Pima – The Spectral Geologist → Excel (template) → Access Database

All the steps needed to export minerals, and the spectral parameters from TSG into Excel are covered in this sheet.

Within TSG, the **Log** screen gives a series of columns, which can have up to 16 columns. You can change the number of columns by right clicking the mouse and **Add/Edit/Del** → **Number of Columns...** The first column should be the **Spectral Item**, or **Index** this is derived from right mouse clicking within the first column, and selecting **Spectral Item** for the graphic of Normalised Hull Quotient; or **Scalar Item** for the Index. The Index or Spectra may not always be sorted correctly. If the sorting is not correct as in the first sample is not at the top and so on down the hole, add the **Scalar Item** → **Index**, Right mouse click again on the index column, and **Sort on this column**. Check the sorting and then you can delete this column if everything is correct.

Once the first column is to your satisfaction, then you can bring in the rest of the columns. This is achieved by right mouse clicking in the column you would like to change/check...**Scalar Item** → **TSA Mineral1** etc.

The sequence of columns from left to right should read, (at least for the first part of the export process):-

1.1   Norm. HullQ or Index

TSA_Mineral1   highest weighted identifiable mineral
TSA_Weight1   percentage attributable to mineral1
TSA_Mineral2   next highest weighted identifiable mineral
TSA_Weight2   percentage attributable to mineral2
TSA_Error   error based on calculation within TSG, greater errors less certainty of mineral id
Wave_AlOH   wavelength of highest absorption feature between 2184 and 2228nm
Depth_AlOH   reflectance value of deepest absorption feature between 2180 and 2230nm
Depth_Water   reflectance value of the deepest water peak between 1860 and 1960nm
AlOH_XT   crystallinity of sericites based on the ratio of Depth_AlOH / Depth_Water (larger ratios indicate possible less molecular water being read by PIMA)...assumes samples are dry and contain no free water. In more weathered sericites, clay crystal structures become ragged and usually contain increased amounts of water within the molecular platelets.
Fe2+   calculation of slope at 1310nm. The main absorption range for Fe is based around 1200nm (just outside the PIMA wavelength range). The effects of high amounts of iron may be seen within the recorded range of the PIMA, by observing the slope of the reflectance spectra. A negative slope would indicate appreciable amounts of iron within the measured sample.
Paragonite_Feat   identifies any spectral inflections within the range of 2188-2200nm which would be attributable to paragonite (may be observed as small shoulders on main AlOH absorption peak)
Muscovite_Feat   identifies any spectral inflections within the range of 2200-2206nm which would be attributable to muscovite (may be observed as small shoulders on main AlOH absorption peak)
Phengite_Feat   identifies any spectral inflections within the range of 2207-2225nm which would be attributable to phengite (may be observed as small shoulders on main AlOH absorption peak)
Kandite   extracts the combined weight of any Kandite minerals identified by TSA

Kaolin_Feat wavelength of deepest absorption feature between 2158-2182nm (diagnostic kaolinite and dickite absorption features occur within this range)

Kaolinite_Feat identifies any spectral inflections within the range of 2159-2165nm which may be attriburable to kaolinite

Dickite_Feat identifies any spectral inflections within the range of 2170-2180nm which may be attributable to dickite

Wave_MgOH wavelength of deepest absorption feature between range 2320-2360nm

Depth_MgOH reflectance value of deepest absorption feature between 2320-2360nm

Wave_FeOH wavelength of deepest absorption feature between range 2238-2262nm

Depth_FeOH reflectance value of deepest absorption feature between 2238-2262nm

MgOH_Feat identifies any spectral inflections within the range of 2320-2360nm which may be attriburable to magnesium chlorite. Small amounts of Mg_Chlorite may be present in samples containing Illite, however the secondary magnesium features of illite are observed in the same range as the main Mg_chlorite diagnostic absorption feature. Therefore Mg_chlorite may not be identified by TSA even though it may be present; it may be masked by the illite features.

FeOH_Feat identifies any spectral inflections within the range of 2238-2262nm which may be attributable to biotite. Biotite may be present in small amounts but as TSA identifies the two main minerals, biotite will not identified.

DAlOH/DMgOH ratio of the relative depths of the AlOH and MgOH features. Useful as the ratio can break out different units within sandstones etc. based on the proportional amounts of aluminium bearing minerals versus mafic minerals. Is also useful for determining the effects of Illite-chlorite mixes … the wavelength of MgOH is affected by the presence of illite; plot the wavelength of MgOH vs. Depth ALOH/Depth MgOH to check for illite interference. Illite-chlorite mixes can be segregated by ALOH.

Kaol_XT calculation based on the difference of the inside slopes of the kaolinite doublet peaks. As kaolinite crystallinity increases the better developed is the doublet, and conversely, the more weathered kaolinite has a very poor doublet, to the extent that only a small shoulder may be developed on the main AlOH peak. The crystallinity calculation examines the development of the slope, values above approx 1.12 may be considered to be highly crystalline.

Sericite extracts the combined weight of any AlOH-1 minerals identified by TSA (includes paragonite, illite, muscovite, phengite and montmorillonite clays)

Export Procedure

The first log set should have 16 columns of mineral id's, weight, error and spectral parameters ie, the order of which I have described various scalar items immediately above. Once all the items are displayed export the scalars by **File → Export → to Csv (scalars)...** This will export the log screen scalars to an ASCII comma set variable (comma delimited) file of your choice which can be read by Excell eg. drillhole.csv. You will have to then overwrite (within TSG) the first set of scalars with the remaining ones (should be up to 12 columns) and then exported again eg. drillhole_1.csv. The two files can then be merged within Excel to produce the one file containing all the mineral id's and spectral parameters.

Open the template file called "TSA_template.xls". Copy the columns "Sample; TSA Mineral1; TSA Weight1; TSA Mineral2; TSA Weight2; TSA Error; Kaol_XT; AlOH_XT" from the merged TSA file into the template from the 3rd line (leaving the "erase me" line). Then copy the line I3:DJ3 down to the bottom of your samples. This will carry the formula down to the bottom of the file. This formula looks at the column header and says "if the column header eg. MgChlorite, is found in Mineral1 or Mineral2 then return the corresponding weight. Therefore you can change the column headers to suit the minerals identified within each particular suite of samples, and the formula will carry through. The last column in the file is headed "Sum"; this sums the line of TSA weights for each sample (I3:~BI3), and should equal 1 (sometimes it is up to 1.005 and other times 0.997). This is also a check to ensure that any zero sums are due to NULL Mineral ID and not due to missed minerals in the header column.

If everything is confirmed within the TSA_Template file, **Save as**... **Excel file type** , the file of your choice eg drillhole_TSA.xls. This file can then be imported into Access, PimaData.mdb. It is essential that the "erase me" line is not deleted from the excel file, as Access will not import the lines containing "NULL" ie. Access will assume that if there are integers within the first 20 lines of the column, Access will assume the column is integer data throughout, and come up with errors for the NULL's. Once done, **Copy** the table within Access and **Append Data to Existing Table** (**TSA Pima Drill**). It is not essential that the columns are in the same order within the two tables, Access looks at the headers and works out which goes where.

The main excel file containing all sample parameters can now be edited. Delete the TSA Minerals, Weights and Error column. Save the file and import into PimaData.mdb. Copy and Append the file into **TSG Parameters Drill**.

This same procedure can be used for sample outcrops as well.

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November 2000