



Industry: Construction materials

Duration: 1987 - ongoing

Location: Milton, Ontario

Case study type: Site rehabilitation

Biodiversity conservation through quarry rehabilitation



Holcim, headquartered in Switzerland, is one of the world's leading suppliers of cement and construction materials. *The Holcim Group* has a market presence in over 70 countries on all continents. In Canada, Holcim operates 2 cement plants with the annual capacity to produce 2.7 million tonnes of Portland Cement and 500,000 tonnes of GranCem (a cement substitute with lower carbon intensity); 25 quarries and pits that produce more than 18 million tonnes per year of crushed stone, gravel and sand; 50 concrete plants and 2 construction companies specializing in major infrastructure projects. Holcim employs approximately 90,000 people worldwide and about 2,900 people in Canada. The Canadian Head Office is located in Concord, Ontario.

Holcim's perspective on biodiversity

Impacts on biodiversity

The production of cement and aggregates is a resource-intensive business that depends on long-term access to raw materials that are acquired through quarrying. Quarry operations and activities can have impacts on both terrestrial and aquatic habitats and the species – flora and fauna – dependent on them. Impacts are mainly due to direct site footprints, clinker production and water use.

Implementing biodiversity conservation

Holcim is of the conviction that biodiversity conservation plays an important role in its long-term resource and reserve strategy. To achieve this commitment, Holcim has embedded its corporate Environmental Policy in business processes to ensure continued focus and systematic performance improvement. The four main pillars of the Environmental Policy are:

1. Integration of environmental management guidelines into business processes and standards worldwide and monitor performance.
2. Promote eco-efficiency, conservation of non-renewable natural resources and recycling of secondary materials.
3. Measure performance, continuously improve and promote best practice in their industry.
4. Engage stakeholders and report publicly on compliance, performance and progress.

A network of environmental coordinators work to ensure that these are aligned and that the underlying principles are consistently applied. The company carries out raw material extraction and management with impacts assessed at each stage of quarry operation.

Both cement plants in Canada and all concrete and aggregate operations in Quebec have been certified to the ISO 14001 Environmental Management System standard. In 2006, Holcim (Canada) Inc. completed rehabilitation plans for its two cement plant quarries. In addition, its aggregate Divisions, Dufferin and Demix, have quarry rehabilitation plans which include ongoing rehabilitation activities. These plans are communicated to local stakeholders on a regular basis through open houses, newsletters and other communication channels.

Land use and biodiversity is addressed mostly at the local level, including raw material management, environmental and social impact assessment and quarry rehabilitation planning.

Commitment to sustainability

Holcim views sustainability as a means to open doors to new opportunities, new relationships and leading to long-term profitability. It has made a major contribution to sustainability through the Holcim Foundation for Sustainable Construction to foster a mindset where sustainability in the construction sector is approached as a technical, design and quality of life issue.

Holcim's vision for sustainability also extends through the construction value chain. It is achieved through developing sustainable building materials, in its approach to quarry rehabilitation, and in implementing innovative new processes for reducing waste and water consumption. Through investments, including in employees, it has continuously improved on sustainable environmental performance and resource use.

Holcim was instrumental in the creation of the World Business Council for Sustainable Development (WBCSD) Cement Sustainability Initiative. It has been recognized four years in a row as the sector leader on the Dow Jones Sustainability Index, the FTSE4Good index Series and the Ethibel Investment Register.



IUCN Partnership

Holcim recognizes that as a resource intensive business, biodiversity is a concern. In February 2007, Holcim and IUCN signed an agreement to work together to develop ecosystem conservation standards for Holcim and to contribute to sector wide improvements.

Under this agreement, one of the main objectives is to “review and assess the approach of the Holcim Group to biodiversity conservation management, establish a baseline, and develop a more comprehensive corporate biodiversity policy and strategy for the Holcim Group.”

As part of this initiative, Holcim requested each operating company, including Holcim (Canada) Inc., to complete a biodiversity questionnaire for each of its quarries with the intent of understanding its baseline. The questionnaire covered the following main areas:

- plant and quarry information;
- ecosystems information;
- location relative to sensitive areas and type of environment;
- level of knowledge of biodiversity at the site;
- areas of value for biodiversity;
- impact assessment;
- groundwater impacts;
- quarry rehabilitation programs and partnerships.

The Biodiversity Management in the Holcim SD Framework Baseline Status report was issued May 2008 to establish the Holcim baseline with respect to biodiversity management. It is based upon the extensive survey completed as part of the Holcim-IUCN partnership.

Water conservation

Aggregates and other construction materials businesses require significant quantities of water. Holcim is aware of the importance of water as a natural resource and acknowledges that its growing scarcity in many locations is a key issue. Holcim is investigating the implementation of comprehensive water management and monitoring systems at all operations.

Reducing use of non-renewable resources

Holcim has started several initiatives to make its business more sustainable. They are looking for alternative materials and to increase the amount of recycled content used in their products, including the use of reclaimed crushed concrete as a substitute for virgin aggregate materials. The amount of recycled materials used as concrete aggregates has tripled in the last three years.

Holcim Quarry restoration program

Rationale

As a member of the Cement Sustainability Initiative, Holcim committed to developing rehabilitation plans for all operating cement-related quarries and communicating them to external stakeholders. In 2004, to ensure that these rehabilitation plans meet both regulatory requirements and good practice standards, internal Group Guidelines on Quarry Rehabilitation Planning were developed and endorsed.

Description

The Quarry Rehabilitation Planning Recommendations are mandatory for all Holcim Group companies and include 10 Principles of Quarry Rehabilitation:

1. Comply with legal requirements.
2. Know your deposit and the impacts.
3. Build an interdisciplinary team.
4. Engage with stakeholders.
5. Plan your rehabilitation.
6. Make financial provision.
7. Carry out and monitor rehabilitation.
8. Report on the status of rehabilitation via the Plant Environmental Profile.
9. Review and update rehabilitation planning.
10. Retain documents.

The Guidelines document also contains Guidance for good practice in rehabilitation planning and a Checklist for self-assessment of status of quarry rehabilitation planning.

Milton Quarry

Holcim operates a quarry along the Niagara Escarpment in Milton, Ontario, through its subsidiary, Dufferin Aggregates, that has been in operation since 1962. Rehabilitation is an integral part of the overall land management program at the Milton Quarry and has been ongoing within the existing quarry for the past 23 years. It makes use of all on-site natural resources, including forest, soils, water and aggregate. The rehabilitated lands are intended to become a valuable public asset with approximately 336 ha of Dufferin-owned lands, including wetlands, lake and reservoir, to be eventually conveyed to the Conservation Authority. Since 1975, Holcim has rehabilitated more than 200 hectares of land in Milton.

Through proper rehabilitation planning, the Milton Quarry now includes natural heritage systems that have both biodiversity and recreational value. The original quarry site has been rehabilitated to a park setting with open areas and two baseball diamonds. The goal of the rehabilitation plan is to design a naturalized landscape with ecological diversity, compatible with the Niagara Escarpment surroundings and include public and private recreational opportunities.

Through an extensive ongoing quarry rehabilitation project the restored landscape now features extensive naturalized water bodies with varying shorelines, wetlands, wooded upland margins and slopes, open space, an education center with access to the Bruce Trail network and many kilometers of cliff face. The Milton quarry was the first site in Ontario that was allowed to leave exposed cliff faces as part of the rehabilitation process. The vertical faces are designed to duplicate the naturally exposed faces of the Niagara Escarpment. The rehabilitation design promotes a diversity of habitats with many plant and animal communities.

Each year additional rehabilitation actions, including plantings, will occur. Some are completed in conjunction with partners such as Scoutrees of Canada and the Halton Conservation Authority who assist in planting hundreds of trees and shrubs as part of the Earth Week Celebrations. On April 26, 2008, the 100,000th tree milestone was achieved.



Water management system

The Milton Quarry has a complex water management system which is unique in the industry. The quarry uses a closed-loop system for process water recycling and reuse. The wash plants utilize a fines recovery system to minimize the amount of wasted material and the material that does go to the silt ponds is eventually used in the rehabilitation of the quarry as base material for slopes.

The water management system includes a 70 hectares reservoir (capacity of 5.5 million m³), wetlands, a lake, three existing sumps and a ground water recharge system with 20 recharge wells. The reservoir is currently filling and used to supplement stream water to the Hilton Falls Reservoir tributary and the ground water recharge system. Currently, water is pumped to the tributary, however, when the reservoir water levels reach design levels, discharge will become passive. Discharge water only occurs to the Hilton Falls Reservoir and the rate of flow is determined in consultation with the local Conservation Authority.

The ground water recharge system is designed to operate either pressurized or passively and is being expanded to include the perimeter of a future Quarry Extension. The recharged water is very important in maintaining groundwater levels that help ensure stream levels and habitat for fish and that other aquatic biodiversity are not affected. The lake and wetland have filled to their operational levels.

Monitoring

Rehabilitation monitoring results have shown that a natural ecosystem can be re-established in 10 to 15 years. Documented monitoring surveys have shown the rehabilitated areas of the Quarry contain over 325 species of flora and more than 235 species of fauna that includes birds, amphibians, reptiles, insects and mammals. The varied habitats of the rehabilitated Milton Quarry lands have resulted in this area developing a significant ecosystem.

Communication and outreach

Dufferin Aggregates has an open door policy responding to inquiries, comments and complaints from neighbors and stakeholders and engages in on-site activities. Holcim hosts over 100 educational and special events each year with the expressed purpose of helping Government, NGOs, stakeholders and the general public, learn more about its operation and the contribution aggregate sites make to a sustainable environment. A large number of the educational events are school groups who come on site and learn about geology, aggregate processing, environmental management and site rehabilitation. Holcim also hosts tours for nature conservancy groups interested in the flora and fauna of the rehabilitated quarries and pits.

Milton Quarry is a founding member of the Bruce Trail Association and maintains more than 3 kilometers of walking trail along the south boundary of the quarry on lands owned by Conservation Halton and across the Dufferin Aggregates footbridge that includes an interpretative plaque and lookout into the active quarry. A similar length of side trails passes over lands owned by Holcim.

Outcomes

Benefits

Economic

Production of cement and aggregates depends on long-term access to raw materials that are acquired through quarrying. Holcim aims to improve its operational approach to resource management and to contribute to broader goals in the communities where it operates. Addressing conservation and biodiversity issues on old, operating and future sites can contribute to economically viable operations and thus sustainable livelihoods for local people.

Biodiversity

During the evaluation and monitoring programs it became evident that good quarry management and rehabilitation can improve and create conditions favourable to biodiversity conservation. On site habitat restoration activities, terrestrial and aquatic, are now maturing and more than 560 species of flora and fauna have been recorded.

Lessons learned

Throughout the development, implementation and follow-up stages of quarry restoration, the following factors are considered key:

- a well developed and financed plan is critical to successful completion;
- engage and work closely with all stakeholders, especially locally;
- promote and use the rehabilitated site as an educational tool.

Management

Internal, as well as IUCN conducted, evaluation and monitoring programs were undertaken to determine and evaluate the impacts of Holcim quarry rehabilitation projects on Biodiversity. These programs also looked at how Holcim integrates biodiversity into its environmental and social impact assessments for greenfield and expansion projects by examining how it operates and closes quarry sites, best practices selection and implementation and identified gaps in current quarry rehabilitation projects. These findings are helping Holcim manage their operations and activities as well as plan for ongoing and future restoration activities.

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