
Glossary

This glossary is not exhaustive, but provides brief explanations of some of the more technical terms used in the introductions to the chapters and in the 'conclusions' sections of the site reports. These explanations are not intended to be full scientific definitions, but are intended to help the general reader, and many are abridged or modified versions of the descriptions given in the Concise Oxford Dictionary of Earth Sciences (Allaby and Allaby, 1990), and other similar works, to which the reader is referred for further details. Many of the more commonplace sedimentary and volcanic rocks are classified or qualified according to their mineral constituents and/or their grain size, as indicated by ((Table 1)). The application of many igneous rock names is, however, commonly based on rock chemistry rather than by reference to precise mineral content. Only major groups of the rock-forming minerals are included. A word printed in bold is cross-referenced to a further glossary entry.

Detailed stratigraphical terms are omitted as they are given context within the tables and figures, but as a general rule the naming of rock-stratigraphical units follows accepted procedures, for example as laid down by the North American Commission on Stratigraphical Nomenclature (1983). Thus for formally named stratiform sequences 'supergroup' is the highest-ranking term, followed in descending order of rank by group, formation, member and bed. The term 'complex' is commonly used for those igneous and metamorphic rock masses showing no coherent internal stratigraphy, and which are thus capable of only informal subdivision.

Accretionary lapilli: Spherical to ellipsoidal pyroclastic fragments, usually in the 2–10 mm size range, possessing an internal tangential arrangement of individual pyroclasts about a nucleus, the structure commonly being emphasized by concentric zoning defined by differing grain-size.

Accretion (of continents or terranes): The addition of crustal material to the edge of an existing continent, thus enlarging it. Continents thus grow by the tectonic addition (accretion) of terranes, initially coherent bodies of rock, which can collide, slide, rotate and be dismembered before finally being 'sutured' into place.

Accretionary prism (or wedge): In active subduction systems this is an imbricated thrust mass mainly consisting of deformed sediments, which is situated immediately above the downgoing oceanic plate, on the landward-side of the trench. In developed systems basic and ultrabasic (ophiolitic) rocks, mélanges and blueschist facies rocks may be found in association with accretionary prisms.

Acid (igneous or volcanic rock): A rather loosely used compositional term commonly reserved for rocks crystallized from magmas with an excess of 67% silica (SiO_2).

Alluvial: Applied to the environments, action, and products of rivers or streams. Alluvial deposits are composed of clastic material deposited in the river floodplain.

Amphibole: Group of minerals, usually black or dark green in colour, that have double silicate anionic chains.

Amphibolite: Generally a medium- or coarse-grained, dark coloured, foliated metamorphic rock mainly composed of amphibole and plagioclase feldspar.

Andesite: Fine-grained volcanic or shallow-level intrusive rock containing plagioclase feldspar in the oligoclase–andesine range, accompanied by pyroxene and/or amphibole together with accessory silicate or oxide minerals. It contains more than 53 wt% SiO_2 and with increasing silica content grades to high-silica andesite (57–63 wt% SiO_2).

Aplite: A pale-coloured, fine-grained, equigranular igneous rock, composed of quartz and alkali feldspar grains, and found as late-stage veins in granitic bodies.

Arthropod (Arthropoda): Diverse phylum of jointed-limbed animals, which includes crustaceans, arachnids and insects. Fossil arthropods include the extinct trilobites.

Ash (volcanic): Unconsolidated deposit consisting of pyroclastic material (glass shards, crystals etc.) less than 2 mm in size. In consolidated rocks the term is commonly used to denote the size of individual volcanoclastic fragments (e.g. coarse-ash grains and fine-ash grains).

Ash-flow tuff (pyroclastic flow): A general term for a lithified deposit formed from a hot, high-concentration flow of pumice or lithic clasts, entrained and transported within a fluidized ash-rich matrix.

Autobreccia: A breccia in which all of the fragments are identical in lithology to the main mass of the rock; literally, a rock that has undergone 'self-brecciation'.

Axial planar: Term applied to a cleavage that strikes parallel to the axial plane of a fold.

Basalt: A dark coloured, fine-grained extrusive or shallow-level intrusive rock mainly composed of plagioclase feldspar, pyroxene and iron-titanium oxides and containing not more than 53 wt% SiO₂

Basic (igneous or volcanic rock): A loosely used compositional term for rocks with relatively high concentrations of iron, magnesium and calcium, and with 45–53% of silica (SiO₂) by weight; includes gabbro (coarse-grained) and basalt (fine-grained variety).

Basin: A depression, usually of considerable size, in which sedimentary and/or volcanic strata may be laid down.

Blue-amphibole: Term for the sodic (Na) amphibole forming the glaucophane-riebeckite amphibole series. Glaucophane with a distinctive blue colour is a high-pressure mineral found in metamorphic rocks (schists and gneisses).

Blueschist: Metamorphic rock that has undergone metamorphism at low temperatures and high pressures. Blueschists contain abundant blue glaucophane amphibole, and are associated with convergent plate boundary environments. They are formed by the metamorphism of a basic protolith, such as gabbro or basalt.

Braidplain: An alluvial tract that is generally much wider than that occupied by meandering rivers, composed of anastomosing channels divided by islands or bars of alluvium.

Clastic: Applied to the texture of fragmental sedimentary rocks (see also volcanoclastic).

Cleavage, (in rock): Generally a finely developed tectonic foliation, penetrating throughout the rock, produced by intense deformation that has caused a partial recrystallization of platy minerals (e.g. clays and silts) perpendicular to the compressive forces; bedding and other primary features are commonly preserved.

Cnidaria: (Coelenterata) Phylum comprising the sea anemones, jellyfish and corals, which is known from the late Precambrian (see Ediacaran).

Conglomerate: Coarse-grained rock with rounded clasts (granules and pebbles) that exceed 2 mm in size (see (Table 1)).

Convergence, convergent margin: A boundary between two lithospheric plates that are moving towards each other. Some are marked by a subduction zone whilst others are zones of collision between plates; zones of strike-slip faulting are the norm in cases where one plate converges at an acute angle, relative to the other (oblique convergence).

Crenulation (of earlier cleavage): Structure caused by a cleavage that has been micro-folded by a cross-cutting foliation that was superimposed during a later deformation.

Cryptodome: A high-level igneous intrusion that causes up-doming of overlying unconsolidated sediments or rocks. They are commonly associated with zones of magma-wet sediment interaction that give rise to peperite.

Crystal-lapilli tuff: A very coarse-grained rock rich in crystals and other pyroclastic fragments greater than 2 mm in size (see also, lapilli).

Dacite: Extrusive or fine-grained intrusive rock containing 63–70 wt% SiO₂ as well as plagioclase feldspar and quartz (commonly as phenocrysts), minor alkali feldspar and hornblende as essential minerals.

Debris flow: A category of sediment gravity flow composed of a slurry of large and small rock fragments that generally depend upon the buoyant and/or cohesive properties of a saturated muddy matrix for sediment support.

Delta: A discrete, roughly triangle or apron-shaped body of sediment formed where a sediment-laden current enters an open body of water. At this point there is a reduction in velocity resulting in rapid deposition of sediment to form the delta.

Devitrification: The development of crystals or crystalline aggregates, such as spherulites, in glassy igneous rock.

Diorite: A coarse-grained igneous rock of intermediate composition, containing up to 5% quartz, plagioclase feldspar in the oligoclase/andesine compositional range and widely varying proportions of ferromagnesian silicate minerals such as pyroxene and hornblende.

Dolerite: A medium-grained basic igneous rock with a similar mineralogy to gabbro.

Dome, volcanic: An extrusion of magma that is largely solidified but still hot (see also cryptodome, pyroclastic block flow).

Ductile: The response to stress of certain rocks or materials that undergo permanent deformation without fracturing.

Dyke: Discordant, or cross-cutting, tabular intrusion, commonly with a vertical or near-vertical attitude.

Ediacaran fossils: Precambrian fossils, named for their type locality in Australia, whose upper age limit is currently in dispute but which are commonly regarded as ranging between 570–543 Ma, with elements of the faunas also recorded from Cambrian strata younger than 543 Ma.

Epiclastic: Term denoting origin, for example of volcanic fragments whose origin as fragments is a direct result of sedimentary processes. Used as a term of origin to qualify a sedimentary rock, or packages of strata, that may occur in volcanoclastic sequences where pyroclastic rocks are also present (see also (Table 1)).

Euhedral: Morphological term referring to grains in igneous rocks, which have a regular crystal shape.

Eutaxitic: A term applied to the discontinuous, streaky structure of certain welded tuffs and other pyroclastic rocks.

Extension: A type of process, or a tectonic environment, characterized by normal faulting, graben formation and sometimes volcanism, developed where the crust is being stretched (extended), generally as a result of regional-scale plate movements.

Extrusive: Applied to all ejected material of volcanic origin, including lava flows and domes; sometimes used for sequences that also include a pyroclastic component.

Feldspars: An important group of rock-forming silicate minerals, which are essential constituents of many igneous rocks. Variations in composition divide the feldspars into two series, the 'alkali feldspars', with end-members albite (Na-rich) and orthoclase (K-rich), and the plagioclase feldspars with end-members albite and anorthite (Ca-rich).

Floodplain: The part of a river valley that is made of unconsolidated river-borne sediment, and periodically flooded.

Fluvial: Pertaining to a river.

Foliation: A continuous, sub-planar rock fabric commonly formed by the preferred orientation of minerals with a general platy or tabular habit. The layers in foliated rocks can be related to the original bedding (commonly designated as S₀), or

to cleavage or gneissosity (see gneiss).

Fore-arc basin: The part of the fore-arc (arc-trench gap) adjacent to the volcanic arc but lying behind the high-point of the accretionary prism or wedge. It is partly infilled by sediments derived from the volcanic arc or uplifted plutonic–metamorphic basement.

Frontal arc: In arc systems, a narrow topographical ridge located immediately behind the fore-arc region. It commonly contains the active volcanic arc, but in those systems that have experienced changes to the angle or position of the subduction zone it may be volcanically inactive.

Frontal arc sliver: A narrow, fault-bounded slice detached from the leading edge of the frontal arc as a result of transcurrent movements generated by oblique convergence.

Gabbro: A coarse-grained basic igneous rock that generally forms large intrusions. It consists largely of plagioclase feldspar, commonly in the labradorite–anorthite range, pyroxene(s) ± olivine (see also dolerite).

Gneiss: Term applied to a coarse-grained, inhomogeneous rock, common in relatively high-grade metamorphic terranes, characterized by a coarse foliation or layering more widely spaced, irregular or discontinuous than that in a schist.

Grading, graded bedding: Sedimentary beds that display a size-sorting effect, commonly with coarse-grade material (sand, pebbles) at the base and fine-grade material (silt, mud) at the top. The opposite relationship is known as reverse grading.

Granite: a pale-coloured, coarse-grained igneous rock, commonly occurring as large intrusions but also found in veins. It consists of between 20 and 40% essential quartz, and at least two-thirds of the feldspars are alkali feldspar; increased proportions of plagioclase feldspar occur in varieties transitional to granodiorite. Accessory minerals may include mica and zircon, but amphibole is commonly absent.

Granitoid: A general term used to encompass unspecified coarse-grained, quartz-rich igneous rocks that may include compositional types such as granite, tonalite and granodiorite.

Granophyre: A fine-scale intergrowth of quartz and either alkali feldspar or plagioclase commonly patchily developed and found as an interstitial, late-stage crystallization product in certain granites or quartz diorites. This textural term has also been used as a rock name or qualifier.

High-density turbidite: Sediment gravity flows made up of clasts of various sizes, up to pebbles and cobbles, in which the particle (grain) support is dependent upon particle concentrations.

Hornfels: A massive, finely crystalline contact metamorphic rock commonly showing a conchoidal fracture.

Igneous rocks: Rocks that have crystallized from a magma.

Ignimbrite: A type of large-volume, pumiceous ash-flow tuff.

Intermediate (igneous or volcanic rock): A term used somewhat loosely to qualify rocks whose chemical composition lies between those of acid and basic end members.

Intraformational breccia: Breccia (see (Table 1)) formed by the contemporaneous erosion and redeposition of a bed of sediment previously deposited, and commonly one that is not fully consolidated (see also soft sediment deformation).

Intrusion: A body of igneous rocks that has been introduced into pre-existing rocks, commonly along a structural feature (joint or fault).

Island arc: A commonly arcuate belt of emergent or partly-emergent volcanoes that is developed above a subduction zone, generally within an oceanic setting. See also volcanic arc, magmatic arc.

Isoclinal fold: A fold in which the two limbs are parallel.

Isotopic dating: Pertaining to the use of isotope abundance ratios, in whole rocks or separated minerals, in order to determine the absolute age of a rock, which is generally expressed in millions of years (Ma). Isotope abundances are also measured in igneous rocks to elucidate the provenance and/or differentiation path of magmas.

Juvenile pyroclastic material: Particulate material that directly owes its fragmentation to a volcanic process; commonly this will include (hot) radially jointed blocks and bombs, variably vesiculated glassy debris (e.g. shards) or blocky glass debris, and in some cases discrete euhedral crystals or angular fragments of formerly euhedral crystals.

Keratophyre: A traditional term for a fine-grained igneous rock consisting of albite or oligoclase (i.e. sodic) feldspar, sometimes with unaltered augite phenocrysts but with a mineralogy that is almost entirely secondary. Keratophyres are found on the ocean floor and in ophiolite complexes, commonly associated with spilites.

Lamina, (plural: laminae): The finest sedimentary layer, less than 1 cm in thickness.

Lapilli, (singular: lapillus): Pyroclastic fragments of any shape with a mean diameter of 2–64 mm (see (Table 1)).

Lava: Molten rock erupted by a volcano.

Lineation: Any linear feature that appears on the bedding or foliation surface of a rock. Lineation may be formed during deformation by the parallel alignment of fossils, pebbles or minerals, the latter in extreme cases producing a rodding structure.

Lithic fragment: The dense or crystalline components of a pyroclastic deposit. They can include ejected fragments of crystallized magmatic material, pieces of the country rock or clasts picked up locally during pyroclastic flowage.

Low-density turbidite: Sediment gravity flows made up largely of clay to medium-sand size grains and in which sediment support is largely independent of particle concentration.

Ma: Abbreviation for *mega annos* meaning 'million years ago'.

Magmatic arc: An alternative term for volcanic arc, generally used in geological belts that contain only plutonic igneous rocks, the calc-alkaline chemistry of which indicates their generation above a subduction zone.

Marginal basin: Also known as back-arc basins, these represent zones of volcanism and accelerated sedimentation that are usually associated with crustal extension or transtension developed behind the volcanic arc. They may occur in fully oceanic settings, or form by rifting of volcanic arc crust.

Medusoid fossils: Imprints of roughly circular or ovoid organisms. Some forms are interpreted as the forerunners of modern jellyfish, but certain other circular imprints may represent the basal attachments, or floats, of frondose organisms.

Mélange: Mappable body or rock composed of broken rock fragments of all sizes and many origins, in a sheared matrix.

Meta-: Prefix commonly used to indicate that a rock has been affected by low-grade metamorphism, while still retaining many recognizable features of its origin (e.g. metasediment).

Metamorphic rock: An aggregate of minerals formed by the recrystallization of pre-existing rocks in response to a change of pressure, temperature or volatile content.

Metamorphism: The process of changing the characteristics of a rock in response to changes in temperature, pressure, or volatile content.

Metasediment: A sedimentary rock that has undergone metamorphism.

Microgabbro: A dark-coloured, medium-grained granular basic rock, mainly composed of plagioclase and pyroxene, generally found in small intrusions or as igneous sheets.

Mudrock: A lithified mud.

Muscovite: A rock-forming hydrous aluminosilicate mineral found in a variety of igneous and sedimentary rocks and especially common in schists. Due to its perfect basal cleavage it readily forms flakes when the rock is rubbed across the skin.

Mylonite: Rock produced in tectonic zones where the precursor rocks have been mechanically broken down and suffered extreme grain-size reduction, producing a commonly 'laminated' (finely foliated) lithology.

Normal grading: As for grading, graded bedding.

Oceanic crust: The oceanic rocks, which are the upper part of the oceanic lithosphere. They commonly consist of a thin sedimentary capping to basaltic pillow lavas, which were originally generated at the oceanic ridge volcanic system. The pillow lavas are in turn underlain by a dyke complex, which passes down into plutonic rocks (see ophiolite).

Olistostrome: A sedimentary deposit, which consists of a chaotic mass of rock and contains large clasts composed of material older than the enclosing sedimentary sequence. Where the clasts are of gigantic proportions they are called 'olistoliths'.

Ophiolite: Sequence of rock types, consisting of deep-sea sediments lying above basaltic pillow lavas, dyke complex, gabbros and ultramafic rocks such as peridotite. Some are remnant tectonic slivers of oceanic crust, others of crust formed in back-arc or marginal basins.

Paragneiss: As for gneiss, but with a mode of occurrence and/or mineralogical composition allowing the observer to conclude that sedimentary processes formed the original rock (protolith).

Pegmatite: Very coarse-grained igneous rock, commonly but not always of granitic composition, with individual crystals at least 2.5 cm long.

Peperite: Rocks produced by fragmentation upon the injection of magma into soft, water-soaked sediments.

Pillow lava: Piles of elongate basaltic lava pods, resembling stacked series of stone pillows, providing good evidence for submarine eruption of the lava.

Pluton: General term applied to a body of intrusive igneous rock, regardless of shape, size or composition.

Plutonic: Descriptive term for igneous bodies that have crystallized at depth and commonly have coarse grain sizes.

Polarity: A term with many separate uses in geology, but here used in the plate tectonic context to describe the direction of outward-facing of a volcanic arc or island arc, i.e. the 'viewing' direction if one is standing on the volcanic axis and looking 'outwards' towards where the trench/subduction system is situated.

Porphyritic: Textural term for a volcanic or intrusive rock containing large and often well-formed crystals (phenocrysts) set in a finer-grained groundmass or matrix.

Protolith: A term derived from the Greek 'protos', meaning 'first', and commonly used as a synonym for the original lithological precursor(s) to rocks whose present appearance and mineralogy have resulted from meta morphism or alteration.

Proximal: Applied to a sediment or sedimentary environment (or volcanic products) close to the origin or source of the material forming the deposit.

Pseudotachylite: A rare, glassy rock produced by frictional melting during extreme dynamic metamorphism in a fault or thrust zone.

Pyroclastic: Term denoting origin, for example of volcanic fragments (glass shards, euhedral or fragmented crystals, 'accidental' or 'cognate' lithic blocks) generated as a direct result of explosive volcanic action. Can be used as a term of origin to qualify a rock, or packages of strata, whose content of pyroclastic fragments is in excess of 75% of the whole (see (Table 1)).

Pyroclastic block and ash flow: A hot mass-flow of pyroclastic debris with a high proportion of angular to subangular volcanic blocks (see table).

Pyroclastic flow, subaqueous pyroclastic flow: A term commonly used loosely, but which should be restricted to describe primary, hot gas-rich mass-flows of pyroclastic debris either on land or within bodies of standing water (subaqueous pyroclastic flows); most are the result of explosive volcanic eruptions.

Quench-brecciation: Non-explosive type of fragmentation process occurring in response to thermal and dynamic stresses generated within a body of magma as it cools during emplacement into wet sediments (see also peperite).

Radiometric: A general term used for those techniques that measure isotopic abundances in whole rocks or minerals.

Repetitive grading: A series of beds, stacked in vertical sequence, each of which constitutes a graded depositional unit (see grading).

Remnant arc, marginal basin etc.: Term denoting a volcanic belt in which magmatic activity has ceased, usually due to major changes in the tectonic configuration of the arc–subduction system.

Reverse grading: Sedimentary beds that display a size-sorting effect, commonly with fine-grade material (silt, mud) at the base and coarse-grade material (sand, pebbles) at the top. The opposite relationship is known as normal grading, graded bedding.

Rhyolite: A fine-grained extrusive igneous rock consisting of essential quartz, alkali feldspar and one or more ferromagnesian minerals. Many rhyolites are porphyritic, with quartz and alkali feldspar phenocrysts.

Rodding structure: A very coarse lineation of minerals or rock streaks, seen as cylindrical structures, or circular to ovoid structures when viewed end-on, which develops in strongly deformed rocks.

Schist: A metamorphic rock of pelitic (aluminous) composition, with a grain size greater than 1 mm, that displays a strong foliation (schistosity) that is commonly defined by mica alignment. See also blueschist.

Shard: Fragment of volcanic glass, may be filamentous, blocky or vesicular with angular or cusped margins, a major juvenile constituent of pyroclastic rocks.

Shear zone: A region, narrow when compared to its length, within which the rocks are intensely deformed.

Sheetflood: A brief but powerful surge of water over a surface, generally caused by heavy rainfall of short duration.

Silicification: The process of introducing silica into a rock, either by filling pore spaces or by replacing other minerals.

Soft sediment deformation: A process causing the disruption, usually by folding, faulting or slumping, of sediments that are not completely consolidated.

Spillite: A low-grade, sodium-rich metamorphic rock, generally containing abundant albite, chlorite and epidote, formed by sea-floor metasomatism of mid-ocean ridge basalts

Strike-slip fault: See transcurrent fault.

Subaerial: Refers to environments and processes occurring within the confines of landmasses.

Subduction zone: The zone, at an angle to the surface of the Earth, down which a lithospheric plate descends. Most present-day subduction zones extend from trenches on the ocean floor. Andesitic volcanoes generally form along the volcanic arc, approximately 100 km above the subducting plate, or slab. Marginal basins are other manifestations of subduction-related magmatism, accompanied by rifting of the crust, behind the volcanic arc.

Terrane: 'earth'; a small crustal plate or fault bounded fragment of a larger plate, with distinctive characteristics, which can be displaced considerable distances from its original site and added to another plate during plate tectonic movement.

Tonalite: a silica-oversaturated, coarse-grained igneous rock consisting of 20–60% essential quartz, and plagioclase feldspar in the oligoclase–andesine compositional range. Mafic minerals may include hornblende and/or biotite mica.

Transcurrent fault (strike-slip fault): A fault in which the major displacement is horizontal and parallel to the strike of a vertical or sub-vertical fault plane. Localized zones of deformation due to pressures and tensions across the fault occur at bends in the fault and can give rise to conditions of transtension. The latter process may cause the formation of rhombic-shaped basins, graben, or marginal basins that may be the focus of rift-related volcanic activity.

Transecting cleavage: Term applied to a cleavage whose strike trend is oblique to the axial plane of a fold, i.e. the cleavage cuts across the fold axis.

Transpression: A tectonic regime that combines both transcurrent (strike-slip) movement with oblique compression.

Transtension: A particular type of tectonic regime, characterized by the formation of extensional zones manifested as rift valleys or certain types of marginal basin, that developed along major transcurrent faults or anastomosing systems of such faults.

Tuff: A collective term for all consolidated pyroclastic rocks (see (Table 1)).

Tuffaceous (mudstone, siltstone, sandstone etc.): A prefix used to denote consolidated epiclastic rocks containing between 25 and 75% of pyroclastic fragments (see (Table 1)).

Turbidity current: Sediment flows, commonly along the floors of lakes or seas, flowing as a result of excess density and in which the grains are suspended by turbulence.

Unconformity: Surface of contact between two groups of unconformable strata, which represents a hiatus in the geological record due to a combination of erosion, tectonism and a cessation of sedimentation.

Undercooling: The state whereby a magma must be cooled to well below its solidus temperature, before crystallization is initiated.

Volcanic arc: Generalized term for a narrow, commonly gently arcuate belt containing many active, dormant or extinct volcanoes. These originated above a subduction zone along the edge of a convergent plate boundary, either in an oceanic (island arc) or continental margin plate tectonic setting. The term can also be applied to associations of ancient volcanic or plutonic (magmatic arc) rocks, which show chemical features indicative of a subduction zone involvement in their genesis.

Volcanic breccia: Term for a pyroclastic rock composed of volcanic rock fragments whose mean diameter exceeds 64 mm, which have an angular or subangular shape indicating they were solid during transport.

Volcanic centre: The region of a volcano containing the main conduit(s) through which the magmas were expelled.

Volcaniclastic: A general term to include the entire spectrum of clastic materials (see (Table 1)) composed in part or entirely of volcanic fragments originating from a variety of particle-forming mechanism (e.g. pyroclastic, epiclastic).

Volcanogenic: A general term applicable to rock sequences, individual rocks or constituents thereof that have originated from volcanic processes.

Welding: A process common in thick, rapidly deposited pyroclastic sequences that have retained their heat, whereby individual pyroclasts are fused together, and at times compressed, to produce a highly compacted lithology.

[References](#)

Grain size (mm)	SEDIMENTARY ROCKS		VOLCANICLASTIC ROCKS		IGNEOUS ROCKS	
			Epilastic (25-75% pyroclasts)	Pyroclastic (>75% pyroclasts)		
256	<i>CONGLOMERATE</i> And <i>BRECCIA</i> <i>GRANULESTONE</i>		<i>VOLCANICLASTIC CONGLOMERATE, BRECCIA, GRANULESTONE</i> etc.	Bombs ... <i>AGGLOMERATE</i> Blocks... <i>VOLCANIC BRECCIA</i>		Very coarse-grained
64				<i>LAPILLI TUFF</i>		
16						Coarse-grained
2	<i>SANDSTONE</i>	<i>TUFFACEOUS SANDSTONE</i> (coarse, medium, fine etc)	Coarse Fine	<i>TUFF</i>	Medium-grained Fine-grained Very fine-grained Cryptocrystalline	
1-2						Very coarse-
1-0.5						Coarse-
0.25-0.5						Medium-
0.125-0.25						Fine-
0.032-0.125						Very fine- grained
0.004-0.032	<i>SILTSTONE</i>		<i>TUFFACEOUS SILTSTONE</i>		Very fine-grained	
<0.004	<i>MUDSTONE</i>		<i>TUFFACEOUS MUDSTONE</i>		Cryptocrystalline	

(Table 1) A simplified comparative grain-size and grain-compositional chart for sedimentary, volcanoclastic and igneous rock types. The volcanoclastic rock classification is modified from Fisher (1961) and Fisher and Schmincke (1984).