Map Unit Properties Table: Carl Sandburg Home National Historic Site

Colored rows indicate units mapped within Carl Sandburg Home National Historic Site. Colors in Age column are U.S. Geological Survey standardized colors. Colors in Map Unit column correspond to those on the Geologic Map Overview Graphic.

Age	Map Unit (Symbol)	Geologic Description	Geologic Issues	Geologic Features and Processes	Geologic History and Park Connections
QUATERNARY	Alluvium (Qal)	Unit Qal contains gravel, sand, silt, and clay deposits associated with streams and rivers. These deposits are loose, unconsolidated sediments and they collect along stream channels, in surficial depressions, and on floodplains.	Qal is associated with active stream channels and delicate riparian habitats, and thus should be avoided for most forms of heavy development. Very low erosion resistance. Sedimentation issues associated with streams and ponds in the park, although not mapped in the park.	Unit may contain historic artifacts. Unit contains gravel, sand, silt, and clay resources. Qal is associated with riparian and riverine habitats.	Qal forms along streams and rivers, recording the evolution of the fluvial environment of the land surface.
SILURIAN and ORDOVICIAN	Granitic gneiss (SOgg)	SOgg was an igneous (or formerly molten magma) rock that has been changed by heat and pressure, called metamorphism, into a light-gray, medium-grained rock that appears striped or banded in appearance, due to alternating bands of light and dark minerals. This unit contains lenses of hornblende-rich gneiss, and is interlayered with Chg, below, on the eastern contact. SOgg may appear as lenses within CZtgn, below.	Where unit crops out on sloped areas, blockfall may be a potential hazard. High erosion resistance.	In order of relative abundance, unit contains: plagioclase feldspar, quartz, microcline, biotite, muscovite, sphene, epidote, allanite, zircon, opaque minerals	Unit was equivalent to part of the Henderson Granite, mapped previously by Keith (1905). Unit emplaced and metamorphosed during mountain building (orogenic events).
CAMBRIAN	Henderson Augen Gneiss (Chg)	Unit Chg is also a metamorphosed igneous rock that appears medium-gray to medium-bluish gray in outcrop exposures. The unit is generally massive, or appears relatively homogenous, with strong foliation defined as alternating bands of dark and light minerals. This banding formed as the unit was exposed to intense heat and pressure. Its characteristic augen (German word for "eyes") appear as bodies of roundish crystals surrounded by swirling bands. These augen are generally less than 2.5 cm (1 in.) in diameter and consist of the mineral microcline (a feldspar, see Glossary). Chg is darker than SOgg and contains the conspicuous augen; Chg has a gradational contact with CZtgn, below. Chg is mapped within park boundaries. More recent mapping by the North Carolina Geological Survey confirmed that Chg is the only bedrock unit within the park boundaries.	Balds may be prone to focusing erosion during runoff events. Where unit crops out on sloped areas, blockfall may be a potential hazard. In areas where people have created social trails to the balds, such as at Little Glassy, foot traffic could dislodge rocks to visitor use areas below. High erosion resistance.	Balds developed on this unit were ceremonial areas for native Cherokee, and trading locales for European settlers. Flat Rock, North Carolina is named for balds or bedrock exposures of Chg. At least nine significant balds occur within the park. Unit contains microcline (feldspar) augen in a matrix of, in order of relative abundance: biotite, muscovite, epidote, allanite, sphene, apatite, zircon, and opaque minerals. Chg is associated with prominent bedrock balds in the park area; these are enigmatic areas below treeline that support only low shrubs and grasses. This type of bedrock does not buffer the pH of acidic meteoric water, and probably contributes to acidic soils. Biodiversity on balds is low compared to surrounding areas.	Unit was also called the "Henderson Granite" by Keith (1905). Unit emplaced and metamorphosed during mountain building (orogenic events). Some gneiss balds provided areas where Carl Sandburg enjoyed walking, sitting, and reflecting on the world around him. Rocky outcrops inspired various names for the property. Christopher G. Memminger (original owner) named the estate Rock Hill. Ellison Smyth (owner prior to the Sandburg's) named it Connemara after the rugged landscape along Ireland's west coast.
LOWER PALEOZOIC – UPPER PRECAMBRIAN	Tourmaline muscovite schist (CZts)	CZts is a medium-gray, medium-grained schistose rock. It appears flaky and platy in outcrop. This appearance is due to the parallel alignment of flat, mica minerals, such as muscovite and biotite. CZts also has tourmaline crystals within the aligned micas. The muscovite in this unit is highly shiny and lustrous. When the feldspar crystals in this unit break down, they become light brown and impart a spotted appearance to the outcrop exposure. This unit weathers to a reddish-brown saprolite with flecks of the lustrous mica.	Due to weathered and schistose (flaky) nature of this unit, it may be unstable on slopes and may provide a slip surface during mass wasting events. Moderate erosion resistance.	Tourmaline may have provided gem material. Unit contains muscovite, biotite, quartz, feldspar, and tourmaline. Unit weathers to produce clay-rich soils.	Unit records metamorphic conditions during mountain-building (orogenic) events.

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LOWER PALEOZOIC – UPPER PRECAMBRIAN	Garnetiferous muscovite schist, amphibolite and hornblende gneiss (CZgms)	Unit CZgms has three rock types grouped into the same mapped unit on the basis of their proximity and interlayered relationships. The three rock types are a schist, amphibolite, and gneiss. The lustrous, flaky schist appears dark-gray to medium-gray in unweathered exposures. The individual minerals are medium-grained. Roundish garnet crystals appear as bulges between the schistose layers. CZgms also includes dark-gray to medium-gray, medium-grained amphibolite. The amphibolite weathers to a brown to reddish-brown, clay-rich saprolite. The gneiss is gray to dark-gray and medium-grained. Thin bands of hornblende-rich (dark mineral) layers define its foliation, or banding. Grading laterally and vertically with the hornblende gneiss is gray, medium-grained, feldspar-rich quartzite, with very thin color banding. The mixed gneiss and quartzite are strongly folded; they appear in weathered outcrop as buff-brown and yellow-brown rock exposures.	Due to the weathered and schistose (flaky) nature of the muscovite schist unit, it may be unstable on slopes and provide a slip surface during mass wasting events. Thick saprolite developed on weathered portions of CZgms may hinder drainage. Where unit crops out on sloped areas, blockfall may be a potential hazard. Moderate to high erosion resistance for quartzite-rich gneisses.	Garnet may have provided abrasive material. Near Mine Gap, a chromium-bearing mineral, fuschite, is present. Unit contains hornblende, muscovite, biotite, quartz, plagioclase feldspar (oligoclase to andesine), microcline feldspar, garnet, and opaque minerals. Rock types weather to produce clay-rich soils.	Unit represents mixed depositional environments prior to regional metamorphism before and during Paleozoic mountain-building events.
	Migmatite (CZtgn)	Migmatites like CZtgn are metamorphic rocks that form under conditions where the heat and pressure are such that the rock partially melts and flows. Portions of the original rock remain intact as stringers and boudins (sausage-shaped masses). CZtgn contains large clumps (blasts) of feldspar crystals that may reach 15 cm (6 in.) in diameter. When CZtgn weathers, it becomes a thick saprolite with relict stringers of CZgms. CZtgn has a gradational contact with Chg, and also contains lenses of biotite granitic gneiss that may be SOgg.	Thick saprolite developed on weathered portions of this unit may hinder drainage. Where unit crops out on sloped areas, blockfall may be a potential hazard. Moderately high erosion resistance.	In order of relative abundance, unit contains: quartz, plagioclase feldspar, microcline feldspar, biotite, muscovite, opaque minerals, epidote, chlorite, and zircon. Rock types weather to produce clay-rich soils.	CZtgn records conditions of extreme heat and pressure during burial deep within the Earth during mountain-building events.
	Ultramylonite (CZmy)	CZmy is extremely fine-grained, so that individual crystals are hard to discern with the naked eye. Ultramylonite forms by extreme deformation, at depths where the pressure and temperature cause the rocks to "flow" plastically rather than break brittlely. CZmy weathers to appear blocky, and dark brown to black in outcrop exposures. CZmy is an isolated, linear geologic unit mapped within CZtgn in the southeast corner of the geologic map.	CZmy forms resistant ledges and breaks apart in blocky masses. Where undercut by erosion, this may cause a blockfall hazard. High erosion resistance.	Ledges of CZmy may have functioned as landmarks. Unit consists of very fine-grained siliceous (containing silica) rocks. Unit forms resistant ledges in streams and may provide riffle habitat for aquatic life.	CZmy records conditions of extreme deformational stress deep within the Earth during mountain-building events.