Best Environmental Practices for Seismic Exploration in Tropical Rainforest

Dave Westlund, Gran Tierra Energy Inc.
Mark Thurber, Walsh Environmental Scientists and Engineers

Seismic exploration programs conducted in remote tropical regions typically emphasize operational efficiencies, security and safety, sometimes at the expense of mitigating environmental impacts in these highly sensitive environments. With the past increases in commodity prices and the opening of new and remote areas in Andean lowlands, acquisition of 2D and 3D seismic is critical to evaluate newly acquired blocks and fulfill important work commitments. In Peru alone an expected 6,000 Kms of 2D seismic is to be acquired in the next several years. A large portion of these data will be acquired in pristine and remote regions of lowland rainforest.

Gran Tierra Energy Inc. and Walsh Environmental Scientists and Engineers (WALSH) are using a set of benchmark environmental standards in Peru that address important impacts without putting onerous demands on the seismic contractor or inflating costs.

Historically seismic acquisition has caused minimal environmental impact compared to other stages or forms of resource extraction. However, as seismic exploration tends to occur early in a project life it allows the opportunity to establish high environmental standards and expectations amongst regulatory agencies, communities and non-governmental organizations. Additionally, seismic acquisition tends to be conducted over relatively large geographic areas, impacting a variety of geomorphically distinct terrains and habitats with varying levels of sensitivity. The baseline data collected in these areas is increasingly used to plan the design and control the execution of the program in order to avoid and mitigate impacts within the direct and indirect areas of influence, especially within high-diversity rainforest where conservation is a priority.

Important direct impacts to be mitigated include: minimizing clearing of rainforest vegetation for heliports, camps, drop zones and seismic lines. Careful planning and scouting allows for balancing operational and safety requirements while reducing the amount of deforestation. Biologically Sensitive Areas (BSAs) are protected by the use of prescribed offset distances. BSAs are small high-value microhabitat areas of intensive animal use including mineral licks, mud baths, trails, leaf-cutter ant farms and nesting areas. Additionally, efforts are made to control waste management in remote areas. Camps have programs to sort biodegradable refuse from non-biodegradable waste. Biodegradable waste is composted in situ. All non-biodegradable refuse is removed from the operations area for proper disposal or recycling. Hazardous non-biodegradable refuse has distinct handling procedures at a certified facility outside the project area. The increase in traffic on roads and rivers is mitigated by controlling operating speeds and usage and encouraging the efficient use of boats for transport of people and supplies. Likewise helicopter flights and associated disturbance of sensitive wildlife areas was minimized through the use of no-fly zones, long-lines and offsets of heliports from sensitive areas.

Important indirect impacts include: minimizing disturbance of normal community and economic activities in remote villages; limiting access to remote areas by opening trails or clearing rivers which facilitates pet collection, charcoal production; hunting, timber harvest, and land speculation.

We have developed a set of benchmark standards based on experience in Colombia, Ecuador and Peru that address mitigation of these impacts.

A team of biological monitors are used to guide and monitors the decisions about camp, heliport, drop zone and seismic line installation. These monitors provide training to the seismic crews on identifying sensitive areas prior to accidental intervention into a BSA prior to and during the seismic operations. The biological information collected by these biologists will also enrich the understanding of the biodiversity in the remote areas of the program where wildlife and plant diversity has little or no anthropogenic impacts. This information will be important for decisions about management in the future, including the petroleum company in their plans for future exploitation, local communities in developing sustainable management plans for their forests, and the government and academic institutions concerned about conservation.

Investments in implementation of an Environmental Management Plan for seismic exploration with effective benchmark environmental standards paves the way for fewer impacts and good stakeholder relations in later phases of exploration and development.