	150	Name of belt	Serbo-Macedonian Metallogenic Province
ID	text	50	Identifying features	B-EUR-1
compt	long integer		Automatic number used to calculate ID	1
nom_sp	text	150	Name of the Spanish belt	

6 Table name: REFERENCE_S_BELT

Field Name	Data Type	Length	Content	Examples
ID	text	50	Identifying features	
Nom	text	150	Name of belt	
compt	long integer		Automatic number used to calculate ID	
ID_BELT	text	50	Attached to lexicon REFERENCE_BELT	
nom_sp	text	150	?	

7 Table name: Conversion Errors

Field Name	Data Type	Length	Content	Examples
Object Type	text	255	Object Type	Module
Object Name	text	255	Object Name	
Error Description	Memo		Error Description	There were compilation errors during…

8 Table name: REFERENCE_GITOLOGY

Field Name	Data Type	Length	Content	Examples
ID	text	50	ID for ore deposit type	A10
PERE	text	50		A
FRANCAIS	text	200	Ore deposit type in French	Gisements syn-orogéniques à tardi…
ANGLAIS	text	200	Ore deposit type in English	Fault-related syn- to late-orogenic ore…
ESPAGNOL	text	200	Ore deposit type in Spanish	Yacimientos sin a tardiorogénicos en …

9 Table name: REFERENCE_LITHOLOGIE

Field Name	Data Type	Length
ID	text	50
PERE	text	50
FRANCAIS	text	200
ANGLAIS	text	200
ESPAGNOL	text	200

Content	Examples
ID for lithology	EPI10
It is parent rock	EPI
Lithology in French	Mass-flow volcanoclastiques s.l., syn- à…
Lithology in English	Syn- to late-eruptive volcaniclastic…
Lithology in Spanish	Mass-flow volcanoclásticos s.l., sin- a…

10 Table name: REFERENCE_PAYS

Field Name	Data Type	Length
ID	text	255
PERE	text	255
FRANCAIS	text	255
ANGLAIS	text	255
ESPAGNOL	text	255
COUR3	text	255

Content	Examples
ID for country name	891
	998
Country name in French	SERBIE
Country name in English	SERBIA
Country name in Spanish	SERBIA
Abbreviation of country name	YUG

11 Table name: REFERENCE_STRATIGRAPHIE

Field Name	Data Type	Length
ID	text	50
PERE	text	50
FRANCAIS	text	100
ANGLAIS	text	100
ESPAGNOL	text	100
INT1	double	
INT2	double	
ORDRE	long integer	

Content	Examples
ID for stratigraphy	C2
	C
Stratigraphy in French	Carbonifère supérieur (Stéphanien-…
Stratigraphy in English	Upper/Late Carboniferous (Stephanian-…
Stratigraphy in Spanish	Carbonífero superior (Stephaniense-…
	320
	295
	10

12 Table name: REFERENCE_STRATIGRAPHIE

Field Name	Data Type	Length
ID	text	50
FRANCAIS	text	55
ANGLAIS	text	55
ESPAGNOL	text	55
CLASSE_A	double	
CLASSE_B	double	
CLASSE_C	double	
CLASSE_D	double	
UNITE	text	50

Content	Examples
ID for substance	Au
Substance in French	Or (métal)
Substance in English	Gold (metal)
Substance in Spanish	Oro (metal)
Quantity in Class A	250
Quantity in Class B	50
Quantity in Class C	10
Quantity in Class D	1
unit in weight	tonne (1000 kg)

13 Table name: REFERENCE_TECTONIQUE

Field Name	Data Type	Length
ID	text	10
FRANCAIS	text	100
ANGLAIS	text	100
ESPAGNOL	text	100

Content	Examples
ID for tectonics	F
Techtonics in French	Faille
Techtonics in English	Fault
Techtonics in Spanish	Falla

4. Materials of RTB Bor Smelting

4-1 Operating Cost

Smelter		Refinery	
Fuel	y = 9891.507 x−0.913		
Electric power	y = 27814587.010 x−0.931	Electric power	y= 4218.665 x−0.209
man power	y = 146.558 x−0.830	man power	y = 34.904 x−0.738
Sub material	y = 15910x−0.7084	Sub material	y = 2581.751 x−0.536
Others	y = 2E−06x + 4.1197	Others	y = 3E−07x + 0.1262

Copper production	t/y	165,000	130,000	110,000	80,000	50,000	30,000	25,000	15,000	10,000
Smelter										
Conc. Charge	t.y	828,617	652,849	552,411	401,754	251,096	150,658	125,548	75,329	50,219
Fuel	t/y	32,370	31,705	31,248	30,394	29,176	27,908	27,469	26,275	25,364
Unit price	$/t	120	120	120	120	120	120	120	120	120
	$/y	3,884,349	3,804,610	3,749,715	3,647,253	3,501,124	3,348,935	3,296,233	3,152,950	3,043,667
Electric power	kwh/y	71,226,076	70,063,966	69,260,994	67,755,700	65,593,613	63,321,908	62,530,296	60,364,683	58,699,260
Unit price	$/kwh	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
	$/y	2,136,782	2,101,919	2,077,830	2,032,671	1,967,808	1,899,657	1,875,909	1,810,940	1,760,978
man power	Man/y	1,389	1,334	1,297	1,229	1,134	1,040	1,008	924	863
Unit price	$/Man	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
	$/y	6,947,214	6,671,274	6,484,480	6,142,762	5,671,048	5,199,350	5,040,669	4,621,404	4,313,586
Sub material	$/y	846,179	789,350	751,820	685,149	597,398	514,722	488,071	420,525	373,632
Others	$/y	4,787,111	3,542,165	2,886,250	1,978,036	1,160,614	666,105	548,782	321,703	211,947
Total cost	$/y	18,601,635	16,909,318	15,950,095	14,485,872	12,897,992	11,628,768	11,249,665	10,327,523	9,703,809
Unit cost/Conc	$/t	22	26	29	36	51	77	90	137	193
Unit cost/Copper	$/t	113	130	145	181	258	388	450	689	970
Unit cost/Copper	C/lb	5.11	5.90	6.58	8.21	11.70	17.58	20.41	31.23	44.02
Refinery										
Cathode	t.y	165,000	130,000	110,000	80,000	50,000	30,000	25,000	15,000	10,000
Electric power	kwh/y	56,520,216	31,137,346	28,266,677	23,507,016	17,906,554	13,321,760	11,987,142	8,917,954	7,051,937
Unit price	$/kwh	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
	$/y	1,695,606	934,120	848,000	705,210	537,197	399,653	359,614	267,539	211,558
man power	Man/y	815	765	733	674	596	521	497	435	391
Unit price	$/Man	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
	$/y	4,073,980	3,827,289	3,663,388	3,370,138	2,979,670	2,606,417	2,484,839	2,173,572	1,954,511
Sub material	$/y	680,564	609,293	563,849	486,396	391,091	308,561	283,531	223,698	185,334
Others	$/y	28,991	21,476	17,512	12,016	7,060	4,056	3,343	1,961	1,292
Total cost	$/y	6,479,140	5,392,178	5,092,749	4,573,760	3,915,018	3,318,686	3,131,327	2,666,769	2,352,695
Unit cost/Copper	$/t	39	41	46	57	78	111	125	178	235
Unit cost/Copper	C/lb	1.78	1.88	2.10	2.59	3.55	5.02	5.68	8.06	10.67
G.total										
Unit cost/Copper	C/lb	6.89	7.78	8.68	10.81	15.25	22.60	26.09	39.29	54.69

4-2 Transaction of Copper Concentrate

TC/RC (Treatment charge/Refining charge) Processing cost

TC; The unit is gross quantity of copper concentrate. Expressed in US$/ t. Concentrate.

RC; The unit is net quantity of copper concentrate. Expressed in US ¢/lb (cents per pound). Copper.

Copper recovery rate

Unitless. The quantity of copper traded is the % of copper content in concentrate minus 1%.

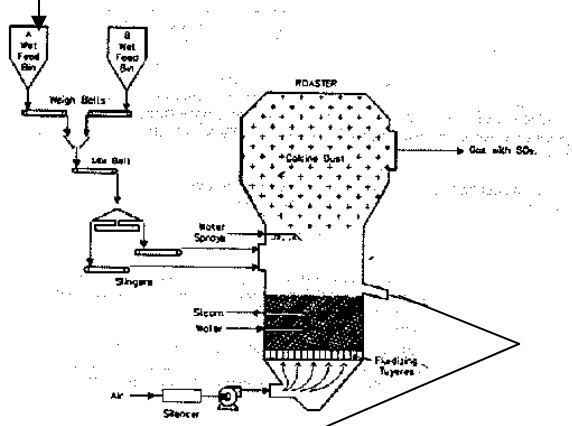
For example, when the copper content in concentrate is 20%, the traded quantity will be 20 minus 1 = 19%. The recovery rate will be (20-1)/ 20 = 95%.

Only gold and silver are evaluated as valuable materials.

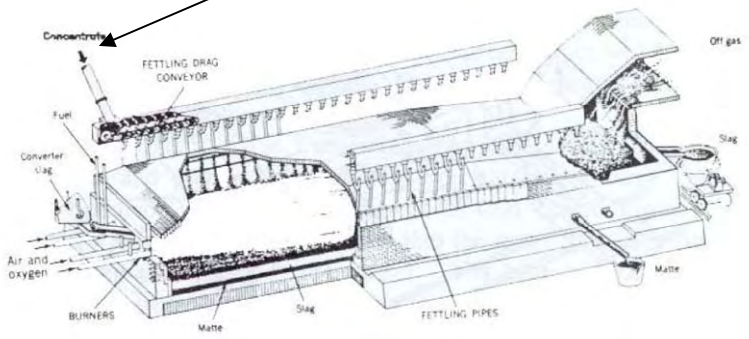
When there are materials in the concentrate that hinder the copper smelting process, such as arsenic, bismuth or antimony, they will be subject to penalty.

4-3 Smelting Process at TIR Bor　　Fluidized bed roaster + reverbertory furnace process

Copper concentrate



Fluidized bed roaster



Reverbertory furnace

The sulfur and some of the iron in the copper concentrate are oxidized in the fluidized bed roaster (solid). The sinter is melted in the reverbertory furnace and separated into matte and slag. When the copper content in the concentrate is 28% or higher, the roaster is not used and the concentrate is fed directly into the reverbertory furnace

4-4 Data Received

Year	unit	1975	1980	1982	1983	1984	1985	1990	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Smelter																						
Concentration	t/y	493,475	507,470	511,341	541,000	566,466	556,466	609,884	519,636	281,463	407,285	389,213	502,118	320,703	489,393	293,775	298,340	187,378	209,000	106,000	88,000	108,000
Cu	%	21.74	20.84	20.08	19.4	19.23	20.91	20.78	20.34	19.18	19.89	20.45	21.9	22.04	20.31	18.99	18.81	18.15	17.2		14.4	18.8
Fe	%																					
S	%																					
Au	g/t					9.44	9.07	8.46	8.22	8.89	4.77	5.39	8.59	6.02	3.08	4.03	3.07	2.87	3.58	2.78	3.18	3.61
Ag	g/t					90.25	37.85	28.34	36.49	30.01	22.27	23.41	41.39	35.44	37.57	29.52	35.78	46.09	36.29	19.03	32.64	40.11
Copper scrap	t/y	44.87	83.18	135.51	100.85	120.57	119.43	151.58	44.14	199.5	185.9	354.5	110.4	34.59	39.85	93.7	50.0	57.2	72.2	79.7	113.1	232.8
Cu	%	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Blister	t/y	26.25	28.314	145.17	209.15	229.81	187.26	272.22	115.80				81.82	51.31	128.0							
Cu	%	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
Anode production	t/y	139.30	158.085	144.071	144.356	152.293	138.881	174.257	128.943	57.447	86.549	87.411	125.154	123.232	112.176	57.801	55.422	38.438	42.000	18.000	15.000	24.000
Cu	%	99.76	99.57	99.52	99.56	99.51	99.52	99.69	99.66	99.71	99.74	99.73	99.71	99.69	99.7	99.79	99.84	99.82	99.82	99.8	99.8	99.8
Au	g/t		20.7	28.1	29.2	30	30	28.3	32.4	61.1	20.3	34.3	34.6	30.9	31.1	32.4	18.7	18.3	28	20.9	23.9	17.5
Ag	g/t		205.3	159.1	138.2	334.1	138.7	128	186	136	90.8	167.5	242.5	233.9	248.6	242.2	211.1	293.2	311.7	185.2	238.7	222.2
Sulfuric acid	t/y	330000	155000	230000	230000	330000	330000	380000	220000	59000	18000	88000	180000	185000	184000	27000	78000	49000	68000	22000	31000	97000
H2SO4	%	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96
Total operation Cost	**US$**										**34,085,852**	**17,533,093**	**35,934,975**	**35,404,284**	**30,670,382**	**19,856,670**	**17,296,011**	**14,423,805**	**10,557,894**	**7,955,183**	**9,055,090**	**13,370,287**
Calculation	**US$**											**9,111,094**	**27,015,240**	**14,006,500**	**12,164,384**		**5,597,485**	**7,172,401**	**8,785,714**	**7,272,497**	**7,712,458**	**11,214,182**
Electric power	kwh/y											72541805	48880224	70412821	74707715		57903928	85774429	78304525	93180874	48379134	70835717
Electric power	US$/kwh											0.01	0.02	0.03	0.02		0.01	0.01	0.02	0.03	0.03	0.03
Electric power	US$/y											**726,418**	**977,604**	**2,112,379**	**1,494,154**		**579,039**	**857,744**	**1,566,091**	**1,594,826**	**1,451,374**	**2,125,072**
Fuel	t/y											334.71	25821	27370	33196		28191	37651	34613	22692	20801	33234
Fuel	US$/ton											59.22	708.83	96.92	62.18		39.93	67.28	71	76.31	83.42	118.24
Fuel	US$/y											**1,982,153**	**18,180,933**	**2,652,700**	**2,064,127**		**1,125,867**	**2,533,159**	**2,457,523**	**1,731,827**	**1,716,535**	**3,929,568**
Man power	US$/y											3052944	8009152	8057764	7800075		3458138	2839302	3724670	3413300	4079038	4467815
Man power	man											1355	1373	1340	1311		1218	1383	1072	1055	1021	972
Sub materials	US$											**685,316**	**821,516**	**746,953**	**690,030**		**343,506**	**691,015**	**889,156**	**369,096**	**416,622**	**571,888**
Others	US$											**654,263**	**1,046,034**	**435,704**	**315,997**		**93,135**	**201,180**	**258,274**	**95,545**	**46,889**	**100,019**
Refinery																						
Feed anode	t/y																					
Electrolytic copper	t/y	137902	131268	128670	123706	127610	133432	151395	114764	51174	72149	74451	104000	106583	94386	50022	45633	32385	35897	14029	11997	31284
Slime	kg/y	180373	250772	189020	177713	258880	238540	203754	184542	74693	80000	104758	132832	154512	157837	85969	70440	46909	53992	21347	16839	38340
Cu	%																					
Au	%			2.45	2.85	1.78	2.04	2.74	2.73	3.08	2.42	2.28	2.93	2.37	2.11	2.43	1.49	1.24	1.82	1.82	1.75	1.38
Ag	%			19.84	16.89	19.44	17.17	14.84	12.11	15.98	11.85	11.09	17.46	15.27	14.87	15.99	15.07	16.83	17.85	12.86	42.8	15.82
Recovery Au to conc.	%					85	103	108	118	122	100	114	117	117	134	135	132	104	132	117	104	135
Recovery Ag to conc.	%					98	209	175	112	138	105	128	112	128	128	122	115	91	125	137	248	140
CuSO4	t/y			130	930	1100	1100	1050	1150	1100	1100	1100	1200	1100	1000	1100	1250	900	900	500	900	600
CuSO4	%																					
Total operation Cost	**US$**										**8,886,582**	**4,327,187**	**11,780,080**	**12,737,734**	**11,394,541**	**7,934,990**	**5,713,252**	**4,466,370**	**4,885,838**	**4,485,832**	**5,164,109**	**5,232,271**
Calculation	**US$**											**2,432,507**	**3,242,129**	**3,922,745**	**3,994,561**		**1,434,049**	**1,332,340**	**2,059,015**	**1,596,503**	**1,795,804**	**2,370,246**
Electric power	kwh/y	55,897,831	60,435,405	54,096,837	56,048,151	56,279,844	58,456,208	58,727,189	42,517,772	19,903,484	27,461,128	29,211,207	40,835,725	39,946,822	38,254,184	20,117,054	20,248,544	14,355,852	15,650,181	8,237,774	7,403,422	15,732,920
Electric power	US$/kwh											0.01	0.02	0.03	0.02		0.01	0.01	0.02	0.03	0.03	0.03
Electric power	US$/y											**292,112**	**816,735**	**1,198,405**	**765,084**		**202,485**	**145,559**	**313,004**	**247,133**	**222,103**	**471,976**
Fuel	t/y																					20185
Fuel	US$/ton																					
Man power	US$/y											**1,732,411**	**1,891,728**	**1,983,131**	**2,779,914**		**1,080,450**	**881,302**	**1,146,570**	**1,106,316**	**1,352,294**	**1,493,212**
Man power	man											681	711	707	694		662	635	497	406	433	421
Sub materials	US$											**396,455**	**721,713**	**720,556**	**431,649**		**146,255**	**298,662**	**584,042**	**196,580**	**220,265**	**402,722**
Others	US$											**9,498**	**11,955**	**20,653**	**17,914**		**4,849**	**5,817**	**5,400**	**2,424**	**1,121**	**2,335**
Precious metal																						
Au	kg/y	5251	3139	3936	4056	3716	4197	4703	4203	2129	1860	1774	3099	2974	2597	1235	1008	921	758	283	176	414
Ag	t/y	37267	32730	28446	19828	27097	35134	22925	21360	9794	8263	8246	16309	15024	18099	7612	8803	5981	8383	2028	1090	3504
Recovery Au to conc.	%					89.5	83.2	91.2	98.4	113.1	85.4	84.6	92.4	94.9	104.5	104.4	127.1	93.6	101.9	86.0	62.9	105.2
Recovery Ag to conc.	%					93.0	167.3	132.6	106.8	115.0	89.0	86.5	78.5	86.8	87.5	87.8	73.5	64.5	84.2	100.5	37.9	80.9

year	unit	1975	1980	1982	1983	1984	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Smelter																						
Operation days	days																					
Plan stop	days							78	71	230	59	328	389	184	216	211	170	99	125	65	206	230
2 line total																						
Matte	t/y	289151	242016	216516	238462	262472	239006	270204	275644	254296	132140	187727	175079	220454	224897	219270	130174	127838	87300	103763	42390	34885
Cu	%	35.81	41.7	43.85	41.04	39.17	42.7	43.8	42.31	39	37.75	40.05	41.87	44.89	44.33	40.94	37.64	35.15	38.16	40.63	40.94	39.76
Rev. slag	t/y	393727	437910	461350	509218	522700	520240	561560	583480	464860	275880	382260	343360	445820	437100	457800	249980	238420	181380	206830	109650	89360
Cu	%	0.56	0.5	0.6	0.54	0.55	0.68	0.61	0.61	0.63	0.62	0.58	0.57	0.58	0.54	0.58	0.52	0.54	0.55	0.61	0.55	0.61
Fe	%																					
SiO2	%																					
Cu% x 10 Rev. slag	%	5.6	5	6	5.4	5.5	6.8	6.1	6.1	6.3	6.2	5.8	5.7	5.8	5.4	5.8	5.2	5.4	5.5	6.1	5.5	6.1
CF slag	t/y																					
Cu	%																					
Fe	%																					
SiO2	%																					
Anode	t/y	105575	98925	109916	108817	109798	115424	57395	86549	75487	98260	100460	89147	48606	44570	31561	33306	12338	11350	30432	37660	15000
O2	%																					
Slag treatment																						
Treated slag	t/y																		14617	139712	360345	306440
Cu	%																		0.71	0.68	0.7	0.75
Recovery	%																		83.5	63.5	57.1	51.3
Refinery																						
Operation days	days																					
Plan stop	days																					
Trouble stop	days																					
Commercial section																						
Operation cell	cell	1185	1147	1083	1105	1152	1115	1156	1009	751	274	637	521	964	830	572	856	274	265	2007	123	168
Dk	A/m2	200-280	200-280	200-280	200-280	200-280	200-280	200-280	200-280	200-280	200-280	200-280	200-280	200-280	200-280	200-280	200-280	200-280	200-280	200-280	200-280	200-280
Current efficiency	%																					
Electric power	AC kwh/t	405.31	460.48	426.37	433.06	441.03	431.61	387.9	365.56	370.48	385	380.62	377.28	392.66	374.79	405.25	402.76	443.73	449.75	435.976	587.19	674.066
Time efficiency	%	90.71	83.48	78.37	80.43	88.95	83.88	92.04	94.28	94.38	94.37	95.92	95.48	94.12	95.43	94.55	94.24	94.48	94.4	93.37	95.07	95.14
Anode life	days	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Cathode life	days	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Anode	kg/pc	270	270	270	270	270	270	270	270	270	210	235	235	235	235	235	235	235	235	235	235	235
Anode scrap	%	18.7	20.93	19.12	18.61	17.24	19.26	14.39	14.74	14.75	13.73	15.01	14.09	17.65	13.87	15.47	15.53	16.5	14.41	15.51	14.5	13.1
Accept deposit	%																					
Starting sheet cell																						
Operation cell	cell	85	81	81	81	79	80	78	72	85	37	41	39	59	58	49	27	23	16	18	7	16
Dk	A/m2																					
Current efficiency	%	90.08	80.89	83.58	87.97	84.6	85/38	91.73	94.38	94.36	96.36	96.54	96.73	93.18	95.51	96.26	95.13	91.08	92.97	92.79	92.39	92.65
Electrolyte	liter/min.cell																					
Cu	g/l	45-50	45-50	45-50	45-50	45-50	45-50	45-50	45-50	45-50	45-50	45-50	45-50	45-50	45-50	45-50	45-50	45-50	45-50	45-50	45-50	45-50
H2SO4	g/l	180-180	180-180	180-180	180-180	180-180	180-180	180-180	180-180	180-180	180-180	180-180	180-180	180-180	180-180	180-180	180-180	180-180	180-180	180-180	180-180	180-180
As	g/l	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	Max. 2	Max. 2	Max. 2	Max. 2
Sb	g/l	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75-0.3	0.75-0.3	0.75-0.3	0.75-0.3	0.75-0.3	0.75-0.3	0.75-0.3	0.75-0.3	0.75-0.3	0.75-0.3	0.75-0.3	0.75-0.3
Bi	g/l	0.0075	0.0075	0.0075	0.0075	0.0075	0.0075	0.0075	0.0075	0.0075	0.3-0.05	0.3-0.05	0.3-0.05	0.3-0.05	0.3-0.05	0.3-0.05	0.3-0.05	0.3-0.05	0.3-0.05	0.3-0.05	0.3-0.05	0.3-0.05
Ni	g/l	3-5	3-5	3-5	3-5	3-5	3-5	3-5	3-5	3-5	1.5-3	1.5-3	1.5-3	1.5-3	1.5-3	1.5-3	1.5-3	1.5-3	1.5-3	1.5-3	1.5-3	1.5-3
Temperature inlet	deg.C	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
Pollution control																						
Emission																						
Stack 1 150 m	Nm3/h								102061	102061	102061	116192	92816	132590	134145	68497	68497	125103	188392	133789	157726	330022
Sox	%								1.52	1.52	1.52	1.3	2.5	2.52	2.04	3.1	3.1	2.7	8.3	2.6	1.4	5.5
Stack 2 80 m	Nm3/h																		80	80	80	
Sox	ppm																		1000	1000	1000	
Stack 3 100 m	Nm3/h							108020	93268	93268	20384	66033	64463	140872	126586	140199		103390	122182	83393	69163	68083
Sox	ppm							0.97	0.97	0.97	0.65	1.53	0.62	0.76	0.759	0.8	0.6	0.8	0.2	0.5	0.5	1
Stack 4 m	Nm3/h																					
Sox	ppm																					
Effluent	m3/day										Refination	35	80	Factory H2SO4		120	360		728	261	225	175
PH												<1				1.51	1.92					
Zn	g/l											0.01	0.16			0.015	0.057					
As	g/l											0.0076	0.16			0.017	0.12					
Cu	g/l											5	10			0.012	0.07					
Cd	g/l															0.0003	0.002					
Pb	g/l											0.0026	0.0061			0.004	0.0087					
Fe	g/l											0.005	0.4			0.24	1.18					
S.S	g/l																					
Hg	g/l																					
Mn	g/l																					
Mn	g/l																					
Cl	g/l											0.015	0.025									
H2SO4	g/l											5	100			0.33	0.54					
Total salt	g/l																					
Soluble substance	g/l											0.1	0.48			0.07	1.5					

5. **The Accounting and Auditing Law of 2002**

1st Section BASIC PROVISIONS
2nd Section BOOKS OF ACCOUNT AND ACCOUNTING DOCUMENTS
3rd Section KEEPING BOOKS OF ACCOUNT
4th Section FINANCIAL STATEMENTS
5th Section AUDITING OF FINANCIAL STATEMENTS
6th Section SUBMISSION AND DISCLOSURE OF FINANCIAL STATEMENTS
7th Section ACCOUNTING AND AUDITING COMMISSION
8th Section PENALTY PROVISIONS
9th Section TRANSITIONAL AND CLOSING PROVISIONS

(Scope and Application of the law) - The provisions of this law apply to:

1) Legal entities (enterprises, cooperatives, banks and other financial organizations, insurance organizations, stock exchanges and stockbrokers)
2) Entrepreneurs (individuals independently conducting commercial activities and reporting profits on those activities as required by income tax laws)

Legal entities are classified as small, medium, or large, according to certain criteria. Entrepreneurs are considered small legal entities. Auditing of financial statements is compulsory for large and medium size legal entities.

(Obligations for preparation and disclosure of financial statements) – Legal entities and entrepreneurs must keep account books, and prepare, present, submit, and disclose financial statements in compliance with legislation, professional rules, and internal rules. Professional rules include IAS, IRFS, and other international accounting rules. In this way, Serbian accounting standards are shown to clearly comply with international accounting standards.

Financial statements should include following 5 statements;

○ Balance Sheet
○ Income Statement
○ Cash Flow Statement
○ Statement of Changes in Equity
○ Notes on Financial Statement

Small legal entities must prepare balance sheets and income statements in place the above.

(Requirement of keeping books of account) – Books of account should include journals, general ledgers, and supporting ledgers, and be kept in such a manner as to allow the accuracy of entries.

(Internal rules, organization and system) – Legal entities and entrepreneurs should through their general rules establish an accounting system and internal control procedures, and designate the person responsible for the legality and validity of business transactions.

(The period for keeping financial statements) – Financial statements should be kept for a period of 50 years. Journals and general ledgers should be kept for a period of 10 years.

(Auditing of financial statements) - Auditing of financial statements is compulsory for large and medium legal entities. The audits should be conducted in accordance with the International Standards of Auditing (IAS) and the Code of Ethics for Professional Accountants. The audits should be conducted in exchange for payment of an agreed fee, whereas such fee in two consecutive years should not exceed 15% of the annual income reported by the auditing firm. The auditing firm should take out liability insurance against any possible damage caused by opinion.

(Accounting and Auditing Commission) - The federal government should, by special directives, establish an Accounting and Auditing Commission for the purposes of monitoring the development of the accounting and auditing profession, and monitoring the application of international accounting regulations.

(Penalty) – Legal entities will be fined 100,000 to 3,000,000 dinars, and entrepreneurs 20,000 to 200,000 dinars, for commercial offences.

6. Comparison of environmental elements in surveyed mines and case studies

			RTB-Bor	Grot Mine	Suwa Ruda Mine	Rudnik Mine	Lece Mine	Costolac Coal Mine	Case Study(SX-EW)	Case Study(CN ⁻)
Physical environmental Element										
	Air pollution	Air pollution by exhaust gas of smelter	It is the same as the exhaust gas process is not executed. The pollution situation is serious. The operation ratio is changing with the SO2 concentration of the exhaust gas.	Not available	Not available	Not available	Not available	Not available because there is no smelter. But, there is the exhaust gas from power plant A and B (SO2 gas and soot).	Not available	Not available
		Air pollution by exhaust gas of delivery vehicle for raw materials and products etc.	There is no house in the mine site. The smelter is in the town. Air pollution situation is serious but its influence is not clear.	Details are uncertain. There is few house in the mine site. It is judged that there is no influence.	No operation now. There is few house in the mine site. There is heavy traffic road near the plant. There is no influence.	Details are uncertain. There is few house in the mine site. There is heavy traffic road near the plant. There is no influence.	No operation now. There is no house in the mine site. It is judged that there is no influence.	Open pit. Mining by excavatorin in the mine site and transporting by belt conveyor. Stripping soil by dragline and transporting it by dump truck. The influence is negligible because there is few machines in a wide area.	Uninvestigated. There is exhaust gas by the vehicle that carries the raw material from the tailing dam.	Uninvestigated. There is exhaust gas by the vehicle that carries the raw material from the tailing dam.
		Air pollution by exhaust gas of construction vehicle with mine	Not available	Not available	Not available	Not available	Not available	Not available	Not available	Not available
	Water pollution	Deterioration of water by wastewater from mine, dressing plant, and tailing dam.	Acid water generates in mine and waste rock dam. The acid water is treated by mixing in the tailing dam. If the pH of pond water is low, precipitate of the heavy metal dissolves again.	There is no problem of wastewater from the dressing plant and the tailing dam.	Details are uncertain. There is no problem of wastewater from the dressing plant and the tailing dam.	Uninvestigated	Details are uncertain. The mine water is acidulous-neutral.	There is no dressing plant. The wastewater on surface of the mine is a little because groundwater has pumped up before the mine is developed.	The process of leaching by sulfuric acid – SX extraction – electrolytic winning is general. It is necessary to consider the leakage of the acid water for the equippment of leaching by sulfuric acid. Oomplete the treatment of waste water after the substitution in the case of cement copper extraction.	The process of the concentration by flotation – CN leaching of the concentrate – CIC is general. Maintain the pound of dam at the alkali side to keep the flotation tail in the tailing dam. It is necessary to maintain the alkali side to tailing dam keeping of flotation tail. Execute surely the CN resolution of the CN leaching drainage.
		Deterioration of water by wastewater of smelter	Acid water is drained off nearly by no processing. Heavy pollution. Immediate neutralizing measures necessity.	Not available	Not available	Not available	Not available	Not available	Prevention for leakage of leaching solution and extracting material.	Select the process which is easy for treatment of waste water in the CIC process.
		Deterioration of water by wastewater of waste rock dam	Acid water generates. Pollution advances. Immediate measures necessity.	Details are uncertain. Acid water generation is possessed if there is a waste rock dam.	Acid water generates. Minimal pollution.	Details are uncertain. Acid water generation is possessed if there is a waste rock dam.	Details are uncertain.	Not available because there is no waste rock dam. However, there is an ash depository in the power plant. (It is not the subject to invest off.) The drain of the ash depository is uninvestigated.	The tailing materials to process are raw materials. Do enough management to start piling up again in the new tailing dam.	The tailing materials to process are raw materials. Do enough management to start piling up again in the new tailing dam.
		Water pollution by wastewater with mine development	Not available	Not available	Not available	Not available	Not available	There is no pollution in the groundwater drawn up. Because the underground water pumps up to lower the water level before development.	Not available	Not available
	Soil pollution	Soil acidification by SO2 exhaust gas of smelter and heavy-metal contamination	Soil acidification by exhaust gas of smelter and soil pollution by heavy metal dust	Not available	Not available	Not available	Not available	The SO2 density of the exhaust gas of the power plant is uninvestigated.	Not available	Not available
		Diffusion of heavy metal inclusion from tailing dam	Drainage is run off in the state similar to no processing as an acid water of the waste rock dam. It is necessary to treat it.	Small potential of contamination	Details are uncertain.	Uninvestigated	Uninvestigated	Not available.(There is a possibility of the dispersion of the grit from stopes.)	Good pH control is necessary. The drain leakage from the tailing dam is prevented.	Good pH control is necessary. The drain leakage from the tailing dam is prevented.
	Waste	Installation of tailing dam	Installation already. Partially planting? (or natural growth?).	Installation already. No planting.	Installation already. No planting but partially natural growth.	Installation already. No planting.	Installation already. No planting.	Not available	Uninvestigated. (It is necessary to install special tailing dam and treatment equipment for its drain.)	Uninvestigated. (It is necessary to install special tailing dam and treatment equipment for its drain.)
		Installation of waste rock dam	Installation already. No planting.	Uninvestigated	Installation already. No planting.	Uninvestigated	Uninvestigated	Not available	Not available	Not available
		Outflow of sediments from various deposit dam	Erosion of the waste rock dam by the rain is large. Erosion of the body of tailing dam by wind. Planting is necessary.	Uninvestigated	Erosion of bank of old tailing dam by rain. Drain to river doesn't flow out. Planting is necessary.	Uninvestigated	Uninvestigated	Uninvestigated	It is necessary to manage well tailing dam.	It is necessary to manage well tailing dam.
		Generation of waste by construction and deforestation with mine development	Not available	Not available	Not available	Not available	Not available	The stripped soil is generated. (It is possible to use it as a reclamation soil.)	Uninvestigated	Uninvestigated
	Bottom sediment	Overflow of sediments from underground, dressing plant, smelter and dam	Bottom sediment in the rivers and ponds gets worse by the precipitation of heavy metals fron the acid water and by the eroded solid. Measures and treatment are necessary.	Deterioration of sediment on bottom of marsh at Bosilegrad side. Details are uncertain. Measures examination is necessary.	Uninvestigated	Uninvestigated	Uninvestigated	Not available	Uninvestigated	Uninvestigated
	Subsidence	Caving of land surface by mining	Mainly, the upper part is open cut and the lower part is underground pit. Only the Brezanik deposit has its risk. There is no influence now.	Distance until the surface is long and the possibility to break the surface is small.	Not available because of the open pit.	Uninvestigated	Uninvestigated	Not available	Uninvestigated	Uninvestigated
	Noise and vibration	Generation of noise and vibration by dressing plant operation	There is no house in the vicinity of the dressing plant, so the probrems of noise and vibration don't exist.	There is no house in the vicinity of the dressing plant, so the probrems of noise and vibration don't exist.	There is no house in the vicinity of the dressing plant, so the probrems of noise and vibration don't exist.	There is no house in the vicinity of the dressing plant, so the probrems of noise and vibration don't exist.	There is no house in the vicinity of the dressing plant, so the probrems of noise and vibration don't exist.	Not available	Uninvestigated	Uninvestigated
		Generation of noise, vibration, and fly rock by blast	There is no house in the vicinity except Bor open pit, so probrem for noise and vibration and fly rock don't exist.	There is underground mine and no house in the vicinity, so probrem for noise and vibration and fly rock don't exist.	There is no house in the vicinity, so probrem for noise and vibration and fly rock don't exist.	Uninvestigated	There is underground mine and no house in the vicinity, so probrem for noise and vibration and fly rock don't exist.	No blast is used because of the mechanical excavation method. There is no house in the vicinity. (there is no probrem of noise and vibration and fly rock.)	Not available	Not available
	Stink	Generation from dressing plant and smelter	There is no house in the vicinity. There are no problems except the stink of exhaust gas from	There is no house in the vicinity, so probrem for stink doesn't exist.	There is no house in the vicinity, so probrem for stink doesn't exist.	There is no house in the vicinity, so probrem for stink doesn't exist.	There is no house in the vicinity, so probrem for stink doesn't exist.	Not available	Uninvestigated	Uninvestigated
Natural environmental Element										
	Geographical and geological features	Road construction and site preparation for mine development	Not available	Not available	Not available	Not available	Not available	Geographical features is modified because of the open pit mining. The access road has been set up.	Uninvestigated	Uninvestigated
	Life and ecosystem	Destruction of forest and meadow /Outflow of and excavated earth	Not available	Not available	Not available	Not available	Not available	Not available	Not available	Not available
		Destruction habitat environment of (precious) species	Not available	Not available	Not available	Not available	Not available	Not available	Not available	Not available
	Global warming	Consumption of energy necessary for operation	Uninvestigated	Uninvestigated	Uninvestigated	Uninvestigated	Uninvestigated	Uninvestigated	Uninvestigated	Uninvestigated
Social environmental element										
	Non-voluntary resident transfer	Deprivation of house and farmland	Facilities existing. Details are uncertain though there is the construction plan of the fourth dam. There is no influence if it is constructed in the mine site.	Facilities existing. It responds by increment of the present equipment. The possibility of the resident transfer in the future is extremely small.	Facilities existing. Thecapacity of the dam is big. There is no possibility of the resident transfer in the future.	Facilities existing. Thecapacity of the dam is big. There is no possibility of the resident transfer in the future.	Facilities existing. The possibility of the resident transfer in the future is extremely small.	There is a village on a part within the range of the deposit. (The zone is not the subject to develop.)	Uninvestigated	Uninvestigated
	Regional economies of employment and means of livelihood, etc.	Job growth	Positive influence by operation.	Positive influence by operation.	Only for safety maintenance. Decrease of employment by unoperation.	Positive influence by operation.	Only for safety maintenance. Decrease of employment by unoperation.	Positive influence by development. Securement of raw material for electric power plant.	Positive influence by operation.	Positive influence by operation.
		Buying and selling of necessary article for business and worker's living	Positive influence by operation.	Positive influence by operation.	Economic stagnation by unoperation.	Positive influence by operation.	Economic stagnation by unoperation.	Positive influence by operation. (Necessary goods for securement of the electric power are produced.)	Positive influence by operation.	Positive influence by operation.
		Improvement of medical treatment and educational environment	Equiped fully as a mine bourg.	Only the elementary school on the mine site. No influence.	Uninvestigated	Uninvestigated	Uninvestigated	Uninvestigated	Uninvestigated	Uninvestigated
	Social infrastructure	Construction road and electric power line, etc. by demand rise	Enough being equipped.	Enough being equipped	Unoperation. Enough being equipped	Enough being equipped	Unoperation. Enough being equipped	Enough being equipped as a society's infrastructure.	Society's infrastructure is a level that can correspond generally enough.	Society's infrastructure is a level that can correspond generally enough.
		Withdrawal of industrial water from river	Getting water from Krivelj river. The used amount is about 4-5% of all.	The mine water is used. Getting water from the river is not scheduled.	Used water is recycled. The shortfall of water is getting from the upstream side brook of tailing dam.	Uninvestigated	Uninvestigated	The pumped underground water is used. It is distributed to the surrounding area as agricultural water.	Uninvestigated	Uninvestigated
	Natural and cultural heritage	Destruction of natural spectacle and cultural asset	Not available	Not available	Not available	Not available	Not available	There are ruins. (The principle is move and restoration. it is possible to develoe after the security distance of 100m is secured, if it is not possible to move it.)	Uninvestigated	Uninvestigated
	Accident	Outflow of sediments from tailing dam by heavy rain and earthquake	There are the equipments that can measure the moisted water level. But, many equipments are with a defective function. The construction of re-installation will be planned.	There is no equipment that can measure the moisted water level.	The moisted water level can be measured. The measuring equipment is a little good.	The moisted water level can be measured. The measuring equipment is good.	Uninvestigated	Not available	Uninvestigated	Uninvestigated
Proposal of mitigation measures (The next column is proposes to the whole.)			・Policy making to promotion the measures of pollution prevention (preferential treatment for tax system, subsidy provision, and foundation of fund by environment tax). ・The execution of measures by the state and local government etc. for an existing mining pollution (For the mine where the person who has the mining right is absent). ・Assistance or exemption to the person entitled who won in the tender to measures against the past pollutions from mining.	・Execution of drastic measures. (Change in the furnace type. Change of equipment type to manufacture sulfuric acid. Installation of SO2 gas processor.) ・Processing of the acid water from the smelting factory. (Basically neutralizing mean). ・Source survey for the processing of acid water from waste rock dam. (to execute drastic investigation of the separation for clear-murky water). ・Execution of the separation for clear-murky water and treatment of the acid water. ・Management to treat the acid water in the tailing dam (management of pH control). ・Execution of planting for the waste rock dam (to	・Confirmation of dissolubility of pollutant in the bottom quality of the marsh. ・Installation of equipments to measure the moisted water level. ・The deforestation of the plant and the formation of the impermeable formation by the soil consolidation (to prevent the pollution of underground water).	・Execution of planting to prevent the erosion for the bank body of old tailing dam. ・Processing of acid water from tailing dam (to prevent deterioration of the bottom sediment such as rivers). ・Execution of planting on surface of waste rock dam (to prevent infiltration of rain water).	Privatization completion mine. (It is necessary to correspond to environmental measures in the future.)	It is necessary to examine the mitigation measures in a concrete redevelopment plan.	This mine is off the subject of the investigation. (EIA has been executed.) The mitigation measures in EIA are not investigated.	If details for the concrete process flow, the operating condition, used equipments and installation site, etc. are not decided, it is difficult to study concrete measures and the mitigation measures.	If details for the concrete process flow, the operating condition, used equipments and installation site, etc. are not decided, it is difficult to study concrete measures and the mitigation measures.