12.0 SAMPLING METHODOLOGY

The techniques are described in considerable detail by Geovic (2003) and Burcham (2003). PAH observed sampling and processing on-site during the period September 1-3, 2004.

The sample bags normally used by Geovic are white double-thickness polyester, with a drawstring at the neck and a label sewn inside the neck. The geologist writes the sample identifier on the inside label and on the outside of the bag, with a permanent marking pen.

12.1 *Pit Sampling*

Most of the sample points were exposed and sampled by test pits, dug using simple hand tools by local labor crews. A standard pitting crew, consisting of two people, is shown in Figure 12-1. A pit photo is presented as Figure 12-2. The standard equipment for a crew consists of hard hats, a steel pry bar, a bucket, rope, a shovel handle or scoop, and steel-toed rubber boots and a harness. A gasoline-driven air blower and 20 meters of vinyl tubing are normally available to provide air when a pit is poorly ventilated, usually at a depth of more than 13 meters. Each pit is normally circular in section and 1.2 meters in diameter, although the diameter may vary slightly.

Spoil not included in the sampling program from the pit is deposited in piles around the pit, but is not rigorously segregated by depth interval. Changes in texture (breccia, limonite) or conspicuous changes in color warranted segregation. A sample is collected each meter by cutting a rectangular groove in one wall of the pit, measuring 10 by 5 centimeters. When more than one sample is collected from an interval concurrently, these are oriented following the main cardinal compass points (N, E, W, S). Each pit is visited once or several times daily by a geologist to log geology, check channel progress, collect the samples from the intervals extended in his absence, and to decide whether to continue digging.

12.2 *Trench Sampling*

The trench in Nkamouna West was intensively sampled after excavation, by channel samples. Since the trench represents effectively only one sample point in a previously-pitted area, and because the main purpose of the trench was for geotechnical information, the trench samples were not used in the resource calculations. Assays and a final report on the second trench were not completed sufficiently for discussion in this TR.

12.3 *Drill Hole Sampling*

Because the UNDP holes were not used by Geovic for resource estimation, the UNDP sample quality is not discussed in detail. From examination of the original log of hole KG-S-1, it is apparent that the UNDP holes were sampled at irregular intervals, corresponding to core-barrel lengths and also to geological breaks.

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Project 43-101

FIGURE 12-1
TWO-MAN PITTING CREW with
BASIC EQUIPMENT (Pit in Foreground)

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Jan/2008

Drawing Name
Fig.12-1.dwg

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pincock, allen & holt 165 S. Union Boulevard, Suite 950 Lakewood, Colorado 80228 Phone (303) 986-6950	***GEOVIC MINING Corp.***	FIGURE 12-2 PIT, SHOWING PRIOR DRILLHOLE in far CORNER and FOUR ADDITIONAL SAMPLING CHANNELS	Jan/2008
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80530	Nkamouna Cobalt Project 43-101		Fig.12-2.dwg

Sample intervals generally varied between 0.5 and 1.65 meters. Each interval was logged by color and texture, and by mineralogy where noted. All samples were analyzed for Ni, Co, Mn, Cr, Cu, Zn, Pb, and MgO. Composites representing 5 to 10 meters were analyzed for Fe_2O_3.

The Geovic diamond-drill holes drilled in 1999 were sampled at 1.0 or 1.5 meter intervals generally, although there were many exceptions due to geological breaks and coring intervals. Core from the laterite zone (earthy) was air-dried, crushed, split and halved, with one half sent for assay. The core from the partly weathered, hard serpentinite was cut into two equal parts along the vertical axis of the core, and one part was forwarded for assay while the other was left as backup in the sample store.

Geovic's reverse-circulation holes, drilled during 2002 and 2003, were almost invariably sampled at one-meter intervals. The reverse-circulation pathway, including the cyclone and collection buckets, was flushed with water after collection of each one-meter interval, to prevent cross-contamination. The sample expelled by the cyclone, including the water used to flush the sample pathway, was logged by the drill geologist for geology, and drilling parameters (wet vs dry, hardness, unusual sample volume, etc.)

After the sample-recovery bucket has stood until most fines had settled, the clear water at the top was decanted, and the wet sample placed in a previously-labeled bag. At the end of the day, the bags were transported to Kongo Camp.

As is typical of reverse-circulation drilling, precise measurement of the recovery percentage was not possible.

Water-soluble polymer ("Baroid EZ Mud") was used to maintain recovery in clay-rich intervals in the lowermost ferralite and upper saprolite horizons. It is recognized that sample recovery in these intervals was unsatisfactory, but these horizons are rarely of economic cobalt grade.

Geovic commissioned a careful study (Burcham, 2003, pages 15-18) of potential downhole contamination. The prominent "manganese spike" typically present near the base of the breccia in drill hole assays reveals that vertical cross-contamination is negligible, since the "manganese spike" in drill holes is just as sharp as it is in channel samples taken from pits.