

APPENDIX B

ASTER Level 1B Processing over the Bootu Creek, Renner Springs and Attack Creek Project Areas

Final Report

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Resource Potentials

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MEMORANDUM

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Subject: Bootu Aster Level 1B Processing
CC :
Date : 13 September 2007

Processed ASTER Filename Structure:

Aster Level 1B data for three scenes were acquired over Bootu area. The ASTER Level-1B data are L1A data with the radiometric and geometric coefficients applied. The Level-1B data generation also includes registration of the SWIR and TIR data to the VNIR data. SWIR parallax errors due to the spatial locations of all of its bands have also been corrected. SWIR Cross talk correction, radiance and dark pixel corrections also applied on data. Seamless geological maps were generated from ASTER imagery to represent surface abundances of either mineral groups or specific mineral identities within the Bootu area respectively. The 14 spectral bands of ASTER, acquired at a pixel resolution of 15 to 90 metres, enabled the generation of maps designed to represent the abundance of broad mineral groups including AIOH (muscovite, kaolinite, smectite), MgOH/carbonate, quartz/silica, ferric oxides and ferrous iron (within silicate or carbonate). However the accuracy of these products was observed to be limited by the broad nature of the ASTER bands. Narrower spectral bands are generally required to discriminate and map specific minerals and to separate the effects of vegetation and the atmosphere.

High level enhancement conducted by targeting the spectral absorption feature of Mn mineralisation areas (supplied by OMM) with appropriate band parameters.

The linear histogram threshold ranges for generated products are:

Ferric Iron abundance = $0.94 < \text{threshold} < 1.2$,
Ferrous Iron = $1.1 < \text{threshold} < 1.5$,
Ferrous silicate = $0.2 < \text{threshold} < 0.3$
AlOH “ = $1.83 < \text{threshold} < 2.18$
MgOH-carbonate “ = $2.3 < \text{threshold} < 2.8$, and
Quartz/silica “ = $1.0 < \text{threshold} < 1.19$

Mn threshold:

Bootu area: 52-66

Renner area: 66-67

Arrack area: 52-60

Image Name	Features	Red band	Green band	Blue band	Pseudo-color
AST_L1B_RGB_321_m53 AST_L1B_RGB_321_vegmask_m53 AST_L1B_RGB_321_15m_m53	Vegetation and visible bands	3	2	1	
AST_L1B_CMYK_123_vegmask*_m53 AST_L1B_CMYK_123_m53	Convert CMYK colour to RGB, map visible bands	1/4	2/4)	3/4	
AST_L1B_RGB_eqL742_m53 AST_L1B_RGB_eqL742_clip_m53	Enhanced structural features	6	3	1	
AST_L1B_decorellation_m53	Decorellation (envi)	13	12	10	
AST_L1B_discriminationformapping_m53 AST_L1B_discrimination_m53	Discrimination for mapping	4/1 4/1	3/1 3/1	12/14 3/5	
AST_L1B_ferric_iron_m53	Ferric oxide				4/3 2/1
AST_L1B__AlOH_ab_m53	Al(OH) abundance				5+7/6
AST_L1B_ep_ch_amph_m53	Epidot/chlorite/amphibole				(6+9)/(7+8)
AST_L1B_sio2_m53	Sio2				12/13
AST_L1B_ferrous_silica_m53 AST_L1B_ferrous_silica_clip*_m53	Ferrous silicates (biot,chl,amph)				5/4
AST_L1B_ferrous_iron_m53 AST_L1B_ferrous_iron_clip*_m53	Ferrous Iron				5/3+1/2
AST_L1B_mgoh_ab_m53	MgOH/Amphibole				6+9/8

NOTE:

M53: GDA94, MGA 53
 RGB: Red Green Blue image
 Clip: 99 % auto clip transform

Abbreviations:

ab: abundance
 CMYK: cyan, magenta, yellow, and key (black)
 Veg mask: vegetation mask applied
 eq: equivalent