7.3.15 Power Supply and Routing

Ensuring a reliable, cost-effective power supply is a critical component for the Côté Gold Project. The majority of the power requirement is for the ore processing plant, with the balance required by the mine itself, along with ancillary needs such as dewatering, administration and other on-site activities. During the initial stages of Project construction, the electrical power demand is expected to be relatively low, less than 5 MW. This power demand would be met through the existing nearby transmission line (1 MW) as well as diesel generators (less than 5 MW). The current schedule anticipates that a 230 kV connection to support operations will be in service for the later stages of construction.

Diesel power is an effective method to support Project construction prior to additional grid power being brought to site and can serve effectively as emergency power for critical site functions. This alternative was brought forward into the EA to be considered for short-term use during the construction phase and subsequent periodic use during the operations phase (and potentially during the closure phase) as needed when grid power is unavailable. On-site diesel-fired power generation to support operations, however, will result in the release of greater amounts of carbon dioxide, NO_x, and particulate emissions than other alternatives and is not considered to be cost effective for normal operations.

Alternative energy sources such as hydroelectric, solar and wind power were considered for primary power generation during operations. The nearest hydroelectric dam is Ontario Power Generation's Wawaitin Generating Station located approximately 90 km north of the Project and the capacity of the facility is too low to meet the Project's power requirements. Without viable energy storage technology, solar and wind generated electricity cannot meet the Project's power requirements on a consistent basis because of the intermittent nature of solar and wind generation. As a result, the use of alternative energy sources as the primary power generation supply has not been assessed in the EA.

A review of transmission infrastructure that could serve the Project during operations has been carried out. A 500 kV Hydro One transmission line is located approximately 90 km east of the Project; however, Hydro One and the Independent Electricity System Operator generally do not allow direct connection to a 500 kV transmission line. In addition to the 500 kV transmission line, there is a 115 kV transmission line located approximately 50 km east of the Project; however, 115 kV will not be sufficient for the Project.

IAMGOLD has thoroughly reviewed whether it is viable or not to run the Project with a 115 kV line. Based on the infrastructure requirements for the Project, a 230 kV transmission line has been deemed necessary, and a 115 kV line is not considered a technically, financially realistic or economically viable solution for IAMGOLD. A 115 kV line could provide a maximum of 70 MW to 80 MW. The current Project design requires 120 MW. In addition, the capacity of a 115 kV line would be at its limit at 70 MW to 80 MW and the stability of the system and capacity to deliver consistent power would be questionable. Also, from an efficiency standpoint, lower voltage lines have greater electrical transmission loss rates and, as such, use of a 115 kV line would waste power and increase power costs. Moreover, with greater power capacity available

through a 230 kV line, IAMGOLD will assess the potential for a more power-intensive mining method, such as in-pit crushing and conveying (IPCC). IPCC use, if deemed appropriate, can significantly reduce GHG emissions typically emitted from the truck fleet. The 120 MW estimate does not include the power which would be required to operate IPCC, as IPCC is still being evaluated by the Project team. Also, with the 230 kV line, IAMGOLD would have capacity in the power system to support potential future expansions of the mine and/or local needs; whereas, with a 115 kV line, expansion options would be entirely eliminated or extremely limited.

A 230 kV line is preferred for capacity reasons but also to prevent energy shortfalls. Power during the operations phase of the Project will be supplied by this new 230 kV transmission line connected to the existing Hydro One in Timmins at the Porcupine Substation. Either one of the proposed alternative transmission line alignments (TLAs) would be owned and maintained by IAMGOLD. The two TLA alternatives are described below.

The transmission line will be of standard design, typically using wooden, two-pole H-frame structures. Steel lattice tower structures will be required for angle and dead-end support. Guy wires will be used to support the structures as required, typically in softer soils and at turning points. The transmission line structure itself is not considered in this alternatives assessment.

A summary of these alternative TLAs is presented in Table 7-7, and the analysis is presented in Appendix U9. No further TLAs are currently considered because those alignments would either be longer or create more environmental disturbance compared to the alternatives considered in the EA.

7.3.15.1 Shining Tree Transmission Line Alignment

The Shining Tree TLA's first segment, of approximately 120 km in length, would be located parallel to an existing 115 kV transmission line from Timmins to the Shining Tree Substation. The second segment, with a length of approximately 40 km, would extend from the Shining Tree Substation to the Project site alongside an existing distribution line. The total length of this TLA would be 157 km. The right-of-way (ROW) would be expanded by a total of 45 m alongside the existing ROW, thereby requiring the clearing of approximately 830 ha of land.

This alternative is longer, and long transmission lines typically experience greater electrical transmission losses and have higher capital requirements for construction. This alternative, however, has a low potential for Project delays which may be caused by new claims, land tenure negotiations or environmental permitting. Most of the potential physical and biological environment effects at the Shining Tree TLA would occur during the construction phase and can be mitigated, with little to no effects anticipated for the human environment. Periodical clearing of the ROW would be required during operation to ensure its safe operation, through manual/mechanical means to avoid the use of approved chemicals. Closure alternatives for this TLA include complete removal or potential transfer to a local service provider.

7.3.15.2 Cross-Country Transmission Line Alignment

The Cross-Country TLA has three segments. The first segment would run parallel to the same existing 115 kV transmission line from Timmins for approximately 46 km. A new route would then go through previously undisturbed land south-west toward the Project site for approximately 68 km, closer to Highway 144 and Gogama. The last 6 km follows the same route as for the Shining Tree TLA, totalling 120 km in length. The ROW would be expanded by a total of 45 m alongside the existing ROW of the 115 kV line for the first segment, and by 50 m for the rest of its length, thereby requiring the clearing of approximately 675 ha of land. This proposed route has been sited to facilitate access for maintenance requirements, while locating it in remote areas to minimize potential effects to the environment and any nearby residents.

This alternative is shorter in length compared to the Shining Tree TLA alternative, and has a more direct route to the Project site. Potential physical and biological environment effects would occur during the construction phase. This alternative would disturb more wildlife habitat, but potential effects to the biological environment are largely expected to be similar and, in some cases, less than the Shining Tree TLA alternative due to its shorter length. Because a section would cross through currently pristine habitat, this alternative has a higher risk of Project delays which may be caused by new claims, land tenure negotiations or environmental permitting. Periodical clearing of the ROW would be required during operation to ensure its safe operation, through manual/mechanical means to avoid the use of approved chemicals. Closure alternatives for this TLA include complete removal or potential transfer to a local service provider.

7.3.15.3 Preferred Transmission Line Alignment

The resulting preferred alignment is the Cross-Country TLA, as this TLA is more cost-effective, while producing no, to minimal effects on the physical, biological and human environments with appropriate mitigation measures (see Appendix U9).

The Cross-Country TLA is a more direct and shorter route to the Project site, which greatly reduces costs. Vegetation clearing is greatly reduced with this alternative. The Cross-Country TLA will clear 155 ha less than the Shining Tree TLA, following in parts Highway 144 which will facilitate access. Additionally, because it is a shorter route, electricity transmission losses will be greatly decreased, reducing operational costs.

SAR have been detected in the area through which both TLA alternatives would pass; particularly little brown myotis bats. However, no bat roosting or hibernacula sites or SAR bird nesting sites have been identified along the proposed TLAs (see Chapter 6), except for some eagle nests on the existing transmission line's poles along the joint TLA section for both alternatives and the Shining Tree TLA alternative. As a result there are no major differences in the potential for effects between the TLA alternatives for the biological environment. Habitat changes may affect some species but can benefit others, such as whip-poor-wills and bats which prefer more open areas.

While the Cross-Country TLA alternative has a somewhat higher risk of Project delays due to the potential for new claims, land tenure negotiations and environmental permitting, it is not currently anticipated that this will affect the Project differently than the Shining Tree TLA alternative would with respect to the above issues.

7.4 Project Alternatives - Mine Closure

IAMGOLD is committed to the progressive rehabilitation of the Project site over the life of the Project. During the closure phase, mining is terminated and final reclamation of the site occurs. Closure alternatives and the proposed progressive and final reclamation measures for the site and related infrastructure are assessed.

Alternative closure methods consistent with Provincial regulatory requirements have been considered, in order to prevent or reduce potential effects to the environment. The following components closures were considered:

- open pit mine (natural flooding, enhanced flooding, backfill with mineral waste);
- water management system (leave in place, partial or full removal);
- stockpiles (re-use, stabilization and covering/revegetation, use in backfill, engineered cover);
- TMF (permanent flooding, covering and revegetation);
- buildings (disassembly and removal, re-use of acceptable buildings);
- infrastructure (decontamination and removal, leave in place for future use, reclaim in place); and
- drainage (stabilize and leave in place, removal).

It should be noted that when the Project proceeds to the permitting phase, a detailed, certified Closure Plan (including financial assurance) is required under Ontario Regulation 240/00 of the *Mining Act* which will be submitted by the proponent for review by applicable government agencies and First Nations, and will be reviewed in consultation with the general public. A conceptual closure plan based on the preferred alternatives identified below is detailed in Chapter 5.

7.4.1 Open Pit Closure

The primary intent of reclamation and closure of the open pit is to achieve a physically safe and chemically stable environment. Based on the pre-feasibility level pit design, the open pit will have a total approximate void volume of up to 630 Mm^3 to level with ground surface at cessation of mining, and cover an approximately circular area of an estimated 210 ha (2.1 km^2).