

Short descriptions of petrofacies in the Gila and Phoenix basins.

Petrofacies designation	Petrofacies name	Basin	Composition	Description
3	Salt river	Phoenix	Lithic-volcanic	Mineralic (granitic derived) with basaltic grains. This petrofacies is characterized by the presence of large quantities of quartz and feldspars (derived from a granitic source) along with mafic minerals as accessories. Basaltic and vitrophyric grains (2-10 percent) are characteristic of this petrofacies, dark mafic volcanics such as andesite, rhyolite, diabase and felsic volcanics can be from trace amounts to rare. Metamorphic grains such as phyllite and schist are rare in the sample. Subround grains of a sallow yellow caliche are occasionally present up to 10 percent.
A	Santan Mountains	Gila	Mineralic	White granite plus schist sand. This petrofacies is characterized by white granite (white+gray with black and/or green flecks) greater than 40 percent and schist greater than 10 percent. The schist may be very-coarse-grained muscovite and quartz, or may be finer grained, with tiny white quartz and/or feldspar, shiny silvery muscovite, and flecks of black magnetite. Accessory minerals in this petrofacies include free quartz and feldspar, biotite, epidote, magnetite and few grains of chlorite. A few quartzite-like grains may also be present.
B	Olberg	Gila	Lithic-volcanic	Mixed granitic and volcanic. This petrofacies is characterized as rich in white granite, quartz and feldspar from the granite, and coarse, subround grains of dacite (which are abundant in GB-19) and light-colored grains of rhyolite (very common in GB-20). Biotite can be 10-30 percent, usually in copperish hexagonal crystals associated with rhyolite. Chlorite and muscovite are secondary, along with epidote, hornblende and sphene (each up to 2 percent). The presence of heterogeneous grains of light-colored volcaniclastics and silica-rich volcanics make this petrofacies unique.
C	Twin Buttes	Gila	Mineralic	Mineralic. (The majority of the grains are derived from white and pink granite.) Quartz and plagioclase are the dominant mineral grains. Potassium feldspar can be common but not as abundant as quartz and plagioclase. Biotite and muscovite are usually present in large flakes and also attached to lithic grains. Epidote and chlorite are mostly present attached to lithics. (Chlorite is usually found as a schist component.) The dominant lithic grains are white and pink granite. Metamorphic grains such as schist and phyllite are rare, and generally muscovitic.
D	Queen Creek	Gila	Lithic-volcanic	Lithic volcanic. This petrofacies is characterized by the presence of rhyolitic grains, along with vitric and felsic volcanics. A brownish-yellow diabase is usually present in this petrofacies. Other lithic grains, such as basalt, obsidian, dacite and maroon colored volcanics, are not greater than 10 percent. An altered granite can be present up to 10 percent.
E	Mineral Mountain	Gila	Lithic-metamorphic	Schist-rich lithic arenite. This petrofacies is characterized by the dominance of schist grains. Other grains such as granite (pink and white), basalt, diabase and rhyolite can be as trace to rare only.
F4	Fountain Hills	Phoenix	Mineralic	Mineralic quartz-feldspathic (granitic derived) with minor mafic volcanics. This petrofacies is characterized by quartz (30-60 percent), plagioclase (brown to gray, from 10 to 40 percent) and potassium feldspar (10-30 percent). Micas usually are rare (biotite, muscovite and chlorite), sphene can be present only as trace. The great majority of the lithic grains are usually present in at no greater than 3 percent. The most common lithic is a pale-gray to brownish dacite. Lithic metamorphic grains are also present in trace amounts.

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F5	Florence	Gila	Mineralic	Arkosic sand with minor lithics. This petrofacies is dominated by light-colored (white+gray+yellow+/- pink) granite and the quartz and feldspars from the granite. There are few mafic minerals such as magnetite and hornblende, and rare micas. Rock fragments such as felsite, schist, gneiss, phyllite and metavolcanics do occur, but are generally less than 2 percent.
G	Picacho	Gila	Mineralic	Lithic volcanic with quartz and feldspar. Quartz and feldspars are the dominant minerals in this petrofacies, micas such as biotite, muscovite and chlorite are usually rare. This petrofacies is characterized by a broad variety of volcanic grains such as vitric volcanics, meta-volcanics, light-colored volcanoclastics, and dark mafic volcanics (basalt, andesite and dacite). Felsic volcanics occur usually in variable proportions from 2-10 percent. The only granitic sample is GB-138. This petrofacies lacks foliated metamorphics.
H	Sacaton Mountains	Gila	Mineralic	Mineralic (quartz-feldspathic, grains derived from granitic source). This petrofacies is characterized by the abundance of quartz and feldspars, biotite, chlorite and muscovite are usually present up to 10 percent, other minerals such as hornblende, sphene, epidote, and oxides can be rare. Garnet crystals occur only as a trace. The lithic fraction is characterized by the dominance of white granite (usually with attached epidote) and pink granite (often with chlorite and/or partially chloritized), along with mica-granite. Hornblende-rich granodiorite is usually rare. Foliated metamorphics such as schist and phyllite, along with felsic volcanics, occur only in trace amounts.
I	Camelback	Phoenix	Mineralic	Quartz-feldspathic and gneissic. This petrofacies is characterized by quartz (20-40 percent) and feldspars (10-30 percent) derived from a granitic source, along with distinctive grains of quartz-feldspathic gneiss (2-20 percent). Granite grains (both white and pink) are 2-10 percent; phyllite and mica-schist are one to six percent each. The presence of subround caliche is characteristic at 10-20 percent. Volcanic grains such as diabase, andesite, basalt, felsic and glassy volcanics are present in trace amounts.
J	Sacaton West	Gila	Mineralic	Mixed mineralic. This petrofacies is characterized by the dominance of quartz and feldspars, usually with equal quantities of micas and mafic minerals. Hornblende is often present in hornblende-rich granodiorite, but few individual crystals can be found. Epidote is also often present as granitic constituent. Magnetite can be up to 15 percent. The dominant lithic grains are white granite and hornblende-rich granodiorite, pink granite is usually present or rare. This petrofacies is also characterized by the absence of volcanic and metamorphic grains.
K	Casa Grande Mountains	Gila	Mineralic	Arkosic sand with micas, minor volcanics. This petrofacies is characteristically rich in quartz (usually abundant), along with common to abundant feldspars. Micas are generally 2-10 percent; hornblende and epidote are 2-10 percent (as lithic constituents and/or as free floating minerals). Garnet crystals can be up to 2 percent, pyroxene crystals are usually a trace. Lithic grains include white granite and a very distinctive hornblende-rich granodiorite (with attached epidote and chlorite), along with muscovitic and chloritic grains of schist and phyllite from 2-10 percent. Volcanic grains are usually present in a variety of colors from 2-10 percent.
L	Superstition Mountains	Gila	Lithic-volcanic	Lithic rhyolitic. This petrofacies is characterized by mostly coarse grained subround to subangular grains of rhyolite (usually from white to pale violet colors). Granite and basalt can be present up to 10 percent, small angular fragments of obsidian occur in trace amounts.

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M	Military	Gila	Lithic-volcanic	Lithic-arkosic sand. This petrofacies is characterized by abundant quartz, and common granite. Schist and feldspars are present, other rock fragments and minerals (magnetite, biotite, muscovite, chlorite, epidote, felsite, and quartzite) are rare, but most occur in small percentages in the petrofacies. The abundant quartz, along with granite and some schist are the best indicators of this petrofacies.
N	Snaketown	Gila	Lithic-volcanic	Lithic-arkosic sand. Free quartz 20-40 percent, plagioclase 10-30 percent, pyroxene and hornblende up to 2 percent, opaques and micas 2-5 percent, epidote less than 2 percent, volcanics 20-40 percent, metamorphic rocks 10-20 percent. It is the combination of free quartz and feldspar (not granite) with abundant rock fragments that characterize this petrofacies. Note that the Snaketown Petrofacies comprises the distal end of the Queen Creek Petrofacies.
P	Paradise	Phoenix	Lithic-metamorphic	Metamorphic with gneiss as the dominant lithic. This petrofacies is characteristically strictly metamorphic. Quartz-feldspathic gneissic grains are the dominant lithic (20-40 percent). Grains of mica-rich gneiss are usually less abundant (2-10 percent). Several varieties of mica schist (muscovitic, biotitic, chloritic) can be present from 2-15 percent. Phyllite grains in light colors (silver to baby-blue and brown-orange) are usually rounded and present from 2-10 percent. Igneous rocks such as granite, diabase, and dark mafic volcanics occur only as traces.
Q	South Mountain	Gila	Mineralic	Mineralic sand with mafics micas, and rock fragments. Quartz-feldspathic sand with monocrystalline micas (biotite, muscovite, chlorite), hornblende, sphene, epidote and magnetite from 2-10 percent. The dominant lithic grains are white granite and hornblende-rich granodiorite. Metamorphic grains such as schist, phyllite, gneiss and amphibolite can be from 2-10 percent. There is also a variety of volcanic grains in this petrofacies (basalt, vitric volcanics, felsic volcanics, etc), but they only occur in trace amounts.
R	Montezuma	Gila	Mineralic	Gneiss as monocrystalline grains and rock fragments, variable amounts of schist. This petrofacies has arkosic to lithic-arkosic sands. Primary constituents are monocrystalline and polycrystalline quartz, plagioclase feldspars and granite fragments in colors such as white, gray and yellow. Pinkish or red colors also occur, but the white/gray/yellow tints are more common. Samples collected closer to the mountain front tend to have more granitic fragments, while those farther away tend to be dominated by monocrystalline grains. Biotite and schist are in most samples and are up to 10 percent. Other grain types that may be present up to 10 percent include potassium feldspar, diabase, and quartzite but they do not occur in all samples. Trace or rare amounts of magnetite, epidote, sphene, gneiss, phyllite and earthy white tuff or caliche grains may also been seen.
T	Taliesin	Phoenix	Mineralic	Quartz-feldspathic with schist. This petrofacies is essentially quartz-feldspathic with quartz (20-40 percent), plagioclase (10-30 percent) and potassium feldspar (10-30 percent). These monocrystalline grains seem to be derived from a granitic source, possibly granodiorite. Mafic minerals are rare in this petrofacies. The chief lithic grains are quartz-muscovite schist and mica schist (10-20 percent); gneiss and phyllite are rare.

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U	Usery	Phoenix	Mineralic	Monocrystalline, granitic derived. Quartz grains are very common, plagioclase and potassium feldspar are 10 to 30 percent, biotite flakes are 2 to 10 percent), epidote is 2-10 percent. Granitic grains comprise the majority of lithic grains, white granite grains are usually 10 to 30 percent); pink granite is 10 to 20 percent. Lithic grains such as dacite, diabase, basalt, felsic volcanics, red volcanics, and rhyolite are usually present in trace amounts. Metamorphic lithic grains such as phyllite, schist and gneiss are also present in trace amounts.
V	Phoenix Mountains	Phoenix	Lithic-metamorphic	Foliated metamorphic rocks (phyllite and schist). This petrofacies is characterized by medium to very coarse subround phyllite grains (10-20 percent), sometimes showing a deep-green (chloritized) phyllite along with coarse, subround, mica-schist grains (10-15 percent). Often grains of hornblende schist can be found in pallid yellowish-green colors (2-5 percent), pink granite is only present as an accessory (two percent), volcanic grains such as andesite, basalt, rhyolite and undifferentiated red volcanics and volcanoclastics are present up to three percent.
W	North	Phoenix	Mineralic	Quartz-feldspathic with phyllite and gneiss as accessories. In this petrofacies quartz is 20-40 percent, plagioclase crystals are 10-30 percent and the chief lithic is schist, 10-30 percent. Phyllite and gneiss grains are rare. Igneous rocks such as granite (white and pink) and hornblende-rich granodiorite are found only as traces. Dacite grains are usually rare. Round to subround tuffaceous grains can be present (2-10 percent).
Y	Lookout	Phoenix	Lithic-metamorphic	Basaltic and mineral rich. This petrofacies is characterized by quartz (20-50 percent), plagioclase (10-30 percent), potassium feldspar (10-20 percent), epidote and hornblende (2-5 percent), with a trace of pyroxene. The dominant metamorphic lithic grain is schist (10-20 percent), followed by phyllite (2-10 percent). Gneiss and green phyllite are rare, sporadic grains of a dark-green amphibolite are present only as trace. Subround dacite grains with very distinctive pyroxene crystals are 2-10 percent. Basaltic-andesite and basalt are usually 2-10 percent, granitic grains (white and pink granite, often with chlorite attached to them) and micro-diorite grains are rare. Dark colored volcanics such as felsic, vitric, and red volcanics occur only as traces.