

**Cameco Australia Pty Ltd**  
**Manyalluluk Project EL9452 - Alteration**

Sample Number	Intensity	Colour	Distribution	Alteration	Comments
ML050200	weak	red	pervasive	Hematite	
ML050200	moderate	red	mineral control	Hematite	alteration of feldspars
ML050201	moderate	red	mineral control	Hematite	alteration of pyroxenes
ML050201	weak	red	pervasive	Hematite	
ML050201	weak	pink	pervasive	Clay	
ML050201	moderate	orange	irregular	Limonite	
ML050202	weak	red	pervasive	Hematite	
ML050203	moderate	maroon	rock type control	Hematite	alteration of volcanic clasts
ML050203	moderate	green	mineral control	Epidote	epidote alteration of feldspars?
ML050203	weak	red	pervasive	Hematite	
ML050204	strong	red	discrete spots	Hematite	
ML050204	moderate	red	pervasive	Hematite	
ML050204	weak	pink	mineral control	Clay	feldpsars
ML050204	weak	white	fracture coating	Clay	
ML050205	moderate		irregular	Bleaching	
ML050205	moderate	orange	irregular	Goethite	
ML050205	moderate	red	pervasive	Hematite	
ML050205	weak	colourless	interstitial	Mica	
ML050205	moderate	white	interstitial	Clay	
ML050206	moderate	white	pervasive	Clay	
ML050206	strong	white	mineral control	Clay	feldpsars
ML050206	moderate	red	surficial coating	Hematite	
ML050207	moderate	red	structural control	Hematite	hematite alteration enveloping quartz veining
ML050207	moderate	green	pervasive	Clay	
ML050207	strong	green	mineral control	Clay	feldpsars
ML050207	strong		pervasive	Bleaching	
ML050207	moderate	colourless	vein/veinlets	Quartz	
ML050208	strong		pervasive	Bleaching	
ML050208	moderate	white	pervasive	Clay	goundmass
ML050208	weak	orange	irregular	Hematite	
ML050208	moderate	colourless	disseminated	Mica	
ML050208	moderate	orange	surficial coating	Hematite	
ML050208	moderate	green	mineral control	Clay	feldpsars
ML050209	moderate	red	irregular	Hematite	
ML050209	strong	black	matrix	Hematite	black hematite alteration of sandstone matrix
ML050210	weak	orange	irregular	Hematite	
ML050210	weak	orange	irregular	Limonite	
ML050210	strong		pervasive	Bleaching	
ML050211	weak	orange	pervasive	Hematite	
ML050211	weak	orange	interstitial	Clay	
ML050211	moderate		pervasive	Bleaching	
ML050211	strong	red	bedding controlled	Hematite	
ML050213	strong		discrete spots	Bleaching	
ML050213	moderate	purple	pervasive	Diagenetic hematite	
ML050213	weak	orange	patches	Hematite	
ML050213	moderate		patches	Bleaching	
ML050214	weak	orange	pervasive	Hematite	
ML050214	moderate		pervasive	Bleaching	
ML050214	strong	maroon	discrete spots	Diagenetic hematite	
ML050216	weak		vug controlled	Quartz dissolution	
ML050216			pervasive	Bleaching	
ML050216	moderate	maroon	clasts	Hematite	
ML050216	moderate	white	vein/veinlets	Quartz	
ML050216	weak	orange	enveloping	Limonite	
ML050218	moderate	orange	irregular	Limonite	
ML050218	weak	red	pervasive	Hematite	
ML050218	moderate	orange brown	vug controlled	Goethite	
ML050220	moderate		pervasive	Bleaching	
ML050220	weak	orange	pervasive	Hematite	
ML050220	moderate		irregular	Silicification	surficial silicification
ML050221	weak	orange	pervasive	Limonite	
ML050221	strong	red	pervasive	Hematite	
ML050223	moderate		pervasive	Bleaching	
ML050223	weak	orange	pervasive	Hematite	
ML050223	weak	maroon	irregular	Diagenetic hematite	
ML050223	strong		patches	Bleaching	
ML050224	weak	orange	pervasive	Hematite	
ML050224	moderate		pervasive	Bleaching	
ML050224	weak		pervasive	Silicification	
ML050224	moderate	red	surficial coating	Hematite	
ML050224	strong		patches	Bleaching	
ML050226	weak		pervasive	Silicification	
ML050226	moderate	red	pervasive	Hematite	
ML050226	weak		stockwork	Quartz	

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Sample Number	Intensity	Colour	Distribution	Alteration	Comments
ML050226	moderate	white	interstitial	Clay	
ML050226	strong	red	crystals	Hematite	botryoidal or mamillary hematite habit within open vugs
ML050227	moderate	white	interstitial	Clay	
ML050227	strong	white	fracture coating	Clay	
ML050227	weak	green	fracture coating	Uranium Secondaries	
ML050227	strong	maroon	pervasive	Hematite	
ML050229	moderate		pervasive	Silicification	
ML050229	strong	red	pervasive	Hematite	
ML050229	strong	maroon	matrix	Hematite	
ML050229	weak	white	matrix	Clay	
ML050229	weak	green	fracture coating	Uranium Secondaries	green uranium secondaries and clay on a fracture
ML050231	strong		pervasive	Silicification	
ML050231	moderate	colourless	vug controlled	Drusy quartz	
ML050231	strong	colourless	vein/veinlets	Quartz	
ML050231	strong	red	pervasive	Hematite	
ML050232	moderate	purple	pervasive	Hematite	
ML050232	moderate	white	mineral control	Clay	amygdulcs replaced with white clay
ML050232	moderate	orange	surficial coating	Limonite	
ML050233	weak	orange	irregular bands	Hematite	
ML050233	weak		pervasive	Silicification	
ML050234	strong	red	rock type control	Hematite	replacement of clay intraclasts or volcanic rip up clasts
ML050234	strong	maroon	pervasive	Diagenetic hematite	
ML050234	moderate	white	mineral control	Clay	after feldspars
ML050236	moderate	red	surficial coating	Hematite	
ML050236	moderate	white	disseminated	Clay	
ML050236	moderate	purple	pervasive	Diagenetic hematite	
ML050236	strong		patches	Bleaching	
ML050237	moderate	green	mottled	Clay	
ML050237	moderate	purple	pervasive	Hematite	
ML050237	moderate	orange	irregular	Limonite	
ML050238	moderate		pervasive	Silicification	
ML050238	weak	white	pervasive	Clay	
ML050238	moderate	pink	matrix	Hematite	breccia matrix hematitically altered
ML050239	moderate	red	matrix	Hematite	breccia matrix hematite altered
ML050239	weak		pervasive	Silicification	
ML050240	weak	red	pervasive	Hematite	
ML050240	moderate		pervasive	Bleaching	
ML050240	moderate	red	fracture coating	Hematite	
ML050240	moderate	red	discrete spots	Hematite	spots are more concentrated towards the surface of the sample
ML050240	weak	white	interstitial	Clay	
ML050241	weak	red	pervasive	Hematite	
ML050241	weak		pervasive	Silicification	
ML050242	moderate	orange	vug controlled	Limonite	limonite infilling amygdulcs
ML050242	moderate	red	pervasive	Hematite	
ML050244	moderate	pink	mineral control	Clay	feldspar alteration
ML050244	moderate	red	pervasive	Hematite	
ML050245	moderate	maroon	irregular	Hematite	
ML050245	moderate	red	pervasive	Hematite	
ML050245	moderate	pink	mineral control	Clay	feldspar
ML050246	moderate	orange	pervasive	Hematite	minor limonite
ML050246	moderate	maroon	fracture coating	Iron Oxides	
ML050246	moderate	white	mineral control	Clay	
ML050247	moderate	red	fracture coating	Hematite	
ML050247	weak	pink	mineral control	Clay	feldspars
ML050247	weak	green	mineral control	Clay	altered / weathered biotite
ML050251	weak	black	weakly disseminated	Oxides (General)	
ML050251	weak	purple	irregular	Diagenetic hematite	
ML050251	strong		pervasive	Bleaching	
ML050251	weak	yellow	pervasive	Clay	
ML050252	strong		pervasive	Bleaching	
ML050252	moderate	red	surficial coating	Hematite	
ML050252	weak	red	irregular bands	Hematite	
ML050252	moderate	white	disseminated	Clay	
ML050253	weak	yellow	weakly disseminated	Clay	
ML050253	weak	purple	irregular	Diagenetic hematite	
ML050253	weak	black	weakly disseminated	Oxides (General)	
ML050253	weak		pervasive	Silicification	
ML050253	weak	red	surficial coating	Hematite	
ML050253	strong		pervasive	Bleaching	
ML050254	moderate	red	structural control	Hematite	
ML050254	weak	red	irregular bands	Hematite	

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Sample Number	Intensity	Colour	Distribution	Alteration	Comments
ML050254	weak	maroon	irregular bands	Diagenetic hematite	
ML050254	strong		pervasive	Bleaching	
ML050254	moderate	white	vein/veinlets	Quartz	
ML050255	moderate		pervasive	Silicification	
ML050255	strong	white	breccia filling	Quartz	
ML050255	weak	colourless	vein/veinlets	Drusy quartz	
ML050255	weak	maroon	crystals	Hematite	hematite dusting drusy quartz crystals
ML050255	moderate	red	pervasive	Hematite	
ML050256	moderate		pervasive	Silicification	
ML050256	moderate	red	pervasive	Hematite	
ML050256	weak	white	vein/veinlets	Quartz	
ML050257	weak	white	vein/veinlets	Quartz	
ML050257	moderate	red	pervasive	Hematite	
ML050257	weak		pervasive	Silicification	
ML050258	strong	maroon	mineral control	Hematite	
ML050258	strong		pervasive	Silicification	
ML050258	moderate	orange	fracture coating	Limonite	
ML050258	strong		clasts	Bleaching	
ML050259	moderate	red	irregular bands	Hematite	
ML050259	weak	red	pervasive	Hematite	
ML050259	weak	yellow	weakly disseminated	Clay	
ML050259	moderate		pervasive	Bleaching	
ML050261	moderate		pervasive	Silicification	
ML050261	weak	red	pervasive	Hematite	
ML050262	weak	red	pervasive	Hematite	
ML050262	moderate		pervasive	Bleaching	
ML050262	weak		pervasive	Silicification	
ML050263	strong	blue green	vug controlled	Any Mineral (unknown)	blue green mineral (pinnite?) infilling amygdules
ML050263	moderate	grey	breccia filling	Quartz	
ML050263	moderate	orange	vug controlled	Limonite	
ML050263	moderate	colourless	vug controlled	Drusy quartz	
ML050263	strong	red	pervasive	Hematite	
ML050264	moderate	white	interstitial	Clay	
ML050264	strong		discrete spots	Bleaching	
ML050264	moderate		pervasive	Bleaching	
ML050264	weak	red	irregular bands	Hematite	
ML050264	moderate	purple	irregular bands	Diagenetic hematite	
ML050265	weak	white	vein/veinlets	Quartz	
ML050265	strong	red	pervasive	Hematite	
ML050265	moderate	black	fracture coating	Oxides (General)	
ML050266	strong	red	pervasive	Hematite	
ML050266	moderate	orange	surficial coating	Goethite	
ML050267	strong	maroon	pervasive	Hematite	
ML050267	moderate	orange	surficial coating	Goethite	
ML050267	moderate		pervasive	Quartz dissolution	
ML050270	strong		pervasive	Bleaching	
ML050270	weak	red	irregular bands	Hematite	
ML050270	weak	orange	irregular bands	Limonite	
ML050270	weak		pervasive	Silicification	
ML050271	weak	red	pervasive	Hematite	
ML050271	moderate		pervasive	Bleaching	
ML050271	strong	red	discrete spots	Hematite	
ML050271	moderate	red	irregular bands	Hematite	
ML050272	moderate	red	pervasive	Hematite	
ML050272	moderate	white	vein/veinlets	Quartz	
ML050272	weak	colourless	crystals	Drusy quartz	
ML050272	weak		vug controlled	Quartz dissolution	
ML050272	strong		pervasive	Silicification	
ML050274	moderate	orange	irregular	Limonite	
ML050274	weak	white	vein/veinlets	Quartz	
ML050274	weak	white	interstitial	Clay	
ML050274	moderate	red	surficial coating	Hematite	
ML050274	moderate		pervasive	Bleaching	
ML050274	weak	maroon	fracture coating	Hematite	
ML050274	weak	colourless	vein/veinlets	Drusy quartz	
ML050276	moderate	red	surficial coating	Hematite	
ML050276	weak	colourless	weakly disseminated	Mica	
ML050276	moderate		discrete spots	Bleaching	
ML050276	weak	orange	pervasive	Hematite	
ML050277	weak	white	weakly disseminated	Clay	
ML050277	weak	orange	irregular	Hematite	surficial hematite
ML050277	strong		pervasive	Bleaching	
ML050279	strong		irregular	Bleaching	
ML050279	moderate	red	irregular	Hematite	
ML050279	strong		pervasive	Silicification	

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Sample Number	Intensity	Colour	Distribution	Alteration	Comments
ML050281	moderate	colourless	disseminated	Mica	
ML050281	weak	orange	irregular	Limonite	
ML050281	strong		pervasive	Bleaching	
ML050282	weak	white	mineral control	Clay	alteration of feldspars
ML050282	weak		vein/veinlets	Quartz	thin hairline quartz veins
ML050282	weak	pink	mineral control	Clay	alteration of feldspars
ML050282	weak	red	pervasive	Hematite	
ML050282	moderate	black	fracture coating	Oxides (General)	
ML050283	strong		pervasive	Bleaching	
ML050283	weak	pink	irregular	Hematite	
ML050284	weak		irregular	Bleaching	
ML050284	moderate	red	pervasive	Hematite	
ML050284	moderate	pink	mineral control	Clay	alteration of feldspars
ML050285	moderate	maroon	irregular bands	Diagenetic hematite	
ML050285	moderate	green	irregular bands	Clay	
ML050285	moderate		irregular bands	Bleaching	
ML050285	moderate	red	rock type control	Hematite	hematite alteration of rock clasts within sandstone
ML050286	moderate	maroon	pervasive	Hematite	
ML050286	moderate	green	disseminated	Clay	
ML050287	moderate	white	mineral control	Clay	alteration of feldspars
ML050287	moderate	red	pervasive	Hematite	
ML050287	moderate	pink	pervasive	Clay	
ML050288	weak	red	irregular	Hematite	
ML050288	moderate	red	surficial coating	Hematite	
ML050288	weak	white	weakly disseminated	Clay	
ML050288	moderate		pervasive	Bleaching	
ML050289	moderate	orange	irregular	Limonite	
ML050289	moderate	white	vein/veinlets	Quartz	
ML050289	weak	white	weakly disseminated	Clay	
ML050289	moderate		vein/veinlets	Bleaching	bleaching enveloping quartz veins
ML050289	weak	red	irregular bands	Hematite	
ML050289	moderate	purple	pervasive	Diagenetic hematite	
ML050290	strong	white	pervasive	Clay	
ML050290	moderate	red	irregular	Hematite	
ML050290	weak	orange	surficial coating	Hematite	
ML050291	moderate	red	irregular	Hematite	
ML050291	moderate	white	disseminated	Clay	
ML050291	weak	red	irregular	Hematite	
ML050291	moderate		irregular	Bleaching	
ML050291	weak		irregular	Bleaching	
ML050292	moderate		pervasive	Bleaching	
ML050292	weak	red	irregular bands	Hematite	
ML050292	weak	white	disseminated	Clay	
ML050293	weak	orange	irregular	Hematite	
ML050293	strong		pervasive	Bleaching	
ML050293	weak	white	disseminated	Clay	
ML050294	weak	yellow	disseminated	Clay	
ML050294	moderate		pervasive	Bleaching	
ML050294	weak	red	irregular	Hematite	
ML050295	weak	orange	fracture coating	Limonite	
ML050295	moderate		pervasive	Silicification	
ML050295	weak	purple	pervasive	Diagenetic hematite	
ML050295	moderate		pervasive	Bleaching	
ML050295	weak	red	discrete spots	Hematite	
ML050295	weak	white	vein/veinlets	Quartz	
ML050296	moderate	black	vein/veinlets	Specular hematite	
ML050296	weak	orange	pervasive	Limonite	
ML050296	weak	white	vein/veinlets	Quartz	
ML050297	weak	red	irregular bands	Hematite	
ML050297	moderate	white	pervasive	Clay	
ML050297	strong		pervasive	Bleaching	
ML050298	moderate	red	pervasive	Hematite	
ML050298	weak	white	vug controlled	Clay	
ML050298	strong	orange	fracture coating	Goethite	
ML050298	moderate	orange	irregular	Limonite	
ML050299	moderate		discrete spots	Bleaching	
ML050299	weak	colourless	disseminated	Mica	
ML050299	strong	maroon	pervasive	Hematite	
ML050300	moderate	red	intraclasts	Hematite	
ML050300	weak	green	disseminated	Clay	
ML050300	weak	orange	irregular	Limonite	
ML050300	moderate	black	fracture coating	Oxides (General)	
ML050300	moderate		pervasive	Bleaching	
ML050300	strong	red	patches	Hematite	

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Sample Number	Intensity	Colour	Distribution	Alteration	Comments
ML050300	moderate	pink	moderately disseminated	Clay	
ML050301	moderate	pink	disseminated	Clay	
ML050301	weak	orange	pervasive	Hematite	
ML050302	moderate	red	irregular	Hematite	
ML050302	moderate	maroon	pervasive	Hematite	
ML050302	moderate	black	fracture coating	Oxides (General)	
ML050302	weak	orange	irregular	Limonite	
ML050303	weak	maroon	irregular spots - blotches	Diagenetic hematite	
ML050303	moderate	white	moderately disseminated	Clay	
ML050303	weak	pink	intraclasts	Clay	
ML050303	moderate		pervasive	Bleaching	
ML050303	weak	orange	irregular	Limonite	
ML050305	strong	maroon	intraclasts	Hematite	
ML050305	weak	white	disseminated	Clay	
ML050305	weak	maroon	pervasive	Diagenetic hematite	
ML050305	moderate		pervasive	Silicification	
ML050305	moderate		pervasive	Bleaching	
ML050306	strong		pervasive	Bleaching	
ML050306	strong		pervasive	Silicification	
ML050306	moderate	red	surficial coating	Hematite	
ML050307	weak	red	irregular	Hematite	
ML050307	strong		pervasive	Bleaching	
ML050307	moderate	white	interstitial	Clay	
ML050308	weak	orange	irregular	Hematite	
ML050308	moderate		irregular	Bleaching	
ML050308	strong	white	intraclasts	Clay	
ML050308	strong		pervasive	Bleaching	
ML050308	moderate	white	interstitial	Clay	
ML050312	strong	red	fracture coating	Hematite	
ML050312	weak	orange	irregular	Limonite	
ML050312	moderate	green	mineral control	Sericite	
ML050312	moderate	red	irregular	Hematite	
ML050313	weak	green	mineral control	Saundersisation	alteration of feldspars
ML050314	moderate	maroon	mineral control	Hematite	hematite alteration of mafics
ML050315	moderate	white	vein/veinlets	Quartz	thin quartz veining
ML050315	moderate	orange	irregular	Goethite	
ML050315	strong	maroon	pervasive	Hematite	
ML050315	strong	black	pervasive	Tourmaline	
ML050316	strong	red	irregular	Hematite	
ML050316	weak		vein/veinlets	Quartz	
ML050316	moderate	grey	irregular	Clay	
ML050316	strong	green	pervasive	Clay	
ML050316	moderate		pervasive	Silicification	
ML050317	moderate	red	rock type control	Hematite	
ML050317	weak		pervasive	Silicification	
ML050319	weak	orange	structural control	Limonite	
ML050319	weak	pink	pervasive	Hematite	
ML050319	moderate	white	gouge hosted	Silicification	indurated sandy gouge
ML050319	moderate	white	breccia filling	Quartz	
ML050319	moderate		pervasive	Silicification	
ML050319	moderate		pervasive	Bleaching	
ML050320	moderate	maroon	bedding controlled	Diagenetic hematite	
ML050320	weak	red	pervasive	Hematite	
ML050320	moderate		pervasive	Bleaching	
ML050321	moderate		pervasive	Bleaching	
ML050321	weak	pink	pervasive	Hematite	
ML050321	weak		surficial coating	Silicification	
ML050322	strong		pervasive	Silicification	
ML050322	moderate	white	fracture coating	Quartz	white quartz filled fractures
ML050322	moderate		pervasive	Bleaching	
ML050322	weak	pink	pervasive	Hematite	
ML050323	moderate		pervasive	Silicification	
ML050323	moderate		clasts	Bleaching	bleached sandstone clasts
ML050323	weak	white	disseminated	Clay	
ML050323	moderate	red	breccia filling	Hematite	breccia matrix
ML050324	strong	red	breccia filling	Hematite	breccia matrix
ML050324	strong		clasts	Bleaching	bleached sandstone clasts in hematitic breccia matrix
ML050324	weak	white	disseminated	Clay	
ML050324	weak		clasts	Silicification	sandstone breccia clasts
ML050326	weak	white	weakly disseminated	Clay	
ML050326	moderate		pervasive	Bleaching	
ML050326	weak	pink	pervasive	Hematite	
ML050327	weak	orange	irregular	Limonite	
ML050327	strong	red	matrix	Hematite	breccia matrix

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Sample Number	Intensity	Colour	Distribution	Alteration	Comments
ML050327	strong		clasts	Bleaching	bleached sandstone breccia clasts
ML050327	weak	colourless	breccia filling	Quartz dissolution	
ML050328	moderate		clasts	Bleaching	
ML050328	moderate		pervasive	Silicification	
ML050328	strong	red	vug controlled	Hematite	weathered out voids with clay and hematite coatings
ML050328	moderate	white	vug controlled	Clay	
ML050328	moderate	red	breccia filling	Hematite	
ML050329	strong		pervasive	Bleaching	
ML050329	weak	red	irregular bands	Hematite	
ML050329	strong	red	intraclasts	Hematite	
ML050330	strong		pervasive	Bleaching	
ML050330	weak	red	irregular	Hematite	
ML050330	weak	white	interstitial	Clay	
ML050331	moderate	purple	pervasive	Diagenetic hematite	
ML050331	weak	red	irregular	Hematite	
ML050331	weak	white	weakly disseminated	Clay	
ML050331	moderate		irregular	Bleaching	
ML050332	moderate		pervasive	Bleaching	
ML050332	moderate	red	surficial coating	Hematite	
ML050332	weak		pervasive	Silicification	
ML050332	weak	red	irregular bands	Hematite	
ML050333	weak		pervasive	Silicification	
ML050333	moderate		pervasive	Bleaching	
ML050333	weak	orange	irregular bands	Hematite	
ML050334	weak	orange	irregular bands	Hematite	
ML050334	moderate		pervasive	Bleaching	
ML050335	strong		pervasive	Bleaching	
ML050335	weak	orange	irregular bands	Hematite	
ML050336	strong		pervasive	Bleaching	
ML050336	weak		pervasive	Silicification	
ML050336	weak	orange	irregular bands	Hematite	
ML050338	weak		pervasive	Silicification	
ML050338	weak	red	pervasive	Hematite	
ML050338	moderate		pervasive	Bleaching	
ML050339	weak	orange	irregular bands	Hematite	
ML050339	moderate	white	disseminated	Clay	
ML050339	strong		pervasive	Bleaching	
ML050340	strong		pervasive	Bleaching	
ML050340	weak	pink	irregular	Hematite	
ML050342	strong		pervasive	Bleaching	
ML050342	weak	orange	irregular	Hematite	
ML050342	moderate	red	fracture coating	Hematite	
ML050343	strong	maroon	liesegang	Hematite	
ML050343	moderate	white	interstitial	Clay	associated with bleached blotches
ML050343	weak	orange	irregular	Limonite	
ML050343	moderate		irregular spots - blotches	Bleaching	
ML050344	moderate		irregular bands	Bleaching	
ML050344	strong	purple	pervasive	Diagenetic hematite	
ML050344	moderate	white	pervasive	Clay	associated with bleached blotches
ML050344	moderate		irregular spots - blotches	Bleaching	
ML050345	weak	red	irregular bands	Hematite	
ML050345	moderate		pervasive	Bleaching	
ML050345	moderate	white	disseminated	Clay	
ML050345	strong	red	surficial coating	Hematite	
ML050345	moderate	black	bedding controlled	Oxides (General)	
ML050345	strong	purple	irregular bands	Diagenetic hematite	
ML050346	weak	white	weakly disseminated	Clay	associated with bleached spots
ML050346	strong		discrete spots	Bleaching	
ML050346	strong	maroon	pervasive	Diagenetic hematite	
ML050347	moderate	white	disseminated	Clay	
ML050347	strong		irregular spots - blotches	Bleaching	
ML050347	moderate		irregular bands	Bleaching	
ML050347	strong	maroon	pervasive	Diagenetic hematite	
ML050348	weak	green	disseminated	Clay	
ML050348	weak	red	irregular	Hematite	
ML050348	moderate		pervasive	Bleaching	
ML050349	strong		pervasive	Bleaching	
ML050349	weak	red	irregular	Hematite	
ML050349	weak	yellow	disseminated	Clay	
ML050350	moderate	white	disseminated	Clay	
ML050350	moderate		pervasive	Bleaching	
ML050350	weak	red	irregular	Hematite	
ML050351	weak		vug controlled	Quartz dissolution	
ML050351	moderate	red	fracture coating	Hematite	

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Sample Number	Intensity	Colour	Distribution	Alteration	Comments
ML050351	strong		pervasive	Silicification	
ML050351	moderate	maroon	pervasive	Diagenetic hematite	
ML050352	strong		pervasive	Bleaching	
ML050352	moderate	red	discrete specks	Hematite	
ML050352	weak	white	weakly disseminated	Clay	
ML050352	moderate	maroon	patches	Hematite	
ML050352	weak		pervasive	Silicification	
ML050353	strong		pervasive	Bleaching	
ML050353	weak	red	irregular bands	Hematite	
ML050353	weak		pervasive	Silicification	
ML050354	strong		pervasive	Silicification	
ML050354	weak	orange	irregular	Hematite	
ML050354	weak		vein/veinlets	Quartz	
ML050355	weak	maroon	discrete specks	Hematite	
ML050355	weak		pervasive	Silicification	
ML050355	moderate		pervasive	Bleaching	
ML050355	weak	orange	irregular	Hematite	
ML050355	weak	purple	irregular bands	Diagenetic hematite	
ML050356	weak	orange	pervasive	Hematite	
ML050356	moderate		pervasive	Bleaching	
ML050357	weak	colourless	weakly disseminated	Mica	
ML050357	weak	orange	irregular bands	Hematite	
ML050357	strong		pervasive	Bleaching	
ML050357	weak	yellow	disseminated	Clay	
ML050358	weak	orange	irregular bands	Hematite	
ML050358	strong		pervasive	Bleaching	
ML050358	weak	white	disseminated	Clay	
ML050359	strong		pervasive	Bleaching	
ML050359	weak	orange	irregular	Hematite	
ML050359	moderate	red	fracture coating	Hematite	
ML050360	weak	white	disseminated	Clay	
ML050360	moderate		irregular bands	Bleaching	
ML050360	weak	red	irregular bands	Hematite	
ML050360	strong		pervasive	Bleaching	strongly bleached granule stone horizons
ML050361	strong	white	bedding controlled	Clay	
ML050361	weak	white	disseminated	Clay	
ML050361	weak	orange	irregular bands	Hematite	
ML050361	strong		pervasive	Bleaching	
ML050362	weak	white	bedding controlled	Clay	
ML050362	strong		pervasive	Silicification	
ML050362	strong		pervasive	Bleaching	
ML050362	moderate	red	irregular bands	Hematite	
ML050363	moderate		pervasive	Bleaching	
ML050363	moderate	red	irregular bands	Hematite	
ML050363	strong	red	intraclasts	Clay	
ML050363	weak	yellow	disseminated	Clay	
ML050364	weak	yellow	disseminated	Clay	
ML050364	moderate	white	disseminated	Clay	
ML050364	strong		pervasive	Bleaching	
ML050364	weak	red	irregular	Hematite	
ML050364	moderate		irregular	Bleaching	
ML050365	strong		pervasive	Bleaching	
ML050365	moderate	orange	irregular bands	Hematite	
ML050365	moderate	white	disseminated	Clay	
ML050365	weak	orange	discrete spots	Hematite	
ML050366	weak		pervasive	Silicification	
ML050366	moderate	white	intraclasts	Clay	
ML050366	strong		pervasive	Bleaching	
ML050366	moderate	orange	irregular bands	Hematite	
ML050367	strong		pervasive	Bleaching	
ML050367	weak	white	disseminated	Silicification	
ML050367	weak	orange	irregular bands	Hematite	
ML050367	moderate	white	intraclasts	Clay	rare clay intraclasts
ML050367	weak		pervasive	Silicification	
ML050368	weak		fracture coating	Quartz	
ML050368	moderate	pink	intraclasts	Clay	thin clay intraclasts
ML050368	moderate	orange	irregular bands	Hematite	
ML050368	moderate		pervasive	Bleaching	
ML050369	weak	pink	pervasive	Hematite	
ML050369	moderate	black	discrete spots	Oxides (General)	spots and blotches throughout sandstone
ML050369	weak	white	disseminated	Clay	
ML050369	moderate	red	irregular	Hematite	
ML050369	moderate		pervasive	Bleaching	
ML050370	weak		pervasive	Bleaching	
ML050370	moderate	maroon	pervasive	Hematite	

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Sample Number	Intensity	Colour	Distribution	Alteration	Comments
ML050370	strong	maroon	discrete spots	Hematite	
ML050370	moderate	red	discrete spots	Hematite	
ML050370	weak		pervasive	Silicification	
ML050371	weak	red	fracture coating	Hematite	
ML050371	strong	purple	pervasive	Diagenetic hematite	
ML050371	moderate	white	fracture coating	Clay	
ML050371	weak	white	mineral control	Clay	feldspar alteration
ML050372	strong		vein/veinlets	Drusy quartz	chaotic drusy quartz veining
ML050372	strong	red	clasts	Hematite	sandstone clasts
ML050372	moderate	orange	vein/veinlets	Limonite	limonite on quartz veining
ML050372	moderate	maroon	breccia filling	Hematite	hematitic breccia groundmass
ML050373	strong	maroon	pervasive	Hematite	
ML050373	moderate		vug controlled	Bleaching	
ML050374	strong	maroon	pervasive	Hematite	
ML050374	moderate	maroon	matrix	Hematite	
ML050374	moderate	red	matrix	Hematite	
ML050374	moderate	white	disseminated	Clay	
ML050375	weak	white	vein/veinlets	Quartz	
ML050375	weak	maroon	fracture coating	Hematite	
ML050375	weak	orange	irregular	Hematite	
ML050375	strong		pervasive	Bleaching	
ML050376	moderate		vein/veinlets	Quartz	
ML050376	weak	white	pervasive	Clay	
ML050376	moderate	green	mineral control	Clay	feldspar alteration
ML050376	weak	red	fracture coating	Hematite	
ML050378	strong	red	enveloping	Hematite	alteration halo surrounding qtz vein
ML050378	moderate	orange	irregular	Limonite	
ML050378	strong	colourless	vein/veinlets	Quartz	
ML050378	moderate	yellow	mineral control	Clay	alteration of feldspars
ML050378	moderate	white	pervasive	Clay	
ML050378	moderate	red	surficial coating	Hematite	
ML050379	moderate	WG	moderately disseminated	Clay	
ML050379	moderate	maroon	pervasive	Hematite	
ML050379	moderate	red	discrete spots	Hematite	
ML050379	weak	colourless	disseminated	Mica	detrital mica
ML050380	strong		pervasive	Bleaching	
ML050380	strong	WG	pervasive	Clay	
ML050380	weak	red	irregular	Hematite	
ML050380	weak	orange	fracture coating	Limonite	
ML050381	moderate	WG	pervasive	Clay	sandstone clasts
ML050381	moderate	orange	irregular	Limonite	
ML050381	weak	red	banded	Hematite	within sandstone
ML050381	strong	maroon	breccia filling	Hematite	
ML050383	moderate	white	moderately disseminated	Clay	
ML050383	strong	maroon	pervasive	Hematite	
ML050383	strong	red	rock type control	Hematite	hematite altered volcanic clasts
ML050384	weak	pink	weakly disseminated	Clay	
ML050384	moderate	purple	irregular bands	Diagenetic hematite	
ML050384	weak	orange	irregular bands	Hematite	
ML050385	moderate	red	surficial coating	Hematite	
ML050385	moderate	purple	pervasive	Diagenetic hematite	
ML050385	moderate		irregular bands	Bleaching	
ML050385	weak	white	interstitial	Clay	
ML050386	moderate	red	pervasive	Hematite	
ML050386	moderate		irregular bands	Bleaching	
ML050386	weak		pervasive	Silicification	
ML050387	weak	white	fracture coating	Quartz	
ML050387	moderate		pervasive	Silicification	
ML050387	weak	orange	pervasive	Hematite	
ML050388	weak	orange	pervasive	Hematite	
ML050388	weak	red	liesegang	Hematite	
ML050388	moderate		pervasive	Bleaching	
ML050388	weak	white	weakly disseminated	Clay	
ML050388	weak		pervasive	Silicification	
ML050389	weak	purple	patches	Diagenetic hematite	
ML050389	weak	white	weakly disseminated	Clay	
ML050389	weak		pervasive	Silicification	
ML050389	strong		pervasive	Bleaching	
ML050389	weak	orange	irregular bands	Hematite	
ML050390	weak		fracture coating	Quartz	
ML050390	strong	white	intraclasts	Clay	
ML050390	strong		pervasive	Bleaching	
ML050390	weak	orange	irregular bands	Hematite	
ML050391	weak	red	irregular bands	Hematite	
ML050391	moderate	red	surficial coating	Hematite	



**Manylluluk Project EL9452 - Alteration**

Sample Number	Intensity	Colour	Distribution	Alteration	Comments
ML050391	strong		pervasive	Bleaching	
ML050391	weak		pervasive	Silicification	
ML050392	weak	orange	irregular bands	Hematite	
ML050392	weak	orange	patches	Limonite	
ML050392	weak	white	disseminated	Clay	
ML050392	moderate		pervasive	Bleaching	
ML050393	strong		pervasive	Bleaching	
ML050393	weak	orange	irregular bands	Hematite	
ML050393	weak		pervasive	Silicification	
ML050394	weak		pervasive	Silicification	
ML050394	moderate	orange	intraclasts	Clay	
ML050394	weak	orange	irregular bands	Hematite	
ML050394	strong		pervasive	Bleaching	
ML050395	moderate	red	pervasive	Hematite	
ML050395	strong		irregular bands	Bleaching	
ML050395	weak	pink	disseminated	Clay	
ML050396	moderate		pervasive	Silicification	
ML050396	moderate		pervasive	Bleaching	
ML050396	weak	orange	pervasive	Hematite	
ML050397	moderate	white	vein/veinlets	Quartz	
ML050397	strong		pervasive	Silicification	
ML050398	weak	green	disseminated	Clay	
ML050398	weak	black	discrete spots	Oxides (General)	
ML050398	moderate		discrete spots	Bleaching	
ML050398	strong	purple	pervasive	Diagenetic hematite	
ML050398	weak	white	disseminated	Clay	
ML050399	weak	black	discrete spots	Oxides (General)	
ML050399	weak	purple	pervasive	Diagenetic hematite	
ML050399	moderate	red	patches	Hematite	
ML050399	weak	white	vein/veinlets	Quartz	
ML050399	weak	white	disseminated	Clay	
ML050399	moderate		pervasive	Bleaching	
ML050400	weak	white	disseminated	Clay	
ML050400	moderate	red	intraclasts	Clay	
ML050400	weak	pink	pervasive	Hematite	
ML050400	weak		pervasive	Silicification	
ML050400	moderate		pervasive	Bleaching	
ML050401	weak		fracture coating	Quartz	
ML050401	weak	pink	pervasive	Hematite	
ML050401	strong		pervasive	Silicification	
ML050402	strong		pervasive	Bleaching	
ML050402	weak		pervasive	Silicification	
ML050402	weak	white	disseminated	Clay	
ML050402	weak	orange	surficial coating	Hematite	
ML050403	moderate		irregular bands	Bleaching	
ML050403	weak	red	irregular	Hematite	
ML050403	weak	white	disseminated	Clay	
ML050403	moderate	purple	irregular bands	Diagenetic hematite	
ML050800	moderate	white	replacement	Clay	
ML050801	moderate	purple	replacement	Clay	clay replacing fx and pyroxene, possibly illite
ML050802	weak	purple	pervasive	Diagenetic hematite	
ML050803	strong	purple	pervasive	Specular hematite	heavy specular hematite alteration
ML050804	moderate	buff	pervasive	Silicification	
ML050807	moderate	purple	pervasive	Diagenetic hematite	
ML050809					variable silicification over local area
ML050810	moderate	purple	pervasive	Diagenetic hematite	
ML050812	moderate	purple	banded	Diagenetic hematite	
ML050814	moderate	purple	pervasive	Diagenetic hematite	alteration of cobbles and boulders in fanglomerate
ML050814	moderate	purple	pervasive	Silicification	silicification of cobbles
ML050815	weak	maroon	pervasive	Diagenetic hematite	
ML050815	weak	orange	interstitial	Clay	
ML050816	weak	pink	interstitial	Clay	
ML050816	weak	red brown (rust)	pervasive	Hematite	
ML050817	weak	maroon	pervasive	Diagenetic hematite	
ML050818	weak	pink	pervasive	Silicification	
ML050820	moderate	maroon	pervasive	Diagenetic hematite	
ML050820	weak	white	drusy quartz	Quartz	
ML050820	strong	white	vein/veinlets	Quartz	
ML050821	moderate	white	vein/veinlets	Quartz	
ML050821	weak	white	pervasive	Silicification	
ML050821	weak	maroon	pervasive	Diagenetic hematite	
ML050822	moderate	white	pervasive	Silicification	
ML050823	weak	maroon	pervasive	Diagenetic hematite	
ML050823	weak	black	botryoidal	Manganese	

**Manylluluk Project EL9452 - Alteration**

Sample Number	Intensity	Colour	Distribution	Alteration	Comments
ML050825	moderate	grey	pervasive	Silicification	
ML050828	weak	white	pervasive	Silicification	
ML050829	moderate	grey	pervasive	Silicification	
ML050831	weak	orange	pervasive	Silicification	
ML050832	moderate	orange	pervasive	Silicification	
ML050835	weak	grey	pervasive	Silicification	
ML050836	weak	grey	pervasive	Silicification	
ML050837	moderate	pink	pervasive	Silicification	
ML050838	weak	cream	interstitial	Clay	
ML050839	weak	purple	pervasive	Silicification	
ML050839	moderate	purple	pervasive	Diagenetic hematite	
ML050840	weak	grey	pervasive	Silicification	
ML050841	weak	orange	mineral control	Clay	alteration possibly related to silicified hematitic breccia 10m away striking 315
ML050842	weak	purple	mineral control	Clay	
ML050843	moderate	purple	pervasive	Diagenetic hematite	
ML050843	weak	white	interstitial	Clay	
ML050844	strong	purple	pod hosted disseminated	Specular hematite	
ML050845	weak	white	mineral control	Clay	
ML050846	moderate	pink	pervasive	Silicification	
ML050847	moderate	purple	pervasive	Diagenetic hematite	
ML050847	moderate	purple	pervasive	Silicification	
ML050848	weak	white	mineral control	Clay	clay alteration of fx