AUGER HAMMER

CONTINUOUS CORING

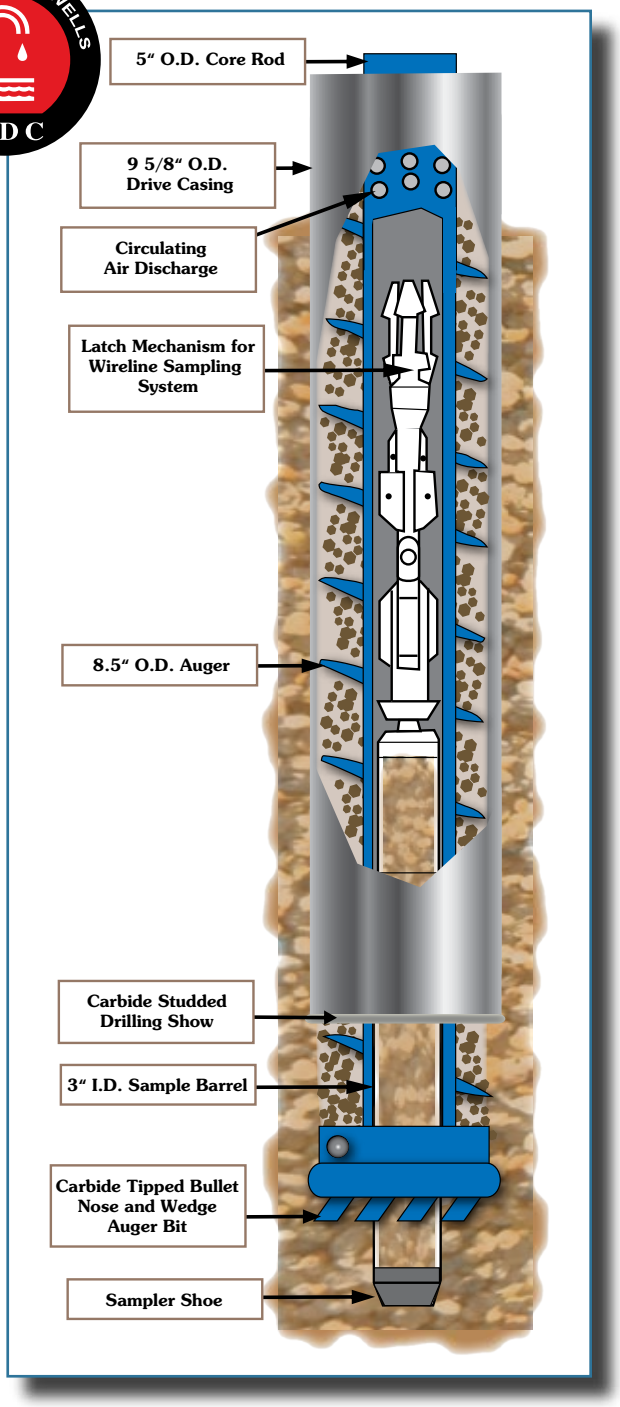
The Auger Hammer Continuous Coring system combines the flexibility and discreet information benefits of Air Rotary Casing Hammer (ARCH) drilling with airless, Hollow Stem Auger continuous dry-coring. Used for investigative, remedial system confirmation sampling or well installation, the technical capabilities of conventional ARCH and dry-core methods are heightened by their combined use as a system.

Method Description

The drilling assembly consists of two primary components: Wireline continuous coring assembly and heavy-wall, flush threaded temporary drive casing. Coring is performed in a similar manner to MOSS® and Christensen® wireline systems. The coring string is 5-inch OD x 4-inch ID hollow coring pipe. A wireline latching sub, short hollow stem auger section, and air diversion sub are attached at the bit area of the pipe assembly. The wireline unit is affixed with either core barrel or conventional drill bit for coring or drill ahead operations, respectively. Core samples are retrieved or delivered by wireline. During either coring or drill operations, cuttings are raised approximately 15-feet away from the bit area by rotation of the auger flights. Cuttings return to the surface are brought by air circulation through the core pipe to the annular space of the pipe and drive casing strings by an air divert system built integral to the coring assembly. Returns are discharged through water tight cyclone separator at the surface. Air is prevented from reaching the sample interval by the presence of the wireline unit internally and soil materials within the outer auger flights.

Any sampling device such as a split spoon, Simulprobe®, Hydropunch® or soil gas probe can be performed through the core pipe assembly by removing the wireline unit, leaving open access to the in-situ information.

Advancement of 9 5/8" OD x 8 5/8" ID outer drive casing occurs either ahead of or subsequent to the coring or sampling event. The temporary casing is used to seal-off troublesome formations or groundwater, provide friction relief to the dry coring operation or to enlarge the borehole to required size for monitoring well construction. The casing is driven into place by a 7000-9000 pound air actuated casing hammer located in the drill rig mast. Removal of the casing is by a hydraulic jacking system capable of 250 tons of force. Borehole abandonment or well construction takes place through the drive casing with sections removed as the height of completion progresses.



Method Benefits

- Provides all the discreet information benefits of casing advance drilling technologies.
- Provides alternate sampling method to normal surface grab samples from cyclone separator.
- Obtains samples quickly through wireline retrieval.
- Provides undisturbed continuous cores similar to hollow stem auger continuous dry coring samples.
- Allows for efficient sampling at any interval.
- Geologic formations and collected core samples are not affected by generated heat or air.
- Allows for the collection of continuous core samples to depths that far exceed hollow stem auger or sonic drilling methodologies.
- 1000-foot depths are possible using telescoping techniques.
- Provides nominal 10-inch boring diameter for flexible well installation sizing.
- Can be used in conjunction with Simulprobe®, Hydropunch® or soil gas probe sampling devices.

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