



**Review and Comparison of  
International Aggregate Standards**



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### Introduction

Currently a lengthy and expensive regulatory process characterizes the licensing and operation of aggregate sites in Ontario, and often neither the aggregate or environmental sectors truly win. There is a desire on the part of two organizations involved in this process to develop the best standards and auditing processes for aggregate extraction in the world. Towards this end Build Green Solutions was retained to conduct an independent comparative review of international aggregate standards and equivalent models.

Following an exhaustive online review BuildGreen Solutions is confident to say that we could find nothing that came close to rivaling the *Draft* SERA Standards in terms of rigour or comprehensiveness related to aggregate extraction.

### Process

In March 2011 Build Green Solutions conducted an exhaustive online search using a wide variety of terms (e.g. green gravel, sustainable aggregate, sustainable quarrying, aggregate code, lifecycle stone standard etc.). This search revealed that there is not yet a true specialized standard for sustainable aggregate extraction. Through the search a number of international equivalents that have been applied to the aggregate sector were identified. These include industry developed frameworks, voluntary industry reporting models and other lifecycle-based standards. This report examines the first two categories but given the extremely generic nature of lifecycle-based standards does not cover these in detail.

Industry developed models reviewed in this report include the *BES Standard 6001: A Framework Standard for the Responsible Sourcing of Construction Products* developed by the BRE Group in the UK, the Quarry Code of Practice developed by the Tasmanian Government and the National Sand, Stone and Gravel Association's principles of sustainability.

- The *BES Standard 6001* is a general certification standard which has been successfully applied to aggregate extraction. It is intended to be a catch-all for any construction products not currently captured under existing certification systems.
- The Quarry Code of Practice (QCP) was originally developed by the Tasmanian government as a voluntary standard demonstrating best practices for the aggregate industry. The Quarry Code of Practice may be the only other direct comparable aggregate standard.
- National Sand, Stone and Gravel Association (NSSGA) in the US have developed a much less rigorous series of principles of sustainability. These principles were found to be in no way binding, but are better understood as a statement from the NSSGA. As such these principles are not discussed in detail.
- The Natural Stone Council is working with the National Science Foundation to develop a standard for sustainable extraction and processing of dimensional stone products (to be entitled the NSC 373). It is anticipated that this standard will be available fall 2011, but there is little substantive information presently available as to what it will ultimately contain.

Voluntary industry reporting provides another approach to aggregate resource management, through self-defined reporting standards. Two examples of voluntary industry reporting were reviewed including

- The Mineral Products Association in the UK's reporting criteria as outlined in the 2009 Concrete Industry Sustainability Performance Report
- Lafarge's "Sustainability Ambitions 2012" which outline a set of target performance indicators developed in partnership with the WWF.

The performance indicators reviewed in these two reports provide interesting comparison to the SERA Standards and are described below.

It should be noted that no review of regulations or permitting related to aggregate extraction or development of new quarries was undertaken in this report. A second report that reviews the most stringent North American regulations may provide valuable comparison for the SERA Standards.

## **Industry Developed Models BES Standards 6001**

BES 6001 is a voluntary standard, developed by the BRE Group in the UK that is not developed specifically an aggregate standard. Rather, it appears that the BES 6001 is a relatively generic standard that is applied to construction products not currently covered by recognized sustainability standards. Many building products including wood, carpet, and paints and coatings are additionally covered by one or more sustainability-related standards.

BES 6001 does not provide prescriptive standards, instead generally requiring that companies have in place a plan to improve their sustainability, that they monitor and report out to stakeholders, and that they act like responsible corporate citizens.

A company following the BES 6001 standard commits to the following:

- to create a written policy to address responsible sourcing principles for material inputs;
- to follow all laws;
- to implement a quality management system following ISO 9001;
- to implement a management system for purchasing process;
- to implement traceability;
- to put in place an Environmental Management System following ISO 14001;
- to implement a Health and Safety Management Plan;
- to establish policy and metrics on environmental performance;
- to regularly review performance
- to report to stakeholders;
- to undertake external verification for environmental performance on issues related to:
  - o Green House Gas emissions
  - o Environmental stewardship
  - o Diversion of waste
  - o Reduction of water extraction
  - o Lifecycle analysis
  - o Reducing transport impacts
- to provide training to employees; and
- to identify and consult with local communities.

From a process point-of-view BES 6001 functions similar to LEED certification in that certain actions are considered compulsory, while others generate credits. The more credits a company achieves, the better the rating (ratings are Pass, Good, Very Good and Excellent).

BES 6001 provides a step in the right direction, but our analysis demonstrates that this standard is not as rigorous, as detailed, or as specialized as those proposed under SERA.

## QUARRY CODE OF PRACTICE

The voluntary Quarry Code of Practice (QCP) is fairly rigorous and prescriptive, but lacks market traction. It appears to be originally a project of the Tasmanian government, and has since been adopted by the United States Agency of International Development (USAID). Although not a true standard with an independent certifying body, the QCP provides interesting benchmarks when compared to standards like SERA. The QCP commits companies to the following:

- protection of watercourses (40 m minimum buffer);
- protection of residences – new quarries not to be located closer than:
  - o 1000 m where blasting;
  - o 750 m where crushing;
  - o 500 m where vibrating;
  - o 300 m if none of the above.
- identify and protect cultural heritage;
- develop an Environmental Management Plan;
- undertake community consultation;
- locate roads in ways to cause least disturbance to residents and environment;
- plan for rehabilitation;
- stockpile topsoil so it is not buried or contaminated;
- protect public roads from mud;
- undertake progressive rehabilitation;
- limit hours from 7 am to 7 pm;
- limit noise in surrounding residential areas to 10dB(a) above normal ambient (areas of sensitive use must not exceed 5dB(a))
- develop a blast plan, and if a history of complaints exist advise neighbours about blasting;
- dust should not normally be visible crossing the boundary of the site, roads must be watered or sealed, and trucks to use dust control measures.

In comparison to SERA the QCP is more prescriptive about issues such as noise and hours of operation, but lacks many important environmental components. Like BES 6001 QCP also lacks the rigour associated with certification, auditing and traceability.

The Comparison Chart below provides a category specific comparison of the *Draft* SERA Standards to equivalent industry developed frameworks. Through this analysis it is clear that SERA is the most rigorous and complete standard for responsible aggregate extraction. It should be noted that BES 6001 and QCP offer valuable learning opportunities as well as an interesting benchmark to test the rigour of SERA.

## COMPARISON CHART

For the sake of an easy comparison we have created a chart comparing the draft SERA standard to BES 6001 and the Quarry Code of Practice. The numerical scoring was done from 0 to 10. A score of 0 means the standard made no significant mention of that particular environmental or social issue. A score of 5 is considered fair performance, meaning the standard made some mention of the issue, though potentially only in general terms. A score of 10 indicates good performance, with the issue being addressed in detail, generally requiring action well above regulatory minimums.

Categories	SERA	SERA Score	BES 6001	BES Score	Quarry Code of Practice	QCP Score
Comply with all laws	Yes	10	Yes	10	Implied	7
Community Consultation	Yes	10	Yes (not considered compulsory, but eligible for credits)	5	Yes (not necessarily ongoing involvement)	5
Respect for Indigenous Rights and Culture	Yes	10	No	0	Identify and protect cultural heritage	5
Benefits to Local Communities and Workers	Yes	8	Yes (training)	3	Yes (training)	5
Environmental Impacts & Site Stewardship	See below for details		See below for details		See below for details	
ISO EMS	Yes	10	Yes	10	Yes	7
Air Quality - Dust	Yes - meet best practices	7	No specific mention of dust	3	Yes - series of prescriptive measures, no dust visible over property line	10
GHG Reduction	25% by 2020	10	Companies set own targets	5	No	0

<b>Categories</b>	<b>SERA</b>	<b>SERA Score</b>	<b>BES 6001</b>	<b>BES Score</b>	<b>Quarry Code of Practice</b>	<b>QCP Score</b>
Noise	Yes - meet best practices	10	No specific mention of noise	3	Yes - prescriptive measures - noise limited to 10dB(a) above ambient in neighbouring areas	10
Water Conservation	Yes - meet best practices, no negative impact on water systems	8	Yes - companies set own targets	5	Nothing on conservation; does mention protection of watercourses	5
Habitat	Yes - meet best practices, ecologically appropriate buffers, off-site habitat offsets	8	No	0	Yes - protection of buffers on watercourses, progressive rehabilitation	7
Rehabilitation	Yes - increase biodiversity of the area	8	No	0	Progressive rehabilitation	5
Encouraging Resource Efficiency	Yes	10	Yes	10	No	0
Traceability	Yes	10	Yes	10	No	0
Chain of Custody	Yes	10	Uncertain	5	No	0
Transportation	Dealt with indirectly in GHG emissions	5	Yes - reducing transport impact - company sets own target	7	Yes - multiple measures - no mud from trucks on public roads, roads away from residences, dust control measures for trucks	7
<b>Total Score:</b>	<b>SERA Score</b>	<b>134</b>	<b>BES Score</b>	<b>76</b>	<b>QCP Score</b>	<b>73</b>

## **VOLUNTARY INDUSTRY PERFORMANCE REPORTING**

### **Mineral Products Association's 2009 Concrete Industry Sustainability Performance Report**

Mineral Products Association (UK) includes a variety of companies involved in the cement and aggregate industries, such as aggregate producers, cement companies and associations of ash, slag and cement admixtures producers. Their report brings together reporting from this membership, in an effort to show progress year over year in its Key Performance Indicators (KPIs). It is the third such annual report.

The KPIs are organized as follows; commitments are much less detailed than those in the SERA standard, but benchmarks may be useful.

#### **SUSTAINABLE CONSUMPTION AND PRODUCTION**

1. Environmental Management
2. Waste Minimization
3. Emissions (excluding CO<sub>2</sub>) – dust, NO<sub>x</sub>, SO<sub>x</sub> (the KPI is not ambitious – reducing convictions for non-compliance with laws to zero)
4. Stakeholder Engagement
5. Quality and Performance
6. Responsible Sourcing (BES 6001 is criterion)

#### **CLIMATE CHANGE AND ENERGY**

1. Energy Efficiency
2. CO<sub>2</sub> Emissions – Production
3. CO<sub>2</sub> Emissions – Transport

#### **NATURAL RESOURCE PROTECTION AND ENHANCING THE ENVIRONMENT**

1. Materials Efficiency
2. Water
3. Site Stewardship and Biodiversity

#### **CREATING SUSTAINABLE COMMUNITIES**

1. Health and Safety
2. Employment and Skills
3. Local Community

## **Lafarge's Sustainability Ambitions 2012**

Through a partnership with the World Wildlife Fund (WWF), Lafarge has committed to a set of sustainability practices which they report on annually through the "Sustainability Ambitions 2012" report. This report reports performance on indicators in Management, Social and Environmental criteria, with "targets" similar to those in the SERA standards, such as stakeholder relationships, workplace safety, and series of environmental indicators such as dust emissions, carbon emissions, quarry rehabilitation plans and environmental audits. Most significantly, through this program Lafarge is submitting their quarries to a screening process through WWF International; this screening tool focuses on biodiversity and the designation of sensitive sites and has been performed on 64% of Lafarge's 1980 sites worldwide.

Although these voluntary reporting models represent industry best-practices they were found to set a less environmentally responsible minimum standard and lack the rigour associated with certification, auditing and traceability.

### **Summary**

Following this online review Build Green Solutions has determined that the *Draft* SERA Standards are the most rigorous and comprehensive of all existing equivalents for the responsible extraction of aggregates.

- BES 6001 standard fails to set requirements for important issues such as greenhouse gas emissions or rehabilitation
- Quarry Code of Practice was found lacking in the rigour associated with third-party verification or auditing, and does not cover important issues such as water conservation and promoting resource efficiency
- Voluntary industry performance reporting lacks the rigour associated with third-party verification or auditing.

Although each of these models offers valuable best-practice guidance for the aggregate industry there is not currently any aggregate certification standard on par with the *Draft* SERA Standards.

In addition to this report Build Green Solutions has provided the SERA Founding Board with supplementary comments we believe should be considered as they look to develop performance indicators and finalize the standards.

### **OTHER DEVELOPMENTS**

Through this report Build Green Solutions has conducted a thorough review of existing responsible aggregate models. The summary below provides additional information on recent developments for responsible aggregate extraction. This information is provided as information to be considered by the SERA Board as it develops final standards and auditing processes.

**Carbon Trust Standard:** A UK quarry owned by the company Tarmac, has become the first in the world to be awarded the Carbon Trust Standard (the Standard requires an absolute reduction of a minimum of 2.5% per year). The company cut 175 tonnes of CO<sub>2</sub> emissions over the past three years. Coxhoe quarry introduced a number of carbon-saving initiatives, which included reducing operational energy used by asphalt plant and machinery, avoiding business travel where possible and promoting more sustainable sourcing. A dedicated 'carbon team' at the quarry monitored energy use over three years and recorded accurate energy data.

**Fair Stone:** This is a standard similar in nature to Fair Trade that aims to set minimum health, safety and environmental standards for quarrying in the developing world. It appears to also be predominantly aimed at the dimensional stone industry. A review of this standard has found it to be not as stringent as SERA.

**SARMA Project - Sustainable Approach to Aggregates:** This project of the South East Europe Transnational Cooperation Program and the EU is working on developing and promoting best practices related to sustainable aggregate extraction. Currently little in the way of outputs exist under this program, and no sustainable aggregate standard.

**Towards Sustainable Mining:** The Mining Association of Canada has created a program where they encourage members to track a series of performance indicators and report out on them each year. Performance indicators have been developed for tailings management, energy management, external outreach and crisis communications management. Additional performance elements addressing issues such as Mine Closure, Water and Mining, are under development.