

5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, AND INFRASTRUCTURE

5.1 Access

Geovic's Cobalt-Nickel Project is located in the Haut Nyong Division, East Province of Cameroon, Africa. The Project's site is 640 kilometers by road from the seaport of Douala, and about 400 kilometers from the capital city of Yaounde. The closest town to the Project site is Lomie, at approximately 33 kilometers to the west – southwest. The closest railroad transport to the Project is at the town of Belabo, at a distance of approximately 240 kilometers. International airports and modern telecommunication facilities exist at Yaounde and Douala. Suitable shipping and receiving facilities exist at the international seaport of Douala.

Access to the Project site is from the seaport of Douala by a well-maintained provincial highway via Yaounde and Ayos. After Ayos and across the Nyong River, the highway to the Central African Republic deteriorates rapidly to a well-traveled two-lane gravel road to Abong Mbang. Turning south from Abong Mbang towards Lomie, the road narrows and is frequented by log and lumber trucks over the next 127 kilometer distance to Lomie. The road from Lomie to Kongo village supports heavy log and lumber transports, as does the road from Kongo village to the project site.

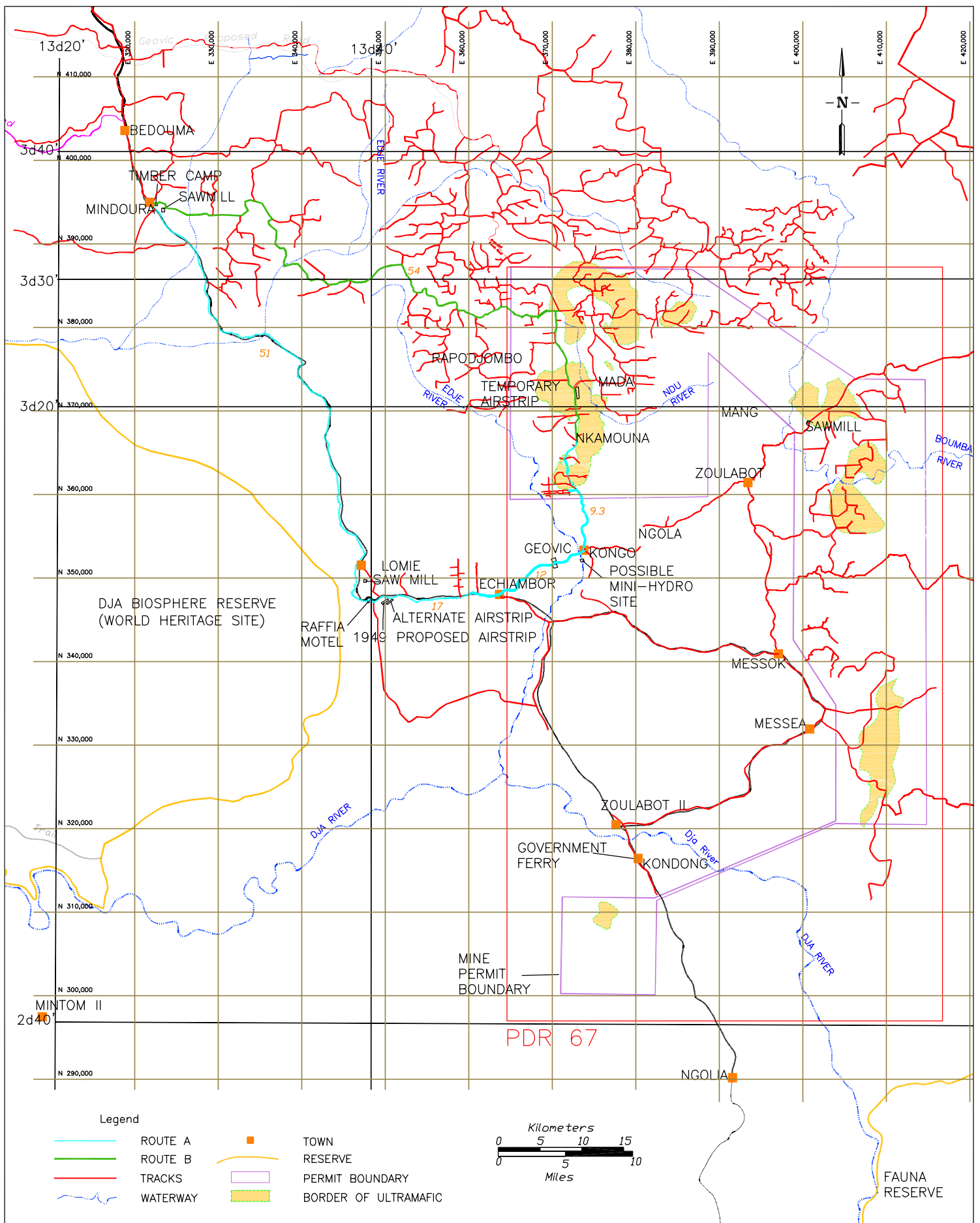
From Lomie, the road passes east to the village of Echiambot where it branches northeast to the Edje River and Kongo village. The project site at Mada is located 15 kilometers north of this village. The trip from Yaounde to Kongo village takes about 8 hours by vehicle.

Transport infrastructure in Lomie includes the Haut Nyong Express that carries people four times per day to Yaounde (18 per bus) and 10 busses per day to Abong Mbang. Motorcycle taxis transport individuals in the Lomie area. Geovic intends to provide, or arrange, scheduled bus and van service between the project and main towns and villages around the project site. Existing roads will be improved and a small, private airstrip will be constructed for flying certain personnel to and from Yaounde or Douala, emergency medical reasons, expediting mail, and delivery of emergency parts and supplies.


Transportation routes to the project are shown in Figure 5-1.

5.2 Climate

The climate of the region is classified as an "Equatorial Guinea" sub-type characterized by two main seasonal types, namely the "main wet" season and "main dry" season, and two minor seasonal types designated as "mini wet" and "mini dry." The site is located on the northwestern margin of the Congo River tropical zone.



- Legend**
- ROUTE A
 - ROUTE B
 - TRACKS
 - WATERWAY
 - TOWN
 - RESERVE
 - PERMIT BOUNDARY
 - BORDER OF ULTRAMAFIC

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**FIGURE 5-1
 TRANSPORTATION ROUTES**

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Annual maximum monthly temperature ranges from 24° to 33° centigrade. The lowest daily minimum temperature recorded is 12° centigrade, but temperatures normally do not fall below 18° centigrade.

The average annual precipitation over a 32-year period is 1,580 millimeters and the humidity is typically high and evaporation rates high on an annual basis. Maximum annual precipitation measured to date totals 2,200 millimeters. The main wet season occurs between September and early November, and the main dry season occurs from November to May. The mini wet season lasts about eight weeks in March to May, and the mini dry season extends from June to mid-September. Limited amounts of rainfall occur throughout the year, except during the months of December and January. The average number of rain-free days at site was 229 and days receiving a total of at least 25 mm of precipitation at Nkamouna are 28 per year. Average monthly evaporation rates exceed rainfall during the two dry seasons. Data for 2004 show total precipitation at 1,820 millimeters, evaporation at 1,951 millimeters, for a net evaporation of 131 millimeters. The prevailing wind direction is from the south and southwest, and averages less than 4-kilometers per hour. Wind gusts rarely exceed 8 kilometers per hour, and are commonly undetectable beneath the tree canopy near the proposed Plant site.

5.3 *Vegetation*

The vegetation in plateau areas is typical of an “evergreen equatorial forest” characterized by diverse endemic plant species. The forest area is stratified in three layers, including the 40-meter tall tree canopy characterized by broad-crown diameters and straight limbless trunks; shorter, more slender, fast-growing, narrow crown-diameter, fragile trees form the intermediate layer; and the scanty undergrowth layer consisting of vines, brush and ferns. Trees of local economic importance include Ayos, Sapelli, Wengive, Iroka, Bubinga, Azobe, and Obeche. Other diverse species occur in swamplands and patches of dense wet-substrate dominated valley floors.

Recent logging has occurred throughout most of the mineralized areas within the Mine Permit. The extent of this logging is documented on satellite images and by ground surveys. These logging activities are independent of Geovic’s operations and were part of pre-existing timber leases within the Mine Permit area.

5.4 *Physiography*

The central part of the cobalt-nickel mineral district is dominated by a series of rolling upland plateaus that are isolated by several river systems that feed into the main Congo River drainage basin. Elevations in the province range from about 450 meters along the lower Dja River to 927 meters above sea level at Mount Guimbiri, located east of Abong Mbang.

The Mada deposit is relatively flat. There is a swamp and small depression in the center of the deposit. The deposit is a crescent shape about 8 kilometers from east to west and 14 kilometers from north to south. The perimeter of the deposit has an approximate elevation of 760 meters above sea level, with the lower central depression of 680 meters.

The following satellite images, vertical aerial photographs and topographic coverage of the Province are available:

■ TOPOGRAPHIC SHEETS

- Abong Mbang, Medoum, Mintom, Ngoila & Nokadouma sheets (1:200,000 scale)
- Geovic coverage of the Mada area (1:10,000 scale)

■ BLACK AND WHITE PHOTOGRAPHS

- Vertical aerial photographs (1:200,000 scale). Flight lines are numbered on the back of 1:200,000 scale topographic sheets and are not comprehensive (1953-54 coverage).

■ SATELLITE IMAGES

- Landsat, USA (1m, 15m and 30m pixel resolution)
- SPOT, French (30 meter pixel resolution)

5.5 *Infrastructure*

The Project site is located in a remote tropical setting that is characterized by an expanding economy driven primarily by the production of forestry related products and minor production of cocoa and palm oil. Government jobs and non-governmental organizations also contribute to the local economy. Several companies conduct substantial logging operations throughout the region and major sawmills are operated within 115 km of the Project site at Lomie, Messamena, and Mindourou. Approximately 300 truck loads of logs are hauled per day in the East Province by contract trucking companies. The local logging industry uses large, modern equipment and employs numerous equipment operators and maintenance personnel. In addition, the industrial center and port city of Douala has several equipment, service and supply companies that support Cameroon's industries as well as much of land-locked West Africa.

The town of Abong Mbang, with a population of approximately 30,000, is located at the entrance to the district. It is the provincial headquarters of the Prefecture and main administrative and commercial center for the Haut Nyong Division. The town hosts a local trade school, service stations (Texaco and Total-Elf), hotels, restaurants and rental phone service. It is the main administrative center for the Ministry of Environment and Protection of Nature, and the Ministry of Mining & Technological Development. The nursing school at Lyos, west of Abong Mbang, is the main training center for local nurses.

Lomie is the closest town to the Mada Project site. At present it takes about one hour to drive the 40 kilometers between Lomie and the Project site. The economy of Lomie is largely undeveloped, except for a large sawmill and surrounding timber harvesting operations. Local businesses include the Lomie Subdivision's government headquarters of the Prefecture, police station, hospital (two doctors and eight nurses), parochial schools, shops, general mercantile stores (3) and the Raffia Motel. Most business activity centers around logging and the local saw mill that is located east of town. Other activities include

road maintenance, palm oil production, limited agricultural activities and general commerce. Lomie's municipality has provided diesel electric power (200kW) to those who can afford it, since 1997. Lomie is the site of a number of domestic and international NGO's that monitor the World Heritage Dja Biosphere reserve and other reserves within the region.

Within the Lomie Subdivision, the number of children in the Lomie primary school district total 3,166 pupils, representing 69 percent of school age children in the Subdivision. Primary schools in the Subdivision total 25, headed by 59 teachers (38-government paid/18-private). The local technical school (SAR.SM) has 78 students who are trained principally in rudimentary building skills.

Messok is the second largest town in the Subdivision and hosts a medical aid station, police station, slab-wood constructed motel and a Belgian-based mission school. Kongo village, approximately 2 kilometers from the site of Geovic's present base camp, is located 32 kilometers east of Lomie. The village population in 1998 totaled about 150 (all names are on the Geovic land lease), and is currently much larger, as is evidenced by the growth of the Geovic funded parochial school.

Mindourou and Messamena are two sawmill centered towns that have been expanding rapidly, both in population and local infrastructure, as has Lomie and Abong Mbang.