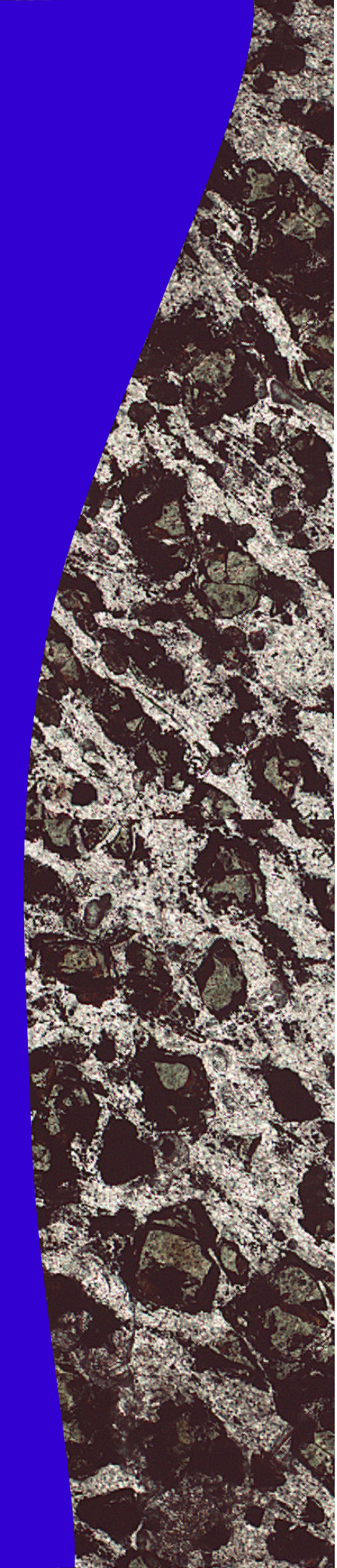

PETROGRAPHIC REPORT
8 Samples from the Smithton Region, NW Tasmania

for

IMX Resources (Adelaide)
(attn. Ian Fahey)

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Petrographic Summary Report

Background

Eight representative samples of RC chips from drillholes in IMX Resources' NW Tasmanian tenements were submitted for petrographic examination, to enable accurate identification of the host rock mineralogy, rock-type and possible protolith and the nature and extent of any mineralization and mineralization-related alteration. Four samples were prepared as polished thin sections and four as standard thin sections. Offcut remnants from the thin section preparation of these rock chips, and also the thin sections themselves, have been scanned to provide a better context for the petrographic descriptions and photomicrographs.

Regional Setting and Major Lithologies

Although I have no information on the exact location of the tenements in the Smithton – Montague area, the rocks submitted for thin section examination are clearly representative of the late Neoproterozoic Spinks Creek Volcanics and associated volcaniclastic unit , the Keppel Creek Formation. These regionally extensive formations comprise submarine tholeiitic basalts with rift tholeiite affinities, abundant interbedded and overlying volcaniclastic metasediments locally derived from this basalt succession, and common (meta)dolerite dykes which are feeders to the basalts. The same mafic volcanic rocks are well exposed on the SE coast of King Island, where the package also includes abundant very olivine-rich, picritic lavas.

Rocks submitted for petrographic description in this represent either mafic meta-igneous lithologies, or volcaniclastic sandstones derived largely from the mafic igneous rocks. Petrographic variations of these two lithological groups and their implications are given below.

Mafic Meta-igneous Rocks

Prehnite-pumpellyite- to low greenschist facies meta-mafic igneous rocks are present in RC chips from holes WMRC04, SRRC03 and SRRC04. Lavas are present in WMRC04 (69-70m) and SRRC03 (92-93m), both being typical sparsely plagioclase+augite-phyric metabasalts with fresh augite and fresh to albitized plagioclase, with common leucoxene-altered FeTi oxides typical, of the Neoproterozoic rift tholeiitic basalts and dolerites of the Smithton Trough. Dolerite chips in WMRC04@69-70m show characteristic ophitic textures of plagioclase laths included within larger fresh augite grains, and carry occasional small chloritized olivine and fresh and altered plagioclase phenocrysts. Those in SRRC04 are slightly finer-grained metadolerite lacking olivine phenocrysts, and could be from either the core of a thick basaltic flow unit, or from a relatively thin dyke or sill.

A single chip in SRRC03@76-77m is an unusual, abundantly and very finely olivine-phyric picritic intrusive rock (picritic dolerite) in which small chloritized olivine crystals are intergrown with thoroughly sericitized plagioclase. This rock has much in common with the picritic rocks of the age on SE King Island, which are interpreted as second stage melts of depleted mantle in a developing volcanic passive margin (Meffre et al., 2004).

Volcaniclastic Sedimentary Rocks

Mainly fine-grained sandstones with textures and clast components defining them as lithic wackes are present in SRRC03 (all three samples), SRRC06 (64-65m) and WMRC04 (45-46m). All are framework-supported or nearly so, with the dominant clasts being 0.2-2mm-sized, subrounded grains of mainly formerly glassy, now chloritized basalts, and occasional quenched basalts with tiny plagioclase microlites in chloritized glass. Mineral clasts include chloritized augite, less common albitized and sericitized plagioclase crystals, and common, distinctive red to red-brown detrital chromite grains and altered FeTi oxide grains with characteristic ilmenite exsolution along octahedral planes. The matrix is always a murky chlorite-sericite-leucoxene +/- microcrystalline epidote intergrowth probably largely after comminuted mafic glass. These rocks all well match the typical fine volcaniclastic sandstones which dominate the Keppel Creek Formation of the Smithton Trough.

An interesting clast type in these lithic wackes is not uncommon (1-2modal%) of notably angular chips of quartz, all of which show no sign of trails of tiny gas/fluid inclusions, strained extinction, or polycrystalline grains that characterize quartz from gneissic metamorphic or granitic provenances. These detrital quartz grains have a very volcanic appearance, and may derive from a unit such as the 582 +/- 4Ma rhyodacitic flow recorded in the upper part of the Keppel Creek Formation (Calver *et al.,* 2004), and detrital grains of volcanic quartz are well known from Keppel Creek Formation lithic wackes (Everard et al., 2007).

Alteration and Mineralization

No magmatic sulfides are present in any sample examined from this set. The alteration assemblages, apart from several chlorite-carbonate-altered clasts, are typical of low grade regional metamorphic degradation (burial metamorphism) of mafic volcanic and volcaniclastic rocks. The chlorite+carbonate-altered clasts are typical of metabasaltic lithologies developed in small shearzones, and are probably not related to significant hydrothermal alteration. Abundant tiny pyrite framboids in lithic wacke sample SRRC03 60-61m are definitely of early diagenetic origin and are not hydrothermal alteration-related.

References

Calver, C.R. , Black, L.P. , Everard, J.L. , Seymour, D.B. 2004 U-Pb zircon age constraints on late Neoproterozoic glaciation in Tasmania. *Geology* 32, 893-896.

Everard, J.L. , Seymour, D.B. , Reed, A.R., McClenaghan, M.P., Green, D.C. and C. R. Calver. 2007. Regional geology of the Southern Smithton Synclinorium. Explanatory Report for the Roger, Sumac and Dempster 1:25 000 scale geological map sheets, far northwestern Tasmania. Mineral Resources Tasmania 1:25 000 Scale Digital Geological Map Series — Explanatory Report 2.

Meffre, S., Direen, N.G., Crawford, A.J. & Kamenetsky, V.S. 2004. Mafic volcanic rocks on King Island, Tasmania: evidence for 579 Ma break-up in east Gondwana. *Precambrian Research* 135, 177-191.

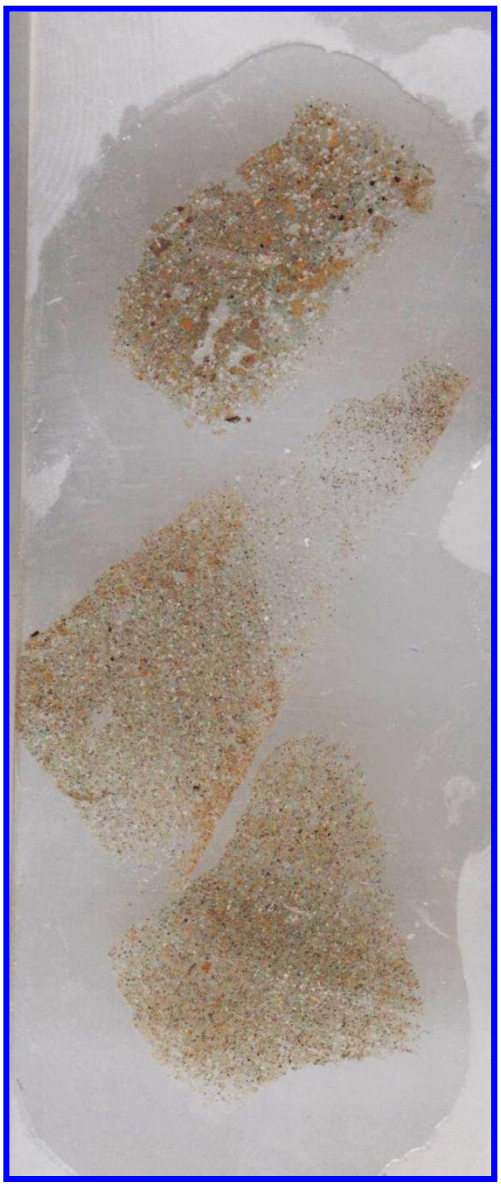
Table 1: Summary petrographic descriptions for Smithton tenement samples

HOLE ID	Depth (m)	Description
SRRC03	60-61	Fine-grained volcaniclastic sandstones (lithic wackes), one laminated with dark, microcrystalline epidote matrix in the darker bands, and one massive and not obviously bedded. Much of the clast population in both chips is formerly glassy mafic lavas, although minor volcanic quartz, red-brown chromites and sericitized detrital plagioclase phenocrysts are also present. Abundant tiny diagenetic pyrite framboids are present in both chips. POLISHED TS
SRRC03	76-77	Chip A is a weathered volcaniclastic sandstone (lithic wacke) dominated by sub-mm clasts of formerly glassy mafic lava. Chip B is a quite finely and strongly olivine-phyric intrusive picrite. Both rocks have a low greenschist facies metamorphic assemblage. STD TS
SRRC03	92-93	One chip in this sample is a typical, sparsely plagioclase+augite-phyric tholeiitic metabasalt of the Spinks Creek Volcanics, with a regional low-grade burial metamorphic assemblage. The other chip is a poorly sorted sandstone (lithic wacke) with occasional rounded lithic clasts to almost 1cm long, but common detrital, unrounded plagioclase phenocrysts. The sandstone shows quite strong chlorite-carbonate hydrothermal alteration but no sulfides. POLISHED TS
SRRC04	43-44	A coarse metabasalt or fine-grained metadolerite with a uppermost prehnite-pumpellyite facies burial metamorphic assemblage of albite-chlorite-leucoxene, occasional pumpellyite, and scattered spots and clots of epidote and epidosite (with interstitial tiny flecks of chalcopyrite). POLISHED TS
SRRC06	64-65	A fine sandstone with mafic lithic wacke composition dominated by formerly glassy, now thoroughly chloritized, basaltic volcanic detritus, and occasional angular quartz phenocrysts fragments from contemporaneous felsic volcanism. One chip shows weak chlorite-carbonate hydrothermal alteration, the others low greenschist facies regional burial metamorphic assemblages dominated by chlorite. STD TS
WMRC04	45-46	A volcaniclastic lithic wacke with a fine- to medium sandstone grainsize, and clasts mainly of chloritized basaltic glass, some with plagioclase microlites. Chromite and FeTi oxide clasts, derived from picritic lavas and tholeiitic dolerites respectively, are quite common. The metamorphic assemblage records low greenschist facies alteration. POLISHED TS
WMRC04	69-70	A lowest greenschist facies metamorphosed, sparsely and finely olivine+ plagioclase–phyric tholeiitic dolerite, with no sign of hydrothermal alteration. It is typical of dolerites associated with the Late Neoproterozoic Spinks Creek Volcanics in the Smithton Trough. STD TS
WMRC04	69-70	A weakly plagioclase+augite-phyric intergranular-textured metabasalt, typical of those in the Smithton Trough Neoproterozoic Spinks Creek Volcanics, and showing a top prehnite-pumpellyite facies regional burial metamorphic alteration assemblage. STD TS

SAMPLE NUMBER WMRCO4 45-46m

PETROGRAPHIC DESCRIPTION

These aircore chips all sample a volcaniclastic lithic wacke with a fine- to medium-sandstone grainsize, and clasts mainly of chloritized basaltic glass, some with plagioclase microlites. Chromite and FeTi oxide clasts, derived from picritic lavas and tholeiitic dolerites respectively, are quite common. The metamorphic assemblage records low greenschist facies alteration.



SAMPLE NUMBER

WMRCO4 45-46m

THIN SECTION DESCRIPTION

This sample consists of three aircore chips, two of which are petrographically identical low-grade burial metamorphosed, matrix-supported mafic volcaniclastic lithic wackes with a fine sandstone grainsize, whereas the third chip is a slightly coarser-grained lithic wacke, with clasts to 2mm long, although most are much smaller. The dominant clasts in all chips are angular sub-0.5mm chips of altered basaltic glass and glassy basaltic lava with tiny plagioclase microlites, with all glass now replaced by fresh and oxidized green chlorite. Coarser-grained chip C contains a few chips retaining fine-grained, quenched basaltic textures, with elongate to acicular altered plagioclase microlites set in chloritized glass. Other clast types in all three chips include occasional (1-2modal%) angular and broken quartz grains which appear to be volcanic (not strained, inclusion-riddled metamorphic or granitic quartz), common detrital red chromites with rounded melt inclusions indicating a volcanic derivation, common opaque detrital FeTi oxides, occasional sericite-altered former plagioclase grains, and mainly quite rounded cherty rock fragments, all set in a matrix dominated by messy green chlorite. The latter probably replaces very fine-grained, comminuted basaltic glass detritus.

ALTERATION, VEINING AND MINERALIZATION

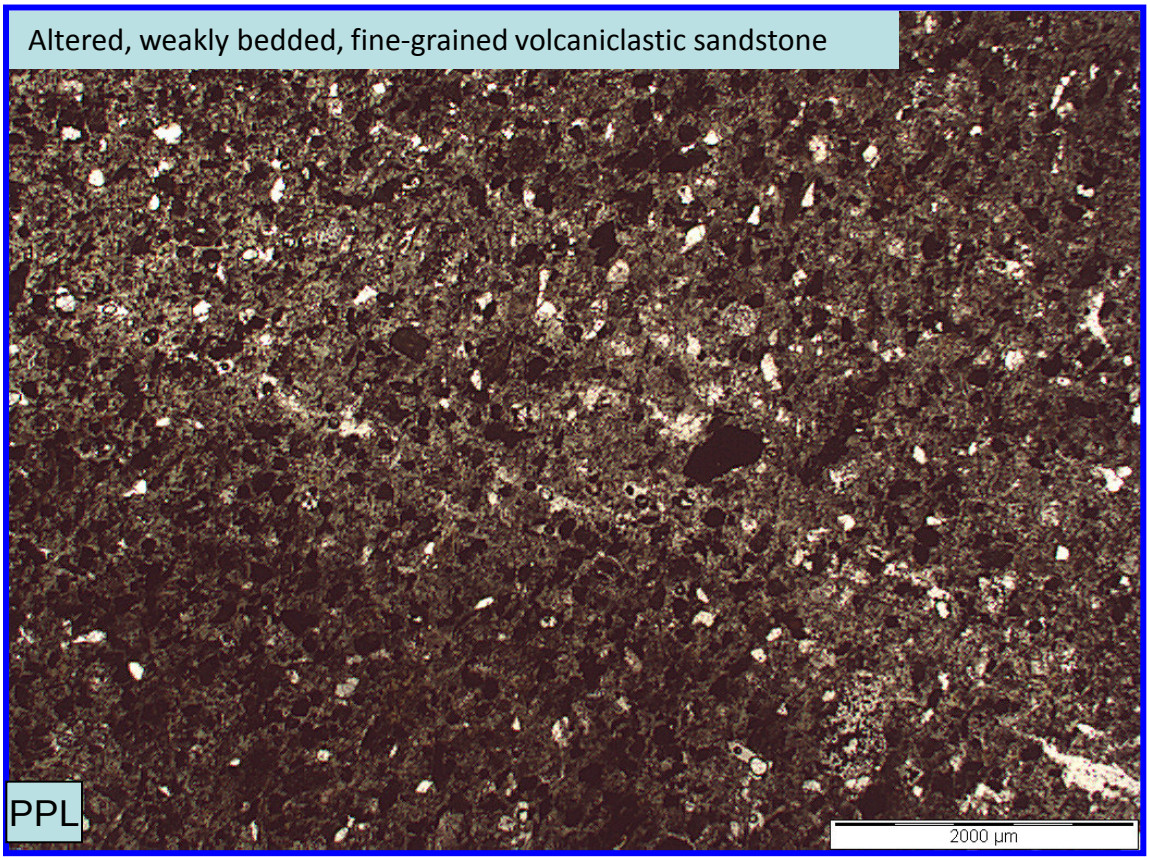
These chips lack veining, and the pervasive, strong chlorite alteration is probably a feature of the originally basaltic glass-rich, reactive clast- and matrix, rather than intense hydrothermal alteration. In reflected light, the chips are seen to carry quite common detrital FeTi oxide grains in which exsolution of ilmenite on octahedral planes is well developed, and others in which the magnetite is being replaced by hematite. The sample is devoid of pyrite and chalcopyrite.

Other Comments

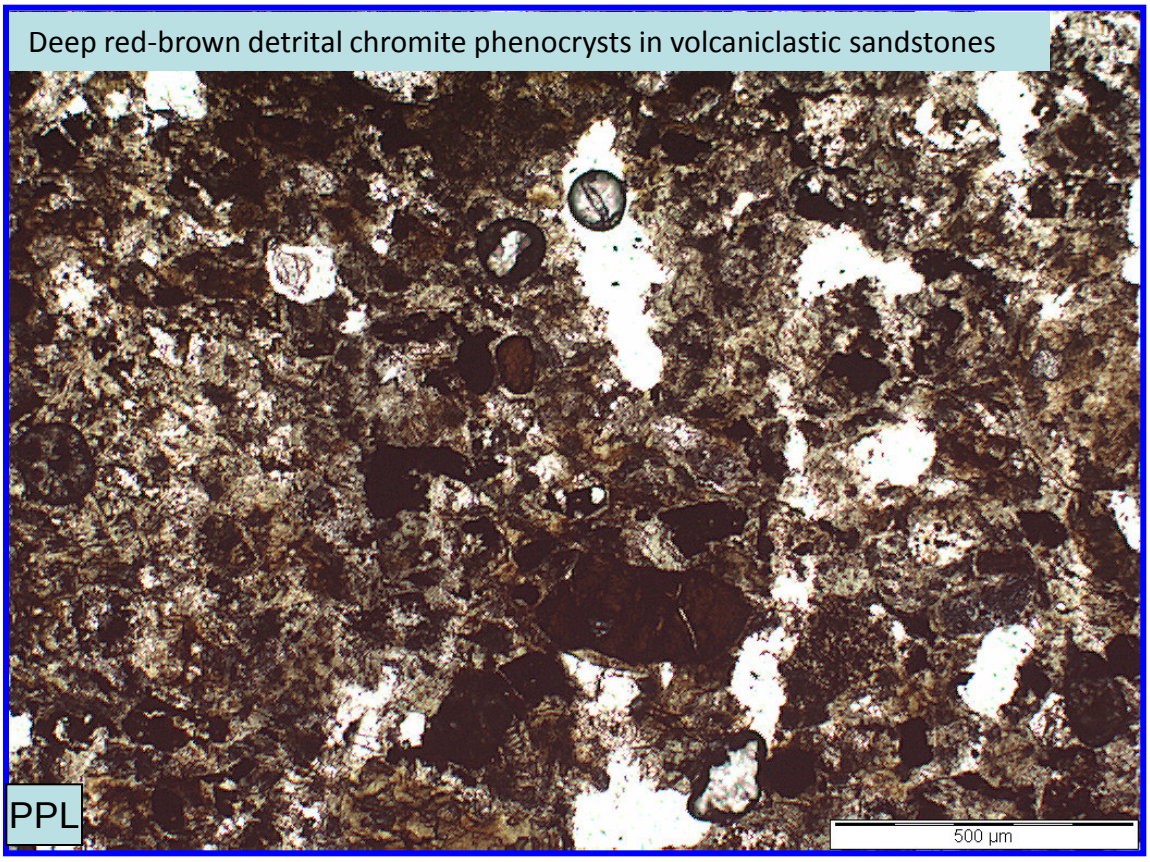
The detrital grain population in this rock is dominated by glassy chips from basaltic volcanics. The common FeTi oxides with ilmenite exsolution are almost certainly derived from doleritic dykes and sills, and the distinctive red detrital chromites from picritic lavas and primitive shallow intrusive rocks. The significance of these points is discussed in the Summary Report.

SAMPLE NUMBER WMRCO4 45-46m

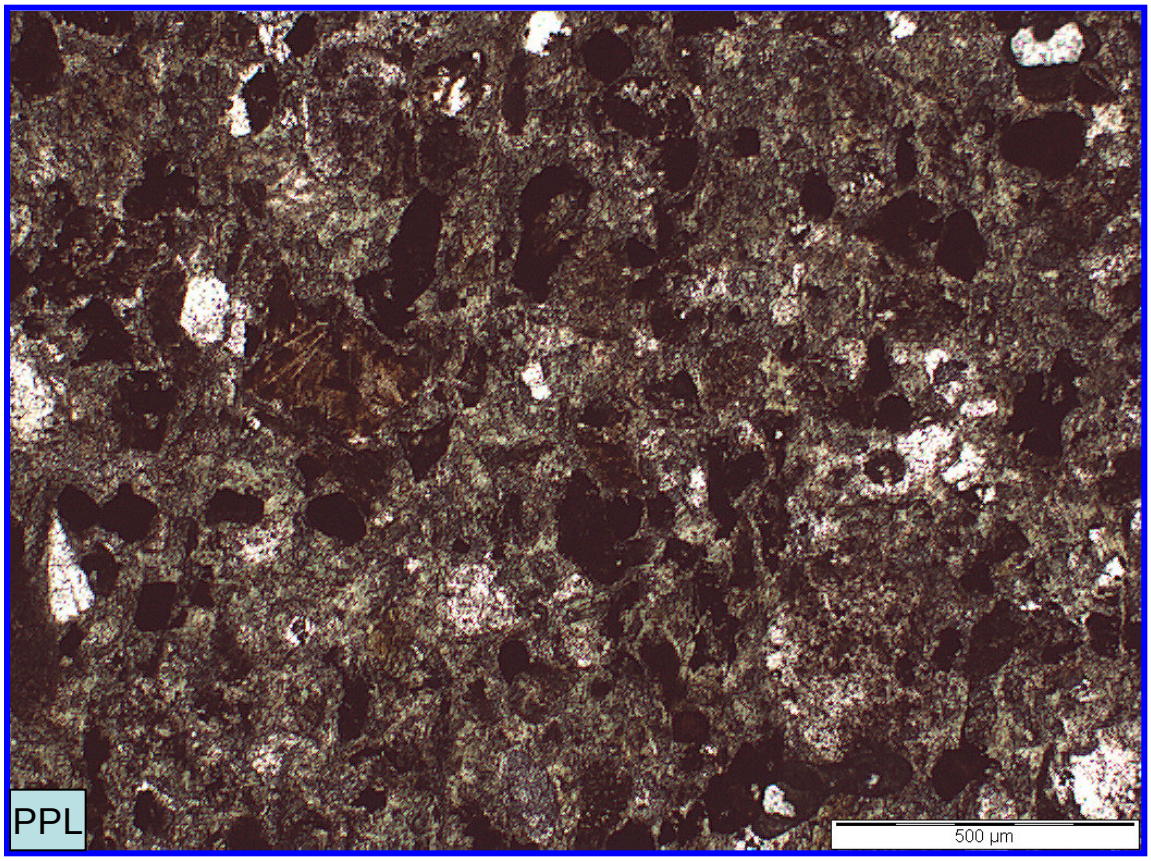
Altered, weakly bedded, fine-grained volcaniclastic sandstone

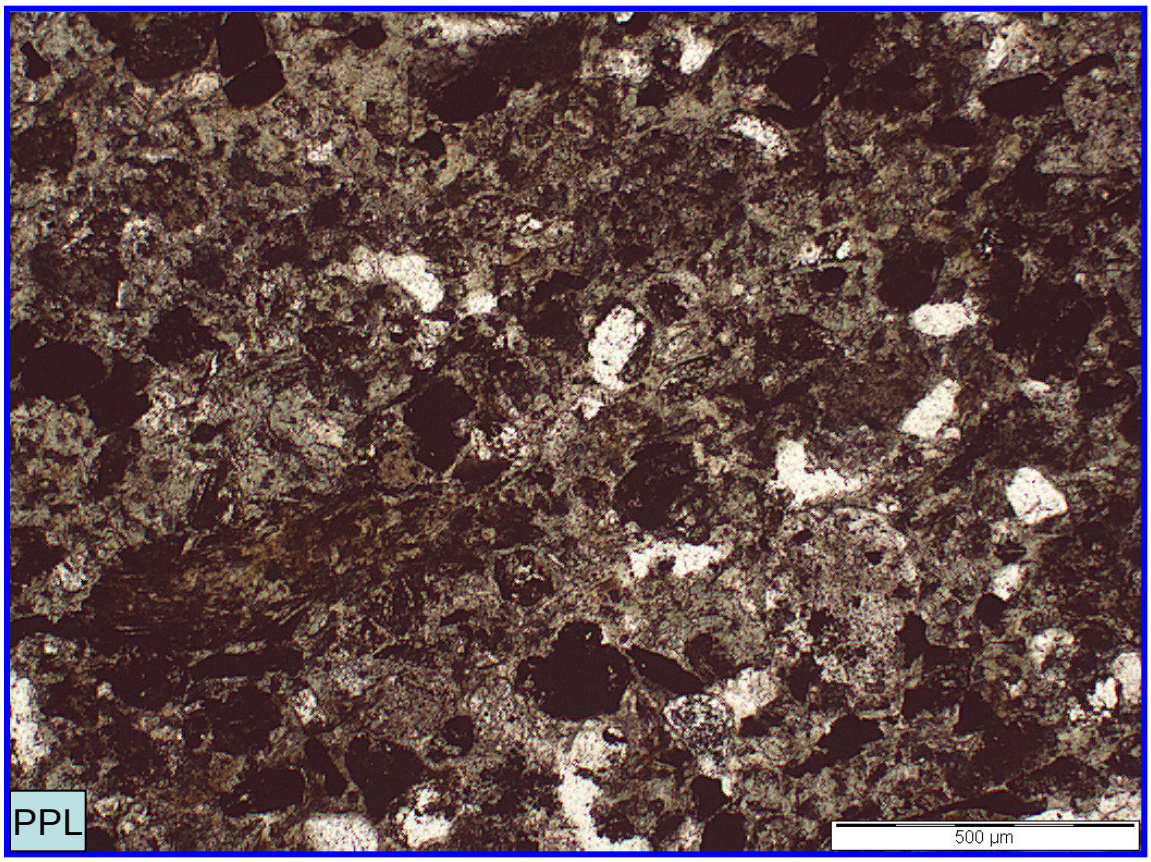


Deep red-brown detrital chromite phenocrysts in volcaniclastic sandstones



SAMPLE NUMBER WMRCO4 45-46m





SAMPLE NUMBER WMRC04 69-70m

PETROGRAPHIC DESCRIPTION

This is a lowest greenschist facies metamorphosed, sparsely and finely olivine+ plagioclase –phyric tholeiitic dolerite, with no sign of hydrothermal alteration. It is typical of dolerites associated with the Late Neoproterozoic Spinks Creek Volcanics in the Smithton Trough.

SAMPLE NUMBER WMRC04 69-70m

THIN SECTION DESCRIPTION

This sample consists of two petrographically identical aircore chips, both being sparsely and finely plagioclase+olivine-phyric, fairly fine-grained metadolerites with excellent textural preservation. Most of the rock consists of 0.2-2mm-sized partly altered plagioclase prisms intergrown with more blocky and equant fresh augite crystals, the latter commonly hosting or partly including small plagioclase laths and defining a typical ophitic to subophitic texture. Small (<1mm long), well formed former olivine crystals make up about 5modal% of this rock and are totally replaced by green chlorite. Some chloritized olivine crystals contain tiny chromite euhedra. Plagioclase is not albitized, but is fairly heavily peppered with microcrystalline epidote granules and not uncommon chlorite. All augite is perfectly fresh and shows no sign of actinolite fringes. FeTi oxides mainly smaller than 0.5mm across are common in interstitial domains between the major minerals, and all are totally altered to turbid leucoxenitic material. Interstitial areas between blocky augites and more prismatic plagioclases are filled by green chlorite, small yellow epidote granules and very minor quartz.

ALTERATION, VEINING AND MINERALIZATION

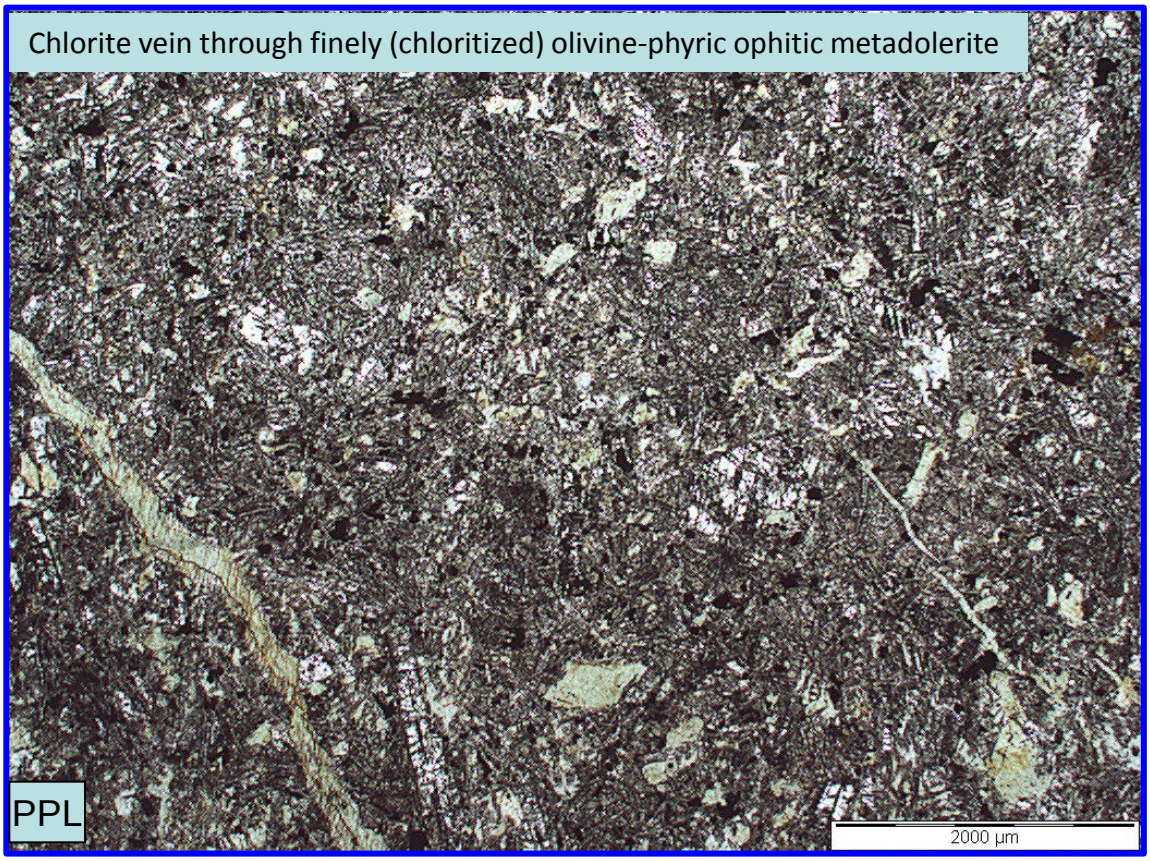
These chips are cut by a number of very narrow veinlets, including some composed solely of chlorite, and others composed of finely acicular epidote, chlorite and patchy prehnite.

Other Comments

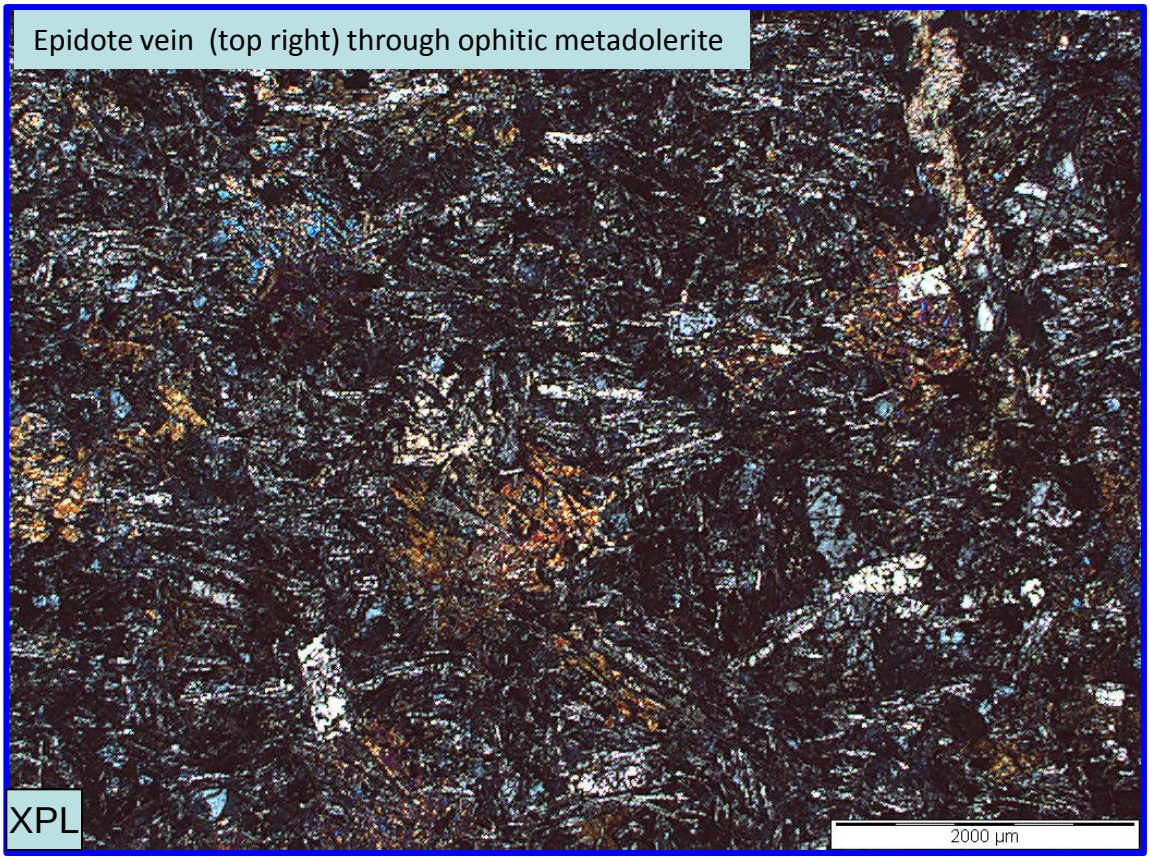
This rock is a typical tholeiitic dolerite associated with the Smithton Late Neoproterozoic Spinks Creek Volcanics. It shows a lowest greenschist facies regional burial metamorphic assemblage, and no sign of hydrothermal alteration.

SAMPLE NUMBER WMRC04 69-70m

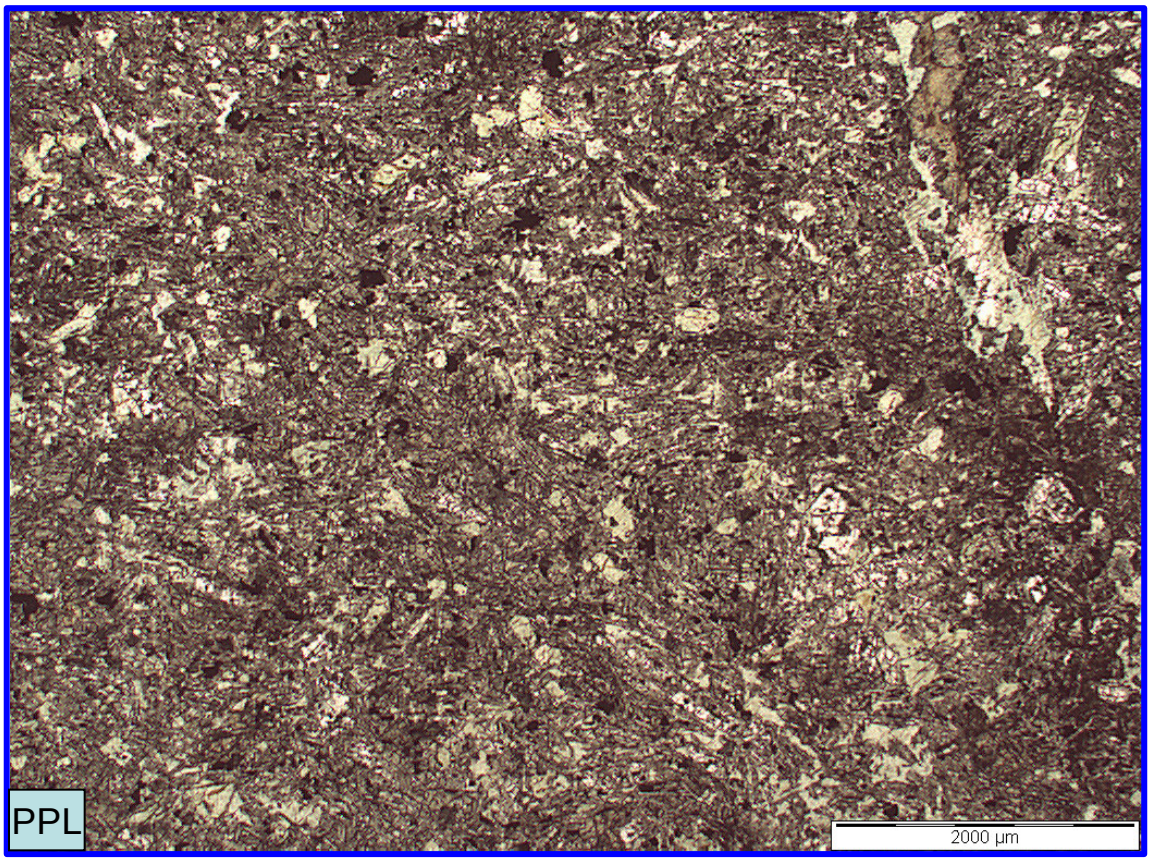
Chlorite vein through finely (chloritized) olivine-phyric ophitic metadolerite



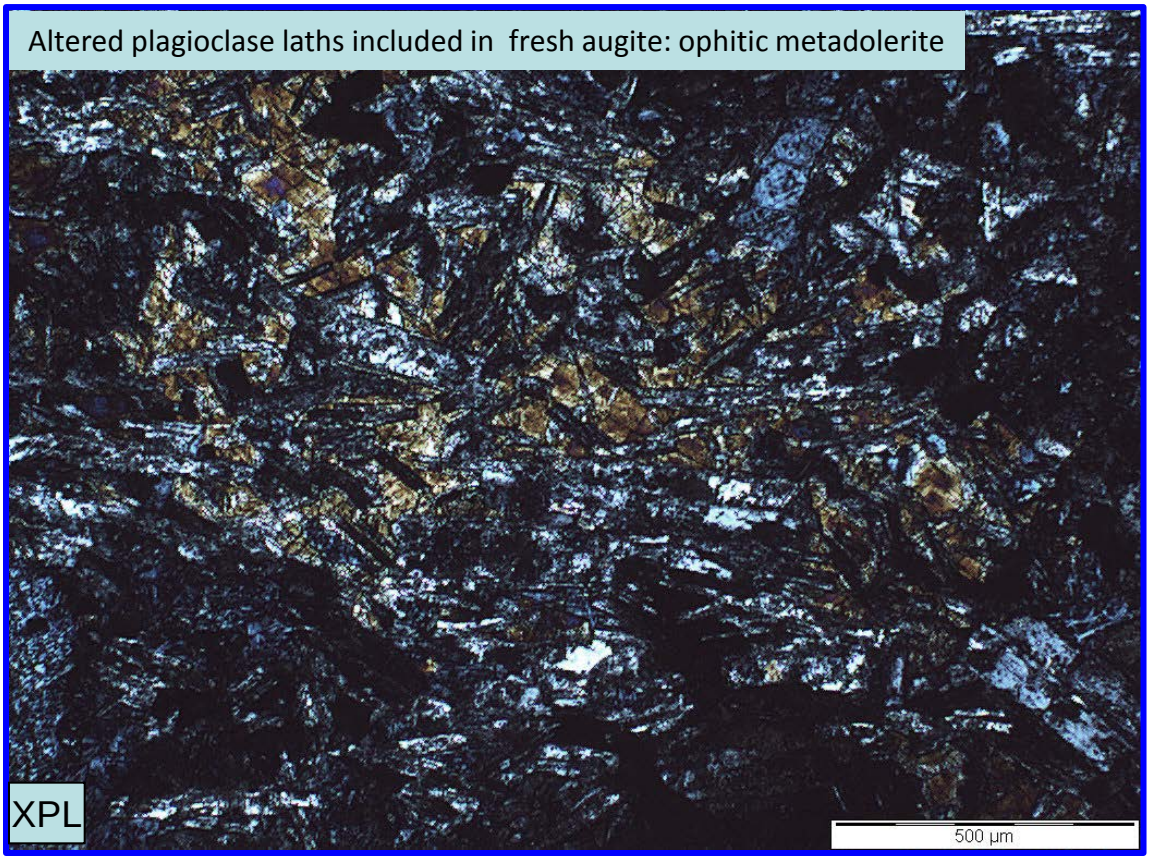
Epidote vein (top right) through ophitic metadolerite



SAMPLE NUMBER WMRC04 69-70m



Altered plagioclase laths included in fresh augite: ophitic metadolerite



SAMPLE NUMBER WMRC04 94-95m

PETROGRAPHIC DESCRIPTION

This is a weakly plagioclase+augite-phyric intergranular-textured metabasalt, typical of those in the Smithton Trough Neoproterozoic Spinks Creek Volcanics, and showing a top prehnite-pumpellyite facies regional burial metamorphic alteration assemblage.

SAMPLE NUMBER

WMRC04 94-95m

THIN SECTION DESCRIPTION

This sample consists of a single large aircore chip. The rock is a sparsely plagioclase+augite-phyric, intergranular-textured (meta)basaltic lava with a near-holocrystalline but rather fine-grained groundmass composed of a network of prismatic plagioclase crystals with interstices filled either by aggregates of fine-grained augite crystals, or by chlorite and leucoxene granules after tiny magmatic FeTi oxides. Plagioclase phenocrysts (<1modal%) are blocky prisms to at least 2mm long with common chlorite alteration. The few sub-mm augite phenocrysts are fresh, equant grains lacking any sign of actinolite alteration.

The elongate plagioclase laths dominating the groundmass of this rock average around 0.5mm long and are not albitized, but they show common spotting by chlorite and turbid, microcrystalline epidote. The small augite grains occurring as clusters interstitial to the plagioclase framework grains are fresh, but small FeTi oxides are entirely altered to tiny blebby grains of turbid leucoxene.

ALTERATION, VEINING AND MINERALIZATION

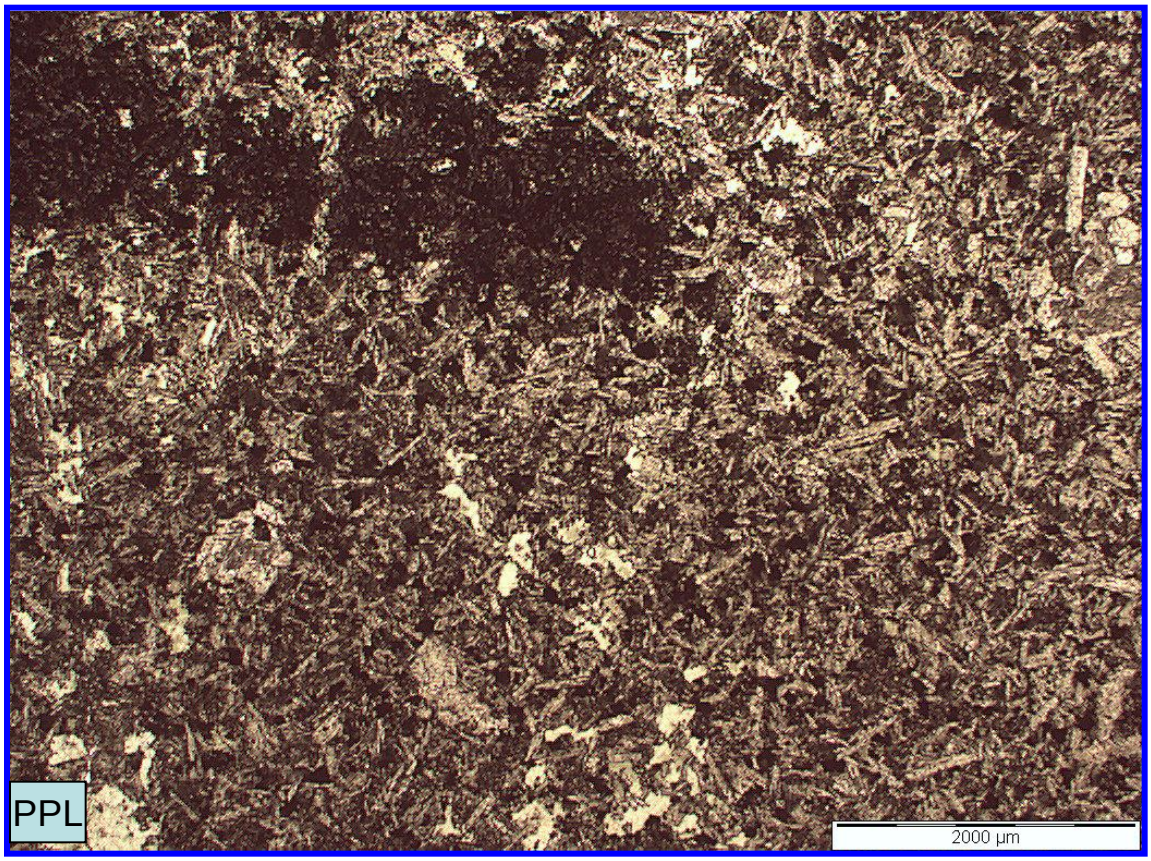
The main alteration of this rock is attributable to regional burial metamorphic degradation at uppermost prehnite-pumpellyite facies conditions. Occasional angular voids are filled with radial aggregates of pale chlorite, sometimes with intergrown fans of prehnite. A few narrow, laminated quartz-chlorite veinlets represent microshears along which repeated fracturing and fluid infiltration occurred during burial metamorphism.

The darker domains in this thin section, evident in the scanned images of both the thin section and the offcuts, represent near-surface manganese oxide-hydroxide alteration along grain boundaries and small fractures.

Other Comments

This is a typical Smithton Trough Spinks Creek Volcanics low-grade burial metamorphosed, tholeiitic metabasalt lava.

SAMPLE NUMBER WMRC04 94-95m



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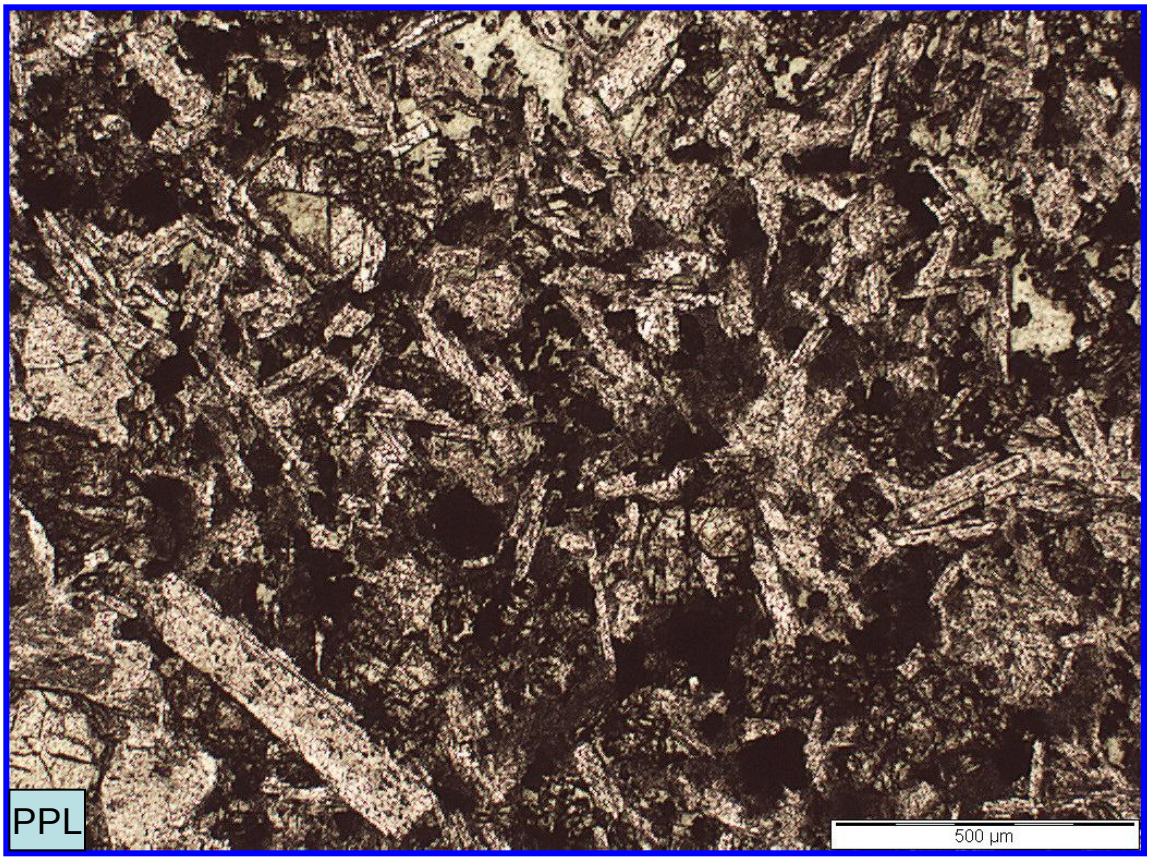
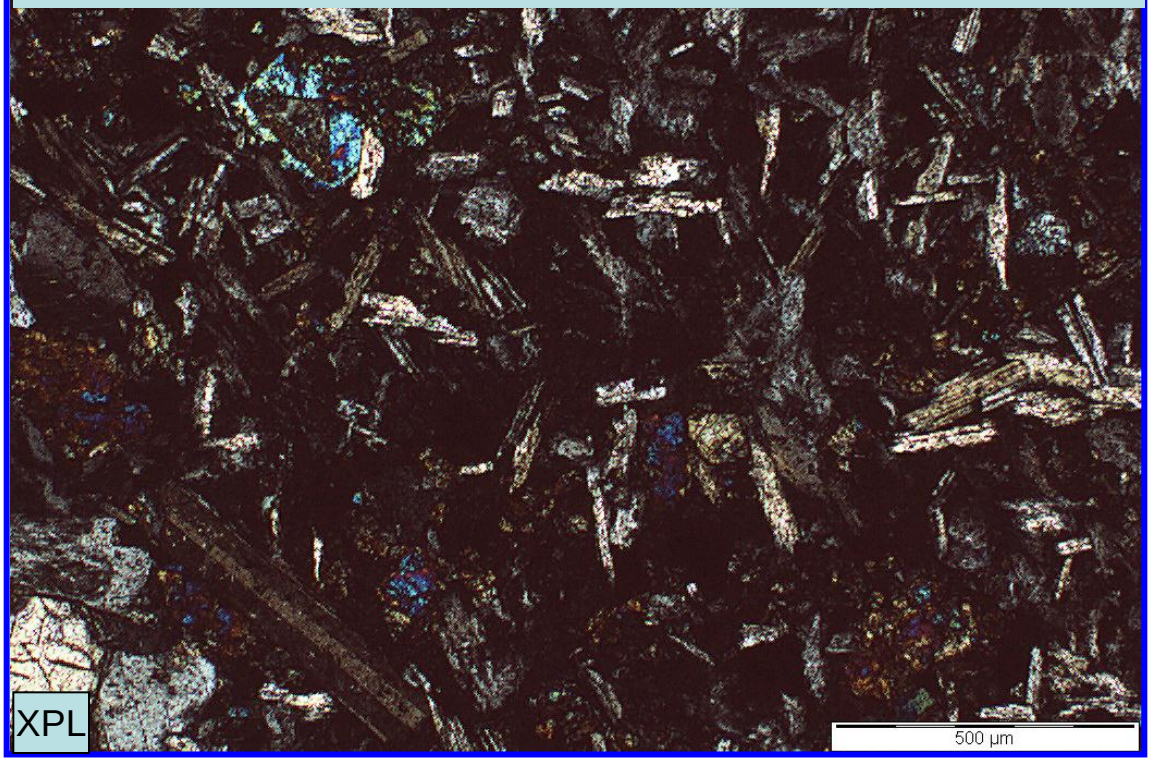


Albitized plagioclase laths and fresh augite granules with interstitial chlorite and turbid leucoxene



SAMPLE NUMBER SRRC03 60-61m

PETROGRAPHIC DESCRIPTION

These chips are fine-grained volcaniclastic sandstones, one laminated with dark, microcrystalline epidote matrix in the darker bands, and one massive and not obviously bedded. Much of the clast population in both chips is formerly glassy mafic lavas, although minor volcanic quartz, red-brown chromites and sericitized detrital plagioclase phenocrysts are also present. Abundant tiny pyrite framboids are present in both chips.

SAMPLE NUMBER

SRRC03 60-61m

THIN SECTION DESCRIPTION

This thin section samples two different rocks, one a laminated volcaniclastic sandstone, the other a more massive fine-grained volcaniclastic sandstone. In the latter, notably angular quartz grains around 0.1-0.2mm long, make up around 1% of the rock. However, murky and turbid, subrounded clasts of devitrified and altered, formerly glassy lava including occasional sericitized possibly felsic clasts, and far more abundant, formerly glassy mafic lava clasts variably altered to chlorite, and sericitized former plagioclase phenocrysts. Other clasts include common, brown-red detrital chromite grains, and detrital FeTi oxide grains. The matrix is a very fine-grained, turbid chlorite, sericite, fine-grained magnetite, and leucoxene intergrowth.

The more laminated metasediment is well bedded, with paler bands composed of thoroughly sericitized plagioclase phenocrysts and less common chloritized formerly glassy mafic clasts, and finer-grained, darker bands with few clasts, and a turbid matrix composed of brown microcrystalline epidote with abundant clusters of tiny globules of diagenetic pyrite. Bedding planes between the paler and darker bands are wavy on a 2-4mm scale and tend to pinch and swell, but the peaks and troughs are not associated with crenulation of a cleavage.

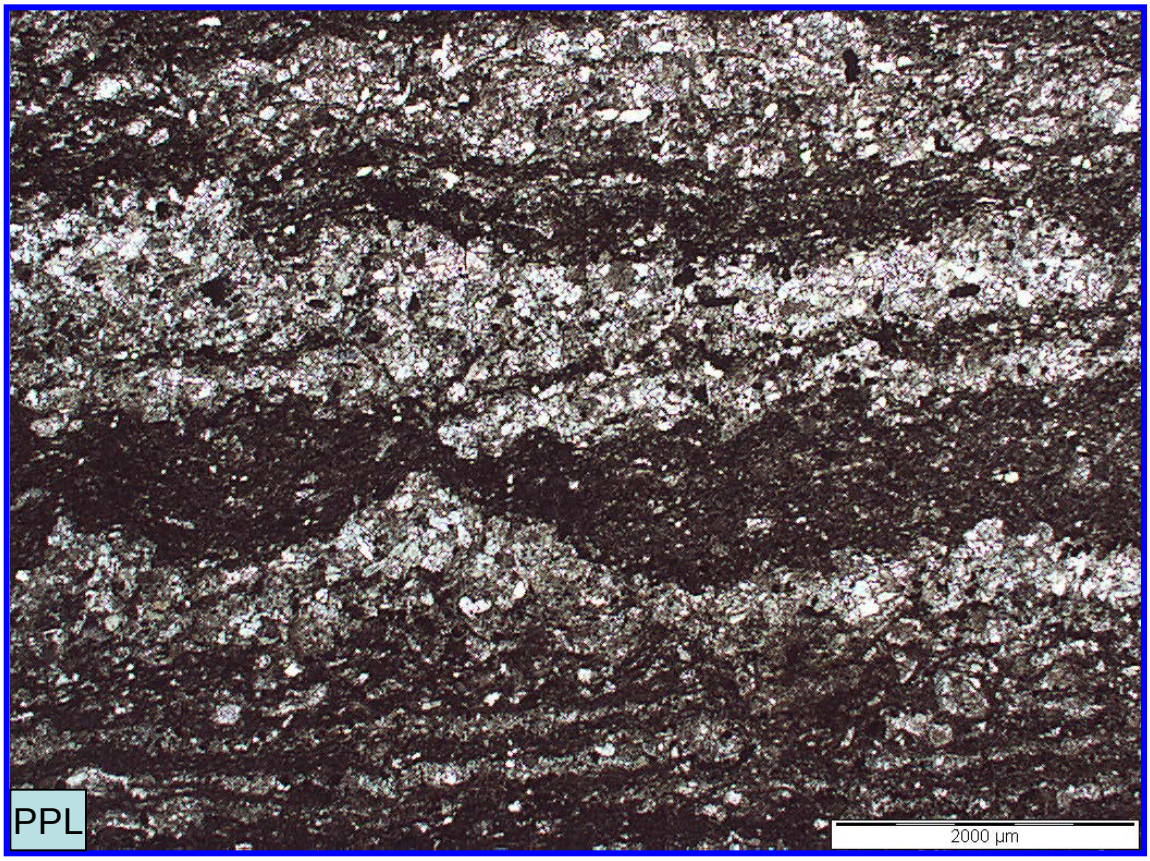
ALTERATION, VEINING AND MINERALIZATION

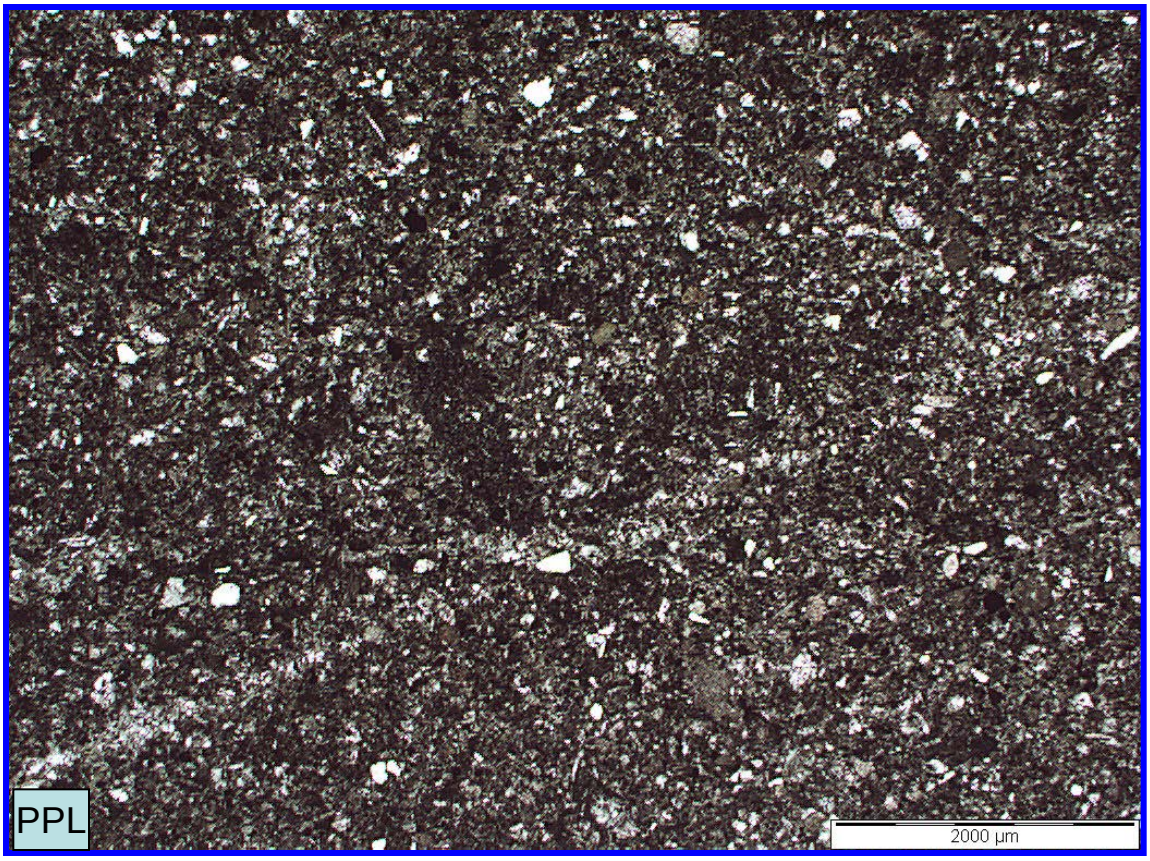
Both chips lacks veining, and the main alteration phase obvious in both chips in reflected light is diagenetic pyrite, present as common, sub-0.1mm framboids set in the matrix . No base metal mineralization is evident in either chip.

Other Comments

This is another volcaniclastic sandstone derived largely from glassy, probably submarine mafic lavas, including some very mafic units judging by the common detrital red-brown chromites. However, the not uncommon angular quartz fragments again appear to be volcanic and not gneissic or granitic in origin, implying the existence of felsic lavas in the provenance area of this sandstone. The metamorphic assemblage is typical of very low greenschist facies.

SAMPLE NUMBER SRRC03 60-61m





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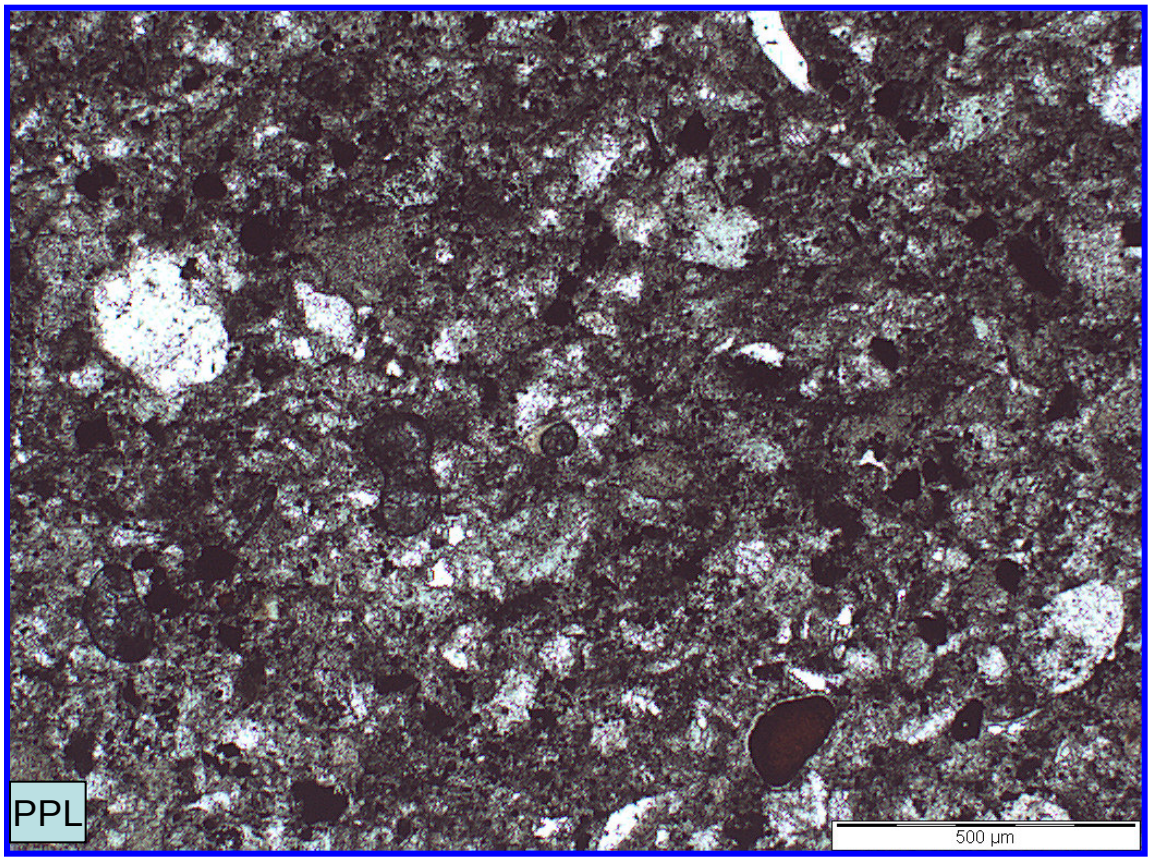
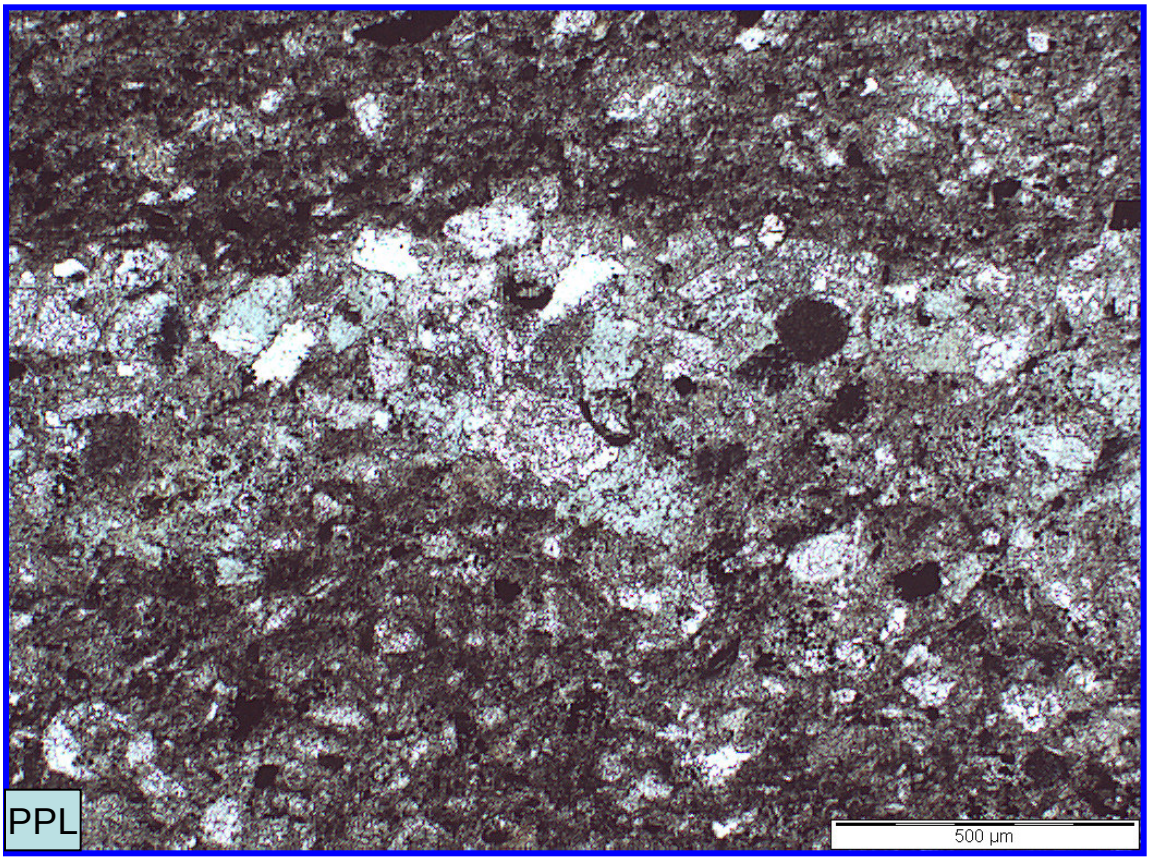
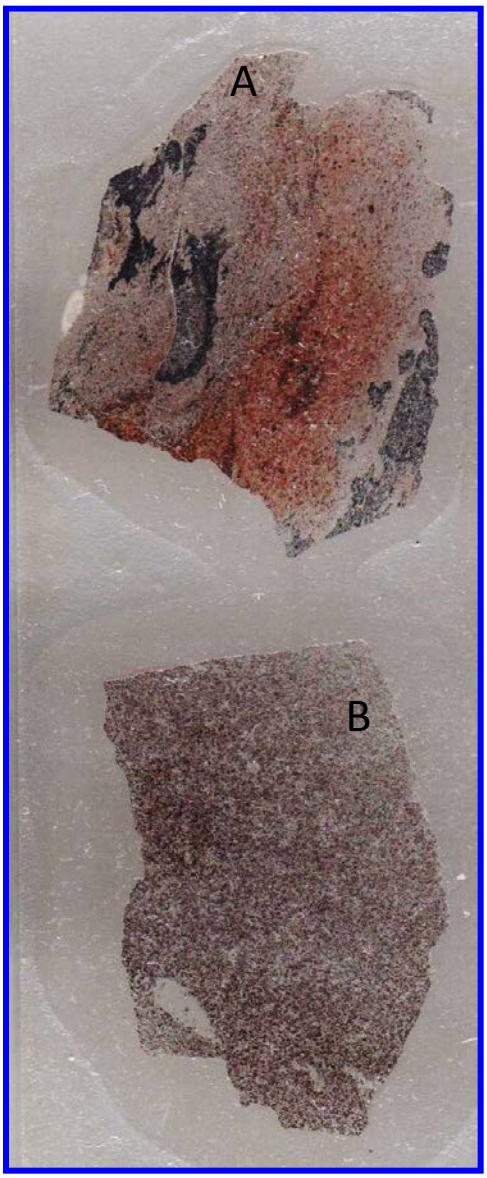




SAMPLE NUMBER SRRC03 76-77m

PETROGRAPHIC DESCRIPTION

Chip A is a weathered volcaniclastic sandstone (lithic wacke) dominated by sub-mm clasts of formerly glassy mafic lava. Chip B is a quite finely and strongly olivine-phyric intrusive picrite. Both rocks have a low greenschist facies metamorphic assemblage.



SAMPLE NUMBER

SRRC03 76-77m

THIN SECTION DESCRIPTION

This sample consists of two aircore chips, referred to herein as A and B (see scanned image of the thin section).

Chip A is a slightly weathered and oxidized, framework-supported volcaniclastic fine sandstone, best termed a lithic wacke, with clasts mainly smaller than 1mm across of formerly glassy mafic lavas , chloritized former mafic glass, and fine-grained siliceous metasediments (cherts?), as well as common 0.05-0.2mm-sized detrital opaque grains that may be include both detrital FeTi oxide grains and goethite-altered former glassy chips. Bedding is present but rather poorly expressed by subtle changes in the grainsize and clast concentration. Occasional clasts retain textures that were almost certainly those of bubble wall shards in basaltic scoria, in which the shards are now pseudomorphed by quartz. The matrix of this sandstone is a very fine-grained quartz-sericite intergrowth, peppered with small porphyroblastic grains of epidote which are zoned from more Fe-rich cores, to paler rims, with the Fe^{3+}-enriched cores often now showing rusty red alteration.

Chip B is an unusual fine-grained picritic intrusive rock, probably from a sill or dyke. It is composed of about 40-50modal% of small (always < 0.2mm long) altered former olivine phenocrysts set in a fine-grained quartz-sericite-altered groundmass containing scattered small epidote grains. Olivine phenocrysts were almost always euhedral, well formed, stout prisms and they are now replaced by green chlorite/serpentine, and all show black rims composed of Fe oxy-hydroxides (goethite, limonite). Occasional grains contain tiny chromite inclusions. The groundmass is strongly altered, but where best preserved appears to have been composed largely of elongate plagioclase laths 0.5-2mm long now replaced by the same quartz – sericite aggregates as the remainder of the altered groundmass.

ALTERATION, VEINING AND MINERALIZATION

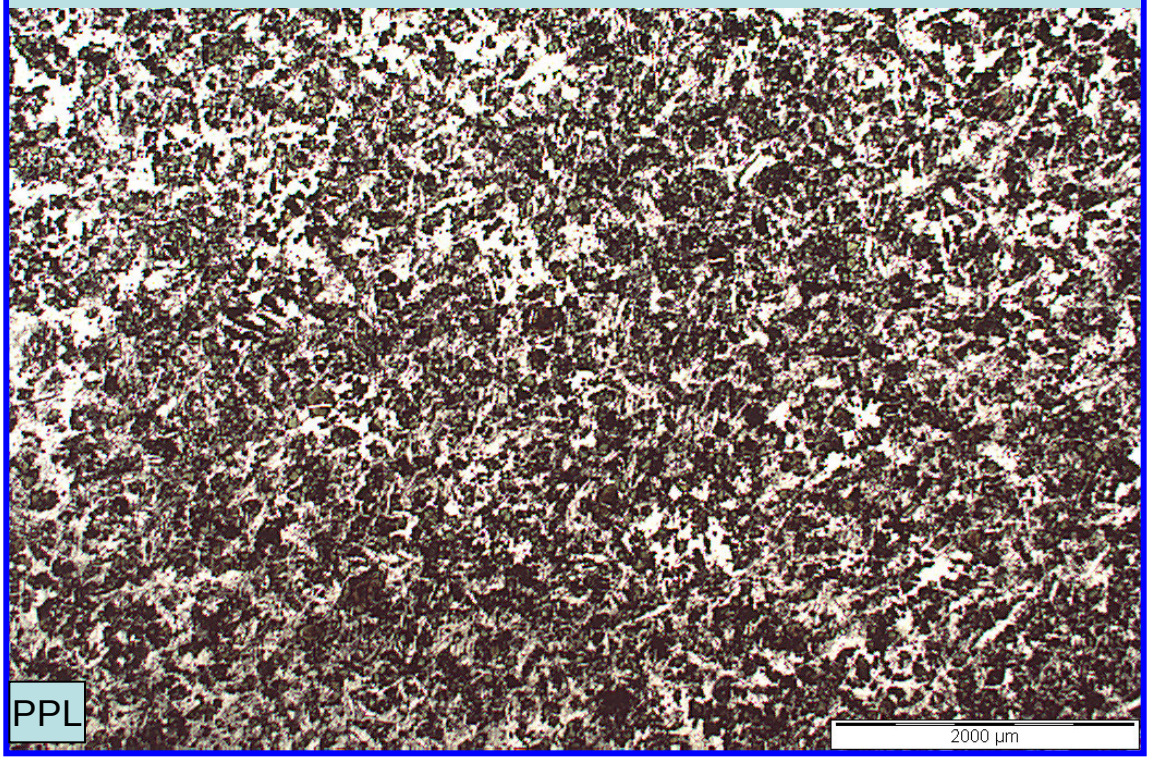
The pervasive alteration of these chips has been noted above. They are not veined, and there appears to be no sulfides in them (using a hand-held LED light on this unpolished slide). Bands of fine-grained goethite, obvious in the scanned images of the slide, pervade Chip 1 probably broadly parallel to the weathering surface.

Other Comments

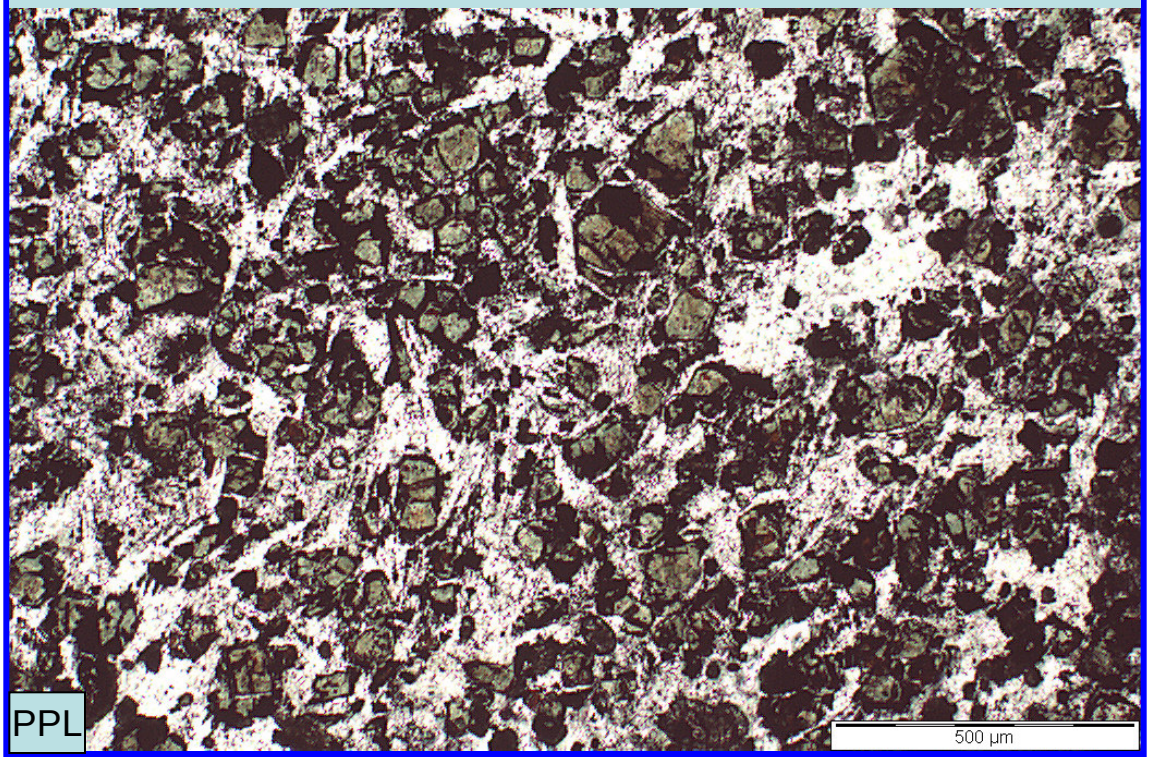
Chip B is a distinctive and unusual, quite primitive picritic intrusive rock akin to the picritic lavas of the same age on SE King Island (see discussion in Summary Report). Chip A derives from submarine, quenched and spalled glassy basaltic lavas. Alteration is typical of regional low-grade burial metamorphism.

SAMPLE NUMBER SRRC03 76-77m

Chip B - abundant small, chloritized olivine crystals intergrown with sericitized plagioclase

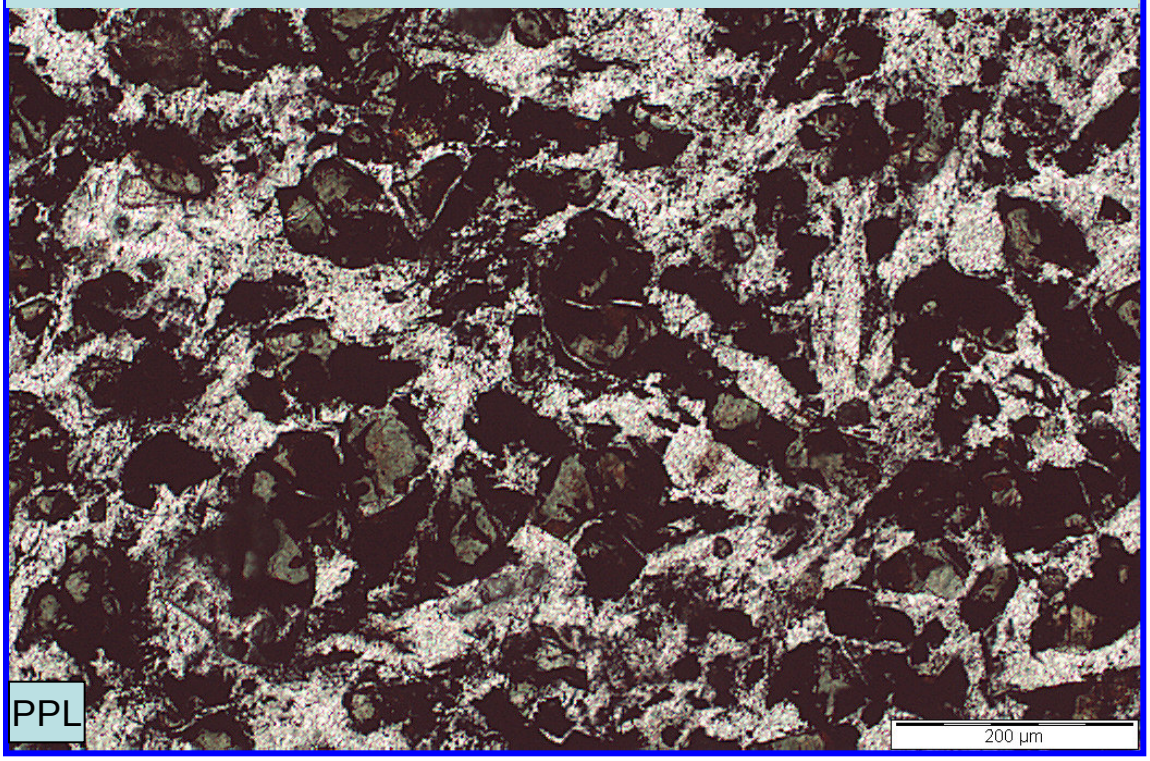


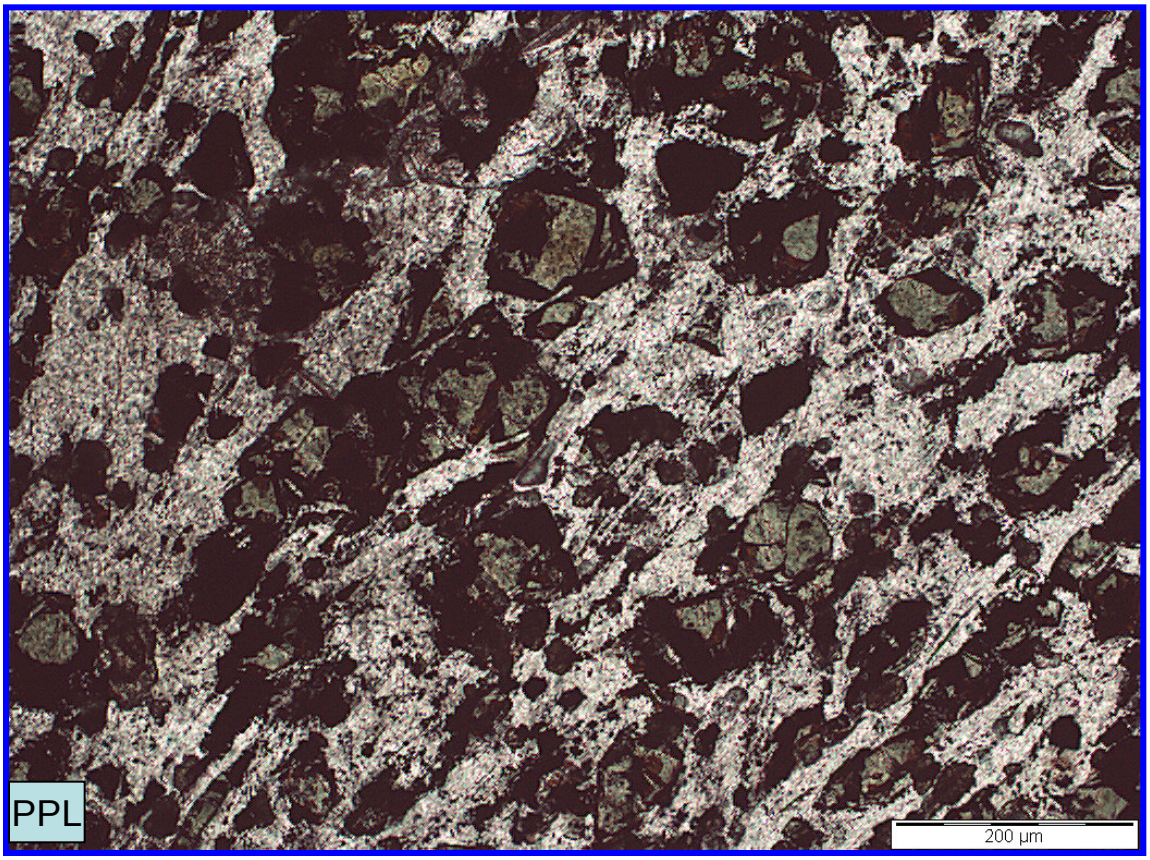
Small, chloritized olivine phenocrysts separated by totally sericitized plagioclase laths - Chip B



SAMPLE NUMBER SRRC03 76-77m

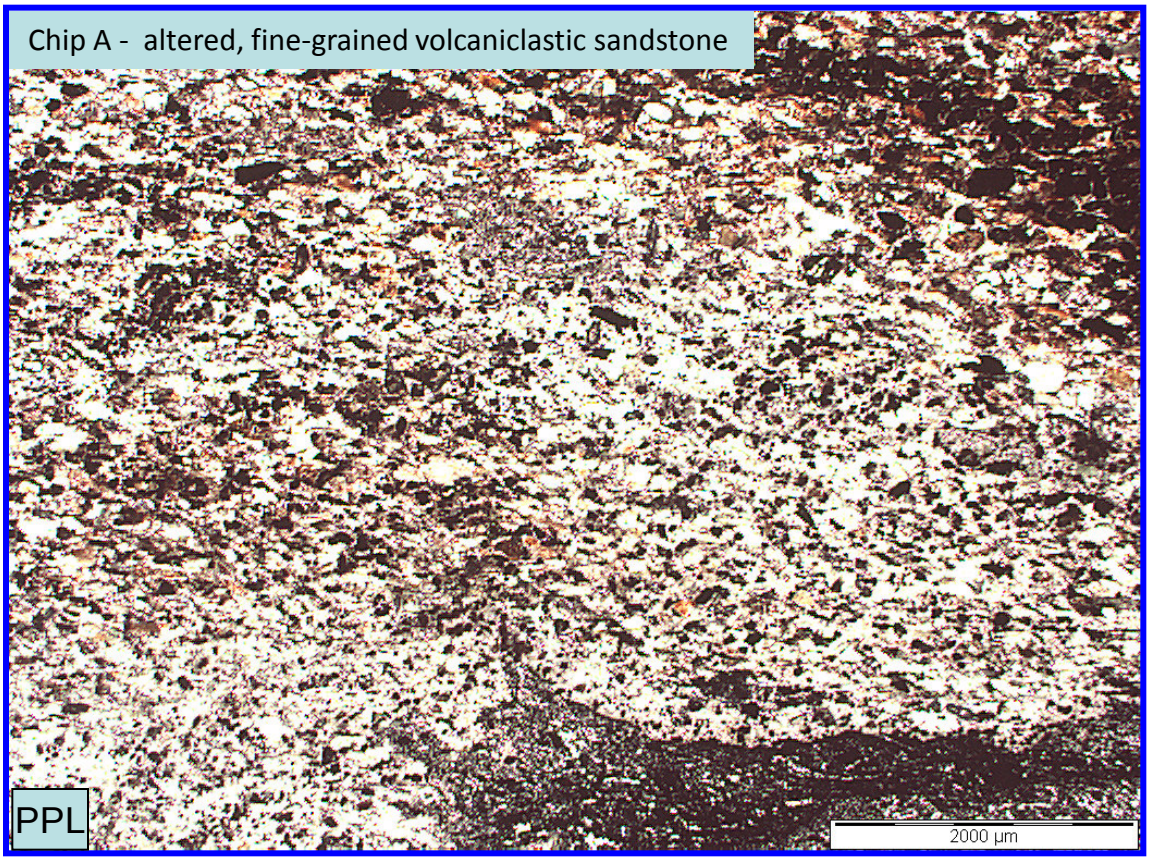
Small, chloritized olivine phenocrysts with dark, hematite-altered rims separated by totally sericitized plagioclase laths



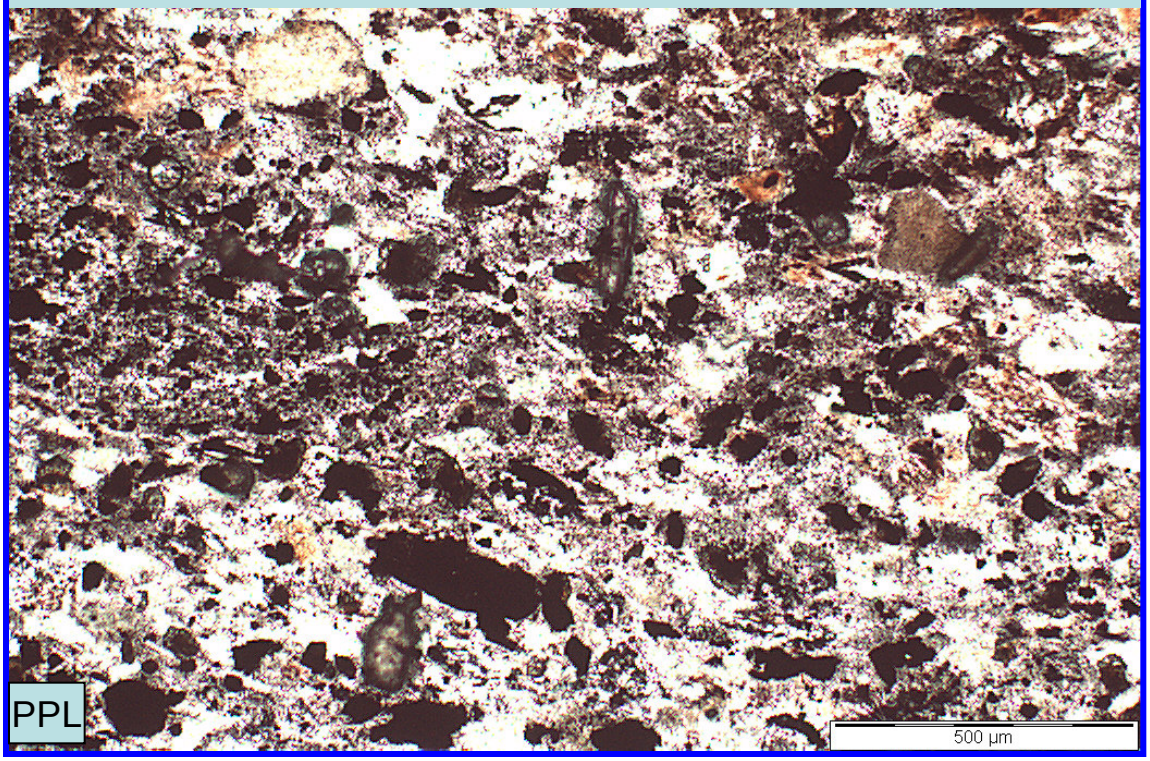


SAMPLE NUMBER SRRC03 76-77m

Chip A - altered, fine-grained volcaniclastic sandstone

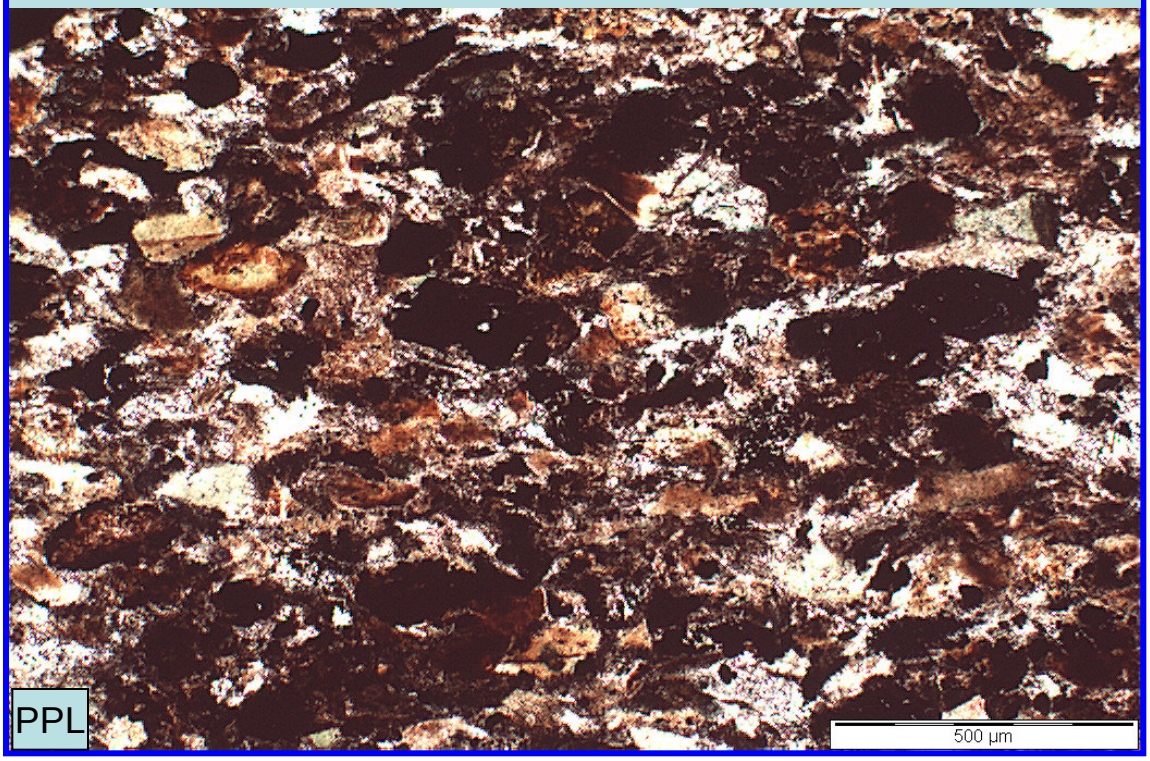


Chip A - altered, fine-grained volcaniclastic sandstone with sericite and quartz-altered matrix

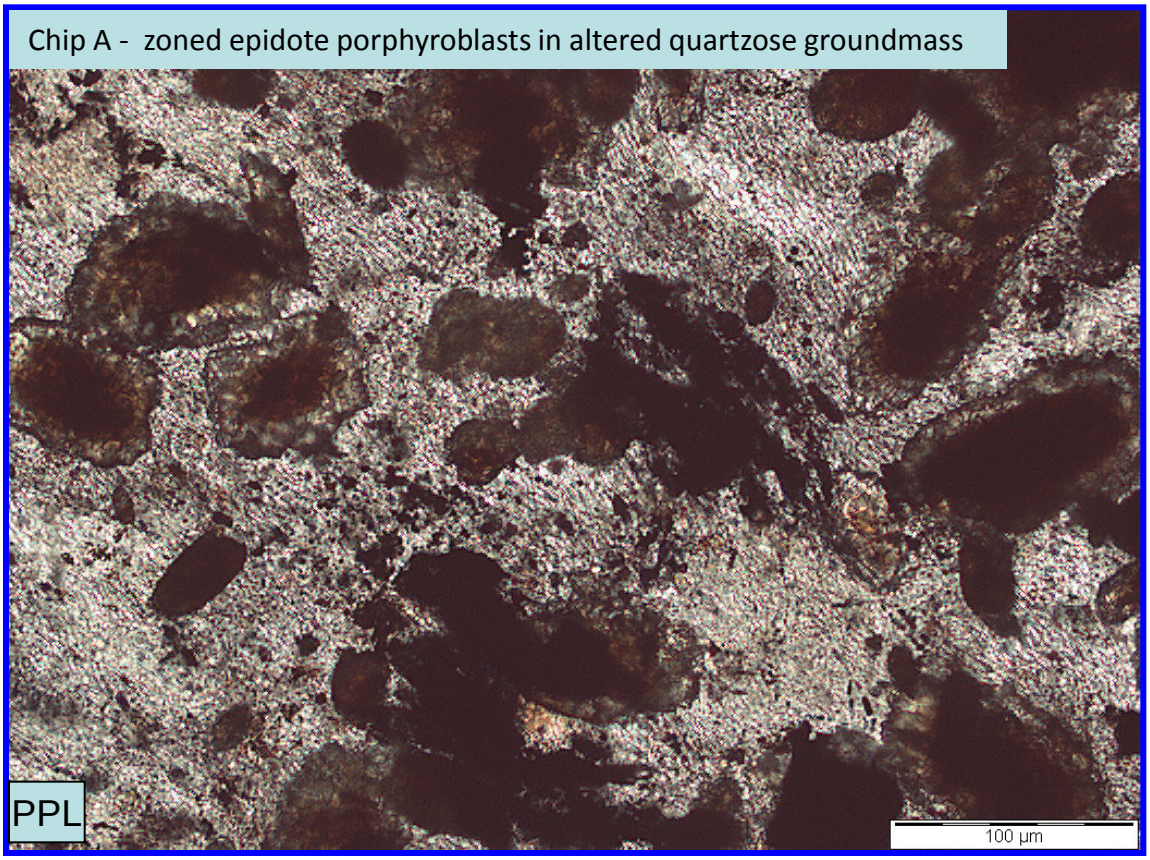


SAMPLE NUMBER SRRC03 76-77m

Chip A - altered, fine-grained volcaniclastic sandstone with hematite-limonite-altered clasts and quartz-altered matrix



Chip A - zoned epidote porphyroblasts in altered quartzose groundmass



SAMPLE NUMBER SRRC03 92-93m

PETROGRAPHIC DESCRIPTION

One chip (A) in this sample is a typical sparsely plagioclase+augite-phyric tholeiitic metabasalt of the Spinks Creek Volcanics, with a regional low-grade burial metamorphic assemblage. The other chip (B) is a poorly sorted sandstone with occasional rounded lithic clasts to almost 1cm long, but common detrital, unrounded plagioclase phenocrysts. The sandstone shows quite strong chlorite-carbonate hydrothermal alteration but no sulfides.

SAMPLE NUMBER

SRRC03 92-93m

THIN SECTION DESCRIPTION

This sample contains two petrographically quite different aircore chips, one a sparsely plagioclase+augite-phyric (meta) basaltic lava , the other an unusual matrix supported volcaniclastic sandstone with strong carbonate-chlorite hydrothermal alteration. The basaltic lava (Chip A) is almost identical petrographically to those described from WMRC04 94-95m, with scattered partly fresh plagioclase and smaller, more equant augite phenocrysts to 2mm long in a finely holocrystalline groundmass composed of a framework of plagioclase crystals with interstitial augite granules and aggregates, and totally leucoxene-altered former tiny FeTi oxides and interstitial chlorite.

The other chip (B) is a matrix-supported, very poorly sorted volcaniclastic sandstone with strong hydrothermal alteration. It retains a distinctive clastic texture, however, with occasional clasts of metabasalt, including one rounded clast almost 8mm long. Many of the clasts in this sandstone are quite prismatic and now composed of fine-grained carbonate and sericite, but their shapes are diagnostic of detrital, locally sourced (as they are not rounded) plagioclase phenocrysts. Far less abundant than detrital plagioclase crystals are occasional chloritized augite crystals, altered former FeTi oxide crystals (phenocrysts?) and subrounded, unstrained quartz grains. The concentration of detrital grains in matrix varies sharply over small distances. The matrix in this rock consists of very turbid, extremely fine-grained chlorite-microcrystalline epidote-pale carbonate intergrowths.

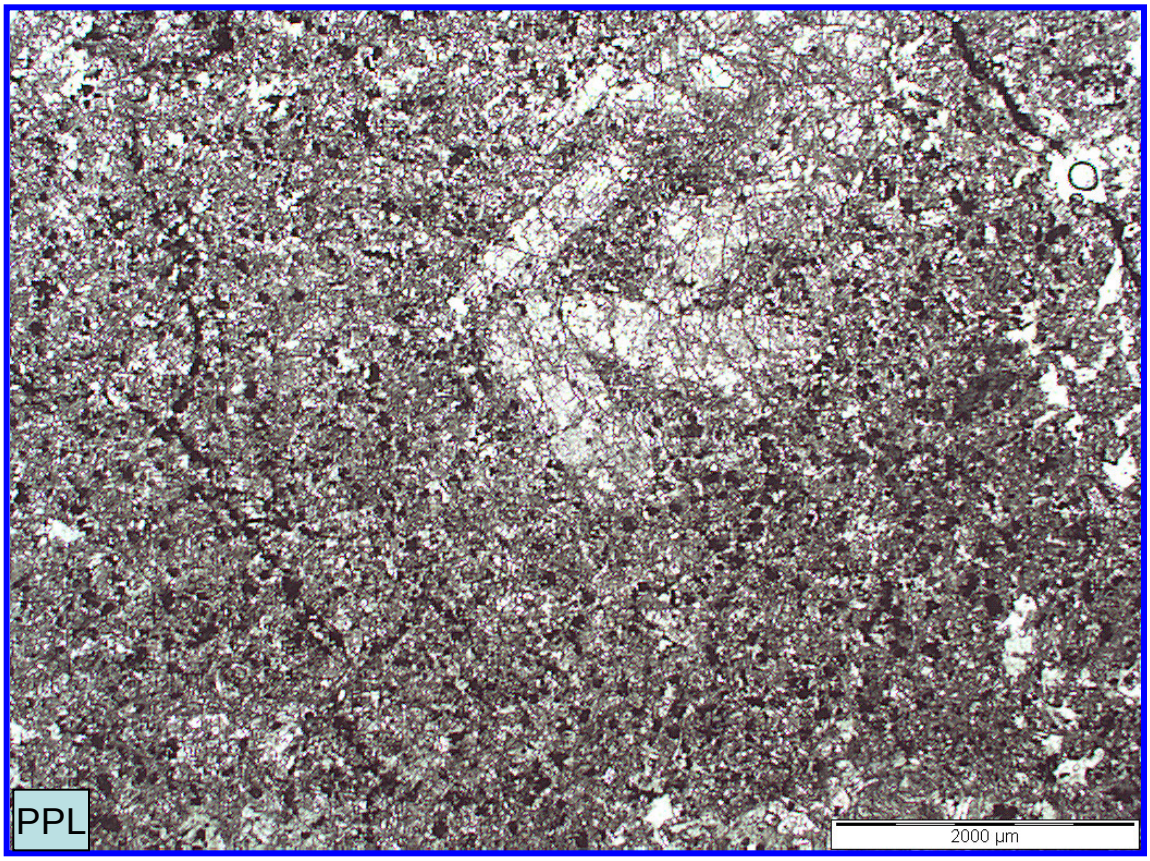
ALTERATION, VEINING AND MINERALIZATION

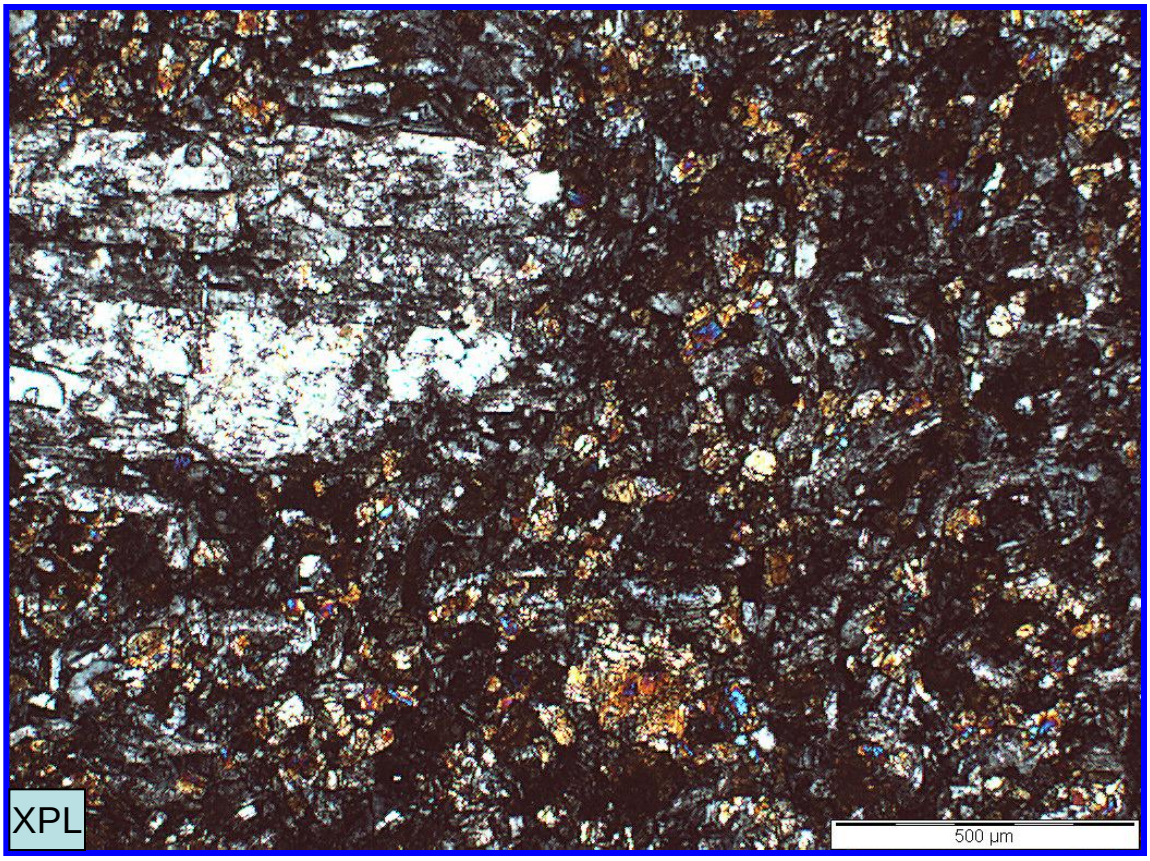
The strong pale carbonate-chlorite alteration overprinting the volcaniclastic sandstone chip is certainly more typical of hydrothermal alteration than regional burial-style metamorphic alteration. In reflected light, this sandstone is seen to carry only a few tiny specks of chalcopyrite and pyrite, and former FeTi oxide grains show well developed hematite blades growing within them.

Other Comments

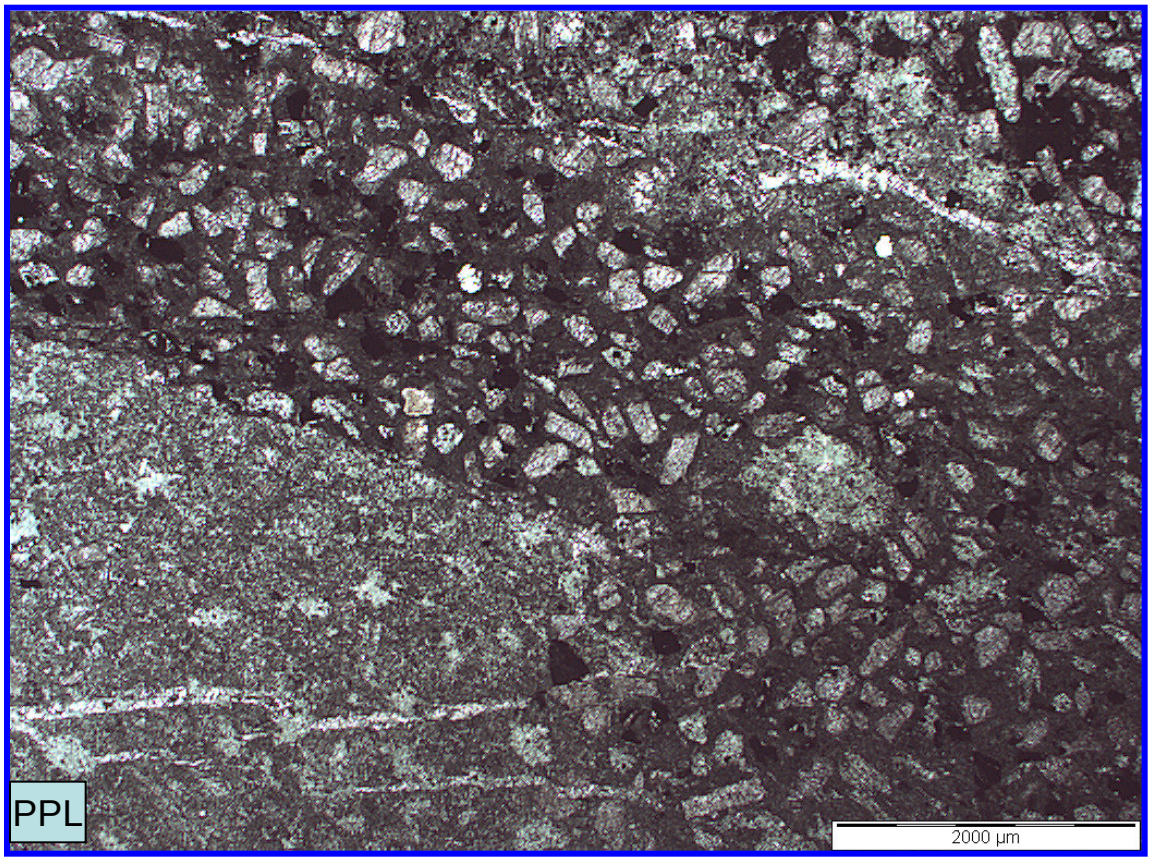
The basaltic lava is a typical Spinks Creek Volcanics metabasalt. The sandstone is unusual in lacking significant formerly glassy lithic clasts, and instead carrying common plagioclase phenocryst detritus which shows little or no rounding, implying they were very locally sources into this poorly sorted sandstone.

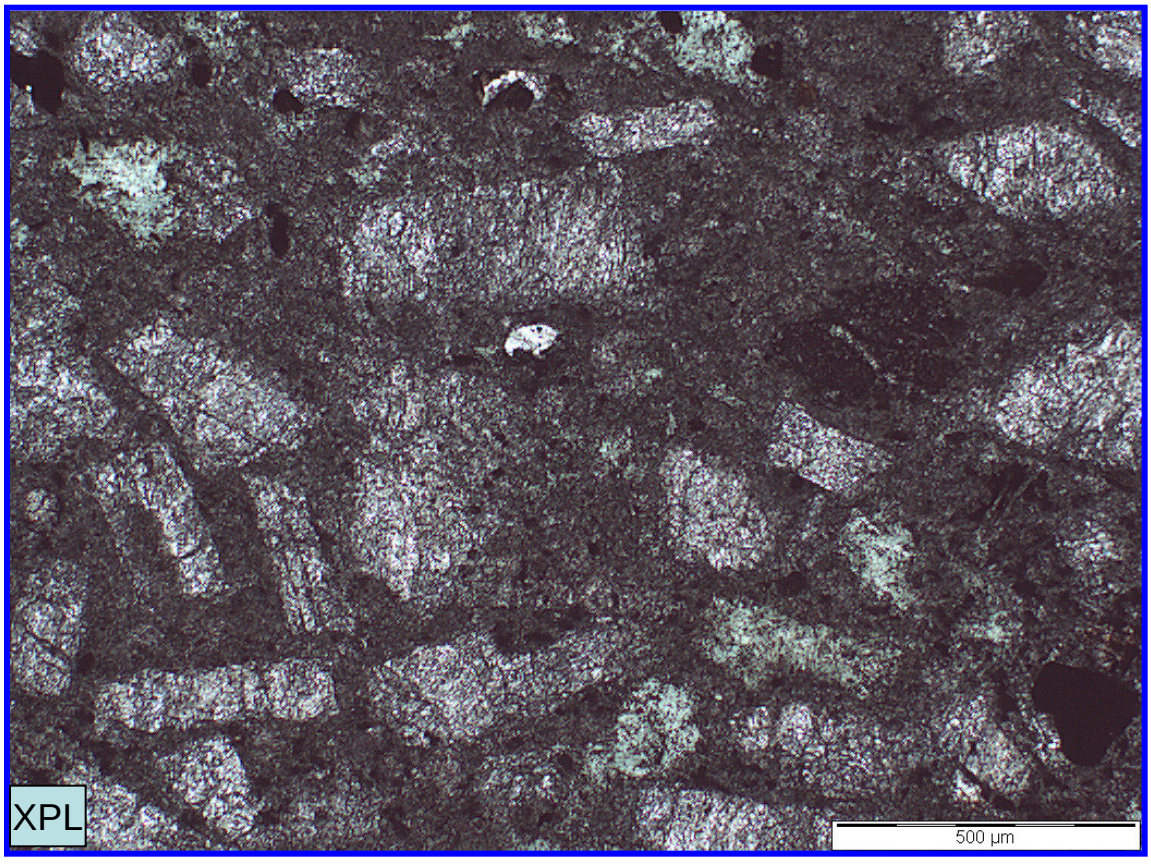
SAMPLE NUMBER SRRC03 92-93m





SAMPLE NUMBER SRRC03 92-93m





SAMPLE NUMBER SRRC04 43-44m

PETROGRAPHIC DESCRIPTION

This is a coarse metabasalt or fine-grained metadolerite with an uppermost prehnite-pumpellyite facies burial metamorphic assemblage of albite-chlorite-leucoxene, occasional pumpellyite, and scattered spots and clots of epidote and epidosite (with interstitial tiny flecks of chalcopyrite).

SAMPLE NUMBER

SRRC04 43-44m

THIN SECTION DESCRIPTION

This sample consists of two petrographically identical aircore chips. Both are holocrystalline but fine-grained metadolerite from a narrow dyke or sill, or coarse metabasalt from the interior of a thick flow. The rock consists mainly of an intergranular-textured intergrowth of 0.2-1mm-sized albitized plagioclase crystals (~40modal%), typically tabular to rather elongate prisms, and multi-crystal clots of small augite grains (~20-25modal%) in interstices between the plagioclase framework crystals. FeTi oxides make up about 3-5modal% of the rock and are present as 0.2-0.5mm-sized, partly skeletal, leucoxene-altered crystals. Interstices between plagioclases not filled by augite are filled by green chlorite and tiny leucoxene granules. Alteration of plagioclase (apart from the pervasive albitization) is limited to spotty sericite and occasional fine-grained pumpellyite patches in some crystals. Augite is entirely fresh, and there is no evidence for the existence of olivine or altered olivine in this rock.

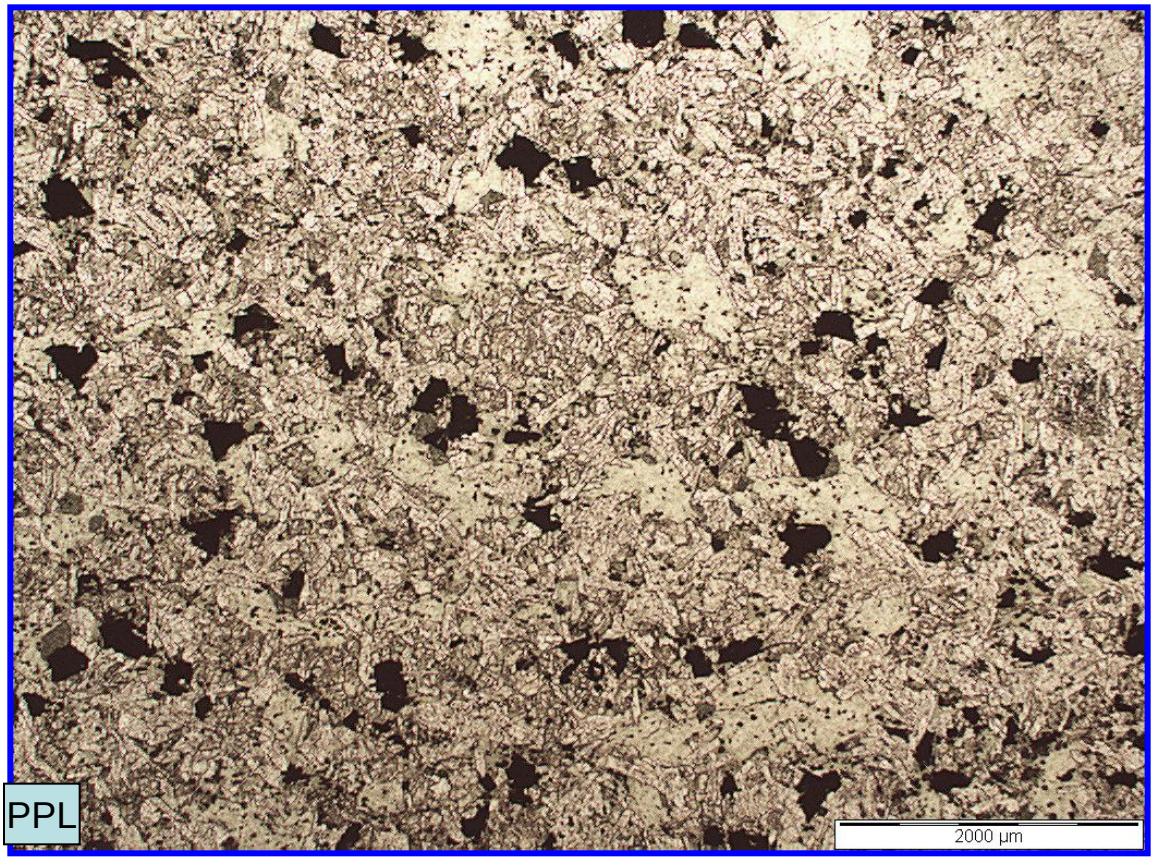
ALTERATION, VEINING AND MINERALIZATION

Apart from the prehnite-pumpellyite facies regional metamorphic overprint affecting this rock, one chip contains a small, 3mm-sized clot of epidosite alteration marked by intergrown pale yellow epidote crystals and common chalcopyrite, the latter in anhedral patches up to almost 1mm across. There is no veining in these chips.

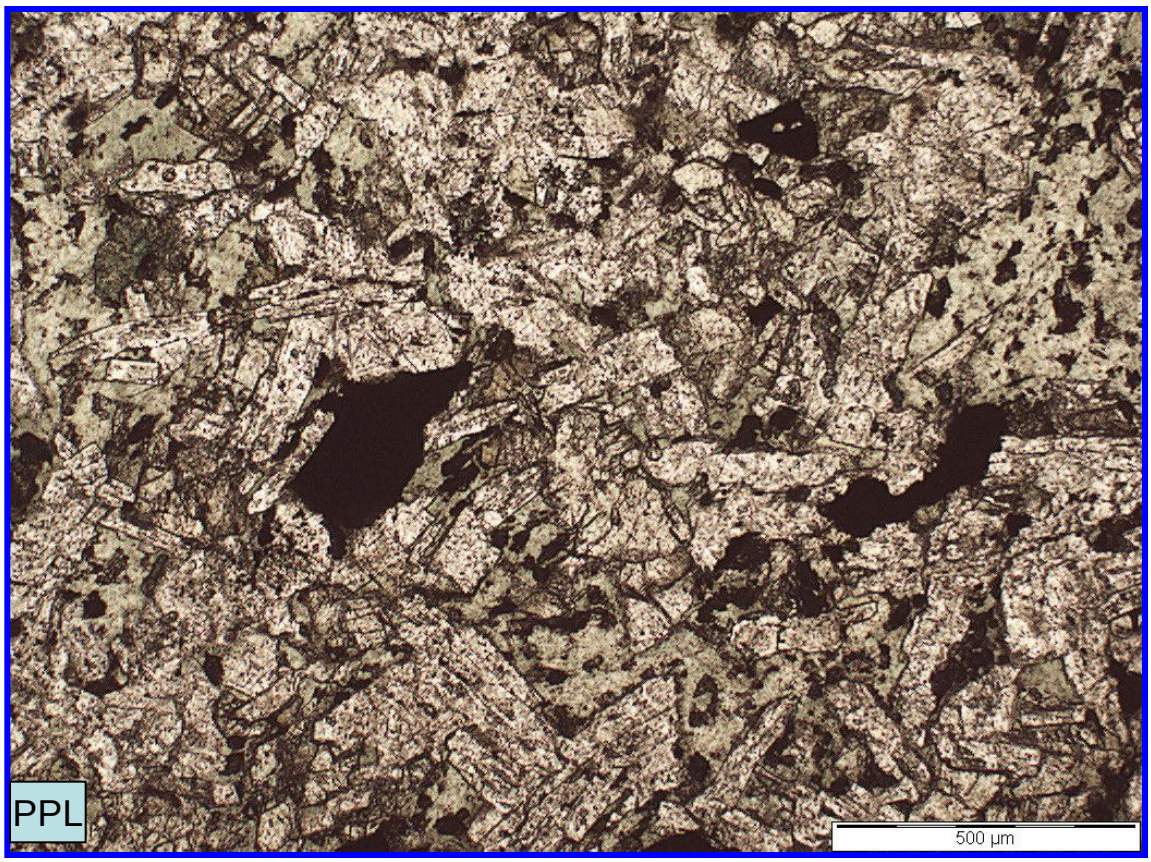
Other Comments

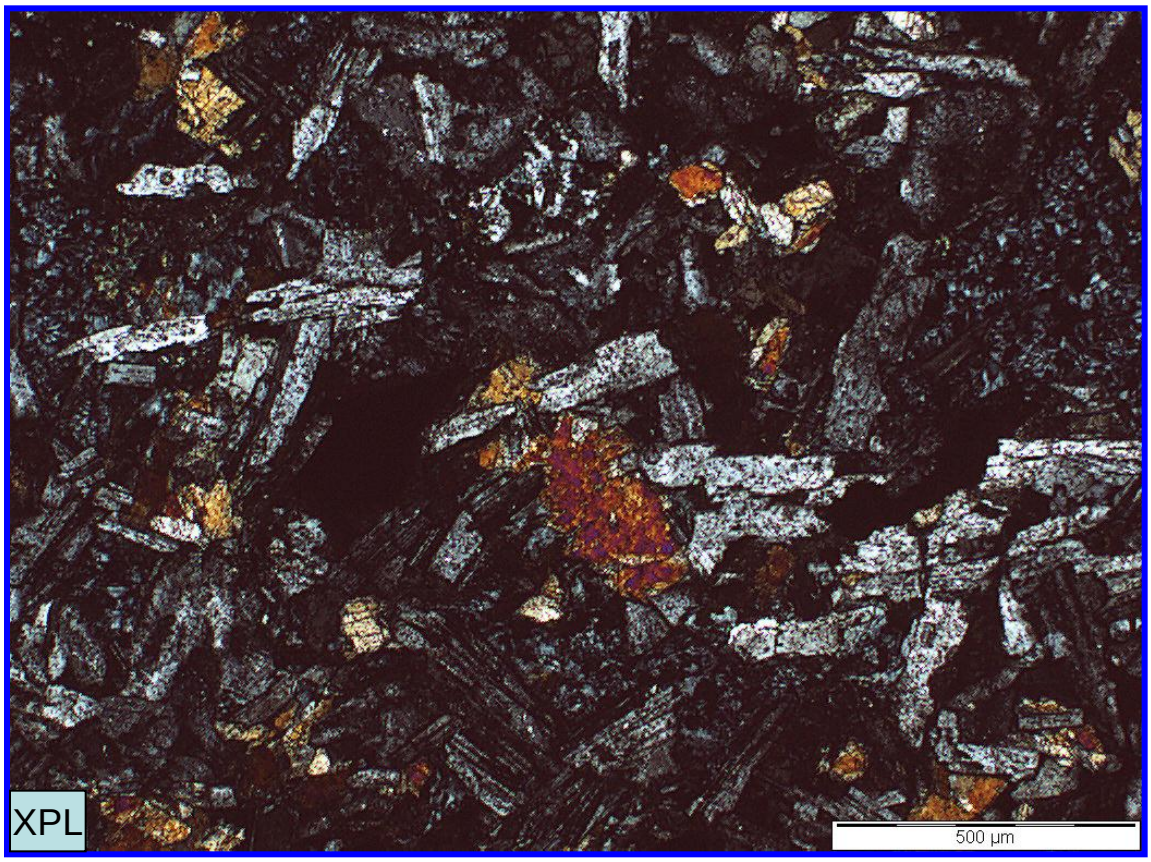
The fresh augite, albitization of plagioclase and occasional pumpellyite in this metabasalt/metadolerite indicate that regional burial metamorphic conditions were around the transition between the top of the prehnite-pumpellyite facies and the base of the greenschist facies (~300^{o}C). Epidosite alteration of metabasites, with common chalcopyrite associated with the epidote, are a common feature of regional burial alteration of metabasalts, and have no exploration significance. The grainsize of this rock is appropriate for either (1) the margins of a dolerite dyke/sill, (2) a thin dolerite dyke/sill, or (3) the core region of a substantial basalt flow.

SAMPLE NUMBER SRRC04 43-44m



SAMPLE NUMBER SRRC04 43-44m





SAMPLE NUMBER SRRC06 64-65m

PETROGRAPHIC DESCRIPTION

These chips are essentially identical fine sandstones with mafic lithic wacke compositions dominated by formerly glassy, now thoroughly chloritized, basaltic volcanic detritus, and occasional angular quartz phenocrysts fragments from contemporaneous felsic volcanism. One chip shows weak chlorite-carbonate hydrothermal alteration, the others low greenschist facies alteration assemblages dominated b y chlorite.

SAMPLE NUMBER

SRRC06 64-65m

THIN SECTION DESCRIPTION

This sample consists of three petrographically identical aircore chips, and a fourth which is slightly more altered. All are framework-supported, ungraded lithic wackes with a fine sandstone grainsize (<0.2mm) and mafic compositions reflecting the basalt-dominated detritus dominating these rocks. A weak bedding-parallel foliation defined by alignment of elongate lithic clasts and interstitial chlorite and sericite has been enhanced by packing associated with burial metamorphism. As in sample WMRCO4 45-46m, the clasts in this wacke are mainly altered, fine-grained mafic volcanics and chloritized glassy chips, but angular volcanic quartz grains (1-2modal%) and detrital FeTi oxide grains (2-4modal%) are well represented, along with less abundant altered plagioclase crystals and extremely fine-grained cherty(?) metasedimentary lithic clasts.

This sample effectively contains no matrix between the framework grains, but streaks of both chlorite and less common sericite occur along grain margins, defining the weak foliation.

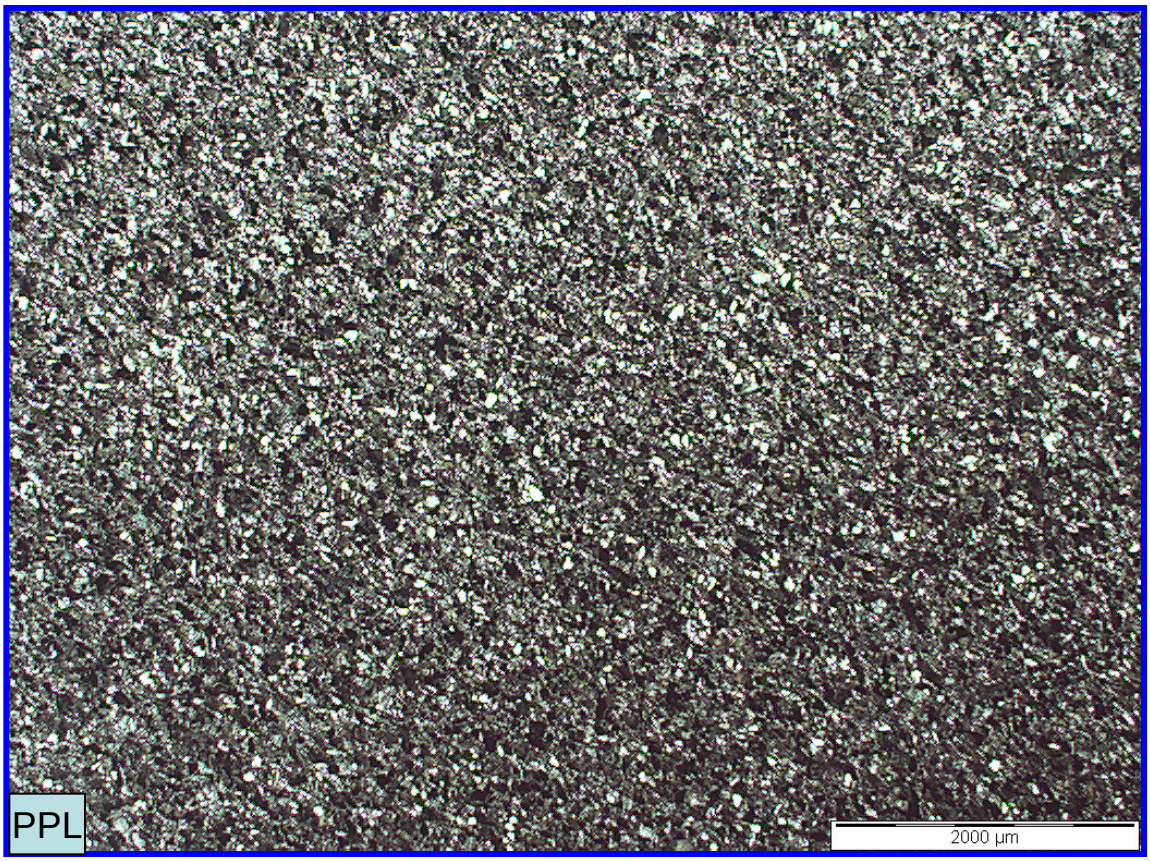
ALTERATION, VEINING AND MINERALIZATION

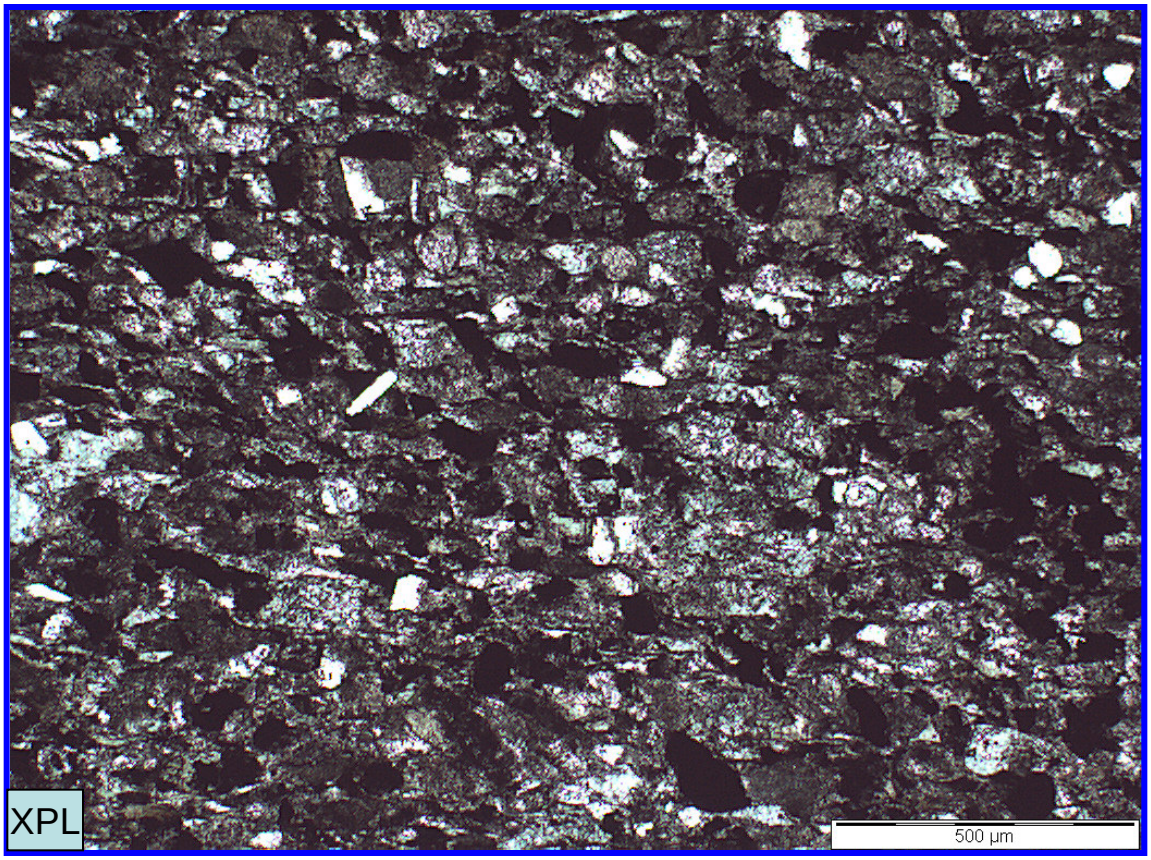
The dominant alteration in these lithic wacke chips is chloritization linked to regional burial metamorphic degradation of these reactive, glass-rich sandstones. One chip shows more abundant chlorite associated with quite strong, pervasive pale carbonate alteration which appears to be of local hydrothermal origin, although there appears (using a hand-held LED light on this unpolished sample) to be no associated pyrite or other base metal sulfides.

Other Comments

As with WMRC04 45-46m, the clastic detritus in this lithic wacke is readily identified as formerly mainly glassy mafic lava, although the widespread chlorite alteration would have obliterated detrital augite, which is often preserved unaltered in other Smithton Trough volcaniclastic sandstones. The quartz phenocryst fragments in this rock suggest that subordinate felsic volcanism was occurring in the Smithton Trough region during the main basaltic magmatic episode. This is discussed in the Summary Report.

SAMPLE NUMBER SRRC06 64-65m





SAMPLE NUMBER SRRC06 64-65m