INTERDEPENDENT LAWS OF EXPECTATIONS.

Negative expectations give birth to negative output.
Positive expectations also give birth to negative output.

(from MURPHY'S laws)

JSC MADNEULI

Ore reserves calculation and optimization using *"NPV Scheduler"* of *Datamine International.*

28.08.2009

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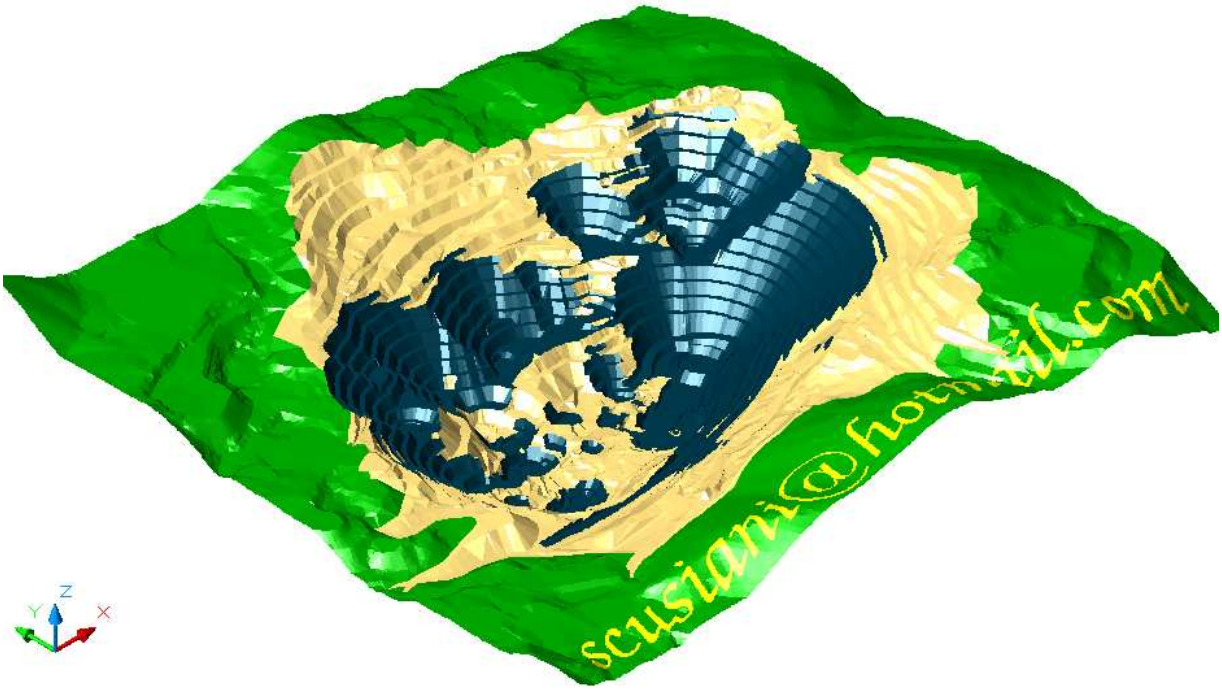
Contentes

Des080709



1. Introduction.

Data used for calculation of copper ore reserves at JSC Madneuli open-pit

1.1 **estrc_1f** – block model by Snowden Group.

1.2 3D wireframe model of the pit surface of Jun 2009 month end survey.

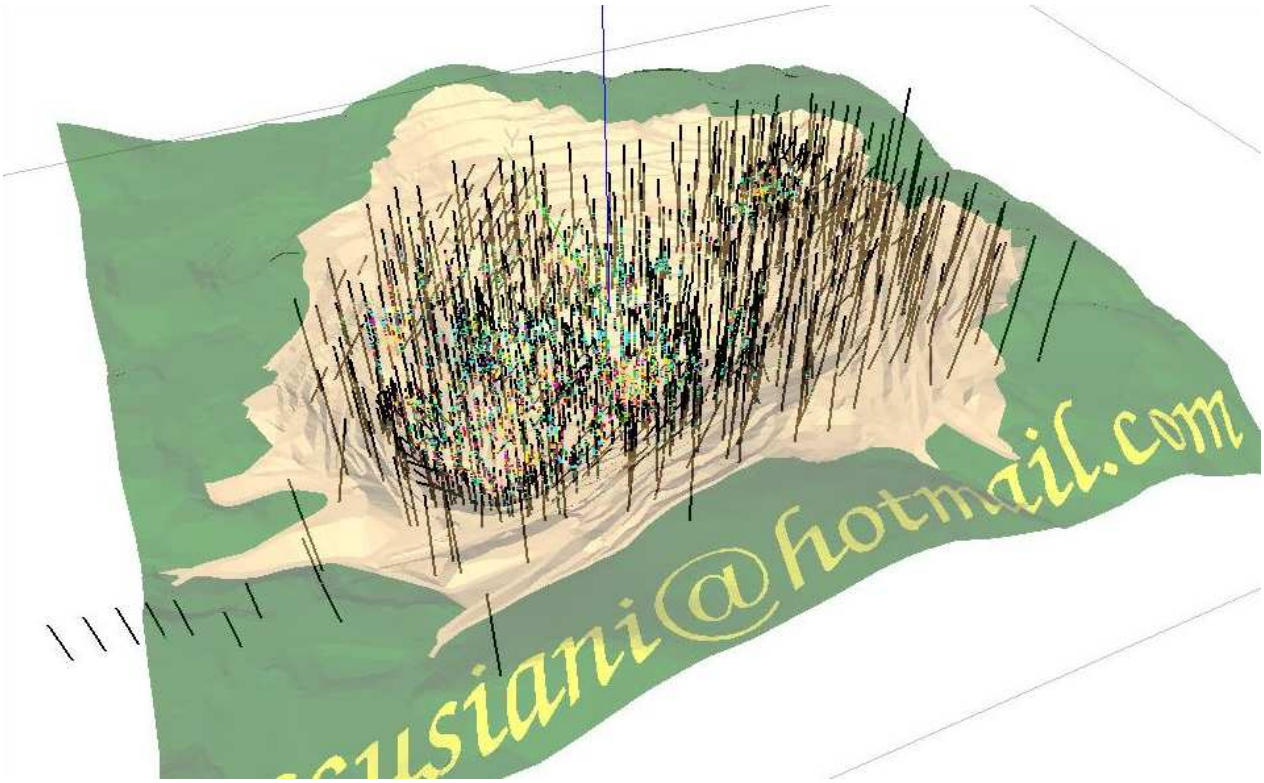
1.3 Current costs and stock prices for copper and gold.

1.1.1 Block model **estrc_1f** was made in 2006 at Snowden, Australia. So called intermediate model **mad08bm2** was made again in Snowden and updated the estrc_1f with additional exploration data of 2007. Reconciliation of the reserves within the final pit does not make any difference between the two models. The amount of exploration works at the deposit leaves no questions in reliability of information within the block model in each part of the deposit, including peripheries. By the level of study estrc_1f can be counted to *Indicated with High Confidence* by JORC code or B-C1 by GKZ (ГКЗ). By other words, **estrc_1f** has no "blank" spaces.

Table1.1.1 *Reconciliation* ***estrc_1f*** *u* ***mad08bm2.*** *within Des_v4 of Snowden did not show any additional reserves by Sep 2008 года.*

Sep-08	Category	Tonnes	CU_FEB07	CU[mad08bm2]	AU_FEB07	AU[mad08mb2]	DENSITY	CU_REC	AU_REC
	[ABSENT]	0.00	0	0	0	0	0	0	0
	[0,0.22]	39,469,000.00	0.089	0.076	0.194	0.215	2.655	84.205	47.29
	[0.22,0.25]	2,380,423.50	0.243	0.235	0.35	0.37	2.684	82.529	46.069
	[0.25,0.31]	3,956,142.60	0.283	0.278	0.378	0.403	2.687	83.274	45.696
	[0.31,0.4]	3,913,870.40	0.354	0.351	0.402	0.426	2.691	82.898	45.08
	[0.4,0.5]	2,627,432.00	0.445	0.446	0.418	0.439	2.696	82.542	44.186
	[0.5,0.6]	1,464,185.90	0.535	0.545	0.418	0.434	2.702	82.284	43.499
	[0.6,0.8]	1,246,641.50	0.651	0.679	0.415	0.432	2.708	83.077	43.599
	[0.8,1]	432,447.50	0.847	0.887	0.428	0.444	2.72	84.89	43.809
	[1,1.4]	257,160.30	1.112	1.156	0.48	0.505	2.736	84.182	44.446
	[1.4,2]	105,996.80	1.572	1.626	0.583	0.611	2.763	85.589	43.17
	[2,3]	14,156.30	2.439	2.36	1.254	1.253	2.814	86.936	43.314
	[3,12]	0.00	0	0	0	0	0	0	0
	TOTAL	55,868,000.00	0.183	0.174	0.254	0.275	2.665	83.831	46.594
CU>0.25	**ore**	**14,018,033.30**	**0.44**	**0.44**	**0.41**	**0.53**			
	waste	41,849,966.70							
CU>0.31	**ore**	**10,061,890.70**	**0.50**	**0.50**	**0.42**	**0.52**			
	waste	45,806,109.30							
CU>0.4	**ore**	**6,148,020.30**	**0.59**	**0.60**	**0.43**	**0.52**			
	waste	49,719,979.70							
CU>0.5	**ore**	**3,520,588.30**	**0.70**	**0.72**	**0.43**	**0.52**			
	waste	52,347,411.70							
CU>0.6	**ore**	**2,056,402.40**	**0.81**	**0.84**	**0.44**	**0.51**			
	waste	53,811,597.60							

PDwg.1.1.1 SE view with geological exploration holes since 1950s till 2007 with Copper grade less than **0.2%** in black



1.2.1 Jul 2009 month end pick-up was made by Mine Survey Department of JSC Madneuli..

1.3.1. Costs and prices:

- *Copper price – 4500 $/t*
- *Gold price – 29 $/g*
- *Mining cost of copper ore – 0.7 $/t*
- *Mining cost of gold ore – 0.61 $/t*
- *Copper ore processing cost – 14.12 $/t*
- *Milling cost of copper ore – 8.46$/t*
- *Heap leach cost of gold ore –9.28 $/m*
- *Dilution – 9%*
- *Mining loss – 9%*
- *Copper recovery in sulphide– 82%*
- *Gold Recovery in sulphide ore – 50%*
- *Copper recovery in oxide ore – 73.2%*
- *Gold recovery in oxide ore– 40%*
- *Heap leach recovery – 63.3%*
- *Mining work load - 2,500,000tons of copper ore per annum.*

2. Resource model.

Table 2.1, Rock classification of estrc_1f block model.

Rock1 – Sulphide ore Cu >= 0.01%

Rock2 – Oxide ore Cu >= 0.01%

Rock3 – Gold bearing quartzite ore Cu<0.2%, Au>=0.4g/т

Rock0 – Waste, Cu<0.01%

2.1 Imported model estrc_1f

Global Stats

	tonnes
Ore	1,223,851,247
Waste	743,053,093
Total	1,966,904,340

Rock Type Stats

	Tonnage	CU	CU Min	CU Max	AU	AU Min	AU Max
	tonnes	Percent	Percent	Percent	g/tonne	g/tonne	g/tonne
Rock 1	1,208,914.816	0.05%	0.01%	4.45%	0.0506	0.0001	7.2948
Rock 2	13,824,312	0.18%	0.01%	1.59%	0.1876	0.0032	1.8332
Rock 3	1,112,119	0.07%	0.01%	0.20%	0.728	0.4001	5.5188
UNDEF RT	536,000	0.00%	0.00%	0.00%	0	0	0
Rock 0	742,517,093	0.01%	0.00%	0.20%	0.0142	0.005	0.9979

2.2 Economoc model

Global Stats

Cash	Revenue	Minimum	Maximum	Process Cost	Minimum	Maximum
	$363,813,484	$1,202	$110,034	$253,551,949	$768.42	$10,267
	Block Count	Mass				
ORE	$27,453	$18,337,402				
Waste	3,026,531	1,948,566,938				
Total	3,053,984	1,966,904,340				

Strip Ratio	106

ORE Stats

	Mass	CU	CU Min	CU Max	AU	AU Min
	tonnes	tonnes	Percent	Percent	g	g/tonne
Rock 1	16,224,366	72,861	0.02%	4.45%	6,760,734	0.005
Rock 2	1,430,882	6,998	0.03%	1.59%	470,993	0.0107
Rock 3	682,154	490	0.01%	0.20%	606,732	0.5511
Total	18,337,402	80,349			7,838,460	

3. Minable reserves

Dwg. 3.1 Pit shell 3D wireframe model (Pit_100)

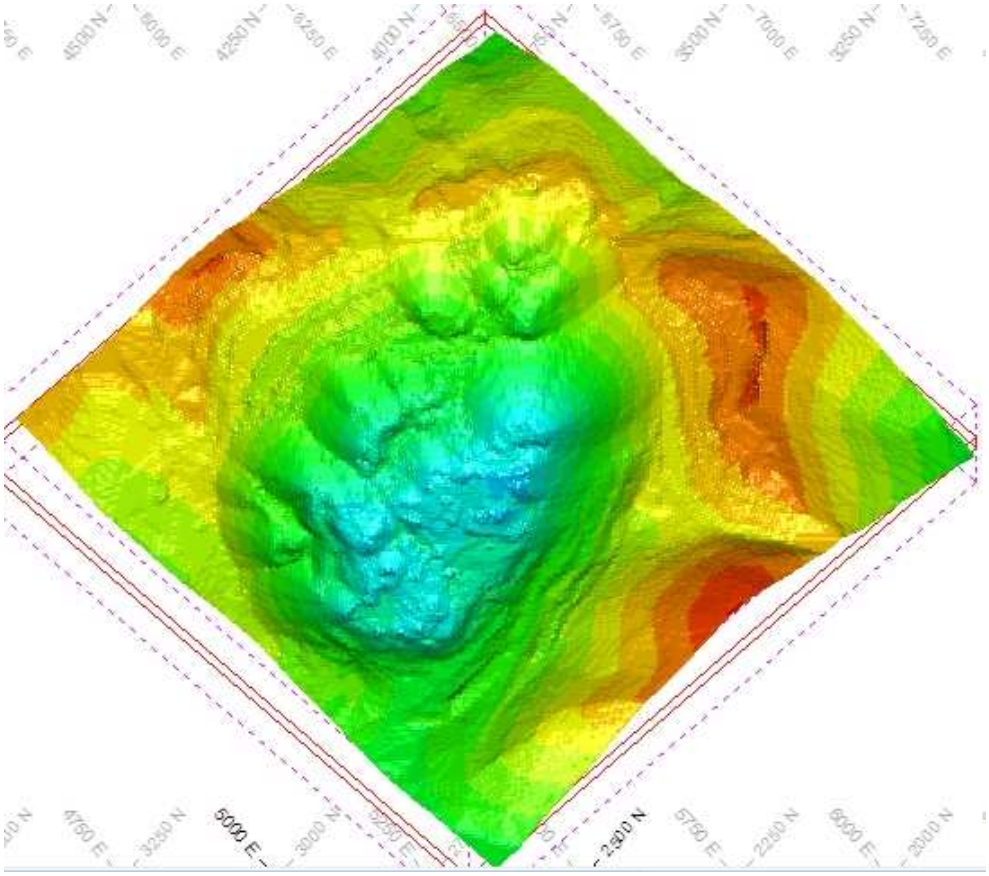
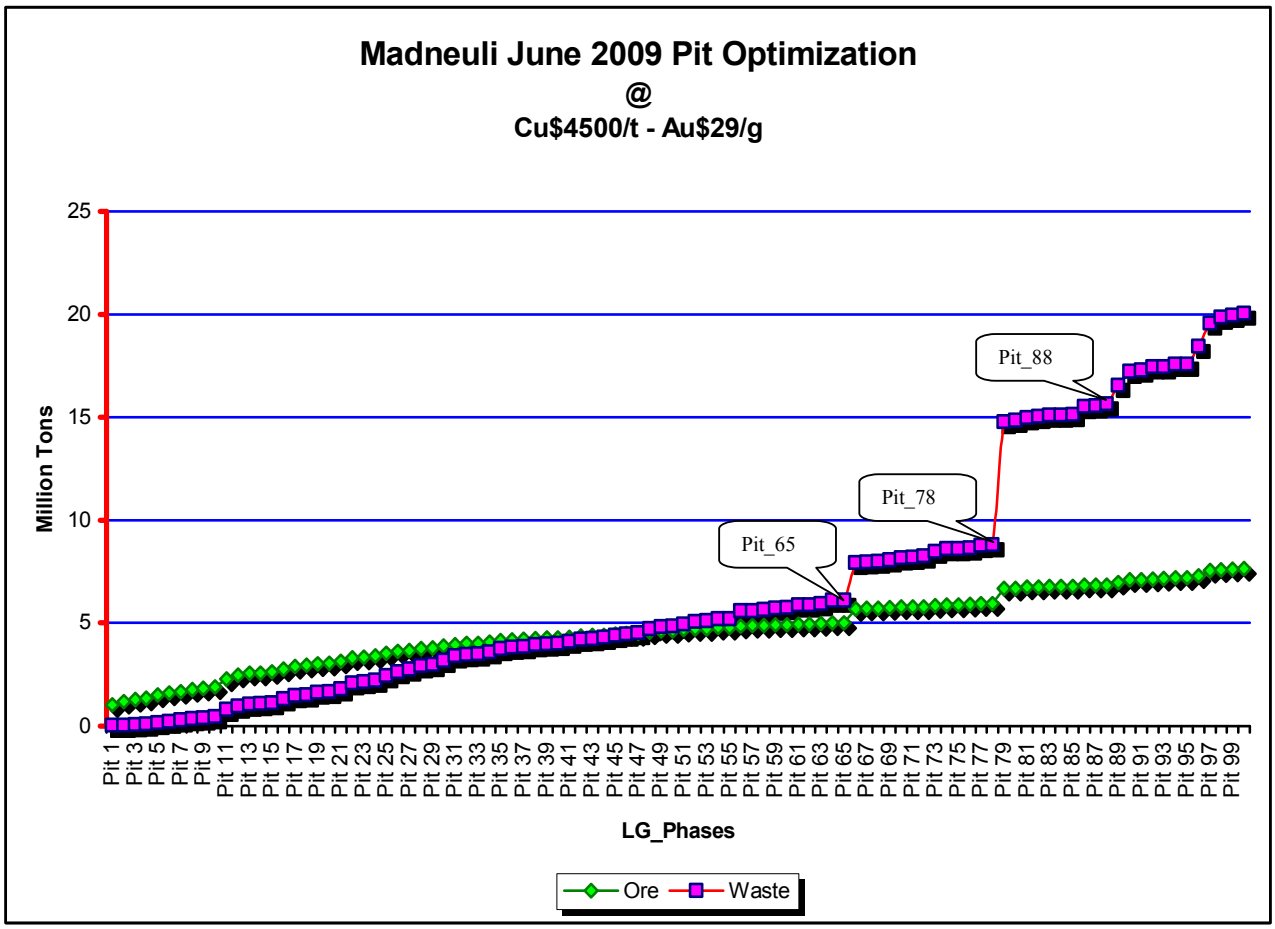


Table 3.1 LG_Phases.

	NPV	Net Revenue	Revenue $	Process Cost $	Mining Cost $	Rock t	**Total Ore t**	Waste t	Strip R.	Sulfide t	Oxide t	Q-Leach t
1	2	3	4	5	6	7	**8**	8	10	11	12	13
Pit1	8,057,629	8,258,339	23,978,256	14,483,609	1,236,308	1,060,733	**1,043,924**	16,809	0.02	898,375	116,971	28,578
Pit2	9,455,257	9,752,410	27,715,430	16,546,093	1,416,927	1,236,728	**1,193,411**	43,317	0.04	995,722	162,616	35,073
Pit3	10,428,009	10,800,394	30,096,675	17,767,588	1,528,694	1,357,628	**1,282,116**	75,512	0.06	1,076,361	166,335	39,420
Pit4	11,232,249	11,671,007	32,064,595	18,762,082	1,631,506	1,466,090	**1,356,599**	109,491	0.08	1,132,598	174,438	49,564
Pit5	12,264,570	12,795,725	35,276,566	20,660,886	1,819,955	1,670,089	**1,496,701**	173,388	0.12	1,237,177	196,754	62,770
Pit6	13,153,785	13,771,562	37,782,966	22,038,916	1,972,488	1,836,451	**1,597,897**	238,554	0.15	1,311,608	215,335	70,954
Pit7	13,824,696	14,512,017	39,873,925	23,249,430	2,112,478	1,979,957	**1,685,473**	294,484	0.17	1,395,166	216,012	74,294
Pit8	14,442,502	15,196,861	41,776,160	24,324,193	2,255,106	2,119,130	**1,762,897**	356,233	0.20	1,470,587	216,012	76,298
Pit9	14,794,763	15,588,974	43,013,116	25,081,422	2,342,720	2,216,616	**1,816,963**	399,653	0.22	1,510,703	229,963	76,298
Pit10	15,231,462	16,077,105	44,674,064	26,124,163	2,472,797	2,350,441	**1,894,165**	456,276	0.24	1,559,433	250,411	84,320
Pit11	17,450,601	18,596,506	53,397,407	31,676,818	3,124,084	3,095,247	**2,290,624**	804,623	0.35	1,955,892	250,411	84,320
Pit12	18,340,603	19,622,906	57,143,226	34,110,418	3,409,901	3,440,581	**2,471,487**	969,094	0.39	2,070,162	296,278	105,046
Pit13	18,781,992	20,136,215	58,962,298	35,271,258	3,554,824	3,612,521	**2,555,288**	1,057,233	0.41	2,151,287	296,278	107,723
Pit14	18,893,510	20,266,292	59,494,283	35,626,182	3,601,809	3,660,017	**2,581,546**	1,078,471	0.42	2,174,872	296,278	110,396
Pit15	19,124,204	20,536,123	60,512,982	36,278,788	3,698,072	3,770,745	**2,639,777**	1,130,968	0.43	2,193,770	301,667	144,341
Pit16	19,824,159	21,359,058	63,298,225	37,984,838	3,954,328	4,075,993	**2,761,589**	1,314,404	0.48	2,285,192	332,057	144,341
Pit17	20,362,363	21,996,913	65,802,303	39,619,583	4,185,807	4,349,268	**2,885,011**	1,464,257	0.51	2,383,674	337,446	163,892
Pit18	20,569,800	22,243,966	66,899,391	40,362,284	4,293,141	4,469,119	**2,944,332**	1,524,787	0.52	2,412,477	349,607	182,249
Pit19	20,897,915	22,636,270	68,334,430	41,251,235	4,446,926	4,642,894	**3,016,283**	1,626,611	0.54	2,459,688	349,607	206,988
Pit20	21,052,020	22,821,134	69,171,570	41,817,795	4,532,640	4,733,114	**3,056,736**	1,676,378	0.55	2,499,469	350,278	206,988
Pit21	21,395,296	23,234,788	71,260,390	43,271,425	4,754,176	4,954,216	**3,160,525**	1,793,691	0.57	2,572,901	380,635	206,988

Pit22	22,098,006	24,088,886	74,069,659	44,876,438	5,104,335	5,382,224	**3,304,094**	2,078,130	0.63	2,630,603	381,983	291,508
Pit23	22,284,250	24,316,228	75,092,556	45,555,909	5,220,419	5,510,741	**3,354,183**	2,156,558	0.64	2,671,377	386,702	296,104
1	2	3	4	5	6	7	8	9	10	11	12	13
Pit24	22,418,027	24,480,024	75,928,651	46,141,299	5,307,328	5,610,114	**3,395,980**	2,214,134	0.65	2,713,174	386,702	296,104
Pit25	22,888,480	25,059,593	78,607,993	47,931,206	5,617,193	5,994,475	**3,541,069**	2,453,406	0.69	2,807,822	386,702	346,545
Pit26	23,200,127	25,446,045	80,136,037	48,879,426	5,810,566	6,237,220	**3,617,251**	2,619,969	0.72	2,851,163	394,808	371,280
Pit27	23,498,481	25,817,380	81,551,032	49,732,019	6,001,632	6,454,032	**3,678,813**	2,775,219	0.75	2,907,344	398,183	373,287
Pit28	23,759,544	26,143,729	83,062,884	50,724,216	6,194,939	6,691,171	**3,762,261**	2,928,910	0.78	2,941,201	411,000	410,060
Pit29	23,915,286	26,339,002	83,796,720	51,146,685	6,311,032	6,795,309	**3,792,654**	3,002,655	0.79	2,970,926	411,000	410,728
Pit30	24,218,250	26,720,262	85,536,565	52,268,223	6,548,080	7,055,950	**3,873,190**	3,182,760	0.82	3,049,449	411,676	412,064
Pit31	24,635,049	27,248,015	87,719,940	53,584,846	6,887,079	7,368,433	**3,967,655**	3,400,778	0.86	3,139,873	414,380	413,402
Pit32	24,772,543	27,422,588	88,469,887	54,038,193	7,009,106	7,490,664	**4,005,295**	3,485,369	0.87	3,162,137	414,380	428,777
Pit33	24,829,168	27,494,617	88,827,337	54,264,983	7,067,738	7,536,472	**4,021,487**	3,514,985	0.87	3,178,330	414,380	428,777
Pit34	24,955,404	27,655,552	89,781,932	54,931,708	7,194,672	7,681,646	**4,070,353**	3,611,293	0.89	3,208,657	429,238	432,457
Pit35	25,149,264	27,903,629	91,253,567	55,958,280	7,391,658	7,913,322	**4,147,773**	3,765,549	0.91	3,265,956	437,331	444,486
Pit36	25,233,379	28,011,638	92,077,932	56,571,250	7,495,044	8,025,985	**4,193,374**	3,832,611	0.91	3,304,853	438,682	449,839
Pit37	25,277,107	28,067,872	92,372,165	56,761,693	7,542,600	8,078,134	**4,209,492**	3,868,642	0.92	3,313,617	438,682	457,193
Pit38	25,369,044	28,186,360	93,098,434	57,262,930	7,649,144	8,203,336	**4,249,178**	3,954,158	0.93	3,341,933	438,682	468,562
Pit39	25,410,182	28,239,439	93,448,525	57,508,841	7,700,245	8,259,386	**4,266,736**	3,992,650	0.94	3,351,396	446,778	468,562
Pit40	25,431,566	28,267,056	93,642,812	57,645,717	7,730,039	8,288,355	**4,276,509**	4,011,846	0.94	3,361,168	446,778	468,562
Pit41	25,531,597	28,396,503	94,391,992	58,142,475	7,853,015	8,438,210	**4,318,163**	4,120,047	0.95	3,373,985	457,569	486,609
Pit42	25,640,605	28,537,985	95,450,851	58,881,891	8,030,975	8,585,683	**4,371,645**	4,214,038	0.96	3,425,461	457,569	488,615
Pit43	25,680,608	28,590,007	95,958,700	59,268,495	8,100,198	8,652,728	**4,399,248**	4,253,480	0.97	3,453,065	457,569	488,615
Pit44	25,718,076	28,638,800	96,302,717	59,510,189	8,153,727	8,713,244	**4,417,422**	4,295,822	0.97	3,464,523	461,610	491,289
Pit45	25,848,953	28,809,719	97,407,989	60,235,873	8,362,397	8,879,781	**4,469,235**	4,410,546	0.99	3,514,985	462,962	491,289
Pit46	25,889,714	28,863,022	97,746,046	60,462,479	8,420,545	8,950,977	**4,486,103**	4,464,874	1.00	3,529,846	462,962	493,294
Pit47	25,950,598	28,942,738	98,294,175	60,834,536	8,516,901	9,059,911	**4,513,585**	4,546,326	1.01	3,541,155	476,460	495,970
Pit48	26,090,390	29,126,403	99,559,331	61,677,841	8,755,086	9,300,402	**4,577,922**	4,722,480	1.03	3,593,456	476,460	508,007
Pit49	26,178,389	29,242,351	100,403,528	62,247,398	8,913,779	9,446,393	**4,619,507**	4,826,886	1.04	3,619,725	489,097	510,685
Pit50	26,199,031	29,269,584	100,680,941	62,455,098	8,956,259	9,488,273	**4,634,336**	4,853,937	1.05	3,634,555	489,097	510,685
Pit51	26,263,955	29,355,421	101,472,139	63,032,392	9,084,327	9,625,760	**4,675,784**	4,949,976	1.06	3,673,985	490,445	511,354
Pit52	26,334,243	29,448,575	102,140,092	63,479,376	9,212,142	9,776,401	**4,708,846**	5,067,555	1.08	3,702,352	491,794	514,700
Pit53	26,358,889	29,481,289	102,639,283	63,874,771	9,283,223	9,840,358	**4,737,077**	5,103,281	1.08	3,730,583	491,794	514,700
Pit54	26,413,649	29,554,116	103,323,065	64,365,166	9,403,783	9,966,418	**4,772,779**	5,193,639	1.09	3,747,419	508,654	516,705
Pit55	26,416,864	29,558,394	103,362,760	64,393,522	9,410,844	9,974,474	**4,774,803**	5,199,671	1.09	3,749,444	508,654	516,705
Pit56	26,606,273	29,811,858	105,013,586	65,406,114	9,795,615	10,442,255	**4,859,764**	5,582,491	1.15	3,789,385	516,736	553,643
Pit57	26,617,378	29,826,716	105,202,120	65,547,796	9,827,607	10,471,636	**4,869,880**	5,601,756	1.15	3,798,825	517,411	553,643
Pit58	26,638,600	29,855,139	105,500,886	65,764,032	9,881,714	10,532,856	**4,885,319**	5,647,537	1.16	3,813,589	518,086	553,643
Pit59	26,671,079	29,898,695	106,023,927	66,151,156	9,974,076	10,627,699	**4,912,960**	5,714,739	1.16	3,831,786	527,530	553,643
Pit60	26,682,237	29,913,675	106,202,972	66,283,212	10,006,085	10,661,684	**4,922,388**	5,739,296	1.17	3,841,215	527,530	553,643
Pit61	26,733,389	29,982,477	106,671,611	66,557,309	10,131,826	10,813,120	**4,943,334**	5,869,786	1.19	3,858,148	527,530	557,655
Pit62	26,740,060	29,991,446	106,805,912	66,661,172	10,153,294	10,837,458	**4,950,750**	5,886,708	1.19	3,860,176	532,919	557,655
Pit63	26,764,438	30,024,285	107,264,095	67,001,160	10,238,651	10,917,386	**4,975,025**	5,942,361	1.19	3,872,312	545,058	557,655
Pit64	26,829,566	30,112,193	107,890,155	67,361,073	10,416,889	11,106,204	**5,000,723**	6,105,481	1.22	3,888,561	554,506	557,655
Pit65	26,829,787	30,112,491	107,910,935	67,379,942	10,418,502	11,108,223	**5,002,070**	6,106,153	1.22	3,889,908	554,506	557,655
Pit66	27,475,367	31,038,048	121,178,462	77,145,255	12,995,159	13,635,469	**5,700,457**	7,935,012	1.39	4,354,355	785,105	560,997
Pit67	27,488,848	31,057,028	121,368,098	77,268,207	13,042,863	13,686,543	**5,709,236**	7,977,307	1.40	4,363,134	785,105	560,997
Pit68	27,496,730	31,068,128	121,527,782	77,381,340	13,078,314	13,713,380	**5,717,314**	7,996,066	1.40	4,371,212	785,105	560,997
Pit69	27,517,555	31,097,534	122,140,629	77,866,710	13,176,385	13,826,598	**5,751,969**	8,074,629	1.40	4,405,867	785,105	560,997
Pit70	27,545,881	31,137,560	122,627,378	78,190,851	13,298,967	13,942,525	**5,775,571**	8,166,954	1.41	4,428,132	785,105	562,334
Pit71	27,556,390	31,152,426	122,862,094	78,360,866	13,348,801	13,993,793	**5,787,710**	8,206,083	1.42	4,438,926	786,451	562,334
Pit72	27,573,408	31,176,512	123,112,920	78,512,096	13,424,312	14,061,408	**5,798,508**	8,262,900	1.43	4,448,372	787,803	562,334
Pit73	27,628,910	31,255,446	124,280,793	79,332,692	13,692,655	14,349,785	**5,857,098**	8,492,687	1.45	4,506,290	788,475	562,334
Pit74	27,655,368	31,293,084	124,837,826	79,720,045	13,824,697	14,494,738	**5,884,755**	8,609,983	1.46	4,533,274	789,148	562,334
Pit75	27,656,281	31,294,383	124,882,770	79,757,714	13,830,673	14,502,219	**5,887,445**	8,614,774	1.46	4,535,963	789,148	562,334
Pit76	27,659,309	31,298,692	125,038,465	79,886,312	13,853,461	14,525,808	**5,896,856**	8,628,952	1.46	4,544,706	789,148	563,002
Pit77	27,687,076	31,338,338	125,767,171	80,400,132	14,028,701	14,699,560	**5,933,886**	8,765,674	1.48	4,580,733	789,148	564,005
Pit78	27,692,012	31,345,391	126,053,687	80,635,902	14,072,394	14,740,214	**5,951,064**	8,789,150	1.48	4,584,775	801,281	565,008
Pit79	28,615,008	32,786,942	143,760,793	90,685,957	20,287,894	21,454,681	**6,668,637**	14,786,044	2.22	5,302,348	801,281	565,008
Pit80	28,625,770	32,803,034	144,208,023	91,030,653	20,374,336	21,553,839	**6,693,248**	14,860,591	2.22	5,308,076	820,164	565,008
Pit81	28,639,874	32,824,179	144,840,327	91,513,522	20,502,626	21,699,517	**6,735,515**	14,964,002	2.22	5,316,842	830,939	587,734
Pit82	28,648,503	32,837,116	145,131,557	91,721,482	20,572,959	21,781,983	**6,750,363**	15,031,620	2.23	5,319,537	843,092	587,734
Pit83	28,661,573	32,856,750	145,518,772	91,972,006	20,690,016	21,885,144	**6,768,250**	15,116,894	2.23	5,337,425	843,092	587,734
Pit84	28,661,830	32,857,135	145,541,927	91,990,849	20,693,943	21,887,829	**6,769,596**	15,118,233	2.23	5,338,770	843,092	587,734
Pit85	28,662,023	32,857,425	145,564,346	92,009,704	20,697,218	21,890,517	**6,770,942**	15,119,575	2.23	5,340,116	843,092	587,734
Pit86	28,698,707	32,913,078	146,832,188	92,821,084	21,098,026	22,338,899	**6,828,874**	15,510,025	2.27	5,398,049	843,092	587,734
Pit87	28,701,766	32,917,683	146,937,975	92,887,411	21,132,881	22,374,932	**6,833,610**	15,541,322	2.27	5,402,111	843,766	587,734
Pit88	28,710,453	32,930,799	147,313,404	93,143,111	21,239,494	22,498,126	**6,851,867**	15,646,259	2.28	5,419,018	845,115	587,734
Pit89	28,774,331	33,030,093	150,286,671	95,058,419	22,198,159	23,528,870	**6,988,620**	16,540,250	2.37	5,555,771	845,115	587,734
Pit90	28,818,775	33,099,394	152,527,565	96,484,324	22,943,847	24,329,465	**7,090,429**	17,239,036	2.43	5,648,134	854,561	587,734
Pit91	28,822,091	33,104,474	152,770,169	96,656,680	23,009,014	24,395,663	**7,103,882**	17,291,781	2.43	5,658,243	854,561	591,078
Pit92	28,830,310	33,117,241	153,566,184	97,240,885	23,208,057	24,586,041	**7,145,594**	17,440,447	2.44	5,699,955	854,561	591,078
Pit93	28,831,265	33,118,709	153,695,551	97,341,228	23,235,614	24,609,440	**7,152,988**	17,456,452	2.44	5,706,680	854,561	591,747
Pit94	28,835,512	33,125,331	154,298,050	97,794,286	23,378,433	24,746,467	**7,185,336**	17,561,131	2.44	5,737,011	856,579	591,747
Pit95	28,836,666	33,127,112	154,502,308	97,954,646	23,420,550	24,783,317	**7,196,785**	17,586,532	2.44	5,747,113	857,926	591,747
Pit96	28,857,714	33,161,036	156,844,051	99,422,539	24,260,475	25,744,086	**7,301,593**	18,442,493	2.53	5,851,921	857,926	591,747
Pit97	28,877,045	33,197,268	161,657,069	102,991,126	25,468,675	27,124,806	**7,557,764**	19,567,042	2.59	6,104,082	857,926	595,756
Pit98	28,880,333	33,202,629	162,293,589	103,341,447	25,749,512	27,445,193	**7,582,777**	19,862,416	2.62	6,129,095	857,926	595,756
Pit99	28,881,098	33,203,899	162,834,734	103,762,379	25,868,456	27,569,044	**7,613,060**	19,955,984	2.62	6,155,339	861,296	596,425
Pit100	28,881,379	33,204,369	163,193,678	104,026,987	25,962,323	27,680,918	**7,631,953**	20,048,965	2.63	6,167,491	868,037	596,425

Dwg 3.2



Shells below Pit_79 exclude block 11c, which has the best grades and recoveries (1,6000,000 tons of ore at Cu = 0.51%, Au=0.62), while all pits include slide area of 10c, block 8c with oxidized rock and low metal recovery, and copper-zinc area with 1,000,000 tons of ore, contaminated with zinc. Mining of 11c appears to be necessary in order to feed the mill with appropriate blending, which means we must chouse Pit_100.

Optimal pits can also characterize *Optimal Extraction Sequence – OES* .
Acoording to Datamine NPV Scheduler manual, **) A Pit Optimizer OES may be practical for a small talk mine but is unlikely to be practical for a large copper mine.*
Which is obvious in this case as well. (Dwg 3.2)

Dwg 3.3 Vertical section of block 11c. Pit_100 limit is in red; Pit_65matches current topography and is drawn in gray. The drawing indicates lack of mining works on 11c within Pit_65.

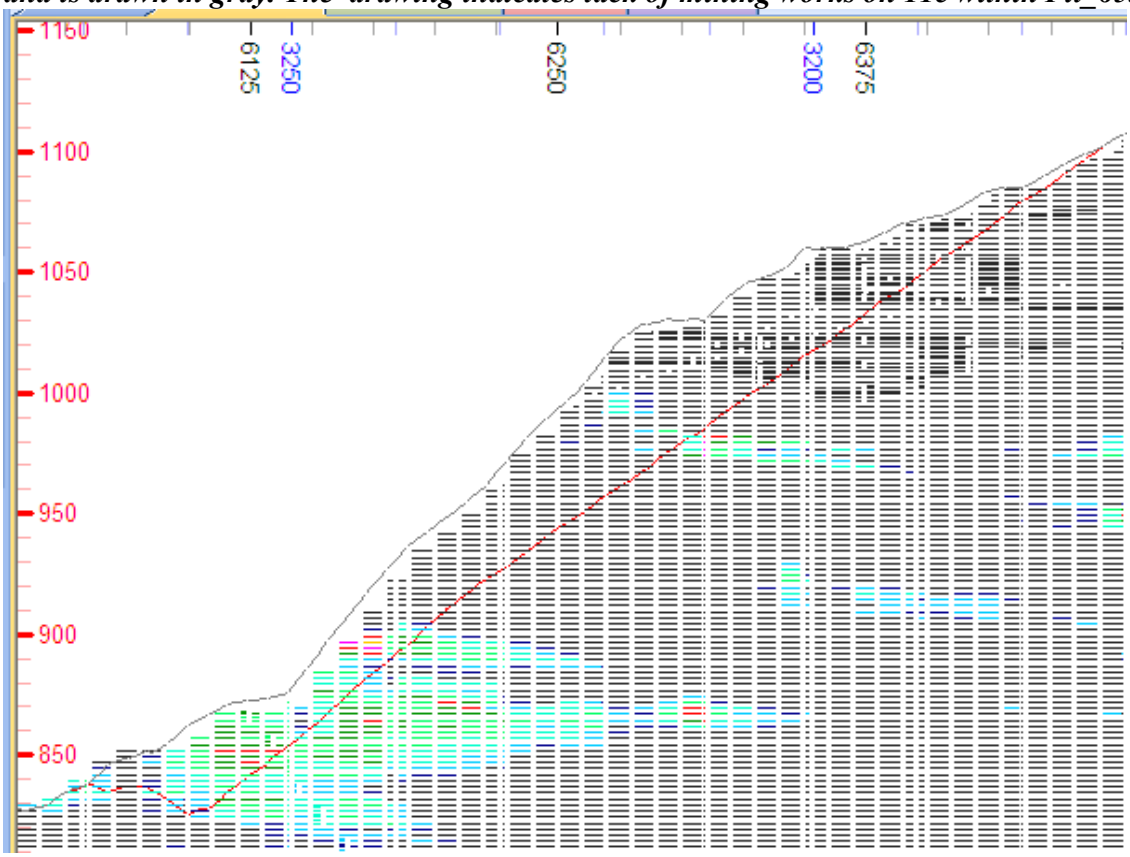


Table 3.3 Minable reserves on Pit_100.

Final Pit	Type	Lifetime	Shells generated			
	LG Max Cash	3.04	100			
Global Stats						
Cash	Revenue	Process Cost	Mining Cost	Net Value	NPV	Ore Value
	163,193,678	104,026,987	$25,962,323	$33,204,369	$28,881,379	$50,944,678
	Block Count	Mass				
ORE	11,473	7,631,953				
Waste	**31,083**	20,048,964				
Total	42,556	27,680,918				
Strip Ratio	2.627					

ORE Stats	Mass	CU	CU Min	CU Max	AU	AU Min
	tonnes	tonnes	Percent	Percent	g	g/tonne
Rock 1	6,167,491	29,924	0.02%	3.17%	3,027,271	0.01
Rock 2	868,037	4,259	0.03%	1.59%	319,046	0.0133
Rock 3	596,425	435	0.01%	0.20%	548,931	0.5511
Total	7,631,953	34,617			3,895,247	

AU Max	CU R	CU R Min	CU R Max	AU R	AU R Min	AU R Max
g/tonne	tonnes	Percent	Percent	g	g/tonne	g/tonne
5.1855	21,784	0.01%	2.31%	1,377,408	0.0045	2.3594
1.8332	2,829	0.02%	1.05%	116,133	0.0049	0.6673
5.5188	0	0.00%	0.00%	316,201	0.3175	3.179
	24,613			1,809,741		

Cut-off grade calculation.

(Appendix 1 – Generic Terms and Equivalents, "Appendix 5A, Australian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code) Effective: 17 December 2004").

Datamine NPV Scheduler uses the following formula:

$$Cut\text{-}Off = (Process.Cost*(1+Dilution))/((Price - SellingCost - Add.CostPerUnitSold) * ProcessRecovery)$$

Cut-off grades at different prices and rock types are shown below:
(*Datamine Mining Power Pack)*

Datamine Pit Optimisation		
Cu price	Rock Type	Cut-off *
$4500/T	Sulfide	0.43%
	Oxide	0.47%
$5500/T	Sulfide	0.35%
	Oxide	0.38%
$6500/T	Sulfide	0.30%
	Oxide	0.32%

Table 3.4 Minable ore reserves based on the work design of optimal pit sell Pit_100 (Des080709) for the end of July 2009.

	Category	Tonnes	Waste	Strip r.	CU	AU	DENSITY	CU_REC	AU_RE
	[ABSENT]	24,392.60			0	0	2	0	0
	[0,0.22]	24,632,000.00			0.067	0.187	2.649	84.971	47
	[0.22,0.25]	1,031,494.40			0.235	0.357	2.683	84.046	43.78
	[0.25,0.31]	1,842,907.50			0.279	0.368	2.686	83.997	43.74
	[0.31,0.4]	2,152,346.20			0.353	0.397	2.691	83.872	44.24
	[0.4,0.5]	1,658,260.20			0.447	0.429	2.696	83.005	44.23
	[0.5,0.6]	1,000,662.80			0.545	0.464	2.702	83.723	44.61
	[0.6,0.8]	793,045.70			0.68	0.427	2.71	84.406	44.88
	[0.8,1]	266,097.60			0.885	0.485	2.722	84.536	46.86
	[1,1.4]	168,800.30			1.153	0.525	2.738	83.336	46.8
	[1.4,2]	87,134.10			1.625	0.583	2.766	84.998	46.39
	[2,3]	22,345.40			2.26	0.972	2.803	86.135	48.53
	[3,150]	1,782.30			3.079	1.558	2.852	91.084	43.75
	TOTAL	33,682,000.00			0.167	0.247	2.659	84.662	46.28
	CU>0.22	9,024,876.50	24,657,123.50	2.73	0.44	0.41	2.70	83.82	44.34
	CU>0.25	**7,993,382.10**	**25,688,617.90**	**3.21**	**0.47**	**0.42**	**2.70**	**83.79**	**44.41**
$6500/t	CU>0.31	6,150,474.60	27,531,525.40	4.48	0.52	0.43	2.70	83.72	44.61
$4500/t	CU>0.4	3,998,128.40	29,683,871.60	7.42	0.61	0.45	2.71	83.64	44.81
	CU>0.5	2,339,868.20	31,342,131.80	13.39	0.73	0.47	2.71	84.10	45.22
	CU>0.6	1,339,205.40	32,342,794.60	24.15	0.87	0.47	2.72	84.37	45.67
	CU>0.8	546,159.70	33,135,840.30	60.67	1.15	0.54	2.74	84.33	46.82
	CU>1	280,062.10	33,401,937.90	119.27	1.40	0.59	2.75	84.13	46.79
	CU>1.4	111,261.80	33,570,738.20	301.73	1.78	0.68	2.77	85.32	46.78
	CU>2	24,127.70	33,657,872.30	1,394.99	2.32	1.02	2.81	86.50	48.18
	CU>3	1,782.30	33,680,217.70	18,897.05	3.08	1.56	2.85	91.08	43.75

Copper equivalent grade calculation:

$$Cu\ Equivalent\ (\%) = Cu(\%)+Au(g/t) * Au\_Price / Cu\_Price * Au\_Rec / Cu\_Rec$$

$$Cu\_Eq = Cu+Au*0.162$$

at Cu=0.31%:

$$Cu\_Eq = 0.31+0.42*0.162 = 0.38\ \%.$$

$$Cu = 0.31 - 0.42*0.162 = 0.25\ \%$$

4. Work design parameters at Pit_100 (Des080709)
Design parameters are used based on the geo-technical research analyses made in the past and on actual rock face angles including rock slide areas.

- *Bench hight –* *20 м*
- *Berm width –* *10 м*
- *Batter angle in stable rock –* *55 degrees*
- *Batter angle in faulty area –* *49 degrees*
- *Main haulage road width –* *20 м*
- *Max road slope –* *10%*
- *OSA in stable rock -* *41 degrees*
- *OSA in faulty rock -* *35 degrees.*

Puc 4.1 Work design Des080709