APPENDIX 1
DRILL HOLES USED IN THE 2004 RESOURCE EXTIMATE
Main Zone 1975-95 Drilling

Hole	Easting	Northing	Elevation	Length Hole (m)	Azimuth	Dip	Year Drilled
1	50495.39	100199.31	1526.96	218.00	0	-90	1974
2	50478.21	100078.54	1525.12	167.70	0	-90	1974
3	50462.00	99954.72	1520.92	229.00	0	-90	1974
4	50446.71	99828.60	1515.71	61.00	0	-90	1974
5	50446.71	99829.53	1515.62	98.50	8	-60	1974
6	50375.22	100197.92	1531.69	106.70	0	-90	1974
7	50374.29	100199.04	1531.20	182.60	190	-60	1974
8	50370.25	100076.24	1529.25	66.80	0	-90	1974
9	50371.02	99956.18	1527.56	152.40	0	-90	1975
10	50248.56	99957.23	1532.49	73.50	0	-90	1975
11	50370.16	99834.46	1524.08	73.80	0	-90	1975
12	50248.27	99833.96	1532.97	154.60	0	-90	1975
13	50370.16	99834.46	1524.08	122.00	0	-50	1975
14	50494.94	100317.82	1529.95	243.00	180	-45	1975
15	50493.47	100077.45	1524.14	228.68	180	-45	1975
16	50248.86	100014.74	1532.93	87.80	180	-45	1975
17	50249.71	100359.54	1551.32	212.80	180	-45	1975
18	50249.43	100092.82	1535.41	151.80	0	-45	1975
19	50126.05	99897.23	1539.62	182.30	0	-45	1975
20	50125.98	99774.45	1538.02	185.40	0	-45	1975
21	50126.10	100076.39	1537.91	260.60	180	-45	1975
22	50126.88	100196.38	1544.50	212.80	180	-45	1975
23	50004.89	100198.16	1541.56	355.40	180	-45	1975
24	50004.89	100061.35	1536.31	231.10	180	-45	1975
25	50004.82	99895.22	1545.24	212.80	180	-45	1975
26	50004.38	99773.89	1545.19	209.10	180	-45	1975
27	49882.33	99775.82	1544.90	243.30	180	-45	1975
28	49882.57	99896.92	1541.53	227.70	180	-45	1975
29	49882.70	100074.61	1528.51	228.00	180	-45	1975
30	49882.48	100199.35	1538.91	240.20	180	-45	1975
31	49774.16	100075.56	1510.08	252.10	180	-45	1975
32	49760.03	99898.43	1538.40	221.70	180	-45	1975
33	49760.22	99774.86	1540.53	215.60	180	-45	1975
34	49760.11	99653.79	1539.86	243.60	180	-45	1975
35	49652.79	99529.02	1547.17	228.70	180	-45	1975
36	49650.10	99652.29	1537.25	63.10	180	-45	1975
37	49647.84	99774.67	1518.49	50.90	180	-45	1975
38	49646.31	99849.57	1529.85	209.50	180	-60	1975
39	49644.21	99967.88	1526.14	228.70	180	-45	1975
40	49882.10	100322.60	1545.02	215.60	180	-45	1975
41	50004.44	100318.55	1551.94	245.70	180	-45	1975
42	50127.69	100317.26	1550.14	246.00	180	-45	1975
43	50003.10	100001.56	1538.88	366.20	0	-90	1975

44	50491.66	100134.51	1525.30	102.11	180	-75	1975
45	50490.97	100011.08	1522.79	353.10	0	-90	1975
49	50125.44	100027.05	1537.91	237.13	225	-45	1975
50	50614.45	100331.60	1522.51	215.80	180	-45	1976
59	50315.68	99994.28	1529.93	133.50	180	-45	1976
60	50428.93	100009.12	1524.88	106.10	180	-45	1976
62	50615.70	99887.11	1500.12	17.68	0	-45	1976
63	50615.70	99887.11	1500.12	72.60	180	-90	1976
64	50493.81	100228.33	1526.89	176.20	180	-45	1976
65	50370.60	100154.92	1530.27	159.41	180	-60	1976
66	50065.51	100047.17	1538.42	246.50	180	-45	1976
67	50068.60	99966.88	1541.18	170.10	180	-45	1976
68	50004.46	99963.65	1539.82	93.60	180	-45	1978
69	50187.22	99968.30	1535.33	93.30	180	-45	1978
70	50187.84	100028.65	1535.53	81.40	180	-45	1978
71	50126.38	99722.86	1541.35	63.10	0	-45	1978
72	50125.43	99982.76	1538.36	60.10	180	-45	1978
77	50004.67	99952.80	1542.42	395.02	0	-70	1994
78	50005.64	100113.44	1540.21	379.78	180	-60	1994
82	50004.15	100197.41	1543.64	419.40	180	-60	1994
83	50065.03	100046.23	1538.32	391.97	180	-60	1994
84	50068.57	99995.17	1540.11	364.24	177	-60	1994
85	50125.98	100092.80	1538.26	313.64	177	-60	1994
87	50249.86	100175.99	1538.82	367.89	180	-60	1994
89	50249.43	100092.82	1535.41	22.86	180	-60	1994
91	50249.43	100092.82	1535.41	367.89	180	-60	1994
93	50250.23	100233.84	1541.88	373.38	175	-60	1994
95	50249.68	100304.43	1545.85	425.81	172	-60	1994
97	50350.95	100248.58	1535.14	402.34	178	-60	1994
99	50601.01	100397.38	1524.60	359.05	180	-60	1994
100	50453.47	100249.18	1530.40	364.85	177	-60	1994
101	50549.69	100346.78	1526.20	369.59	177	-60	1994
102	50350.39	100148.53	1531.23	297.18	180	-60	1994
103	50352.28	100347.84	1542.11	364.85	180	-60	1994
104	50450.45	100348.27	1535.50	367.59	180	-60	1994
105	50100.27	100299.93	1550.40	364.85	180	-60	1994
107	50100.24	100199.87	1544.80	370.94	181	-60	1994
108	50301.73	100298.43	1542.10	367.89	180	-60	1994
110	50201.15	100300.18	1548.10	383.13	180	-60	1994
111	50200.53	100199.69	1542.30	364.85	180	-60	1994
112	49999.53	100049.62	1535.90	319.13	225	-45	1994
114	49950.80	100152.43	1540.90	367.89	180	-60	1994
120	49949.21	100250.25	1545.49	413.61	180	-60	1994
121	49948.15	100359.14	1550.03	377.04	180	-60	1994
123	49899.50	99950.43	1540.16	401.42	180	-60	1994
124	49799.38	100043.43	1522.63	337.41	180	-60	1994
126	50000.81	100304.48	1551.23	438.00	180	-60	1994
128	50048.55	100150.31	1542.44	458.11	178.5	-60	1994
129	50552.61	100448.60	1531.16	501.70	188	-60	1994

130	50150.69	100152.22	1541.99	480.67	180	-60	1994
131	50150.41	100050.87	1536.78	517.25	180	-60	1994
132	50550.10	100247.93	1524.80	373.38	180	-60	1994
133	50450.60	100165.26	1527.26	465.51	180	-60	1995
134	50252.45	100400.71	1554.43	508.10	180	-60	1995
135	50550.28	100098.49	1519.86	370.64	180	-60	1995
136	50649.85	100199.35	1517.02	385.88	180	-60	1995
137	50449.76	100000.58	1524.08	200.25	180	-60	1995
139	50300.01	100000.53	1530.56	349.61	180	-60	1995
141	50200.06	99998.89	1534.77	303.58	180	-60	1995
142	50099.60	99949.92	1540.78	529.44	180	-60	1995
143	50049.61	99900.15	1543.34	415.14	180	-60	1995
146	50203.65	99899.62	1533.63	309.98	180	-60	1995
151	50301.74	100148.82	1534.56	401.42	180	-60	1995
153	50100.50	100401.23	1557.05	447.14	180	-60	1995
154	49900.65	100348.85	1546.19	385.27	180	-60	1995
157	49799.98	100205.32	1527.20	538.58	180	-60	1995
159	49651.35	100202.32	1509.37	502.01	180	-60	1995
163	49649.61	100096.54	1495.10	495.91	180	-60	1995
166	49574.56	99891.16	1505.87	514.20	180	-60	1995
169	49570.40	99698.11	1530.52	389.23	180	-60	1995
171	49650.27	99995.61	1526.00	428.85	180	-60	1995
172	49798.32	99999.46	1531.00	261.21	180	-60	1995
174	49950.63	100053.41	1533.94	300.84	180	-60	1995
175	49899.70	100199.29	1539.75	428.85	180	-60	1995
177	50599.74	99900.84	1500.83	41.76	0	-60	1995
181	50600.29	100593.14	1526.21	50.90	180	-45	1995
182	50504.45	100701.72	1510.49	78.33	180	-45	1995
183	50402.78	100675.48	1517.27	91.44	180	-45	1995
206	49799.99	99900.50	1539.62	401.42	180	-60	1995
210	49554.17	100097.32	1472.79	453.23	180	-60	1995
213	49650.73	99800.07	1526.12	337.41	180	-45	1995
216	50199.06	100104.91	1537.14	438.00	180	-60	1995
217	50249.32	100001.02	1532.34	253.29	180	-60	1995
218	50358.43	100045.00	1529.60	328.27	180	-60	1995
226	50647.11	100347.70	1520.39	242.93	180	-60	1995
234	49948.97	99900.01	1545.73	252.07	180	-60	1995
235	50051.36	100301.72	1551.57	440.14	180	-60	1995
236	49999.86	99949.70	1542.14	332.84	180	-60	1995
237	50301.14	99899.94	1530.72	286.82	180	-60	1995
239	50049.39	99799.40	1543.57	63.09	180	-60	1995
240	50101.29	99851.83	1541.33	406.91	180	-60	1995
242	49800.02	100096.21	1517.42	398.07	180	-60	1995
244	50453.09	100048.33	1524.76	300.84	180	-60	1995

1975-95 Drilling totals Main Zone 136 Holes 37,902.51 metres

Main Zone 2003 Drilling

Hole	Easting	Northing	Elevation	Length Hole (m)	Azimuth	Dip	Year Drilled
03-258	50050.10	100219.68	1546.11	348.80	180	-62	2003
03-260	50075.02	100249.06	1547.99	368.30	180	-60	2003
03-263	50124.82	100249.85	1547.63	371.30	180	-60	2003
03-265	50175.45	100199.26	1543.60	398.50	180	-60	2003
03-268	50174.99	100149.70	1541.31	364.33	180	-60	2003
03-271	50224.97	100249.83	1544.92	365.55	180	-65	2003
03-274	50225.35	100200.01	1541.63	351.83	180	-60	2003
03-276	50074.79	100149.58	1542.75	352.90	180	-60	2003
03-277	50224.81	100149.61	1539.09	351.74	180	-60	2003
03-279	50174.94	100249.90	1546.45	353.40	180	-60	2003
03-280	50099.70	100099.22	1539.64	356.70	180	-60	2003
03-281	49975.18	100223.74	1545.19	368.50	180	-60	2003
03-283	50140.33	100040.40	1538.52	355.20	0	-90	2003
03-284	49925.53	100149.83	1540.11	364.63	180	-68	2003
03-285	49900.71	100150.04	1537.06	200.91	180	-60	2003
03-286	49925.67	100040.31	1532.73	350.30	180	-68	2003
03-287	49973.58	100121.95	1540.19	402.00	180	-60	2003
03-288	50300.60	99989.88	1530.53	423.80	0	-65	2003
03-289	50319.25	99991.28	1529.70	251.50	165	-60	2003
03-290	50050.04	100110.23	1540.81	452.60	180	-60	2003
03-291	50149.75	99897.60	1537.32	448.20	0	-66	2003
03-292	49925.10	100249.23	1544.69	441.40	180	-60	2003
03-293	50075.01	99898.66	1542.66	432.90	0	-67	2003
03-294	50025.72	99899.24	1544.88	435.70	180	-65	2003
03-295	50200.21	100050.07	1535.92	413.60	0	-78	2003
2003 Drilling totals Main Zone			25 Holes	9324.59	metres		

Main Zone 2004 Drilling

Hole	Easting	Northing	Elevation	Length Hole (m)	Azimuth	Dip	Year Drilled
04-302	50125.00	99850.00	1537.00	404.90	181	60	2004
04-300	50150.00	99900.00	1537.00	381.10	186	65	2004
04-314	49800.00	99660.00	1538.00	249.40	352	-55	2004
04-312	49850.00	99705.00	1542.00	228.00	2	-66	2004
04-308	50400.00	99825.00	1519.00	267.70	0	-65	2004
04-309	50388.57	100130.43	1527.00	258.50	4	-66	2004
04-310	50025.00	99790.00	1545.00	279.90	354	-65	2004
04-299	50399.72	99925.30	1522.24	403.70	0	-65	2004
04-296	50390.70	100032.64	1525.72	432.30	0	-64	2004
04-306	49775.00	99850.00	1540.00	303.70	5	44	2004
04-316	49825.00	99900.00	1538.00	323.20	0	-45	2004
04-304	49850.00	99950.00	1536.00	410.10	0	70	2004
2004 Drilling totals Main Zone			12 Holes	3942.50	metres		

East Zone 1975-95 Drilling

Hole	Easting	Northing	Elevation	Length Hole (m)	Azimuth	Dip	Year Drilled
46	50736.36	100364.67	1515.11	124.10	180	-45	1975
47	50736.36	100364.67	1515.11	182.30	180	-65	1975
48	50858.78	100423.12	1507.14	124.40	180	-45	1975
51	50675.85	100355.59	1518.96	203.61	180	-45	1976
52	50797.45	100409.33	1510.44	214.60	180	-45	1976
53	50981.43	100415.24	1491.95	151.80	180	-45	1976
54	50855.12	100354.11	1500.14	47.60	180	-45	1976
55	50982.94	100500.42	1498.11	236.83	180	-45	1976
56	50918.22	100419.95	1500.26	160.93	180	-45	1976
57	50859.14	100512.46	1512.61	237.13	180	-45	1976
58	50737.79	100491.06	1519.05	237.13	180	-45	1976
73	50797.55	100469.26	1516.53	264.70	180	-45	1980
74	50860.51	100571.12	1515.53	361.60	180	-45	1980
75	50736.83	100306.90	1513.15	191.11	0	-70	1994
76	50737.92	100363.72	1515.25	304.80	180	-65	1994
79	50737.27	100420.22	1517.70	352.04	180	-65	1994
80	50677.80	100356.46	1518.83	355.70	182	-60	1994
81	50797.55	100469.26	1516.53	364.85	183	-60	1994
86	50857.75	100420.30	1507.04	361.49	180	-60	1994
88	50918.22	100419.95	1500.26	365.76	180	-50	1994
90	50981.37	100463.23	1495.04	367.59	185	-60	1994
92	50850.45	100343.65	1500.06	365.76	180	-59	1994
94	50982.32	100412.48	1490.27	245.67	180	-60	1994
96	50679.77	100280.41	1516.51	370.64	180	-60	1994
98	50676.93	100430.37	1521.30	357.23	180	-60	1994
106	50749.23	100498.28	1518.22	501.70	180	-65	1994
109	50801.12	100549.48	1516.40	526.09	180	-60	1994
113	50850.50	100507.13	1513.20	431.60	180	-60	1994
115	51867.03	100946.89	1360.08	233.78	171	-45	1994
116	50900.16	100499.36	1507.63	359.97	180	-60	1994
117	51972.75	100976.04	1344.09	227.69	180	-45	1994
118	51867.21	100869.96	1349.02	282.55	180	-45	1994
119	50993.93	100596.99	1500.19	471.22	180	-60	1994
122	51093.32	100600.07	1491.39	388.92	186	-60	1994
125	50650.78	100496.61	1523.45	489.51	180	-60	1994
127	50799.38	100339.02	1508.95	318.82	180	-60	1994
138	50799.23	100254.23	1504.31	216.71	180	-60	1995
140	50751.94	100603.22	1519.07	812.90	180	-65	1995
144	50849.63	100195.37	1491.01	29.57	0	-65	1995
145	50851.78	100603.23	1515.41	599.54	180	-60	1995
149	51189.57	100803.96	1463.06	300.84	180	-60	1995
178	50773.53	99999.49	1487.95	32.61		-90	1995
180	50996.63	100099.58	1467.50	29.57		-90	1995
184	50991.58	100696.80	1492.27	623.93	180	-60	1995
219	51041.87	100497.58	1488.92	151.49	180	-60	1995

221	50995.38	100500.94	1495.62	245.06	180	-60	1995
222	50798.49	100303.77	1506.04	251.76	180	-60	1995
224	50747.09	100301.74	1511.81	264.26	180	-60	1995
228	51044.44	100394.83	1482.20	148.44	180	-60	1995
230	50949.17	100500.59	1502.24	299.31	180	-60	1995
233	50900.54	100367.35	1496.11	212.45	180	-60	1995
1975-1995 Drill Holes East Zone			51 holes	14999.66	metres		

East Zone 2003 Drilling

Hole	Easting	Northing	Elevation	Length Hole (m)	Azimuth	Dip	Year Drilled
03-248	50777.80	100250.36	1506.40	405.18	0	-65	2003
03-249	50876.27	100398.76	1504.02	339.63	180	-60	2003
03-250	50774.65	100198.65	1503.93	375.00	0	-66	2003
03-251	50825.10	100450.17	1514.05	387.80	180	-67	2003
03-252	50725.91	100249.13	1512.24	366.77	0	-76	2003
03-253	50725.70	100298.18	1514.08	420.43	0	-77	2003
03-254	50824.77	100300.02	1502.63	383.20	0	-85	2003
03-255	50700.29	100249.79	1515.05	389.94	0	-68	2003
03-256	50825.05	100349.74	1506.23	57.10	0	-90	2003
03-256A	50825.29	100352.06	1506.37	381.10	0	-90	2003
03-257	50699.84	100474.57	1520.32	404.77	180	-60	2003
03-259	50700.09	100149.25	1509.70	380.79	0	-73	2003
03-261	50849.89	100301.71	1499.11	362.80	0	-76	2003
03-262	50824.84	100400.54	1509.95	400.20	180	-60	2003
03-264	50824.91	100279.86	1500.96	198.10	0	-45	2003
03-266	50750.48	100278.55	1511.20	164.33	0	-45	2003
03-267	50775.00	100302.20	1510.07	417.38	0	-60	2003
03-269	50725.34	100280.32	1513.80	131.10	0	-45	2003
03-270	50875.03	100323.62	1497.06	253.66	0	-88	2003
03-272	51024.05	100475.04	1491.12	200.00	90	-60	2003
03-273	50875.06	100324.01	1496.73	169.21	0	-70	2003
03-275	50700.05	100524.30	1521.64	222.26	330	-53	2003
03-278	50750.48	100099.87	1495.94	362.20	0	-63	2003
03-282	50750.17	100094.23	1495.56	93.60	150	-60	2003
2003 Drill Holes East Zone			24 holes	7266.55	metres		

East Zone 2004 Drilling

Hole	Easting	Northing	Elevation	Length Hole (m)	Azimuth	Dip	Year Drilled
04-297	50950.00	100300.00	1486.00	173.20	0	-66	2004
04-298	50975.00	100300.00	1484.00	267.70	0	65	2004
04-311	51025.00	100300.00	1477.00	318.30	356	-65	2004
04-313	51025.00	100300.00	1477.00	143.30	0	-44	2004
2004 Drill Holes East Zone			4 holes	902.50	metres		

Far West and Gully Zone

Hole	Easting	Northing	Elevation	Length Hole (m)	Azimuth	Dip	Year Drilled
61	49140.29	99316.04	1481.50	133.50	180	-40	1976
147	49005.28	99388.53	1524.87	377.04	180	-60	1995
148	49127.86	99332.56	1485.34	288.65	180	-60	1995
150	48916.91	99294.21	1540.61	401.42	180	-60	1995
152	49003.72	99589.50	1514.67	328.27	180	-60	1995
155	49004.87	99787.66	1497.77	358.14	180	-60	1995
156	48908.29	99695.52	1521.24	372.77	180	-60	1995
158	49114.81	99719.20	1473.86	386.18	180	-60	1995
160	49122.48	99487.83	1475.31	398.37	180	-60	1995
161	48509.37	99694.48	1529.66	395.33	180	-60	1995
162	48604.60	99848.27	1466.34	349.61	180	-60	1995
164	48609.37	99846.75	1466.21	329.79	90	-60	1995
165	48504.74	99844.02	1477.73	343.51	0	-60	1995
167	48306.97	99688.62	1538.51	410.57	180	-60	1995
168	48919.45	99195.82	1544.69	380.09	180	-60	1995
170	49005.06	99293.43	1530.60	350.82	180	-60	1995
173	48811.99	99180.16	1539.21	349.61	180	-60	1995
176	48802.44	99288.57	1521.95	441.05	180	-60	1995
187	48921.54	99095.96	1555.38	345.03	180	-60	1995
189	49003.32	99188.95	1536.46	316.08	180	-60	1995
192	49130.69	99187.83	1505.62	361.49	180	-60	1995
193	48704.43	99288.79	1532.26	317.60	180	-60	1995
194	48509.63	99693.61	1529.83	391.97	0	-60	1995
195	48804.12	99378.49	1508.09	365.50	180	-60	1995
196	48405.49	99690.71	1533.56	291.69	0	-60	1995
197	48907.22	99700.05	1520.90	200.56	0	-45	1995
198	48705.46	99900.47	1434.25	364.85	180	-60	1995
199	49002.75	99767.69	1501.28	313.03	0	-45	1995
200	49117.27	99613.58	1471.37	300.84	0	-45	1995
201	48508.36	99768.17	1510.59	331.32	0	-60	1995
202	48705.40	99192.07	1548.91	377.04	180	-60	1995
203	48400.79	100100.30	1522.35	295.96	180	-45	1995
204	48814.38	99082.98	1557.29	334.37	180	-60	1995
205	48606.28	99798.59	1479.88	233.78	180	-60	1995
207	48864.02	99136.19	1553.23	294.74	180	-60	1995
208	48607.22	99694.08	1492.15	209.40	180	-60	1995
209	48651.36	99828.27	1469.44	261.21	180	-60	1995
211	48915.09	99397.35	1535.84	349.61	180	-60	1995
212	48799.51	99677.99	1506.28	203.30	0	-45	1995
214	49006.53	99687.48	1508.94	334.67	180	-60	1995
215	48800.99	99480.81	1510.76	300.84	180	-60	1995
220	48955.27	99239.34	1538.68	306.93	180	-60	1995
223	48869.15	99247.27	1543.48	408.74	180	-60	1995
225	49053.41	99240.89	1520.45	310.90	180	-60	1995
227	49053.63	99149.46	1531.72	302.40	180	-60	1995

229	49137.22	99086.99	1512.60	197.21	180	-60	1995
231	48955.05	99142.15	1547.53	297.79	180	-60	1995
232	49004.53	99090.73	1546.57	157.58	180	-60	1995
238	49053.41	99240.89	1520.45	216.41	90	-60	1995
241	48864.09	99136.17	1553.54	404.47	90	-60	1995
243	48919.45	99195.54	1544.66	340.16	90	-60	1995
Total of 51 holes				16432.19	metres		

Far East Zone 2004 Condemnation Drilling

Hole	Easting	Northing	Elevation	Length Hole (m)	Azimuth	Dip	Year Drilled
04-315	51569.77	100821.34	1412.22	201.20	179	-45	2004
04-318	51579.79	100611.45	1384.00	154.60	180	-45	2004
04-320	51760.18	100633.35	1360.00	117.40	180	-45	2004
04-317	51387.85	100708.26	1456.00	197.30	180	-45	2004
04-319	51580.15	100418.21	1403.00	108.80	180	-45	2004
2004 Drill Holes Far East Zone			5 holes	779.30	metres		

2004 Geotechnical Drilling

Hole	Easting	Northing	Elevation	Length Hole (m)	Azimuth	Dip	Year Drilled
04-303	50146.98	100013.59	1535.94	402.10	183	74	2004
04-305	50145.00	100150.00	1545.00	402.10	358	-75	2004
04-307	50800.00	100117.00	1493.00	249.40	355	-75	2004
04-301	50797.47	100498.23	1516.41	249.70	0	-76	2004
2004 Drill Holes			4 holes	1303.30	metres		

APPENDIX 2

QUALITY CONTROL OF ASSAY DATA

RED CHRIS EXPLORATION

1994-2004

for

Red Chris Development Co. Ltd.
Suite 488-625 Howe St.,
Vancouver, B. C. V6C 2T6

by

A. J. Sinclair, P. Eng./P. Geo
Sinclair Consultants Ltd.
2972 West 44th Ave.,
Vancouver, B. C.

December 16, 2004

INDEX

SUMMARY

1. The 1994 and 1995 American Bullion assay data for Au and Cu by Min-En lab are of an acceptable and consistent quality, based on a re-evaluation of quality control information summarized by Smee (1995, 1996) and including (1) replicate analyses of three standards and (2) duplicate analyses of many pulps by an independent lab (Chemex).

2. Three in-house standards prepared for bcMetals Corp. by CDN Resource Laboratories Ltd. in 2003, have well-established mean values for Cu and Au that make the standards useful reference materials for quality control of sampling and assaying related to the 2003 drilling program. These standards were inserted routinely with analytical batches to obtain the 2003 analytical data.

3. The principal lab for assaying samples from the 2003 and 2004 drilling programs is IPL Ltd. Repeat analyses of standards indicate that IPL 2003 Cu and Au analyses are of acceptable accuracy.

4. Every 20th IPL pulp in 2003 was submitted to an independent lab (Chemex) in order to monitor for bias. Results indicate that for both Cu and Au the two labs agree satisfactorily. Where bias is noted, it is either negligible in magnitude or affects so few samples near the cutoff grade that the bias will have negligible impact on resouce\reserve estimates.

5. 2003 Precision of IPL data is adequate, as demonstrated by independent data sets including (1) repeat analyses of standards, and (2) repeat analyses of pulps checked by Chemex.

6. Quality control data for the 2004 drilling/sampling/assaying were obtained in comparable manner to the 2003 data. The principal lab, IPL, produced acceptable quality data for both Cu and Au. Blanks and standards were analyzed with excellent reproducibility; internal precision by IPL is acceptable; comparisons of IPL with Chemex for both Au and Cu are acceptable; and blind duplicate analyses by IPL are of acceptable quality.

7. Inherent geological (sampling) variability is the principal contributor to total variability within the data. For Cu the sampling variability is about 5 times the combined subsampling plus analytical variability; for Au the sampling variability is about 2.5 times the combined subsampling plus analytical variability. All these sources of error are random and will be minimized during resource/reserve estimation because many data will be used for the estimation of each block and the errors are compensating.

8. The Au/Cu ratio for various data sets is consistent, ranging from about 0.8 to 1.0.

INTRODUCTION

This report, prepared at the request of Mr. Ian Smith, has the general aim of reporting on the quality and suitability of data to be used as the basis of a resource estimate of the Red Chris deposit. The available data includes half-core samples obtained by American Bullion during the summers of 1994 and 1995 and half-core samples from fill-in drilling by BCMetals during the late summer of 2003 and the summer of 2004. The American Bullion pulps and rejects were not available. Hence, quality of data was assessed by a re-evaluation of information in two reports on quality control by B. Smee (1995, 1996). For the 2003 drill data, a rigorous quality control program was instituted that incorporated

(1) preparation of 3 in-house standards (low, medium and high grades) and their integration into analyses throughout the program,

(2) duplicate analyses of every 20th pulp by a second lab (Chemex) as a monitor for bias,

(3) duplicate analyses of selected pulps by the principal lab (IPL) as a check on analytical precision of the principal lab, and

(4) an independent sampling of half-cores for analysis by IPL to provide an indication of inherent geological (short range sampling) variability.

EVALUATE AMERICAN BULLION QC DATA (Smee Reports 1995 and 1996)

1994 QC Data (Smee, 1995)—data file: 94assayd.eas

Min-En was the principal lab for the 1994 assay data. A selection of 248 duplicate pulps were analyzed by Chemex as a check on Min-En results. Note that such duplicates do not provide a quantitative estimate of the precision of either of the labs in question, rather, they produce an average precision of the two labs with no indication as to which, if either, is the better quality lab. These paired data for Cu are shown in Figure 1--the two labs compare favourably for values below 0.67% Cu—bias is not evident and the scatter about the y = x line is acceptable. If 3 outliers are omitted the average precision of the labs is 10.4% for low Cu values (Figure 2) with an average absolute difference of 0.01% Cu for data averaging 0.209% Cu. For values >0.67% Cu (Figure 3) there is no evidence of bias; the average absolute difference is 0.031% Cu and the average precision of the two labs is about 7.3%.

The Au/Cu ratio for these data is variable but averages about 0.82; there is a relatively strong correlation between Au and Cu values.

The duplicate gold data, shown on Figure 4, are divided into two groups based on density of values. A low group (less than 0.48gpt Au) shows no evidence of bias (Figure 5). The random error is large with an average 2-lab precision of 61%. The 26 high Au values have an average 2-

lab precision of 24.4% (Figure 6) for data averaging about 0.9 gpt Au, and show a small fixed bias (demonstrable by a paired t-test) of about (0.938 – 0.863) = 0.075 gpt with Chemex high relative to Min-En.

All precisions quoted previously in this section are average precisions for Min-En and Chemex data. There is nothing in Smee's 1995 report that allows the quantitative determination of precision of the Min-En data. The ability of Min-En to reproduce three standards (average Cu values of 0.474%, 1.306% and 0.511%; average corresponding gold grades of 0.137gpt, 0.949gpt and 0.260gpt) within narrow limits over a period of approximately 5 months, as shown graphically in Smee's report, is a good indication of an acceptable level of random error (i.e., acceptable precision).

Overall, the 1994 American Bullion data by Min-En agree adequately with checks by Chemex. Where bias occurs it is small and Chemex is high relative to Min-En. Hence, accepting Min-En data might involve a small element of conservatism. I agree with Smee's conclusion that Min-En replicate analyses of standards represent a reasonable indication that Min-En results are accurate relative to those standards.

1995 QC Data (Smee, 1996)—data file: 95assayd.eas

The 1995 quality control program was more extensive than that of 1994 and is described in more detail by Smee than his account of the 1994 data. Data reproduced by Smee are re-evaluated in the following subsections.

Standards

Three standards, RC-A, RC-B and Min-En were analyzed in replicate by Min-En on an ongoing basis during the sampling/analytical program for 1995. Time plots of these analyses, in Smee (1996), show a remarkably narrow range of reproducibility in all cases. A summary of available statistics is given in Table 1.

TABLE 1: STATISTICAL PARAMETERS* FOR THREE STANDARDS FOR 1994 AND 1995 ANALYTICAL DATA.

		Red Chris and Min-En Standards					
Metal	**Year**	**RC-A**		**RC-B**		**Min-En**	
		m*	**s**	**m***	**s**	**m***	**s**
Au	1994	0.137		0.949		0.260	
	1995	0.125	0.006	0.919	0.039	0.259	0.009
Cu	1994	0.474		1.306		0.511	
	1995	0.466	0.002	1.300	0.003	0.519	0.004

*m = mean value, s = standard deviation; Cu in %; Au in gpt

Overall precisions can be determined for the 1995 data because standard deviations of the replicate analyses are available. These precisions are summarized in Table 2 and indicate remarkably good reproducibility of standard values. In all cases, precisions for Cu are very much better than for Au. These levels of precision are optimistic relative to what would be expected from routine data because standards are extremely well homogenized materials and generally become known to the lab operators (of course the Min-En standard was an internal lab standard rather than a client-inserted standard).

TABLE 2: AVERAGE PRECISIONS DETERMINED FROM REPLICATE ANALYSES OF STANDARDS, 1995 (Data from Smee, 1995, 1996)

Standard m(gpt)	Au Pr	Au m(%)	Cu Pr	Cu
RC-A	0.125	9.6%	0.466	0.9%
RC-B	0.919	17.0%	1.300	1.0%
Min-En	0.259	6.9%	0.519	3.1%

m = average, Precision = Pr = 200s/m

There is no way of checking for accuracy quantitatively from the data available in Smee's reports because no accepted values for the standards are given.

The data of Table 1 are useful in comparing analytical results for standards in 1995 with results for the previous year. The copper data for the two years are consistent for all standards. This implies that all the copper data for 1994 and 1995 are of consistent accuracy. The gold data, however, present a minor problem as follows: the average gold values reported for RC-A and RC-B for 1995 are significantly lower than are the average values of 1994. Conversely, the gold average for the Min-En standard for 1995 is slightly higher than the corresponding average for 1994 data. The bias in the RC standards can be demonstrated by conducting a test to determine if the 1994 values are within the 95% confidence limits of the 1995 data. For both standards the 1994 data are outside the confidence limits of the 1995 values for Au in the two standards and we conclude that there is a small but significant bias between the gold values reported for 1994 and 1995. For both RC standards, the 1994 data are high relative to the 1995 values—for RC-A by 100(.012)/.125 = 9.6% and for RC-B by 100(.03)/.919 = 3.3%. There are no recent, independent checks of accuracy of these data. From a practical point of view the great majority of very low gold values circa 0.125 gpt (mean value of RC-A) will have only a minor impact on resource/reserve estimation—consequently, any potential negative impact of these biases will be minor. The bias noted for standard RC-B is within the range commonly encountered for data sets of this type.

Duplicate Data

The 1995 duplicate Au data are shown in Figure 7. Although a linear model almost superimposes on the y = x line for the total data, complexity is indicated by the combination of a positive y-intercept and a slope less than 1.0. Two subgroups are defined by a gap in the data. A group of low Au values (<0.4 gpt) are seen to be biased (Figure 8) with Min-En high relative to Chemex—the average difference (based on a linear model) is shown for a few pertinent values below:

Chemex value (gpt)	**0.1**	**0.2**	**0.3**	**0.35**
Calc'd Min-En value	0.134	0.240	0.347	0.400
Diff as % of Min-En	25.4%	16.7%	13.5%	12.5%

The duplicate, high-Au data, shown on Figure 9, are well-reproduced by Min-En and Chemex; the linear model is almost superimposed on the y =x line. The average precision of the two labs is 19% for an average Au grade of 0.688 gpt.

The average Au/Cu ratio for these 496 samples is 1.05 $\pm$ 0.06 (average with 95% confidence limits). The relatively strong correlation of Au and Cu is evident in the linear trend of Figure 10.

Duplicate Cu data, ranging up to 1.57% Cu, are very well duplicated by Min-En and Chemex (Figure 11). Two subgroups are based on density of data; Culo is <0.68% Cu; Cuhi is .>0.76%Cu. The low values (averaging about 0.158%Cu) have an average precision for the two labs of 11.9% and a mean absolute difference of 0.008%; the upper group (averaging about 0.98%Cu) has an average precision for the two labs of 5.9% and a mean absolute difference of 0.023%Cu.

In summary: the reproducibility of Cu by the two labs in 1995 is exceptionally good. Au values above 0.4 gpt are well reproduced by both labs; for values <0.4 gpt Min-En is significantly higher than Chemex on average, but this will have little overall impact on resource/reserve estimation because many of the low values will not be important in defining reserves.

2003 DRILLING PROGRAM

Introduction

A program of infill drilling and sampling was undertaken in August 2003 with quality control sampling integrated into the general program. Evaluation of several labs (Assayers, Chemex, Acme, IPL) led to IPL being selected as the principal lab for analyses, with Chemex as the check lab. The overall QC program involved establishing standards, monitoring of IPL results by Chemex and duplicate sampling and analyses, as discussed below.

In-House Standards—data files: umpireL.eas, umpireM.eas, umpireH.eas

Round Robin Analyses

Three in-house standards (high, medium and low grades) were prepared by CDN Resource Laboratories Ltd. (CDN) for RCDC. Following the physical preparation, 20 subsamples of each pulped standard were sent to Assayers Ltd to test for homogeneity. The test results were deemed satisfactory by CDN and twenty samples of each were then sent to each of IPL, Chemex and Acme. Summary statistics for results by Assayers Ltd. and the 3 additional labs are given in Table 3. Examination of these results indicates that IPL is low for Au in two standards, relative to the other three labs and IPL is low for Cu in all standards relative to the other three labs. This suggests a problem with IPL analyses (i.e., a possible low bias for both Cu and Au) as emphasized in Table 4 where IPL data are compared with the 4-lab and 3-lab averages.

TABLE 3: AVERAGE GRADES BY FOUR TEST LABS FOR 3 IN-HOUSE STANDARDS

Std	Metal	IPL		Assayers		Chemex		Acme	
		m*	s*	m*	s*	m*	s*	m*	s*
BCM_L	Au	.285	.011	.291	.008	.282	.005	.286	.008
	Cu	.322	.005	.360	.002	.362	.004	.340	.003
BCM_M	Au	.524	.027	.559	.036	.565	.027	.578	.030
	Cu	.478	.006	.567	.004	.557	.008	.558	.006
BCM_H	Au	.675	.054	.762	.028	.762	.026	.749	.035
	Cu	.873	.011	.920	.006	.883	.009	.916	.007

* m = arithmetic mean, s = standard deviation, Cu in %, Au in gpt. N = 20 for each

TABLE 4: AVERAGE GRADES FOR THREE IN-HOUSE STANDARDS

Std	Metal	4 Labs		3Labs (omit IPL)		IPL original	
		m	s	m	s	m	s
BCM-L	Au	.286	.0133	.286	.0142	.285	.011
	Cu	.346	.0169	.354	.0107	.322	.005
BCM-M	Au	.556	.0352	.567	.0309	.524	.027
	Cu	.540	.0367	.561	.0076	.478	.006
BCM-H	Au	.737	.0519	.757	.0302	.675	.054
	Cu	.898	.022	.907	.0184	.873	.011

To check these contrasting results summarized in Table 4, three tests were undertaken:

1. IPL was presented with the problem and asked to reanalyze all the pulps (i.e., 3 x 20 = 60 pulps to be reanalyzed).
2. Drill hole 248 was the first hole to be sampled and assayed after round robin analyses of the in-house standards. For Hole 248 all samples above 0.3 % Cu were reanalyzed by a lab other than IPL or Chemex (Acme was selected arbitrarily).

3. The first batch of monitor assays by Chemex (which included samples taken shortly after the umpire samples were first analyzed) was compared with IPL results.

Reanalyses of Standards by IPL—data file:

The original and check analyses of standards by IPL are summarized in Table 5. The check analyses by IPL are much more in line with results from the other three labs than are the original data. I conclude, the original IPL data were in error

New, accepted mean values for the 3 standards, calculated as a weighted average of the 3-lab average and the new IPL results, are listed in Table 5.

TABLE 5: COMPARE ORIGINAL AND CHECK-IPL ANALYSES FOR IN- HOUSE STANDARDS

Std	**Metal**	**IPL (Original)**		**IPL (Check)**		**New Mean Value**
		m	**s**	**m**	**s**	
BCM-L	Au	.285	.001	.295	.012	0.288gpt
	Cu	.322	.005	.351	.006	0.353%
BCM-M	Au	.524	.027	.541	.030	0.561gpt
	Cu	.478	.006	.561	.007	0.561%
BCM-H	Au	.675	.054	.703	.030	0.744gpt
	Cu	.873	.011	.907	.013	0.907%

M = mean value, s = standard deviation, N = 20 for each case. Au in gpt, Cu in %.

Hole 248 Repeat Analyses by Acme—data file: 03-248.eas

Eighty-three sample pulps from ddh 248, with reported Au grades in excess of 0.3gpt, were submitted to Acme Lab as an independent check on initial results by IPL. Acme and IPL gold values for ddh 248 pulps show no evidence of bias (Figure 12). Scatter about the best fit line is less for data pairs averaging less than 1.1 gpt compared with higher values. For the lower values the mean absolute difference is 0.048gpt, the relative error is 0.102 for grades averaging 0.591gpt and the average interlab precision is 20.4%. For values higher than 1.1gpt the mean absolute difference is 0.237gpt, the relative error is 0.145 for data averaging 2.04gpt and the average interlab precision is 29.1%.

The copper data less than approximately 0.85% Cu are reproduced well by the two labs (Figure 13)—the average precision for the two labs for these assays averaging 0.615% Cu is 12.1%. The mean absolute difference by the two labs is 0.030% Cu.

Paired data above approximately 0.85% Cu are biased (Figure 14a). A linear model fitted to the data has the equation

$$AcmeCu = 0.837IPLCu + 0.104$$

Applying this equation to a range of IPL values gives the average biases listed in Table 6. The Acme-IPL bias in high copper values may relate to the fact that Acme used an ICP finishing procedure for the assays they reported.

TABLE 6: AVERAGE BIASES FOR VARIOUS IPL Cu GRADES RELATIVE TO CORRESPONDING ACME GRADES FOR SAME PULPS

Calculated Acme grade	Assumed IPL grade	Difference (absolute)	Difference* (% of IPL)
0.941 %	1.0 %	0.059	-5.9%
1.276	1.4	0.124	-8.9%
1.611	1.8	0.189	-10.5%
1.945	2.2	0.255	-11.4%
2.615	3.0	0.385	-12.8%

*Differences are biases relative to IPL

The disparity between Acme and IPL Cu results for hole 03-248 was investigated by submission of the same pulps to Chemex for assay. Chemex results are compared with IPL in Figure14b where a bias is evident, albeit a lesser bias than demonstrated in Figure 14a and Table 6. For example, for IPL values of 1.0 and 1.4% Cu the Chemex biases are –5.9% and –8.9% respectively. A disparity of about 5% is widely accepted in the mining industry so IPL values above 1.0% Cu must be considered—this bias in high Cu values is not consistent with independent checks on Cu values by Chemex as part of the general monitoring program (see next section) for which Chemex and IPL Cu values are in excellent agreement. Furthermore, the disparity between Acme and IPL Cu values (IPL is high, on average) is in contrast to an earlier concern that IPL round robin Cu values were low relative to analyses by three other labs that included Acme (Assayers, Chemex and Acme). I conclude that the bias of high IPL Cu analyses (>1.0% Cu) for hole 03-248 data is a local random aberration that is not evident in the more extensive data base.

Chemex Monitor Analyses—data file check3.eas

Check analyses of pulps received from Chemex are compared with corresponding original analyses by IPL. A plot for Au data (AA finish) is shown in Figure 15. In general, the comparison is acceptable. With one outlier removed there is no evidence of bias and the scatter of paired data about the y = x line is reasonable—the average interlab analytical error is $s_a = 0.0749$ giving a mean absolute difference of 0.06 gpt and an average interlab precision of 33.6%. Samples >1gpt were also analyzed by fire assay with gravimetric finish—for the 11 samples involved, the two labs compare favourably as shown in Figure 16a. Similarly, the IPL gravimetric analyses compare favourably with the IPL AA-finish analyses as illustrated in Figure 16b.

For Cu duplicates (Figure 17) the two labs (IPL and Chemex) are in even better agreement than for gold. The average 2-lab error (standard deviation) is s_a = 0.047%, to give a mean absolute difference of 0.038%, an average relative error of 0.090 and an average 2-lab precision of 17.9%. These data are discussed in greater detail below in a section entitled "Regular Chemex Checks of IPL Pulp Analyses".

Conclusion

These tests indicated that the original, poor results by IPL on the RCDC' in-house standards are limited to the original round robin analyses of the in-house standards and are not representative of the subsequent (2003) assay data. A second set of analyses by IPL are consistent with those of the 3 other round robin labs; monitoring data shows IPL to be consistent, on average, with Chemex check results.

Precision of IPL Data

Two independent sets of data allow quantification of the precision of IPL analyses—(1) pulps first analyzed by IPL, checked by Chemex and returned to IPL as renumbered pulps, and (2) duplicate analyses of in-house standards.

IPL Rechecks of Chemex Checks on IPL Pulps—data file: checks3.eas

A total of 250 pulps analyzed by IPL (approx. one in every 20 samples) were sent to Chemex for check analyses during the 2003 drill program. The pulps were renumbered and returned to IPL to be rechecked as 'blind' pulps thus providing a sound basis with which to estimate average, IPL analytical precision throughout the analytical program of October and November 2003. The paired, non-zero IPL Au analyses are shown on Figure 18a. Data were divided into two subgroups—low values have a relatively tight scatter about y = x; high values have a relatively wide scatter about y = x. For the low-grade group (Figure 18b) no bias is evident—the y = x line and the RMA line are superimposed. Omitting one outlier, the mean absolute difference is 0.03gpt, the average relative error is 0.183gpt and the average 2-lab precision is 36%. The high values (Figure 18c) have a mean absolute difference of 0.214gpt, a relative error of 0.190 and an average precision of 38% These results, in general, indicate that IPL Au data are unbiased and have a moderate level of random analytical error

IPL duplicate Cu analyses for 240 pulps (non-zero) are shown in Figure 19a. The low values (<0.6%Cu), plotted on Figure 19b, are in good agreement. Values below 0.6% Cu have a mean absolute difference of 0.02%, an average relative error of 0.096 and an average precision of 19%. The high Cu values, shown on Figure 19c, are also in good agreement with a mean absolute difference of 0.066% Cu, an average relative error of 0.062 and an average precision of 12.5%.

The great majority of Au analyses by IPL and Chemex are fire assays with an atomic absorption finish. The relatively small number of monitoring samples that assayed above 1.0gpt was rerun as fire assays with a gravimetric finish by both IPL (twice—each time they analyzed the same pulp) and Chemex. For Chemex (Figure 20a) and the original IPL (Figure 20b) gravimetric assays there is remarkably close agreement with corresponding AA finish results. For the second set of IPL results (Figure 20c) there is a slight underestimation of IPL gravimetric finish relative to AA finish—on average the underestimation is 0.225 gpt for values averaging 2.28gpt. Because results by gravimetric finish are accepted as the final value in the data base used for resource estimation the use of gravimetric-finish values is seen as a conservative decision.

Blanks analyzed routinely by IPL with all analytical batches reported low values at or near the detection limit, indicating an absence of contamination of material during analysis. The maximum gold value in a blank is 0.03 gpt with an average value of 0.013 gpt. The maximum copper value in a blank is 0.02% with an average value of 0.013%.

Replicate Analyses of In-House Standards.

IPL analyzed the in-house standards in replicate on two separate occasions because the first set of analyses indicated that a bias existed relative to three other labs involved in the round robin analyses of the standards. Precisions, estimated from both sets of replicate analyses, are summarized in Table 5. In brief, the results indicate that precision for Au in standards is circa 10% whereas precision for Cu is circa 3%. These results are significantly better precision estimates than are those based on blind duplicates, as discussed in the previous section.

TABLE 7: PRECISIONS ESTIMATED FROM IPL REPLICATE ANALYSES OF IN-HOUSE STANDARDS.

Std	Metal*	IPL (Original)			IPL (Check)		
		Mean	Stdev	Pr(%)	Mean	Stdev	Pr(%)
BCM-L	Au	.285	.001	0.70%	.295	.012	8.1%
	Cu	.322	.005	3.11%	.351	.006	3.4%
BCM-M	Au	.524	.027	10.3%	.541	.030	11.1%
	Cu	.478	.006	2.5%	.561	.007	2.5%
BCM-H	Au	.675	.054	16.0%	.703	.030	8.5%
	Cu	.873	.011	2.52%	.907	.013	2.9%

*N = 20 for each average and standard deviation. Au in gpt, Cu in %.

Monitoring IPL Analyses

Two sets of analytical data serve as a monitor of IPL analytical data by independent labs, (1) regular monitoring of IPL pulp analyses by Chemex, and (2) selected reanalyses (ddh 248) of IPL pulps by Acme.

Regular Chemex Checks of IPL Pulp Analyses—datafile: checks3.eas

IPL pulps checked by Chemex, were returned as renumbered pulps to IPL who produced a second analysis. Each of these two analyses by IPL can be compared with the Chemex check results. A comparison of original IPL Au analyses with Chemex values has been discussed briefly above. The recheck Au data versus Chemex are considered best in two subgroups, low and high values, separated at approximately 0.54gpt (Figure 21). Low values by the two labs are in exceptionally good agreement with a mean absolute difference of 0.020gpt, a relative error of 0.099 and average precision of 20%. The linear model for the higher data shows an average bias of approximately 10% (for grades averaging about 1.55gpt Au) with IPL analyzing high relative to Chemex. The high values have a relative error of 0.074 and an average precision of 15%. Figure 22 shows the second IPL AU analyses versus the Chemex monitor values.

Recheck Cu analyses by IPL are shown versus check analyses by Chemex on Figure 23. The recheck analyses have a remarkably good comparison with Chemex data, indicating no measurable bias and having a high level of reproducibility (i.e., an average precision for the two labs of 8% for an average grade of 0.52%Cu). The original IPL data versus Chemex, similarly shows no evidence of bias but the average precision of the two labs is higher at 17.7%.

It is of interest to note that for both Cu and Au, the routine analyses by IPL show substantially more random scatter than do the recheck (nonroutine/special study) analyses. This indicates that routine analyses are less precise than are non-routine analyses involving analyses of groups of pulps submitted or resubmitted for special studies. Note that the original comparison of Chemex Au vs. IPL Au indicated no bias whereas the comparison of Chemex Au vs. the second IPL analysis indicated IPL to be about 10 percent higher for values greater than about 0.7gpt. Considering these results in the light of round robin analyses of standards and other check analyses by Acme, it seems that IPL has a moderate random variability for Au from batch to batch.

Special Acme Checks of IPL Pulp Analyses for ddh 248—datafile: 03-248.eas

Repeat analyses of pulps for ddh 248 with reported grades greater than 0.3gpt Au or 0.3% Cu were sent to another independent lab (Acme) as a check on IPL. These data are discussed in detail in an earlier section. In general, they show that the two labs agree acceptable for gold analyses and for Cu analyses less than 0.85% Cu. However, for higher Cu grades Acme measures low relative to IPL. The pulps were sent to Chemex as an independent check and Chemex results for high Cu values, shown plotted in Figure 14b, are discussed in an earlier section. In brief, the Chemex-IPL comparison is better than the Acme-IPL comparison but there remains about a 10 percent bias in Cu data above 1.5% Cu, with IPL high relative to Chemex. The regular monitoring information (see Figure 23) indicates that this bias is not present throughout the 2003 data.

Duplicate Half Cores—data file: half-core_rej.eas

Total sampling variability can be quantified by comparing analyses for duplicate samples, in this case, duplicate half cores. A plot of 60 such data for Cu, taken as part of the 2003 quality control program, is given in Figure 24. These data show extremely good agreement on average, with a total average error of $s_t = 0.1187$ (giving a precision of 28.2%). The mean absolute difference of 0.095%Cu means that, on average, any two duplicate core values will differ, on average, by about 0.1%Cu. Average relative error is 0.141 for an average grade of 0.843% Cu to give an average half-core to half-core precision of 22.5%.

A plot of the second half-core Cu value against a second coarse reject sample grade from the same half core is shown in Figure 25. These results are somewhat surprising because they show less variability than analytical error alone, a situation that can arise because the analytical error was determined for a different data set i.e., the data are not consistent. The subsampling plus analytical error based on Figure 25 is $s_{ss+a} = 0.028$. Consequently, the sampling error is estimated to be

$$s_s = (s_t^2 - s_{ss+a}{}^2)^{½} = (0.1187^2 - 0.028^2)^{1/2} = 0.12\%\text{Cu}$$

which is nearly 5 times the combined sampling plus analytical error.

Half-core, paired values that are lower than about 0.38%Cu have much less dispersion than do higher values. The lower group of 10 values has an average precision of about 18.2% whereas, the higher group of 50 values has an average precision of about 27.1%.

Duplicate half-core data for Au are plotted in Figure 26. The RMA linear model is almost coincident with the y = x line indicating no evidence of bias. The data have a relatively wide dispersion about the y = x line: the total error is $s_t = 0.245$gpt giving a mean absolute difference of 0.2gpt, a relative error of 0.345 and a precision of about 69%. A comparable plot for duplicate rejects is shown in 'Figure 27 where the combined subsampling plus analytical error is 0.092%Cu to give a mean absolute difference of 0.073gpt, a relative error of 0.136 and a precision of 27.2%. In this case the sampling error for Au is

$$s_s = (s_t^2 - s_{ss+a}{}^2)^{½} = (0.245^2 - 0.092^2)^{1/2} = 0.227$$

which is approximately two and one-half times the subsampling plus analytical error.

This independent sampling of the 2003 core indicates that the 2003 analytical data are unbiased. Moreover, by far the largest source of variability in the analytical data arises because of inherent geological variability over short distances i.e., the half-core sampling error is very much larger than the combined subsampling plus analytical error—about 5 times larger in the case of copper and about two and one-half times larger in the case of gold. All of these sources of variability are random in nature and their impact will be compensatory during resource/reserve estimation because many samples will be used in the estimation of each block considered.

2004 DRILLING PROGRAM

Introduction

The 2004 quality control program for Red Chris sampling and assaying followed a similar pattern to that of 2003. Approximately every 20th sample was selected as a duplicate pulp which was first analyzed by IPL, then was sent as a blind pulp to Chemex for a check analysis after which the Chemex pulp returned to IPL as a blind pulp. This procedure ensures a reasonable control on possible bias and provides a fair check of IPL internal precision. Company standards and blanks were inserted with each analytical batch by IPL.

Standards and Blanks (data file: RC04_QAQC_xlsv5.xls)

A total of 25 blank samples were inserted in the stream for quality control assaying of samples from the 2004 drilling program. Of these, Cu reported as 0.00% in one sample, 0.01% in 20 samples and 0.02 % in 4 samples. In the case of gold, all 25 samples reported equal to or less than 0.01 g/t. These are very acceptable values and indicate that contamination of samples, in general, is not a problem during analyses of 2004 samples.

Three standards prepared for the 2003 assaying program were also used for the 2004 quality control work. The accepted values of these 'high', 'medium' and 'low' grade standards are listed in Table 5 and are based on round robin analyses conducted prior to the 2003 sampling/analytical program. Table 8 compares the statistics of the 2004 results for these standards with the accepted values.

TABLE 8: COMPARISON OF 2004 SUMMARY STATISTICS FOR INTERNAL STANDARDS WITH ACCEPTED VALUES

Standard	Metal	Accepted	2004 Summary Results		
	.	Value	n	mean	std. Dev.
H	Au	0.744 g/t	26	0.751g/t	0.0300
	Cu	0.907%	26	0.897%	0.0316
M	Au	0.561g/t`	22	0.564g/t	0.0250
	Cu	0.561%	22	0.555%	0.0163
L	Au	0.288g/t	25	0.301g/t;	0.0105
	Cu	0.353%	25	0.347%	0.0131

The data of Table 8 indicate that the averages obtained by IPL for both metals in all three standards is acceptable close to the accepted value. In all cases, the accepted value is within the 95% range of values reported by IPL. Moreover, the standard deviations in all cases are very small indicated a high degree of analytical reproducibility of the standards by IPL.

Precision of IPL Data (data file: RC04_QAQC.txt)

IPL ran duplicate Au and Cu analyses of 105 pulps as part of their 2004 internal quality control program.

Copper

The Cu data have been divided into 2 subgroups arbitrarily (at about 0.2% Cu) based on two characteristic spreads about the y = x line on an x vs y plot. Results are illustrated in Figures 29 and 30. The lower grade subgroup plots very close to the y = x line (i.e., no bias) and indicates an average analytical error of s_a = 0.0058 for data averaging 0.0935% Cu. This translates to an average precision of about 12%.

The higher grade Cu duplicates similarly show no indication of bias. The average analytical error is s_a = 0.0121 for data averaging 0.5389% Cu which gives an average precision of about 4.5%. Both the high and low grade duplicate copper analyses show that bias is not present and that reproducibility is acceptable.

Gold

The 105 pulps analyzed in duplicate for Au can be divided into two subgroups (at approx. 0.25 g/t) based on scatter about the y = x line. These two subgroups are illustrated in Figures 31 and 32. The lower grade data center closely about the y = x line and thus indicate no bias. The scatter about the line gives an average analytical error of s_a = 0.01494 for data averaging 0.0767g/t which gives an average analytical precision of about 39%. This is equivalent to a precison of about 15% at a grade of 0.2g/t.

The high grade subgroup of duplicate Au values plots about the y = x line, indicating no bias. The spread of data about the y = x line give an average analytical error of s_a = 0.0392 which gives an average precision of about 17%. Reproducibility for both the low grade and high grade subgroups is acceptable.

Au/Cu Ratio

The quality control data provide an opportunity to check the character of Au/Cu ratios relative to previously obtained data. On an x vs y plot the data have a pronounced linear trend with a slope of about 0.8 and substantial scatter. This result is consistent with data from previous drilling campaigns.

External Lab Check for Bias in IPL Data. data file: RC2004_Rechecks_ALS_IPL.txt

Introduction:

One hundred and two pulps were analyzed as check analyses by Chemex. These pulps were subsequently returned to IPL as ‘blind’ pulps for reanalysis by IPL.

Copper

Duplicate Cu analyses by IPL (initial analyses) and Chemex are illustrated in Figure 33. The data group closely about the y = x line with very little scatter indicating that no bias exists between the two labs. The very slight scatter of data about the y = x line suggests that both labs have a acceptable quality precision. An acceptable comparison also exists between IPL (second Cu analyses) and Chemex check analyses.

Gold

In the case of Au, a single high grade sample produces values of 1.23 and 1.15g/t, relatively good agreement for such a high value. With this influential value removed, the duplicate Au analyses by IPL (initial analysis) and Chemex scatter about the y = x line acceptably indicating no bias between the two labs as shown on Figure 34. Two samples are somewhat removed from the y = x line relative to the bulk of the plotted points; in both cases IPL measured high relative to Chemex. In contrast, the high grade value omitted on the diagram was analyzed high by Chemex relative to IPL. The second set of IPL Au analyses show a slight bias of about 5% or less relative to Chemex check analyses, with Chemex values being slightly higher on average. This level of difference is common between laboratories and is considered acceptable; in any case, IPL values are conservative relative to Chemex values. In general, the dispersion of data indicates acceptable quality of check analyses.

IPL Blind Precision Test. data file: RC2004_Rechecks_ALS_IPL.txt

Introduction

The 102 samples analyzed by Chemex were returned to IPL as ‘blind’ pulps for Au and Cu analyses. These second sets of analyses are compared with the original IPL analyses to establish the true lab analytical precision for the 2004 data.

Copper

Blind duplicate Cu analyses of pulps by IPL are plotted on Figure 35 and show a small but real bias of about 4.5% between the two sets of data.. A bias of this magnitude in duplicate samples, analyzed at different times, is expectable for routine analyses in a lab and is generally acceptable. The blind precision for copper analyses, taken relative to the mean value of the duplicate pulps analyzed, is about 11.5% for data averaging approximately 0.24% Cu.

Gold

Original IPL Au analyses of pulps are plotted versus blind duplicate analyses by IPL on Figure 36. This diagram and related statistics indicate no recognizable bias. If the highest (influential) value plotted is omitted, the statistics change slightly but, again, no bias can be recognized (see

Table 9). Similarly, if only the data less than 0.4 g/t Au are considered, no bias is recognized.

TABLE 9: STATISTICS FOR VARIOUS LINEAR MODEL FOR IPL BLIND DUPLICATE PULP ANALYSES (Au g/t)

n	Slope*	Intercept*	Dispersion	Remarks
102	1.030(.0224)	-.0162(.0065)	.0684	All data
101	0.982(.0220)	-.0090(.0059)	.0624	Data less largest influential value
87	0.989(.0390)	-.0079(.0059)	.0500	Data less than 0.4 g/t Au

*Value in brackets is one standard error

The precision for blind gold analyses, taken relative to the mean grade of the duplicate pulps analyzed (0.187 g/t Au), is about 41%, almost the same as the precision for internal (known) duplicates by IPL.

CONCLUSIONS

The writer is in agreement with Smee that the accuracy and precision of the 1994 and 1995 Red Chris assay data for Cu and Au, obtained for American Bullion Minerals Ltd., meets quality levels that are generally acceptable throughout the mining industry.

An exhaustive quality control program incorporated into the 2003 Red Chris drill program by bcMetals demonstrates that the Cu and Au assay data obtained in 2003 isare of acceptable accuracy and precision. Moreover, the inherent sampling variability for both metals is demonstrated to be very much larger than the combined variability arising from both subsampling and analytical protocols. These random errors will be minimized during resource/reserve estimation because they are compensating in nature in cases such as this where many samples are used in the estimation of a block.

A quality control program for assays obtained for the 2004 drilling program duplicates the general procedures of the 2003 drilling. Analyses of standards and internal duplicates by IPL demonstrates an acceptable quality for internal lab procedures. Check analyses of pulps by Chemex indicate that no significant bias is present in the IPL and Chemex data. Blind checks of pulps by IPL indicate a very acceptable level of internal precision by IPL for both Cu and Au.

All data sets examined indicate a strong direct relation between gold and copper—Au/Cu ratios are commonly in the range 0.8 to 1.0.

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Sinclair, A. J., and G. H. Blackwell, 2002, Applied mineral inventory estimation; Cambridge University Press, Cambridge, U. K., 381 p.

Smee, B. W., 1995, Report on analytical quality, Red Chris project; report prepared for American Bullion Minerals Ltd., Vancouver, January, 21 p. plus two appendices that include duplicate pulp analyses.

Smee, B. W., 1996, Report on analytical quality for the 1995 drill results, Red Chris project; report prepared for American Bullion Minerals Ltd., Vancouver, February, 25 p. plus appendices including duplicate pulp analyses and analyses of in-house standards.

FIGURES

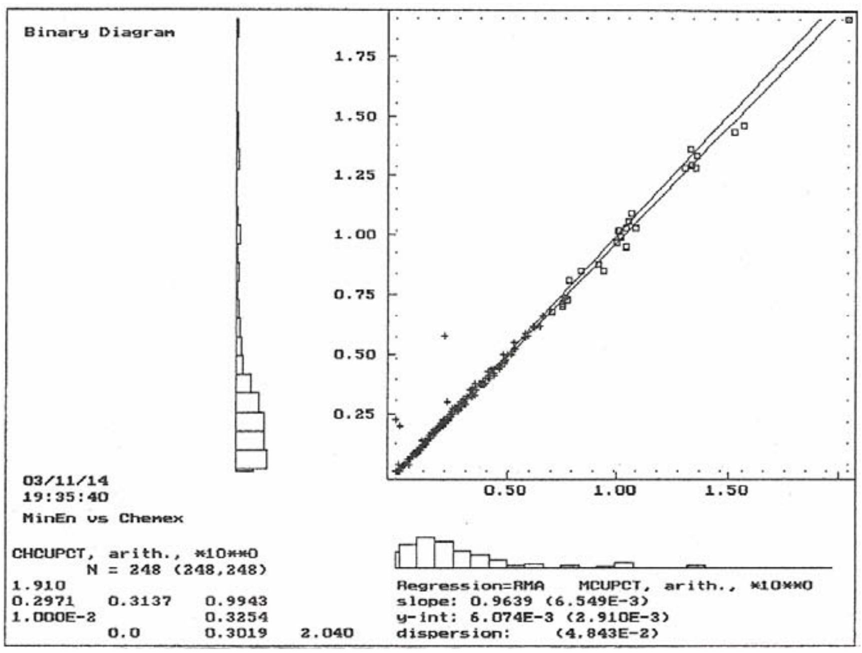


Figure 1: Scatter diagram of check Cu assays by Chemex (CHCUPCT) versus Min-En Cu assays (MCUPCT) on the same pulps in 1994 (Data from Smee, 1995). Upper line is y = x; lower line is reduced major axis line (RMA) fitted to the data. Various statistics are defined in Appendix 1. Plus signs and open squares represent two arbitrary subgroups considered separately.

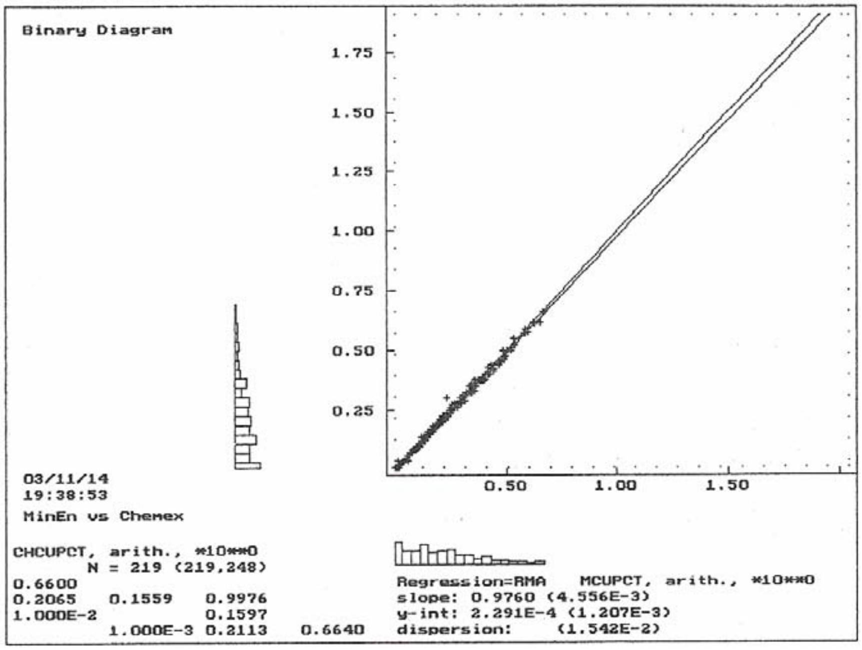


Figure 2: Scatter diagram of check Cu assays below 0.67% Cu by Chemex (CHCUPCT) versus corresponding Min-En Cu assays (MCUPCT) on the same pulps in 1994 (Data from Smee, 1995). Upper line is y = x; lower line is reduced major axis line (RMA) fitted to the data. Various statistics are defined in Appendix 1.

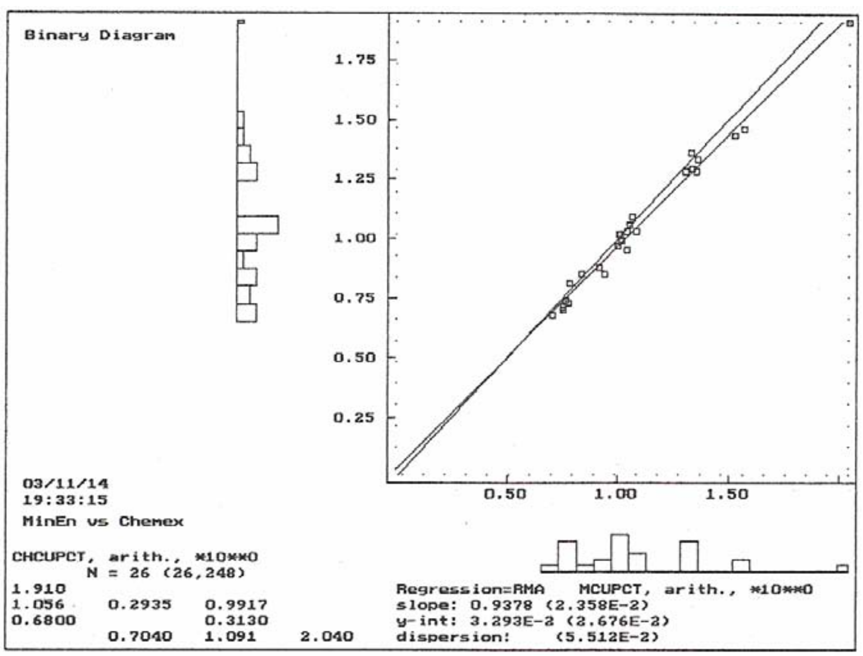


Figure 3: Scatter diagram of check Cu assays greater than 0.67%Cu by Chemex (CHCUPCT) versus corresponding Min-En Cu assays (MCUPCT) on the same pulps in 1994 (Data from Smee, 1995). More steeply sloping line is y = x; other line is reduced major axis line (RMA) fitted to the data. Various statistics are defined in Appendix 1.

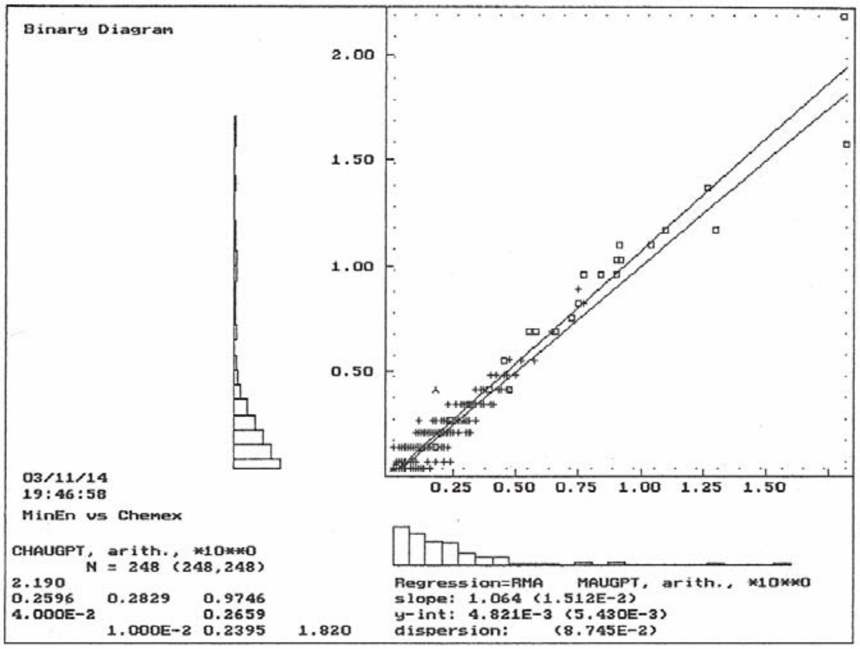


Figure 4: Scatter diagram of check Au assays by Chemex (CHAUGPT) versus Min-En Cu assays (MAUGPT) on the same pulps in 1994 (Data from Smee, 1995). Lower line is y = x; upper line is reduced major axis line (RMA) fitted to the data. Various statistics are defined in Appendix 1.

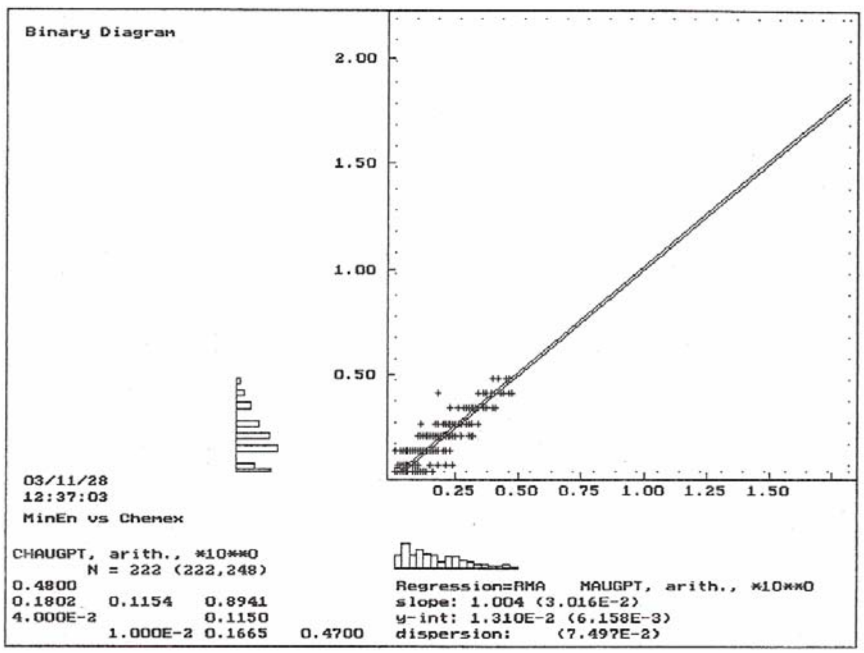


Figure 5: Scatter diagram of check Au assays less than 0.48 gpt by Chemex (CHAUGPT) versus corresponding Min-En Cu assays (MAUGPT) on the same pulps in 1994 (Data from Smee, 1995). Lower line is y = x; upper line is reduced major axis line (RMA) fitted to the data. Various statistics are defined in Appendix 1.

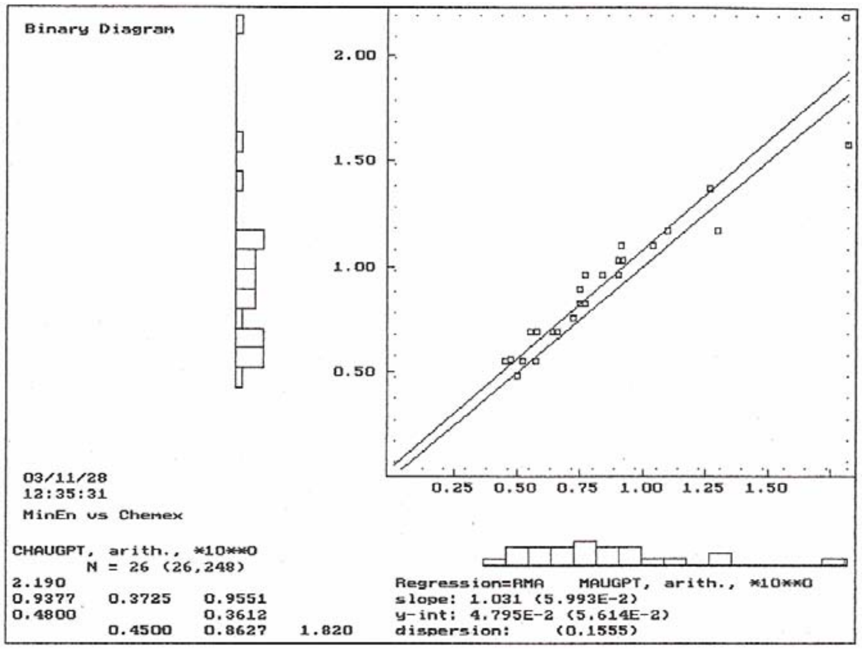


Figure 6: Scatter diagram of check Au assays greater than 0.48gpt by Chemex (CHAUGPT) versus corresponding Min-En Cu assays (MAUGPT) on the same pulps in 1994 (Data from Smee, 1995). Lower line is y = x; upper line is reduced major axis line (RMA) fitted to the data. Various statistics are defined in Appendix 1.

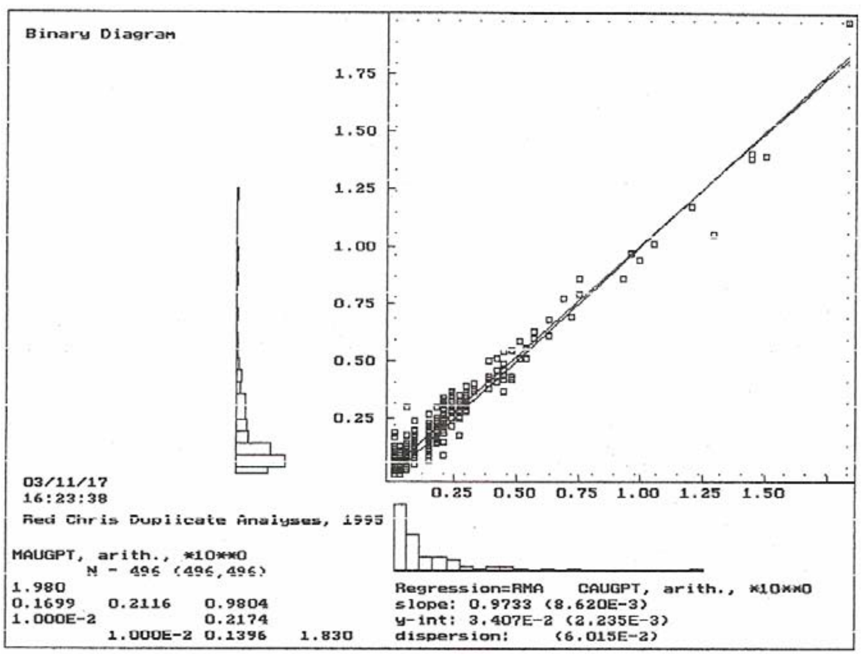


Figure 7: Scatter diagram of check Au assays by Chemex (CAUGPT) versus Min-En Cu assays (MAUGPT) on the same pulps in 1995 (Data from Smee, 1996). Lower line is y = x; upper line is reduced major axis line (RMA) fitted to the data. Various statistics are defined in Appendix 1.

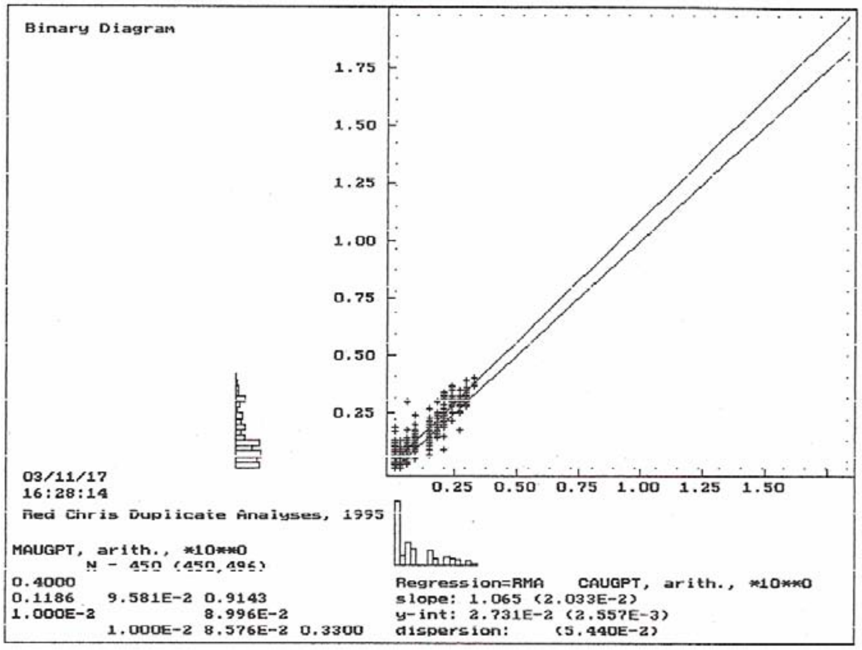


Figure 8: Scatter diagram of check Au assays less than 0.4 gpt by Chemex (CAUGPT) versus Min-En Cu assays (MAUGPT) on the same pulps in 1995 (Data from Smee, 1996). Lower line is y = x; upper line is reduced major axis line (RMA) fitted to the data. Various statistics are defined in Appendix 1.

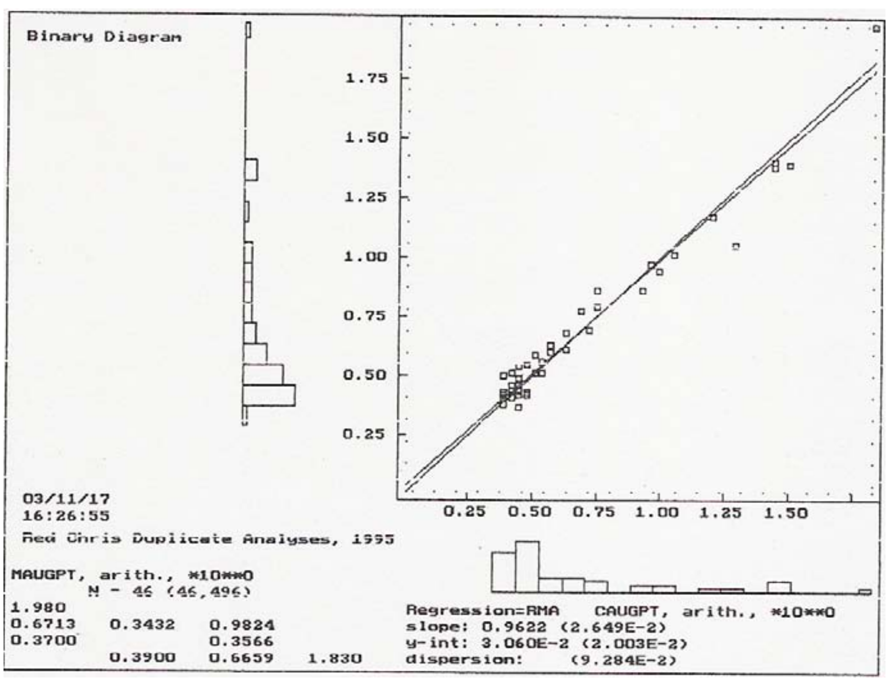


Figure 9: Scatter diagram of check Au assays greater than 0.4 gpt by Chemex (CAUGPT) versus Min-En Cu assays (MAUGPT) on the same pulps in 1995 (Data from Smee, 1996). More steeply sloping line is y = x; more gently sloping line is reduced major axis line (RMA) fitted to the data. Various statistics are defined in Appendix 1.

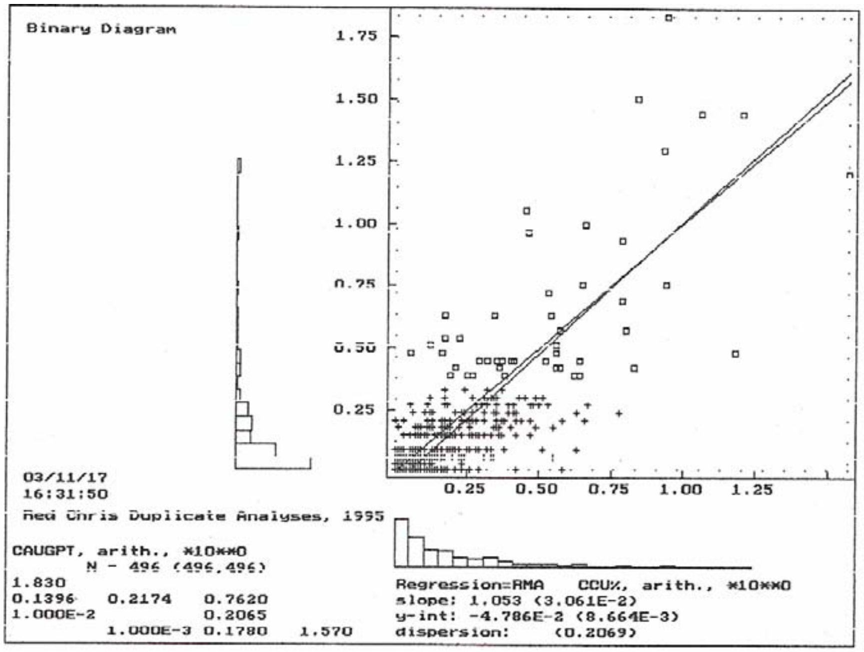


Figure 10: Scatter diagram of Cu (%) versus Au (gpt) for 1995 Chemex check analyses. Data after Smee, 1996) indicating a relatively strong correlation between Cu and Au with an average Au/Cu ratio of about 0.95.

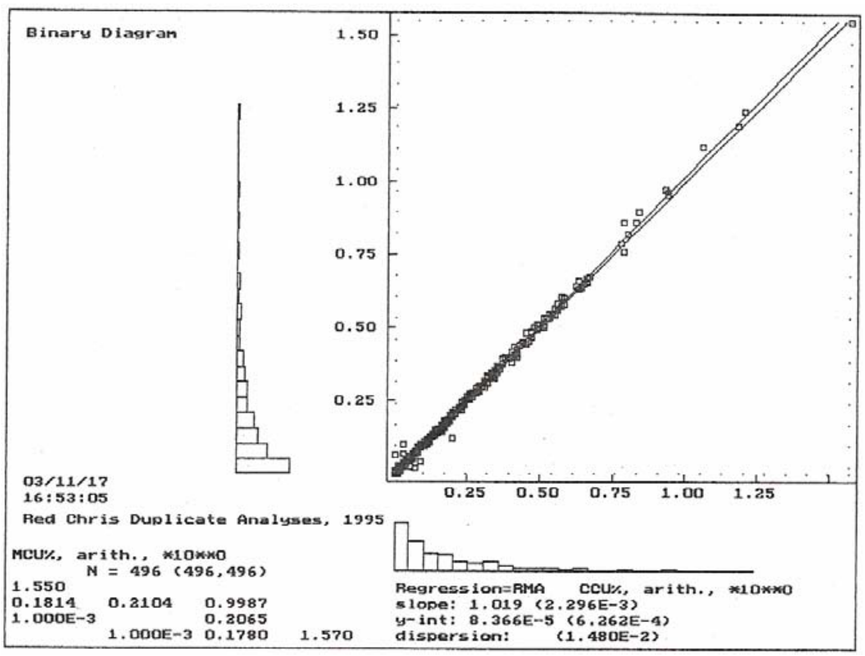


Figure 11: Scatter diagram of check Cu assays by Chemex (CCU%) versus Min-En Cu assays (MCU%) on the same pulps in 1995 (Data from Smee, 1996). Lower line is y = x; upper line is reduced major axis line (RMA) fitted to the data. Various statistics are defined in Appendix 1.

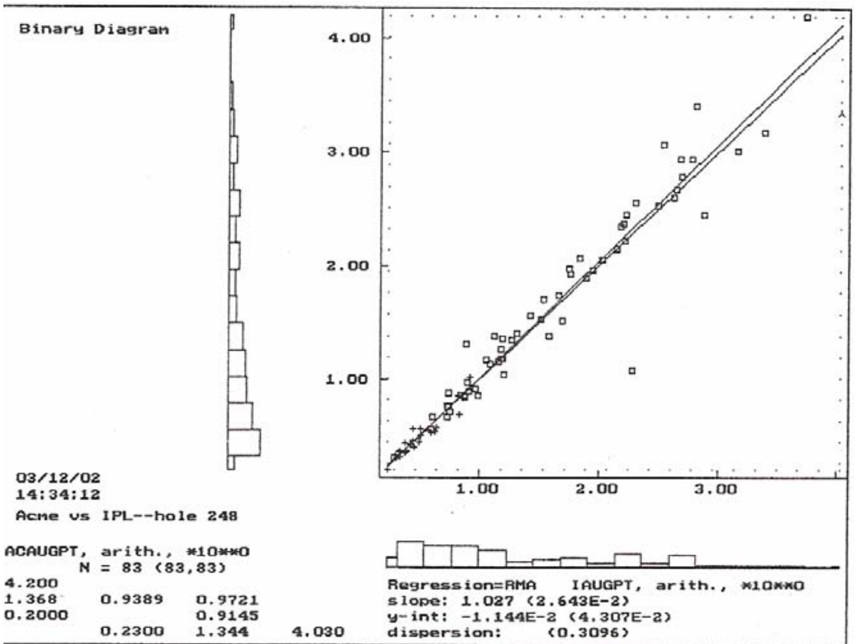


Figure 12: Scatter diagram of check Au assays by Acme (ACAUGPT) versus IPL Au assays (IAUGPT) on the same pulps in 2003 (Data from file:AcvI.eas). Lower line is y = x; upper line is reduced major axis line (RMA) fitted to the data. Various statistics are defined in Appendix 1.

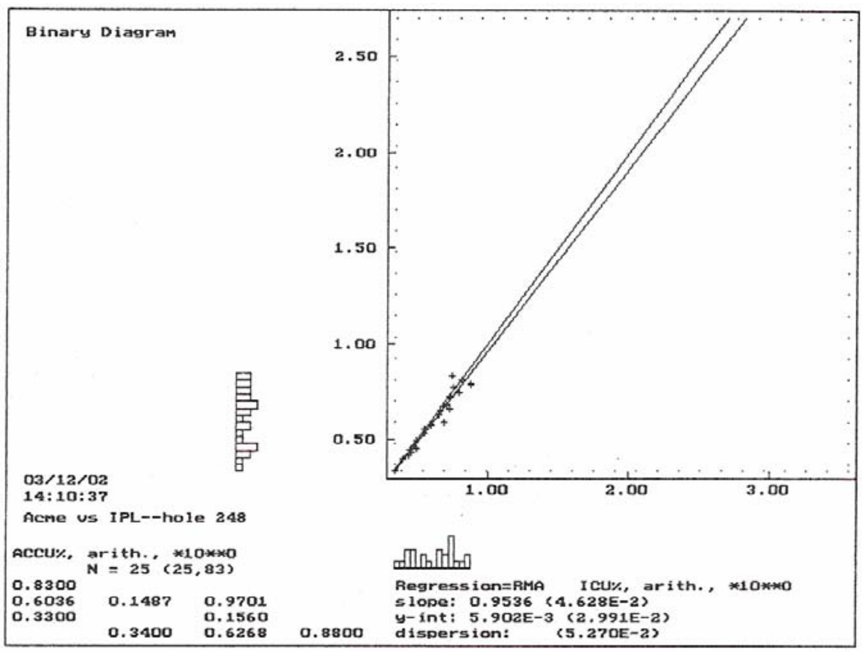


Figure 13: Scatter diagram of check Cu assays less than 0.88%by Acme (ACCU%) versus IPL Cu assays (ICU%) on the same pulps in 2003 (Data from file:AcvI.eas). Upper line is y = x; lower line is reduced major axis line (RMA) fitted to the data. Various statistics are defined in Appendix 1.

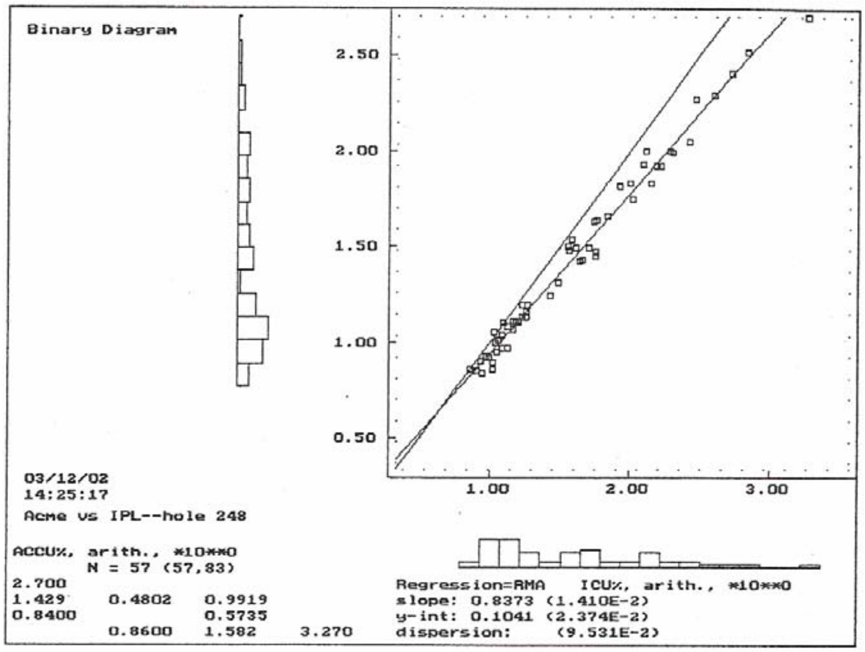


Figure 14a: Scatter diagram of check Cu assays greater than about 0.84%Cu by Acme (ACCU%) versus IPL Cu assays (ICU%) on the same pulps in 2003 (Data from file:AcvI.eas). Upper line is y = x; lower line is reduced major axis line (RMA) fitted to the data. Various statistics are defined in Appendix 1.

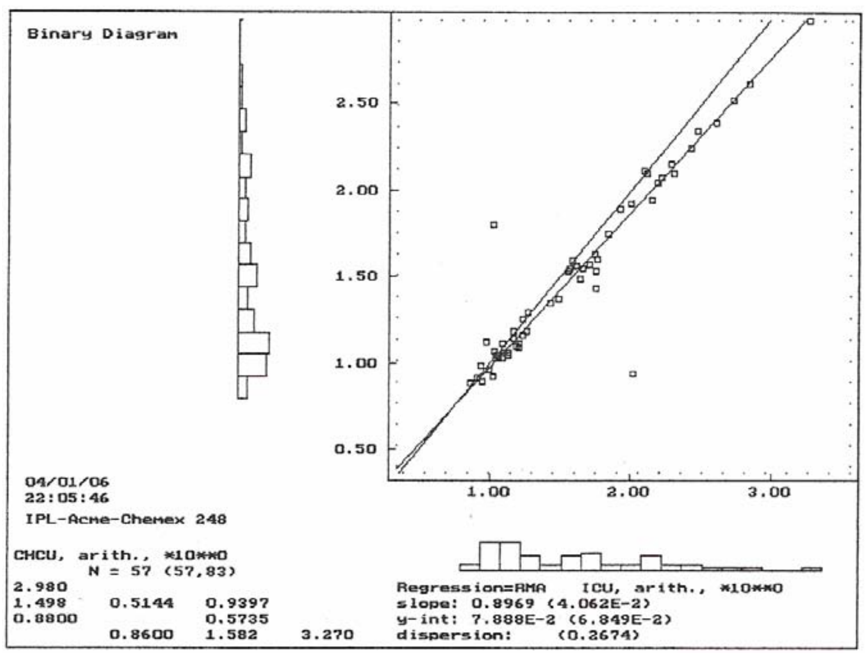


Figure 14b: Scatter diagram of check Cu assays (same samples as in Figure 14a) by Chemex (CHCU) versus IPL Cu assays (ICU) on the same pulps. (Data file:03-248.eas). Upper line is y = x; lower line is reduced major axis line (RMA) fitted to the data. Various statistics are defined in Appendix 1.

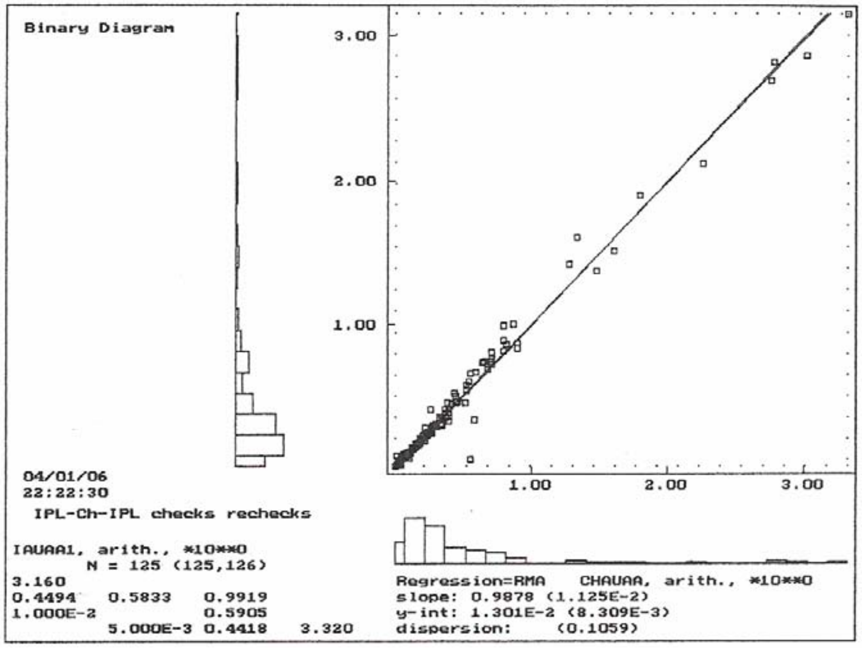


Figure 15: Scatter diagram of original Au assays by IPL (IAUAA1) versus Chemex check Au assays (CAUAA) on the same pulps in 2003 (Data from file: checks2.eas). Lower line is y = x; upper line is reduced major axis line (RMA) fitted to the data. Various statistics are defined in Appendix 1.

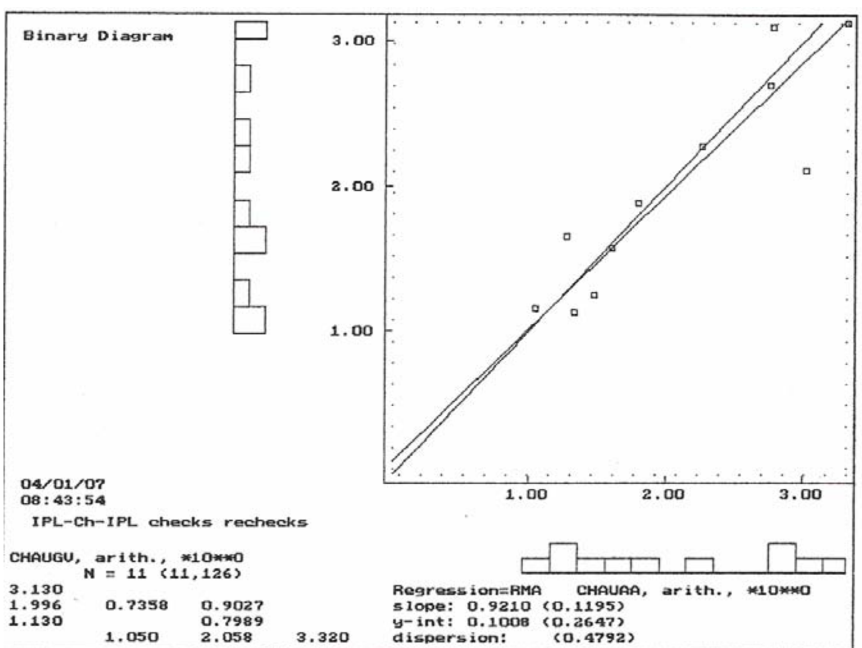


Figure 16a: Scatter diagram of check gravimetric Au assays by Chemex (CHAUGV) versus Chemex AA-finish Au assays (CHAUAA) on the same pulps in 2003 (Data from file: checks3.eas). Steeper-dipping line is y = x; other line is reduced major axis line (RMA) fitted to the data. Various statistics are defined in Appendix 1.

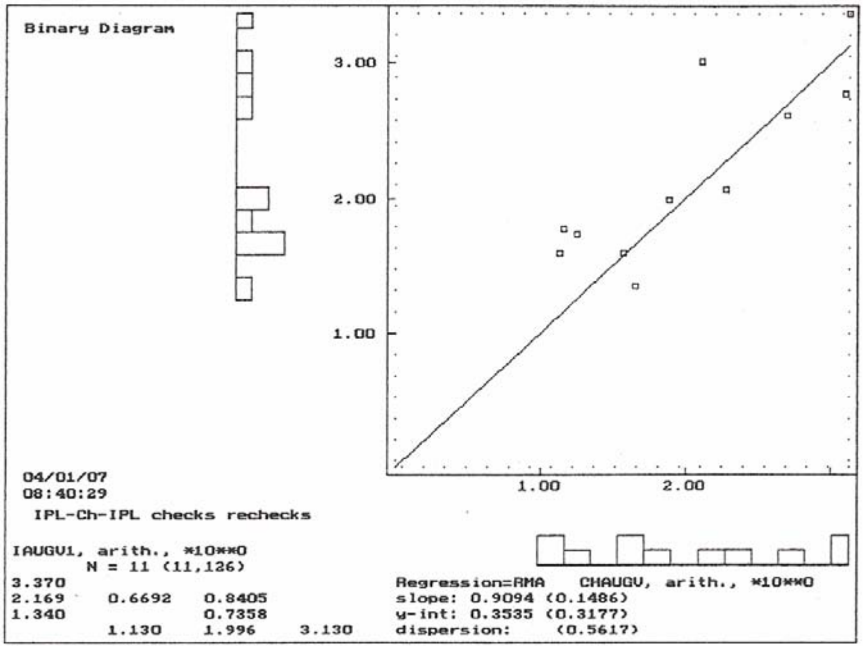


Figure 16b: Scatter diagram of gravimetric Au assays by IPL (IAUGV1) versus check gravimetric Au assays by Chemex (CHAUGV) on the same pulps in 2003 (Data from file: checks3.eas). Line is y = x. Various statistics are defined in Appendix 1.

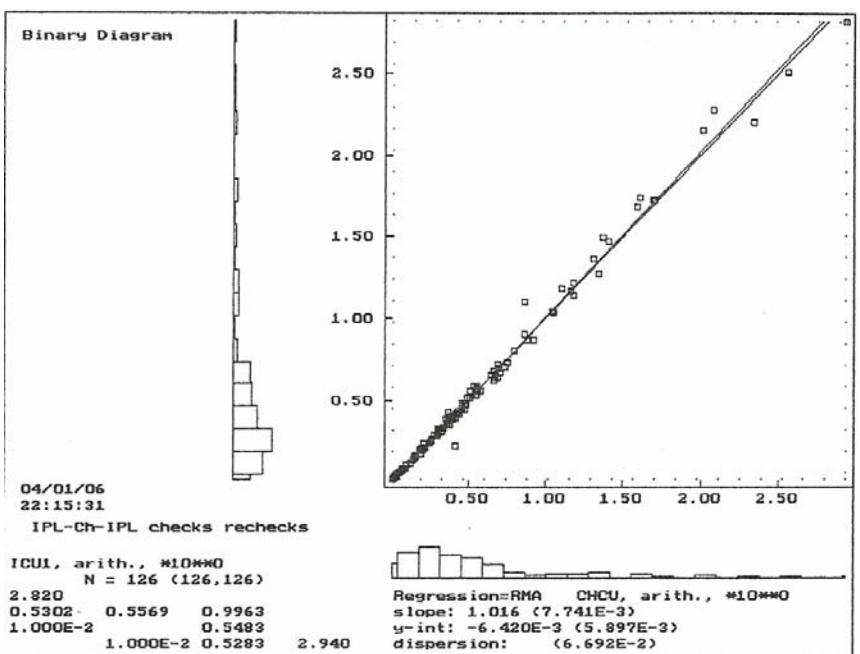


Figure 17: Scatter diagram of check Cu assays by Chemex (CHCU) versus initial IPL Cu assays (ICU1) on the same pulps in 2003 (Data from file: checks3.eas). Lower line is y = x; upper line is reduced major axis line (RMA) fitted to the data. Various statistics are defined in Appendix 1.

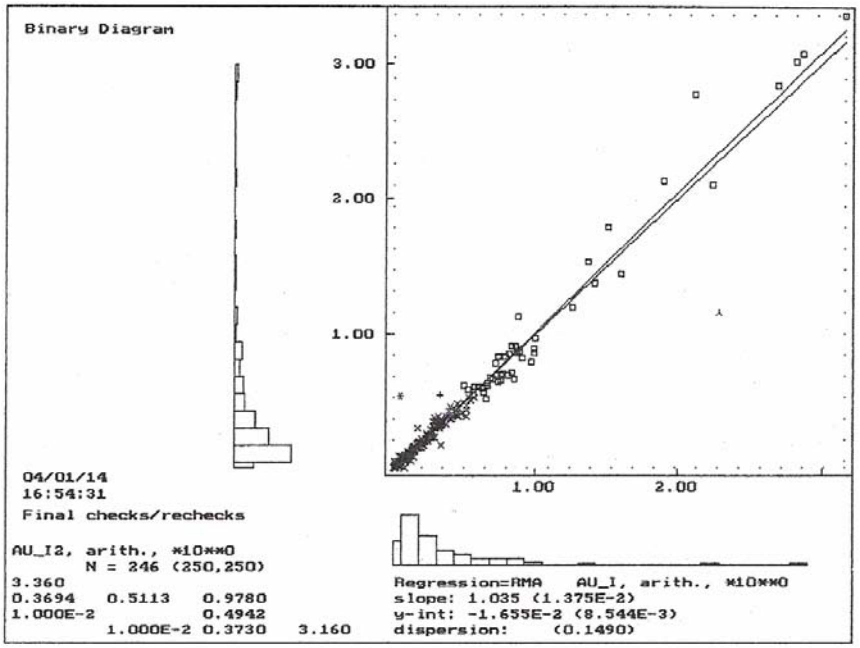


Figure 18a: Scatter diagram of Au assays by IPL (AU_I) versus IPL blind duplicate Au assays (AU_I2) on the same pulps in 2003 (Data from file: checks3.eas). Lower line is y = x; upper line is reduced major axis line (RMA) fitted to the data. Various statistics are defined in Appendix 1.

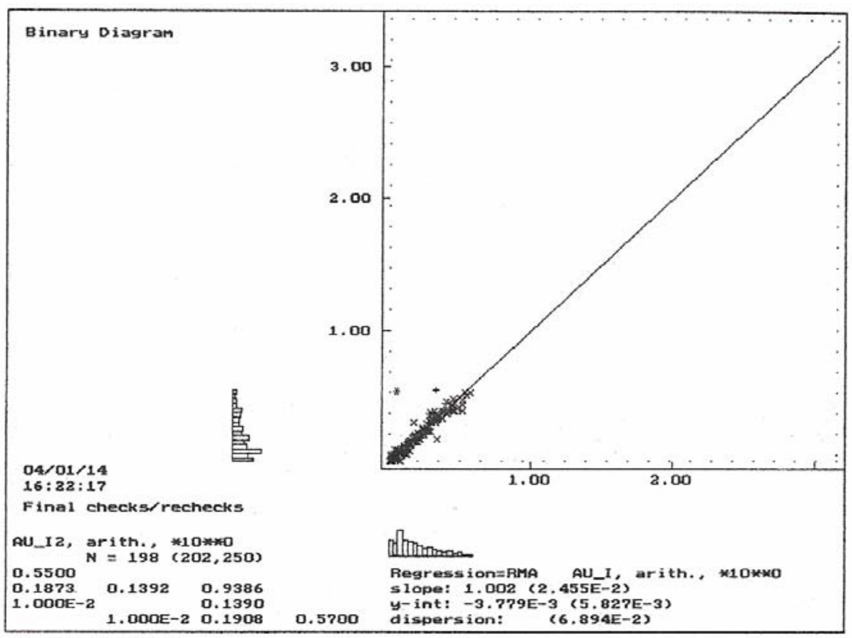


Figure 18b: Scatter diagram of Au assays by IPL (AU_I) versus IPL blind duplicate Au assays (AU_I2) on the same pulps in 2003 for duplicate analyses less than 0.55gpt. (Data from file: I-Ch-I.eas). The RMA line is essentially coincident with y = x. Various statistics are defined in Appendix 1.

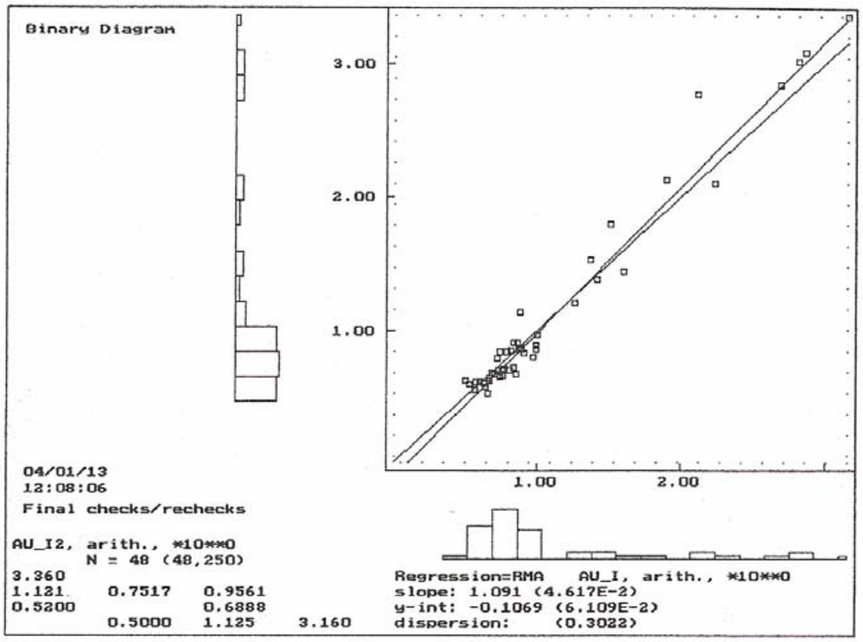


Figure 18c: Scatter diagram of Au assays by IPL (AU_I) versus IPL blind duplicate Au assays (AU_I2) on the same pulps in 2003 for duplicate analyses greater than 0.52gpt. (Data from file: I-Ch-I.eas).Gently-sloping line is y = x; steeper line is RMA line fitted to the data. Various statistics are defined in Appendix 1.

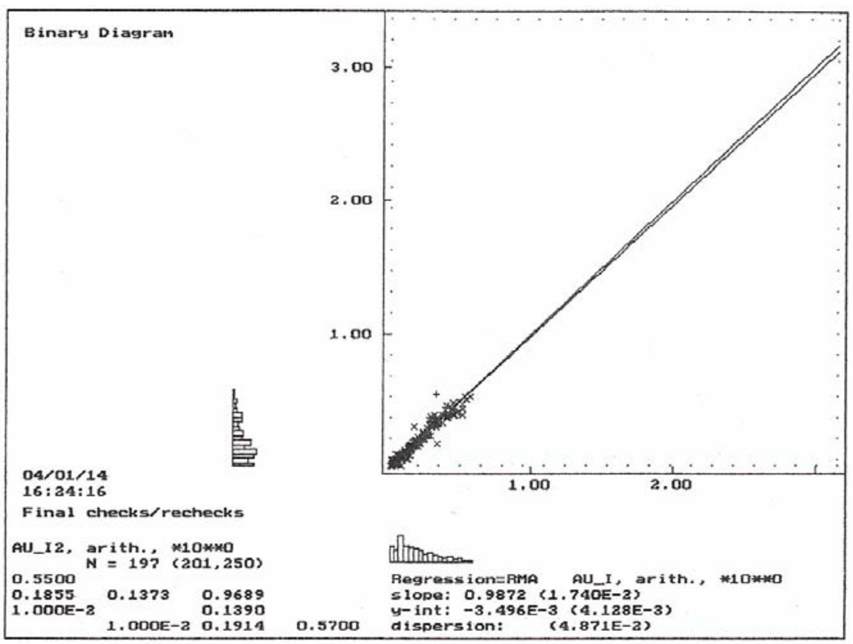


Figure 18d: Scatter diagram of Au assays by IPL (AU_I) versus IPL blind duplicate Au assays (AU_I2) on the same pulps in 2003 for duplicate analyses less than 0.55gpt with the removal of one outlier. Compare results with Figure 18b to see the effect of removing one outlier. (Data from file: I-Ch-I.eas). The RMA line is nearly coincident with y = x. Various statistics are defined in Appendix 1.

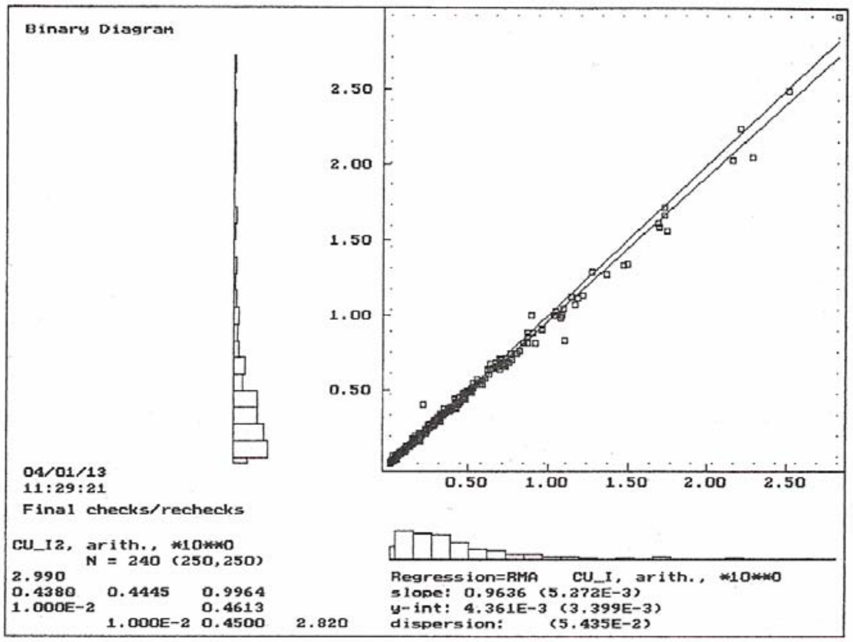


Figure 19a: Scatter diagram of original Cu assays by IPL (CU_I) versus second blind Cuy assay by IPL (CU_I2) on the same pulps in 2003 (Data from file: checks3.eas). Upper line is y = x; lower line is reduced major axis line (RMA) fitted to the data. Various statistics are defined in Appendix 1.

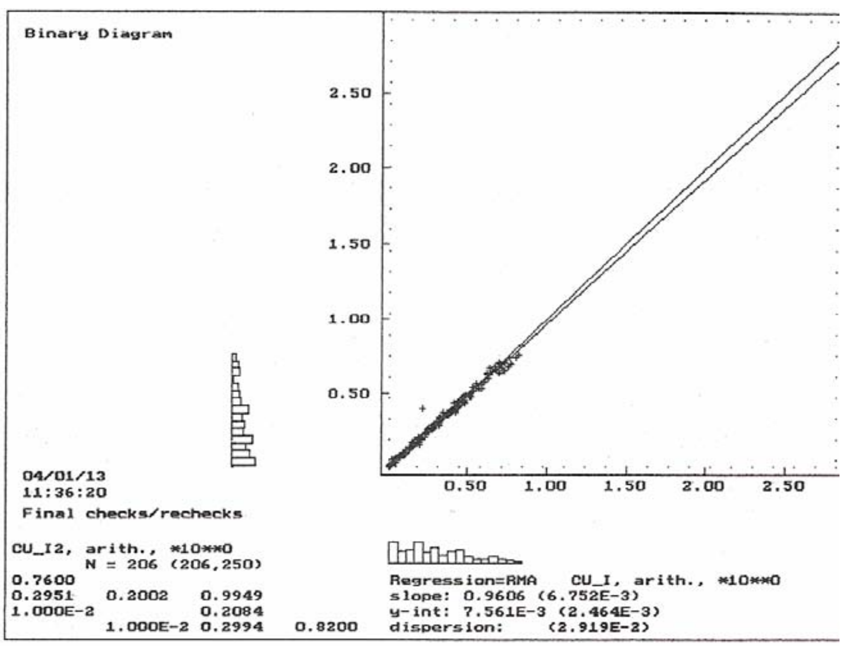


Figure 19b: Scatter diagram of original low Cu assays (<0.82%) by IPL (CU_I) versus second blind Cu assay by IPL (CU_I2) on the same pulps in 2003 (Data from file: checks3.eas). Upper line is y = x; lower line is reduced major axis line (RMA) fitted to the data. Various statistics are defined in Appendix 1.

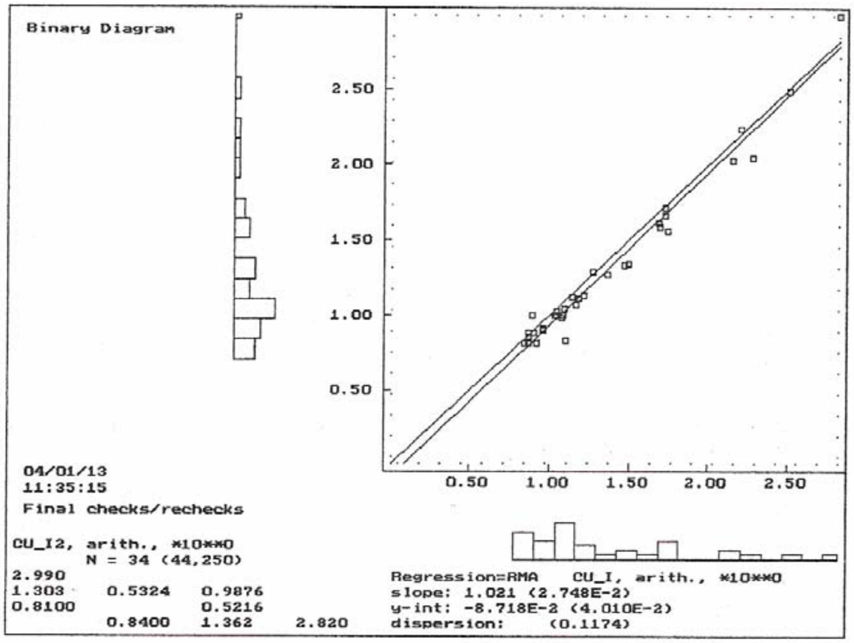


Figure 19c: Scatter diagram of original high Cu assays (>0.82%Cu) by IPL (CU_I) versus second blind Cu assay by IPL (CU_I2) on the same pulps in 2003 (Data from file: checks3.eas). Lower line is y = x; upper line is reduced major axis line (RMA) fitted to the data. Various statistics are defined in Appendix 1.

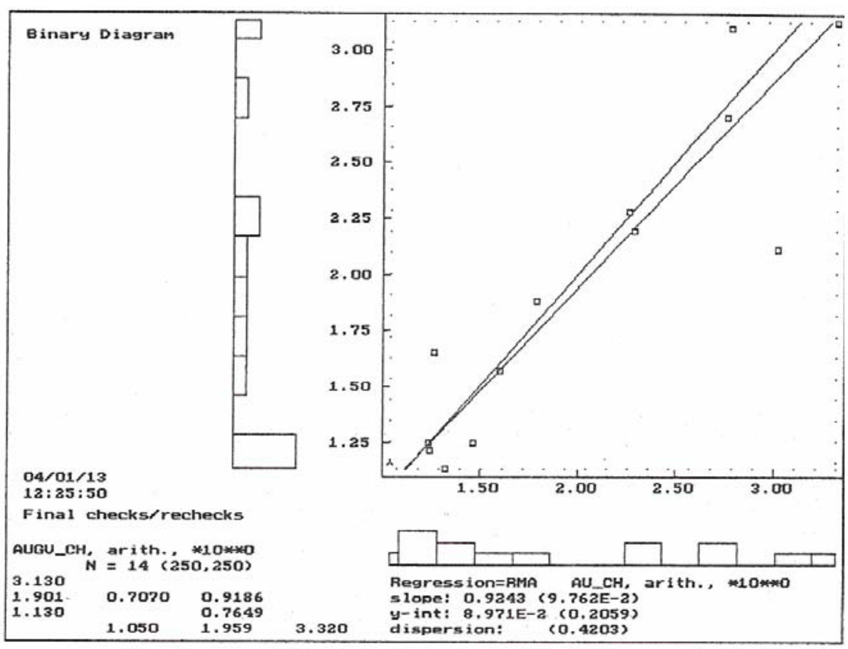


Figure 20a: Scatter diagram of Chemex check, gravimetric gold analyses (AUGV_CH) versus Chemex standard AA-finish gold analyses (AU_CH). Data from file: checks3.eas. Upper line is y = x; lower line is reduced major axis line (RMA) fitted to the data. Various statistics are defined in Appendix 1.

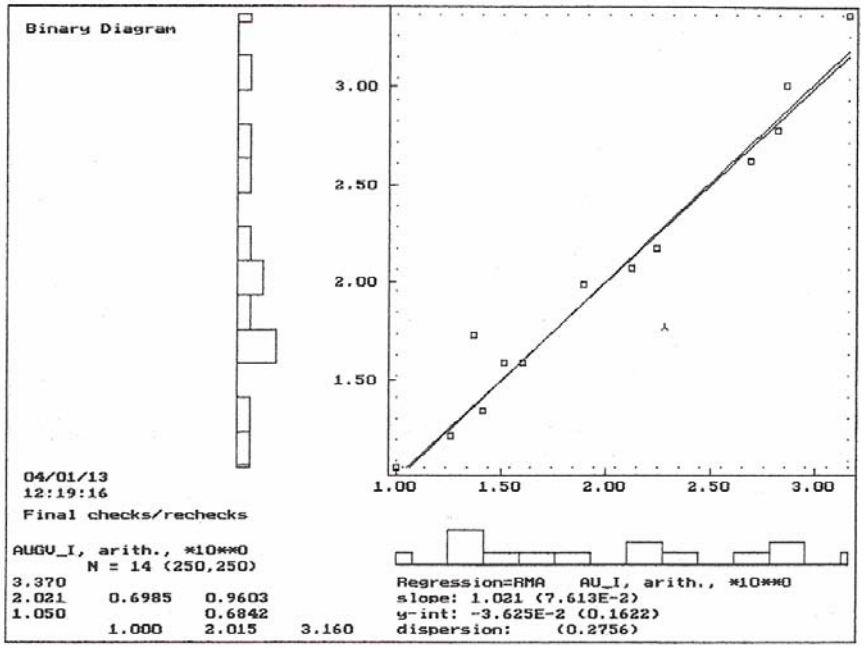


Figure 20b: Scatter diagram of initial IPL gravimetric gold analyses (AUGV_I) versus IPL standard AA-finish gold analyses (AU_I). Data from file: checks3.eas. Gently sloping line is y = x. Steeply sloping line is reduced major axis line (RMA) fitted to the data. Various statistics are defined in Appendix 1.

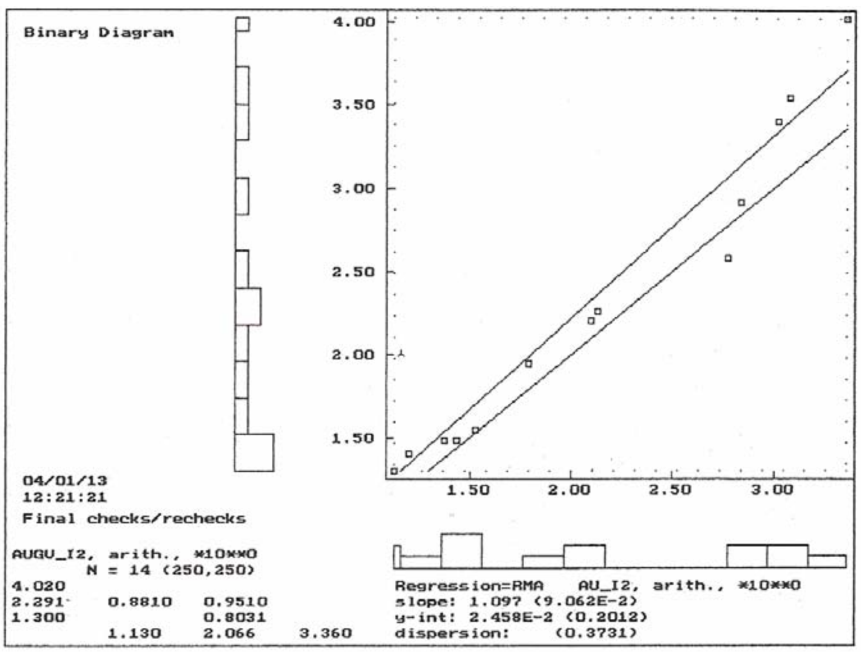


Figure 20c: Scatter diagram of second IPL gravimetric gold analyses (AUGV_I2) versus IPL standard AA-finish gold analyses (AU_I). Data from file: checks3.eas. Lower line is y = x. Upper line is reduced major axis line (RMA) fitted to the data. Various statistics are defined in Appendix 1.

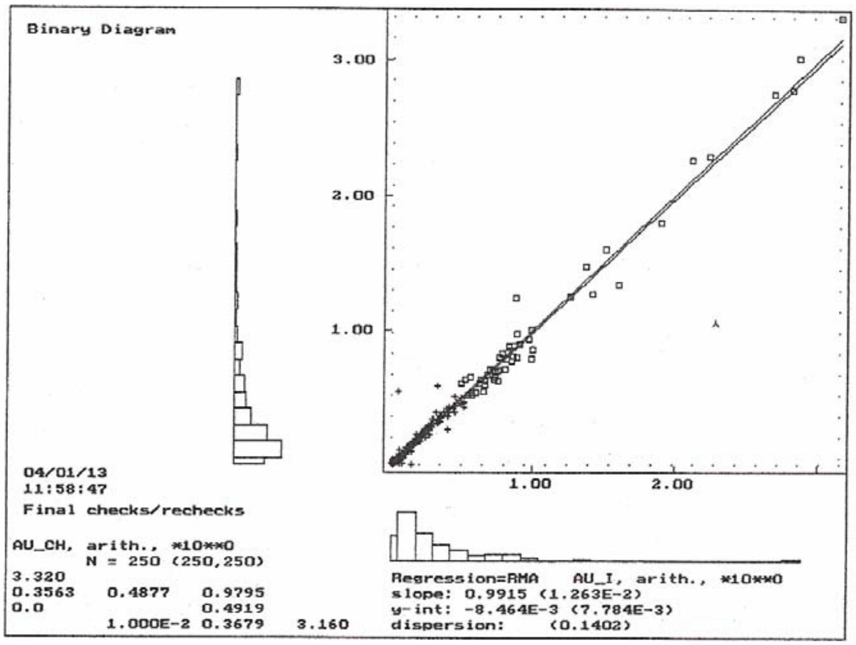


Figure 21: Scatter diagram of original Au assays by IPL (AU_1) versus monitor assay by Chemex (AU_CH) on the same pulps in 2003 (Data from file: checks3.eas). Upper line is y = x; lower line is reduced major axis line (RMA) fitted to the data. Various statistics are defined in Appendix 1.

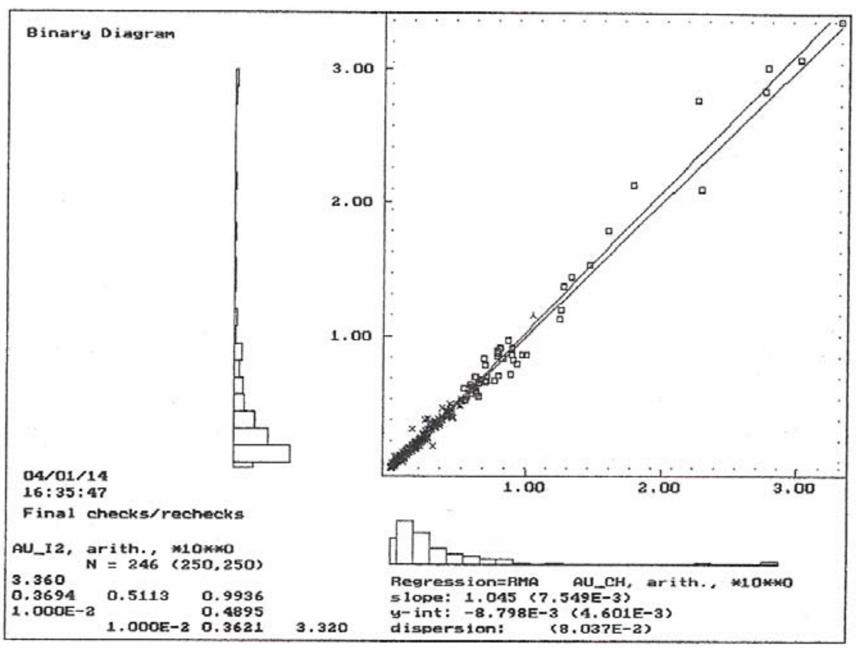


Figure 22: Scatter diagram of Chemex Au assays (AU_CH) versus corresponding second Au assay by IPL (AU_I2) on the same pulps in 2003 (Data from file: checks3.eas). The upper line is y = x. The lower line is reduced major axis line (RMA) fitted to the data. Various statistics are defined in Appendix 1.

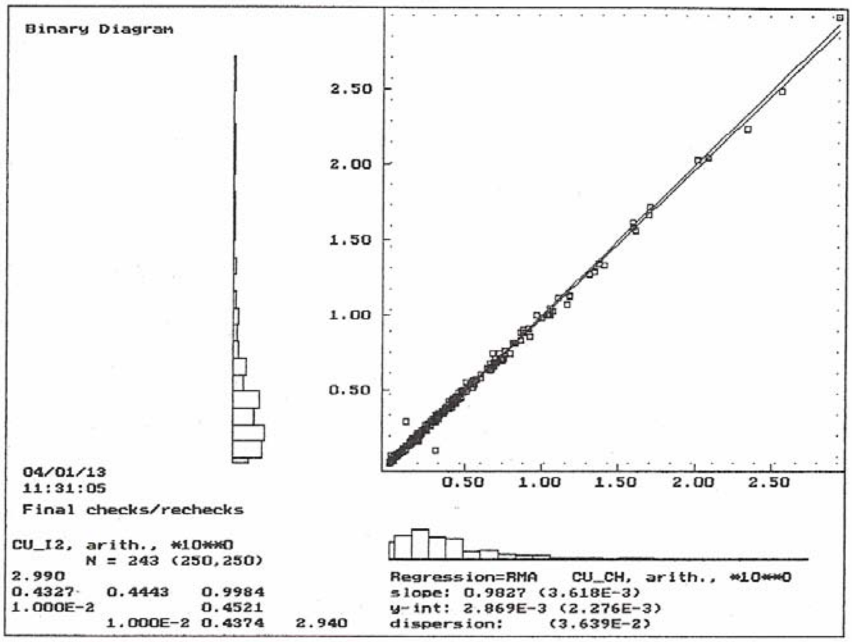


Figure 23: Scatter diagram of Chemex Cu assays (CU_CH) versus corresponding second Cu assay by IPL (CU_I2) on the same pulps in 2003 (Data from file: checks3.eas). Upper line is y = x; lower line is reduced major axis line (RMA) fitted to the data. Various statistics are defined in Appendix 1.

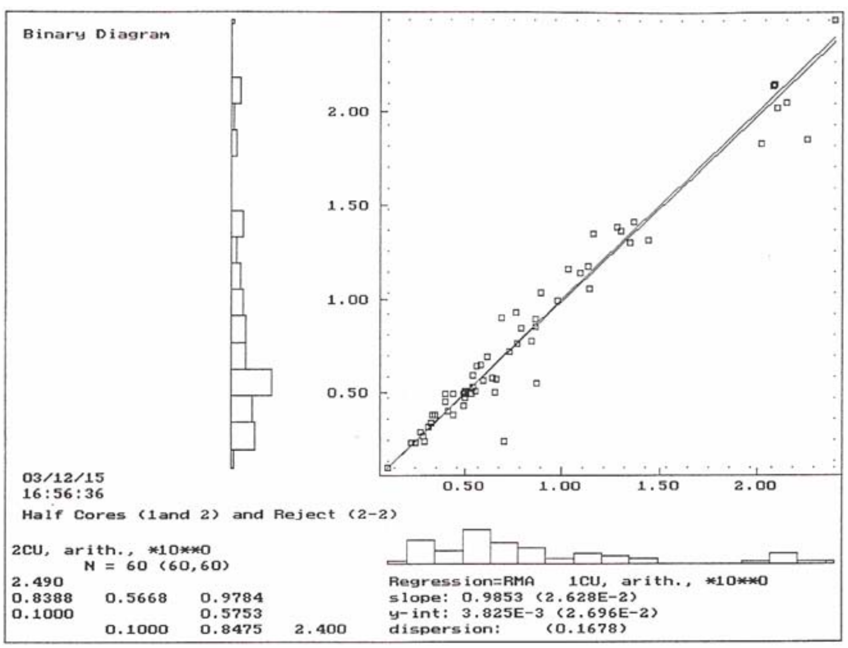


Figure 24: Scatter diagram of first half core Cu analyses by IPL (1CU) versus Cu analyses of facing half cores by IPL (2CU). Upper line is y = x; lower line is reduced major axis model (RMA) fitted to the data. Various statistics are defined in Appendix 1.

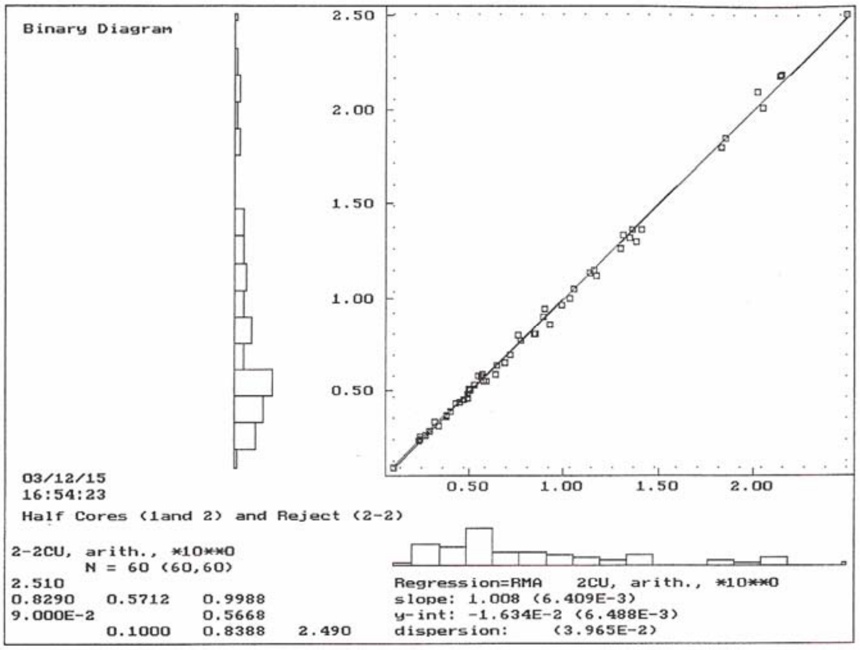


Figure 25: Scatter diagram of second half core Cu analyses by IPL (2CU) versus Cu analyses of reject from second half cores by IPL (2-2CU). The y =x line and the reduced major axis line are essentially coincident. Various statistics are defined in Appendix 1.

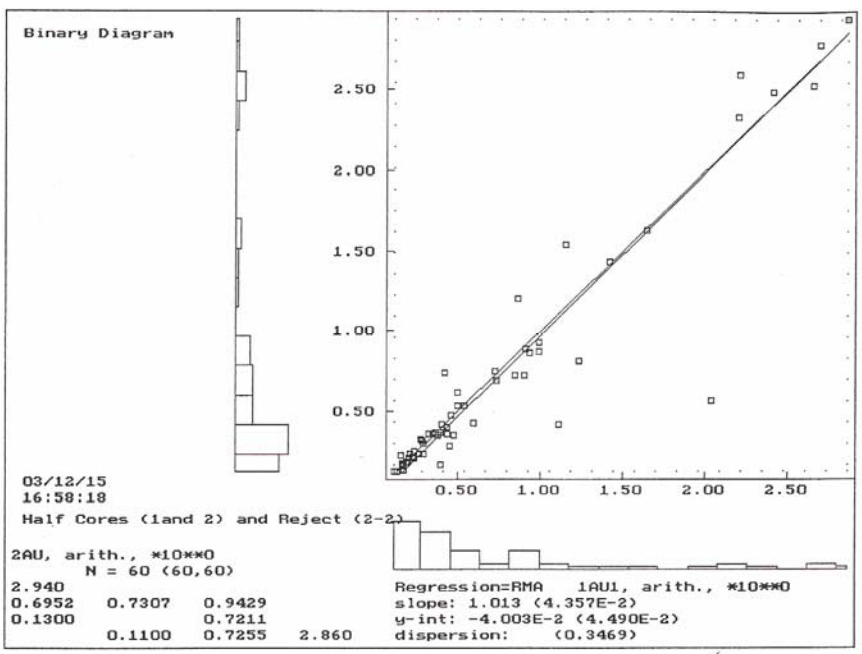


Figure 26: Scatter diagram of first half core Au analyses by IPL (1AU) versus Au analyses of facing half cores by IPL (2AU). Upper line is y = x; lower line is reduced major axis model (RMA) fitted to the data. Various statistics are defined in Appendix 1.

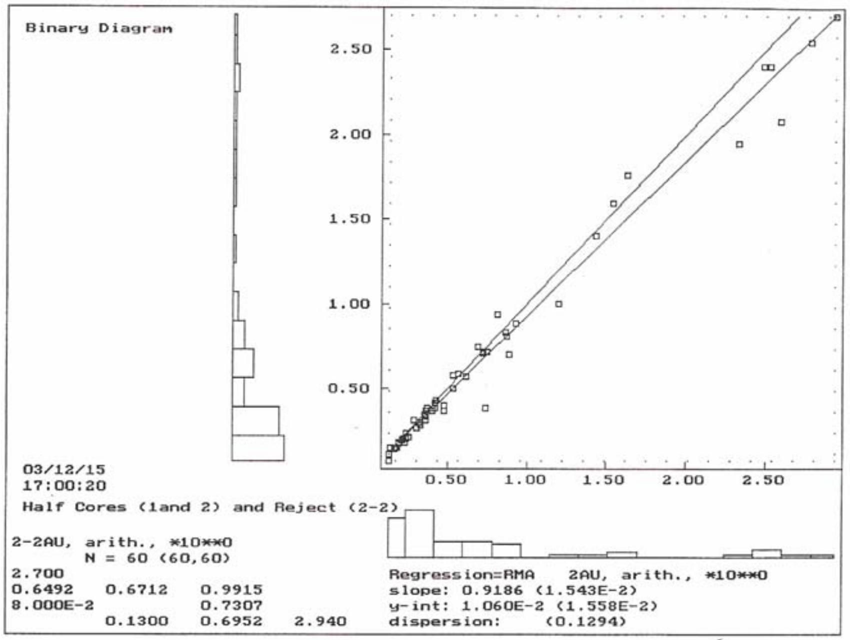


Figure 27: Scatter diagram of second half core Au analyses by IPL (2AU) versus Au analyses of reject from second half cores by IPL (2-2AU). Upper line is y = x; lower line is reduced major axis model (RMA) fitted to the data. Various statistics are defined in Appendix 1.

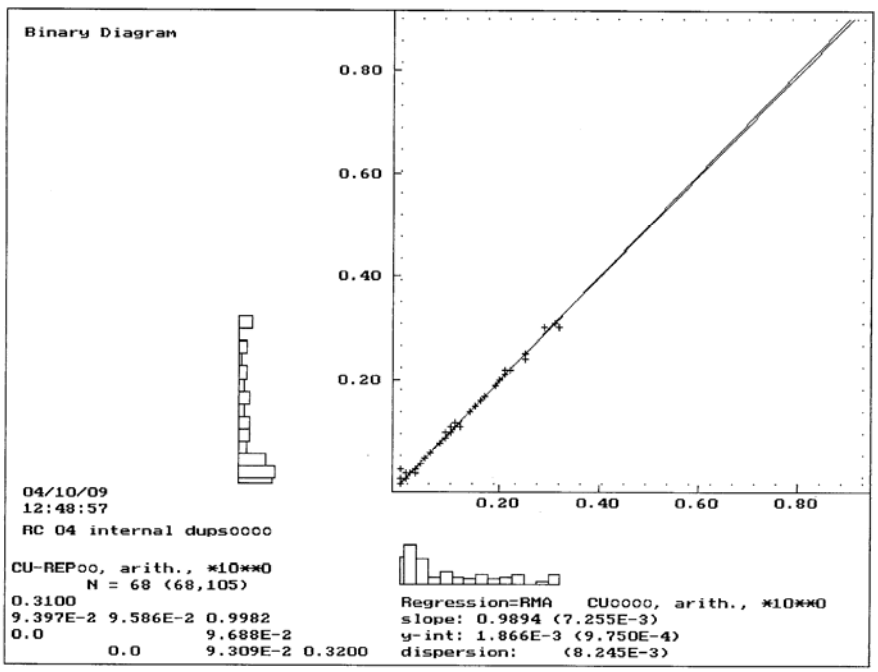


Figure 28: Scatter diagram of Cu assays for internal duplicate pulps by IPL for 2004 values less than 0.32% Cu. The y = x line and the RMA line are statistically equivalent. Various statistics are defined in Appendix 1.

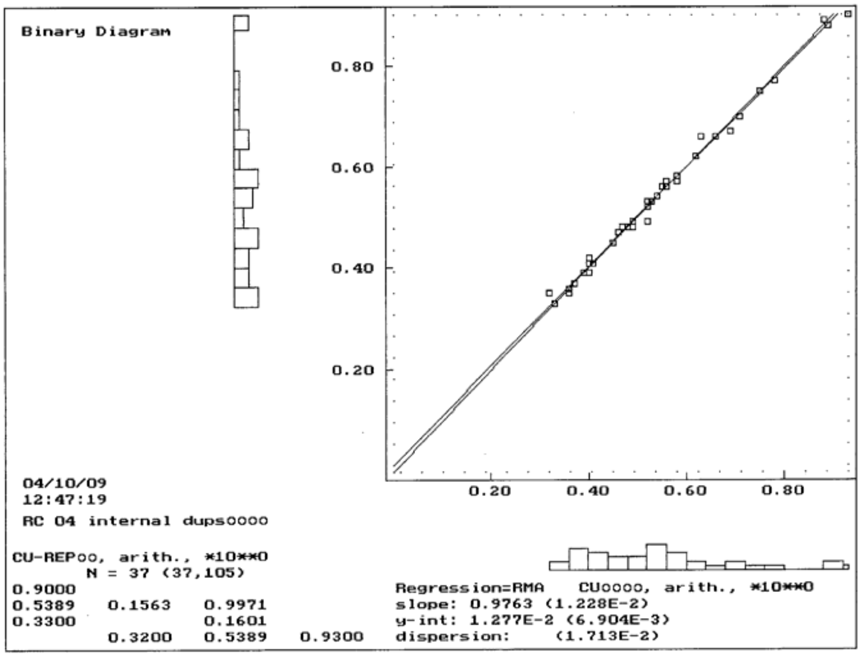


Figure 29: Scatter diagram of Cu assays for internal duplicate pulps by IPL for 2004 values greater than 0.32% cu. The y = x line is statistically equivalent to the RMA line. Various statistics are defined in Appendix 1.

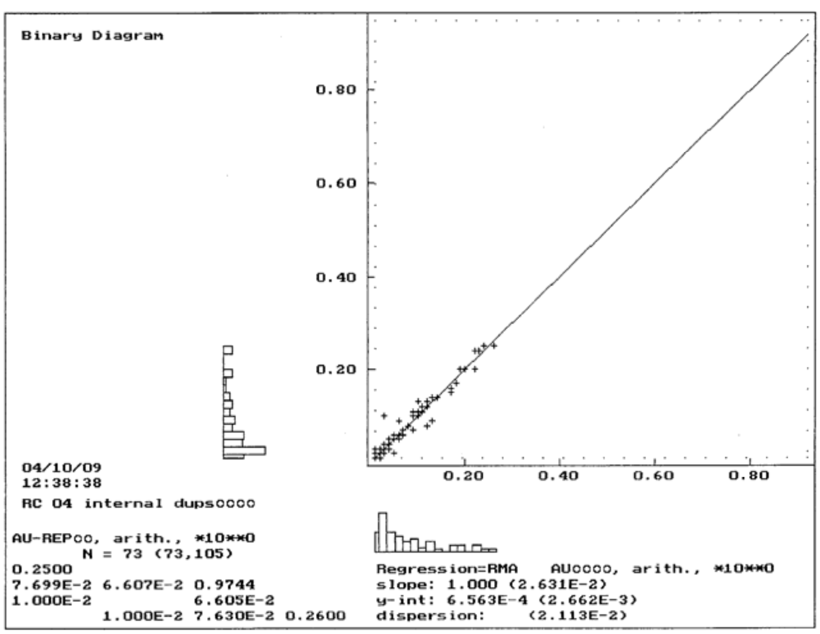


Figure 30: Scatter diagram of Au assays for internal duplicate pulps by IPL for 2004 values less than ca 0.25 g/t Au. The y = x line and the RMA line are statistically equivalent. Various statistics are defined in Appendix 1.

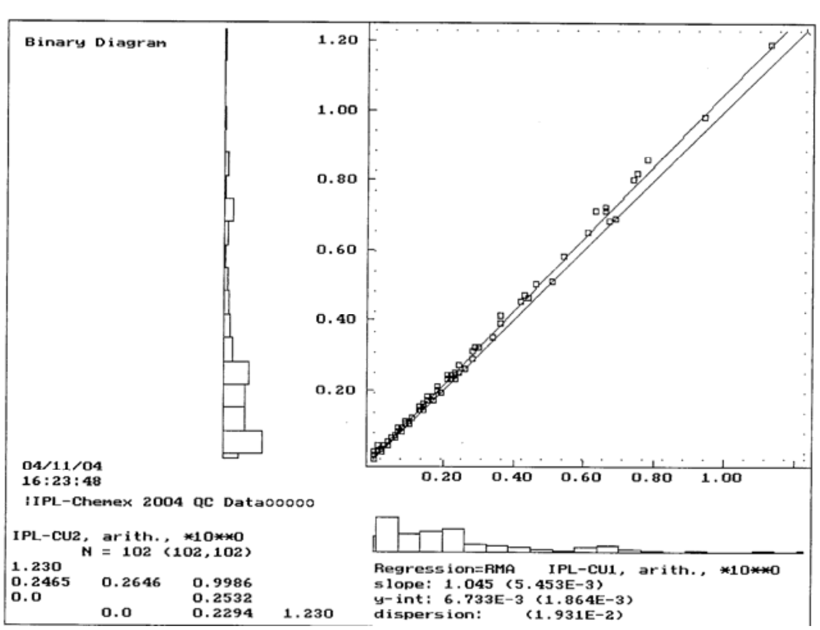


Figure 31: Scatter diagram of Au assays for internal duplicate pulps by IPL for 2004 values greater than ca 0.25 g/t Au. The y = x line and the RMA line are statistically equivalent. Various statistics are defined in Appendix 1.

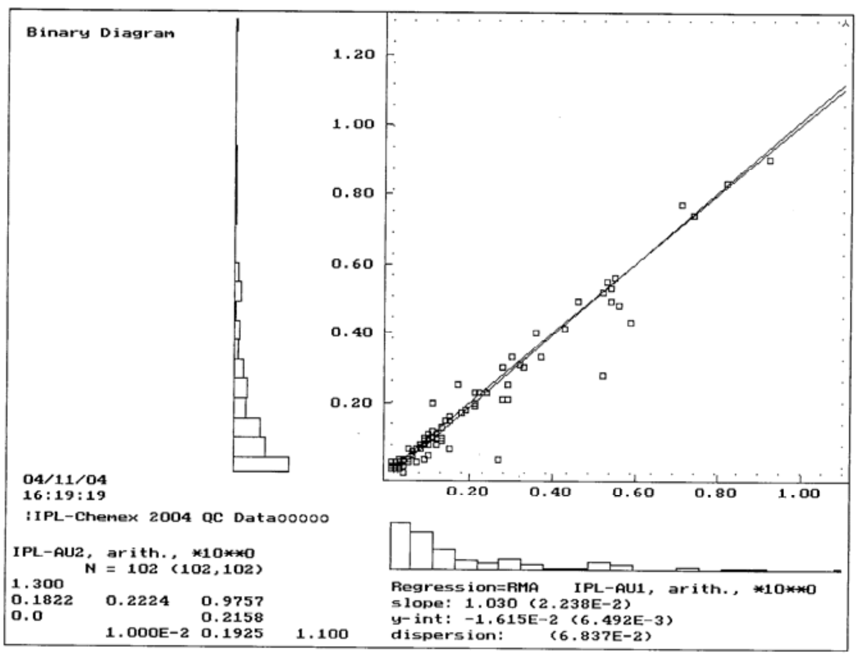


Figure 32: Scatter diagram of IPL initial Cu assays versus Chemex check analyses of pulps for 2004 data. The y = x line and the RMA line are statistically equivalent. Various statistics are defined in Appendix 1.

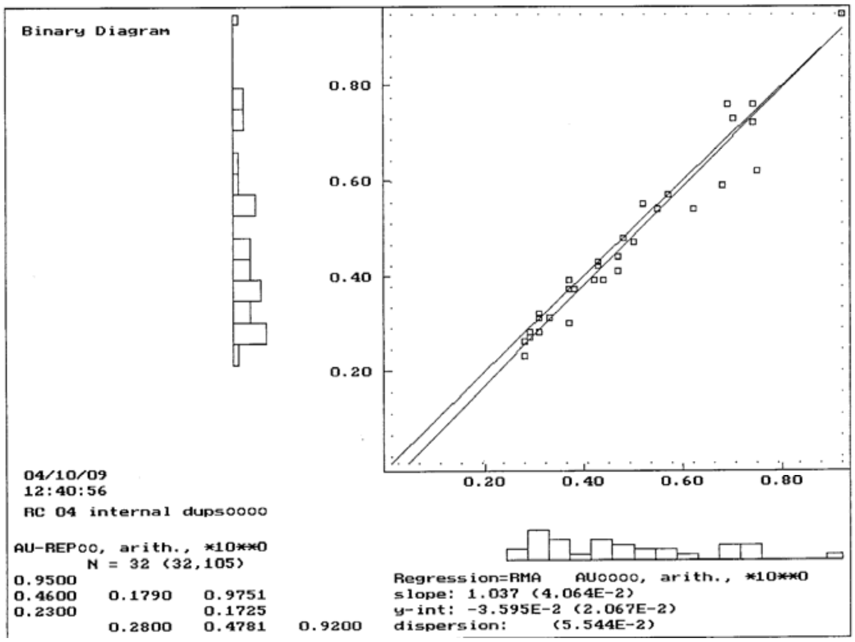


Figure 33: Scatter diagram of IPL initial Au assays versus Chemex check analyses of pulps for 2004 data. The y = x line and the RMA line are statistically equivalent. Various statistics are defined in Appendix 1.

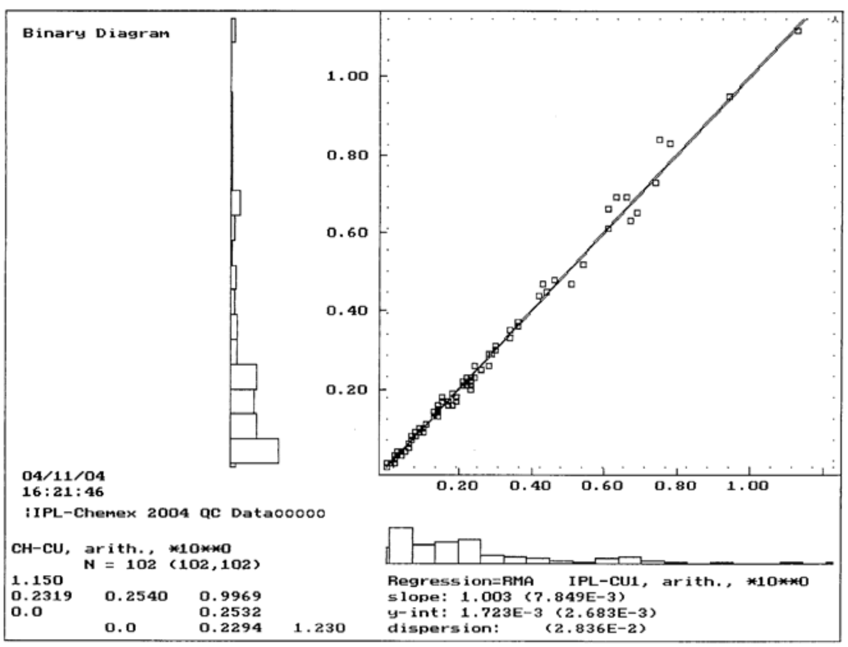


Figure 34: Scatter diagram of IPL initial Cu assays versus IPL 'blind' analyses of same pulps for 2004 Cu analyses. The upper line is the RMA line, the lower is the y = x line; the two lines differ statistically. Various statistics are defined in Appendix 1.

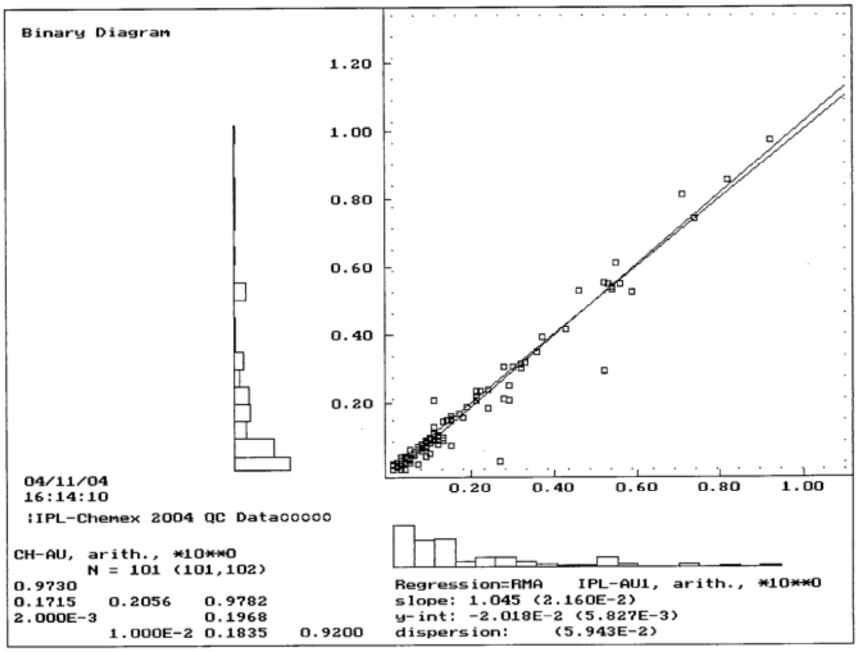
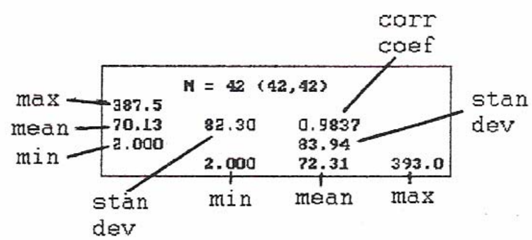
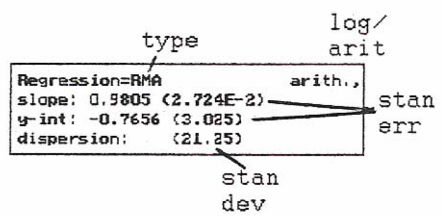


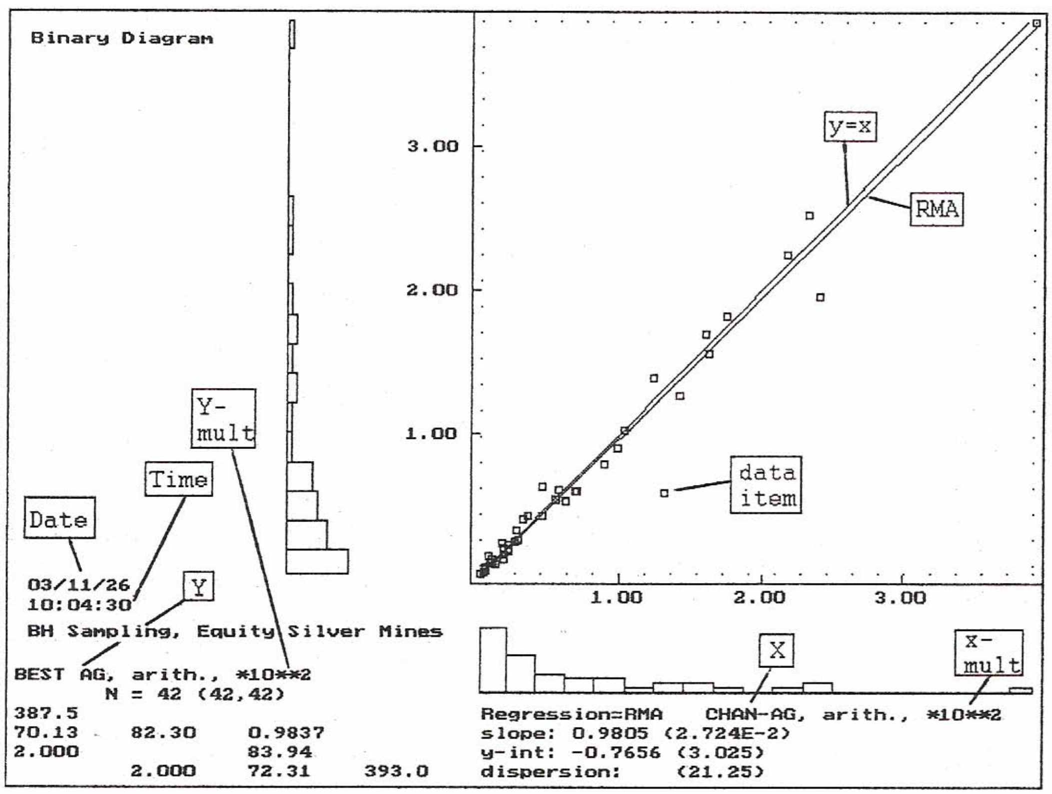
Figure 35: Scatter diagram of IPL initial Au assays versus IPL 'blind' analyses of same pulps for 2004 Au analyses. The y = x line and the RMA line are statistically equivalent. Various statistics are defined in Appendix 1.

APPENDIX 1

LABELLED DIAGRAMS INDICATING THE VARIOUS STATISTICS APPEARING ON DIAGRAMS THROUGHOUT TEXT.







Explanation of Terms

Max	maximum value
Mean	arithmetic mean
Min	minimum value
Stan dev	standard deviation
Corr coef	simple correlation coefficient
Type	Type of regression viz. Classical least squares or reduced major axis
Log/arit	Indicates whether data are arithmetic or log-transformed
Stan err	standard error of estimates of y-intercept and slope
Dispersion	standard deviation of data about the fitted line