1.0 INTRODUCTION

Geostat Services (GS) was commissioned by Harmony Gold Operations Ltd (Harmony) to undertake a geostatistical resource estimate of the Rising Tide deposit in March 2003. This deposit comprises part of the Burnside Project area, located approximately 180km south of Darwin in the Northern Territory, Australia. The aim of this work was to provide a geostatistical gold resource of the Rising Tide orebody, using the latest available drilling assays and the greater understanding of the deposit geology.

2.0 DATA

A total of 269 exploration drillholes were used for the resource estimate, representing 15,035m. Validation of the drillhole database was not performed, as this was considered to be completed by Harmony prior to receiving the data. Drillholes are based on a regular grid of 25m along-strike and 20m across-strike. Larger drillhole spacings along-strike up to 50m are located on the margins of the deposit, with across-strike spacings up to 40m. All holes defining the Rising Tide resource are oriented grid north, with holes dipping at an average of -60°.

A topography surface constructed from drillhole collars, and two surfaces representing the base of weathering, and top of fresh material were supplied by Harmony. Densities applied were 2.1 t/m^3 from the topography surface to the base of weathering, then 2.3 t/m^3 to the transitional zone between the base of weathering and top of fresh material, and 2.7 t/m^3 to blocks within fresh material below this transitional zone.

3.0 WIREFRAMING

Three grade envelopes were delineated for the Rising Tide deposit by Harmony, corresponding to an approximate 0.7g/t Au cutoff. The main lode (RT001) comprises a shallow dipping, continuous zone of mineralisation with an average downhole thickness of 3.8m. The second lode, RT002 consists of several separate solids with varying degrees of continuity, with most of the 4.2m thick lode located in the eastern half of the deposit. RT003 is similar to that of RT002, and comprises a series of solids with varying continuity, with some solids based on singular sections only and lacking in strike continuity, and others continuous over several drillhole lines, all of which average 3.1m in total downhole thickness. Sectional interpretations were made using vertical north-south sections, linked to form solids and validated by Harmony.

4.0 STATISTICS

4.1 Descriptive Statistics – Exploration and Grade Control Data

Sample intervals within the exploration database were examined to determine the dominant sample length. Nearly all sample intervals were 1m in length, and compositing was performed on the dataset to 1m to ensure all composites within solids were of equal length. Statistics were run within the exploration drillhole database for all constrained composite data by lode, and are presented in Table 4.1, for both cut and uncut data. Only uncut statistics for the RT003 lode are presented, as the maximum composite grade within this lode is lower than that of the 10 g/t Au top-cut grade. No other mineralisation indicators were used, as data was extracted from within wireframes.

Parameter	RT001		RT002		RT003
	Cut (10g/t)	Uncut	Cut (6g/t)	Uncut	Uncut
No composites	490	490	154	154	164
Minimum	0.01	0.01	0.09	0.09	0.11
Maximum	10	29.40	6	21.60	8.95
Mean	2.30	2.39	2.43	2.89	2.14
Median	1.51	1.51	1.88	1.88	1.53
Standard deviation	2.17	2.66	1.76	3.15	1.66
Variance	4.73	7.09	3.09	9.94	2.75
Coefficient Variation	0.94	1.11	0.72	1.09	0.78

Table 4.1 Exploration composite statistics within solids (g/t Au)

The coefficient of variation (CV) describes the variability of data relative to the raw average grade, and in general, values above 1.0 will indicate that problems may be caused by extreme values. CV values also provide an indication of the need for top-cutting prior to interpolation. However, the coefficient of variation assumes an underlying normal distribution, thus its application is limited. All lodes at Rising Tide show slightly elevated coefficient of variation values within the uncut dataset, indicating that extreme values could be problematic during interpolation of gold grades.

Exploration composites for all lodes suggest a lognormal distribution, as shown by statistical plots in Figures 4.1 to 4.3. The distribution is distorted below 0.7g/t Au, with composites below this grade representing internal dilution within the lodes. Lognormal probability plots show a slight inflexion at approximately 0.7g/t Au, which corresponds to the Au grade cutoff used for wireframing the lodes.

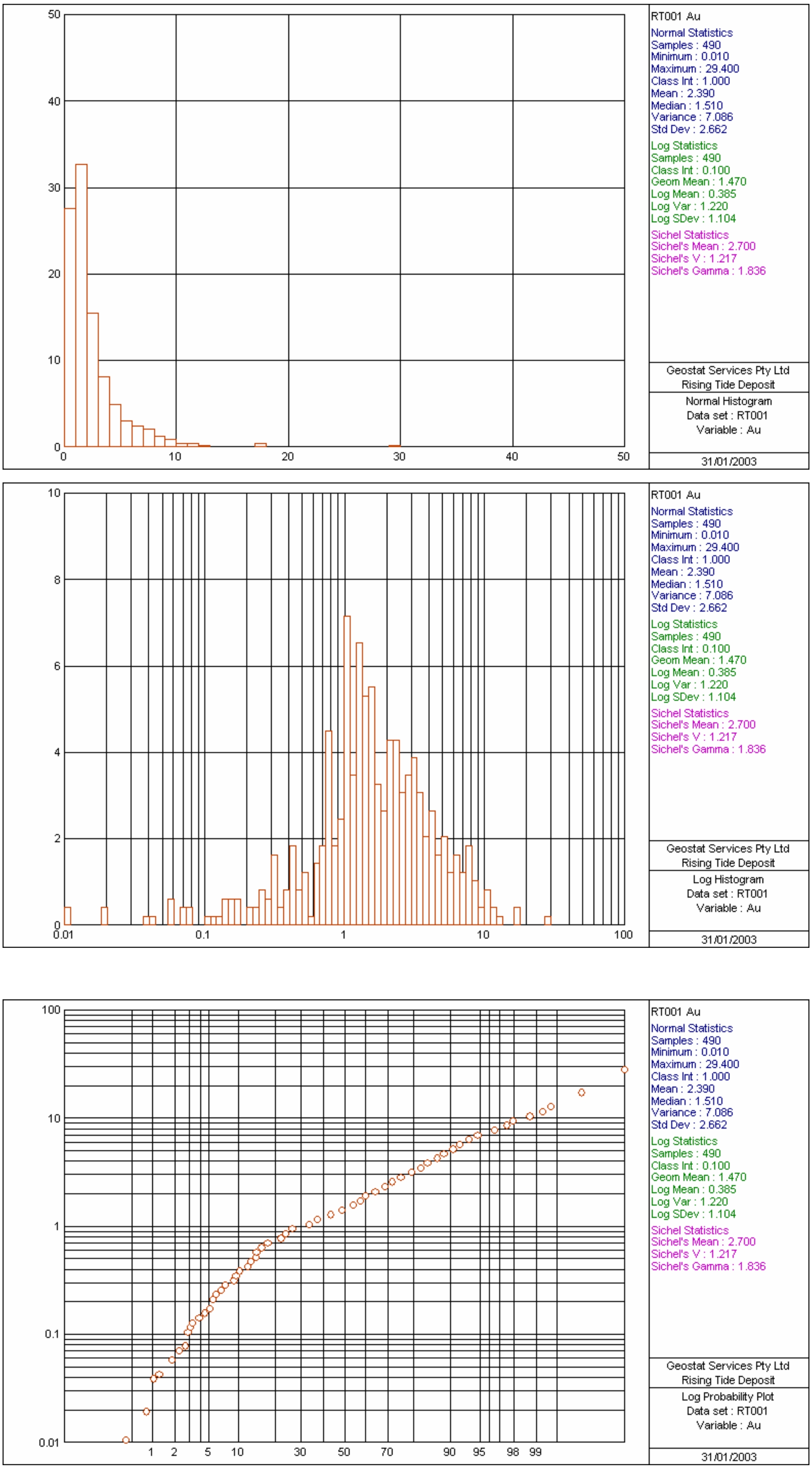
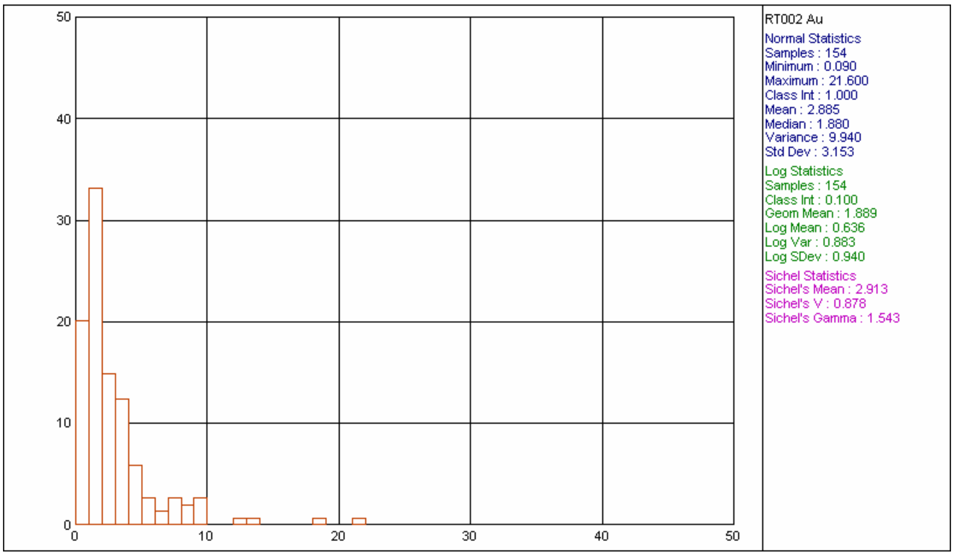
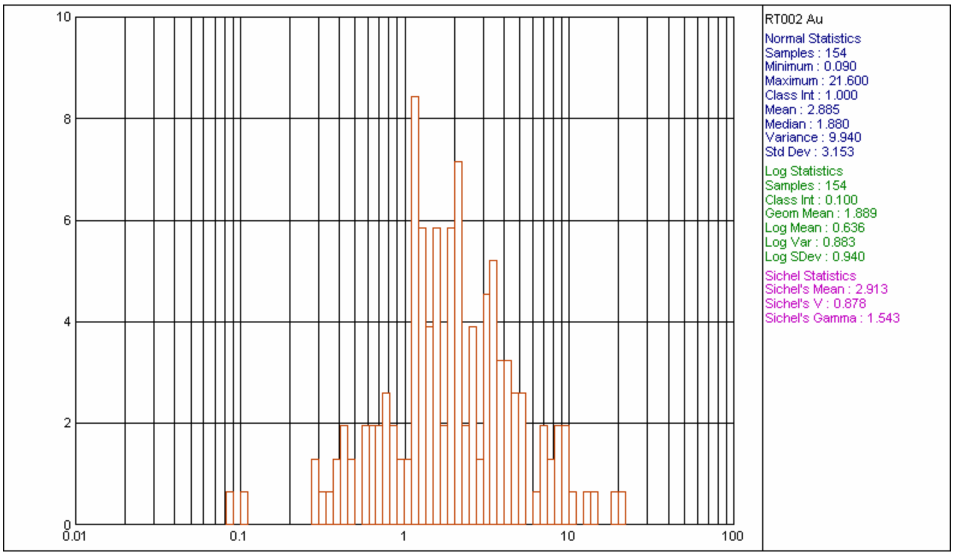


Figure 4.1 Normal and log histograms, and lognormal probability plots – RT001 Lode





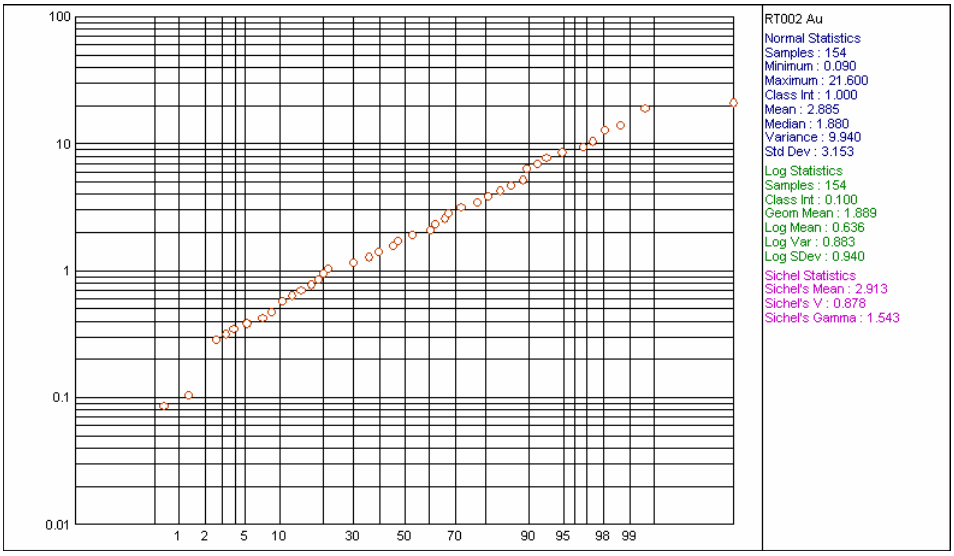
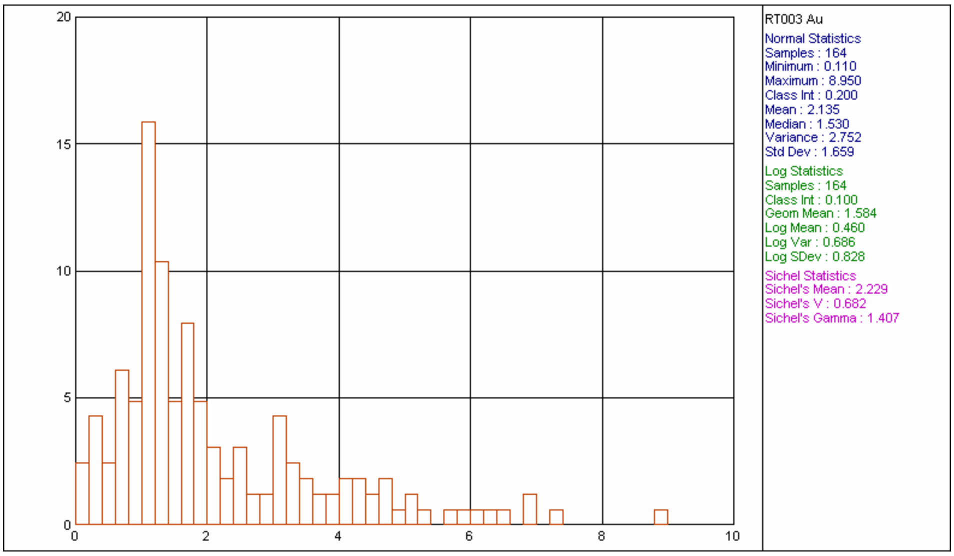
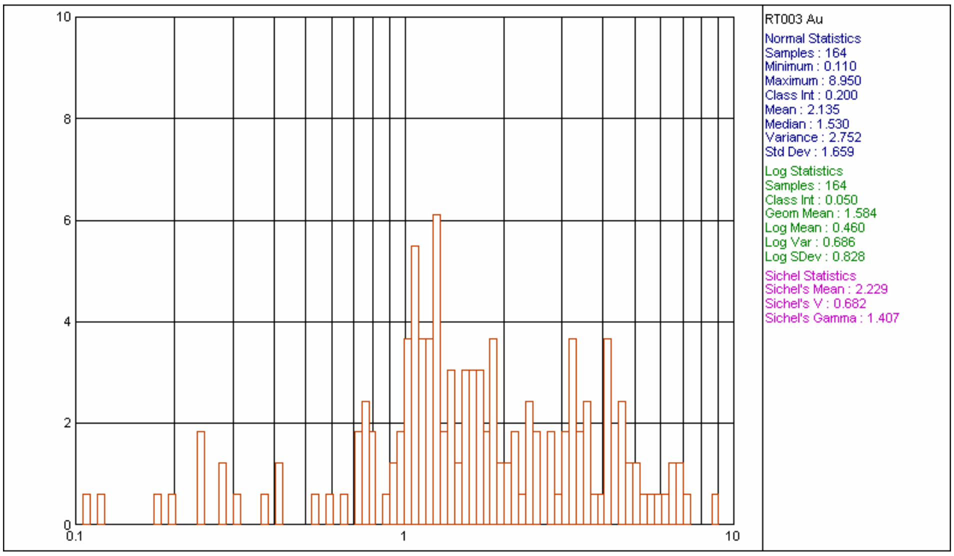


Figure 4.2 Normal and log histograms, and lognormal probability plots – RT002 Lode





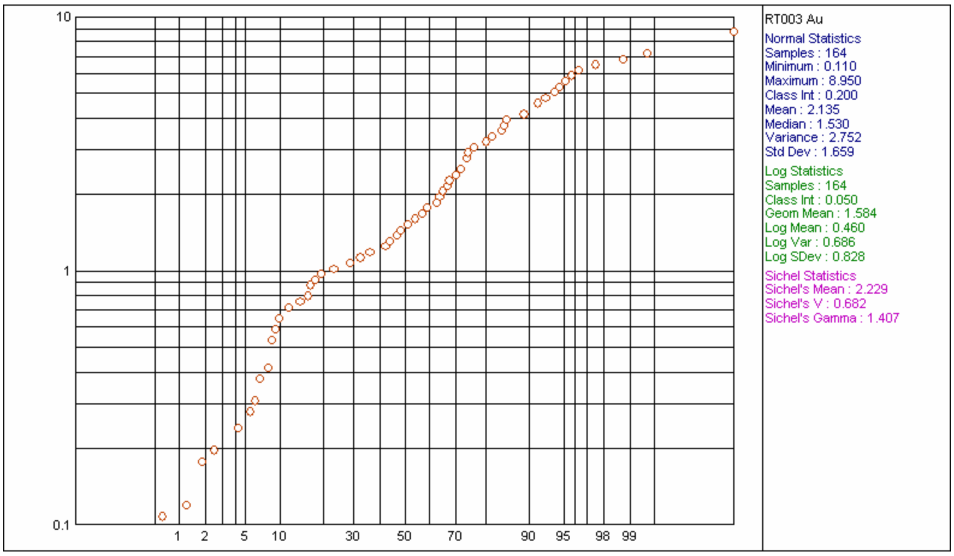


Figure 4.3 Normal and log histograms, and lognormal probability plots – RT003 Lode

4.2 Top-cutting of exploration composite data

Composite data within the exploration database was assessed for the need of a top-cut to be applied to data prior to grade estimation. The determination of a high-grade cut is made on the basis of probability plots, with the general criteria for the top-cuts being a marked change, a kink, or pronounced disintegration at the higher end of the probability distribution.

Since Au composites exhibit several high-grade extreme values, with an elevated coefficient of variation, top-cutting of Au data is necessary to reduce the impact of extreme values on estimation of Au grades. It is recommended that a top-cut of 10g/t Au is used for the RT001 and RT003 lodes. A lower cutoff of 6g/t Au is recommended for the RT002 lode, as this lode comprises large across-lode variability within discontinuous solids. These top-cuts of 10g/t Au and 6g/t Au lower the CV for all lodes below 1.0, thus providing a more representative dataset for accurate interpolation of grades.

5.0 VARIOGRAPHY

Variography analysis using traditional variograms was performed on composite data for the resource model. Exploration composites within all lodes were combined together in order to provide sufficient data for reliable variography analysis. Fan interpretation of variograms in the horizontal plane show a 060° strike, with across-strike plane interpretations showing a dip of -20° towards 150°.

Variograms with two spherical structures were modelled, with results in Table 5.1. The quality of variograms were fair, although low data levels, the thin lode nature and lack of data continuity have prevented more robust variograms. The narrow lode width of the Rising Tide lodes have resulted in poor downhole variography, with the sill reached within two lags, and a weakly defined nugget effect.

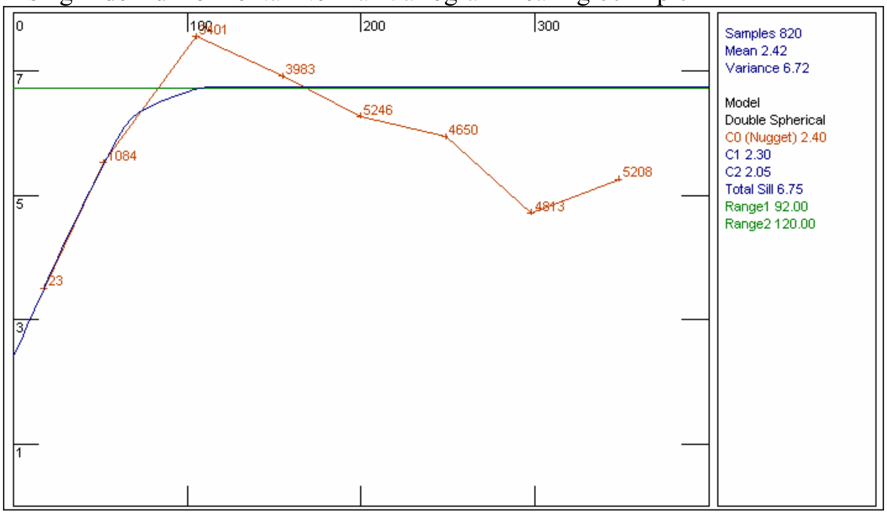
Lode	Nugget Effect	Sill 1	Range 1*	Sill 2	Range 2*
RT001, 002, 003	0.40	0.38	92 x 70 x 2.5	0.22	120 x 95 x 3

*Note: Ranges are expressed in metres as strike x down-dip x downhole

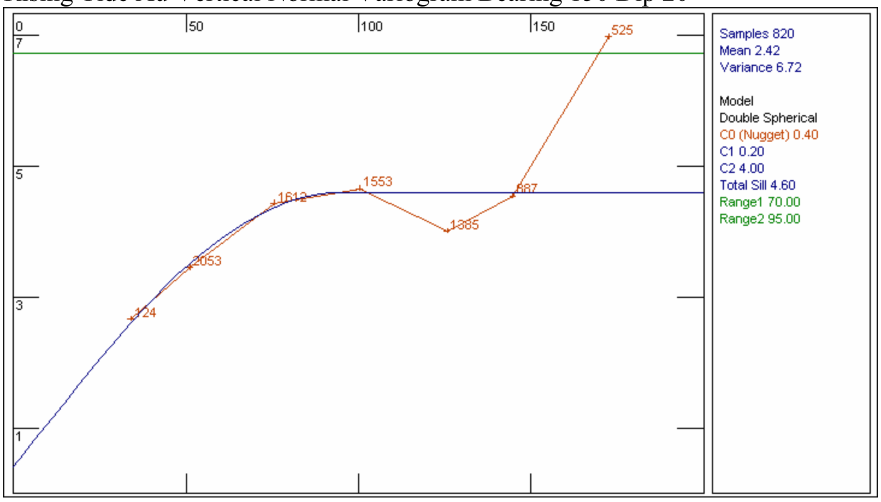
Table 5.1 Model variogram parameters for Rising Tide deposit

Maximum continuity ranges indicate that a high degree of grade continuity is present down-dip (95m) as compared to along-strike (120m). More drillhole data is needed to increase confidence in the variograms obtained, particularly infill drilling in the down-dip and across-lode directions. Variogram model plots are included as Figure 5.1.

Rising Tide Au Horizontal Normal Variogram Bearing 60 Dip 0



Rising Tide Au Vertical Normal Variogram Bearing 150 Dip 20



Rising Tide Au Downhole Normal Variogram Downhole

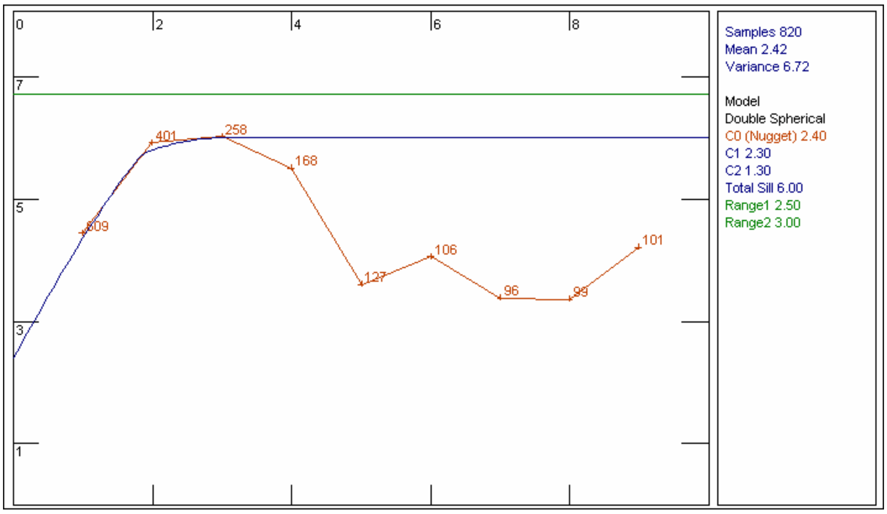


Figure 5.1 Variogram models for all lodes – Rising Tide deposit

6.0 BLOCK MODELLING AND GRADE INTERPOLATION

6.1 Block sizes and modelling parameters

Block size dimensions were considered for the Rising Tide deposit, taking into account drilling density and distribution of assay data within wireframes. A block size of 5m x 5m x 2.5m (E x N x RL) is recommended as being the optimum overall block size for all lodes, given the average along-strike drill spacing of 25m. As all lodes are narrow in width, a block size of 5m in the across-strike dimension was considered to best fit this variable width, despite the across-strike drill spacing of 20m.

Block model origin and extents are defined below in Table 6.1.

Model Limits	Extent of Model	No of Blocks	Block Size
3720-4210N	490m	98	5m
9570-10236E	670m	134	5m
1155-1050mRL	105m	42	2.5m

Table 6.1 Rising Tide Resource Model Extents

A standard block model method was used, which considers a whole block to be ore if a minimum of 50% of the block is interpreted as ore. The solid wireframes were used to constrain the blocks available for grade interpolation. Wireframe volumes were compared to block model volumes to validate the standard block model methodology, with results in Table 6.2. The difference between the two volumes for all lodes is within adequate margins for JORC classification of the resource model.

Lode	Wireframe Volume	No of Model Blocks	Model Volume	% difference
RT001	207,493	3,421	213,812.5	3.0%
RT002	73,834	1,194	74,625	1.1%
RT003	63,323	1,008	63,000	-0.5%
TOTAL	**344,650**	**5,623**	**351,437.5**	**2.0%**

Table 6.2 Validation of block model volumes against wireframe volumes

Ordinary kriging, using parameters derived from the traditional variograms was chosen to interpolate grades into blocks for all lodes. The skewed nature of the data distribution makes this technique ideal, whereas other techniques such as inverse distance interpolation assume a normal distribution, which can lead to errors if the data is not cut appropriately. Inverse distance techniques also do not utilise the information obtained from the variogram in interpolation of blocks, and thus the spatial correlation between composites is not taken into account.

Inverse distance interpolation using a power weighting of 2 was also used to interpolate grades into blocks as a validation of the kriged model, and for comparison of final model grades. An octant search was utilised for inverse distance interpolation, with a maximum of three composites per octant. All other inverse distance model parameters are identical to those used for ordinary kriging.

Each lode was treated as a separate hard boundary, restricting the Au grade interpolation to drillhole data located within each solid. A minimum of 2 composites and a maximum of 6 composites were used to interpolate each block grade for all lodes. A tight constraint on the maximum number of composites for interpolation was necessary to limit the effects of the large across-lode and along-strike variability present in the Rising Tide deposit. An additional constraint of 3 maximum composites was allowed from each drillhole for interpolation of grades for a given block in order to limit any undue influence from particular drillhole intercepts. A discretisation array of 5 (north) by 5 (east) by 2 (RL) was used to refine the kriging weights for each model block.

A search ellipse was used to select the composites to estimate a particular block. Generally, this is less than or equal to the maximum range parameters for the three principal directions modelled in the variography. All lode search ellipses were identical to variography maximum range parameters, with dimensions of 120m (E) x 95m (N) x 10m (RL).

The search ellipse orientations are usually based on strike and dip directions determined from fan contours and variograms during variography analysis of the dataset. However, since the variography is based on combined lode datasets, set directional increments and low data levels, with the resulting interpretations not always reflecting local variations in geometry, some fine-tuning of the search ellipse orientations is often required to best fit the actual geometry of the individual lodes. The lodes were subdivided into three interpolation domains by easting to reflect the changing geometry of the lodes with respect to strike and dip. Table 6.3 below lists the strike and dip orientations employed for each lode and interpolation domain.

Domain	**RT001**		**RT002**		**RT003**	
	Strike	Dip	Strike	Dip	Strike	Dip
9570E – 9610E	060	-37.5/150	055	-25/150	060	-25/150
9610E – 9680E	060	-35/150	055	-25/150	060	-25/150
9680E – 10234E	060	-25/150	090	-15/150	060	-25/150

Table 6.3 Strike and dip orientations for all lodes – Rising Tide deposit

Strike orientations for the RT001 and RT003 lodes were set at 060°. A strike of 055° is present for the RT002 lode, apart from the eastern area which was allocated an east-west strike. This area to the east consists of RT002 solids defined by singular sectional drillhole intercepts, or linked weakly over two to three drill lines. The strike of these discontinuous solids is uncertain, and these solids were thus allocated a 090° strike in line with their geometry. A shallowing of dip from west to east is evident for the RT001 and RT002 lodes, from -37.5° to -25° for RT001, and from -25° to -15° for RT002. As the majority of the RT003 lode is located in the eastern area of the Rising Tide deposit, a consistent strike and dip is present throughout this lode.

6.2 Block model validation

The Rising Tide block model was validated by several methods, including visual validations on-screen, global statistical comparisons of input and block grades, sectional comparisons of polygonal vs model grades, local grade/depth and grade/easting relationships, and Q-Q plots. The model was validated visually by viewing vertical sections and plans of the block model, with spatial comparison of kriged block grades against input composite grades to ensure grade trends were represented correctly.

6.2.1 Global statistical validations

Input average composite grades were statistically compared with mean block grades by lode and weighted by volume, with summary results tabulated in Table 6.4 below. Average weighted model grades from both ordinary kriging and inverse distance interpolation methods are very similar for all lodes, with little separating the two grades. For the RT002 lode, both interpolation methods give slightly underestimated model grades compared with the global composite grade. This is a function of the small, discontinuous nature of the solids comprising the lode, low data levels on singular sections, and large across-lode variability where both models fail to support the local high grades present in the composites.

Lode	Number of Composites	Number of Blocks	Method	Block mean grade	Composite mean grade	% difference
RT001	490	3421	OK	2.27	2.22	2.1%
			ID	2.27	2.22	2.1%
RT002	154	1194	OK	2.09	2.14	-2.0%
			ID	2.11	2.14	-1.0%
RT003	164	1008	OK	2.15	2.14	0.4%
			ID	2.16	2.14	0.7%

Table 6.4 Statistical validation of Au interpolated grades – Rising Tide deposit

6.2.2 Sectional polygonal vs model grade comparisons

Comparisons were performed between kriged model and polygonal grades on a sectional basis for all lodes to assess the validity of the modelling process, and to identify any potential areas for improvement. Wireframes were subdivided into sectional subwireframes corresponding to defined drill sections to produce sectional polygonal volumes. Sectional polygonal grades were produced by averaging composite grades within each subwireframe. Model block grades were extracted within the extents of each drill section, and averaged to produce the mean model grade per section. Tables 6.5 to 6.7 outline the polygonal vs model comparisons, with comments explaining the largest differences between the two sectional reported grades.

The across-lode and along-strike grade variability present at Rising Tide is responsible for large differences between polygonal and model grades on some sections. One example is the high grade anomaly present on section 9930E for the RT001 lode. This cluster of high grade composites has caused elevated model grades on adjacent sections, as blocks on these sections captured the high grade composites within their search ellipses and used them for grade interpolation. Small areas of internal dilution on other sections are also responsible for producing lower model grades than of the sectional polygonal grades, an example of which is illustrated below in Figure 6.1.

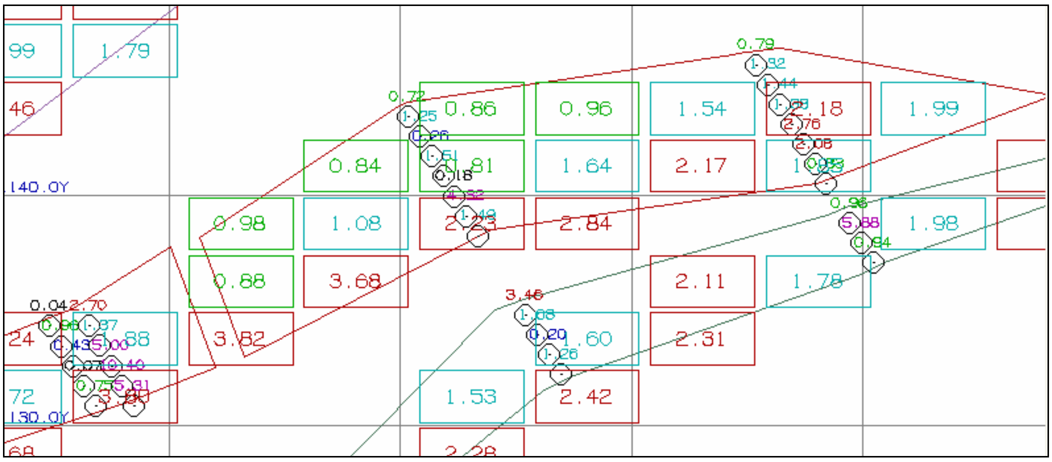


Figure 6.1 Section 10030E showing internal dilution within RT001 lode

The middle drillhole intercept in the above figure shows waste composite grades of 0.26g/t Au and 0.18g/t Au amongst ore composite grades ranging from 0.73g/t Au to 4.32g/t Au, which has lowered model grades to around 0.9g/t Au in the immediate vicinity. This large across-lode and along-strike variability is common at Rising Tide, and the present drillhole dataset needs to be consolidated with infill drilling to boost composite data levels, verify local high-grade areas and provide a more robust dataset for grade interpolation.

The absence of drilling data to the south on some sections has also caused problems in comparing sectional polygonal grades with model grades. Sections where drilling data were absent for the RT002 and/or RT003 lodes include 9680E, 9755E, 9955E and 10180E, and polygonal grades for these sections were derived by weighting the polygonal grades on adjacent sections by their respective volumes.

The comparisons of sectional polygonal and model grades has highlighted the low composite data levels present at Rising Tide, and the need for infill drilling to 12.5m along strike. This infill drilling would generate more robust wireframes, due to increased definition of the orebody, and help control the effect of the across-lode and along-strike variability present at Rising Tide.

Section	No of Intersects	No of Composites	Polygonal Volume	Model Volume	Polygonal Grade	OK Model Grade	Grade % difference	Comments
9580E	3	8	3866	4875	2.12	2.24	5.7%	Edge effects elevate grades
9605E	5	19	9132	11063	2.49	2.34	-5.8%	
9630E	4	18	9298	10188	2.30	2.28	-1.2%	
9655E	6	20	8767	9688	1.62	2.28	41.2%	Grabs HG comps from 9630E
9680E	3	8	6667	7000	2.43	2.23	-8.3%	8 comps only, located at top of lode, information effect here
9705E	4	9	4667	4125	1.70	1.80	6.1%	
9730E	2	4	2740	2938	1.62	1.85	13.9%	4 comps only, forced to take comps from adjacent sections
9755E	4	10	4376	4875	2.08	2.11	1.0%	
9780E	2	2	4809	4813	1.28	2.09	63.6%	Solid forks into two, one fork is uninformed, thus comps taken from other sections
9805E	5	17	4764	4000	2.20	2.19	-0.3%	
9830E	5	10	4992	5125	2.95	2.94	-0.1%	
9855E	5	26	7610	7750	3.04	3.16	4.1%	Very high across-lode variability on this section
9880E	4	12	5151	4625	2.41	2.66	10.1%	2 forks, limited no of comps, large across-lode variability
9905E	5	16	6188	6875	2.44	3.18	30.0%	Grabs HG comps from 9930E, thus elevating grades
9930E	6	22	8829	8625	4.75	4.53	-4.6%	HG anomaly on this section, dragged down by lower grades on adjacent sections
9955E	2	5	3904	3375	1.24	2.72	119.2%	Low no of comps, grabs HG comps from 9930E
9980E	2	10	2821	2750	2.66	2.54	-4.5%	
10005E	3	12	2585	2938	2.17	2.02	-7.1%	2 small lodes, high across-lode variability
10030E	6	33	8412	9438	2.37	2.65	11.9%	High across-lode variability
10055E	4	13	7655	8500	1.69	2.05	21.2%	Geometry of solid flattens, takes higher grade comps from adjacent sections
10080E	8	38	16580	18500	1.89	1.81	-4.1%	
10105E	11	58	25088	25438	1.91	1.88	-1.9%	
10130E	7	31	14279	13625	1.77	1.72	-2.5%	
10155E	8	34	10946	11188	2.36	1.95	-17.2%	HG comps on section not supported by adjacent sections, high across-lode variability
10180E	7	24	10435	10125	1.77	1.69	-5.0%	
10205E	6	18	8440	8125	2.71	2.46	-9.1%	HG comps on section not supported by adjacent sections, high across-lode variability
10230E	6	16	4494	3250	3.08	3.18	3.1%	

Table 6.5 Sectional validation of Au interpolated grades – Rising Tide 001 lode

Section	No of Intersects	No of Composites	Polygonal Volume	Model Volume	Polygonal Grade	OK Model Grade	Grade % difference	Comments
9655E	2	2	990	1063	3.11	2.20	-29.2%	2 comps only, 1.63g/t and 4.58g/t Au
9680E	1	0	1256	1625	2.18	1.76	-19.5%	No composites on this section, forced to take from other sections
9705E	2	4	1583	1813	1.68	2.16	28.3%	4 comps only, takes HG comps from 9730E
9730E	1	2	889	1000	2.85	2.80	-1.5%	2 comps only, takes lower grade comps from 9705E
9755E	2	0	1234	1625	2.89	2.75	-4.9%	No composites on this section, forced to take from other sections
9780E	2	5	1341	1438	2.91	2.92	0.3%	End of western lode, edge effect preent
9980E	2	11	4526	5313	2.80	2.75	-2.0%	High across-lode variability, edge effect present
10005E	3	15	4962	5125	1.86	1.96	5.3%	Takes HG comps from 10030E, small lode and small no of blocks
10030E	3	16	3665	3313	2.76	2.61	-5.3%	Internal dilution present, large across-lode variability
10055E	6	23	6492	6563	3.03	2.88	-4.9%	2 forks, 1 fork HG comps not supported along strike
10080E	4	17	3434	3000	3.62	3.57	-1.5%	
10105E	2	8	3382	3188	2.76	2.56	-7.3%	
10130E	7	24	9378	9438	1.35	1.37	1.6%	
10155E	4	18	13405	13750	1.72	1.64	-4.6%	Internal dilution present, takes lower grade comps from 10130E
10180E	0	0	10548	10125	1.83	1.88	2.7%	No composites on this section, forced to take from other sections
10205E	4	10	6750	6250	2.06	2.06	-0.2%	End of eastern lode, edge effect present

Table 6.6 Sectional validation of Au interpolated grades – Rising Tide 002 lode

Section	No of Intersects	No of Composites	Polygonal Volume	Model Volume	Polygonal Grade	OK Model Grade	Grade % difference	Comments
9805E	3	7	1453	1438	2.08	2.03	-2.2%	
9830E	2	4	1891	1688	2.12	2.71	27.8%	4 comps only, takes HG comps from 9855E
9855E	1	2	726	438	4.37	2.95	-32.5%	2 comps only, takes lower grades from adjacent sections
9880E	1	2	933	625	2.09	1.74	-16.8%	2 comps only, very low model volume
9905E	6	14	4220	3563	1.55	1.72	11.2%	Wide spaced comps, few model blocks
9930E	4	11	3559	3000	1.80	1.65	-8.7%	High across-lode variability
9955E	2	0	2487	2875	0.00	2.05		
9980E	3	10	3914	4625	2.69	3.15	16.7%	Takes HG comps from 10005E
10005E	2	8	3733	4438	3.11	2.88	-7.5%	HG comps on section, takes lower grades from adjacent sections
10030E	6	18	5447	5688	1.91	2.29	19.6%	Takes HG comps from 10005E
10055E	3	8	2497	2188	3.30	2.35	-28.8%	8 comps only, high across-lode variability, edge effect
10105E	2	7	2242	2688	2.06	2.13	3.3%	
10130E	4	12	4279	4438	1.89	1.99	5.2%	
10155E	3	11	2910	3250	2.60	2.01	-23.0%	2 forks, small no of model blocks, HG unsupported along strike
10180E	6	20	8958	9188	1.77	1.94	9.3%	Takes HG comps from 10155E, large across-lode variability
10205E	9	24	13201	12313	2.07	2.00	-3.5%	
10230E	2	6	874	563	1.71	1.79	4.6%	Very low model volume

Table 6.7 Sectional validation of Au interpolated grades – Rising Tide 003 lode

6.2.3 Grade/Depth and Grade/Easting validations

Figures 6.2 to 6.4 illustrate the grade/depth relationship averaged within 2.5m RL increments for both input data and model grade data, together with the number of composites for all lodes within the Rising Tide deposit. Figures 6.5 to 6.7 illustrate the grade/easting relationship averaged within 25m easting increments for input composite data and 10m easting increments for model grade data, together with the number of composites for the RT001, RT002 and RT003 lodes respectively.

A smoothing of grades for the RT001 lode with respect to depth is present, with model grades averaging out the high variability of sample input grades (Figure 6.2). The slight overestimation of composite grades by the block model from 1090mRL to 1075mRL is coincident with very low numbers of composites over this interval, and a change in local geometry of the lode. Comparison of model grades with composite grades with respect to easting (Figure 6.5) illustrates a very close reconciliation, with model grades reproducing the fluctuations in composite grades.

The grade/depth relationship for RT002 shows a very similar trend to that for RT001, with model grades showing a smoothing of composite grades (Figure 6.3). Composite grades are highly variable from bench to bench, particularly between 1143-1120mRL, reflecting the large variation in grade across the lode. This zone is coincident with one of the largest proportions of blocks within the lode; hence the smoothing of the variable composite grades by the block model has resulted in the underestimation of the global composite grade by the block model in Table 6.3. The grade/easting relationship plot (Figure 6.6) illustrates a reasonable validation of composite grades by the block models, with only a slight underestimation of composite grades occurring in the east.

The high variability of composite grades in the RT002 lode is also present in the RT003 lode (Figure 6.4), with model grades attempting to reproduce the composite grade fluctuations. An information/edge effect is present both at the surface and at the bottom of the model, with elevated model grades caused by the presence of high-grade composites amongst the few composites present in these areas. The grade/easting relationship plot illustrates a reasonable reconciliation of model grades with composite grades, with a slight smoothing of local composite grade fluctuations by the resource model (Figure 6.7).

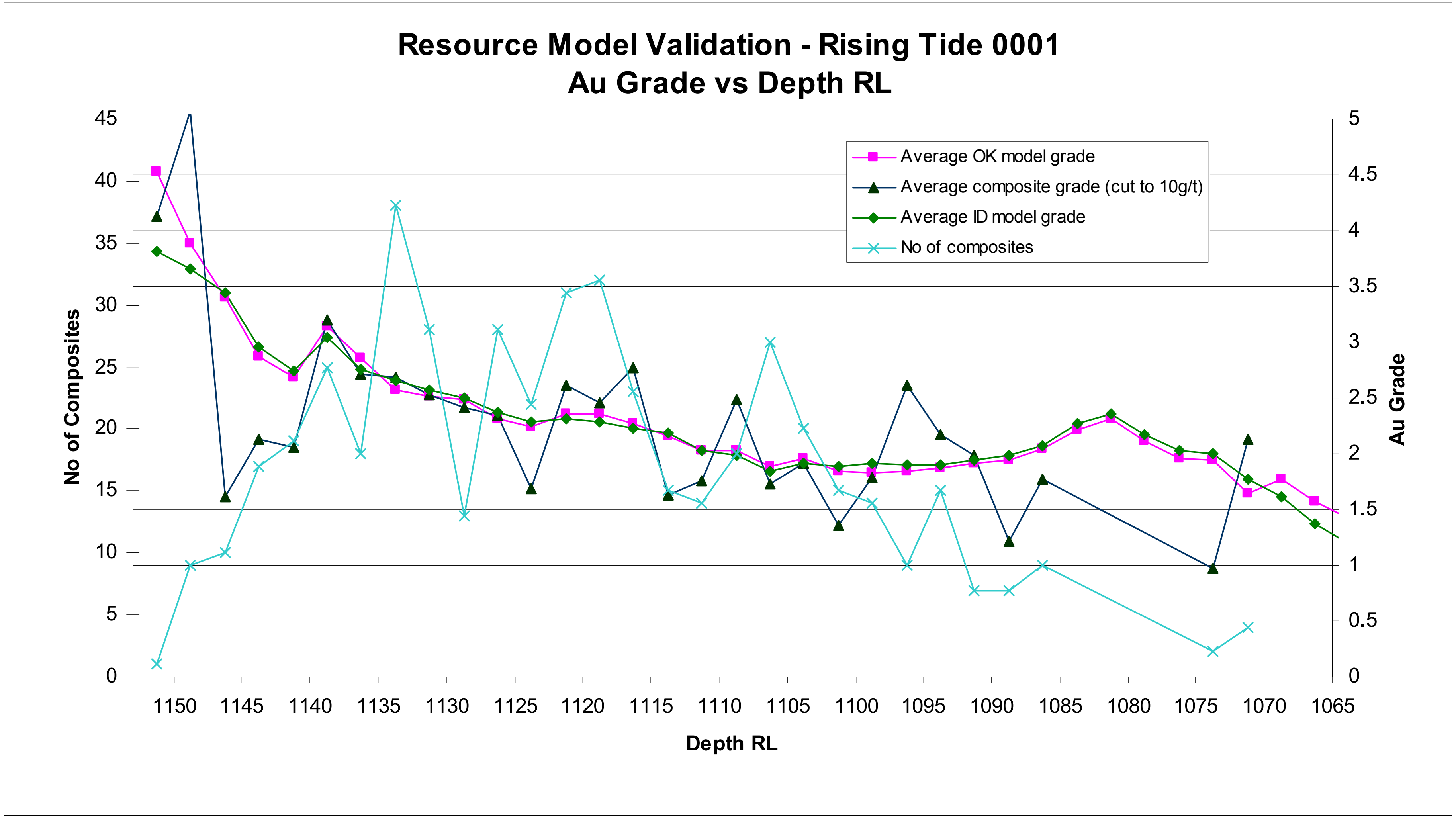


Figure 6.2 Au Grade vs Depth validation plot – RT001 lode, Rising Tide deposit

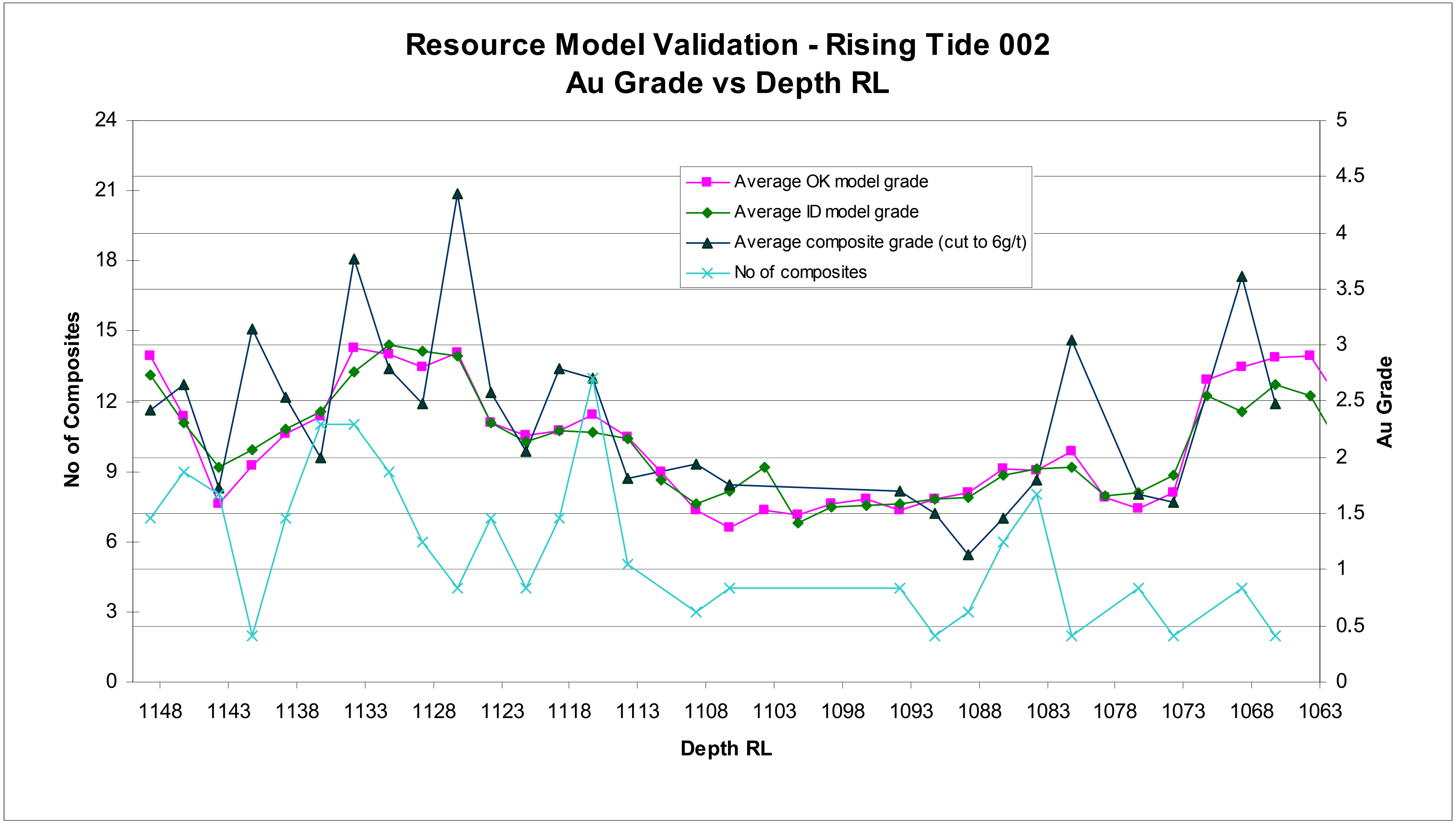


Figure 6.3 Au Grade vs Depth validation plot – RT002 lode, Rising Tide deposit

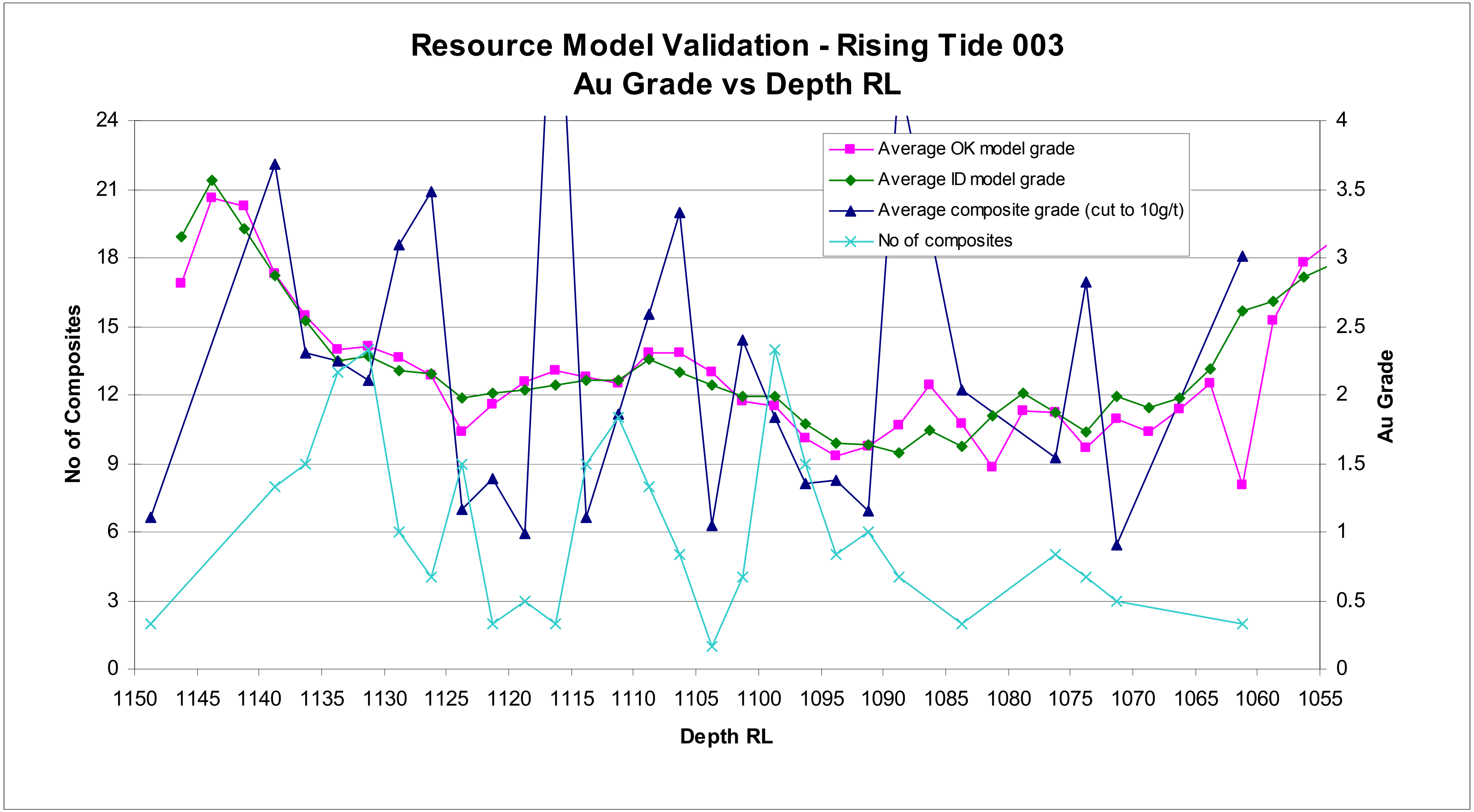


Figure 6.4 Au Grade vs Depth validation plot – RT003 lode, Rising Tide deposit

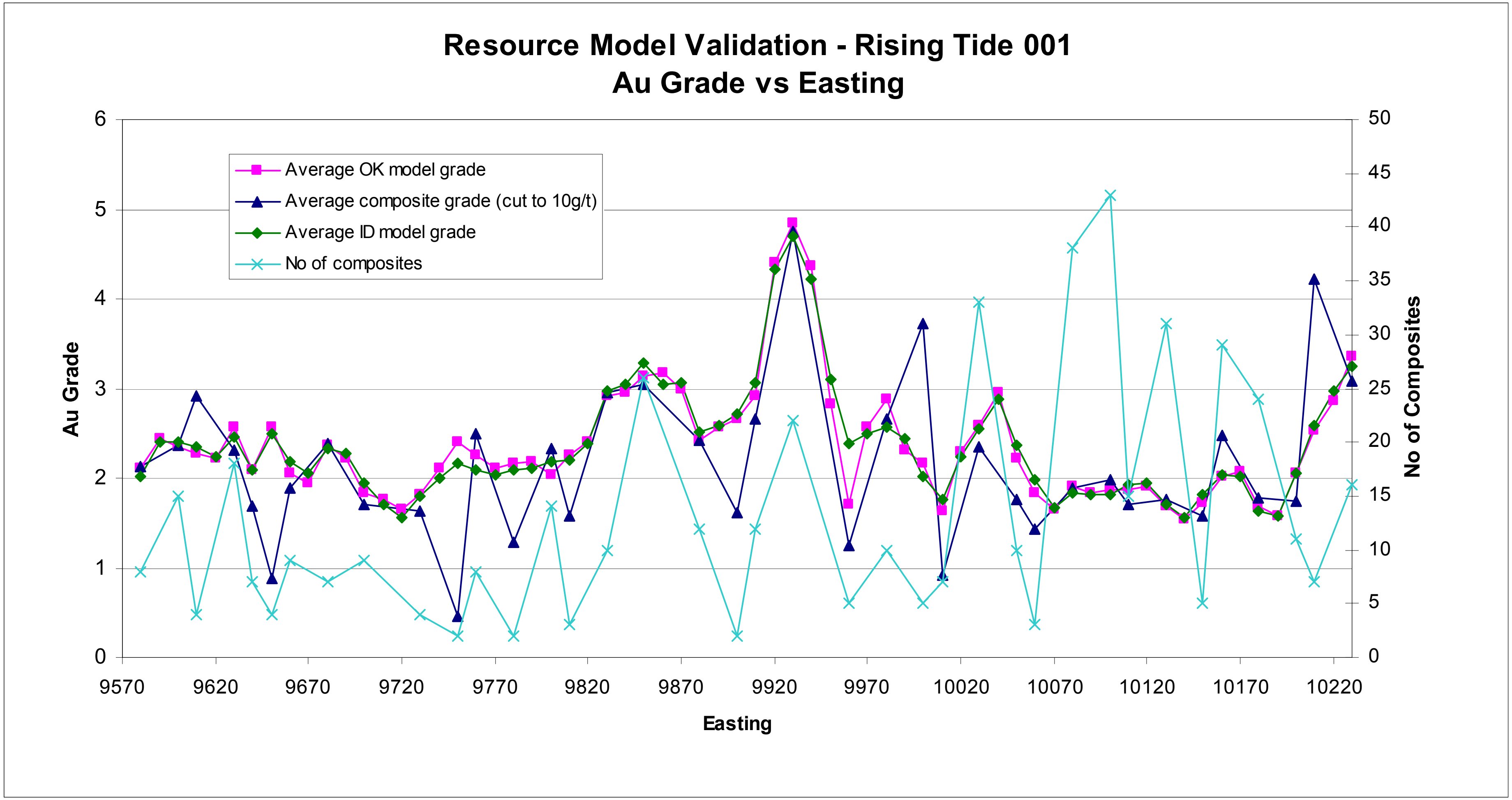


Figure 6.5 Au Grade vs Easting validation plot – RT001 lode, Rising Tide deposit

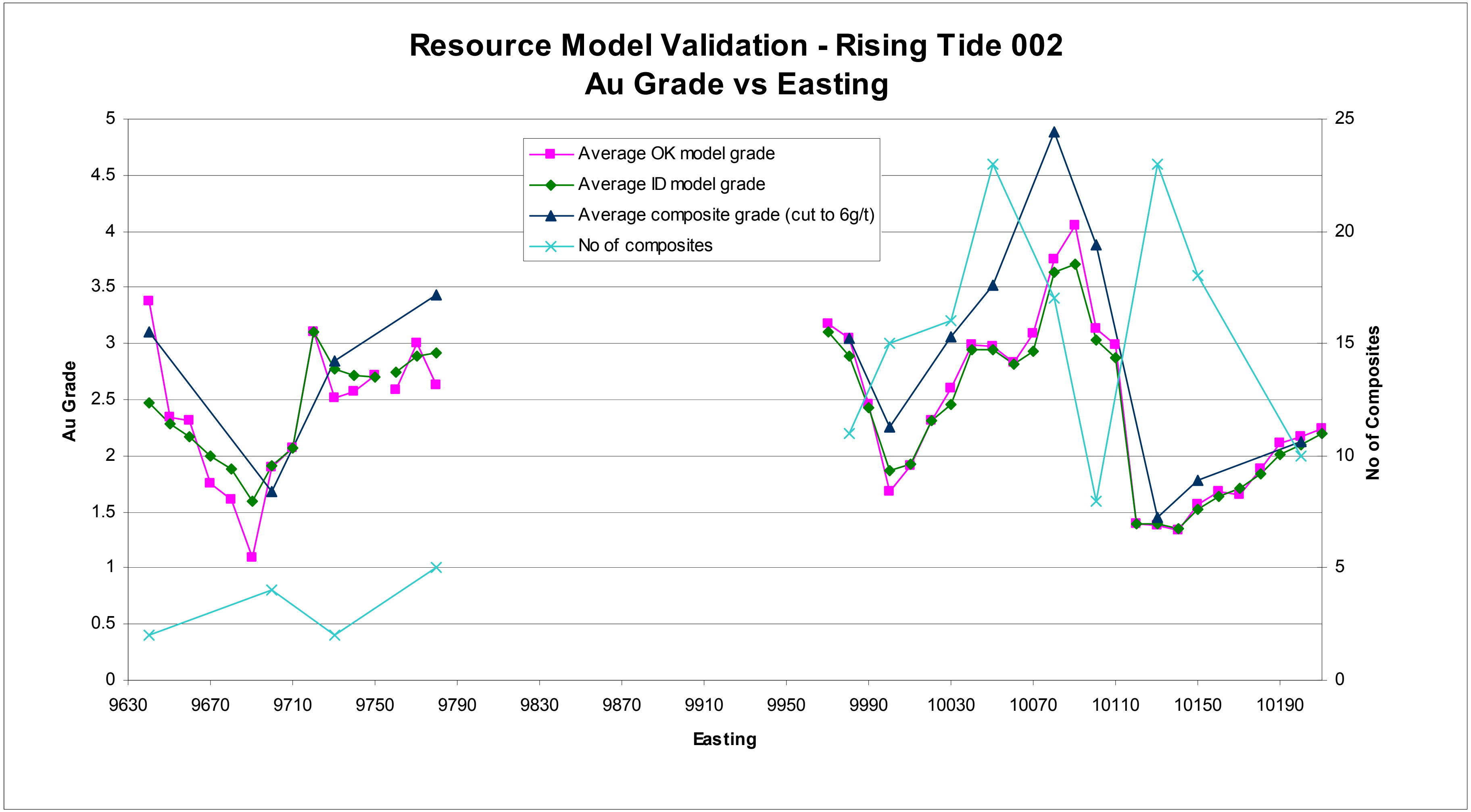


Figure 6.6 Au Grade vs Easting validation plot – RT002 lode, Rising Tide deposit

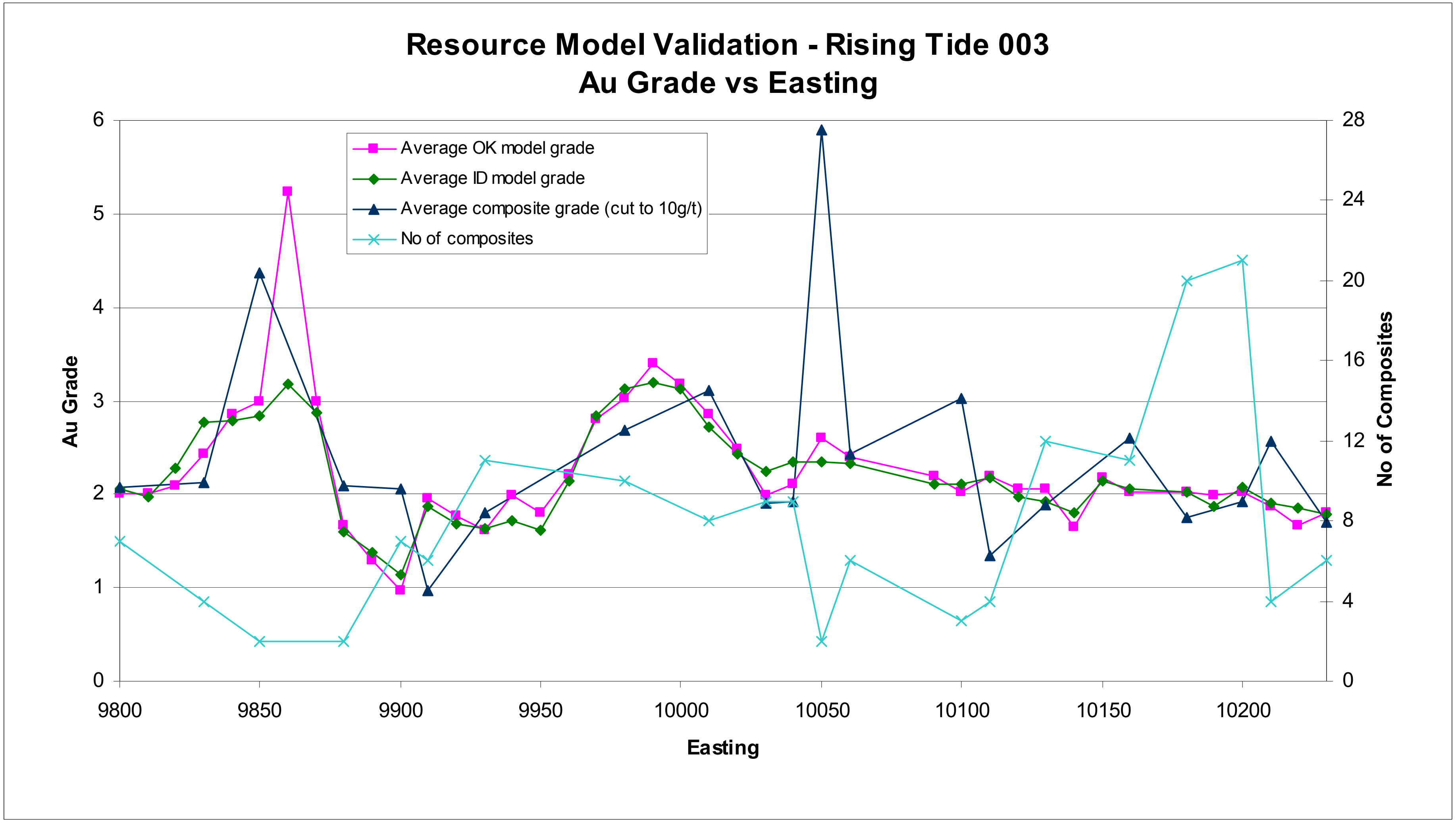


Figure 6.7 Au Grade vs Easting validation plot – RT003 lode, Rising Tide deposit

6.2.4 Q-Q Plots

Q-Q plots were constructed to examine the relationship between composite grades and model grades for each lode at Rising Tide. A q-q plot is essentially a scatterplot showing matching quantiles from two datasets. A quantile is defined as any fraction of a dataset. An ideal data distribution on a q-q plot should lie close to a line diagonally bisecting the graph over all assay values with a 1:1 relationship between both sets of data. A 1:1 line indicates that the two data distributions have the same shape and are identical.

A q-q plot is first constructed by sorting assay values in each dataset, and a cumulative frequency distribution calculated for each dataset. These frequency values are plotted on a cumulative frequency plot for each dataset, and assay values corresponding to matching quantiles are read from the cumulative frequency plots for both datasets and plotted on the q-q plot.

Q-Q plots for each lode are illustrated respectively in Figure 6.8.

The trends in Figure 6.8 show an indicative bias towards composite grades above approximately 2.5g/t Au. Below this threshold, a smaller bias towards model grades is evident. Care should be taken in interpreting these plots, as they do not take into account composite data locations, and thus the across-lode and along-strike variability is not considered in these plots. The suggested bias towards composite grades is likely a result of a number of factors, including low composite data levels, small block size relative to drilling density, large grade variability across-lode and along-strike, and the discontinuous nature of the lodes, particularly for RT002 and RT003.

The main factor for the bias is likely the low composite data levels present, particularly when comparing the number of composites to the number of blocks for each lode. Table 6.9 lists the relative numbers of composite grades as compared to model blocks.

Lode	Number of Composites	Number of Blocks
RT001	490	3421
RT002	154	1194
RT003	164	1008
TOTAL	**808**	**5,623**

Table 6.9 Relative numbers of composite grades vs number of model blocks

With the high contrast in data levels between both datasets present, the spread of grades is thus different for both datasets, and hence the potential bias towards composite grades. It is expected that infill drilling will address this indicative bias by way of boosting drillhole data levels and thus providing a more robust dataset for comparison with model grades.

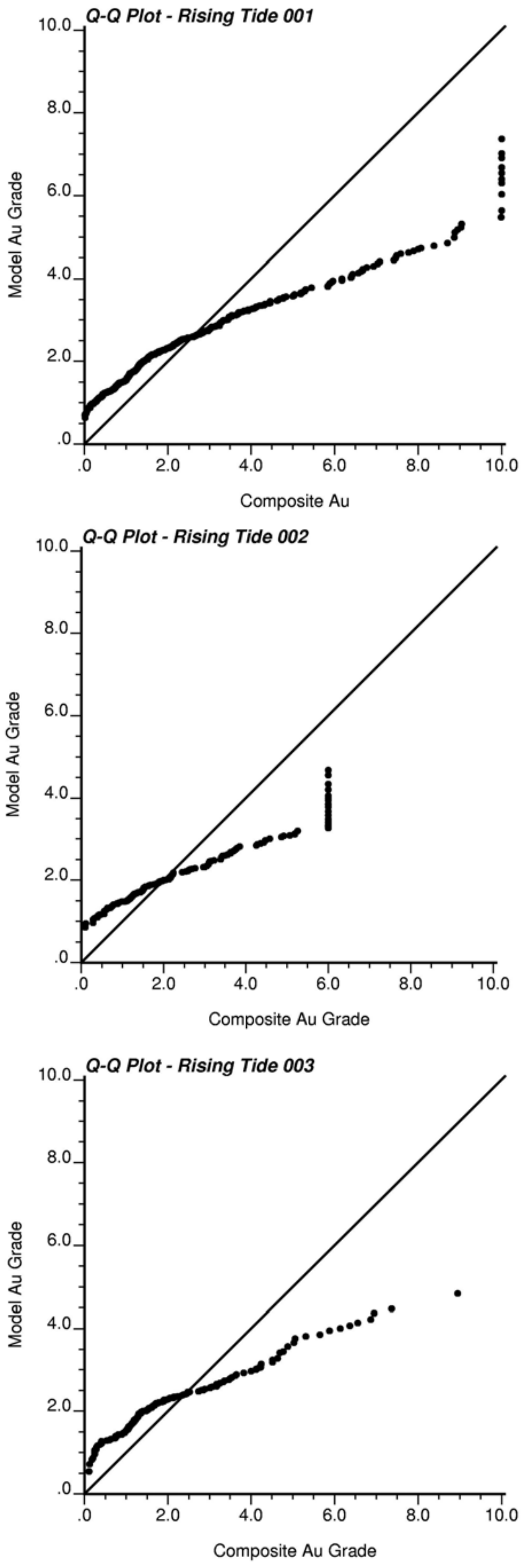


Figure 6.8 Q-Q plots of model vs composite grades – Rising Tide

7 RESOURCE CLASSIFICATION AND REPORTING

The Rising Tide model resource has been classified into Indicated and Inferred categories according to the JORC code, using a combination of kriging variance, drilling density and confidence in grade continuity between drill sections. An Inferred category was applied to selected small solids within the RT002 and RT003 lodes, as few drillhole intercepts are located within this lode, and there is uncertainty in lode continuity with poor definition by drilling. Blocks within these solids were interpolated by drillhole data on sole sections without supporting composite data along strike, and given the small, discontinuous nature of these solids, an Inferred category was considered appropriate for these blocks. The RT001 lode, and larger solids from the RT002 and RT003 lodes were classified on the basis of kriging variance.

The kriging variance is used as an objective measure of the geostatistical confidence in a given block, and represents the value of the squared error between the actual grade and the estimated grade generated by the kriging process. It is dependent on a number of criteria, including block size, internal block discretisation, sample numbers and the variogram parameters but is independent of the actual grade. Thus, using the Rising Tide variography as a guide, blocks for the Rising Tide deposit were suitable to be classified as Indicated if they were spaced approximately within 25m along-strike from drillholes, and 30m down-dip between drillholes. An Inferred classification is appropriate for those blocks located more than 25m along-strike from drillholes, and greater than 30m down-dip between drillholes. The ranges above represent a guideline only for the classifications, and actual ranges used to determine the threshold between Indicated and Inferred blocks were applied to modified distances from those above, using the spatial distribution of composite data as an additional guideline.

The classified Mineral Resource is reported in Table 7.1 above a 0.7g/t Au cutoff as at 10th March 2003. The topography and weathering surfaces were used to construct a density model, which was used in reporting of model tonnage and grades. Both ordinary kriged grades and inverse distance grades are reported for comparison.

Category	Volume	Tonnage	OK Au g/t	ID Au g/t
Indicated	241,000	557,600	2.22	2.22
Inferred	110,437	268,606	2.17	2.18
Total	**351,437**	**826,206**	**2.20**	**2.20**

Table 7.1 Rising Tide Classified Mineral Resource above 0.7 g/t Au as at 10th March 2003

A breakdown of this model resource by bench, and also by Au grade and classification category within each bench is included as Appendix 1.

Figure 7.1 illustrates the grade-tonnage relationship for all combined lodes for Rising Tide at a range of cut-off grades, to test the sensitivity of the model to the cut-off grade applied. Cutoff grades are bracketed next to points representing the tonnage and average grade applicable at these cut-off grades.

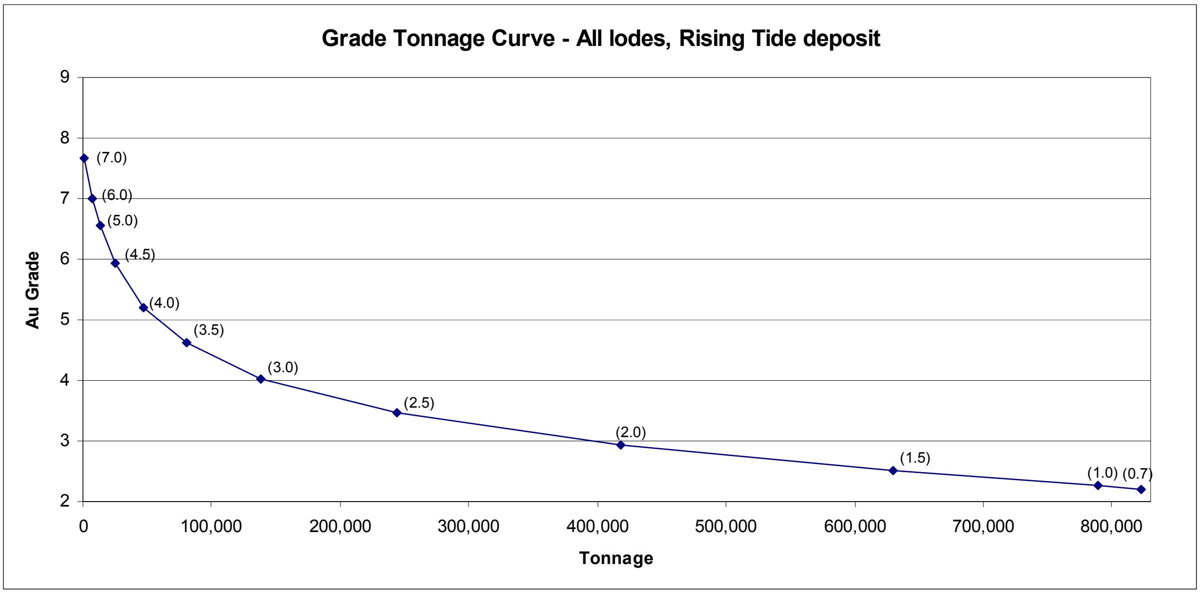


Figure 7.1 Grade Tonnage Curve for all lodes, Rising Tide deposit

8 RECOMMENDATIONS

A number of recommendations are made, in light of the completed resource model for Rising Tide, including infill drilling, additional drilling to extend and link wireframes, and improved solids modelling.

The current drilling density of 25m along-strike and 20m across-strike at Rising Tide is sufficient for an Indicated and Inferred classification of the orebody, following JORC guidelines. However, the number of composites utilised for ordinary kriging interpolation is relatively low, and the effects of across-lode and along-strike variability are difficult to constrain with the current data levels and drill spacing. It is recommended that infill drilling is carried out between existing drill-lines, resulting in an overall 12.5m spacing between drill lines along strike. The benefits of this infill drilling are summarised as follows:

- doubling of the composite database;
- reduced effects of across-lode and along-strike grade variability;
- verification of high grade areas within the orebody eg sections 9855E, 9930E, 10080E;
- improved quality of variograms;
- scope for Measured classification of the orebody;
- improved q-q plot distribution trends; and
- more robust wireframes.

It is recommended that the infill lines are drilled on a staggered grid to those of existing drill lines to provide definition in uninformed areas.

A number of small, discontinuous lodes are present within the RT002 and RT003 lodes at Rising Tide. These lodes are unsupported along-strike with the current drill spacing, and are often based on singular sectional mineralisation anomalies. It is recommended that infill drilling be carried out to confirm these anomalies, and that these lodes are modelled along-strike instead of east-west. This would have the effect of aligning them with the dominant direction of the orebody, and provide a more realistic definition of mineralisation within these discontinuous lodes.

The quality of variograms modelled for Rising Tide is fair, although they are compromised by low data levels, the thin lode nature and lack of data continuity along strike. The nugget effect is poorly defined due to a lack of composite data and the thin nature of the lodes at Rising Tide. The current variogram structures for the three principal directions are adequate for an Indicated and Inferred classification of the Rising Tide orebody, however, more short-range definition of spatial continuity is required in order to potentially achieve a Measured classification of the orebody. Infill drilling as described above would provide a more robust dataset for variography analysis, and increase confidence in variogram parameters.

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APPENDIX 1

RISING TIDE
RESOURCE MODEL DETAILED REPORTS