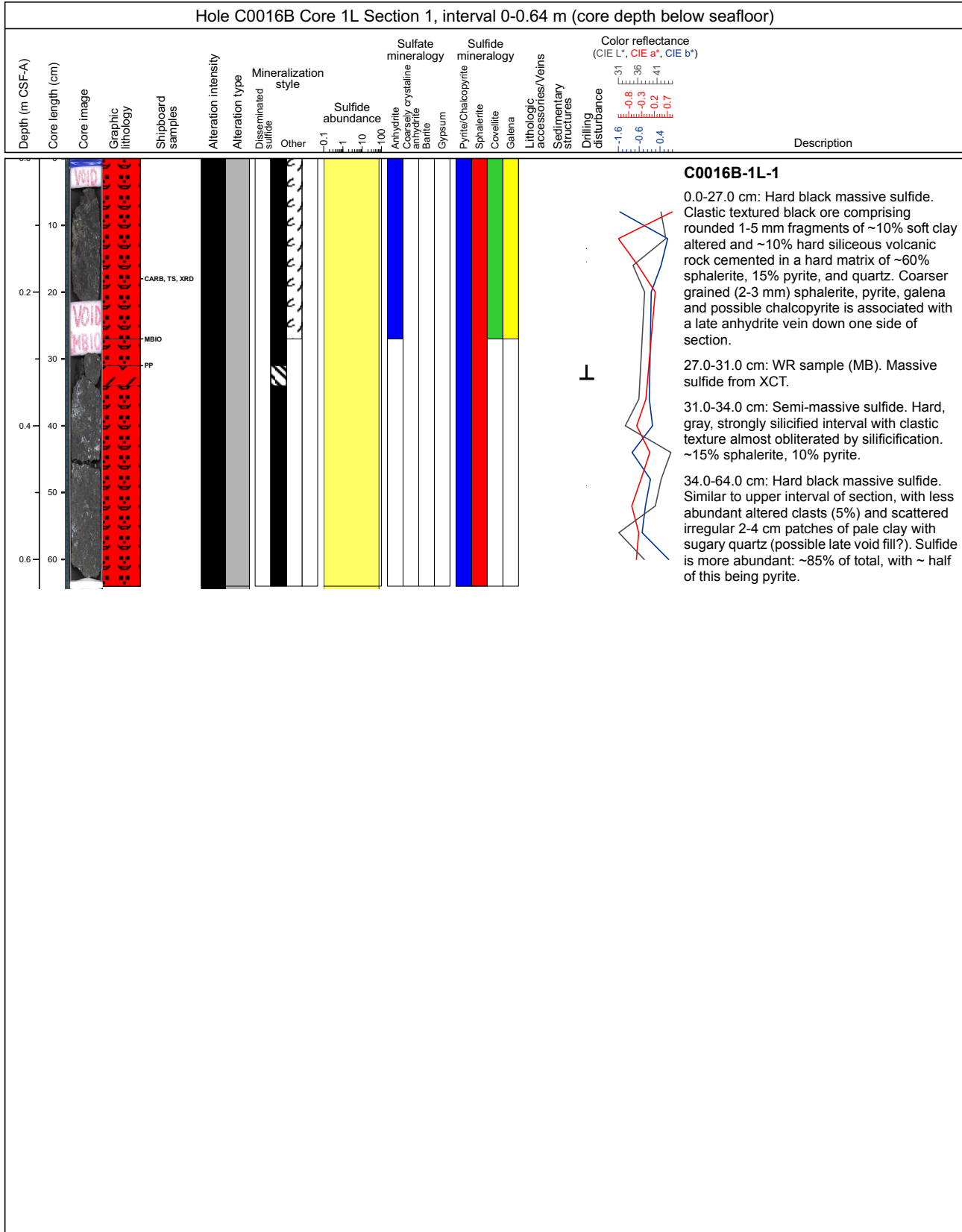


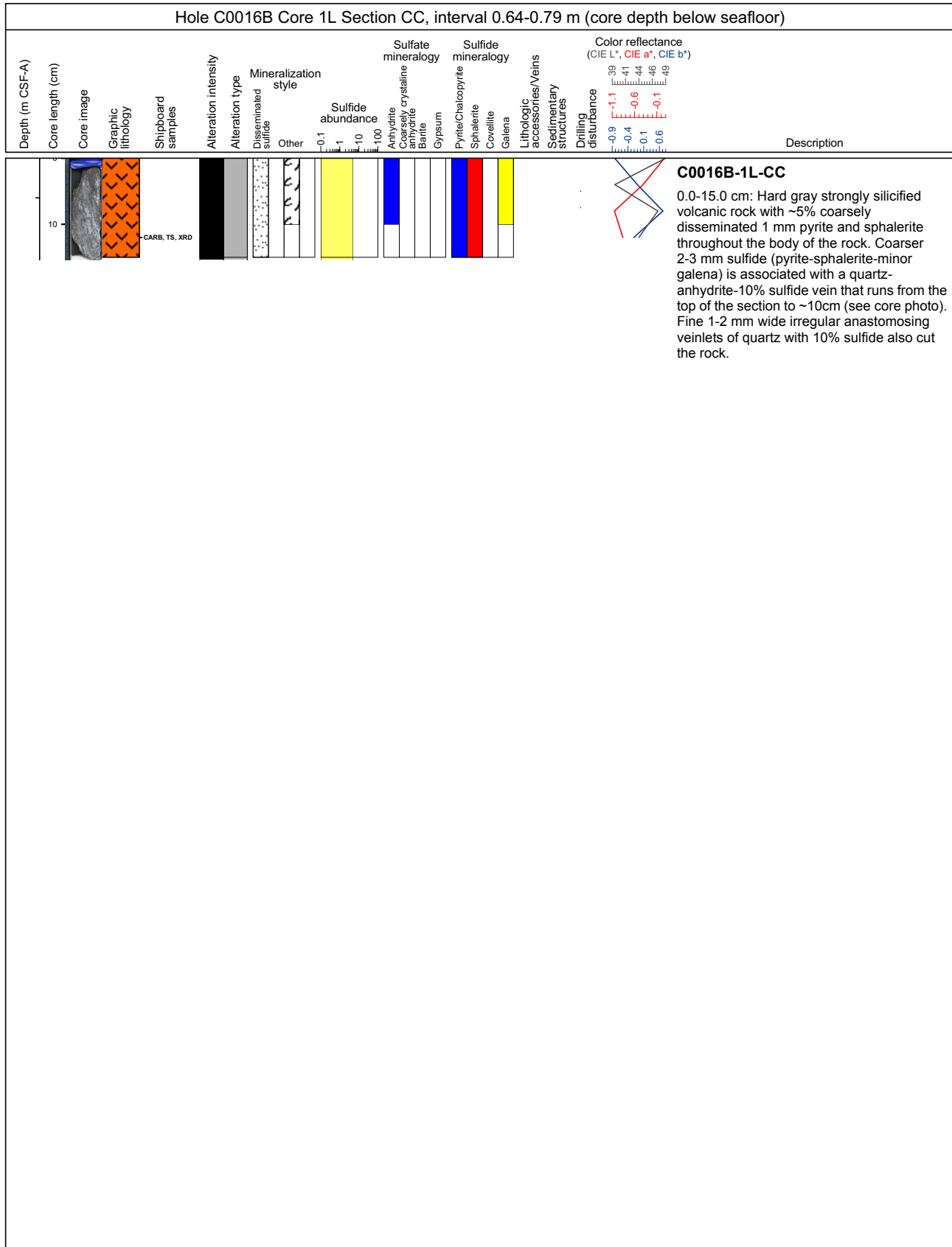
# Core Photo

C0016A-1L NO RECOVERY

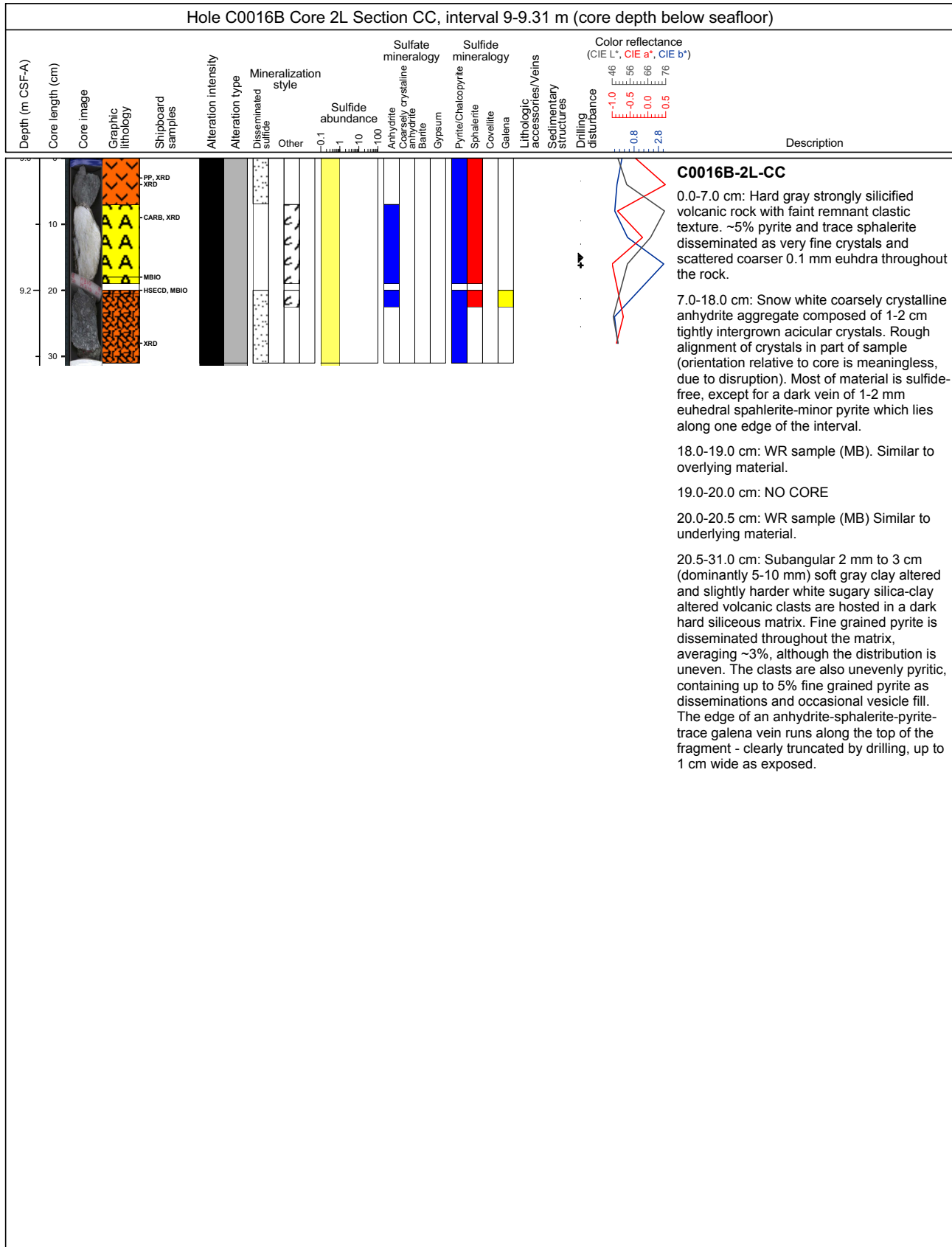
Hole C0016B Core 1L Section 1, interval 0-0.64 m (core depth below seafloor)



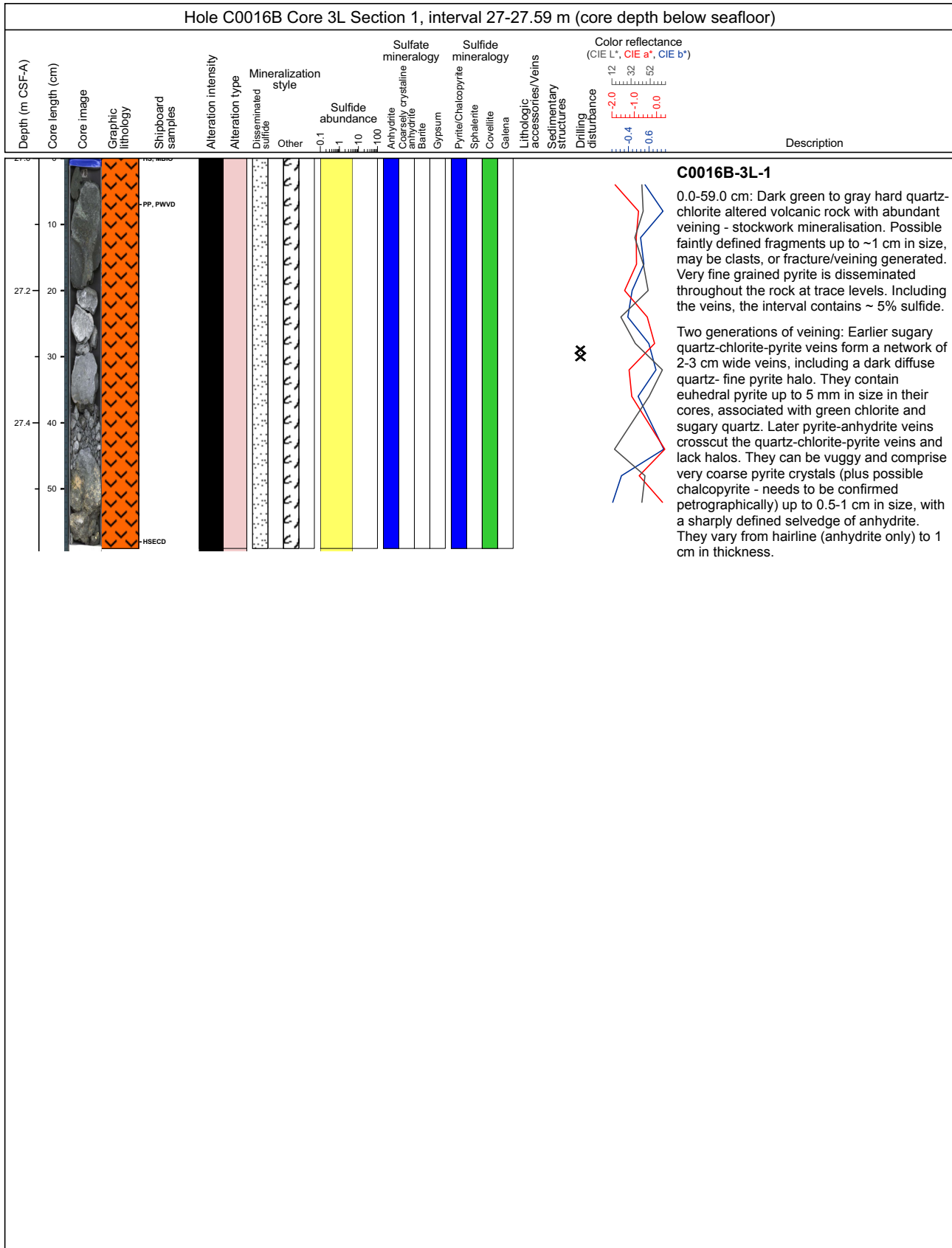
### Core Photo



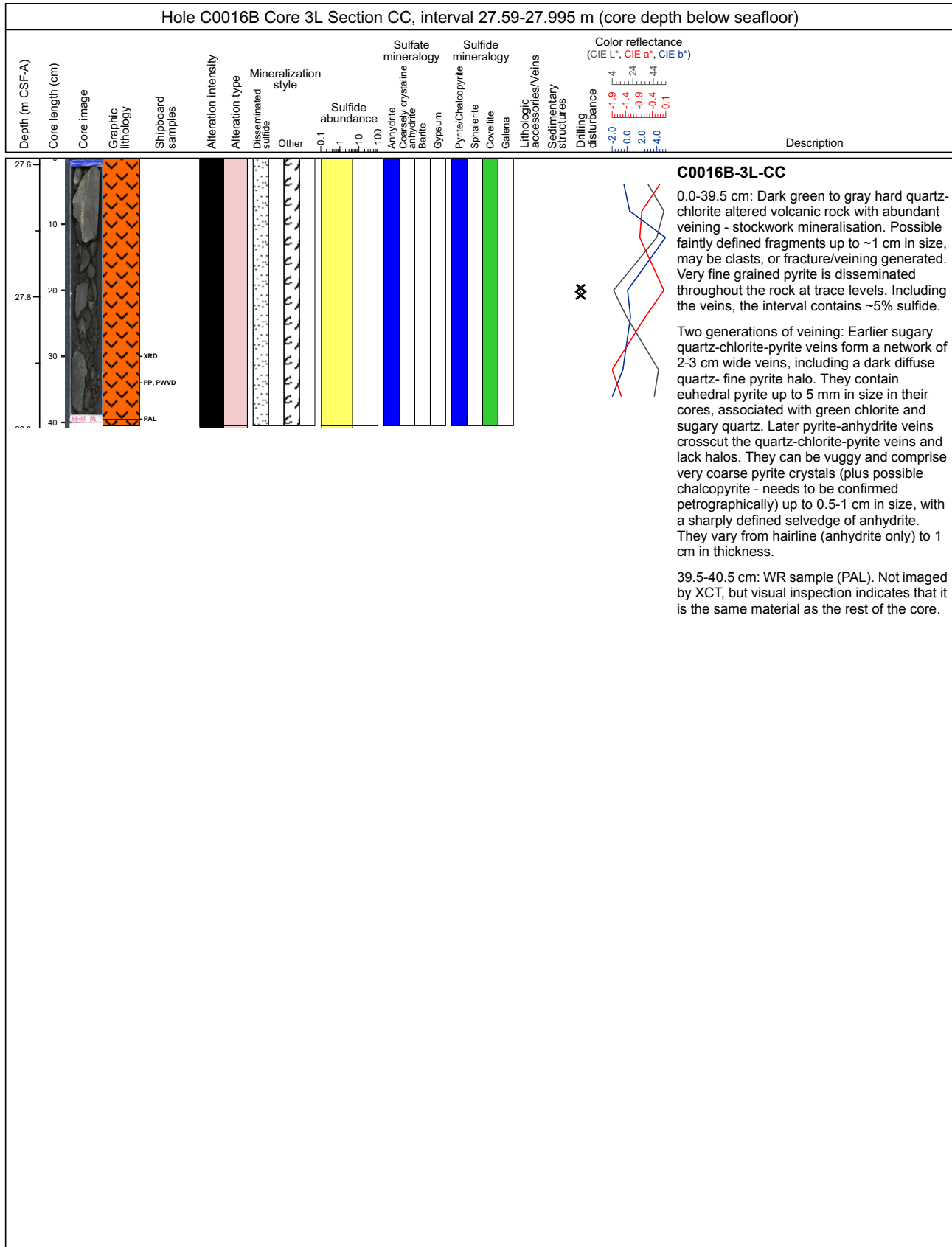
# Core Photo



# Core Photo



# Core Photo



## C0016B-1L-1: 18-20 cm

**Macroscopic description:** Sphalerite-pyrite rich “black ore” massive sulfide.

**Thin section mineralogy:**

Sphalerite	40%	Pyrite	10%
Muscovite/illite	20%	Anhydrite	10%
Quartz	15%	Galena	4%
		Chalcopyrite	1%

**Description:**

Poor quality thin section – polish is uneven and areas have been plucked during polishing.

Illite/muscovite-pyrite altered clasts of volcanic rock, typically ~5 mm in size, and fragments of quartz, typically 1-2 mm in size, are cemented in a crystalline matrix of quartz-muscovite-sulfide (pyrite-sphalerite-chalcopyrite-galena) and late coarsely crystalline anhydrite.

A consistent paragenesis is present in the sulfide and sulfate phases. Early iron-poor sphalerite appears to be detrital in origin and typically occurs as 0.5mm subhedral, slightly rounded crystals, which commonly exhibit chalcopyrite disease. This first generation of sulfide is overgrown by the other sulfide phases present in the sample. Pyrite occurs as euhedral to subhedral grains, both as single crystals and as overgrowths, with galena, on early sphalerite, and is itself replaced by and overgrown by chalcopyrite. A second generation of iron-poor sphalerite overgrows early sphalerite and the other sulfide phases and also forms colloform and atoll textured aggregates, implying crystallization into open space. The final phase of precipitation is represented by coarse 2-3mm anhydrite crystals, which overgrow all other phases in the sample.

**Images (331-C0016B-1L-1\_18-20\_TSS\_nn.PDF)**

**01:** Illite/muscovite altered volcanic clast containing disseminated pyrite and quartz fragments cemented in quartz-muscovite-sulfide (pyrite-sphalerite-chalcopyrite-galena) [PPL, x10].

**02:** Same FOV as 01. Illite/muscovite altered volcanic clast containing disseminated pyrite and quartz fragments cemented in quartz-muscovite-sulfide (pyrite-sphalerite-chalcopyrite-galena) [XPL, x10].

**03:** Same FOV as 01. Illite/muscovite altered volcanic clast containing disseminated pyrite and quartz fragments cemented in quartz-muscovite-sulfide (pyrite-sphalerite-chalcopyrite-galena) [RL, x10].

**04:** Same area as 01, larger FOV. Illite/muscovite altered volcanic clasts containing disseminated pyrite and quartz fragments cemented in quartz-muscovite-sulfide (pyrite-sphalerite-chalcopyrite-galena). Interstitial late anhydrite is visible in upper centre of image [PPL, x2.5].

**05:** Same area as 02, larger FOV. Illite/muscovite altered volcanic clasts containing disseminated pyrite and quartz fragments cemented in quartz-muscovite-sulfide (pyrite-sphalerite-chalcopyrite-galena). Interstitial late anhydrite is visible in upper centre of image [XPL, x2.5].

**06:** Same area as 03, larger FOV. Illite/muscovite altered volcanic clasts containing disseminated pyrite and quartz fragments cemented in quartz-muscovite-sulfide (pyrite-sphalerite-chalcopyrite-galena). Interstitial late anhydrite is visible in upper centre of image [RL, x2.5].

**07:** Coarse anhydrite overgrowing quartz and sulfide [PPL, x2.5].

**08:** Same FOV as 07. Coarse anhydrite overgrowing quartz and sulfide [XPL, x2.5].

**09:** Same FOV as 07. Coarse anhydrite overgrowing quartz and sulfide [RL, x2.5].

**10:** Chalcopyrite pseudomorphically replacing euhedral pyrite [RL, x5].

**11:** Colloform/atoll textured sphalerite overgrowing pyrite and chalcopyrite [PPL x5].

**12:** Same FOV as 11. Colloform/atoll textured sphalerite overgrowing pyrite and chalcopyrite [RL x5].

**13:** Chalcopyrite diseased sphalerite [RL x40].

**14:** Pyrite-chalcopyrite-sphalerite-galena intergrowth. Chalcopyrite overgrows pyrite and sphalerite shows chalcopyrite disease. [RL x20].

**15:** Early subhedral sphalerite, with a later overgrowth of sphalerite [PPL x5].

**16:** Same FOV as 15. Early subhedral sphalerite, with a later overgrowth of sphalerite [PPL x5].

**17:** Early and late sphalerite intergrown with pyrite and chalcopyrite [PPL x5].

**18:** Same FOV as 17. Early and late sphalerite intergrown with pyrite and chalcopyrite [RL x5].

## C0016B-1L-CC: 12-14 cm

**Macroscopic description:** Strongly silicified volcanic rock with ~5% coarsely disseminated pyrite and sphalerite.

**Thin section mineralogy:**

Quartz	60%	Pyrite	5%
Muscovite/illite	25%	Sphalerite	5%
Anhydrite	5%	Galena	Trace
		Chalcopyrite	Trace

**Description:**

Poor quality thin section – polish is uneven and areas have been plucked during polishing.

The rock comprises intergrown quartz-muscovite/illite-pyrite and sphalerite with late coarse anhydrite veining/space fill. There is no visible evidence of volcanic fabric in the thin section.

1mm subhedral sphalerite and 0.1mm pyrite euhedra are the most abundant sulfides, and sulfides display a similar paragenesis to that seen in the overlying massive sulfide (see C0016B-1L-1: 18-20 cm). Early sphalerite is locally overgrown by a second generation of sphalerite, or pyrite and/or minor galena. Pyrite shows replacement by and overgrowths of chalcopyrite.

**Images (331-C0016B-1L-CC\_12-14\_TSS\_nn.PDF)**

- 01:** Representative view of sample. Intergrown quartz-muscovite/illite-sphalerite-pyrite. [PPL, x5].
- 02: Same FOV as 01.** Representative view of sample. Intergrown quartz-muscovite/illite-sphalerite-pyrite. [XPL, x5].
- 03: Same FOV as 01.** Representative view of sample. Intergrown quartz-muscovite/illite-sphalerite-pyrite. [RL, x5].
- 04:** Sphalerite-pyrite-chalcopyrite-galena-quartz intergrowth [RL x20].
- 05: Same FOV as 04.** Sphalerite-pyrite-chalcopyrite-galena-quartz intergrowth [PPL x20].
- 06:** Sphalerite overgrown by galena, which is overgrown by pyrite, which is overgrown by chalcopyrite [RL, x10].
- 07:** Higher magnification view of the galena-pyrite-chalcopyrite overgrowth at left of FOV in 06 [RL, x40].
- 08:** Sphalerite with Fe-rich core [PPL, x10].
- 09: Same FOV as 08.** Sphalerite with Fe-rich core [RL, x10].
- 10:** Sphalerite overgrown by pyrite, which is overgrown by chalcopyrite, hosted in quartz and muscovite/illite [RL, x10].
- 11: Same FOV as 10.** Sphalerite overgrown by pyrite, which is overgrown by chalcopyrite, hosted in quartz and muscovite/illite [PPL, x10].
- 12: Same FOV as 10.** Sphalerite overgrown by pyrite, which is overgrown by chalcopyrite, hosted in quartz and muscovite/illite [XPL, x10].
- 13:** Corroded coarse anhydrite crystal [PPL x5].
- 14:** Corroded coarse anhydrite crystal [XPL x5].
- 15:** Typical 1mm subhedral sphalerite grains with pyrite and sphalerite overgrowths [PPL x2.5].
- 16: Same FOV as 15.** Typical 1mm subhedral sphalerite grains with pyrite and sphalerite overgrowths [RL x2.5].