**For Submission to:**

**Center for the Development of Enterprise (CDE)**
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1160 BRUSSELS
Belgium

**Jamaica Promotions Corporation (JAMPRO)**
18 Trafalgar Road
Kingston 10, Jamaica W.I.

**November 27, 2013**

CD+A
CONRAD DOUGLAS & ASSOCIATES LTD.

# MARKET ASSESSMENT AND DESIGN AND IMPLEMENTATION OF A MARKETING INITIATIVE FOR LIMESTONE AND ITS DERIVATIVES

# FINAL REPORT


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***Submitted to***

**CENTER FOR THE DEVELOPMENT OF ENTERPRISE (CDE)**
Avenue Van Nieuwenhuyse 2A
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and

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**November 27, 2013**

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## LIST OF ACRONYMS

CD&A - Conrad Douglas & Associates Limited

CDE - Centre for the Development of Enterprise

EDF - European Development Fund

ACP - African, Caribbean and Pacific/EU joint Institution

GCC- Ground Calcium Carbonate

PCC - Precipitated Calcium Carbonate

NWA – National Works Agency

BOOT - Build, Own, Operate and Transfer

STATIN - Statistical Institute of Jamaica

ITC - International Trade Centre

RFP - Request for Proposal

JAMPRO – Jamaica Promotions Corporation

FGD - Flue Gas Desulphurization

GOJ - Government of Jamaica

EIA - Environmental Impact Assessments

NEPA - National Environment & Planning Agency

MSTEM - Ministry of Science, Technology, Energy & Mining

MGD - Mines and Geology Division

USA – United States of America

ASTM – American Society for Testing and Materials

PVC - Polyvinyl Chloride

JPSCo - Jamaica Public Service Company

BMT - Billion Metric Tons (BMT)

# EXECUTIVE SUMMARY

# 1.0. EXECUTIVE SUMMARY

## 1.1. Introduction

Conrad Douglas & Associates Limited (CD&A) was contracted by the Centre for the Development of Enterprise (CDE) and JAMPRO to conduct a market assessment and design and implement a market initiative for Jamaican limestone and its derivatives.

The Centre for the Development Enterprise (CDE) is an ACP (African, Caribbean and Pacific)/EU joint Institution created in the framework of the Cotonou Agreement.

CDE's financial resources mainly come from the European Development Fund (EDF). Its objective is to ensure the development of professional ACP enterprises operating in the private sector.

CDE operates in complementarity with the European Commission, the Secretariat of the ACP Group of States and the European Investment Bank in the framework of support to the private sector.

The long term objective is to foster the growth, competitiveness and sustainability of the sector. The specific project objectives of the CDE are:

- To identify product development and market opportunities
- To undertake a sector assessment (including production capacity, technology, environmental management system, legal and regulatory framework required) of the non-metallic minerals sector with focus on limestone and its value-added derivatives

This CDE sponsored Final Report consolidates and expands on two (2) previous Intermediary Reports. These reports examined various market opportunities that are accessible in the medium term and the capacity of local mining operations to meet existing demand by supplying raw materials or products that are consistent with market specifications. The goal is to provide a basis for further detailed studies (management

audits, conceptual engineering designs, and feasibility studies) that will stimulate and guide further development of the local limestone sector so that domestic and export market opportunities may be seized through the development of a vertically integrated high value added limestone industry.

The report is divided into two (2) integrally related sections, and a third related section which points the way forward. The sections are as follows:

- An Assessment of Market Opportunities
- An Assessment of Local Operations (Sector Assessment)
- The Way Forward

The project got underway with an inception meeting at JAMPRO on April 17, 2013. Subsequently various project activities were carried-out during project implementation. It became necessary to support the thrust for the renewed effort to develop the sector by involvement in various related activities and by extending the Terms of Reference, in general, to also include a limited contact market survey for Jamaica.

### 1.2. Approach & Methodology

Standard, internationally accepted methods were applied throughout the study. In preparing the Market Opportunities and Sector Assessments respectively, an interactive interdisciplinary approach was undertaken involving a combination of desktop research, literature reviews and field investigations. These covered all aspects of the project. The approach for the sector assessment was influenced by the findings of the market sector assessment and previous knowledge of the limestone industry in Jamaica. Thirty (30) quarries were visited, inspected and discussions convened with the operators.

### 1.3. Findings (Key Results of the Intervention)

#### 1.3.1. Market Assessment

The market opportunity study established that there are good market opportunities in the domestic, regional (CARICOM – Trinidad & Tobago, Suriname, Guyana, Barbados, Haiti and

Jamaica), and extra-regional markets for limestone aggregate, ground calcium carbonate (GCC), quicklime, precipitated calcium carbonate (PCC), and additives in various kinds of building plasters. Further market investigations also established that there are good market opportunities for worked and non-worked monumental stones that are cut or sawn from re-crystallized limestone (marble, travertine, or alabaster); and also various forms of calcareous stones along with certain types of enamels & glazes, and engobes.

A break-down of the economic value of the products examined for the regional and extra-regional market for the period 2008 to 2012 is illustrated in Figure 1 below.

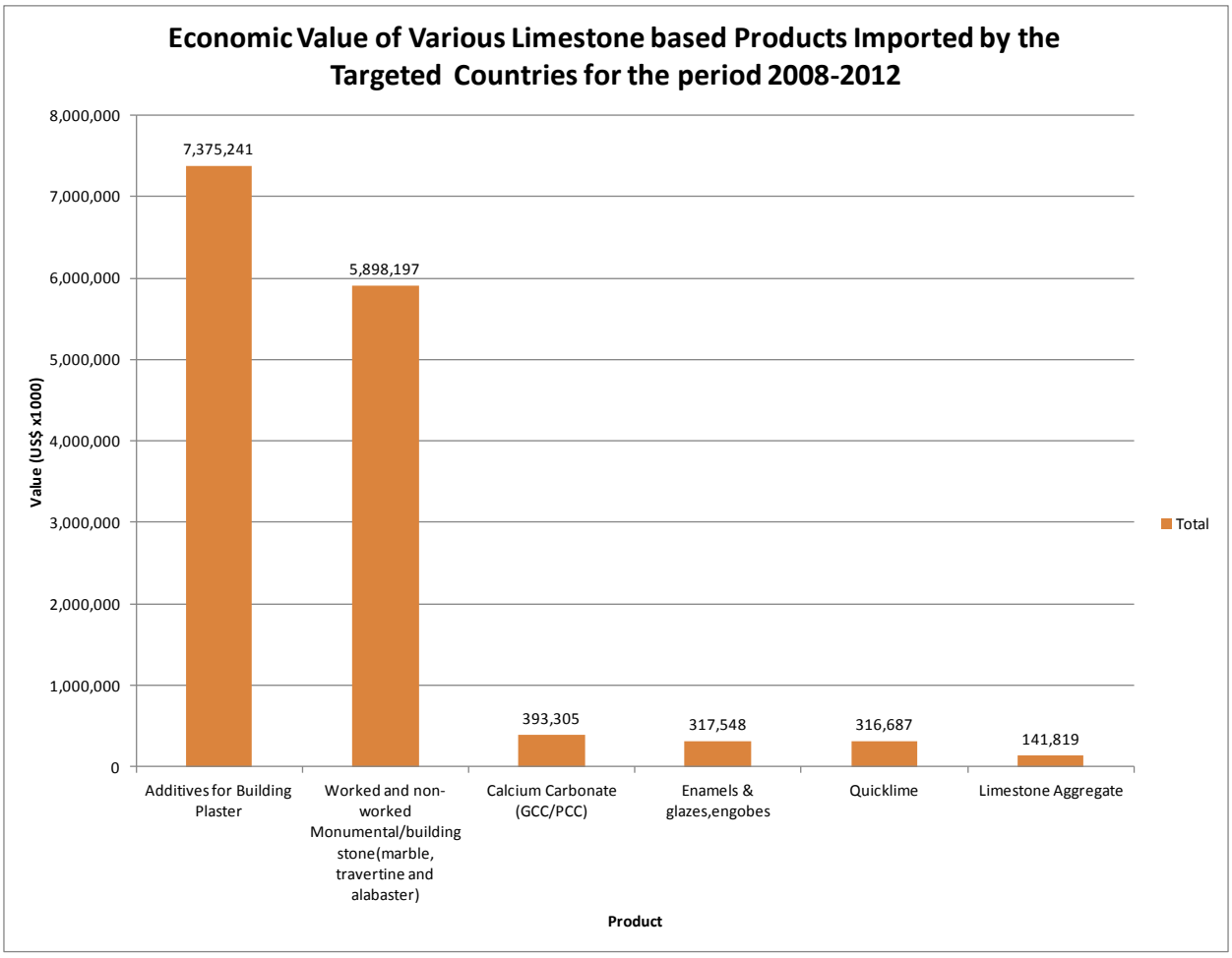



**Figure 1: Economic Value of various Limestone Products Imported by Markets in targeted countries for the period 2008-2012**

The markets analyzed are well developed and for the period 2008 – 2012, limestone based products valued at US$14.4 billion were imported from various sources. This included mainly suppliers from the USA, Canada, and Turkey who traded a gross value of US$6.5 billion. The ten (10) major suppliers to the market, as well as the suppliers that originate from the region (exporters among markets in targeted countries) are illustrated in Figure 2 below.

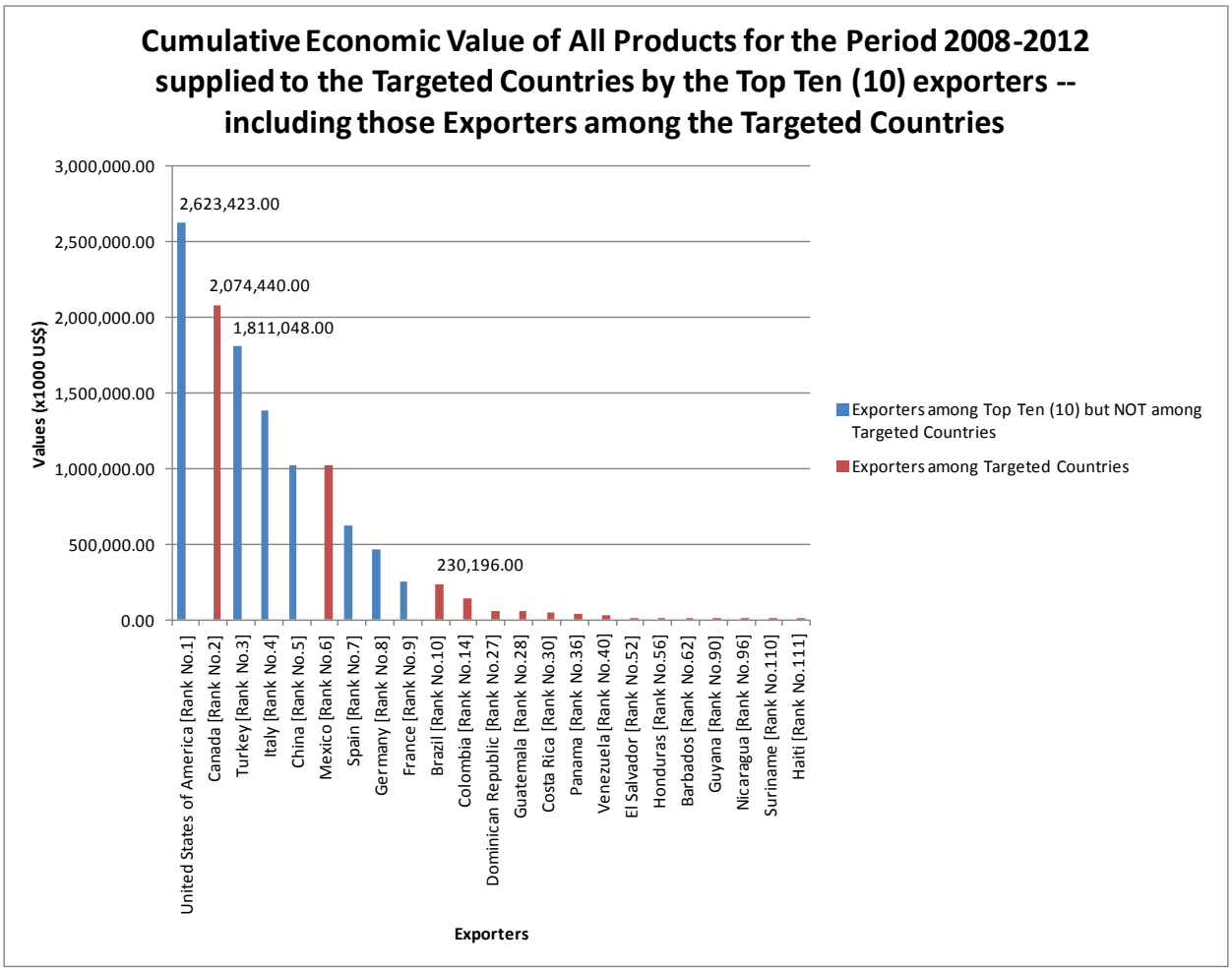



**Figure 2: Cumulative Economic Value of All Products for the period 2008 – 2012 Supplied to the Markets in targeted countries by the Top Ten (10) Exporters who are among the Markets in targeted countries**

The domestic market for limestone aggregate is being adequately supplied from existing local quarry operators which have the installed capacity for meeting any foreseeable

increase in demand which may arise from government or private investment in road and housing development.

In addition to meeting domestic demand, there are two (2) operators in the sector who are engaged in supplying the export markets. There is scope for expanding exports.

The study identified market opportunities in Caricom and the Americas for limestone aggregate which are being serviced from other suppliers. Over the last five years these suppliers earned US$140 million. The ten (10) major suppliers to the market along with the suppliers who originate from the region (exporters among markets in targeted countries) are illustrated in Figure 3 below.

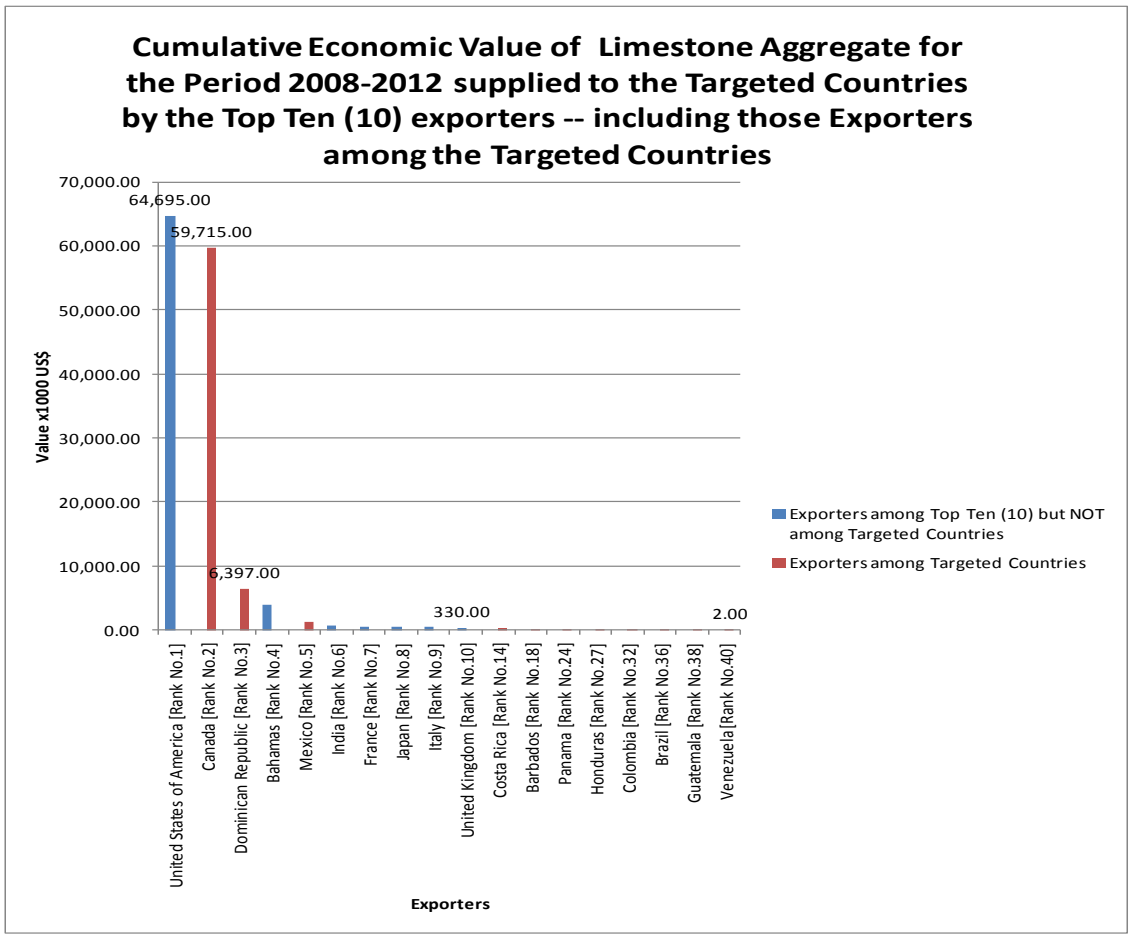



**Figure 3: Cumulative Economic value of Limestone aggregate for the Period 2008-2012 supplied to the Markets in targeted countries by the Top Ten (10) exported – including those exporters among the Markets in targeted countries**

The domestic market for GCC is being adequately satisfied from two local suppliers but there is substantial opportunity for exporting into the very large markets of Central; South; and North America.

GCC is used in the animal feed and paint industries, locally and overseas. There are applications for which GCC can be used and the potential exists to access these markets with more informed data.

High value added PCC is not currently manufactured in Jamaica. The production off PCC will facilitate the production of high value added fine chemicals and pharmaceuticals.

There is an opportunity for the establishment of a PCC plant. This could facilitate the production of fine chemicals and pharmaceuticals such as calcium propionate, calcium-magnesium supplements, as well as high grade paper, which are being imported into the Jamaica market and the region.

The import and export data for the 18 countries under consideration did not make any distinction between PCC and GCC. However, there is active trading in both products. For the period 2008 - 2012 this was valued at US$371 million. Access to these markets, as in the other cases investigated, would require displacing existing suppliers' market share.

The markets in North and South America are particularly attractive and sufficiently large to warrant further investigation on how to provide competition from Jamaica, bearing in mind that PCC is not currently available from local sources. Such a project would require a technical and economic feasibility study to be done. A PCC plant is an integral unit of the value added chain, namely: limestone, lime, carbon dioxide production process in which PCC is derived under controlled conditions using the preceding raw materials of lime and carbon dioxide. Based on installed infrastructure, the development of a commercial PCC Plant should be contemplated in the medium to long term.

Quicklime is considered one of the most attractive and versatile limestone derivatives because of its wide range of applications. The short fall of manufacturing capacity over the past five years has resulted in the importation of US$11.8 million to the domestic market.

There is therefore an opportunity for increased earnings from import substitution as well as exports to a target market which over the past five years was cumulatively valued at US$309 million. To meet this demand, requires the installation of new capacity. Such an investment would also reduce the exposure of the local bauxite industry, facilitate the development of other downstream business (e.g. hydrated lime and PCC) and make possible the export of calcined lime and its derivatives to the Caribbean, USA, and other markets.

GCC and hydrated lime are additives in a group of products classified as building plasters which are premium priced commercial items. The market size and value of these products (e.g. grout and thinset) was reportedly in excess of US$7 billion based on the International Trade Centre (ITC) records. These additives are therefore among the highest value market segment and along with the potential for PCC listed earlier, require more detailed assessment.

Elementary qualitative profiles are attached in Appendix 7. These are pre-cursors to Opportunity Profiles and Pre-feasibility Studies to indicate commercial viability as an early component of Phase II. Several Opportunity Profiles on various limestone derivatives and other non-metallic minerals may also be prepared in Phase II.

### 1.3.2. Sector Assessment

Paradoxically, despite the enormous 150 billion metric tons of world class high quality limestone resources of Jamaica, of which a minimum of 50 billion metric tons is estimated to be recoverable, the Jamaican limestone industry is underperforming and in need of immediate intervention. The underperformance originates primarily from the fact that the Jamaican economy has been experiencing low and negative growth for several year combined with the fact that the major products are low value added aggregates for the construction industry.

A SWOT analysis of the Jamaica limestone industry is shown below:

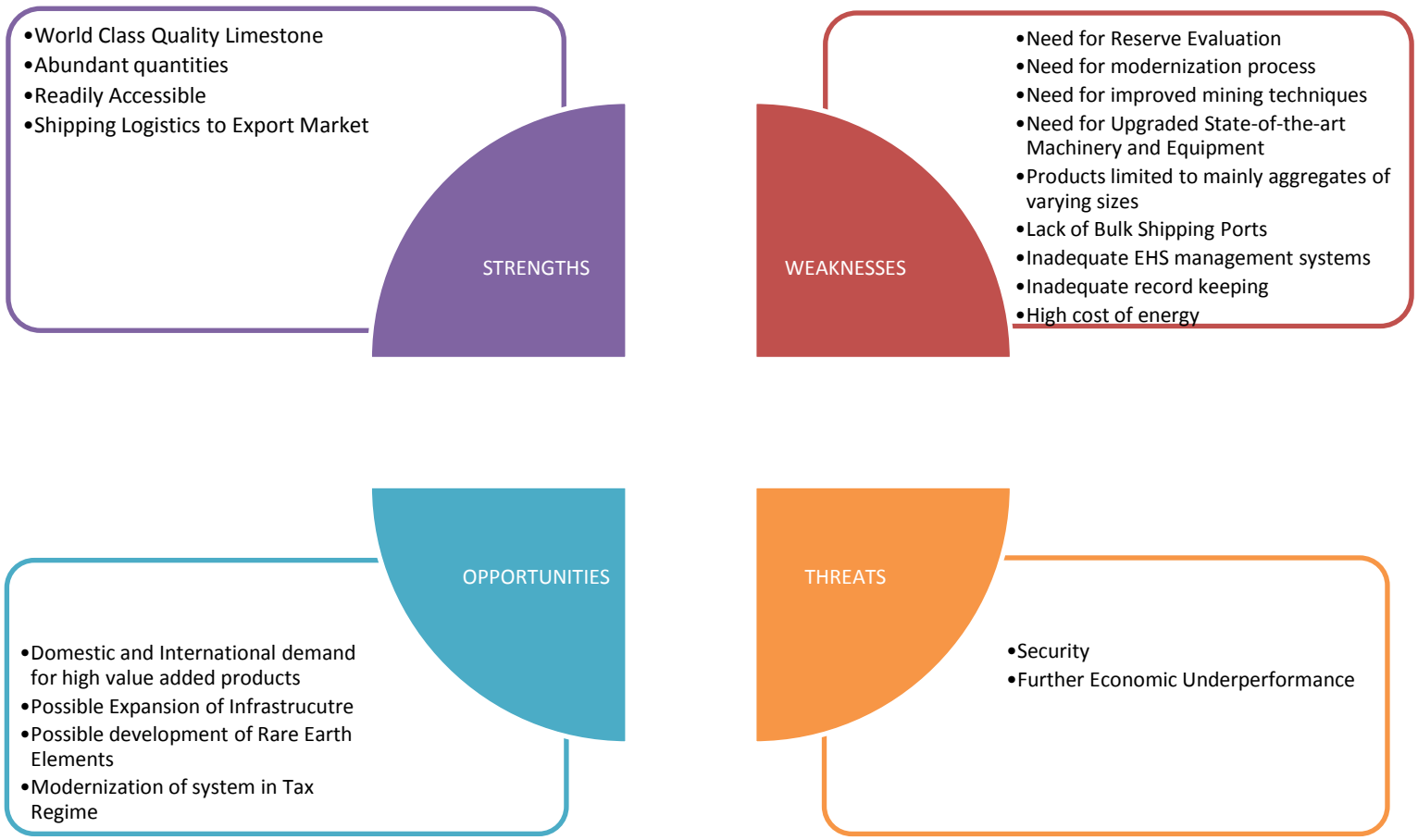



**Figure 4: A SWOT Analysis of the Limestone & Derivatives Industry**

Most companies are operating at just above break-even point, or are closed. Only eleven (11) of thirty (30) companies assessed were operating consistently, but at reduced levels.

Limited cash flows cause some of these companies to be operating without stockpiles and producing only on an as-needed basis.

Many companies operate block-making facilities as an add-on to their core business and to meet the limited building and domestic housing construction demand. This also adds a measure of cash flow.

Qualitative (chemical and physical characteristic) and quantitative assessment of raw material reserves require updating through the implementation of comprehensive geotechnical investigations.

Jamaica has an abundance of high quality limestone (approximately 60% of the island by weight and 80% of the total surface coverage consists of limestone. This presents diverse opportunities for the development of limestone products and its derivatives.

Given the very limited access to port facilities, the first areas of intervention should be:

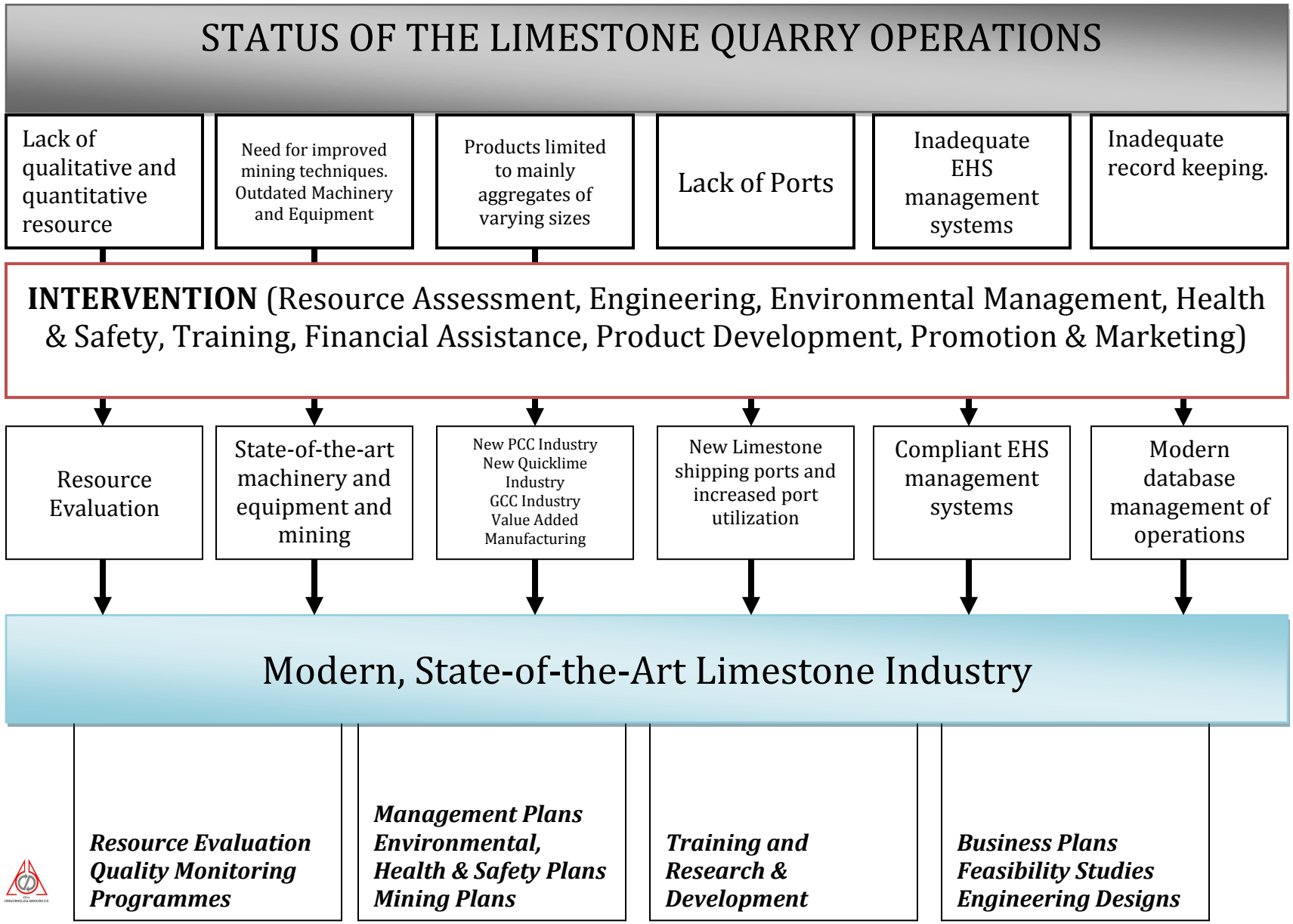
- Local market development (largely dependent on economic growth),
- Increase in the construction industry such as more infrastructure development and building and housing construction,
- Manufacture and export of derivatives, for example,

    - ground calcium carbonate (GCC),
    - increased production of lime
    - precipitated calcium carbonate (PCC) and
    - high value added manufacturing for import substitution and exports

There are substantial opportunities for import substitution.

Development of port infrastructure (or sharing of port facilities) for bulk loading is a priority for the development of an export industry. This should be addressed after an export oriented contact market survey. A Gap Analysis on the Limestone quarry and operations are shown below:

# GAP ANALYSIS



### 1.3.3. Selected Enterprises

For the operating facilities selected for upgrading to seize the opportunities an in-depth study of those companies operating or where operations are curtailed to determine the real needs must be done. This would involve conducting basic engineering designs and feasibility studies or developing business plans. This is an activity which Phase II of the project anticipates.

Based on our field investigations, the following fourteen (14) operations were selected for in depth analysis and further development:

1. Lydford Mining Company Limited
2. Chemical Lime Company of Jamaica Limited
3. John's Hall Aggregates Limited
4. Crichton Quarry Limited
5. Trelawny Aggregates Limited
6. Marjoblac Quarry and Block Factory Limited
7. Evans Quarry Limited
8. South Coast Aggregates Limited
9. James Quarry Limited
10. Somerset Enterprises Limited
11. S&G Aggregates Limited
12. Dacosta Construction and Heavy Equipment Limited
13. Chippenham Park Limited
14. Jamaica Aggregates Limited

A total of fourteen (14) Enterprise Fiche Forms were submitted to the above named quarry operators. Only five (5) responses have been received to-date, in spite of concentrated efforts. These are attached in Appendix 8.

In addition, thirty (30) Enterprise Fiche Forms were given to the Quarry Advisory Board for distribution among its membership.

### 1.3.4. Review of the Regulatory Framework

The following potential environmental impacts from the limestone industry were reviewed and presented in the body of the report:

- Physical Impacts
  - Fugitive dust emissions
  - Noise and vibration
  - Water quality
  - Geology, geotechnical and drainage
  - Aesthetics
- Biological Impacts
  - Loss of biodiversity
- Socio-Economic and socio-cultural
  - Employment & Worker Health and Safety
  - Archaeological and historical heritage
  - Traffic
  - Solid waste management
  - Sewage treatment and disposal

There is a land-use conflict arising from declaration of environmental protected areas, which result in the sequestration of major deposits of limestone and at least one excellent candidate site for the establishment of a limestone bulk shipping port. This policy conflict is in need of resolution at the highest level. Specifically, this pertains to Homers Cove, which is a part of the declared Negril Marine Park.

The regulatory framework embracing the following was reviewed:

- Mining Legislations
- Environmental Legislation
- Other Operating Statutes
- Land Use Legislation
- Taxation Legislation

### 1.4. Conclusions

Our conclusions are as follows:

1. Given the lack of major construction projects or infrastructure works an immediate assessment should be made of the Jamaican limestone resources under the control of selected operators. These should be classified into categories suitable for construction aggregates of various types including flue gas desulphurization (FGD) and limestone derivatives (Lime, GCC, PCC and high value added derivatives currently imported into Jamaica and the region).
2. At the same time a parallel off-shore **contact market study** should be conducted for the export of these products aimed at attracting investment in the establishment of local manufacturing enterprises. Given the status of the local economy the operating status of the industry is unlikely to improve until growth is restored to the economy. The future of the industry must be import substitution orientated and export driven.
3. The construction of the north-south highway from the Spanish Town area to the Ocho Rios area is one such way in which the operators in proximity to the final alignment can obtain market for their production.
4. The announcement of a proposed Trans-shipment Port which could be possibly located in the Portland Bight area and Logistics Hub in St. Catherine are other major projects from which the industry could also benefit. This would favour operators in the Hill Run and adjoining areas. However, operators outside of the influence of these two major projects will need special attention. ***The logistic hub and expanded transshipment port envisages the substantial build-up of major infrastructure, as well as a number of buildings. This represents what could be a new wave in Jamaica's modern industrial development.***
5. ***The development of a rare earth metals industry as well as revitalization and expansion of the alumina industry could also increase the demand for lime in the future.***

### 1.5. Recommendations

Our recommendations are as follows:

- The Jamaican limestone industry is not generally in a sufficiently good condition to take advantage of the opportunities that exists. Intervention is needed – market and funding.
- Joint venture partnerships (international – national) to integrate the substantial high quality resources with capital markets and technology is a major strategic option which should be vigorously pursued.
- There is very limited access to port facilities
- The industry requires incentives similar to those given to foreign companies. It is noteworthy that these incentives will be repealed under the new tax incentive scheme – Omnibus Act, to be ready by end of year (December 2013).
- There is the need for an increase in the manufacture and export of derivatives such as lime and PCC to replace imports.

    - Jamaica has an abundance of high quality limestone (approximately 60% of the island by weight and 80% of the total surface coverage comprises limestone. This presents diverse opportunities for the development of derivatives.

- There is the need to address the high cost of energy. Recent initiatives by the GoJ to construct a new 360 MW power plant and to introduce 115 MW of renewable energy augers well for a reduction in electricity cost in the near future.
- There is the need to curtail illegal quarry operators
- Careful considerations should be made for increasing production of GCC, Quicklime and installing a PCC plant after detailed domestic and international market surveys, locational analysis, feasibility studies inclusive of economic and financial analyses, conceptual engineering designs and detailed environmental impact assessments, will be necessary in developing the industry.

### 1.6. The Way Forward

Among the first activities of Phase II must be a special sub-component to conduct a Domestic and International Contact Market Survey.

Despite the dedicated efforts of JAMPRO, MSTEM, Commissioner of Mines and the Mines & Geology Division it has been identified that there is the urgent need for the establishment of a Jamaica Industrial Mineral Institute (JIMI) to focus on driving the growth and development of the limestone industry and the non-metallic minerals sector in general.

JIMI does not need to start from scratch, but takes on board existing institutions and the use formal strategic relationships such as Memorandum of Understandings (MoUs) for the utilization of existing facilities and resources. JIMI must be vested with an authoritative executive decision making mandate among its leadership.

Research & Development and innovation must be a part of the Mining School, which is under development at the tertiary level.

Intervention is required in the form of resource assessment, engineering, environmental management, health & safety, training, financial assistance, product development, promotion & marketing.

For the medium and long term, access to port facilities is an imperative. Certain existing ports both on the north coast and south coast could be adapted to receive and bulk load limestone in the medium term.

For the long term, development of new ports to service operators would be required. The feasibility of such development would depend on vast throughput tonnages. This in turn links with the export marketing of limestone to the offshore end users, for example building and construction industry and flue gas desulphurization (FGD), among others. Any new port facilities should also provide for palletized cargo.

Operators complain of the high cost of energy – notably electricity and fuel. The feasibility of establishing alternate energy supplies via renewables such as wind and solar should be investigated. These could supply a cluster of limestone operations.

The logical sequence for the way forward is described below and illustrated in the schematic below, which captures the three (3) phases of the project:

1. Conduct Management Audits of individual limestone quarries within the sector.
2. Prepare investment opportunity and needs profiles of the sector.
3. Introduce a greater level of scientific, technological and research and development inputs into the sector.
4. Prepare profiles of the companies' needs for investment and joint ventures and other forms of partnerships and,
5. Implement a sound investment promotion initiative that seeks to support new investment and diversification of the sector in the areas of opportunity identified.
6. Technical and financial assistance to those companies entering new partnerships, implementing new product diversification plans, upgrading existing operations and implementing environmental, health & safety management plans.

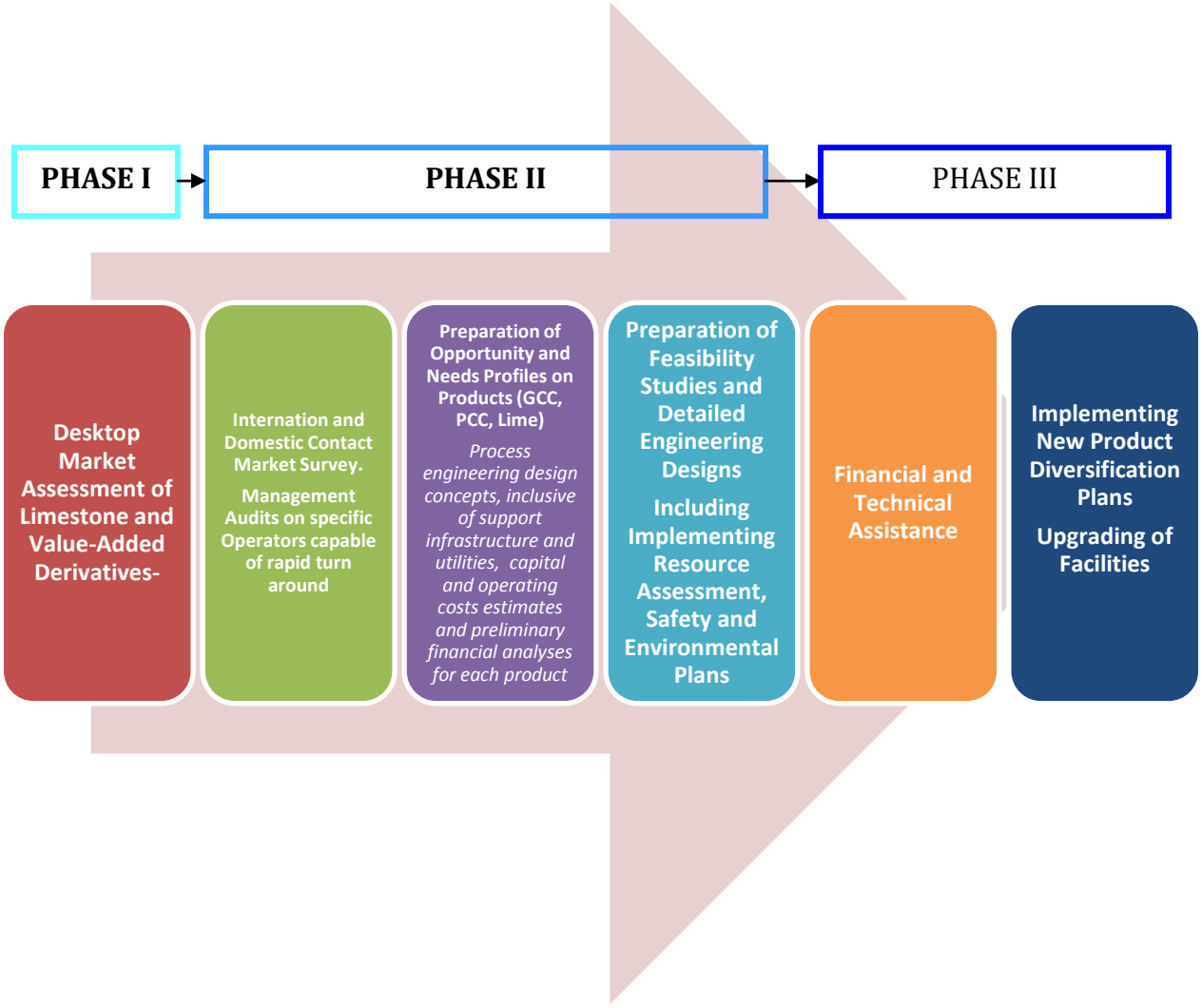



**Figure 5: Schematic of the Way Forward**

# ASSESSMENT OF MARKET OPPORTUNITIES

# 2.0. ASSESSMENT OF MARKET OPPORTUNITIES

## 2.1. Introduction

The Center for the Development of Enterprise (CDE), by way of an email letter dated December 14, 2012 invited Conrad Douglas & Associates Limited, along with other local and international consultants, to participate in a limited tender for the provision of consultancy services in respect of a Market Assessment and Design and Implementation of a Marketing Initiative for Limestone and its Derivatives.

All firms were required to submit Full Technical and Financial Proposals, by January 31, 2013, using the respective forms outlined in the Request for Proposal (RFP), made available to the firms on December 14, 2012.

Conrad Douglas & Associates Limited (CD&A) won the project through an international competitive tender. The contract was signed on March 26, 2013. The Centre for the Development of Enterprise (CDE) and JAMPRO are cooperating to conduct a market assessment and design and implementation of a market initiative for Jamaican limestone and its derivatives. Understanding the market will help Jamaica to develop their limestone and its derivative industry.

This project is expected to yield significant impact on the development and diversification of the non-metallic minerals industry in the mining sector, particularly that of limestone and its derivatives.

This report represents the completion of Deliverable No. 1, which involves the submission of an Assessment of Market Opportunities.

### 2.1.1. Approach & Methodology

The following is an outline of the activities that defined the market assessment as described in the Terms of References (TOR) provided by CDE/JAMPRO:

- Assessment of local, regional and internationally accessible markets through *desk research*
- Estimation of domestic and regional demand for limestone and value added products in the medium term.
- Determination of the technical specifications of the limestone and value added products required *by potential buyers*.
- Assessment of competition in the targeted markets

These activities were given as necessary and sufficient to be used to guide the preparation of the Market Assessment Report. However, although the TOR emphasized the use of desk research only, CD&A expected that provisions would have been made for contact surveys to be done since this would provide empirical data to improve the reliability of the information.

In the absence of financial support to conduct in-depth contact surveys, standard and innovative methods and approaches were used in conducting the Market Assessment.

This involved:

1. Researching the various end-uses of limestone and its derivatives.
    a. This was done in order to identify the existing industries and businesses in Jamaica that are directly involved in the utilization of limestone as raw material or inputs in their manufacturing processes and businesses.
    b. It was also useful for identifying potential new industries that could be developed to produce value added limestone derivative that are contained in commercial products in the pharmaceutical, food, and other industries.
2. Obtaining import and export data for limestone and its derivatives from the Statistical Institute of Jamaica (STATIN).
3. The execution of a *limited* contact survey of the major industries identified as being involved in the direct utilization of limestone.

a. In order to conduct the contact survey industry specific questionnaires (See Appendix 1 to Appendix 3) were prepared to capture the various elements of the market.
b. The questionnaire was administered to the major operators of each of the identified industries. The list of major operators was initially generated from local business directories; and as the contact survey was carried out was evolved to capture the actual market.

4. Obtaining trade data from the databases of International Trade Centre (ITC), and where possible, testing this against trade data generated by the respective countries and/or cross-referencing the export information provided by one country with the corresponding importing country's information provided by the ITC database.
5. The collection of technical specifications from local producers to determine their suitability in their existing form for the targeted markets.
6. Direct discussions were held through field visits with senior officials of:
   a. Five (5) paints companies,
   b. Two(2) construction and paving companies,
   c. Two (2) animal feed manufacturers and suppliers.

   All of these companies use limestone or its derivatives as integral inputs into their operations.

7. The Regional and International markets that were assessed through desk study were:
   - Caricom
     - ✓ Barbados
     - ✓ Guyana
     - ✓ Haiti
     - ✓ Suriname
     - ✓ Trinidad & Tobago
   - Central America
     - ✓ Costa Rica

- ✓ Dominican Republic
- ✓ El Salvador
- ✓ Guatemala
- ✓ Honduras
- ✓ Nicaragua
- ✓ Panama

- North America
  - ✓ Canada
  - ✓ USA
- South America
  - ✓ Brazil
  - ✓ Venezuela

## 2.2. Findings

### 2.2.1. Classification and End uses of Calcium Carbonate

As a raw material, calcium carbonate has three (3) forms:

- Limestone
- Ground Calcium Carbonate (GCC)
- Precipitated Calcium Carbonate (PCC)

The various end uses of are shown in Table 1, Figure 6 and Figure 7 below.

**Table 1: Principal End-uses of Limestone**

| **Construction** |
|---|
| Coarse aggregate (+37.5 mm)(+ 1/2 in.) |
| Macadam |
| Riprap and Jetty Stone |
| Filter Stone |
| Other coarse aggregate |
| Coarse aggregate, graded |
| Concrete aggregate, graded |
| Bituminous aggregate, graded |
| Bituminous surface-treatment aggregate |
| Railroad ballast |
| Other graded coarse aggregate |
| Fine aggregate (- 3/8 in.) |
| Stone sand, concrete |
| Stone sand, Bituminous mix or seal |
| Screening, undesignated |
| Other fine aggregate |
| Coarse and fine aggregate |
| Graded road base or sub-base |
| Un-paved road surfacing |
| Terrazza and exposed aggregate |
| Crusher run or fill or waste |
| Roofing granules |
| Other coarse and fine aggregates |
| Other construction materials |

| |
|---|
| **Agricultural** |
| Agricultural limestone |
| Poultry grit and mineral food |
| Other agricultural uses |
| **Chemical and Metallurgical** |
| Cement manufacture |
| Lime manufacture |
| Dead-burned dolomite manufacture |
| Flux stone |
| Chemical stone |
| Glass manufacture |
| Sulphur oxide removal |
| **Special** |
| Mine dusting or acidic water treatment |
| Asphalt fillers or extenders |
| Whiting or whiting substitute |
| Other fillers or extenders |
| **Other miscellaneous uses** |
| Refractory stone |
| Sugar refining |
| Other specified uses not listed |

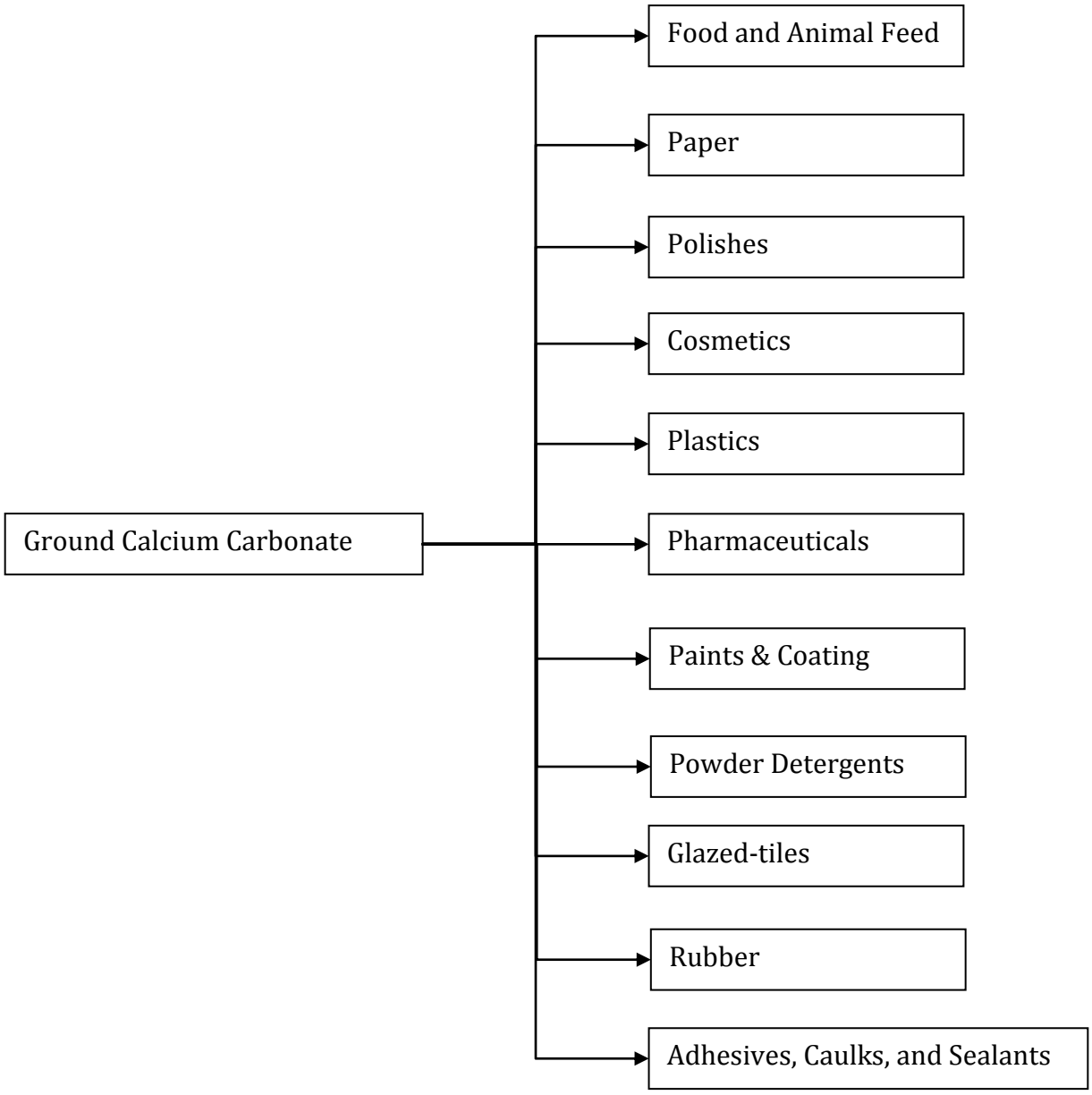



**Figure 6: End Uses for Ground Calcium Carbonate (GCC)**

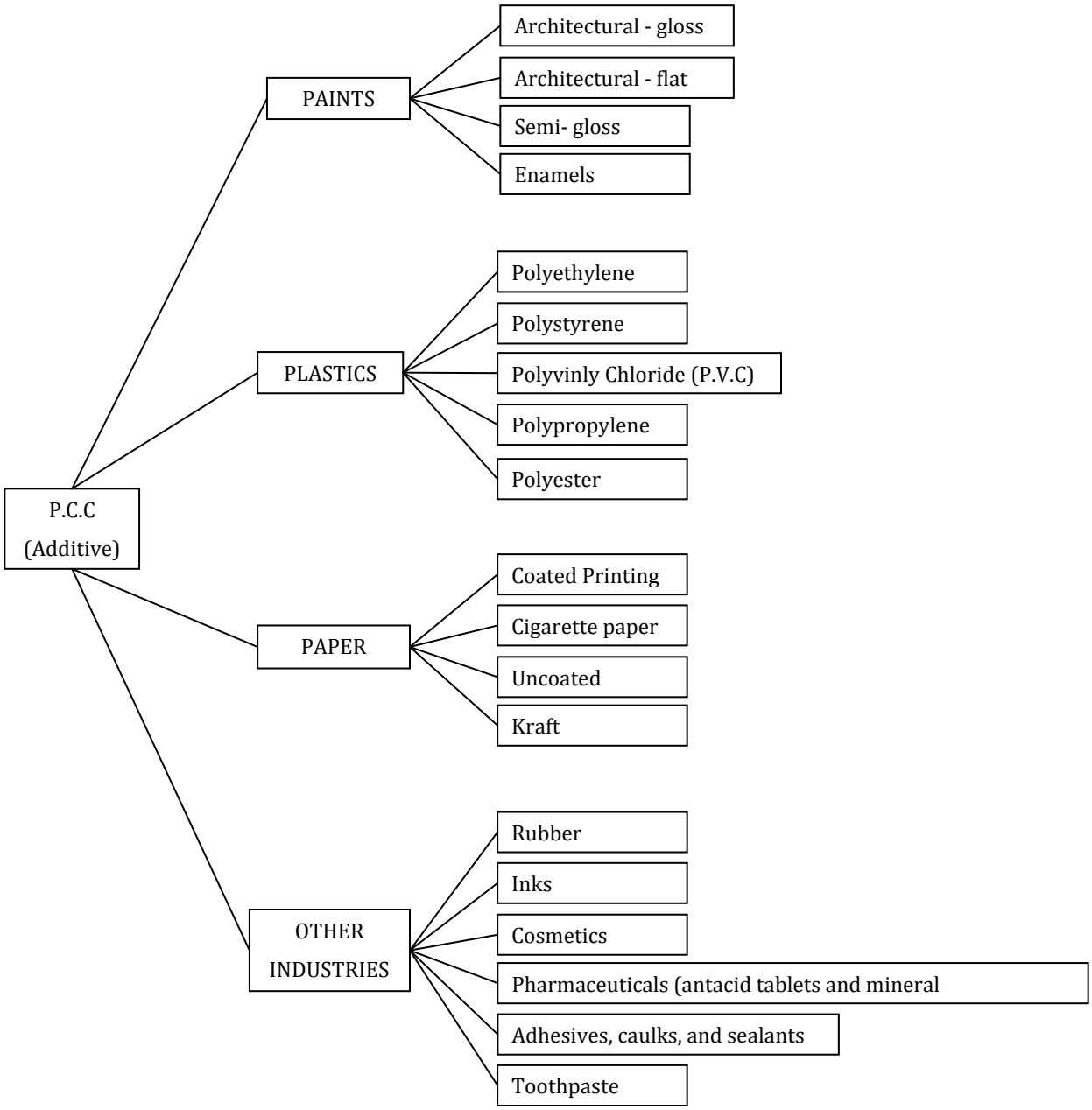



**Figure 7: End Uses of Precipitated Calcium Carbonate (PCC)**

### 2.2.2. Market Assessment

The preliminary indications are that good opportunities exist in the local, regional and extra-regional markets for limestone, limestone derivatives and value added product groups considered. These are:

- Limestone aggregate
- Ground calcium carbonate (GCC)
- Quicklime
- Precipitated calcium carbonate (PCC)
- Enamels & glazes and engobes
- Worked and non-worked monumental stones, and
- An additive in various kinds of building plasters (thinset, grout, fillers, etc).

#### 2.2.2.1. Limestone Aggregate

##### *2.2.2.1.1. Domestic Market for Limestone Aggregate*

The vast majority of limestone aggregate consumed locally is used in the road construction, infrastructure and housing industries. This material is supplied by quarries operating at diverse locations close to where it is used throughout the country[1]. A relatively recent policy by The National Works Agency (NWA) in Jamaica has reduced the amount of limestone aggregate used in road construction by prescribing a substitute aggregate which is not as porous as limestone, and therefore does not interfere with the integrity of the asphalt in its function as road paving. This limestone substitute takes the form of crushed, sized and screened river shingles and non-skid aggregates which is of volcanic origin. Its preference arises from the fact that it has better non-skid properties, which makes it functionally superior to limestone. However, it must be noted that this carries with it a

[1] See Assessment of Operations (Sector Assessment)

greater potential for negative impact on the islands water ways and surrounding riparian environment.

The prime driver of the aggregate market is the state of the Jamaica economy and the government's subsequent ability to fund necessary road constructions and rehabilitation projects, or to invite investors to do so on a Build, Own, Operate and Transfer (BOOT) basis.

In personal communications with a senior manager from the NWA, he reported that more than one-third of Jamaica's road network valued at over JM$300 billion dollars was in need of reconstructions and/or substantial rehabilitation.

Furthermore, based on the aggregate tonne per lane kilometer and the associated concrete works, he estimates that approximately 5.7 million tonnes of aggregate are used by publicly funded projects. This reportedly represents approximately half of the total aggregates used in Jamaica, the other half being utilized in privately financed projects (residential, commercial etc.). This is significantly more than the 2.6 million tonnes of limestone aggregate production reported in 2011 by the Mines and Geology Department, which regulates the operation of the quarries. While it is not possible to determine which of the two reported volumes represents the actual consumption, it is instructive to note that using the lower tonnage the gross annual value of the local market for limestone aggregate would be approximately JM$1 billion.

#### *2.2.2.1.2. Regional and International Markets for Limestone Aggregate*

The quantities and associated values of limestone aggregate imported into select countries of Caricom (excluding Jamaica), Central America, North America, and South America are summarized below.

**Table 2: Regional and International Demand for Limestone Aggregate Imported by Markets in targeted countries as sourced from ITC database.**

| Region | 2008 | 2009 | 2010 | 2011 | 2012 | Total |
|---|---|---|---|---|---|---|
| | Quantity (tonnes) | | | | | |
| Caricom | 27,646 | 742 | 52,141 | 12,790 | 0 | 93,319 |
| Central America | 29 | 209,504 | 183,727 | 19 | 16 | 393,295 |
| North America | 2,574,563 | 1,669,817 | 1,534,694 | 1,429,752 | 1,533,767 | 8,742,593 |
| South America | 121,341 | 1 | 176,000 | 273,313 | 444,079 | 1,014,734 |
| **Total** | 2,723,579 | 1,880,064 | 1,946,562 | 1,715,874 | 1,977,862 | 10,243,941 |

* Figures do not include importation of aggregate from Jamaica
**The regions are represented by select countries within each territory.
***Jamaica is not included in the Caricom

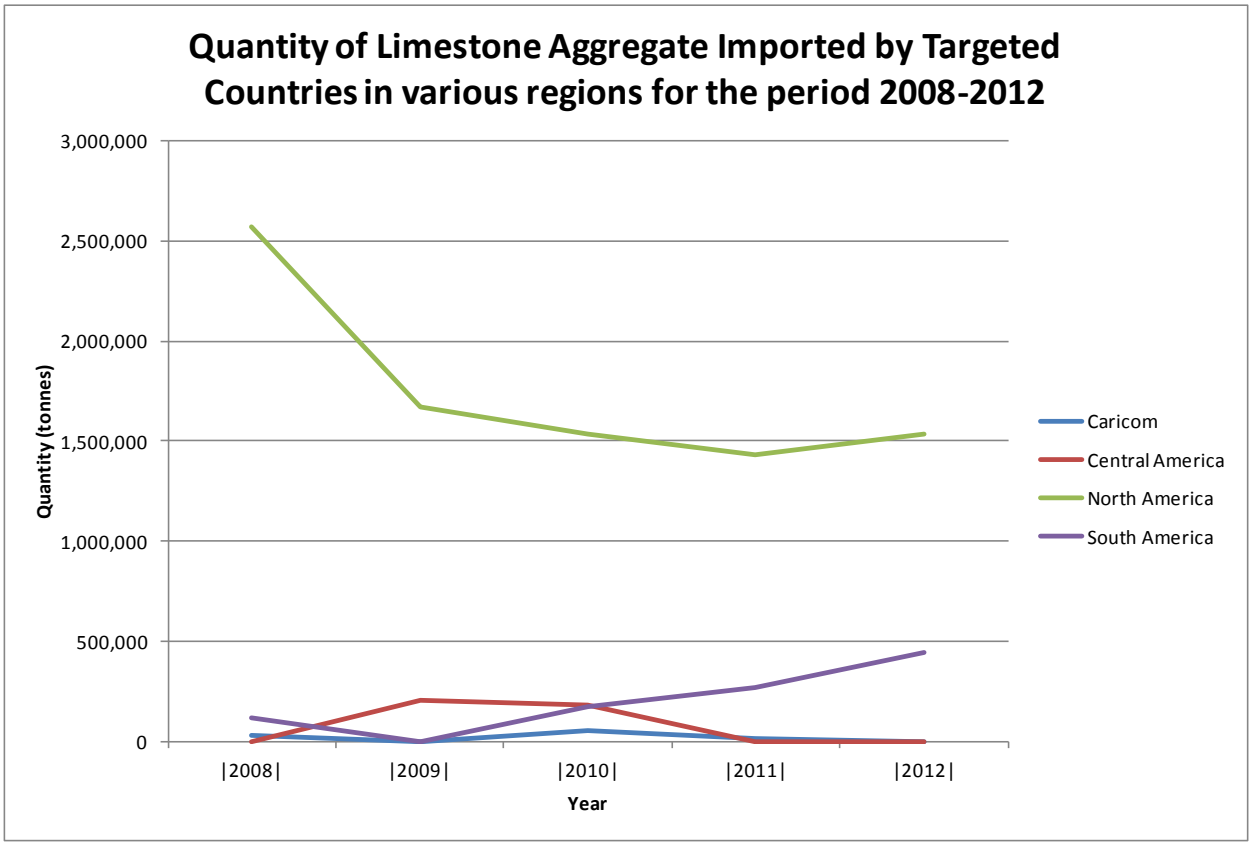



**Figure 8: Regional and International Demand for Limestone Aggregate Imported by Markets in targeted countries as sourced from ITC database**

**Table 3: Values for Regional and International Demand for Limestone Aggregate Imported by Targeted Markets as sourced from ITC Database**

| Region | 2008 | 2009 | 2010 | 2011 | 2012 | Total |
|---|---|---|---|---|---|---|
| | Value (x1000 US$) | | | | | |
| Caricom | 1,485 | 1,383 | 1,458 | 672 | 1 | 4,999 |
| Central America | 17 | 819 | 703 | 17 | 16 | 1,572 |
| North America | 33,536 | 23,131 | 24,112 | 20,875 | 19,833 | 121,487 |
| South America | 1,088 | 2 | 1,919 | 3,252 | 7,500 | 13,761 |
| **Total** | 36,126 | 25,335 | 28,192 | 24,816 | 27,350 | 141,819 |

* Figures do not include importation of aggregate from Jamaica
**The regions are represented by select countries within each territory.
***Jamaica is not included in the Caricom

Over the past five years the Caricom region imported approximately 93,300 tonnes of limestone aggregate valued at US$5 million; while for Central America, the corresponding quantity and value were 393,295 tonnes and US$1.6 million respectively; for North America the corresponding quantity and value were 8.7 million tonnes and US$121.5 million; while for South America the corresponding quantity and value were 1 million tonnes and US$13.7 million. Overall the countries collectively imported 9.9 million tonnes of limestone aggregate, for a total value of US$142 million. This represents an opportunity to develop an export market for limestone aggregate from Jamaica to share the lucrative business, provided that it can be done at more competitive terms than those being offered by the existing suppliers. Such a determination can only be made using direct contact survey and other marketing tools.

#### 2.2.2.2. Calcium Carbonate (GCC/PCC) Market

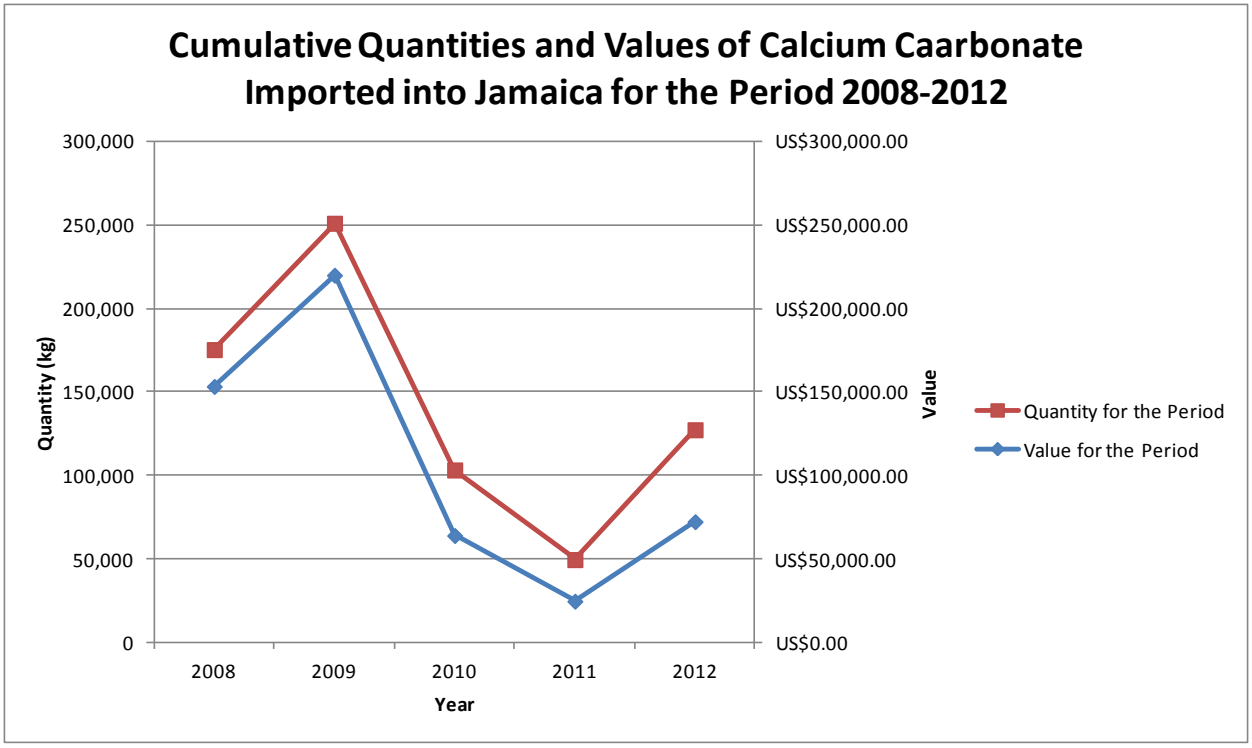
Market opportunities exist for Ground Calcium Carbonate (GCC) and Precipitated Calcium Carbonate (PCC) for the domestic and International markets. The import and export data for the countries and regions under consideration did not make any distinction between GCC and PCC. For this reason the market assessment of both products will be treated as one except where there is other data to support a separation. Details are elaborated on below.

#### *2.2.2.2.1. Domestic Market for Calcium Carbonate (GCC/PCC)*

The Jamaican market for the traditional use of GCC is currently being satisfied by two (2) local companies who are also involved in export. As a consequence, the import data reported for GCC/PCC refers mainly to PCC and other non-GCC variants. The quantities and values of GCC/PCC imported over the past five years are shown below. Overall, 707 tonnes of PCC valued at US$534,370 was supplied to the Jamaican market from overseas sources. The PCC which is imported is primarily consumed by the paint manufacturing companies. Direct customer contact was made with the five leading paint companies from whom we obtained market information and product specification.

**Table 4: Domestic Demand and Value for GCC/PCC Imported by Jamaica as sourced from STATIN Database**

| Year | Quantity (tonnes) | Value (x1000 US$) |
|---|---|---|
| 2008 | 175 | 153 |
| 2009 | 251 | 219 |
| 2010 | 103 | 64 |
| 2011 | 50 | 24 |
| 2012 | 127 | 72 |
| **Total** | **707** | **534** |




On the basis of the high price for PCC, its diverse end uses in the production of fine chemical and pharmaceutical products such as calcium propionate, and calcium-magnesium supplements, as well as high grade paper, there is an opportunity for the establishment of a PCC plant. This could facilitate the production of high value added products which are being imported into the Jamaica market and the region. Examples of these are shown in Table 5 below.

**Table 5: Value of selected High-Value Added Calcium Carbonate based Products, Imported by Jamaica as sourced from STATIN Database**

| Year | Value (US$) | | | |
|---|---|---|---|---|
| | Paper | Pharmaceutical, food, and medical grade applications of limestone | PVC and Plastics | Total |
| 2008 | 96,939,574 | 2,756,966 | 7,414,281 | 107,110,821 |
| 2009 | 102,935,680 | 22,818,034 | 20,485,804 | 146,239,517 |
| 2010 | 99,752,354 | 25,136,172 | 24,346,693 | 149,235,219 |
| 2011 | 103,410,357 | 32,410,896 | 25,937,992 | 161,759,245 |
| 2012 | 107,187,801 | 38,600,614 | 22,996,208 | 168,784,622 |

The commercial viability of such projects would require the preparation of feasibility studies, basic engineering designs, and environmental impact assessments. It must be noted that two or more components of these projects may be implemented in integrated limestone chemical complex. For example: limestone aggregates, quicklime, hydrated lime, and PCC provide successive raw materials, intermediates and finished products for each succeeding operation.

#### *2.2.2.2.1. Regional Market and International Market for Calcium Carbonate (GCC/PCC)*

The total amounts of GCC and PCC imported and exported from each region under consideration are summarized below.

**Table 6: Regional and International Demand for Calcium Carbonate (GCC/PCC) Imported by Markets in targeted countries as sourced from ITC Database.**

| | 2008 | 2009 | 2010 | 2011 | 2012 | Total |
|---|---|---|---|---|---|---|
| | Quantity (tonnes) | | | | | |
| **Caricom** | | | | | | |
| **Export** | 94 | 293 | 350 | 66 | 34 | 837 |
| **Import** | 4,281 | 2,894 | 9,227 | 1,978 | 361 | 18,741 |
| **Central America** | | | | | | |
| **Export** | 62,683 | 154,185 | 70,673 | 56,090 | 51,962 | 395,593 |
| **Import** | 37,565 | 26,437 | 29,356 | 35,661 | 25,779 | 154,798 |
| **North America** | | | | | | |
| **Export** | 125,050 | 139,424 | 139,440 | 158,719 | 150,245 | 712,878 |
| **Import** | 195,557 | 153,692 | 161,658 | 168,750 | 169,709 | 849,366 |
| **South America** | | | | | | |
| **Export** | 3,954 | 3,778 | 5,344 | 8,953 | 8,735 | 30,764 |
| **Import** | 18,707 | 39,524 | 31,069 | 46,849 | 10,787 | 146,936 |

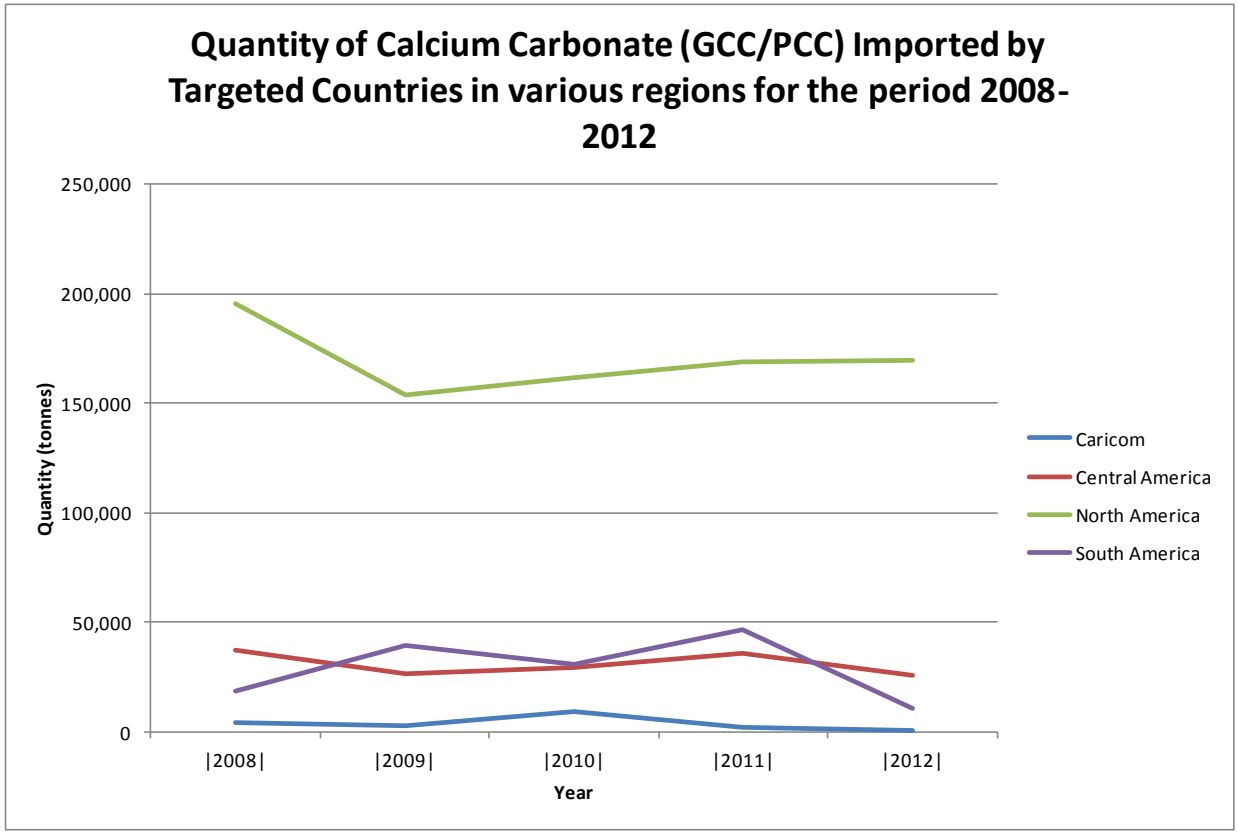



**Figure 9: Regional and International Demand for Calcium Carbonate (GCC/PCC) Imported by Markets in targeted countries as sourced from ITC Database**

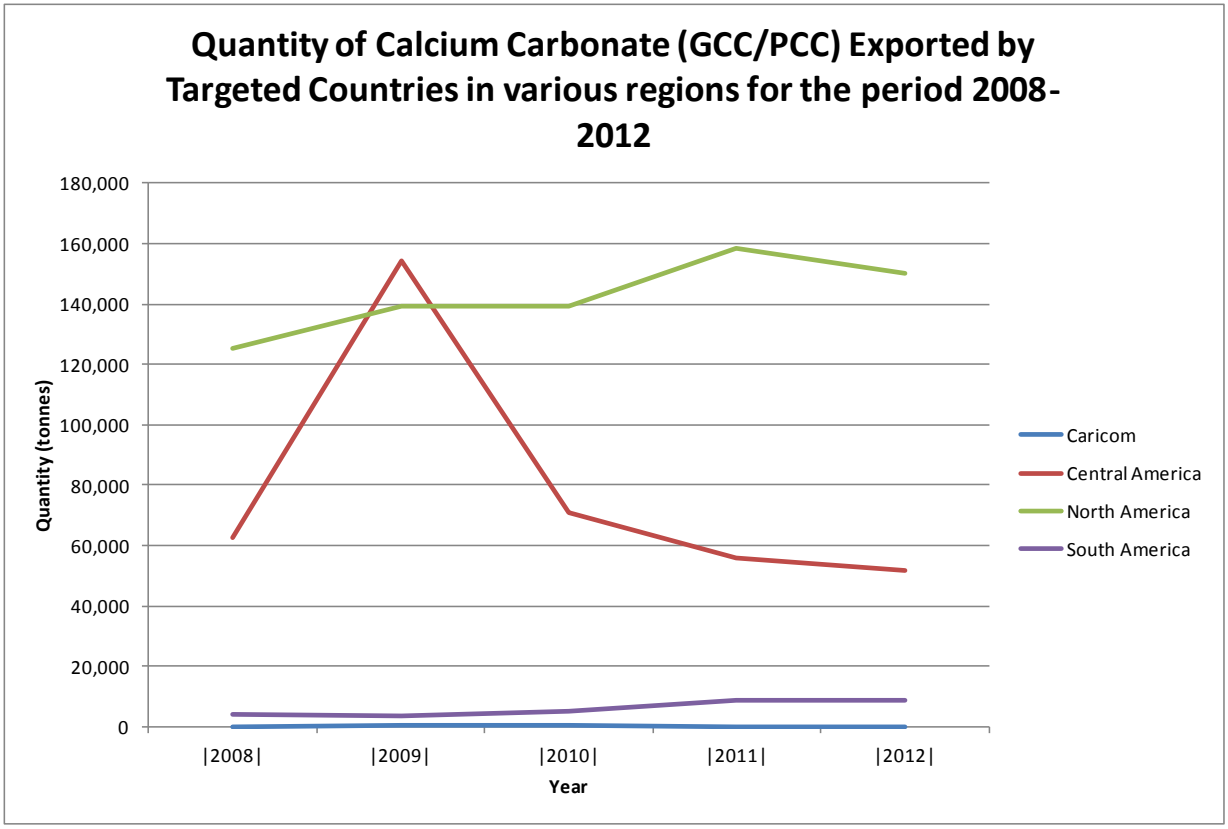



**Figure 10: Regional and International Demand for Calcium Carbonate (GCC/PCC) Exported by Markets in targeted countries as sourced from ITC Database**

**Table 7: Regional and International Value of Calcium Carbonate (GCC/PCC) Imported by Markets in targeted countries as sourced from ITC Database**

| | 2008 | 2009 | 2010 | 2011 | 2012 | Total |
|---|---|---|---|---|---|---|
| | Value (x1000 US$) | | | | | |
| **Caricom** | | | | | | |
| **Export** | 39 | 29 | 45 | 17 | 7 | 137 |
| **Import** | 1,846 | 1,141 | 1,329 | 626 | 56 | 4,998 |
| **Central America** | | | | | | |
| **Export** | 17,537 | 25,504 | 11,044 | 9,990 | 9,293 | 73,368 |
| **Import** | 11,414 | 8,545 | 11,337 | 13,787 | 13,453 | 58,536 |
| **North America** | | | | | | |
| **Export** | 66,443 | 45,600 | 56,108 | 64,431 | 60,438 | 293,020 |
| **Import** | 44,480 | 41,079 | 49,763 | 53,461 | 53,486 | 242,269 |
| **South America** | | | | | | |
| **Export** | 1,222 | 1,245 | 2,187 | 4,425 | 4,860 | 13,939 |
| **Import** | 11,458 | 25,196 | 16,148 | 27,922 | 6,788 | 87,512 |

***Caricom***: A total of 19,000 tonnes of calcium carbonate (GCC/PCC) valued at approximately US$5 million was imported into the region from sources excluding Jamaica. Existing With the exception of Haiti, for which there was insufficient data available, all countries imported from multiple sources in close as well as distant proximity to the region. The markets in Barbados, Guyana, and Trinidad are all supplied with products from one or more of the Dominican Republic, Canada, or the USA. These are three (3) important competitors that exports from Jamaica would need to replace to successfully export additional business into new markets.

The potential for increased earnings from business with these Caricom countries warrants a detailed and comprehensive examination of the market through direct customer contact and other surveys with end-users. This is particularly important since, as a Caricom country, Jamaica would enjoy an additional advantage of the Common External Tariff (CET) which competitors from extra-regional sources would be required to pay.

***Central America***: The targeted Central American countries in this study imported a total of 154,798 tonnes of calcium carbonate (GCC/PCC) with a value of US$58.5 million over the past five years while exporting 395,593 tonnes for a value of US$73.4 million. This significant difference in value between export and import suggests that the lower value GCC was exported while the higher priced PCC was imported. The implication here is that there is an opportunity for exporting PCC to these countries.

***North America***: This is by far the largest market under consideration, and during the five year period the combined importation of GCC/PCC was 849,000 tonnes valued at US$242 million dollars compared to exports of 713,000 tonnes valued at US$293 million, excluding imports from and exports to Jamaica. There has been a 13% point to point decline in combined imports by Canada and the USA between 2008 and 2012, but last year's importation of 170,000 tonnes of GCC/PCC valued at US$53 million represents an opportunity for expansion of Jamaica's current market share to this region by displacing existing suppliers with high quality substitute product at competitive terms.

***South America***: Over the past five years, the two countries considered in this group – Brazil and Venezuela, imported 147,000 tonnes of GCC/PCC with a combined valued at US$87 million. This represents the second largest market after North America that has been identified to provide the prospect for expansion of export from Jamaica. Both South American countries import the vast majority of their GCC/PCC requirement from the USA but the size of the market is sufficiently large and value attractively high to warrant an investigation on how to provide a serious competitive alternative from Jamaica to seize this market opportunity. This too will require a more in depth study.

#### 2.2.2.3. Quicklime

##### *2.2.2.3.1. Domestic Market for Quicklime*

While Jamaica has an abundance of high-grade limestone to satisfy the need of a large production facility for several years beyond the economic life of a lime plant the country finds itself in the paradoxical situation of importing lime at prices in excess of those that normally obtain in other countries and for which it can be produced locally.

Quicklime is used primarily in production of alumina in the Jamaica bauxite industry and the quantity used each year is a function of the amount of bauxite processed for that period. Local operating lime kilns typically provide the requirements for the alumina plants but due to the age and/or low level of reliability from the units the country had had to import the short fall between demand and supply each year. This shortfall creates a negative exposure to the production and efficiency of the alumina plants because of the over dependence on import as well as handling challenges. This situation is exacerbated when, as is now the case, when there is a worldwide shortfall in lime supply

Over the past five years Jamaica imported 56,500 tonnes of quicklime valued at US$11.8 million to supplement locally produced volumes. The medium term prospects for increased earnings from this value added limestone product is linked to replacement of the imported quantities from locally produced operations which could almost immediately replace the average spend of US$2 million on importation annually over the past two years.

By taking advantage of the import substitution opportunity outlined above, the basis would be laid for a long term solution for the replacement of inefficient kilns and the investment in new kiln capacity to:

- Satisfy the Jamaica calcined lime market by supporting the existence and growth of the alumina industry
- Seed development of other downstream business (e.g hydrate lime, milk of lime, and PCC
- Make possible the exportation of calcined lime and derivates to the Caribbean USA and other markets shown below

**Table 8: Domestic Demand for and Value of Quicklime Imported by Jamaica as sourced from STATIN Database**

| Year | Quantity (tones) | Value (US$) |
|---|---|---|
| 2008 | 27,812 | 4,972,145 |
| 2009 | 4,472 | 525,884 |
| 2010 | 4,408 | 661,466 |
| 2011 | 16,080 | 4,789,475 |
| 2012 | 3,694 | 818,693 |
| **Total** | **56,465** | **11,767,663** |

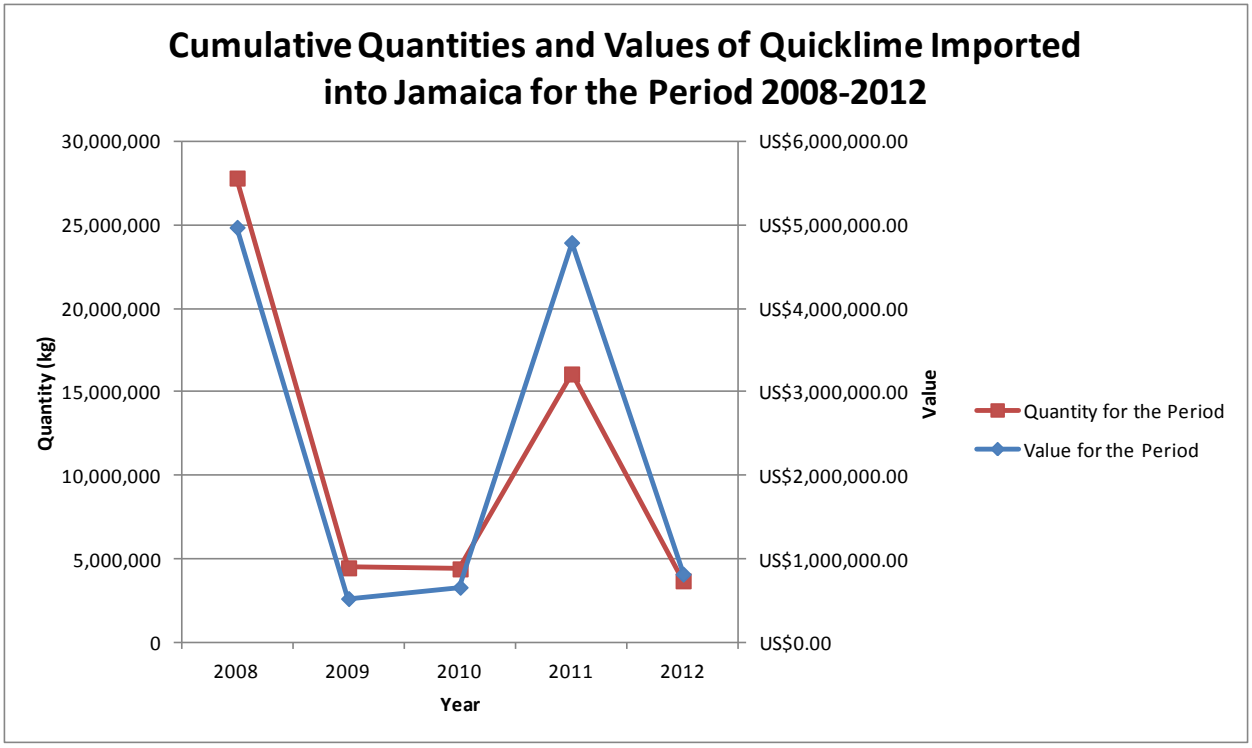



**Figure 11: Domestic Demand for and Value of Quicklime Imported by Jamaica as sourced from STATIN Database**

### *2.2.2.3.2. Regional and International Market for Quicklime*

The total amount quicklime imported and exported from all the region under consideration is summarized below.

**Table 9: Regional and International Demand for Quicklime Imported by Markets in targeted countries as sourced from ITC Database.**

| | 2008 | 2009 | 2010 | 2011 | 2012 | Total |
|---|---|---|---|---|---|---|
| | Quantity (tonnes) | | | | | |
| **Caricom** | | | | | | |
| **Export** | 10,628 | 301 | 0 | 0 | 0 | 10,929 |
| **Import** | 15,106 | 9,159 | 34,860 | 17,354 | 0 | 76,479 |
| **Central America** | | | | | | |
| **Export** | 12,484 | 8,772 | 17,947 | 24,904 | 39,746 | 103,853 |
| **Import** | 14,870 | 10,980 | 12,631 | 14,094 | 15,836 | 68,411 |
| **North America** | | | | | | |
| **Export** | 376,903 | 367,305 | 472,503 | 533,537 | 482,244 | 2,232,492 |

| | 2008 | 2009 | 2010 | 2011 | 2012 | Total |
|---|---|---|---|---|---|---|
| | Quantity (tonnes) | | | | | |
| **Import** | 326,844 | 363,293 | 456,674 | 509,649 | 478,203 | 2,134,663 |
| **South America** | | | | | | |
| **Export** | 14,085 | 2,658 | 581 | 8,966 | 1,433 | 27,723 |
| **Import** | 30,990 | 18,047 | 12,166 | 33,068 | 14,449 | 108,720 |

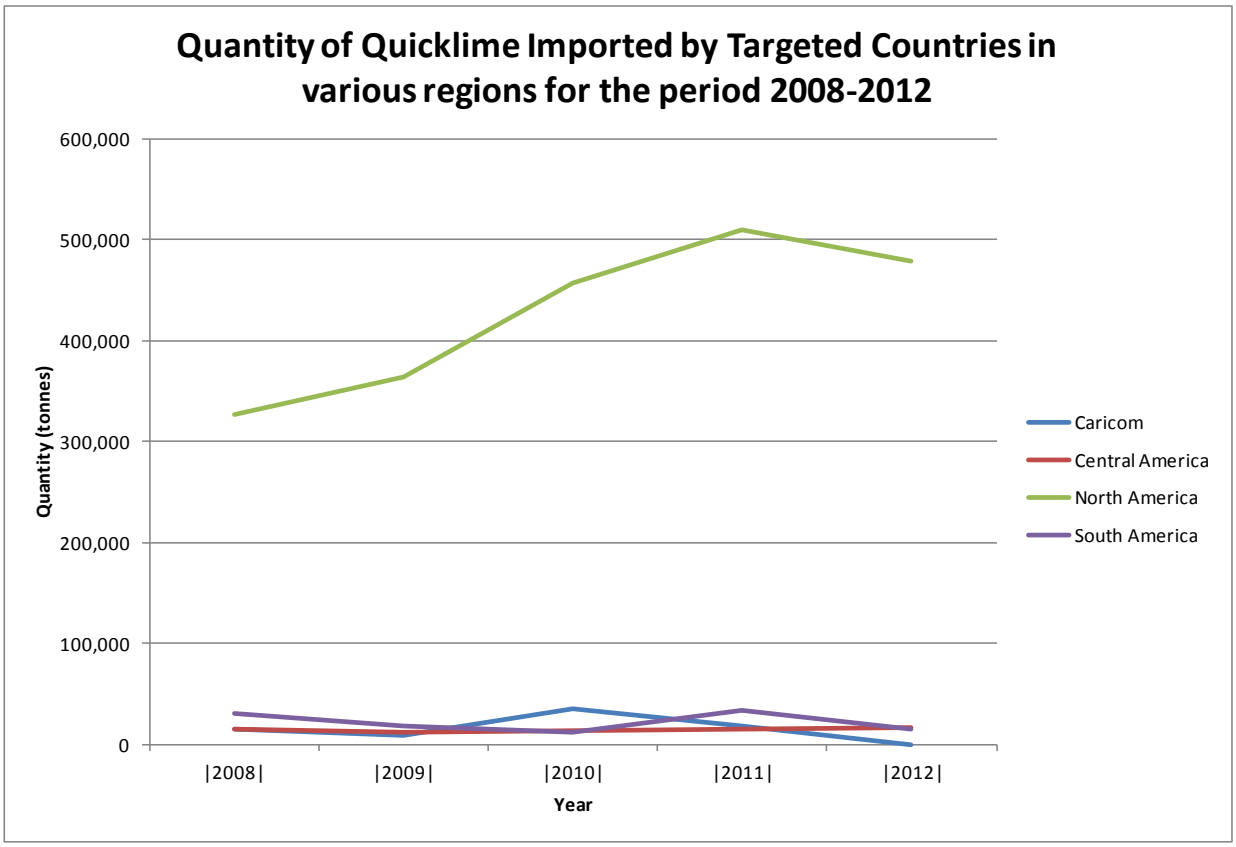



**Figure 12: Regional and International Demand for Quicklime Imported by Markets in targeted countries as sourced from ITC Database**

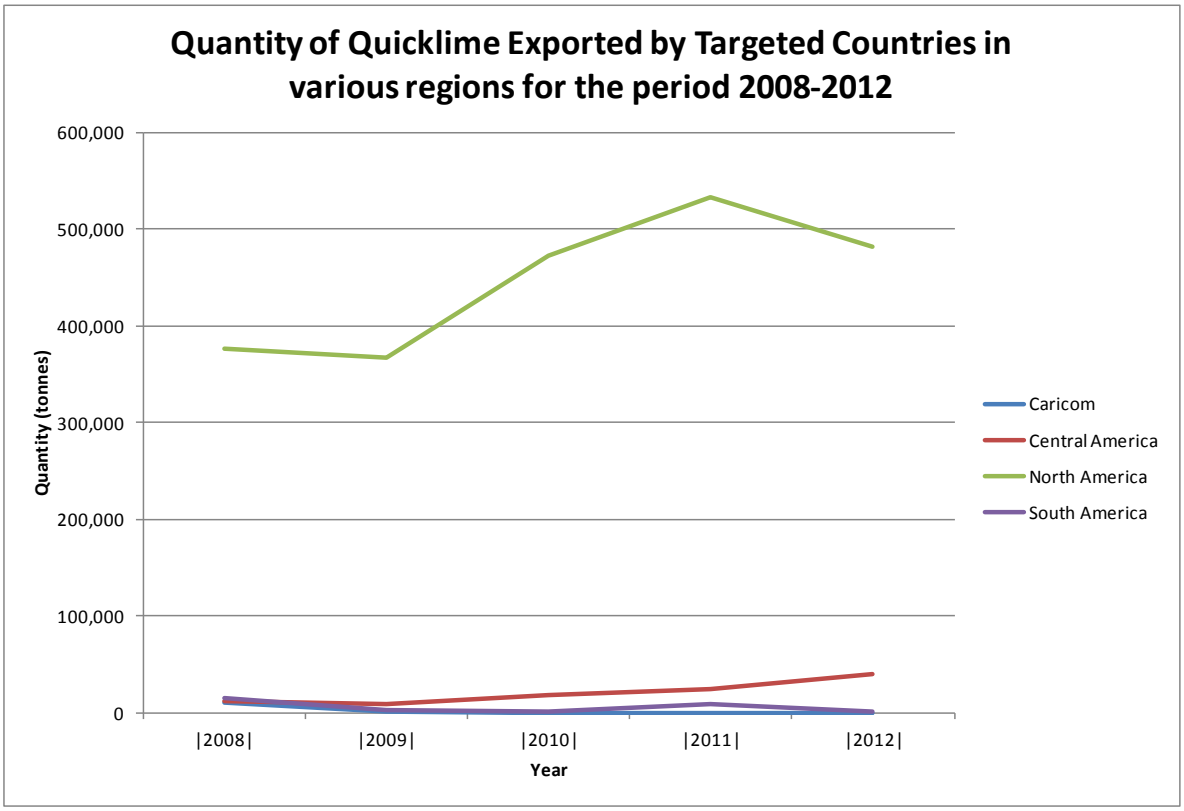



**Figure 13: Regional and International Demand for Quicklime Exported by Markets in targeted countries as sourced from ITC Database**

**Table 10: Value of Regional and International Demand for Quicklime Imported by Markets in targeted countries as sourced from ITC Database**

| | 2008 | 2009 | 2010 | 2011 | 2012 | Total |
|---|---|---|---|---|---|---|
| | Value (x1000 US$) | | | | | |
| **Caricom** | | | | | | |
| **Export** | 1,072 | 247 | 0 | 0 | 0 | 1,319 |
| **Import** | 1,983 | 2,356 | 6,628 | 3,249 | 0 | 14,216 |
| **Central America** | | | | | | |
| **Export** | 1,649 | 1,064 | 2,349 | 3,777 | 4,882 | 13,721 |
| **Import** | 2,025 | 1,675 | 1,866 | 2,294 | 2,609 | 10,469 |
| **North America** | | | | | | |
| **Export** | 41,167 | 46,299 | 62,181 | 72,675 | 67,589 | 289,911 |
| **Import** | 40,216 | 46,624 | 57,365 | 65,951 | 65,172 | 275,328 |
| **South America** | | | | | | |
| **Export** | 818 | 86 | 336 | 347 | 549 | 2,136 |
| **Import** | 5,383 | 2,876 | 1,835 | 4,688 | 1,892 | 16,674 |

***Caricom***: The combined importation of quicklime by markets in the targeted Caricom countries over the past five years was 76,479 tonnes at a value of US$14.2 million. This and other markets in Caricom would provide opportunities for lime produced from a facility in Jamaica.

For the Period, the major players in the Caricom market were Colombia, Guatemala, Mexico, and Barbados, accounting for 41.4%, 21.6%, 16.24%, and12.4% (respectively) of the cumulative market value.

***Central America***: The markets in the targeted countries of the Central American region imported approximately 68,411 tonnes of quicklime valued at approximately US$10.5 million over the period 2008-2012. For the same period they also exported 103,853 tonnes of similar material valued at US$13.7 million.

For the period, the major players in the Central American market were the USA, Guatemala, and Honduras, accounting for 70.70%, 11.60%, and 9.73% (respectively) of the cumulative market value.

***North America***: This represents the largest market in terms of quantities imported and exported. The cumulative amount of quicklime imported for the period was 2.1 million tonnes valued at US$275 million. A similar amount of quicklime was exported for the period, totaling 2.2 million tonnes valued at US$290 million. There doesn't seem to be any significant deficit between import and export. For the Period, the major players in the North American market were Canada and the USA accounting for 76% and 23% respectively of the cumulative market value.

***South America***: The cumulative import for quicklime by the markets in the targeted countries in South America was 108,720 tonnes valued at approximately US$16.7 million. The corresponding exports were 27,732 tonnes valued at US$2.1 million. For the period, the major players in the South American market are Colombia, Uruguay, and Guatemala, accounting for 59.69%, 15.26%, and 8.10% (respectively) of the cumulative market value.

### 2.2.2.4. Enamels & Glazes and Engobes

#### *2.2.2.4.1. Domestics Market for Enamels & Glazes and Engobes*

For the Period 2006-2010, the cumulative amount of enamels, glazes and engobes imported by markets in Jamaica was 19 tonnes valued at US$37,000. Therefore, the domestic market under current market regimes does not represent significant opportunity.

Jamaica did not export any enamels, glazes and engobes for the period.

**Table 11: Domestic Demand for and Value of Enamels, Glazes and Engobes Imported by Jamaica as sourced from ITC Database**

| Year | Quantity (tonnes) | Value (x1000 US$) |
|---|---|---|
| 2006 | 6 | 9 |
| 2007 | 5 | 10 |
| 2008 | 1 | 3 |
| 2009 | 1 | 9 |
| 2010 | 6 | 6 |
| Total | 19 | 37 |

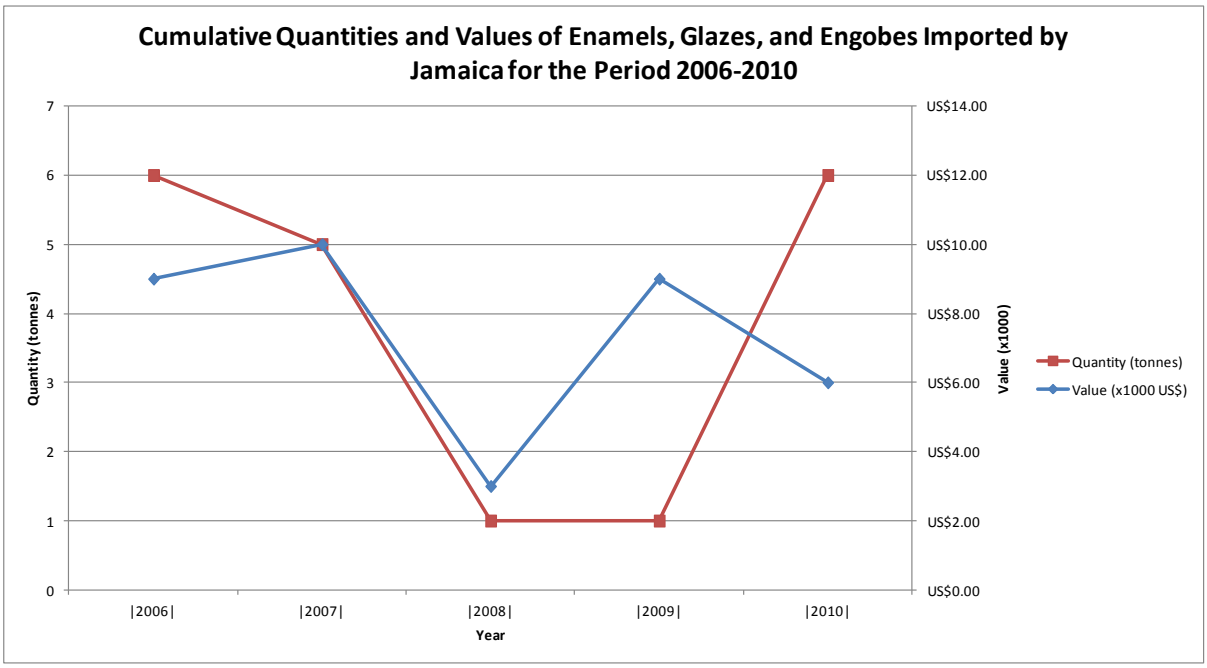



**Figure 14: Domestic Demand for and Value of Enamels, Glazes and Engobes Imported by Jamaica as sourced from ITC Database**

#### *2.2.2.4.2. Regional and International Market for Enamels & Glazes and Engobes*

**Table 12: Regional and International Demand for Enamels & Glazes, and Engobes Imported by Markets in targeted countries as sourced from ITC Database.**

| | 2008 | 2009 | 2010 | 2011 | 2012 | Total |
|---|---|---|---|---|---|---|
| | Quantity (tonnes) | | | | | |
| **Caricom** | | | | | | |
| Export | 0 | 0 | 0 | 0 | 0 | 0 |
| Import | 173 | 27 | 36 | 49 | 69 | 354 |
| **Central America** | | | | | | |
| Export | 19,834 | 26,059 | 23,414 | 22,327 | 20,942 | 112,576 |
| Import | 15,732 | 9,377 | 10,302 | 14,576 | 25,798 | 75,785 |
| **North America** | | | | | | |
| Export | 5,111 | 4,460 | 6,550 | 5,654 | 5,623 | 27,398 |
| Import | 12,343 | 2,517 | 4,746 | 5,351 | 6,235 | 31,192 |
| **South America** | | | | | | |
| Export | 16,295 | 19,305 | 23,341 | 24,194 | 25,893 | 109,028 |
| Import | 8,181 | 8,005 | 9,506 | 5,856 | 1,470 | 33,018 |

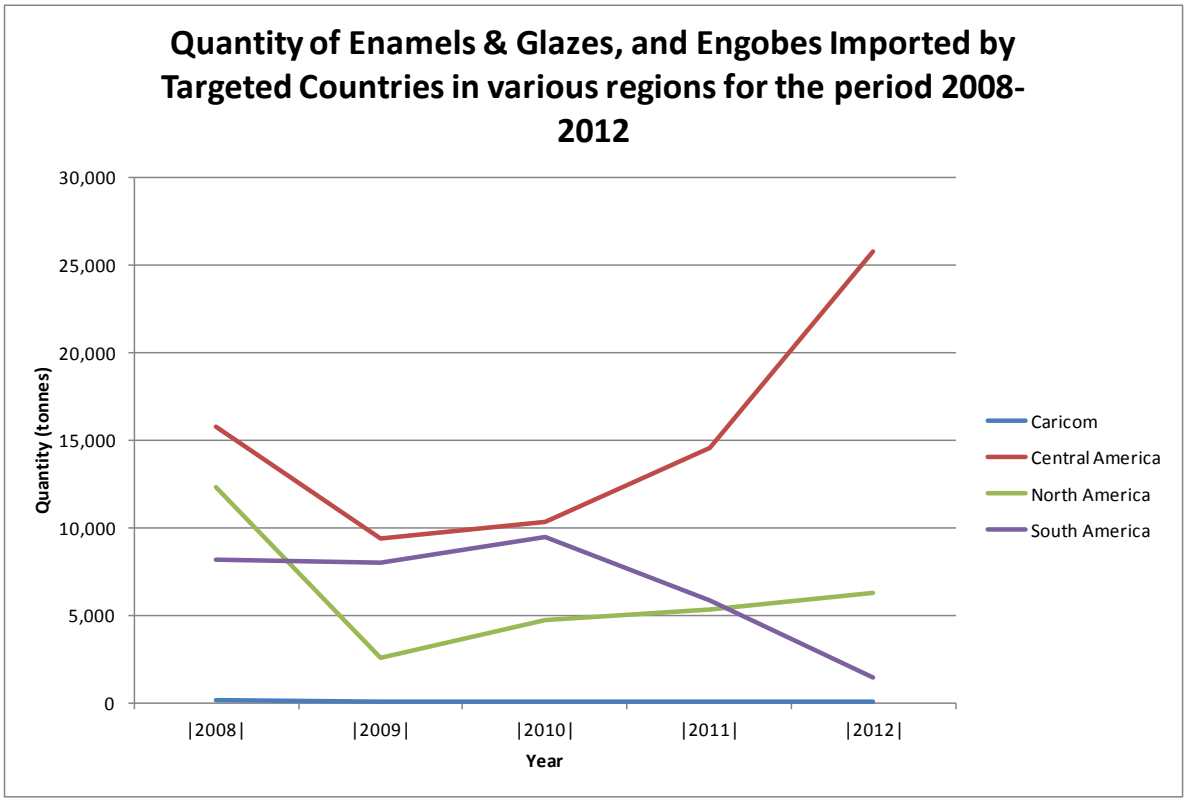



**Figure 15: Regional and International Demand for Enamels & Glazes, and Engobes Imported by Markets in targeted countries as sourced from ITC Database.**

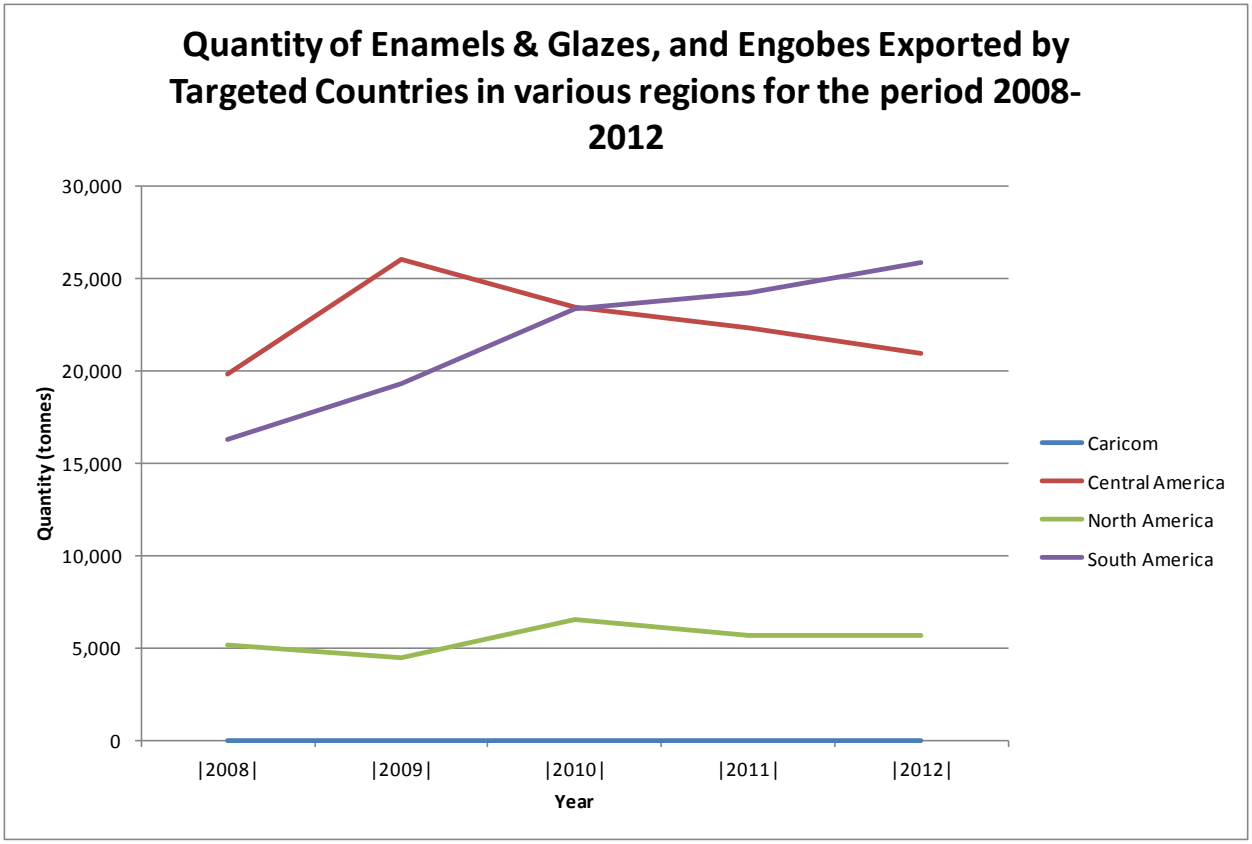



**Figure 16: Regional and International Demand for Enamels & Glazes, and Engobes Exported by Markets in targeted countries as sourced from ITC Database.**

**Table 13: Value of Regional and International Demand for Enamels & Glazes, and Engobes Imported by Markets in targeted countries as sourced from ITC Database**

| | 2008 | 2009 | 2010 | 2011 | 2012 | Total |
|---|---|---|---|---|---|---|
| | Value (x1000 US$) | | | | | |
| **Caricom** | | | | | | |
| Export | 0 | 0 | 0 | 0 | 0 | 0 |
| Import | 228 | 65 | 79 | 75 | 108 | 555 |
| **Central America** | | | | | | |
| Export | 17,742 | 21,062 | 20,617 | 22,273 | 21,103 | 102,797 |
| Import | 28,921 | 24,331 | 36,054 | 43,606 | 48,490 | 181,402 |
| **North America** | | | | | | |
| Export | 42,297 | 29,335 | 34,415 | 37,592 | 43,117 | 186,756 |
| Import | 25,037 | 11,215 | 12,247 | 12,401 | 14,924 | 75,824 |
| **South America** | | | | | | |
| Export | 12,738 | 14,045 | 16,686 | 18,319 | 22,575 | 84,363 |
| Import | 13,127 | 12,375 | 14,433 | 12,773 | 7,059 | 59,767 |

***Caricom**:* The markets of the targeted countries in Caricom did not export any enamel, glazes, and engobes for the period 2008-2012. The cumulative import quantity for the same period was 354 tonnes valued at US$555,000.

The Caricom markets are reflective (independently) of the Jamaican domestic market, and consequently do not represent a significant opportunity under the existing regional market.

***Central America***: Of the targeted countries, in cumulative quantity and value, Central America represents the largest import and export market for enamels, glazes, and engobes. The cumulative import quantity for the period 2008-2012 was 75,785 tonnes valued at US$181.4 million. The cumulative export quantity was 112,576 tonnes valued US$102.8 million.

The primary competitors in the market are USA, Spain, and Mexico accounting for 50.50%, 18.39%, and 15.75% of the market value respectively.

***North America***: The USA and Canada collectively imported 31,192 tonnes valued at US$75.8 million. They also cumulatively exported 27,398 tonnes valued at US$186.8 million. The main suppliers to the North American market were USA, Mexico, and Germany accounting for 32.49%, 24.98%, and 8.09% of the value of the product traded respectively. Canada accounted for 3.47% of the total market value.

***South America***: The cumulative import for enamels, glazes, and engobes by the markets in the targeted countries in South America was 33,018 tonnes valued US$59.8 million. Markets in the targeted countries of South America exported 109,028 tonnes of enamel, glazes, and engobes valued at US$84.4 million. The main suppliers were Brazil, Argentina Spain, and Mexico accounting for 23.28%, 20.66%, 16.03%, and 12.66% of the market value respectively. USA and Canada account for 1.81% and 0.03% respectively.

#### 2.2.2.5. Worked and non-worked Monumental Stones (marble, travertine, and alabaster)

##### *2.2.2.5.1. Worked and non-worked Monumental Stones (marble, travertine, and alabaster)*

For the period 2006-2010 Jamaica imported 8,230 tonnes of worked and non-worked monumental stones made of either marble, travertine, or alabaster. This had a cumulatively valued at US$14.8 million.For the same period imports of these products declined.

With the exception of 2009 in which 29 tonnes of product valued at US$52,000 was exported to Mexico, Jamaica did not export any monumental stones for the period.

**Table 14: Domestic Demand for and Value of Worked and non-worked Monumental Stones (marble, travertine, and alabaster) Imported by Jamaica as sourced from ITC Database**

| Year | Quantity (tonnes) | Value (x1000 US$) |
|---|---|---|
| 2006 | 2,076 | 2,213 |
| 2007 | 3,119 | 6,490 |
| 2008 | 1,811 | 3,509 |
| 2009 | 773 | 1,615 |
| 2010 | 451 | 960 |
| Total | 8,230 | 14,787 |

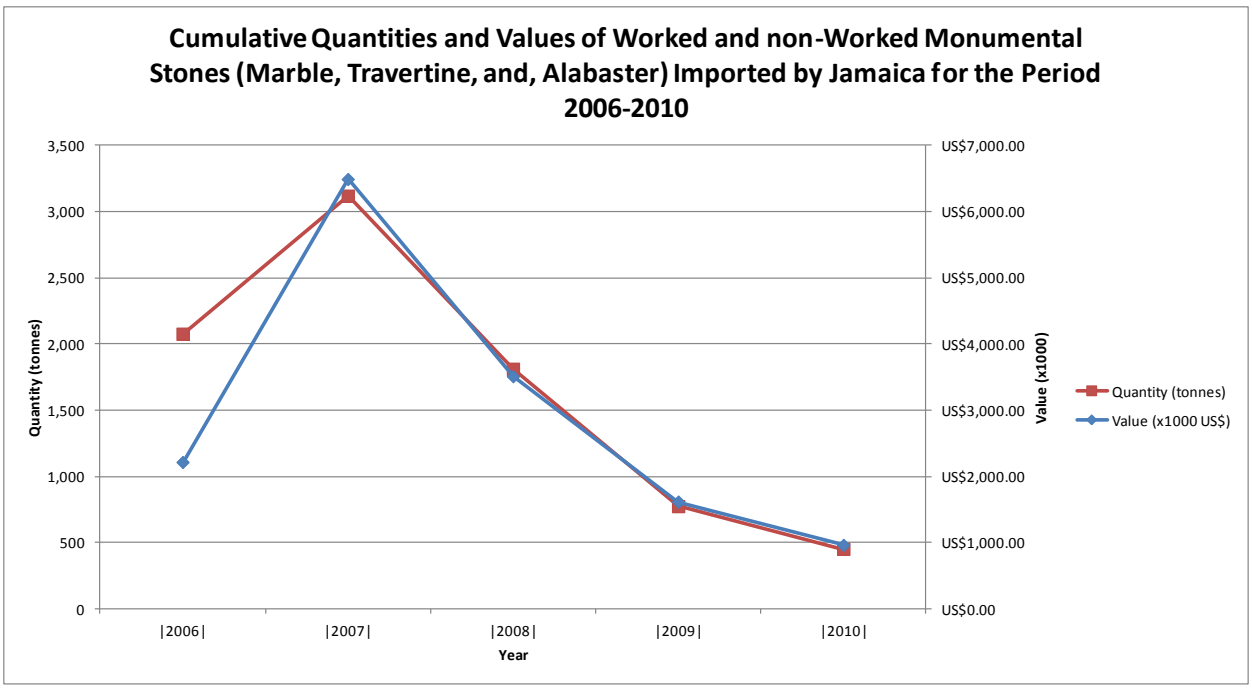



**Figure 17: Domestic Demand for and Value of Worked and non-worked Monumental Stones (marble, travertine, and alabaster) Imported by Jamaica as sourced from ITC Database**

#### *2.2.2.5.2. Regional and International Market for worked and non-worked Monumental Stone (marble, travertine, and alabaster)*

**Table 15: Regional and International Demand for Worked and non-Worked Monumental Stones (marble, Travertine, and alabaster) Imported by Markets in targeted countries as sourced from ITC Database.**

| | 2008 | 2009 | 2010 | 2011 | 2012 | Total |
|---|---|---|---|---|---|---|
| | Quantity (tonnes) | | | | | |
| **Caricom** | | | | | | |
| Export | 7 | 64 | 2 | 4 | 1 | 78 |
| Import | 3,617 | 2,637 | 1,587 | 1,310 | 1,715 | 10,866 |
| **Central America** | | | | | | |
| Export | 117,077 | 72,489 | 72,743 | 84,142 | 82,363 | 428,814 |
| Import | 134,477 | 93,283 | 94,066 | 106,870 | 87,907 | 516,603 |
| **North America** | | | | | | |
| Export | 160,727 | 170,449 | 187,295 | 224,057 | 208,718 | 951,246 |
| Import | 2,442,915 | 1,523,135 | 1,282,065 | 1,109,482 | 1,098,854 | 7,456,451 |

| South America | | | | | | |
|---|---|---|---|---|---|---|
| Export | 5,249 | 3,313 | 3,802 | 3,884 | 5,630 | 21,878 |
| Import | 93,599 | 78,350 | 75,220 | 82,752 | 63,509 | 393,430 |

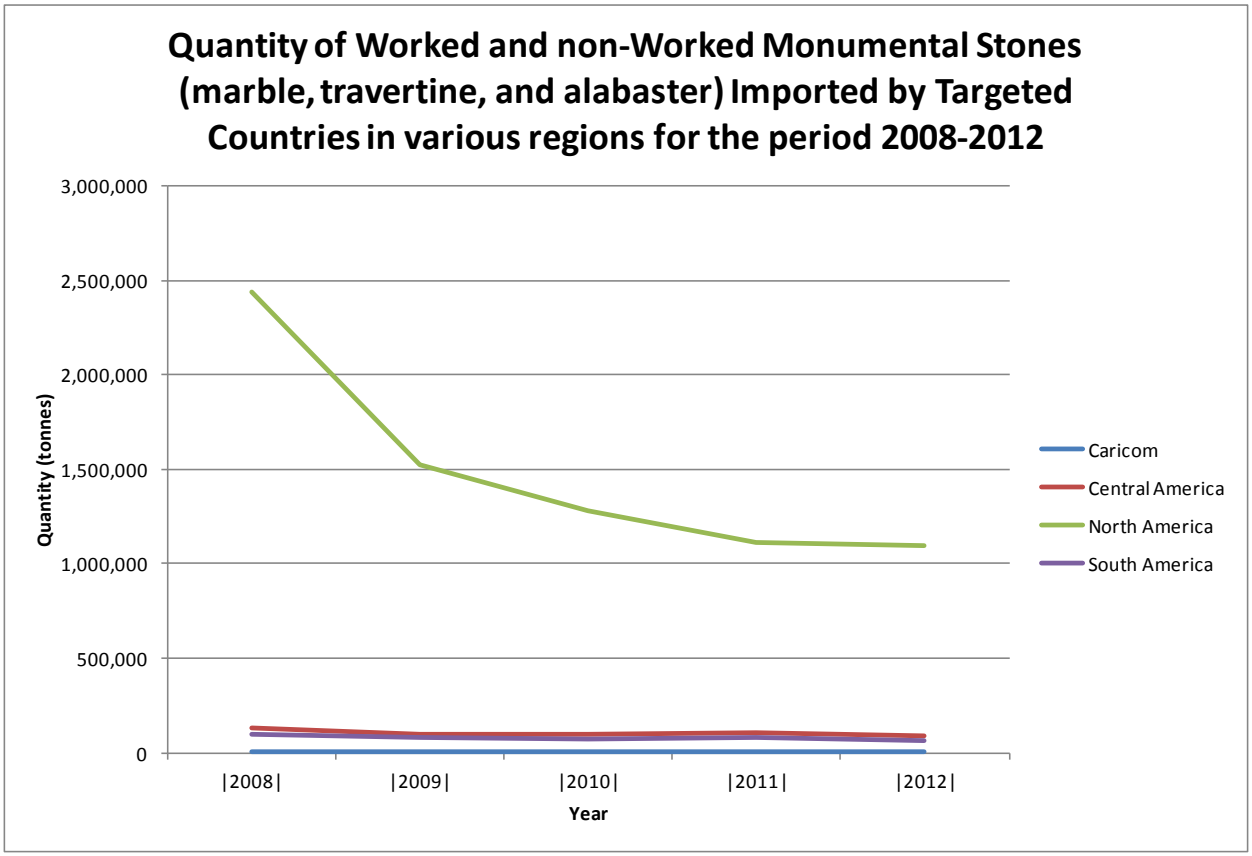



**Figure 18: Regional and International Demand for Worked and non-Worked Monumental Stones (marble, travertine, and alabaster) Imported by Markets in targeted countries as sourced from ITC Database.**

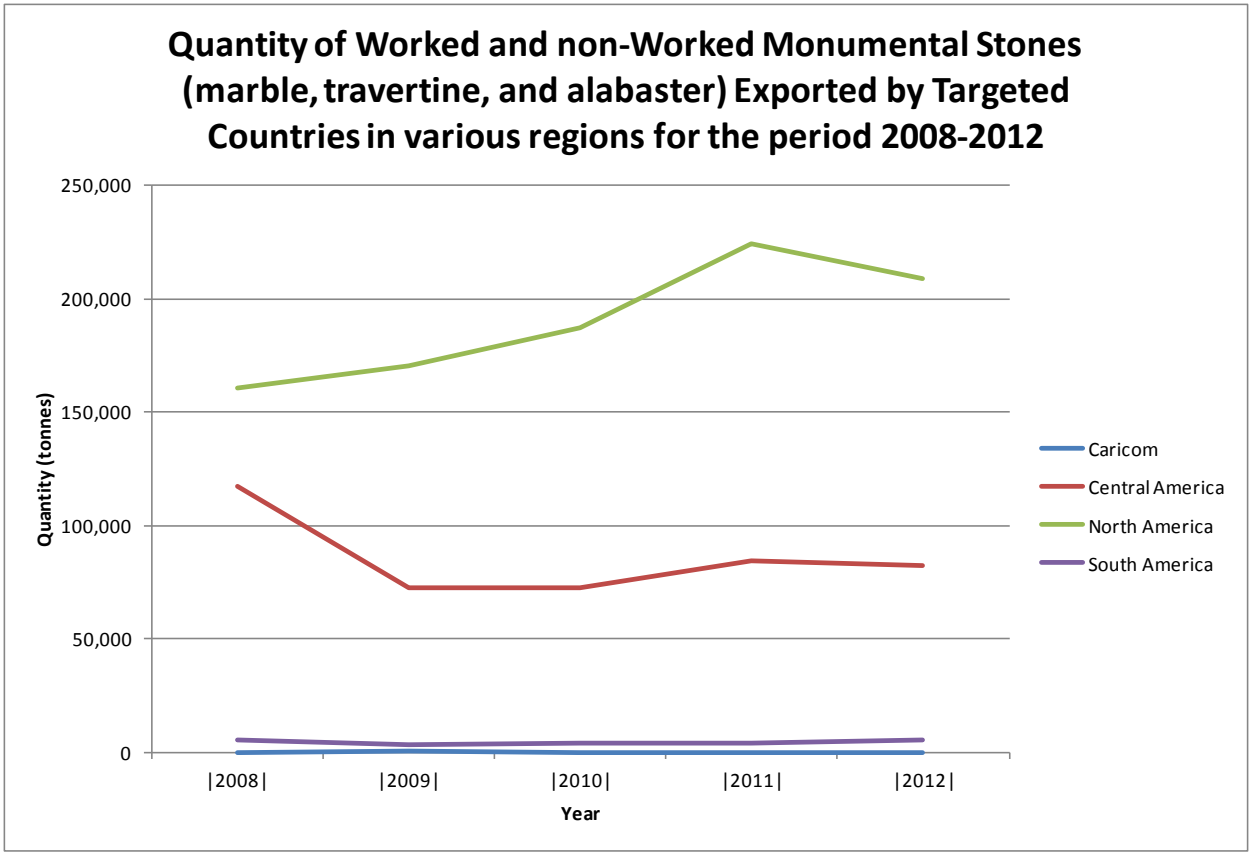



**Figure 19: Regional and International Demand for Worked and non-Worked Monumental Stones (marble, Travertine, and alabaster) Exported by Markets in targeted countries as sourced from ITC Database.**

**Table 16: Value of Regional and International Demand for Worked and non-Worked Monumental Stones (marble, Travertine, and alabaster) Imported by Markets in targeted countries as sourced from ITC Database**

| | 2008 | 2009 | 2010 | 2011 | 2012 | Total |
|---|---|---|---|---|---|---|
| | Value (x1000 US$) | | | | | |
| **Caricom** | | | | | | |
| Export | 21 | 125 | 13 | 15 | 4 | 178 |
| Import | 6,956 | 4,780 | 1,746 | 1,836 | 4,523 | 19,841 |
| **Central America** | | | | | | |
| Export | 106,073 | 66,761 | 66,938 | 72,922 | 71,502 | 384,196 |
| Import | 92,764 | 62,662 | 64,972 | 72,191 | 64,465 | 357,054 |
| **North America** | | | | | | |
| Export | 52,246 | 45,378 | 50,808 | 51,727 | 64,592 | 264,751 |
| Import | 1,443,428 | 905,653 | 896,214 | 951,068 | 1,055,311 | 5,251,674 |

| | 2008 | 2009 | 2010 | 2011 | 2012 | Total |
|---|---|---|---|---|---|---|
| | Value (x1000 US$) | | | | | |
| **South America** | | | | | | |
| Export | 5,256 | 3,548 | 4,030 | 4,780 | 7,953 | 25,567 |
| Import | 66,833 | 57,109 | 46,561 | 58,475 | 40,650 | 269,628 |

***Caricom**:* The markets in the targeted countries of Caricom imported 10,866 tonnes of worked and non-worked monumental stone valued at approximately US$19.8 million for the period 2008-2012. For the same period they exported 78 tonnes valued at US$178,000.

For the period, the major players in the Caricom market were the USA, Italy, and Turkey – accounting for 32.99%, 23.25%, and 20.31% (respectively) of the cumulative market value.

***Central America***: Markets in the targeted countries of Central America imported 516,603 tonnes of worked and non-worked monumental stones for the period 2008-2012 valued at US$357 million. During the same period markets in these countries exported 428,814 tonnes of the same product valued at US$384 million.

For the period, the major players in the Central American market were Spain, Italy, and Egypt –accounting for 42.66%, 16.01%, and 9.42% (respectively) of the cumulative market value.

***North America***: This region represents the largest import market for worked and non-worked monumental stones among the targeted countries. For the period 2008-2012, markets for the targeted countries in North America imported 7.5 million tonnes of product valued at US$5.3 billion. The region also exported 951,246 tonnes of product valued at US$264 million.

For the period, the major players in the North American market were Turkey , Italy, and China – accounting for 32.91%, 22.44%, and 15.08% (respectively) of the cumulative market value.

***South America***: Markets in the targeted countries of South America imported 393,430 tonnes of material for the period 2008-2012 valued at approximately US$269.3 million. For

the same period markets in those targeted countries exported 21,878 tonnes of product valued at US$25.6 million.

For the period, the major players in the South American market were Spain, Italy, and Greece – accounting for 26.40%, 22.75%, and 17.01% (respectively) of the cumulative market value.

#### 2.2.2.6. Additives in Building Plasters (thinset, grout, fillers, etc)

##### *2.2.2.6.1. Domestic Market for Additives in Building Plasters*

Over the past ten years there has been an increase in the number of local manufacturers of grout, thinset, and other building plasters. These companies currently use GCC produced locally and imported lime in their formulation. The volumes and values of these products are summarized for domestic, regional and international markets are summarized below.

**Table 17: Domestic Demand for and Value of Additives in Building Plasters Imported by Jamaica as sourced from STATIN Database**

| Year | Quantities (Tonnes) | Value (x100US$) |
|---|---|---|
| 2008 | n/a | n/a |
| 2009 | 1,169 | 2,206 |
| 2010 | 741 | 1,701 |
| 2011 | 740 | 1,791 |
| 2012 | 892 | 2,155 |
| **Total** | **3,542** | **7,853** |

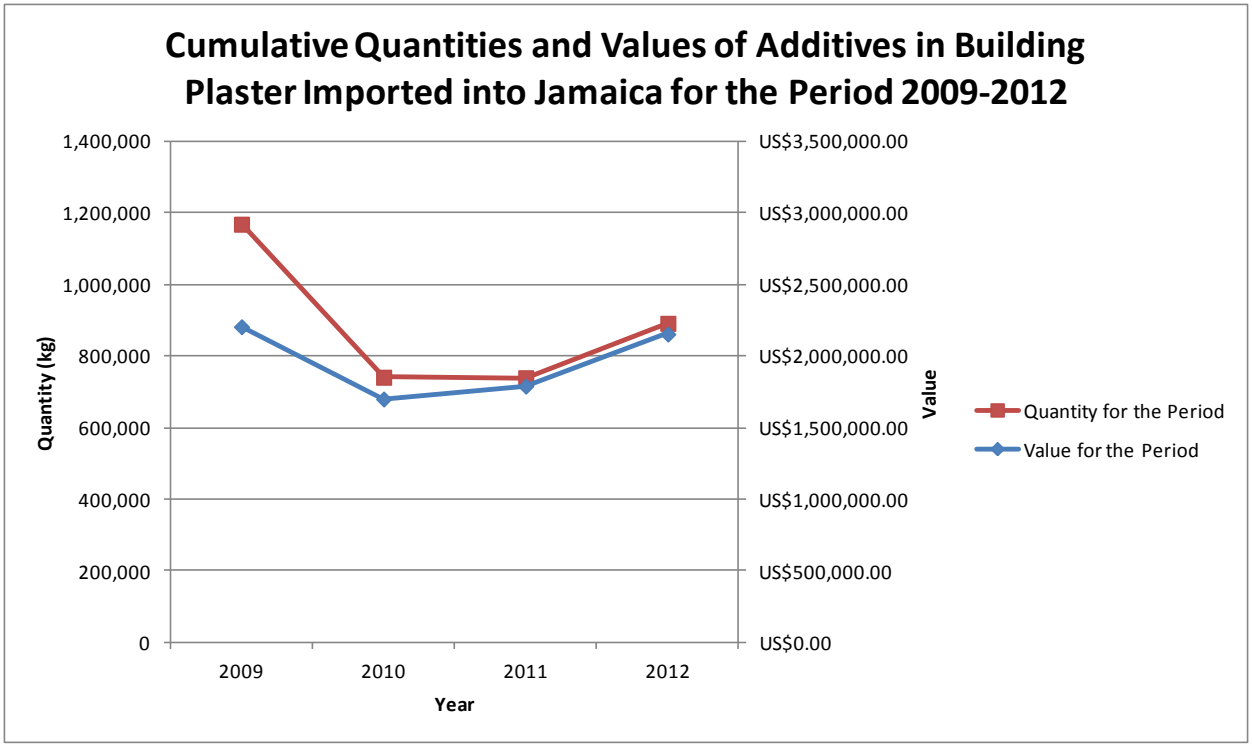



**Figure 20: Domestic Demand for and Value of Additives in Building Plasters Imported by Jamaica as sourced from STATIN Database**

**Table 18: Regional and International Demand for Additives in Building Plaster Imported by Markets in targeted countries as sourced from ITC Database**

| | 2008 | 2009 | 2010 | 2011 | 2012 | Total |
|---|---|---|---|---|---|---|
| | Quantity (tonnes US$) | | | | | |
| **Caricom** | | | | | | |
| **Export** | 4,661 | 3,161 | 3,247 | 723 | 702 | 12,494 |
| **Import** | 47,516 | 12,387 | 11,902 | 8,655 | 5,052 | 85,512 |
| **Central America** | | | | | | |
| **Export** | 69,049 | 56,552 | 54,594 | 64,215 | 75,047 | 319,457 |
| **Import** | 137,687 | 121,468 | 122,568 | 143,236 | 110,353 | 635,312 |
| **North America** | | | | | | |
| **Export** | 240,297 | 217,186 | 241,880 | 265,782 | 282,261 | 1,247,406 |
| **Import** | 88,748 | 132,859 | 136,824 | 148,073 | 176,520 | 683,024 |
| **South America** | | | | | | |
| **Export** | 29,527 | 27,263 | 32,527 | 36,955 | 41,614 | 167,886 |
| **Import** | 19,275 | 14,869 | 20,074 | 22,776 | 19,645 | 96,639 |

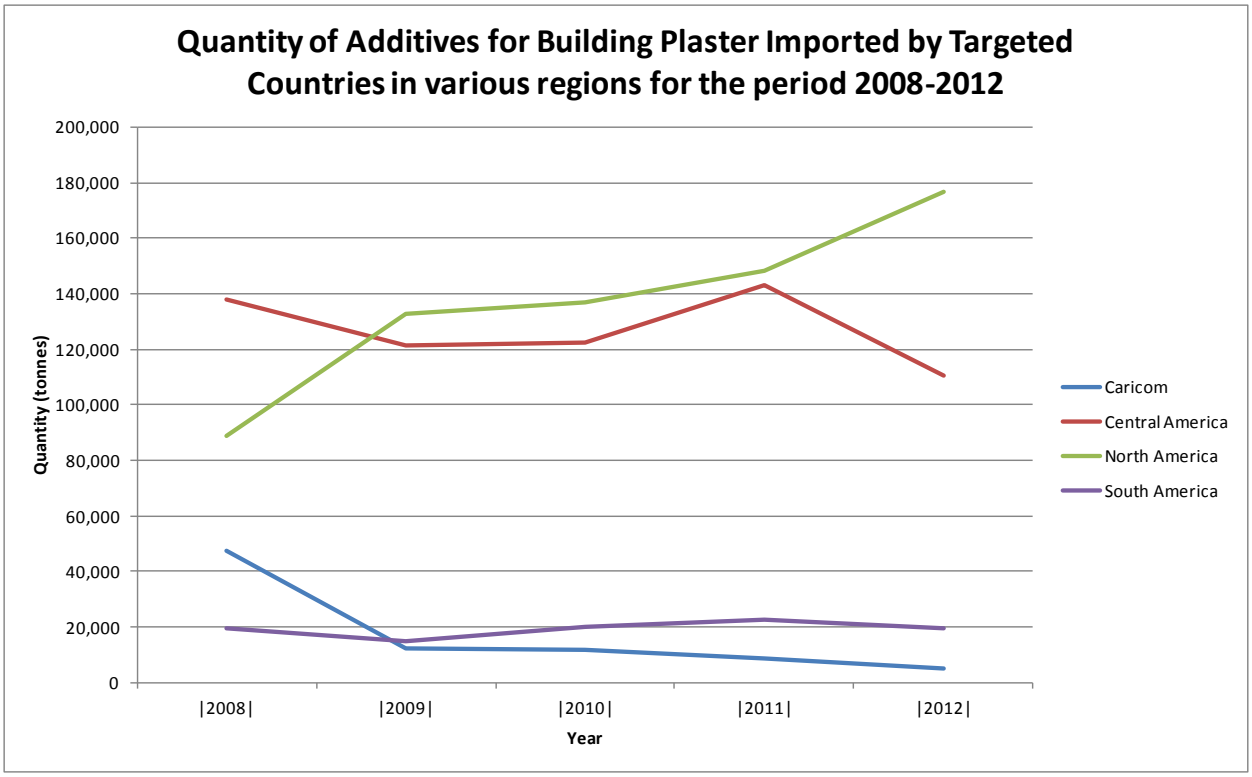



**Figure 21: Regional and International Demand for Additives in Building Plaster Imported by Markets in targeted countries as sourced from ITC Database**

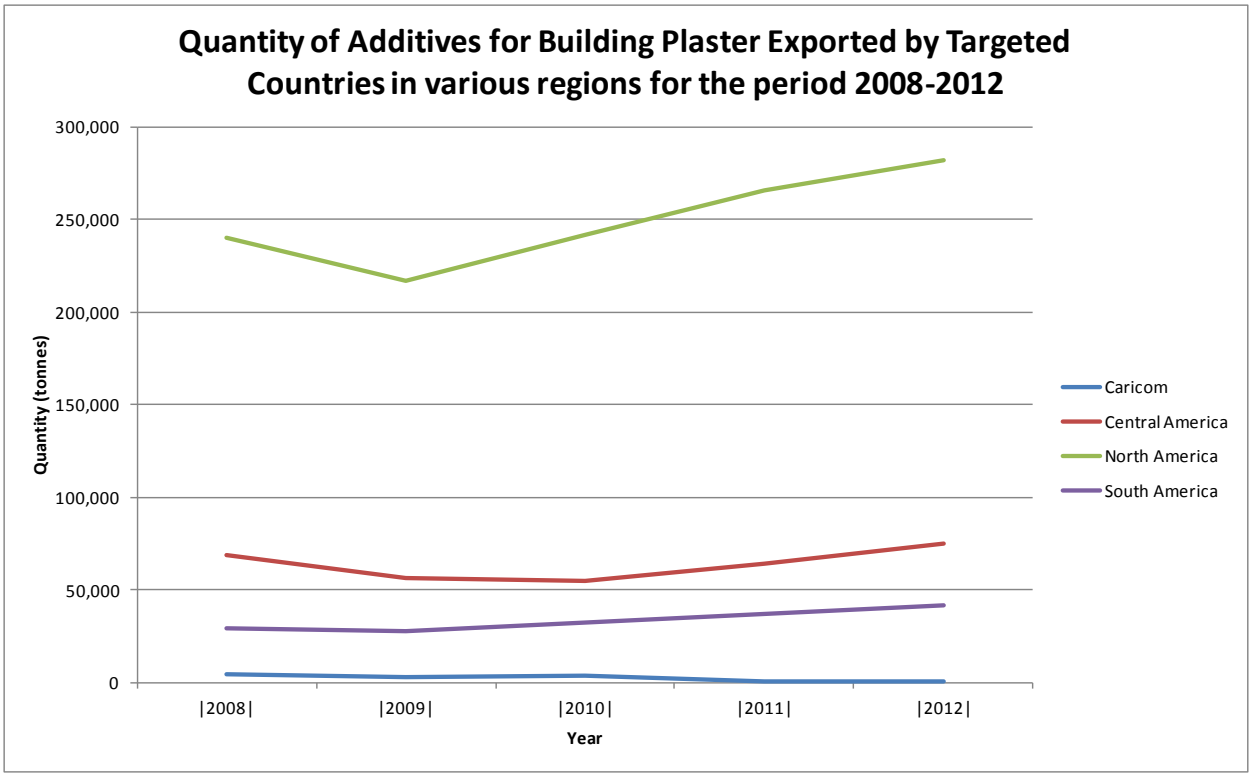



**Figure 22: Regional and International Demand for Additives in Building Plaster Exported by Markets in targeted countries as sourced from ITC Database**

**Table 19: Value of Regional and International Demand for Additives in Building Plaster imported by Markets in targeted countries as sourced from ITC Database**

| | 2008 | 2009 | 2010 | 2011 | 2012 | Total |
|---|---|---|---|---|---|---|
| | Value (x1000 US$) | | | | | |
| **Caricom** | | | | | | |
| **Export** | 1,608 | 1,531 | 1,659 | 983 | 1,196 | 6,977 |
| **Import** | 12,123 | 12,663 | 12,210 | 6,192 | 3,564 | 46,752 |
| **Central America** | | | | | | |
| **Export** | 37,300 | 28,826 | 33,482 | 38,747 | 44,636 | 182,991 |
| **Import** | 208,825 | 176,411 | 212,511 | 257,475 | 267,534 | 1,122,756 |
| **North America** | | | | | | |
| **Export** | 145,531 | 96,061 | 94,034 | 106,205 | 105,984 | 547,815 |
| **Import** | 1,070,494 | 963,072 | 1,113,876 | 1,300,440 | 1,417,171 | 5,865,053 |
| **South America** | | | | | | |
| **Export** | 24,603 | 19,057 | 24,834 | 29,560 | 30,308 | 128,362 |
| **Import** | 58,366 | 43,013 | 65,348 | 86,254 | 88,070 | 341,051 |

***Caricom**:* For the period of 2008-2012, markets in the targeted countries of Caricom cumulatively imported 85,512 tonnes of additives used in building plaster valued at approximately US$46.8 million. For the same period similar markets exported 12,494 tonnes valued at US$7.0 million.

For the period, the general trend for the importation by markets within the targeted countries of Caricom shows that demand has decreased sharply since 2008 and has continued with relatively modest but consistent decreases through to 2012. The export market shows a similar trend for the same period.

***Central America***: For the period of 2008-2012, markets in the targeted countries of Central America cumulatively imported 635,312 tonnes of additives used in building plaster valued at approximately US$1.1 billion. For the same period similar markets exported 319,457 tonnes valued at US$183.0 million.

The data suggests that the Central American import markets for the targeted countries experienced a moderate decrease in 2008. However, for subsequent years leading up to and inclusive of 2011, the markets have experienced sustained increases in demand. Despite this, in 2012 the market experienced its sharpest decrease for the period. The export market has followed a similar trend but has continued with a sustained increase through to 2012.

Although the data suggests that the demand is decreasing, the value of the product shows improvement over the same period.

Over 65% of the market is supplied by the USA, with Germany, Mexico, and Guatemala trading as the second, third, and fourth major suppliers to the market – collectively supplying over 15% of market.

***North America***: For the period of 2008-2012, markets in the targeted countries of North America cumulatively imported 683,024 tonnes of additives used in building plaster valued

at approximately US$5.9 billion. For the same period similar markets exported 1.23 million tonnes valued at US$547.9 million.

The data for the period suggests that markets in the targeted countries of North America have had a sustained demand for the product – showing almost annual improvements in the amount of product imported.

***South America***: For the period of 2008-2012, markets in the targeted countries of South America cumulatively imported 96,639 tonnes of additives used in building plaster valued at approximately US$341.1 million. For the same period similar markets exported 167,886 tonnes valued at US$128.4 million.

The South American import market shows consistent demand for the product with marginal fluctuations occurring over the period.

The major suppliers to the market are: USA, Germany, France, and Switzerland – accounting for 43%, 16%, 9%, and 7% of the market value respectively.

### 2.2.3. Product specifications

Product specification refers to the physical and chemical characteristics of a particular form of calcium carbonate that allows a manufacturer to identify its suitability for, and qualify its use in, their production process and end product(s).

Specifications usually have a range of values which vary depending on the intended application.

In some instances manufactures will use calcium carbonate of a particular specification across a whole product line, or they may use various forms of calcium carbonate of varying specifications for specific product lines. They may also manipulate their production process in order to compensate for the quality of the calcium carbonate – a process which affects the operating cost of the manufacturer and ultimately their product profitability and competiveness.

Therefore, in citing product specifications it is important that direct contact be made with the major market consumers to determine what specification is ideal for their production process and product formulation in the context of their operations and operating climate.

The limited contact survey of the domestic market indicated that the major consumers across the industry regarded the domestic supply of calcium carbonate without significant complaint about the physical or chemical specifications of the major suppliers. In most instances they purchased from more than local supplier, a circumstance which was not governed by any significant irreconcilable distinction in the product specifications of either supplier. Some manufactures preferred one particular product over another; however no impression was given that the distinctions of non-preference were beyond reconciliation with their own production process or the production process of the supplier to meet product physical specification or packaging preference.

Some manufacturers have significant emphasis on both physical and chemical specifications whereas others have an emphasis on physical rather than chemical specifications based in part on the application. With regards to the former, key players in the paving industry have a greater emphasis on the physical specifications, for which the ASTM standards provide the relevant specifications of the aggregate material. Indications are that the relevant ASTM standards are: ASTM D242/D242M; ASTM D692/D692M – 09; and D1073 – 11. These specifications refer to variety of physical parameters such as: density, grading, grading variability, polishing characteristics, soundness, degradation, and plasticity index.

The major local industries that use GCC uniformly report that they generally work with the material supplied by the two major suppliers in the market.

The typical specification cited by one of the major suppliers to the feeds industry is shown in Table 20 below.

**Table 20: Typical Physical, Chemical and Particle Size (Distribution) Properties for Calcium Carbonate used in the Domestic Feeds Industry**

| | |
|---|---|
| **Physical** | |
| Moisture | 0.1 |
| Top size | -6 Tyler Mesh (3.5mm) |
| Specific gravity | 2.71 |
| **Chemical** | |
| Calcium Carbonate | >99.08 |
| Magnesium carbonate | <0.39 |
| Moisture | <0.1% |
| **Particle Size** | |
| **Tyler Mesh** | **Typical % Retained** |
| +6 | 1.3 |
| +10 | 19.0 |
| +20 | 30.0 |
| +80 | 32.7 |
| -80 | 17.0 |
| **Packaging:** | 25 kg or 1 tonne semi-bulk bags |

The typical specifications cited by major suppliers to the paints industry for GCC are shown in Table 21, Table 22, and Table 23 below. It should be noted that:

a. The scope of parameters that are relevant to the paint industry exceed those of the feeds industry,
b. Parameters that are relevant to the paving industry are not relevant to either the feeds or paint industry and vice versa.
c. The product described in Table 23 below is also useful as raw material for the production of other value added products besides paint. This is likely to be true for the products described in Table 21 and Table 22 since they share similar specification values that may indicate a correlation to physical properties that play a functional role in defining the suitability of calcium carbonate for another application besides paint.

**Table 21: Typical Specification Ranges of GCC as cited by Domestic Major Supplier(s) to the Paint Industry**

| | |
|---|---|
| Calcium Carbonate | 97% to 99% |
| Silica | 0.01% to 0.19% |

| | |
|---|---|
| Ph | 8.7 to 10 |
| Density | 2.67 to 2.70 g/cm$^3$ |
| Oil absorption | 12.63 to 21.73 gm/100gm |
| Dry brightness | |
| At 580 nm against $MgCO_3$ | 90.0 to 94.0 |
| Particle Size | 62% - 64% passing 325 mesh |

**Table 22: Typical Specifications of GCC as cited by Domestic Major Supplier to the Paint Industry**

| **Chemical Analysis of raw material** | |
|---|---|
| Calcium Carbonate=CaO x 1.78477 | 99.10% |
| Magnesium Carbonate=MgO x 2.09176 | 0.54% |
| Silicon Dioxide ($SiO_2$) | <0.05% |
| Iron Oxide ($Fe_2O_3$) | 0.03% |
| Aluminum Oxide ($Al_2O_3$) | 0.03% |
| Sodium Oxide ($Na_2O$) | 0.02% |
| Potassium Oxide ($K_2O$) | <0.01% |
| Manganese Oxide (MnO) | 0.01% |
| Loss on Ignition (LOI) | 43.13% |
| Oil Absorption | 20.5g/100gm |
| pH (ASTM 1984C 110-84) | 9.9% |
| Brightness (ASTM 1984C 110-84) | 93.4% |

**Table 23: Typical Specifications of GCC as cited by Domestic Major Supplier to the Paint Industry**

| **Chemical Analysis of raw material** | |
|---|---|
| Calcium Carbonate ($CaCO_3$) | 99.7% |
| Iron Oxide ( $Fe_2O_3$) | 0.019% |
| Magnesium Carbonate (MgCO3) | 0.17% |
| Aluminium Oxide (Al2O3) | 0.27% |
| Moisture | 0.084% |
| **Physical Properties** | |

| | |
|---|---|
| Specific Gravity | 2.71 |
| Hardness (Mohs) | 3 |
| **Fineness** | |
| Residue on a 45 sieve | Nil |
| Mean Particle Size | 7.7 |
| Particles < 22 | 99.6% |
| Particles < 2.9 | 3.9% |
| **Whiteness** | |
| Brightness | 92.1% |
| Bulk (Packed) Density | 1.1 g/cm3 |
| pH value | 9.8 |
| Oil Absorption | 17% |
| Plasticizer (DBP) absorption | 23.5% |
| Application | Plastics*: Polyoefin, Plasticized and Unplasticized PVC, Pigment Master Batches, Polyurathane* |

Specification for GCC of a particular international chemicals trader's product is also shown in Table 24 below. The table describes a range of GCC variants for their ultra-fine and medium-fine products based on variations in their physical specifications.

Table 25 describes the mutual chemical (and other) specifications of the manufactured GCC variants. The actual end-uses of each variant as raw material are cited as:

- ✓ Adhesives
- ✓ Agriculture
- ✓ Asphalt Products
- ✓ Caulk and Sealants
- ✓ Ceramics
- ✓ Cleansers
- ✓ Drilling Fluids
- ✓ Joint Compound
- ✓ Paint and Coatings
- ✓ Pesticides

- ✓ PVC Pipe
- ✓ Rubber
- ✓ Traffic Paint
- ✓ Vinyl Flooring

It should be noted that the *extra-domestic* product described by Table 25 is inferior in purity to the domestic products cited in Table 21, Table 22, and Table 23 above.

Table 27 describes the typical specifications for PCC as cited by an international major supplier to the domestic paint industry. Indications are that all the major paint manufacturers source their PCC from the same international supplier.

## Table 24: Physical Specifications for an International Chemicals Trader for their Ultra-fine GCC product

| Parameter | Q1 | Q1T | Q2 | Q2T | Q3 | Q3T | Q4 | Q6 | G8 |
|---|---|---|---|---|---|---|---|---|---|
| Surface treatment | | Treated | | Treated | | Treated | | | |
| Median Particle size (microns, Sedigraph) | 1.1 | 1.1 | 2 | 2 | 3.2 | 3.2 | 4.3 | 6 | 9 |
| Dry Brighness (Hunter Reflectance) | 90 | 90 | 90 | 90 | 89 | 88 | 88 | 87 | 93 |
| Oil Absorption (lbs oil/100lbs, ASTM D-261 | 21 | 21 | 18 | 16 | 18 | 15 | 17 | 16 | 15 |
| Moisture (%, ASTM D-280) | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.15 | 0.2 |
| Water Demand (ml/100gms) | 95 | | 68 | | 55 | | 54 | 45 | 41 |
| Loose Bulk Density (lbs/ft3, ASTM C-110) | 30 | 32 | 44 | 41 | 40 | 40 | 40 | 45 | 50 |
| Compacted Bulk Density (lbs/ft3, ASTM C-110) | 45 | 48 | 52 | 55 | 60 | 60 | 60 | 65 | 85 |
| Weight Per Gallon (lbs/solid gallon) | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 |
| 325 mesh residue | 0.05 | 0.05 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.01 | 0.05 |
| Hegman Grind (ASTM D1210) | 5.5 | 5.5 | 6.5 | 6.5 | 6 | 6 | 6 | 5 | 4 |

## Table 25: Physical Specifications for an International Chemicals Trader for their GCC Medium-fine product

| Parameter | Q325 | Q200 | Q200T | Q100 | Q60 | GeoTex FXZ | Q40-200 | GeoTex FXT | Q12-40 | Q6-20 |
|---|---|---|---|---|---|---|---|---|---|---|
| Surface Treatment | | | Treated | | | | | | | |
| Median Particle size (LLS-Cilas) | 13 | 22 | 22 | 24 | 20 | | | | | |
| Dry Brightness (Hunter Reflectometer) | 86 | 84 | 84 | 83 | 78 | | | | | |
| Oil Absorption (lbs oil/100lbs, ASTM D-261 | 14 | 12 | 12 | 12 | 12 | | | | | |
| Moisture | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 |
| Water Demand (ml/100gms) | 40 | 36 | | 36 | | | | | | |
| Loose Bulk Density (lbs/ft3, ASTM C-110) | 50 | 55 | 55 | 55 | 55 | 89 | 85 | 90 | 90 | 90 |
| Compacted Bulk Density (lbs/ft3, ASTM C-110) | 60 | 80 | 80 | 80 | 95 | 110 | 98 | 106 | 100 | 100 |

| Parameter | Q325 | Q200 | Q200T | Q100 | Q60 | GeoTex FXZ | Q40-200 | GeoTex FXT | Q12-40 | Q6-20 |
|---|---|---|---|---|---|---|---|---|---|---|
| Weight Per Gallon (lbs/solid gallon) | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 |
| Hegman Grind (ASTM D1210) | 2 | | | | | | | | | |
| **Mesh Size** | | | | | | | | | | |
| -4 | | | | | | | | | | |
| -6 | | | | | | | | | | 100 |
| -8 | | | | | | | | | 100 | 85 |
| -12 | | | | | | | | | 95 | 61 |
| -16 | | | | | | | | | 72 | 28 |
| -20 | | | | | | 100 | 100 | 100 | 56 | 7 |
| -40 | | | | 100 | 100 | 99 | 99.5 | 99.5 | 7 | |
| -60 | | 100 | 100 | 99.9 | 99.6 | 71 | 60 | 60 | 3 | |
| -100 | 100 | 99.9 | 99.9 | 99 | 96.5 | 48 | 23 | 23 | | |
| -200 | 99.9 | 99 | 99 | 79 | 78 | 27 | 6 | 6 | | |
| -325 | 99.5 | 82 | 82 | 66 | 61 | 17 | | | | |

**Table 26: Chemical and other Specifications for an International Chemicals Trader for their Ultra-fine and Medium-fine GCC products**

| **Chemical Properties** | |
|---|---|
| Calcium Carbonate | 96.5% |
| Magnesium Carbonate | 2.0% |
| Silica and silicates | 1.0% |
| Other | 0.5% |
| **Other Properties** | |
| Color | White |
| Alkalinity (as NaOH, ASTM D-1208) [mg/gm] | 0.4 |
| pH (ASTM D-1208) [saturated solution] | 9.4 |

| | |
|---|---|
| Hardness (Hand. Of Chem. Phy.) [Mohs, relativel/non-abrasive] | 3 |
| Solubility (Hand. Of Chem. Phy.) [gm/100 ml H2O at 100 oC | 0.0035 |
| Particle Shape (Microscope) | Irregular, unaxial |
| Specific Gravity (ASTM D-153) | 2.7 |
| Refractive Index (Hand. Of Chem. Phy.) | 1.6 |
| Weight/Solid Gallon (s.g. x 8.345) [lbs/solid gallon (0.0443 solid gallons/pound)] | 22.6 |
| Linear Expansion Coefficient (Hand. Of Chem. Phy.) [/oC] | 4.30E-06 |

**Table 27: Typical Specifications for PCC as cited by a Major International Supplier to Domestic Paint Industry**

| Physical Properties | Metric | English | Comments |
|---|---|---|---|
| Specific Gravity | 1.85 g/cc | 1.85 g /cc | Slurry |
| Density | 2.70 g/cc | 2.70 g/cc | dry |
| Solids Content | 1.84 g/cc | 0.06667 lb /cc | Slurry |
| Moisture Absorption at Equilibrium | 0.040% | 0.040% | Moisture Loss 110C (dry) |
| Particle size | 3.2um | 3.2um | Median Diameter |
| Specific Surface Area | 3.2m2/g | 3.2m2/g | |
| **Optical Properties** | **Metric** | **English** | **Comments** |
| Refractive Index | 1.5 | 1.57 | dry |
| Reflection Coefficient, Visible (0-1) | 0.955 | 0.955 | Y – Brightness (dry) |
| **Descriptive Properties** | | | |
| Calcium Carbonate % | | 98 | |
| FDA | | 21 CFR 174.5, 175.300, 178.3297 | |
| Hegman (dry) | | 6 | |
| Magnesium Carbonate | | 1 | |
| Pounds Pigment/gallon (slurry) | | 1 | |
| Pounds Pigment/Solid Gallon (dry) | | 11.3 | |
| Retained in 325 mesh (dry) ppm | | 22.6 | |

## 2.3. Conclusions

1. There are opportunities , in the medium term, to increase sales of limestone aggregate, Ground Calcium Carbonate (GCC), quicklime, Precipitated Calcium Carbonate (PCC), and additives for building plasters to new markets through import substitution, as well as exporting to Caricom and extra regional countries. Jamaica currently has the infrastructural capability and capacity to supply limestone

aggregate and GCC to these markets while it would require restoration and / or expansion of installed capacity to respond to the local and export market opportunities for quicklime. The study has also identified that significant additional earnings can be made through the establishment of a vertically integrated lime infrastructure in which PCC is produced for selling direct to market as well as for secondary use as a raw material to produce even higher value added products in the diverse pharmaceutical industry through joint venture or incentive induced foreign investment.

2. The available data shows that there are several options to enter new markets or grow market share in the Caricom, Central American, North American and South American regions, for the range of limestone derivatives as shown in Table 28 and Table 29 below. The wide differences in the unit price of each group of products illustrate the tremendous opportunity for Jamaica to share in the high value segment of the overall market for limestone derivatives.

**Table 28: Average Annual Quantity Imported for the Range of Limestone Derivatives**

| | Quantity (tonnes) | | | | |
|---|---|---|---|---|---|
| **Product** | **Caricom** | **Central America** | **North America** | **South America** | **Total** |
| Additives for Building Plaster | 17,102 | 71,537 | 136,605 | 19,328 | 244,572 |
| Calcium Carbonate (GCC/PCC) | 3,748 | 22,083 | 169,873 | 29,387 | 225,092 |
| Limestone Aggregate | 18,664 | 6 | 1,748,519 | 202,947 | 1,970,136 |
| Quicklime | 15,296 | 4,550 | 426,933 | 21,744 | 468,522 |
| Grand Total | 54,810 | 98,177 | 2,481,929 | 273,406 | 2,908,322 |

**Table 29: Average Annual Value for the Range of Limestone Derivatives Imported**

| | Average Value (x1000 US$) | | | | | |
|---|---|---|---|---|---|---|
| **Product** | **Caricom** | **Central America** | **North America** | **South America** | **Total** | **Unit Price** |
| Additives for Building Plaster | 9,350 | 56,155 | 1,173,011 | 68,210 | 1,306,726 | 5.343 |
| Calcium Carbonate (GCC/PCC) | 1,000 | 7,226 | 48,454 | 17,502 | 74,182 | 0.330 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Limestone Aggregate | 1,000 | 2 | 24,297 | 2,752 | 28,051 | 0.014 |
| Quicklime | 2,843 | 572 | 55,066 | 3,335 | 61,816 | 0.132 |
| Grand Total | 14,193 | 63,955 | 1,300,827 | 91,800 | 1,470,775 | 0.506 |

3. Based on the current demand across existing industries (paint, animal feed, building plasters) the local market for GCC is saturated as virtually all users purchase their requirements from the two large operating plants. However, opportunities exist to supply product to operators in the value added end users group such as the paper, glass, plastics and pharmaceutical industries. It would however require detailed feasibility involving direct contact and other market surveys to establish actual viability.
4. Since all the markets examined are currently being serviced by existing suppliers from diverse locations, exports from Jamaica would need to have special features to displace competitors who already have a foot hold there. On the basis of the following factors:

    - very high purity of Jamaica's limestone,
    - our centrally located shipping port which makes access to many large markets in Central, North, and South America convenient and economical and,
    - the availability of numerous bulk and ocean freight containerized services. With short transit time to market we are well positioned to provide attractive options that could be competitive with existing suppliers. A final determination would however require more in-depth analysis.

5. The Dominican Republic and the USA are major competitors in the regional market for GCC and other limestone derivative products.
6. The existing local limestone processing operators should be engaged through formal consultation with a view to develop their existing infrastructure to enhance their capability of to produce high value added limestone derivatives currently imported into the Jamaica and the region.

7. A contact survey and analysis should be conducted in targeted markets for the export of these products and to attract investment in the establishment of local manufacturing enterprises.
8. The construction of the north-south highway from the Spanish Town area to the Ocho Rios area provides a market opportunity for operators who produce limestone aggregate in proximity to this development.
9. The market prospects for virtually all limestone derivative products imported to the Caricom, Central American, North American and South American region is very encouraging and has the potential to generate considerable opportunities for Jamaica. However, in order to move forward in a meaningful manner, it is imperative that more concrete information be generated through direct interaction with end-users in the various markets.

### 2.4. Recommendations

The desktop Product and Market Opportunity study has provided information on good possibilities and sufficiently strong potential business opportunities. We therefore recommend a more direct and focused study through direct contact survey and other marketing tools to provide more reliable data to form the basis of a commercially feasible and bankable investment proposal.

We further propose that the recommendations from Assessment of Operations (Sector Assessment), especially as they relate to the state of the industry be considered as companion activities to be implemented as part of a holistic strategy to maximize the potential benefits for all stake holders involved in the limestone business sector.

# ASSESSMENT OF OPERATIONS (SECTOR ASSESSMENT)

# 3.0. ASSESSMENT OF OPERATIONS (SECTOR ASSESSMENT)

## 3.1. Introduction

The Center for the Development of Enterprise (CDE), by way of an email letter dated December 14, 2012 invited Conrad Douglas & Associates Limited, along with other local and international consultants, to participate in a limited tender for the provision of consultancy services in respect of a Market Assessment and Design and Implementation of a Marketing Initiative for Limestone and its Derivatives.

All firms were required to submit Full Technical and Financial Proposals, by January 31, 2013, using the respective forms outlined in the Request for Proposal (RFP), made available to the firms on December 14, 2012.

Conrad Douglas & Associates Limited (CD&A) won the project through an international competitive tender. The contract was signed on March 26, 2013. The Centre for the Development of Enterprise (CDE) and JAMPRO are cooperating to conduct a market assessment and design and implementation of a market initiative for Jamaican limestone and its derivatives. Understanding the market will help Jamaica to develop their limestone and its derivative industry.

This project is expected to yield significant impact on the development and diversification of the non-metallic minerals industry in the mining sector, particularly that of limestone and its derivatives.

This report represents the completion of Deliverable No. 2, which involves the submission of Assessment of Operations (Sector Assessment).

### 3.1.1. Approach & Methodology

The following outline the Terms of References (ToR) provided by CDE/JAMPRO, used to guide the preparation of the Sector Assessment:

- Assessment of existing operations and investment opportunities for the sector:

  - assessment of products,
  - production capacity,
  - technology,
  - equipment and training requirements,
  - management capacity in key areas
- An overall environmental management system gap analysis and recommendations for improvement.
- Policy and legislation support gaps.

Standard and innovative methods and approaches were used in conducting the Sector Assessment. This involved:

1. Obtaining a schedule of all the limestone operations registered with the Mines and Geology Division (MGD) of the Ministry of Science, Technology, Energy & Mining (MSTEM). These numbered 152 at February 2013).
2. Conducting a review of a Study done in 2006 by MSTEM, which listed 58 active limestone quarries. From a review of this list, the Quarries Register at the Mines and Geology Division was researched to obtain up to date registration of the quarries across Jamaica, and the following information:

    a. The locations of these quarries,
    b. Contact persons,
    c. Telephone numbers,
    d. E-mail addresses.

3. Reviewing the membership list of the Mining and Quarrying Association of Jamaica.
4. Preparing a comprehensive questionnaire (See Appendix 6) to capture the various elements of the operations.
5. Selecting quarries based on the more recent knowledge of the limestone operations across Jamaica to provide for a mix of large (approximately 150,000 metric ton per year (mtpy) and small (approximately 50,000 mtpy and less). The spread of limestone quarries visited covered operations in:

a. St. Catherine,
b. Clarendon,
c. Manchester,
d. St. Elizabeth,
e. St. Ann,
f. Trelawny, and
g. St. James.

Additionally, telephone calls were made to operators of quarries licensed in Westmoreland, Hanover, and inland parts of Manchester, St. Elizabeth, St. Ann and St. James. Telephone calls were made to determine whether or not the quarry was active as a prerequisite to arranging a visit to the operation.

Where the operators of these quarries indicated that only marl was being produced for dump purposes, did not undertake any screening (product sizing) operation and did not plan to, these operations were not visited and were so noted.

Contact information was not always reliable and some sites were visited unannounced. These were notably the smaller operators providing material on an as-needed basis.

Voice mails and follow-up calls were made to several operators listed without contact being made. Licensed sites were also visited where telephone contact could not be made and several of these were found to be disused for some time and/or abandoned.

6. A total of thirty (30) quarries spatially distributed on the northern and southern sides of the island were visited and ten (10) other operators were contacted by telephone. Ten (10) of the active operations participated in the survey and for which the Questionnaire was completed to the extent possible. One major operator in Clarendon did not participate nor did an established operator of value engaged in

production to meet domestic demand for some products as well as export in St. Elizabeth.

7. Review of the environmental management requirements and processes applicable to the limestone sector, in particularly and to mining and quarrying, in general.
8. Discussions with National Environment & Planning Agency (NEPA).

## 3.2. Review of Regulatory Framework

The mining and processing of limestone has the potential for having negative impacts on the environment (atmospheric, land and water, social and economic). It will therefore be necessary to conduct detailed Environmental Impact Assessments (EIA) and obtain the requisite permits and licenses prior to start-up of the operations. Among the major outputs of the EIA should be environmental management plans and monitoring. These must be specific for each site since they will vary in their physiography, geology, hydrology, biological, ecological, micrometeorological, socio-cultural, historical heritage and economic characteristics.

All risks to the environment and potential impacts will therefore need to be clearly identified and assessed and the operations permitted and licensed before commencement of operations. The following are risks to the environment which may occur as a result of the mining and processing of limestone:

### 3.2.1. Physical Impacts

#### 3.2.1.1. Fugitive Emissions

During activities such as clearing of vegetation and land preparation in general, potential negative impacts from fugitive dust may occur.

During site clearance and short term construction activities, there is a possibility that stockpiles of various materials associated with the proposed project may have to be maintained in the project area. These stockpiles, without proper management and monitoring can dry out and result in fugitive dust formation which can be dispersed by the wind and affect air quality. Other activities such as vehicular traffic may contribute to this problem.

These potential impacts can be avoided or mitigated by an effective dust suppression regime. Dust fall monitoring should be a feature of the environmental management program.

#### 3.2.1.2. Noise and Vibration

Heavy vehicles, various mechanical equipment and site activities, can generate noise that may exceed acceptable levels. There is the potential for noise to be generated during pre-construction, construction and the operational phases, as heavy equipment moves around the quarry and when and shortly after blasting has taken place.

#### 3.2.1.3. Water Quality

The impacts on groundwater from mining activities should be negligible as there are few toxic and hazardous chemicals, waste streams and minimal disposal activities associated with such developments that could affect groundwater quality.

A potential impact associated with surface water may arise from increased sediment loads primarily during pre-construction, construction and the operational phases caused by removal of vegetation and improper stockpiling of aggregates.

Potential problems may be avoided by treating effluent stream before they are discharged to the external environment. Particulates and suspended solids may be removed by filtration. Treatment plants may also be erected on-site for collection of effluents.

#### 3.2.1.4. Geology and Geo-Technical

The potential exists for erosion and slope failure. In order to avoid this, slope reinforcement and stabilization may be required. If the overall widths of haul roads are kept at a minimum and proper road cutting designs are carried out within prescribed contour elevations, the potential for erosion to occur will be reduced. Quarries should be excavated in a basic open pit mine design (pit bench) pattern to prevent the wall of the pits from collapsing.

#### 3.2.1.5. Aesthetics

Aesthetics will be impacted. The removal of vegetation and soils and construction activities will cause a distinct change in the appearance of the land and land use. These are major, but reversible impacts.

### 3.2.2. Biological Impacts

#### 3.2.2.1. Loss of Biodiversity

The loss of biodiversity will probably be the most significant negative impact. It is an unavoidable impact for which there is no direct mitigation.

Creative conservation consistent with government policy and early rehabilitation of the mined out areas must be integral to the mine plans. An ecological assessment should be done to ensure that any rare or endangered species in any project area, including herpetofauna and avifauna and other mobile species in the project area.

### 3.2.3. Socio-Economic and Socio-Cultural

#### 3.2.3.1. Employment & Worker Health and Safety

There will be employment opportunities during all phases of any mining project, which normally include residents of the surrounding communities, due to their proximity to the project site, and their knowledge of the area and local operations. Trained and qualified staff is commonly employed on these quarry operations.

There are risks associated with any working condition. This is primarily important where workers interact with mobile and heavy equipment. The operations must be designed and operated in compliance with the regulatory framework for the industry.

#### 3.2.3.2. Archaeological and Historical Heritage

It is difficult, and nearly impossible, to predict whether any archaeological or historical heritage relics or artifacts will exist (especially underground) in any project area. However, the history and previous uses of the general area should be taken in to consideration.

#### 3.2.3.3. Traffic

Any existing main roads that will be used to deliver and remove any materials and equipment to and from proposed site locations and the added vehicles that frequently move have the potential to add to the existing volume on roads during peak usage periods. During these situations the relevant authorities should be properly notified.

#### 3.2.3.4. Solid Waste

There are various types of waste materials that may be generated during the implementation of a mining project/quarry that must be planned for and properly managed. Waste generated may include, chemicals and lubricants, from the equipment maintenance area, vegetative matter (land clearing waste), and garbage from site office operations. Potential impacts could occur during the handling, collection storage and disposal of the waste materials. Disposal must be to certified sites by licensed operators.

#### 3.2.3.5. Sewage

Sewage waste generated by the population of workers can enter the ground and surface water system and have a negative impact. Provisions must be made for toilet facilities through the use of portable chemical toilets facilities during the pre-construction and construction phases. Permanently thereafter during the operation phases tertiary sewage treatment systems should be preferably used.

Several legislations related to the following were assessed:

- **Mining Legislation**
  - Minerals (Vesting) Act, 1947
  - The Mining Act, 1947
  - The Petroleum Act, 2006
  - The Quarries Control Act, 1983
- **Environmental Legislation**
  - The Beach Control Act, 2004
  - Endangered Species Act, 2000
  - National Solid Waste Management Authority Act, 2001
  - Natural Resources Conservation Authority (NRCA) Act, 1991
  - Air Quality Regulations, 2006
  - Public Health Act, 1985
  - Forestry Act, 1937
  - Jamaica National Heritage Trust Act, 1985
  - Watershed Protection Act, 1963
  - Water Resources Act, 1995
  - Underground Water Control Act, 1959
  - Wildlife Protection Act, 1945
  - Disaster Preparedness & Emergency Management Act, 1993
- **Land Use Legislation**
  - Crown Property (Vesting) Act, 1960
  - Land Acquisition Act, 1947
  - Land Development and Utilization Act, 1966
  - Local Improvement Act, 1914
  - Town & Country Planning Act, 1987
- **Taxation Legislation**
  - The Customs Act, 1941
  - General Consumption Act, 1991
  - Harbour Fee Act, 1927
  - Income Tax Act, 1955
  - Land Taxation (Relief) Act,1959
  - Land Valuation Act, 1957
  - Property Act Tax, 1903
  - Stamp Duty Act, 1937
  - Transfer Tax Act, 1971
  - The Bauxite (Production Levy), 1974
  - The Bauxite and Alumina Industries (Encouragement) Act, 1950

- The Bauxite and Alumina Industries (Special Provisions) Act, 1977
- The Cement Industry (Encouragement and Control) Act, 1948

- **Other Operating Statutes**
  - Foreign Nationals and Commonwealth Citizens (Employment) Act, 1964
  - Labour Relations and Industrial Disputes Act, 1975
  - Shipping Act, 1999
  - Standards Act, 1969
  - The Caribbean Community, 2005
  - The Cargo Preference Act, 1979
  - The Export Industry (Encouragement) Act, 1956
  - The Free Zone Act, 1985
  - Wharfage Act, 1895
- **International Agreements**
  - Free Trade Area of Americas (FTAA)
  - World Trade Organization (WTO) Agreement
  - European Partnership Agreements
  - CARICOM

**Table 30: List of Legislation related to the Limestone Industry**

| Mining Legislations | | |
|---|---|---|
| **Legislations** | **Policies Description** | **Institutions Responsible** |
| Minerals (Vesting) Act, 1947 | The Minerals (Vesting) Act, through the Minister, has the power to declare that all minerals being in, on or under any land or water, whether territorial waters, rivers, or inland sea, are vested in and are subject to the control of the Crown. As such this Act governs the extent to which royalties are payable to landowners | Mines and Geology Division (MGD)<br>Ministry of Agriculture (MOA)<br>Ministry of Science, Technology, Energy & Mining (MSTEM) |
| The Mining Act, 1947 | The Mining Act regulates the activities of the mining sector including the various intricacies involved in the granting of licenses, prospecting rights and regulations, compensation payments and the utilization of special lands under a mining lease. | Commissioner of Mines |
| The Petroleum Act, 2006 | An act to repeal the Petroleum (Production) Act, to provide for the vesting in the Crown of petroleum existing in its natural state in strata in Jamaica, for the exploration and production of petroleum, for the establishment and functions of the Petroleum Corporation of Jamaica, and for matters connected with or incidental to the matters aforesaid. | Ministry of Science, Technology, Energy & Mining (MSTEM) |

| | | |
|---|---|---|
| The Quarries Control Act, 1983 | The Quarries Control Act of 1983 designates the establishment of quarry zones, and controls licensing and operations of all quarries. A Quarries Advisory Committee is mandated under the act to regulate this industry. | Ministry of Science, Technology, Energy & Mining (MSTEM) |

**Environmental Legislations**

| Legislations | Policies Description | Institutions Responsible |
|---|---|---|
| The Beach Control Act, 2004 | An act relating to the floor of the sea and the overlying water and to the foreshore and beaches of this island, and to the establishment of a Beach Control Authority for the purpose of controlling and regulating the use of the floor of the sea and the overlying water and of the foreshore and beaches of this island in the interests of the public and of persons who have acquired rights therein and for purposes incidental to or connected with the matters aforesaid. | National Environmental and Planning Agency(NEPA) |
| Endangered Species Act, 2000 | An act to provide for the prosecution, conservation and management of endangered species of wild fauna and flora and for the regulation of trade in such species and for connected matters. | National Environmental and Planning Agency |
| National Solid Waste Management Authority Act, 2001 | The National Solid Waste Management Authority (NSWMA) under this Act has the responsibility to manage and regulate the solid waste sector. It includes requirements for licenses | National Solid Waste Management Authority (NSWMA) |

| | | |
|---|---|---|
| | for operators and owners of solid waste disposal facilities (in addition to permit requirements of NEPA). | |
| Natural Resources Conservation Authority (NRCA) Act, 1991 | The Act is the overriding legislation governing environmental management Jamaica. It also designates National Parks, Marine Parks, and Protected Areas and regulates the control of pollution as well as the way land is used in protected areas. Section 9 of the Act creates a Ministerial discretion to declare parts of or the entire island a 'prescribed area', in which specified activities require a permit, and for which activities an environmental impact assessment may be required. The Natural Resources (Prescribed Areas) (Prohibition of Categories of Enterprise, Construction and Development) Order, 1996 and the Permits & Licensing Regulations was passed pursuant to section 9 of the Natural Resources Conservation Authority Act, 1991. | National Environmental and Planning Agency |
| Air Quality Regulations, 2006 | This regulation speaks to the quality of the air shed within which an industrial entity is discharging emissions (gases or particulate matter). Discharge license requirements are outlined in Part I of this Act, and Part II speaks to the stack emission targets, standards and guidelines. | National Environmental and Planning Agency |

| | | |
|---|---|---|
| Public Health Act, 1985 | This Act controls and monitors pollution from point sources. Any breaches of this Act would be sent through the Central Health Committee which takes action through the Ministry of Health, Environmental Control Division (E.C.D.). The ECD has no direct legislative jurisdiction, but works through the Public Health Act to monitor and control pollution from point sources. | Ministry of Health (Environmental Control Division) |
| Forestry Act, 1937 | This Act provides for the management and the declaration of Forest Reserves on Crown Lands and regulates activities in Forest Reserves. This Act will be reviewed to determine if the upgraded activities (particularly mining) will impact on Forest Reserves and to what extent. | Ministry of Water, Land, Environment and Climate Change (Forestry Department) |
| Jamaica National Heritage Trust Act, 1985 | The Act is administered by the Jamaica National Heritage Trust (JNHT), formerly the Jamaica National Trust. This Act provides for the protection of important areas, including the numerous monuments, forts, and statues, buildings of historic and architectural importance in Jamaica. | Jamaica National Heritage Trust (JNHT) |
| Watershed Protection Act, 1963 | The purpose of this Act is to provide for the protection of watersheds and areas adjoining watersheds and promote | National Environmental and Planning Agency |

| | | |
|---|---|---|
| | the conservation of water resources. The entire island, however, is considered to be one watershed, but for management purposes is divided into smaller units. The Act makes provision for conservation of watersheds through the implementation of provisional improvement schemes whereby soil conservation practices are carried out on land. A Watershed Policy is now under consideration with a view to taking watershed management to another level of greater effectiveness. This includes a review of the Act and the development of regulations. | |
| Water Resources Act, 1995 | The Water Resources Act is expected to provide for the management, protection, controlled allocation and use of water resources of Jamaica. Thus the water quality control for both surface and ground water are regulated by this Act. | Water Resources Authority (WRA) |
| Underground Water Control Act, 1959 | The Underground Water Control Act of 1959 is the legal instrument and is enforced by the Water Resources Authority (WRA). | Water Resources Authority<br><br>National Environmental and Planning Agency |
| Wildlife Protection Act, 1945 | This Act is primarily concerned with the protection of specified species of fauna. This Act has also undergone review particularly in the area of increased fines and the number of animals now enjoying protected status. Further | National Environmental and Planning Agency |

| | | |
|---|---|---|
| | amendments are being undertaken to address a variety of other issues relating to the management and conservation of these natural resources, and the inclusion of flora. | |
| Disaster Preparedness & Emergency Management Act, 1993 | The principal objective of the Act is to advance disaster preparedness and emergency management measures in Jamaica by facilitating and coordinating the development and implementation of integrated disaster management systems. | Office of Disaster Preparedness and Emergency Management (ODPEM) |

**Land-use Legislations**

| Legislations | Policies Description | Institutions Responsible |
|---|---|---|
| Crown Property (Vesting) Act, 1960 | An act to provide for the vesting of Crown Lands in the Commissioner of Lands, the vesting of certain other Crown property in the Accountant General and for other matters connected therewith or incidental thereto. | Commissioner of Lands<br>Ministry of Water, Land, Environment and Climate Change |
| Land Acquisition Act, 1947 | An act to make provision for the acquisition, and for the temporary occupation, of land required for public purposes. | Commissioner of Lands<br>Ministry of Water, Land, Environment and Climate Change |
| Land Development and Utilization Act, 1966 | An act to make provision for the development and utilization of agricultural land. | Commissioner of Lands<br>Ministry of Agriculture |

| | | |
|---|---|---|
| | | Ministry of Water, Land, Environment and Climate Change |
| Local Improvement Act, 1914 | An act to amend the local Improvements Law | Commissioner of Lands<br><br>Ministry of Water, Land, Environment and Climate Change<br><br>Council of Kingston and St. Andrew Corporation. |
| Town & Country Planning Act, 1987 | This Act governs the development and use of land. Under this law the Town Planning Department is the agency responsible for the review of any plans involving industrial development. The law allows for specific conditions to be stipulated and imposed on any approved plans | Town Planning Department |

**Taxation Legislations**

| Legislations | Policies Description | Institutions Responsible |
|---|---|---|
| The Customs Act, 1941 | This act governs the transaction of goods imported or exported, in or out of the island whether it is transported by air or sea. | Commissioner of Custom and Excise |
| General Consumption Act, 1991 | An act to make provision for the imposition of a general consumption tax and matters connected therewith or incidental thereto. | Commissioner of Tax payer Appeal |

| | | |
|---|---|---|
| Harbour Fee Act, 1927 | An act to re-impose harbour fees and light dues on vessels entering any harbour in the island. | Port Authority |
| Income Tax Act, 1955 | An act to make provision for the imposition of an Income Tax on the people of the island. | Commissioner of Inland Revenue<br>Taxpayer Audit<br>Tax (Revenue) Administration |
| Land Taxation (Relief) Act,1959 | This act makes provision of the imposition of a tax fee on land. | Commissioner of Inland Revenue<br>Land Taxation Relief Board<br>Commissioner of Land Valuations |
| Land Valuation Act, 1957 | An act to make provision for determining the valuation of land for taxation, rating and other purposes and for matters connected therewith or incidental thereto. | Commissioner of Land Valuations |
| Property Tax Act, 1903 | An act to make provision for the tax payable under the Property Tax Act | Commissioner of Inland Revenue<br>Land Taxation Relief Board<br>Commissioner of Land Valuations |
| Stamp Duty Act, 1937 | Information about this tax type that governs the sale or transfer of property, land, importation of vehicles, estate duty. An act further to amend the Stamp Duty Law | Ministry of Finance<br>Commissioner of Tax payer |

| | | |
|---|---|---|
| Transfer Tax Act, 1971 | An act to impose tax upon transfers of interests in land and securities and to provide for matters connected therewith or incidental thereto. | Ministry of Finance<br>Commissioner of Tax payer<br>Land Taxation Relief Board |
| The Bauxite (Production Levy), 1974 | An Act to provide for the imposition of a production levy on bauxite and laterite won in Jamaica, and for matters incidental thereto or connected therewith | Commissioner of Tax payer Appeal<br>Commissioner of Tax payer audit<br>Tax (Revenue) Administration |
| The Bauxite and Alumina Industries (Encouragement) Act, 1950 | An act to make provision for the grant of special concession to producers in Jamaica of bauxite and alumina | Commissioner of Mines<br>Minister of Energy, Mining and Telecommunications |
| The Bauxite and Alumina Industries (Special Provisions) Act, 1977 | An act to make special provisions for bauxite, alumina and other related enterprises in which the Government participates, and to provide that income tax paid by any bauxite producer shall be allowed as a credit against production levy payable by that bauxite producer. | Commissioner of Custom and Excise<br>Commissioner of Mines<br>Minister of Energy, Mining and Telecommunications<br>Commissioner of Custom and Excise |
| The Cement Industry | An act to encourage the manufacture of cement in Jamaica | |

| | | |
|---|---|---|
| (Encouragement and Control) Act, 1948 | and to make provision for the granting of relief from custom duty, tonnage tax and income tax and surtax to persons engaged in such manufacture, and to regulate the importation, sale and distribution in Jamaica of cement, and for purposes incidental to or connected with any of the foregoing. | |

**Other Operating Status Legislation**

| Legislation | Policies Description | Institutions Responsible |
|---|---|---|
| Foreign Nationals and Commonwealth Citizens (Employment) Act, 1964 | An act relating to the employment of persons who are not citizens of Jamaica, and matters incidental thereto or connected therewith | CARICOM |
| Labour Relations and Industrial Disputes Act, 1975 | An act to provide for the regulation of relations between employers and workers, to establish an industrial disputes tribunal for the settlement of industrial disputes, to provide for boards of inquiry to inquire into industrial disputes and matters connected with labour relations or economic conditions, and for purposes incidental to or consequential on the foregoing | Ministry of Justice<br>Ministry of Labour and Social Security |
| Shipping Act, 1999 | An Act to make better provision in respect of the regulation of merchant shipping generally; and more particularly in | Ministry of Transport, Works and Housing (Maritime Authority) |

| | | |
|---|---|---|
| | respect of the registration of ships, the employment and certification of seafarers, the safety of shipping; to significantly consolidate the law relating thereto, and to make provision for matters connected therewith. | CARICOM |
| Standards Act, 1969 | An act to promote standardization in relation to commodities, processes and practices, and for that purpose to provide for the establishment of a Bureau of Standards and to define its functions. | Bureau of Standards<br><br>Standards Council |
| The Caribbean Community, 2005 | An act to repeal the Caribbean Community and Common Market Act and to make new provisions for giving effect to the revised treaty of Chaguaramas establishing the Caribbean Community; and for matters connected therewith | Conference of Heads of Government (the Conference)<br><br>The Community Councils of Ministers (the Council);<br><br>Council for Finance and Planning (COFAP)<br><br>Council for Trade and Economic Development (COTED)<br><br>Council for Foreign and Community Relations (COFCOR) |

| | | |
|---|---|---|
| | | Council for Human and Social Development (COHSOD)<br><br>Other organization of the Community as may be specified by order;<br><br>Minister responsible for CARICOM Affairs |
| The Cargo Preference Act, 1979 | An Act to make provision for the reservation of certain cargoes for carriage by ships owned by the Government and for matters incidental thereto or connected therewith. | Maritime Authority<br><br>Commissioner of Customs and Excise |
| The Export Industry (Encouragement) Act, 1956 | An act to make provision for the grant of concessions in relation to income tax, tonnage tax and customs duties in aid of industries producing exclusively for export and for other matters incidental thereto or connected therewith. | Commissioner of Customs and Excise |
| The Free Zone Act, 1985 | An act to repeal the Kingston Export Free Zone Act and to provide for the establishment and operation of export free zones in designated areas, and for matters connected therewith or incidental thereto. | Port Authority<br><br>Commissioner of Customs and Excise |
| Wharfage Act, 1895 | | Port Authority |

| International Agreements | | |
|---|---|---|
| **Agreements** | **Description** | **Members** |
| Free Trade Area of Americas (FTAA) | The agreement is to unite all free economies (excluding Cuba that is) of the Western Hemisphere, by eliminating tariffs and employing common investment and trade rules among the 34 member countries by 2005. | Antigua & Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Canada, Colombia, Chile, Costa Rica, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, St. Kitts and Nevis, St. Lucia, St. Vincent & The Grenadines, Suriname, Trinidad & Tobago, United States, Uruguay, and Venezuela. |
| World Trade Organization (WTO) Agreement | The agreements are the result of negotiations between the members. The current set were the outcome of the 1986–94 Uruguay Round negotiations which included a major revision of the original General Agreement on Tariffs and Trade (GATT). | The WTO currently has 159 members (almost all of the 123 nations participating in the Uruguay Round signed on at its foundation, almost all of the rest of the GATT members followed, and 29 others became WTO observers and subsequently got membership). |

| | | |
|---|---|---|
| European Partnership Agreements | The Partnership Agreement between the Caribbean Forum (CARIFORUM - CARICOM member states and the Dominican Republic) and the European Union (EU) is the new trade agreement which replaces the chapters on trade in the Cotonou Agreement. This initiative is a response to the challenges of globalization and development, and establishes a new trading relationship with the 27 members of the EU in conformity with World Trade Organization (WTO) rules and regulations. This will bring closure to the preferential, non-reciprocal trade regimes which previously governed trade between CARIFORUM and the EU. | The agreements are a scheme to create a free trade area (FTA) between the European Union and the African, Caribbean and Pacific Group of States (ACP). |
| CARICOM | CARICOM's main purposes are to promote economic integration and cooperation among its members, to ensure that the benefits of integration are equitably shared, and to coordinate foreign policy. Its major activities involve coordinating economic policies and development planning; devising and instituting special projects for the less-developed countries within its jurisdiction; operating as a regional single market for many of its members (CARICOM Single Market); and handling regional trade disputes. | Currently CARICOM has 15 full members, 5 associate members and 8 observers. All of the associate members are British overseas territories, and it is currently not established what the role of the associate members will be. |

### 3.3. Findings

Limestone is defined as a bedded sedimentary deposit made up essentially of calcium carbonate.

Jamaica has a large quantity of high grade limestone which is suitable for the production of products such as aggregates for the building and construction industry, ground calcium carbonate (GCC), precipitated carbonate (PCC), lime and a wide array of high value added products consistent with the diverse end-use structure of limestone and lime.

The tertiary white limestone group which covers approximately two-thirds of the island, is the most important source of limestone, with calcium carbonate in excess of 90% and commonly in excess of 95% (see Figure 23 below).

Quantitatively, the limestone resources are estimated at 57.5 billion metric tons (BMT) for industrial, chemical and metallurgical grade and 11.5 BMT for the whiting grade.

The pick and shovel winning of limestone was replaced by mechanized quarrying, initially the bulldozer and front end loader and simple screening methods.

Historically, the demand for limestone has depended on the vagaries of the construction industry. Crushing and screening plants were brought into the operations. As the locus of construction shifted, the suppliers with portable crushing plants followed the market. As limestone usage increased, plants ramped up production to meet the sector needs producing various aggregates to satisfy the market demand.

As the expansion of the industry progressed, limestone derivatives have attracted the interest of companies, two of which now produce GCC for the local market but also supply the export market with bagged GCC.

Within the last five years there has been a downturn in the economic activity and this has affected the industry negatively.

Plants are invariably located in the general area of communities and this has created employment in the main. Most companies conducted on the job training from an apprentice start.

The bauxite/alumina companies, and before that the sugar industry, produced well trained artisans from within their apprenticeship programmes who in later years entered the limestone industry. Today the industry has a well trained workforce.

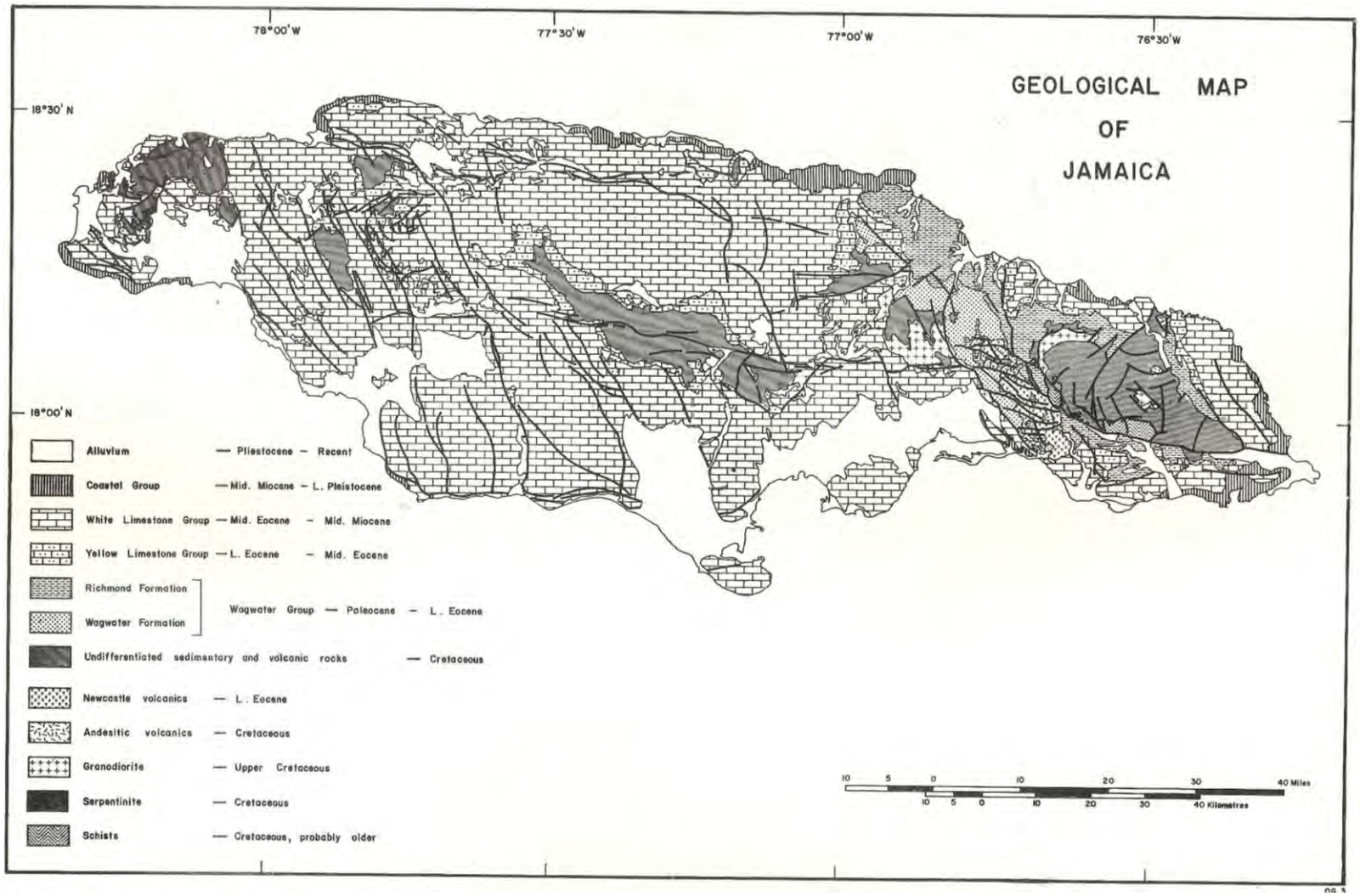



**Figure 23: Geological Map of Jamaica**
***Source: The Mineral Resources of Jamaica, Bulletin No. 8, 2nd Edition, Revised 1981***

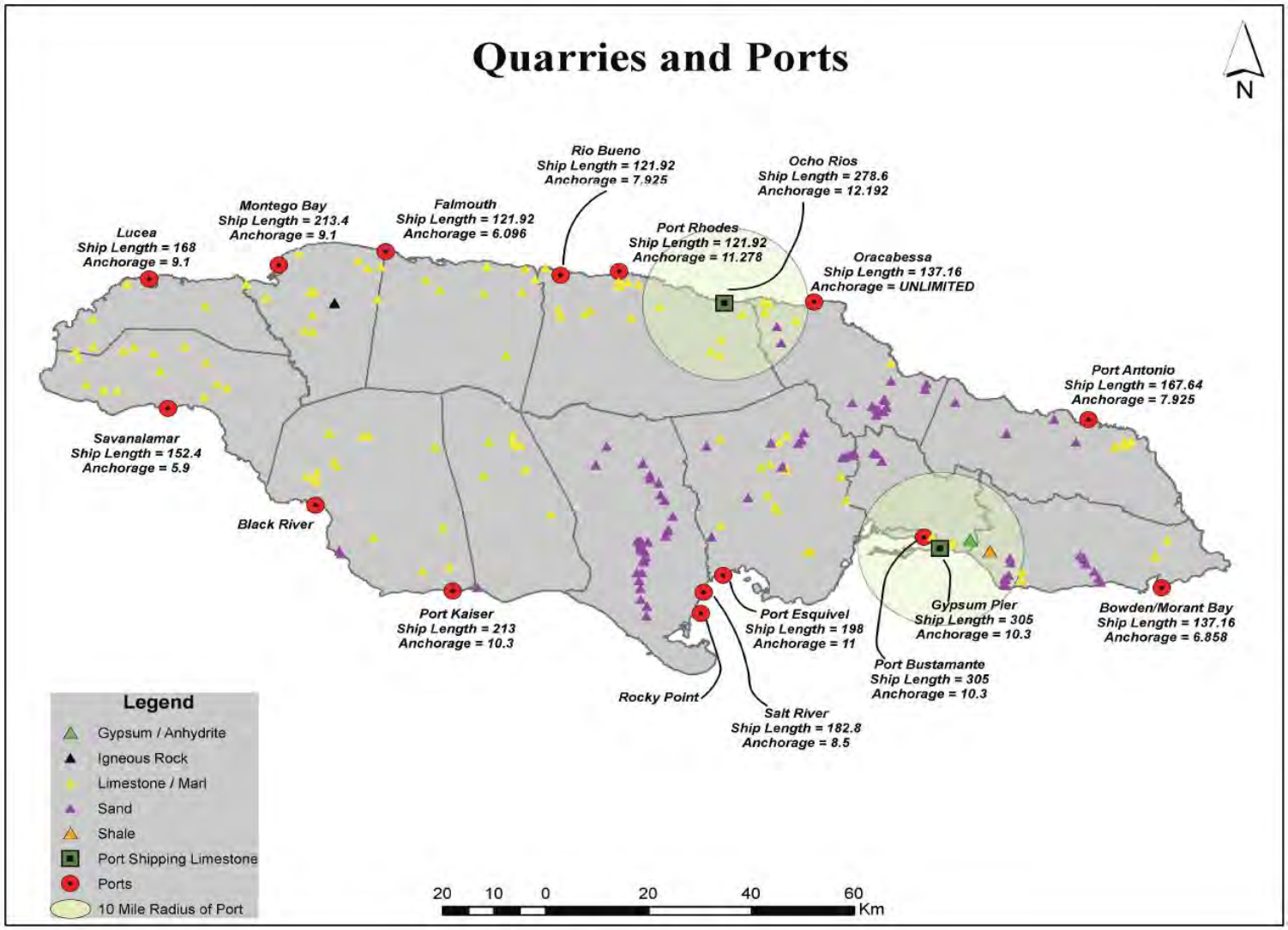



**Figure 24: Quarries and Ports**
***Source: Ministry of Science, Technology, Energy & Mining***

Thirty (30) quarry sites were visited during field investigations and their current operating status are broken out as follows:

- Eleven (11) of the quarries visited were active at the time of the field visit and producing mixed aggregates. One of these quarries was producing mixed aggregates for internal use only and had no third party sales.
- Eight (8) of the quarries visited operated on an as-needed basis.
- Two (2) of the quarries visited were in a state of planned restart.
- Nine (9) quarries visited or contacted by telephone either produced marl or were abandoned.

### 3.3.1. Production capacity

Most companies report to be operating at just above break even or are closed. Only ten (10) of thirty (30) companies surveyed were operating consistently but at reduced levels. Most quarries were operating well below installed capacity and some at just above 50%. This results from the low availability of local markets. Building construction and infrastructure developments are stated to be at an all-time low.

Many of the operators have not reassessed their reserves status and can only advise "years of reserves" remaining. Lydford Mining Company Limited (LMCL) and Chemical Lime Company of Jamaica Limited have had extensive core drilling done and have updated, proven reserves.

### 3.3.2. Assessment of products

The following is a list of products that the quarries assessed are producing:

- Construction aggregate
- Fill material
- Asphalt sand
- Neutralizer
- Fertilizer grade (GCC)

- Animal feed grade (GCC)

Except for Lydford Mining Company Limited (LMCL) none of the operators assessed are exporting limestone in bulk. LMCL exports the following:

- Crushed aggregate
- Limestone for flue gas desulphurization and
- Whiting grade limestone,
- Ground calcium carbonate, in bags.

Creative attempts have been made to export limestone to the Caribbean region by others but wharfage and lack of a backhaul commodity makes this uncompetitive.

The operators have been able to supply aggregates to the odd housing development projects and single housing undertakings but no major projects.

Of significant importance is that the operators depend on integrated, subsidiary block-making facilities to generate and support cash flows.

Given the poor state of the market, stockpiles, of any size, are not maintained.

### 3.3.3. Technology, Equipment and Processes Applied

The crushing of limestone rock to aggregates of various sizes is a simple, straightforward crushing process. The selection of the crushers is influenced by the hardness and general physical quality of the stone and the sequencing of the crushers with intermediate screening processes and the recycling of oversize material being employed.

Typically the harder limestone is first broken by a jaw crusher with impact crushers following in tandem. The less hard limestone typically can be broken with impact crushers in sequence or, in the case of softer limestone being ground, for example softer whiting grade aggregate of smaller sizes, a single impact crusher with recycling provision in the comminution process.

However the initial process commences with how the in situ limestone is blasted using millisecond delay detonators to control the explosive sequence used in order to create shattering of the rock.

In earlier years where possible, bulldozers were used to rip and stockpile the broken rock. The more recent trend is to use excavators to break and load the broken rock into heavy duty trucks which haul the material to the crushing plant.

Alternately where favourable conditions exist such as a level quarry floor, the excavator loads directly into a mobile track mounted crushing plant, with recycling capability. The mobile plant follows the quarry face, and in turn loads the finished sized product into trucks for stockpiling and sale.

Cone crushers usually follow the impact breaker for the production of more finely ground aggregates.

A feature of the supplier of the crushing plant is to collaborate with the purchaser by sampling and testing the crushing strength of the rock. Arising out of these tests the supplier will make appropriate recommendations on the crushers and flow diagram, indicating the projected product throughput. The quarry operator will be guided by this in the final selection of the crushing plant.

It stands to reason that operators will have varying make-up of the crushing system appropriate to the needs in volumes and sizes of finished aggregates.

The establishment of crushing systems, except for two operators, continues to be conventional crushing and screening processes with fixed plants.

One operator utilizes a track mounted crushing and screening system at one location fed by an excavator while deploying at another companion location specially selected crushing and screening systems for the product types required.

The other deploys a series of track mounted crushing and screening systems in tandem which follow the mine face and is fed by an excavator.

The companies are unable to upgrade or expand due to the high cost of financing even if the markets were to open up.

Plant and quarrying machinery and equipment were generally aged, upwards of 20 years old and reliability was challenging. Machinery and equipment experience frequent breakdowns and are in need of replacement.

The excavator is the mining machinery of choice and deployed across the better established operations. Bulldozers and front end loaders predominate among the smaller operators. – Cat. D-8 and D-9 and Cat. 950, Cat. 966 and Cat. 988 typically.

Many quality specifications (chemical and physical) provided were dated. Quality determinations in some instances are done to meet bid proposals and not carried out routinely.

### 3.3.4. Environmental Management

Every effort is made to operate at safe and environmentally acceptable conditions but in a time of depressed throughput these are sometimes compromised.

Most of the operations do not have water wells or a supply of municipal water and this has to be trucked in at a cost. Some operators harvest rain water. Dry crushing has to be done.

Dust emissions are not under positive control. Similarly also wetting of the site is limited. Unless the sites are remote from communities, operations are curtailed at high winds.

Except for the larger operations mine benches and faces are not well defined and attention is required in this area.

### 3.3.5. Management and Organization

The operations visited had generally knowledgeable and experienced managers in place to drive the process.

Machinery and equipment operators were also well experienced, some relocating from the bauxite-alumina industry with the downturn in that industry. It was noted that many casual workers were employed given the recent decline in the limestone industry. Additionally, the companies reported that on-the-job-training is the primary method of skills upgrading.

In one instance, one (1) company reported sending employees to workshops of equipment manufacturer for further training.

Equipment operators are not in short supply but some operators complain of skilled, experienced artisans migrating. When the industry plans to enter an expansion mode then additional training needs will become necessary.

### 3.3.6. Some of the Major Challenges of the Limestone Sector

**A lack of port facilities**

- Port facilities (shared or tonnage determined for a stand-alone facility) for bulk loading of limestone are essential if Jamaica is to realize real benefits from the vast limestone resources of excellent quality; otherwise the industry will remain in stagnation.

**The companies assessed point to the high cost of energy.**

- Some of those on the JPSCo grid terminate the supply in favour of own generation, but even so complain of the high cost of fuel.

**The industry requires incentives similar to those given to foreign companies.**

- It is noteworthy that these incentives will be repealed under the new tax incentive scheme – Omnibus Act, to be ready by end of year (December 2013)
- Operators complain about the high cost of lubricants, spare parts and other inputs.
- Operators made mention of the Bauxite and Alumina Industries Encouragement Act, under which a business engaged in the mining of bauxite or the production of alumina in Jamaica automatically qualifies for import duty concessions on capital goods, lubricating oils, grease and other chemicals.

**A complaint made is that illegal quarry operators are underselling licensed operators.**

**Extortion**

- One quarry operator in an as-needed mode, complained of extortion, theft of fuel and lubricants. The extortionists turn up once the operator starts supplying material. This quarry is in a remote area.

## 3.4. Enterprises Selected for Upgrade

### 3.4.1. Background

In recommending the companies identified for intervention certain criteria were considered which assisted the process. These are not all inclusive and there was some subjectivity. For example, if the company have resource access but unable to establish an operation other than marketing quality material into the low end market and thus wasting a valuable resource. Some criteria:

1. Access to the resource limestone of quality for current and upend use
2. Quality and quantity of the resource under the company's control
3. Having an established and proven operation – quarrying and crushing system
4. Production of products that the market requires
5. Period in operation – say five years and over
6. Identification of the experience of the management team
7. Quality and experience of the workforce
8. Capacity of the current operation and ability to expand
9. Proximity to an existing port, potential port or deep water location
10. Willingness and desire for betterments and improvements
11. Compliance with accepted Environmental, Health & Safety (EHS) Standards.
12. Compliance with the Mining Act and Quarries Regulations.

As a rule of thumb, it is generally accepted that limestone quarry operations falling within a 10-mile (16 km) radius of a pier or deep water location could be expanded to provide bulk export of the products. Truck transportation to the load port would be the immediate method of delivery and becomes very expensive as the distance exceeds this theoretical 10-mile radius.

A selection of limestone quarries (See Figure 25 below), briefly described below and which operators participated in the survey show potential for expansion, export driven production or to be better established, given the exposure of limestone under their control.

Based on our field investigations, the following fourteen (14) operations were selected for in depth analysis and further development:

1. Lydford Mining Company Limited
2. Chemical Lime Company of Jamaica Limited
3. John's Hall Aggregates Limited
4. Crichton Quarry Limited
5. Trelawny Aggregates Limited
6. Marjoblac Quarry and Block Factory Limited
7. Evans Quarry Limited
8. South Coast Aggregates Limited
9. James Quarry Limited
10. Somerset Enterprises Limited
11. S&G Aggregates Limited
12. Dacosta Construction and Heavy Equipment Limited
13. Chippenham Park Limited
14. Jamaica Aggregates Limited


**Figure 25: Enterprises Selected for Upgrade and Proposed Port Facilities**

### 3.4.1. Lydford Mining Company Limited

The company is located at Lydford, St. Ann, is well established, exporting aggregates and whiting in bulk shipments through Jamaica Bauxite Mining Limited's (JBM's) Ocho Rios Port.

Production is currently at 512,000 MT/Year but the operation has the potential to export over two (2) million metric tons per year if certain facilities and funding become available to justify the expansion. The facilities required would be the use of the former bauxite storage building at the port, currently idle, and which has a capacity to store over 80,000 MT of aggregate and whiting and is serviced by a deep water pier with an alongside draft of 42 ft. (13 meters).

Export material is currently stored in a restricted area at the western section of the port site. Ship loading is serviced by a single conveyor belt limited to a rate of approximately 1000 MT/Hour. Trucks cross the main road to deposit material (aggregate and whiting) on to a single "surge" pile. By having access to the building, trucks would no longer have to cross the main road but deposit the material approximately one mile (1.6 km) inland, initially to a to-be-established stockpile area. Material can be fed from the stockpile on to the overland conveyor belt which is elevated above the main road and enters the top of the building. Ideally the entire overland conveyor system, approximately six (6) miles (10 km) in length, should be activated.

The overland conveyor system has been vandalized over the years since the closure of the bauxite operations in 1984. When active it conveyed approximately three (3) MMT of bauxite annually. This has the potential for the short term (12 months) primary bulk export facility for limestone. Alternately the construction of an independent conveyor system, such as the Ropecon system in use at the Jamalco mining operations should be investigated.

The company is well managed and innovative in its mining and crushing systems, including production of Ground Calcium Carbonate (GCC) in a small fixed mining plant. The Company's crushing systems are all track mounted and hence mobile.

The company operates at two (2) crushing locations. A combination of a jaw crusher and secondary impactor are used at one location and an impactor at the other, all with recycling capabilities.

### 3.4.2. Chemical Lime Company of Jamaica Limited

Chemical Lime Company of Jamaica Limited (CLC) operation is located at Brazilletto, Salt River, Clarendon. The company was initially being established to produce burnt lime and mixed aggregates. The company is currently producing mixed aggregates and supplying limestone to the CEMEX lime plant at Halse Hall, Clarendon. The Jamalco alumina plant is supplied with lime produced at the CEMEX plant.

The CLC operation is well placed near the sea, approximately two (2) miles (3.2 km) inland, and the location favours the establishment of a bulk loading port.

The mining site is well laid out and properly benched.

Two crushing systems are in operation with an Eagle 1200 double impact crusher applied in one operation and a Kolberg/Pioneer jaw crusher in the other with recycling facilities.

An extensive drilling programme was recently carried out to quantify and classify the reserves.

### 3.4.3. John's Hall Aggregates Limited

John's Hall Limited is located at John's Hall in St. James. Apart from supplying the limited domestic market, the company has been exploring bulk export of limestone to the Caribbean area from port facilities in Montego Bay. The operation is located approximately seven (7) miles (11 km) from Montego Bay, within the general acceptable limits for trucking to export.

Cost of wharfage and one-way shipping costs to the Caribbean are proving to be non-competitive.

The production is diversified and can be supplied into the housing market, infrastructure, sand, dump and supports a block-making facility.

The crushing system comprises a jaw crusher, followed by cone crushers and intermediary screening and recycling processes.

### 3.4.4. Crichton Quarry Limited

The operations which is located at Retirement near John's Hall, St. James, closed fifteen (15) months ago due to market conditions but the crushing equipment on site is being readied for restart. The reserves should be investigated in the absence of any information from the operators.

### 3.4.5. Trelawny Aggregates Limited

Operation is ongoing but at a much reduced rate – approx. 25% of installed capacity. The operations comprise primary and secondary impact crushers. The operation is located at Braco, Trelawny near the Tankweld Port at Rio Bueno. Exports of limestone through this port should be investigated in the event of offshore markets being identified, from an overseas contact market survey.

There is an active block-making plant as part of the overall operations.

A reassessment of the reserves should be done.

### 3.4.6. Marjoblac Quarry and Block Factory Limited and Evans Quarry

Both quarries are located at Chudleigh, Manchester, well inland, and provide mixed aggregates of all types for the domestic market. Both have their own block making plants.

Marjoblac is currently operating at approximately 30% of installed capacity. The operations comprise a Cedar rapids impact crusher and Trio horizontal impact crusher feeding a secondary hammermill.

The Evans Quarry utilizes two small jaw crusher and two hammermills in the operations.

Evan Quarry is a small operation, approximately 30,000 MT/Year and producing mainly for the company's block making plant.

### 3.4.7. South Coast Aggregates Limited (Brompton, St. Elizabeth) and James Quarry Limited (Baptist, Luana, St. Elizabeth)

**South Coast Aggregates** quarry has the potential for expansion. Located at Brompton, St. Elizabeth it is within a six (6) mile (10 km) radius of a once planned port at Font Hill to service the once planned Luana Petrojam Oil Refinery.

The company operates a 400 MT/hour impact crusher but operated will below this throughput rate.

**James Quarry Limited** is located at Baptist, near Luana within a nine (9) mile (14 km) radius of Font Hill and has the potential for development of whiting and mixed aggregates. The quarry is currently producing truckloads of quality limestone for use mainly as dump material.

No chemical or physical data was available but the material has varying degrees of hardness and the apparent brightness of whiting grade material. It is in a general area from which GCC is being manufactured.

If markets are identified these two (2) operations together could justify a low cost rudimentary type load port at Font Hill. This would also facilitate use by another operator, Hodges Aggregates and Powders Ltd. located nearby.

### 3.4.8. Somerset Enterprises Limited (Somerset, Manchester) and S&G Aggregates Limited (Dunsinane, Manchester)

These two quarries have been long established and well equipped. They are located well inland and fall within five (5) miles of each other.

They supply a variety of aggregates for the building and construction industry and for infrastructure development.

S&G aggregates utilizes a mobile crushing system with the individuals unit mounted in tandem, comprising jaw and cone crushers, following the face and being loaded by an escalator.

Somerset Enterprises operates two fixed plants comprising an impact crusher in one operation and a jaw crusher feeding a Cedar rapid hammermill in the other. Trucks deliver blasted rocks to the crushing plants from the quarry face.

The S&G mobile system is approximately four (4) years old. S&G also maintains a small fixed crushing plant as a back-up system.

Somerset is operating at less than 25% of capacity.

S&G is operating at less than 50% of capacity. The material is mainly dolomitic.

### 3.4.9. Dacosta Construction and Heavy Equipment Limited

This is the foremost of the five (5) producing quarries located in the Hill Run area of St. Catherine. It is very productive providing aggregates for infrastructure development, building construction and dump. The operation utilizes 250 MT/hour impact crushers. The operator recently acquired a 400 MT/Hour impact crusher to supplement the 250 MT/Hour crushing system but expansion is currently limited by lack of market.

The company provides its own generator sets for the crushing system. Cost of fuel is a major challenge.

### 3.4.10. Chippenham Park Limited

Chippenham Park Limited operated for many years producing limestone from its own quarry for lime production. Some of the lime was sold as lime while a part of the production was hydrated lime and sold to the agricultural sector.

The quarry and lime plant were closed three (3) years ago, market and cost of electricity being cited as significant factors. The company now purchases reject lime which is beneficiated and hydrated for supply to the agricultural sector.

Energy supply would be a key consideration if the lime plant is to be reactivated.

### 3.4.11. Jamaica Aggregates Limited

Jamaica Aggregates Limited is a joint venture between Jamaica Pre-Mix Limited and LaFarge N.A.

The company supplies mainly crushed river aggregates from operations at Yallahs, St. Thomas plus the supply of transit-mix concrete from locations across Jamaica.

The company secured the Paul Mountain, St. Catherine limestone site which is reported to contain 44 MMT of limestone reserves and 314 MMT of inferred limestone resource.

The site is fully equipped to commence operations but has been dormant since it was taken over. It is now planned to establish an alternate route from the quarry site/crushing plant to the main road near Kitson Town to facilitate trucking of material. The previous trucking route was over a narrow unpaved road through communities from Paul Mountain to the main road at Friendship.

### 3.5. Conclusions

Our conclusions are as follows:

1. Given the lack of major construction projects or infrastructure works an immediate assessment should be made of the Jamaican limestone resources under the control of selected operators. These should be classified into categories suitable for construction aggregates of various types including flue gas desulphurization (FGD) and limestone derivatives (Lime, GCC, PCC and high value added derivatives currently imported into Jamaica and the region).
2. At the same time a parallel off-shore **contact market study** should be conducted for the export of these products aimed at attracting investment in the establishment of local manufacturing enterprises. Given the status of the local economy the operating status of the industry is unlikely to improve until growth is restored to the economy. The future of the industry must be import substitution orientated and export driven.
3. The construction of the north-south highway from the Spanish Town area to the Ocho Rios area is one such way in which the operators in proximity to the final alignment can obtain market for their production.
4. The announcement of a proposed Trans-shipment Port which could be possibly located in the Portland Bight area and Logistics Hub in St. Catherine are other major projects from which the industry could also benefit. This would favour operators in the Hill Run and adjoining areas. However, operators outside of the influence of these two major projects will need special attention. ***The logistic hub and expanded transshipment port envisages the substantial build-up of major infrastructure, as well as a number of buildings. This represents what could be a new wave in Jamaica's modern industrial development.***
5. ***The development of a rare earth metals industry as well as revitalization and expansion of the alumina industry could also increase the demand for lime in the future.***

### 3.6. Recommendations

Our recommendations are as follows:

- The Jamaican limestone industry is not generally in a sufficiently good condition to take advantage of the opportunities that exists. Intervention is needed – market and funding.
- Joint venture partnerships (international – national) to integrate the substantial high quality resources with capital markets and technology is a major strategic option which should be vigorously pursued.
- There is very limited access to port facilities
- The industry requires incentives similar to those given to foreign companies. It is noteworthy that these incentives will be repealed under the new tax incentive scheme – Omnibus Act, to be ready by end of year (December 2013).
- There is the need for an increase in the manufacture and export of derivatives such as lime and PCC to replace imports.

    - Jamaica has an abundance of high quality limestone (approximately 60% of the island by weight and 80% of the total surface coverage comprises limestone. This presents diverse opportunities for the development of derivatives.

- There is the need to address the high cost of energy. Recent initiatives by the GoJ to construct a new 360 MW power plant and to introduce 115 MW of renewable energy augers well for a reduction in electricity cost in the near future.
- There is the need to curtail illegal quarry operators
- Careful considerations should be made for increasing production of GCC, Quicklime and installing a PCC plant after detailed domestic and international market surveys, locational analysis, feasibility studies inclusive of economic and financial analyses, conceptual engineering designs and detailed environmental impact assessments, will be necessary in developing the industry.

# THE WAY FORWARD

## 4.0. THE WAY FORWARD

Among the first activities of Phase II must be a special sub-component to conduct a Domestic and International Contact Market Survey.

Despite the dedicated efforts of JAMPRO, MSTEM, Commissioner of Mines and the Mines & Geology Division it has been identified that there is the urgent need for the establishment of a Jamaica Industrial Mineral Institute (JIMI) to focus on driving the growth and development of the limestone industry and the non-metallic minerals sector in general.

JIMI does not need to start from scratch, but takes on board existing institutions and the use formal strategic relationships such as Memorandum of Understandings (MoUs) for the utilization of existing facilities and resources. JIMI must be vested with an authoritative executive decision making mandate among its leadership.

Research & Development and innovation must be a part of the Mining School, which is under development at the tertiary level.

Intervention is required in the form of resource assessment, engineering, environmental management, health & safety, training, financial assistance, product development, promotion & marketing.

For the medium and long term, access to port facilities is an imperative. Certain existing ports both on the north coast and south coast could be adapted to receive and bulk load limestone in the medium term.

For the long term, development of new ports to service operators would be required. The feasibility of such development would depend on vast throughput tonnages. This in turn links with the export marketing of limestone to the offshore end users, for example building and construction industry and flue gas desulphurization (FGD), among others. Any new port facilities should also provide for palletized cargo.

Operators complain of the high cost of energy – notably electricity and fuel. The feasibility of establishing alternate energy supplies via renewables such as wind and solar should be investigated. These could supply a cluster of limestone operations.

The logical sequence for the way forward is described below and illustrated in the schematic below, which captures the three (3) phases of the project:

1. Conduct Management Audits of individual limestone quarries within the sector.
2. Prepare investment opportunity and needs profiles of the sector.
3. Introduce a greater level of scientific, technological and research and development inputs into the sector.
4. Prepare profiles of the companies' needs for investment and joint ventures and other forms of partnerships and,
5. Implement a sound investment promotion initiative that seeks to support new investment and diversification of the sector in the areas of opportunity identified.
6. Technical and financial assistance to those companies entering new partnerships, implementing new product diversification plans, upgrading existing operations and implementing environmental, health & safety management plans.

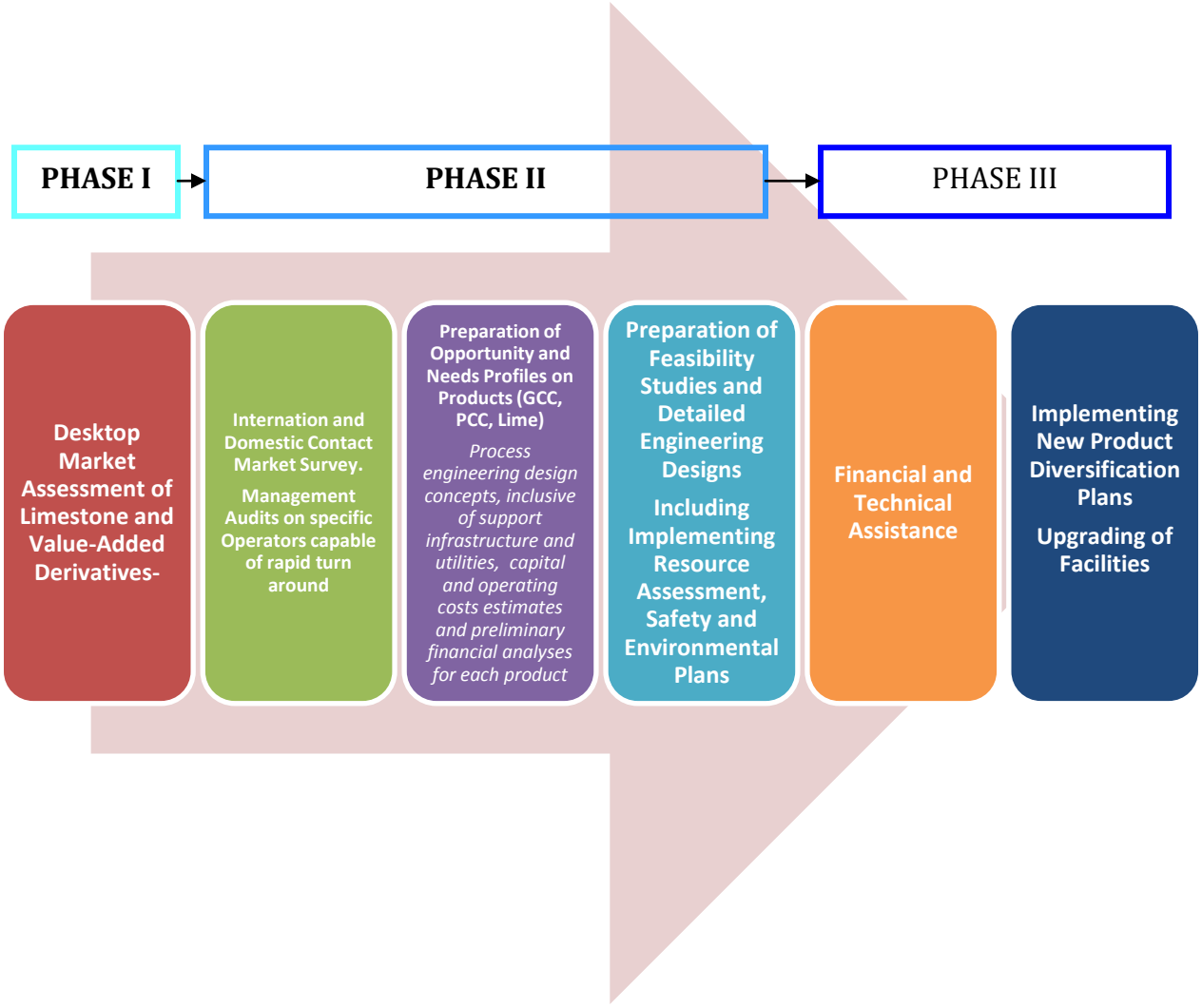



**Figure 26: Schematic of the Way Forward**

# APPENDIX

## Appendix 1: Questionnaire to Asphalt and Paving Companies

# MARKET ASSESSMENT AND DESIGN AND IMPLEMENTATION OF A MARKETING INTIATIVE FOR LIMESTONE AND ITS DERIVATIVES QUESTIONNAIRE

*The Centre for the Development of Enterprise (CDE) and JAMPRO are cooperating to conduct a market assessment and design and implementation of a market initiative for Jamaican limestone and its derivatives. Understanding the market will help Jamaica to develop their limestone and its derivative industry.*

*This project is funded by the Centre for the Development of Enterprise (CDE), an ACP (African, Caribbean and Pacific)/EU joint Institution created in the framework of the Cotonou Agreement to support the development of the private sector in ACP countries.*

*CDE's financial resources come mainly from the European Development Fund (EDF) and its operations compliment the programmes of the European Commission, the Secretariat of the ACP Group of States and the European Investment Bank in the framework of support to the private sector.*

*This project is expected to yield significant impact on the development and diversification of the non-metallic minerals industry in the mining sector, particularly that of limestone and its derivatives.*

*We understand that completing the questionnaire is time consuming and thank you in advance for taking the time to answer all the questions.*

## 1. General Information

a. Name:_____

b. Signature: _____

c. Tel._____Fax._____E-mail address:_____

d. Title/Position at Company:_____

_____

e. Name of Company:_____

_____

f. Address of Company:_____

_____

_____

_____

g. Brief Description of Company's Activities:_____

_____

_____

_____

h. Years of operation?_____

_____

i. Principal Company or Subsidiary:_____

_____

j. Company Website:_____

**2. Manufacturing Operations**:

a. What is the average age of the facility?_____

b. How much asphalt do you produce?_____

c. What is the percentage aggregate used?_____

d. What is the required size distribution for the aggregate? (You may provide the information as an attachment of fill out the information below)

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e. Are there any chemical specifications for the aggregate? If yes, please list below, or you may supply the information as an attachment.

f. How is your product packaged?

**3. Challenges and Opportunities:**

g. What are your company's greatest challenges? (e.g. movement of materials, areas of greatest cost, etc.):

**THANK YOU FOR TAKING THE TIME TO PARTICIPATE IN THIS IMPORTANT SURVEY.**

## Appendix 2: Questionnaire to Manufacturers of Animal Feed

# MARKET ASSESSMENT AND DESIGN AND IMPLEMENTATION OF A MARKETING INTIATIVE FOR LIMESTONE AND ITS DERIVATIVES QUESTIONNAIRE

*The Centre for the Development of Enterprise (CDE) and JAMPRO are cooperating to conduct a market assessment and design and implementation of a market initiative for Jamaican limestone and its derivatives. Understanding the market will help Jamaica to develop their limestone and its derivative industry.*

*This project is funded by the Centre for the Development of Enterprise (CDE), an ACP (African, Caribbean and Pacific)/EU joint Institution created in the framework of the Cotonou Agreement to support the development of the private sector in ACP countries.*

*CDE's financial resources come mainly from the European Development Fund (EDF) and its operations compliment the programmes of the European Commission, the Secretariat of the ACP Group of States and the European Investment Bank in the framework of support to the private sector.*

*This project is expected to yield significant impact on the development and diversification of the non-metallic minerals industry in the mining sector, particularly that of limestone and its derivatives.*

*We understand that completing the questionnaire is time consuming and thank you in advance for taking the time to answer all the questions.*

1. What is your annual consumption of calcium carbonate?_____
2. What is (are) the form(s) in which you purchase calcium carbonate?
   2.1. GCC (yes/no)_____
   2.2. Other_____
3. Please provide the physical and chemical specification for each form of the calcium carbonate listed above. If you may provide the specifications as a separate attachment:
   3.1. Physical:_____
   3.2. Chemical:_____
   3.3. Do you use any substitute for calcium carbonate in your feeds?

☐ Yes ☐ No

3.4. If yes, what is it, and from where/whom do you purchase it?_____

_____

_____

_____

4. What is the source of calcium carbonate below:

| Source | Average Quantity (MT) | Price |
|---|---|---|
| Local: | | |
| ➢ *Hodges (if applicable)* | | |
| ➢ *Lydford (if applicable)* | | |
| ➢ *Other(s)(if applicable):* | | |
| • | | |
| • | | |
| • | | |
| • | | |
| • | | |
| Importation: | | |
| ➢ | | |
| ➢ | | |
| ➢ | | |
| ➢ | | |

5. Package form (calcium carbonate):

➢ 25kg ☐ Yes ☐ No

- 45kg ☐ Yes ☐ No
- Bulk ☐ Yes ☐ No

6. Overall value of calcium carbonate purchased

| | Actual (2012) | Projected (2013) |
|---|---|---|
| Ground calcium carbonate (GCC) | ➢ | ➢ |
| Other | ➢ | ➢ |
| Total | ➢ | ➢ |

7. What are the range of feeds manufactured and the calcium carbonate content?

| Feed Type | % Calcium Carbonate used in Feed Mix |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

8. Overall **local** feed sales:
   - 8.1. Volume:_____
   - 8.2. Value:_____
9. Overall **export** feed sales:
   - 9.1. Volume:_____
   - 9.2. Value:_____

10. Frequency of shipment and destination:

10.1. Export to **Caricom** countries

| Export Country (Caricom) | Frequency | Annual | Sales Volume | |
|---|---|---|---|---|
| | | 2008-2011 (Average) | 2012 (Actual) | 2013 (Estimated) |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

10.2. Export to **non-Caricom** countries

| Export Country (non-Caricom) | Frequency | Annual | Sales Volume | |
|---|---|---|---|---|
| | | 2008-2011 (Average) | 2012 (Actual) | 2013 (Estimated) |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

11. Installed Capacity of Plant:_____

12. Percent utilization:

    12.1. Past five years (2008-2012):_____

    12.2. Current year (2013):_____

    12.3. Projected for the next five years:_____

13. What are your company's greatest challenges? (e.g. movement of materials, areas of greatest cost, etc.):_____

14. Are there any plans for expansion of production capacity?_____

15. What are the expected impacts of **any** expansion on the demand for Calcium Carbonate?_____

**THANK YOU FOR TAKING THE TIME TO PARTICIPATE IN THIS IMPORTANT SURVEY.**

## Appendix 3: Questionnaire to Manufacturers of Paint

# MARKET ASSESSMENT AND DESIGN AND IMPLEMENTATION OF A MARKETING INTIATIVE FOR LIMESTONE AND ITS DERIVATIVES QUESTIONNAIRE

*The Centre for the Development of Enterprise (CDE) and JAMPRO are cooperating to conduct a market assessment and design and implementation of a market initiative for Jamaican limestone and its derivatives. Understanding the market will help Jamaica to develop their limestone and its derivative industry.*

*This project is funded by the Centre for the Development of Enterprise (CDE), an ACP (African, Caribbean and Pacific)/EU joint Institution created in the framework of the Cotonou Agreement to support the development of the private sector in ACP countries.*

*CDE's financial resources come mainly from the European Development Fund (EDF) and its operations compliment the programmes of the European Commission, the Secretariat of the ACP Group of States and the European Investment Bank in the framework of support to the private sector.*

*This project is expected to yield significant impact on the development and diversification of the non-metallic minerals industry in the mining sector, particularly that of limestone and its derivatives.*

*We understand that completing the questionnaire is time consuming and thank you in advance for taking the time to answer all the questions.*

1. What is your annual consumption of calcium carbonate?_____
2. What is (are) the form(s) in which you purchase calcium carbonate?
   2.1. GCC (yes/no)_____
   2.2. PCC (yes/no)_____
   2.3. Other_____
3. Please provide the physical and chemical specification for each form of the calcium carbonate listed above. If you may provide the specifications as a separate attachment:
   3.1. Physical:_____
   3.2. Chemical:_____

3.3. Do you use any substitute for calcium carbonate in your Paints?

☐ Yes ☐ No

3.4. If yes, what is it, and from where/whom do you purchase it?_____

_____

_____

_____

3.5. Do you or can you use calcium carbonate to substitute for any other raw material?

☐ Yes ☐ No

3.6. If yes, what is it, and from where/whom do you purchase it?_____

_____

_____

_____

4. What is the source of calcium carbonate below:

| **Source** | **Average Quantity (MT)** | **Price** |
|---|---|---|
| Local: | | |
| ➢ *Hodges (if applicable)* | | |
| ➢ *Lydford (if applicable)* | | |
| ➢ *Other(s)(if applicable):* | | |
| • | | |
| • | | |
| • | | |
| • | | |
| • | | |

| Source | Average Quantity (MT) | Price |
|---|---|---|
| Importation: | | |
| ➢ | | |
| ➢ | | |
| ➢ | | |
| ➢ | | |
| ➢ | | |

5. Package form (calcium carbonate):

- ➢ 25kg ☐ Yes ☐ No
- ➢ 45kg ☐ Yes ☐ No
- ➢ Bulk ☐ Yes ☐ No

6. Overall value of calcium carbonate purchased

| | Actual (2012) | Projected (2013) |
|---|---|---|
| Ground calcium carbonate (GCC) | ➢ | ➢ |
| Other | ➢ | ➢ |
| Total | ➢ | ➢ |

7. What are the range of Paints manufactured and the calcium carbonate content?

| Paint Type (non-texture, textured or any other applicable classification) | % Calcium Carbonate used in Paint Mix |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

8. Overall **local** Paint sales:
   8.1. Volume:_____
   8.2. Value:_____
9. Overall **export** Paint sales:
   9.1. Volume:_____
   9.2. Value:_____
10. Frequency of shipment and destination:

| Export Country | Frequency | Annual | Sales Volume | |
|---|---|---|---|---|
| | | 2008-2011 (Average) | 2012 (Actual) | 2013 (Estimated) |
| | | | | |
| | | | | |
| | | | | |
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|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

11. Installed Capacity of Plant:_____

12. Percent utilization:

    12.1. Past five years (2008-2012):_____

    12.2. Current year (2013):_____

    12.3. Projected for the next five years:_____

13. What are your company's greatest challenges? (e.g. movement of materials, areas of greatest cost, etc.):_____

14. Are there any plans for expansion of production capacity?_____

15. What are the expected impacts of **any** expansion on the demand for Calcium Carbonate?_____

**THANK YOU FOR TAKING THE TIME TO PARTICIPATE IN THIS IMPORTANT SURVEY.**

## Appendix 4: List of Quarries Registered at February 2013 – Mines & Geology Division

| Licence # | Operator | Quarry Location | Parish | Material | Expiry Date |
|---|---|---|---|---|---|
| QL1675 | Taron Wilson & Mozart Rowe | Rose Hall | Clarendon | Limestone | 03-Aug-08 |
| QL1882 | West Indies Aggregates | Rio Minho, Longville | Clarendon | Sand & Gravel | 21-Jul-09 |
| QL1793 | Lloyd George lopez | Suttons | Clarendon | Sand & Gravel | 19-Jan-10 |
| QL1911 | Morgans Mining Co. Ltd. | Rio Minho | Clarendon | Sand & Gravel | 09-Mar-11 |
| QL1972 | Lawrence Williams/Lloyd Murray | Oak Royal Gardens Via Juno Crescent,Chate | Clarendon | Marl | 24-Sep-11 |
| QL1916 | Lee Robert Gore (formerly 1560) | West of May Pen Bridge | Clarendon | Sand & Gravel | 09-Mar-12 |
| QL1756 | Jamaica Quarry Products | Chateau | Clarendon | Sand & Gravel | 18-Jul-12 |
| QL1221 | H. B. Stone and Sand Ltd | South Of Glenmuir Bridge (Rio Minho) | Clarendon | Sand & Gravel | 19-Sep-12 |
| QL1775 | Clarendon Chemical Co. (James Nelson) | Rio Minho, North Hall | Clarendon | Sand & Gravel | 19-Sep-12 |
| QL1998 | Max Leiba | Sevens | Clarendon | Sand & Gravel | 19-Sep-12 |
| QL1306 | Lloyd George lopez | Suttons | Clarendon | Sand & Gravel | 19-Dec-12 |
| QL1451 | Winston Henry | Clarendon Park | Clarendon | Limestone | 09-Mar-13 |
| QL1655 | William Shagoury | Old Bowens along Rio Minho | Clarendon | Sand/Gravel | 04-Jun-13 |
| QL1656 | William Shagoury | Old Bowens, Dry River | Clarendon | Sand | 04-Jun-13 |
| QL1705 | William Shagoury | Dunkleys | Clarendon | Sand/Gravel | 04-Jun-13 |
| QL1837 | Chemical Lime Company of Ja. Ltd. | Salt River | Clarendon | Clay | 04-Jun-13 |
| QL1869 | William Shagoury | Rio Minho | Clarendon | Sand/Gravel | 04-Jun-13 |
| QL1874 | William Shagoury | Rio Minho | Clarendon | Sand/Gravel | 04-Jun-13 |
| QL1890 | Mika Aggregates Limited | Chateau (Rio Minho) | Clarendon | Sand/Gravel | 04-Jun-13 |
| QL1917 | Lee Robert Gore (formerly 1266) | Race Course | Clarendon | Sand/Gravel | 04-Jun-13 |
| QL2012 | Alcoa Minerals of Jamaica (JAMALCO) | Hayes | Clarendon | Sand | 18-Jun-13 |
| QL1918 | Lee Robert Gore (formerly 1265) | West of May Pen Bridge | Clarendon | Sand & Gravel | 18-Jul-13 |
| QL1617 | Nassief Deenah | Colebeck | Clarendon | Limestone | 14-Sep-13 |
| QL1600 | Cecil & Paulete Mcealla | Colebeck | Clarendon | Marl | 13-Oct-13 |
| QL1301 | Howard Brown | Woodleigh | Clarendon | Sand & Stone | 07-Nov-13 |
| QL1406 | Woodleigh Quarry Ltd. (Howard Brown) | Chateau | Clarendon | Sand & Stone | 07-Nov-13 |
| QL1640 | Ronald Edwards | Danks | Clarendon | Sand & Gravel | 13-Nov-13 |
| QL1959 | Jerome Bailey | Chateau (Rio Minho) | Clarendon | Sand & Gravel | 13-Nov-13 |
| QL2002 | Singh's Property Co. Limited | Sevens Plantation | Clarendon | Limestone | 30-Aug-15 |
| ML146 | Rugby Jamaica Lime & Minerals Ltd. | Peak Pen | Clarendon | Limestone | 08-Mar-21 |
| ML152 | Chemical Lime Co. of Jamaica | Braziletto | Clarendon | Limestone | 04-Jul-24 |
| QL1783 | Delroy Pearce | Silver Spring | Hanover | Limestone | 18-Jan-09 |
| QL1471 | Wylie D. Hastings | Great Valley | Hanover | Limestone | 22-Mar-09 |
| QL1732 | Cardinal Paisley | Cave Valley | Hanover | Limestone | 21-Oct-09 |
| QL1884 | Western Aggregates & Marl Quarry | Quasheba Mountain | Hanover | Limestone | 19-Jan-10 |
| QL1934 | David Holland | Chester Castle | Hanover | Limestone | 19-Apr-13 |
| QL1242 | Buchannan Brothers | Glasgow | Hanover | Limestone | 21-Jul-13 |
| QL1511 | Great River Quarry (A. Petgrave) | Great River | Hanover | Limestone | 24-Feb-14 |
| QL1032 | Charles Wilson | Sprish Hill | Hanover | Limestone | 19-Apr-14 |
| QL1598 | North Rock Aggregates | Chigwell | Hanover | Limestone | 24-Feb-15 |
| QL 1846 | D. R. Foote Construction | Haughton Court | Hanover | Limestone | 29-Jan-16 |
| QL1253 | Caribbean Cement Company Limited | Rockfort | Kingston | Limestone | 21-Jul-13 |
| QL1271 | Marjoblac Ltd | Chudleigh, Christiana | Manchester | Limestone | 20-Jun-09 |
| QL1711 | Petroleum Corp. Ja. | Wigton | Manchester | Limestone | 21-Dec-10 |
| QL1768 | Harry Enfield Shields | Lambert, Mile Gully | Manchester | Limestone | 09-Jan-12 |
| QL1247 | A & P Powell Ltd | Somerset | Manchester | Limestone | 10-Dec-12 |
| QL1759 | Trevor Blake & Victor Brown | Mile Gully | Manchester | Limestone | 20-Jan-13 |

| Licence # | Operator | Quarry Location | Parish | Material | Expiry Date |
|---|---|---|---|---|---|
| QL1737 | Burchell Mclarty | Patrck Town | Manchester | Limestone | 09-Mar-13 |
| QL1881 | Cad's Incorporation Ltd | Dee-Side | Manchester | Limestone | 09-Mar-13 |
| QL1644 | Windalco | Shooters Hill | Manchester | Limestone | 20-Jun-13 |
| QL1615 | Roy Phillips | Alligator Pond | Manchester | Dune Sand | 31-Jul-13 |
| QL1274 | Carlton Morris | Spitzbergen | Manchester | Limestone | 21-Oct-13 |
| QL1261 | Sydney McPherson | Green Vale | Manchester | Limestone | 19-Apr-14 |
| QL1927 | S&G Limestone Ltd. | Dunsinane | Manchester | Limestone | 03-Sep-15 |
| QL1062 | Reuben Evans | Chudleigh | Manchester | Limestone | 30-Nov-15 |
| QL1682 | Marjoblac Ltd | Chudleigh | Manchester | Limestone | 19-Apr-16 |
| QL1894 | Neal Scott Limited | Spring Gardens | Portland | Sand & Gravel | 03-Aug-10 |
| QL1658 | Michael Schloss & Trevor Officer | Friendship | Portland | Marl | 20-Jun-11 |
| QL1754 | Rupert Miller | Berrydale | Portland | Sand & Gravel | 09-Mar-12 |
| QL1949 | Duke Construction Co./Mr. Gulab Dukharran | White River | Portland | Sand & Gravel | 25-Jul-12 |
| QL1888 | Ira Brown | Fairy Hill | Portland | Limestone | 09-Mar-13 |
| QL1608 | William Solomon | Craigmill, White River | Portland | River Stones | 04-Jun-13 |
| QL1678 | Joseph & Ian Wallen | Springfield, Swift River | Portland | Sand & Gravel | 29-Oct-13 |
| QL1856 | Oniel Gordon/Winsome Crosdale | Hope Bay | Portland | Sand & Gravel | 30-Nov-13 |
| QL1862 | Hudson King | Berrydale | Portland | Sand & Gravel | 29-Jan-14 |
| QL1630 | Cornelius Carr | Sherwood Forest | Portland | Limestone | 19-Apr-14 |
| QL 1635 | Oliver and Bernice Scott | Hope Bay | Portland | Limestone | 18-Jul-14 |
| QL1719 | Ransford and Hilda Newman | Sherwood Forest | Portland | Limestone | 04-Jun-15 |
| QL 1392 | Paradise Plum | Hope Bay | Portland | Marl | 13-Nov-15 |
| QL1287 | Ja. Gypsum & Quarries Ltd. | Bito | St. Andrew | Gypsum | 16-Feb-09 |
| QL794 | Warren Shaw & Michelle Shaw-Elliot | Chalky River | St. Andrew | Sand & Gravel | 19-Apr-12 |
| QL1710 | Warren Shaw & Michelle Shaw-Elliot | Cane River, Newstead | St. Andrew | Limestone | 30-Sep-12 |
| QL1920 | Incomparable Enterprises Ltd. | Ferry Pen | St. Andrew | Limestone | 21-Dec-12 |
| QL1982 | Neveast Supplies Ltd. | Dallas Castle | St. Andrew | Limestone | 07-Apr-13 |
| QL1395 | Karl W. Soutar & Jennifer Soutar | Sandy River, Temple Hall | St. Andrew | Sand | 04-Jun-13 |
| QL1448 | Ansel Roberts | Mount Ogle | St. Andrew | Sand | 04-Jun-13 |
| QL1975 | Fiederick & Hope Seixas | Temple Hall | St. Andrew | Sand & Gravel | 30-Aug-13 |
| QL1950 | Sure Products Manufacturing Co. Ltd. | Ferry Pen | St. Andrew | Limestone | 31-Aug-13 |
| QL1715 | Jamaica Quarry Products | New Green, Claremont | St. Andrew | Limestone | 13-Oct-13 |
| QL 1177 | Agro Stress Co. Ltd. | Water River | St. Andrew | Sand | 30-Nov-13 |
| QL 2016 | Kenneth Walker | Bull Bay | St. Andrew | Limestone | 30-Aug-14 |
| QL1791 | Jamaica Gypsum | Bito | St. Andrew | Pozzolan | 04-Jun-15 |
| QL1681 | Howard T. McKenzie | Newstead, Bull Bay | St. Andrew | Limestone | 13-Oct-15 |
| QL1248 | Channus Block & Marl Quarry Ltd. | Browns Town | St. Ann | Limestone | 20-Sep-08 |
| QL0897 | Adolph Clarke | Bamboo | St. Ann | Limestone | 03-Aug-10 |
| QL1241 | Channus Block & Marl Quarry Ltd. | Browns Town | St. Ann | Limestone | 09-Dec-11 |
| QL1503 | Jamaica Bauxite Mining | Lydford | St. Ann | Limestone | 11-Apr-12 |
| ML113 | Sherman Harris | Browns Town | St. Ann | Limestone | 27-May-12 |
| QL1245 | Warren Shaw | Lydford | St. Ann | Limestone | 31-Jul-13 |
| QL1638 | Prince Brown | Antrim Pen, Green Castle Dist. | St. Ann | Limestone | 19-Apr-14 |
| QL0837 | Chippenham Park Ltd. | Bamboo | St. Ann | Limestone | 20-May-14 |
| QL1339 | Herbert Chin | Eltham` | St. Ann | Limestone | 31-Jul-15 |
| ML131 | Lydford Mining Ltd. | Belmont, Lydford | St. Ann | Limestone | 24-Feb-17 |
| QL1700 | Yvonne Miller | Sandy Gut River At Riversdale | St. Catherine | Sand & Gravel | 19-Apr-11 |

| Licence # | Operator | Quarry Location | Parish | Material | Expiry Date |
|---|---|---|---|---|---|
| QL1781 | Clive Curtis | Mount Mathews, Cassava River | St. Catherine | Sand & Gravel | 03-Aug-11 |
| QL1676 | Clive Curtis | Hillsborough, Waugh Hill | St. Catherine | Limestone | 26-Aug-11 |
| QL0485 | Tulloch Estate Ltd. | Tulloch | St. Catherine | Limestone | 12-Sep-11 |
| QL1971 | Lasco Distributors Ltd. | White Marl (Rio Cobre) | St. Catherine | Sand & Gravel | 21-Oct-11 |
| QL1951 | Richard Rigg | Dove Hall (Rio Pedro) | St. Catherine | Sand & Gravel | 15-Nov-11 |
| QL1749 | Tulloch Estate Ltd. | Bog Walk | St. Catherine | Limestone | 09-Dec-11 |
| QL1880 | Phil's Incorporated Ltd. | Tredegar Park | St. Catherine | Limestone | 09-Dec-11 |
| QL1323 | Mogul Constr. & Transport Ltd. | Hill Run | St. Catherine | Limestone | 29-Jan-12 |
| QL1842 | Global Fenix S.A. | Colbee | St. Catherine | Limestone | 14-Mar-12 |
| QL1376 | Jethro & Dervol Williams | Shenton | St. Catherine | Limestone | 21-Jul-12 |
| QL1578 | L& B Mining Ltd | Guanaboa Vale P.O. | St. Catherine | Limestone | 05-Aug-12 |
| QL1968 | New Testament Church of God | Bridgeport | St. Catherine | Limestone | 19-Sep-12 |
| QL1992 | Cecille Rochester | Treadegar Park | St. Catherine | Limestone | 29-Sep-12 |
| QL1601 | United Estates Limited | Rio Doro at New Hall | St. Catherine | Sand/Gravel | 04-Jun-13 |
| QL1298 | Leon Martin Dixon | Harkers Hall | St. Catherine | Sand & Gravel | 18-Jul-13 |
| QL1742 | Worthy Park Estate Ltd | Lluidas Vale | St. Catherine | Sand & Gravel | 18-Jul-13 |
| QL1763 | Jamaica Baptist Union | Zion Hill | St. Catherine | Sand & Gravel | 18-Jul-13 |
| QL1994 | Rio Tinto Alcan | Ewarton | St. Catherine | Limestone | 25-Jul-13 |
| QL1915 | Errol & Ramon Morrisson | Sunnyside | St. Catherine | Limestone | 19-Sep-13 |
| QL1977 | Errol, Eric & Ramon Morrison | Dove Hall | St. Catherine | Limestone | 19-Sep-13 |
| QL1739 | United Estates Ltd | New Works | St. Catherine | Limestone | 13-Oct-13 |
| QL1914 | Matrix Engineering | Cocoa Walk (Myttins River) | St. Catherine | Sand & Gravel | 21-Oct-13 |
| QL 1990 | Ann Marie Phillips/Karen Rodney | | St. Catherine | Sand & Gravel | 07-Nov-13 |
| QL1084 | Gloria Mattadeen | Bog Walk P.O | St. Catherine | Sand & Gravel | 07-Nov-13 |
| QL1806 | Donroy Depluzer | Pleasant Hill, Bog Walk | St. Catherine | Sand & Gravel | 07-Nov-13 |
| QL1308 | Knolford Farms Ltd | Rio Doro, Riversdale | St. Catherine | Sand | 13-Nov-13 |
| QL1311 | Faurens Ltd. | Colbeck | St. Catherine | Sand & Gravel | 13-Nov-13 |
| QL1844 | Lorna Smith & Donovan Davis | Harkers Hall, Edward Piece | St. Catherine | Sand & Gravel | 13-Nov-13 |
| QL1866 | Rodney Galloway and Evona Walker | Raincome | St. Catherine | Sand & Gravel | 13-Nov-13 |
| QL1924 | DaCosta Contruction & Heavy Equipment | Hillrun | St. Catherine | Limestone | 13-Nov-13 |
| QL1326 | Dennis Montaque | Hill Run | St. Catherine | Limestone | 24-Feb-14 |
| QL1654 | Colin Lee | Hamshire, Riversdale | St. Catherine | Limestone | 19-Apr-14 |
| QL1976 | Keith Scott | Paul Mountain | St. Catherine | Limestone | 19-Apr-14 |
| QL1852 | Rodeo Holdings | Dove Hall, Sligoville | St. Catherine | Limestone | 07-Jun-14 |
| QL1730 | Worthy Park Estate Ltd | Thetford Mountain | St. Catherine | Limestone | 25-Jul-14 |
| QL1365 | Gloria Mattadeen | Shenton | St. Catherine | Limestone | 04-Jun-15 |
| QL748 | Kieth Anthony Scott | Paul Mountain | St. Catherine | Limestone | 04-Jun-15 |
| QL1456 | Donald Braham | | St. Catherine | Limestone | 18-Jul-15 |
| QL1357 | Vincent Hall | Bannister Hall | St. Catherine | Limestone | 31-Jul-15 |
| QL1516 | Agatha Goode | Ashley District | St. Catherine | Sand & Gravel | 31-Jul-15 |
| QL1324 | Eroy Linford Goode | Cherry Garden Mountain, Kitson Town | St. Catherine | Limestone | 31-Oct-15 |
| QL1531 | United Estate limited | Wakefield | St. Catherine | Marl | 07-Nov-15 |
| QL1698 | New Era Homes 2000 Ltd. | Campeachy | St. Catherine | Limestone | 07-Nov-15 |
| QL1679 | Mogul Constr. & Transport Ltd. | Hill Run | St. Catherine | Limestone | 18-Jan-16 |
| QL1249 | Little's Establishment (Thomas Guyah) | Moxham | St. Catherine | Limestone | 20-Jan-16 |
| QL1798 | Ja. Pre Mix Ltd. (f Keith Scott 0748) | Paul Mountain | St. Catherine | Limestone | 16-Jun-16 |
| QL1260 | Clifford Webster | Spring gardens | St. Catherine | Limestone | 25-Jul-16 |

| Licence # | Operator | Quarry Location | Parish | Material | Expiry Date |
|---|---|---|---|---|---|
| QL1541 | Pampie H. Mindley | Bellevue | St. Elizabeth | Limestone | 18-Jan-09 |
| QL1782 | Ermena Dennis | Y.S. | St. Elizabeth | Limestone | 18-Jan-09 |
| QL1840 | Carisbrook Mining Company Limited | Grove Hill District | St. Elizabeth | Limestone | 20-Jun-11 |
| QL1766 | Horace Shields | Exton | St. Elizabeth | Limestone | 19-Jan-12 |
| QL1838 | Austin Levy | Hermitage- Brownberry | St. Elizabeth | Marl | 14-Sep-12 |
| QL1579 | Simon & Claudia Sangster | Thatchfield | St. Elizabeth | Dune Sand | 19-Dec-12 |
| QL1506 | Clement Foster | Content Mountain, Lacovia | St. Elizabeth | Limestone | 09-Mar-13 |
| QL1780 | Keith Chambers | Bogue | St. Elizabeth | Limestone | 09-Mar-13 |
| QL1729 | J. Wray & Nephew Ltd | Holland Estate, Lacovia | St. Elizabeth | Limestone | 19-Apr-13 |
| QL1556 | Michael R James | Baptist District | St. Elizabeth | Limestone | 21-Jul-13 |
| QL1693 | Karl Dacosta | Craigie Top, Middle Quarters | St. Elizabeth | Limestone | 21-Jul-13 |
| QL1938 | Austin Levy | Thatchfield | St. Elizabeth | Dune Sand | 31-Jul-13 |
| QL1188 | Steve Thomas | Elderslie | St. Elizabeth | Limestone | 14-Sep-13 |
| QL1196 | Kenneth Bennett | Luana | St. Elizabeth | Limestone | 19-Apr-14 |
| QL1454 | Carisbrook Mining (Gene Dixon) | Carisbrook | St. Elizabeth | Limestone | 19-Apr-14 |
| QL1979 | Precise Block Making Co. Ltd. | Bellevue | St. Elizabeth | Limestone | 19-Apr-14 |
| QL1993 | Terry May Harris | Ginger Hill | St. Elizabeth | Limestone | 19-Sep-14 |
| QL1123 | Alumina Partners Of Jamaica | Sorn Hill, Myresville | St. Elizabeth | Limestone | 21-Oct-14 |
| QL1123 | Glenroy Augustus Beckford | Hill Top | St. Elizabeth | Limestone | 19-Dec-14 |
| QL0938 | Neville and Mitzy Smith | Brompton | St. Elizabeth | Limestone | 21-Jul-15 |
| QL2003 | Maxwell Construction | | St. Elizabeth | Limestone | 30-Aug-15 |
| QL1762 | Austin Levy | Thatchfield, Hill top | St. Elizabeth | Limestone | 07-Nov-15 |
| QL 2029 | Horatio McMahon | Goshen | St. Elizabeth | Limestone/Marl | 29-Jan-16 |
| QL1871 | J. Wray & Nephew Limited | Domotto, Appleton Estate | St. Elizabeth | Limestone | 29-Jan-16 |
| QL1922 | Hodges Minerals & Powders | Luana | St. Elizabeth | Limestone | 21-Dec-19 |
| QL1408 | Henry Rhoden (Western wheels) | Sunderland, Flamstead | St. James | Sandstone | 05-Aug-09 |
| QL1834 | Nationwide Designs Co. Ltd. | Norwood | St. James | Marl | 01-Jul-11 |
| QL1597 | Errol Construction Co. Ltd. | Yorkland | St. James | Limestone | 08-Dec-11 |
| QL1119 | Build Tech Limited (Henry Rhoden) | Morelands | St. James | Limestone | 03-Aug-12 |
| QL1910 | Clarence Nelson | Mount Horeb | St. James | Limestone | 03-Aug-12 |
| QL1784 | Spot Valley Sports Entertainment & Training | Rose Hall District | St. James | Limestone | 02-Dec-12 |
| QL1637 | Silbert Romans | Chatam District | St. James | Limestone | 21-Jul-13 |
| QL1680 | Western Jamaica Mining & Construction | Mount Horeb | St. James | Limestone | 27-Aug-13 |
| QL1702 | Danmore Ltd. | Retirement | St. James | Limestone | 14-Sep-13 |
| QL1954 | George/ Andie Anderson | Adelphi | St. James | Limestone | 20-Jan-14 |
| QL1707 | Kent Industries | Kent Estate | St. James | Limestone | 16-Feb-14 |
| QL1947 | Spring Vale Farms Ltd. | Spring Vale | St. James | Limestone | 19-Apr-14 |
| QL1671 | Alfed Joseph Carey | Nunhide, Plum, Barnett Bush | St. James | Limestone | 18-Jul-15 |
| QL1618 | Leyden Investment Ltd (Donald Campbell) | Lottery | St. James | Andesite | 14-Sep-15 |
| QL1322 | Johns Hall Aggregates | Johns Hall | St. James | Limestone | 13-Oct-15 |
| QL 2014 | Keiffer L.R. Singh | Morelands | St. James | Limestone | 07-Nov-15 |
| QL1483 | Crichton Quarries Ltd | Retirement | St. James | Limestone | 29-Jan-16 |

| Licence # | Operator | Quarry Location | Parish | Material | Expiry Date |
|---|---|---|---|---|---|
| QL1304 | Morris Murray | Comfort Valley | St. Mary | Sand & Gravel | 21-Jul-09 |
| QL1277 | Guild's Engineers and Commercial | Devon Pen | St. Mary | Sand & Gravel | 03-Aug-10 |
| QL1051 | Ruby Bennett | Comma | St. Mary | Limestone | 06-Feb-11 |
| QL1507 | Solomon Jacobs | Thousand Pen, Castleton | St. Mary | Sand & Gravel | 21-Jul-11 |
| QL1744 | Multi Minerals mining Ltd | Warwick Castle | St. Mary | Sand & Gravel | 14-Sep-11 |
| QL1811 | Headley Moore | Robins Bay, St. Mary | St. Mary | Limestone | 09-Dec-11 |
| QL1491 | Leggo Records | Montrose | St. Mary | Sand & Gravel | 01-Jan-12 |
| QL1613 | Winston Williamson | Friendship Gap | St. Mary | Sand & Gravel | 24-Feb-12 |
| QL1695 | Israel Transport & Equipment Co. Ltd. | Lots 141&142 Grays Inn, Fort Stewart | St. Mary | Sand & Gravel | 24-Feb-12 |
| QL1860 | Israel Transport & Equipment Co. Ltd. | Dry River | St. Mary | Sand & Gravel | 19-Apr-12 |
| QL2032 | Shyton Sand & Services Ltd (formerly 1514) | Thousand Pen, Milepost 22 | St. Mary | Sand & Gravel | 18-Jul-12 |
| QL1712 | Donald Mitchell | Dry River, Fort Stewart, Enfield | St. Mary | Sand & Gravel | 25-Jul-12 |
| QL1314 | Leaford Hudson | | St. Mary | shingle | 19-Sep-12 |
| QL1760 | White Hall Estate | White Hall | St. Mary | Stone | 04-Jun-13 |
| QL1831 | St. Mary Banana Estates Ltd. | Agualta Vale | St. Mary | Sand & Gravel | 18-Jul-13 |
| QL1948 | Newton Nerdon | Fort George | St. Mary | Sand & Gravel | 07-Nov-13 |
| QL1342 | J. A. S. Cocoa Growers Co-Op Federation Ltd. | Richmond | St. Mary | Sand & Gravel | 13-Nov-13 |
| QL1643 | Terrence Gillette | Broadgate Square | St. Mary | Sand & Gravel | 13-Nov-13 |
| QL1909 | David Wilson | Rio Nuevo | St. Mary | Sand & Gravel | 13-Nov-13 |
| QL1528 | D & K Farms Ltd. | Hamilton Mountain | St. Mary | Marl | 24-Feb-14 |
| QL1382 | PH & Sons Aggregates | Springfield, Morant Bay | St. Thomas | Sand & Gravel | 25-May-08 |
| QL1779 | Winston Anderson | Wheelerfield | St. Thomas | Limestone | 08-Jan-09 |
| QL1861 | Bewelk Equipment and Construction Ltd. | Morant River | St. Thomas | Sand & Gravel | 09-Dec-09 |
| QL1530 | Ludlow Remnicks | Easington | St. Thomas | Sand & Gravel | 19-Jan-10 |
| QL1786 | Coast to Coast Quarries Ltd. | Easington | St. Thomas | Sand & Gravel | 09-Mar-11 |
| QL1300 | Felicity Lightbourne | Yallahs | St. Thomas | Sand & Stone | 15-Nov-11 |
| QL1883 | Original Coast to Coast | Yallahs River | St. Thomas | Sand & Gravel | 15-Nov-11 |
| QL1929 | Serge Island Dairies Ltd. | Morant River, East of Belvedere main road. | St. Thomas | Sand & Gravel | 15-Nov-11 |
| QL1854 | Fitzrobert's Quarries | Albion | St. Thomas | Sand & Stone | 20-Jan-12 |
| QL1064 | Bewelk Equipment and Construction Ltd. | Morant River | St. Thomas | Sand & Gravel | 19-Apr-12 |
| QL1898 | Jamaica Aggregates Limited | Poor Man's Corner | St. Thomas | Sand & Gravel | 19-Apr-12 |
| QL1899 | Jamaica Aggregates Limited | 31 Moloynes Road, | St. Thomas | Sand & Gravel | 19-Apr-12 |
| QL1900 | Jamaica Aggregates Limited | Heartease | St. Thomas | Sand & Gravel | 19-Apr-12 |
| QL1442 | Alvin Merrick Nicholas | Lot 15, Part Of Albion | St. Thomas | Sand | 07-Jun-12 |
| QL1623 | Norman Ogilvie | Johnston River, Seaforth | St. Thomas | Sand & Gravel | 25-Jul-12 |
| QL1848 | Joseph Lue | Denvers Pen | St. Thomas | Sand | 19-Dec-12 |
| QL1940 | Jamaica Producers Group | Wheelerfield (PG River) | St. Thomas | Sand & Gravel | 19-Dec-12 |
| QL1885 | Paul Biersay | Morant | St. Thomas | Sand | 04-Jun-13 |
| QL1790 | Christopher Burgess | Mount Sinai, Llandeway | St. Thomas | Sand & Gravel | 18-Jul-13 |
| QL1808 | Howard Mcpherson | Mount Sinai | St. Thomas | Sand & Gravel | 18-Jul-13 |
| QL1902 | Earth Rocks Ltd. | York | St. Thomas | Sand & Gravel | 18-Jul-13 |
| QL2020 | Donlas Development Corporation Limited | Metzgar Run | St. Thomas | Limestone | 18-Jul-13 |
| QL1225 | Earthcrane Haulage Ltd | Yallahs River | St. Thomas | Sand & Gravel | 30-Aug-13 |
| QL1564 | Dudley Fyffe | Green Castle | St. Thomas | Marl | 14-Sep-13 |
| QL 2007 | Michael Lane | Yallahs River | St. Thomas | Sand & Gravel | 13-Nov-13 |
| QL1770 | White Rocks Quarry Ltd | Montpelier Pen , yallahs | St. Thomas | Limestone | 15-Nov-13 |
| QL1863 | Agajah Deenah | Morant River | St. Thomas | Sand & Gravel | 30-Nov-13 |

| Licence # | Operator | Quarry Location | Parish | Material | Expiry Date |
|---|---|---|---|---|---|
| QL1379 | Segree Universal Co. Ltd. | Morant River, York | St. Thomas | Sand/Gravel | 29-Jan-14 |
| QL1748 | Norman Murray | Woodbourne, Yallahs | St. Thomas | Sand & Gravel | 29-Jul-14 |
| QL1923 | Original Coast to Coast | Yallahs River, Norris | St. Thomas | Sand & Gravel | 29-Jul-14 |
| QL1252 | Caribbean Cement Co. Ltd. | Cambridge Hill | St. Thomas | Shale | 25-Jul-16 |
| QL1859 | Amaterra Jamaica Rio ( Keith Russell) | Stewart Castle | Trelawny | Limestone | 25-Aug-11 |
| QL1645 | Coral Francis | Wakefield | Trelawny | Marl | 06-Oct-11 |
| QL1965 | Port Authority of Jamaica | Falmouth | Trelawny | Beach Sand | 13-Oct-11 |
| QL1875 | Southfield Development Corporation Ltd. | Southfield, Perth Town | Trelawny | Limestone | 30-Oct-11 |
| QL1876 | Braco Estate Limited | Braco Estate | Trelawny | Marl | 09-Dec-11 |
| QL1801 | Southfield Blocks & Aggregates Ltd. | Southfield | Trelawny | Limestone | 06-Jun-12 |
| QL1606 | Hemel Hines | Perth Town | Trelawny | Limestone | 30-Sep-12 |
| QL1931 | Northwestern Marl & Aggregates Ltd. | Southfield | Trelawny | Limestone | 05-Oct-12 |
| QL1937 | Clint Walters | Summer Hill | Trelawny | Limestone | 21-Dec-12 |
| QL1101 | Trelawny Aggregates Ltd | Braco | Trelawny | Limestone | 03-Mar-13 |
| QL1381 | Keith Russell | Duncans Bay | Trelawny | Limestone | 19-Apr-14 |
| QL1670 | Bengal Forms Limited | | Trelawny | Limestone | 07-Jun-14 |
| QL1461 | Hugh Barnett | Ulster Spring | Trelawny | Limestone | 25-Jul-14 |
| QL1535 | Valentine Silvera | Brompton , Old Mountain | Trelawny | Limestone | 04-Jun-15 |
| QL1650 | Trewlany Sugar Company | Long Pond | Trelawny | Limestone | 04-Jun-15 |
| QL1194 | Renford Black | Salt Marsh | Trelawny | Limestone | 31-Jul-15 |
| QL1743 | Trelawny Sugar Co. | Gales Valley, Hamden Div. | Trelawny | Limestone | 29-Jan-16 |
| QL1497 | Superior Aggregates | Mint, Grange Hill | Westmoreland | Limestone | 14-Jan-09 |
| QL1498 | Dane R. Foote | Prospect Park | Westmoreland | Limestone | 05-Aug-09 |
| QL1475 | James Jackson | Negril Spots | Westmoreland | Limestone | 14-Sep-11 |
| QL1416 | Paul Lewis Cooke | New Hope Property | Westmoreland | Marl | 03-Aug-12 |
| QL1672 | Marvin Salabie | Bullstrode | Westmoreland | Limestone | 30-Sep-12 |
| QL1777 | Wycliffe Reid | Fort William | Westmoreland | Limestone | 30-Sep-12 |
| QL1906 | Demrock Ltd | Ramble, Knockalva | Westmoreland | Limestone | 02-Mar-13 |
| QL1704 | Weverley Wagstaffe & Evelyn Pearce | Old Hope | Westmoreland | Marl | 13-Oct-13 |
| QL1870 | MGRA | Grange Hill | Westmoreland | Limestone | 13-Oct-13 |
| QL1157 | Desmond Williams | Springfield, | Westmoreland | Limestone | 15-Nov-13 |
| QL1538 | Carmel Stone Crushing Co. Ltd | Mount Carmel | Westmoreland | Limestone | 24-Feb-14 |
| QL1872 | ABR Quarries Ltd. | Mount Eagle | Westmoreland | Limestone | 07-Nov-14 |
| QL1981 | Starline Construction and Realty Ltd | | Westmoreland | Limestone | 19-Dec-14 |
| QL1139 | Gladstone James & Colin James | Galloway | Westmoreland | Limestone | 04-Jun-15 |
| QL1799 | Ansel Jackson | Robins River | Westmoreland | Limestone | 04-Jun-15 |
| QL1723 | Cecil Mckenzie | Ferris | Westmoreland | Marl | 07-Nov-15 |
| ML128 | Caribbean Mining Corp. Ltd. | Georges Plain | Westmoreland | Limestone | 07-Mar-16 |
| QL1810 | Ian Gordon | Old Hope | Westmoreland | Limestone | 25-Jul-16 |
| QL 1980 | Winston Campbell | Mint, Grange Hill | Westmoreland | Limestone | |

*Source: Mines & Geology Division*

## Appendix 5: List used for the Final Selection of Quarry Operators Contacted

| License Number | Operator | Quarry Location | Parish | Material | Status | Telephone # | CONTACT PERSON |
|---|---|---|---|---|---|---|---|
| QL1869 | William Shagoury | Rio Minho | Clarendon | Sand & Gravel | Active | 986-2394 | Mr. W. Shagoury |
| ML146 | Rugby Jamaica Lime & Minerals Ltd. | Peak Pen | Clarendon | Limestone | Active | 780-0653 | Mr. Jermaine Lynch |
| ML152 | Chemical Lime Co. of Jamaica | Braziletto | Clarendon | Limestone | Active | 381-3144 | Mr. Hugh Elliston |
| QL1253 | Caribbean Cement Co. | Rockfort | Kingston | Limestone | Active | 928-6231-5 | |
| QL1271 | Marjoblac Ltd | Chudleigh, Christiana | Manchester | Limestone | Active | 964-9871/964-9178 | |
| QL1062 | Reuben Evans | Chudleigh | Manchester | Limestone | Active | 964-2062 | |
| QL1247 | A & P Powell Ltd | Somerset | Manchester | Limestone | Active | 425-1962 / 961-8031-2 | Mr. Andrew Henry |
| QL1927 | S & G Limestone Ltd | Dunsinane | Manchester | Limestone | Active | 881-8848 / 6034230 | Mr. Paul Page |
| QL1287 | Jamaica Gypsum & Quarries Ltd | Bito | St. Andrew | Gypsum | Active | 372-0336 / 928-6102 | Mr. Yohn Downie |
| QL1710 | Warren Shaw & Michelle Shaw-Elliot | Cane River, Newstead | St. Andrew | Limestone | Active | 973-1579 | Mrs. Michelle Sh Elliott |
| QL1920 | Incomparable Enterprises | Ferry Pen | St. Andrew | Limestone | Active | 853-1666 / 1121 | Mr. L. Wallace |
| ML131 | Lydford Mining Ltd. | Belmont, Lydford | St. Ann | Limestone | Active | 383-1926 | Mr. Leo Cousins |
| QL1323 | Mogul Constr. & Transport Ltd. | Hill Run | St. Catherine | Limestone | Active | 754-6830-2 | Mr. Clive Fagan |
| QL1924 | DaCosta Contruction & Heavy Equipment Ltd. | Hill Run | St. Catherine | Limestone | Active | 381-4169/ 984-2386 | Mr. Dermott DaCosta |
| QL1123 | Alumina Partners Of Jamaica | Sorn Hill, Myersville | St. Elizabeth | Limestone | Inactive | 962-3251-9 | |
| QL0938 | Neville and Mitzy Smith - company now called Southcoast Aggregate | Brompton | St. Elizabeth | Limestone | Active | 373-5659 | Mr. Neville Smith |
| QL1922 | Hodges Minerals & Powders | Luana | St. Elizabeth | Limestone | Active | 965-2980-3 | Mrs. Jennifer Ince |
| QL1483 | Crichton Quarries Ltd | Retirement | St. James | Limestone | Active | 952-3250 | |
| QL1784 | Spot Valley Sports | Rose Hall District | St. James | Limestone | Active | 953-0744 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Entertainment & Training Complex | | | | | | |
| QL1707 | Kent Industries –email at morgan_ent@yahoo.com | Kent Estate | St. James | Limestone | Active | 940-2819 | |
| QL1322 | Johns Hall Aggregates – sent email to aggregates@cwjamaica.com | Johns Hall | St. James | Limestone | Active | 610-8094-5/ 816-3446 | Mr. Neville Reid |
| QL1831 | St. Mary Banana Estates Ltd./ Four Rivers – sent email to clawson@jpjamaica.com | Agualta Vale | St. Mary | Sand & Gravel | Active | 996-2344/ 996-2356 | |
| QL1695 | Israel Transport & Equipment Co. Ltd. – sent email to owengrant@anngel.com | Lots 141&142 Grays Inn, Fort Stewart | St. Mary | Sand & Gravel | Active | 905-2838 / 931-6178 | |
| QL1786 | Coast to Coast Quarries Ltd. | Easington | St. Thomas | Sand & Gravel | Active | 706-3230 | |
| QL1225 | Earthcrane Haulage Ltd – currently not in operation, completed form | Yallahs River | St. Thomas | Sand & Gravel | Active | 923-5491-5 | Mr. George Walder |
| QL1064 | Bewelk Equipment | Morant River | St. Thomas | Sand & Gravel | Active | 982-2467 | Mr. Brian Chin |
| QL1498 | Dane R. Foote – sent phillip foote an email | Prospect Park | Westmoreland | Limestone | Active | 957-4300 | |
| QL1139 | Gladstone / Colin James | Galloway | Westmoreland | Limestone | Active | 347-3704 | Colin James |
| QL1872 | ABR Quarries Ltd. | Mount Eagle | Westmoreland | Limestone | Active | 955-2910/372-8698/383-2462 | Andrew/Suzette Sankar |
| QL1538 | Carmel Stone Crushing Co. Ltd | Mount Carmel | Westmoreland | Limestone | Active | 817-5802/ 381-1770/ 469-1552 | Owen James |
| QL 1759 | TREVOR BLAKE/VICTOR BROWN | | | Limestone | Active | 772-0225/ 809-1386 | Trevor Blake/Victor Brown |
| QL 1979 | PRECISE BLOCK – Rex Whyte | | | Limestone | Active | 382-5502/ 965-0945 | |
| QL 1933 | BUCHANAN QUARRY | Glasglow | Hanover | Limestone | Active | 386-4923 | Tony Buchanan |
| QL 1993 | TERRY MAY HARRIS | | | Limestone | Active | 425-6721 | |
| QL 1274 | CARLTON MORRIS | | | Limestone | Active | 320-5502/ 336-4677 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| QL 1881 | CADS INC – | Deeside | Manchester | Limestone | Active | 456-8864/ 425-7844 | Charles Darby, Snr |
| QL 1511 | DESMOND/JOAN WILLIAMS | | | Limestone | Active | 447-4791 | |
| QL 1947 | SPRINGVALE FARMS | | | Limestone | Active | 366-6859 | Elmore James |
| QL 1188 | STEVE THOMAS | Elderslie | St. Elizabeth | Limestone | Active | 841-2236/ 340-7920 | |
| QL 1556 | MICHAEL JAMES - p.k.james@cwjamaica.com | | | Limestone | Active | 965-2362/ 365-0187 | |
| QL 1838 | AUSTIN LEVY | | | Limestone | Active | 382-8439 | |
| QL 1675 | TARON WILSON/MOZART ROWE | Rose Hall | Clarendon | Limestone | Active | 987-7935/ 350-2564/ 453-3340 | |
| QL 1768<br><br>QL 1766 | HARRY SHEILDS<br><br>HORACE SHEILDS | Lambert, Mile Gully | Manchester | Limestone | Active | 844-3304/ 382-5651 | |
| QL 1032 | CHARLES WILSON | Spanish Hill | Hanover | Limestone | Active | 956-2321 | Paul Wilson |
| QL 1934 | DAVID HOLLAND | Chester Castle | Hanover | Limestone | Active | 399-4815 | |
| QL 1248 | CHANNUS BLOCKS | Brown's Town | St. Ann | Limestone | Active | 670-6516 | |
| QL 1638 | PRINCE BROWN | Antrim Pen, Green Castle District | St. Ann | Limestone | Active | 973-7279<br><br>385-7040 | |
| QL 1339 | HERBERT CHIN | | | Limestone | Active | 330-4966 305-3268 | Constance Chin |
| QL 078 | KEITH SCOTT | Paul Mountain | St. Catherine | Limestone | Active | 925-5513 | |
| QL 1737 | BURCHELL MCLARTY | Patrick Town | Manchester | Limestone | Active | 383-1951/ 793-0242 | |
| QL 1693 | KARL DACOSTA | Craigie Top, Middle Quarters | St. Elizabeth | Limestone | Active | 369-1202/ | |
| QL 0938 | MITZY SMITH | Brompton | St. Elizabeth | Limestone | Active | 373-5659/ 634-4298 | |
| QL 1775 | CLARENCE NELSON | | St. James | Limestone | Active | 420-1896 | |
| QL 1637 | SILBERT ROMANS | Chatam District | St. James | Limestone | Active | 952-9937<br><br>388-0480 | |
| QL 1875 | SOUTHFIELD DEVLP | Southfield, Perth | Trelawny | Limestone | Active | 570-6195 | ANDRE BROWNING |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Town | | | | | |
| QL 1597 | ERROL CONSTRUCTION | | | Limestone | Active | 952-2119 | ERROL VASSELL |
| QL 1618 | LEYDEN | | | Limestone | Active | 929-3263<br>819-6648 | DONALD CAMPBELL |
| QL 1672 | MARVIN SALABIE | Bullstrode | Westmoreland | Limestone | Active | 841-8551<br>918-7906 | |
| QL 1650/1743 | TRELAWNY SUGAR | Long Pond | Trelawny | Limestone | Active | 912-9288 | PAUL HARRIS |
| QL 1859 | AMATERRA | | | Limestone | Active | 610-5570 | KEITH RUSSELL |
| QL 1483 | CRICHTON QUARRIES | | | Limestone | Active | 395-9583 | JACQULINE LAWRENCE |
| ML 128 | CARIBBEAN MINING | | Westmoreland | Limestone | Active | 388-3544<br>862-0136 | DAVE NORTON |
| QL 1670 | BENGAL FARMS | | | Limestone | Active | 975-6256 | ANNE HOPWOOD |
| QL 1606 | HERNEL HINES | Perth Town | Trelawny | Limestone | Active | 534-1298 | |
| QL 1249 | LITTLE'S ESTABLISHMENT | Moxham | St. Catherine | Limestone | Active | 370-8778/<br>995-8500 | THOMAS GUYAH |
| QL 1915 | ERROL/RAMON MORRISON | | | limestone | Active | 461-4017 | ERROL MORRISON |
| | | | | | Active | | |

***Ministry of Science, Technology, Energy & Mining***

## Appendix 6: Questionnaire – Sector Assessment

**MARKET ASSESSMENT AND DESIGN AND IMPLEMENTATION OF A MARKETING INTIATIVE FOR LIMESTONE AND ITS DERIVATIVES**

**QUESTIONNAIRE**

*The Centre for the Development of Enterprise (CDE) and JAMPRO are cooperating to conduct a market assessment and design and implementation of a market initiative for Jamaican limestone and its derivatives. Understanding the market will help Jamaica to develop their limestone and its derivative industry.*

*This project is funded by the Centre for the Development of Enterprise (CDE), an ACP (African, Caribbean and Pacific)/EU joint Institution created in the framework of the Cotonou Agreement to support the development of the private sector in ACP countries.*

*CDE's financial resources come mainly from the European Development Fund (EDF) and its operations compliment the programmes of the European Commission, the Secretariat of the ACP Group of States and the European Investment Bank in the framework of support to the private sector.*

*This project is expected to yield significant impact on the development and diversification of the non-metallic minerals industry in the mining sector, particularly that of limestone and its derivatives.*

*We understand that completing the questionnaire is time consuming and thank you in advance for taking the time to answer all the questions.*

Conrad Douglas & Associates Limited Page 1 of 8 CD*PRP 577/13

1. **General Information**

    1. License No.:_____
    2. Material being mined/quarried:_____
    3. Location of operations:_____
    4. Business Name:_____
    5. Business Address:_____
    6. Owner/Principal:_____
    7. Contact person:_____
    8. Tel._____Fax._____E-mail address:_____
    9. Website:_____

2. **Products and Production Data**

    a. Materials produced:

    (Material 1) :_____

    (Material 2) :_____

    (Material 3) :_____

    (Material 4) :_____

    (Material 5) :_____

    (Material 6) :_____

    (Material 7) :_____

    (Material 8) :_____

    (Material 9) :_____

    (Material 10) :_____

b. Are there Physical and Chemical Specifications for:

| | Physical Specifications (yes/no) | Chemical Specification (yes/no) |
|---|---|---|
| (Material 1) | | |
| (Material 2) | | |
| (Material 3) | | |
| (Material 4) | | |
| (Material 5) | | |
| (Material 6) | | |
| (Material 7) | | |
| (Material 8) | | |
| (Material 9) | | |
| (Material 10) | | |

c. Where you have indicated "yes" please provide the relevant list of specifications, or any formal source which guides your specifications

**3. Annual Production by Materials Category:**

| | Planned Capacity | Current Capacity | Production Build-up (last three[3] years) |
|---|---|---|---|
| (Material 1) | | | |
| (Material 2) | | | |
| (Material 3) | | | |
| (Material 4) | | | |
| (Material 5) | | | |
| (Material 6) | | | |
| (Material 7) | | | |
| (Material 8) | | | |
| (Material 9) | | | |
| (Material 10) | | | |

4. **Please indentify your current markets below:**

| | Local Market | International Market |
|---|---|---|
| (Material 1) | | |
| (Material 2) | | |
| (Material 3) | | |
| (Material 4) | | |
| (Material 5) | | |
| (Material 6) | | |
| (Material 7) | | |
| (Material 8) | | |
| (Material 9) | | |
| (Material 10) | | |

5. **Production Technique – Quarrying Methods.**

a. Does your quarry conduct pre-mine drilling?_____

b. Is there a Quarry Plan?_____

c. Which one of the following blasting techniques is used:

i. ☐ Internal?

ii. ☐ Contracted?

d. What is the hole spacing?_____

e. Please describe the layout of the benches:

i. Typical bench width: _____

ii. Typical bench face height: _____

f. Transfer of blasted material from quarry floor to processing (crushing) plant_____

_____

_____

g. Is dry crushing/screening practiced, or is the material washed?_____

_____

_____

cde JAMPRO

**6. Machinery and Equipment**

| Machinery/Equipment | Quantity | Sizes/capacity | Age |
|---|---|---|---|
| Bulldozers | | | |
| Front End Loaders | | | |
| Excavators | | | |
| Weight scale | | | |
| Other Equipment: | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |

7. **Plant:**

a. What is the average age of the plant?_____

b. Do you have a Layout and Flow Diagram for your quarry? If "yes" please provide. If "no" please describe as best as possible: _____

8. **Management Structure**

   a. Please describe your organizational structure (*if you have an organizational chart , then that can be submitted instead*):_____

   b. How many employees do you have?_____

   c. What certification and training is required for your employees:_____

9. **Environmental, Health and Safety (EHS)**

   a. Who has responsibility for EHS?_____

   b. What are the measures taken to control fugitive dust and emissions from the plant site?_____

   c. What measures are taken to control the intrusion of noise and vibration into surrounding communities?_____

d. How are waste/oily materials, discarded (includes machinery parts and materials)?_____

e. Are you in possession of copies of the laws and regulations governing our operations?_____

**10. Challenges and Opportunities:**

a. What are your company's greatest challenges? (e.g. movement of materials, areas of greatest cost, etc):_____

**THANK YOU FOR TAKING THE TIME TO PARTICIPATE IN THIS IMPORTANT SURVEY.**

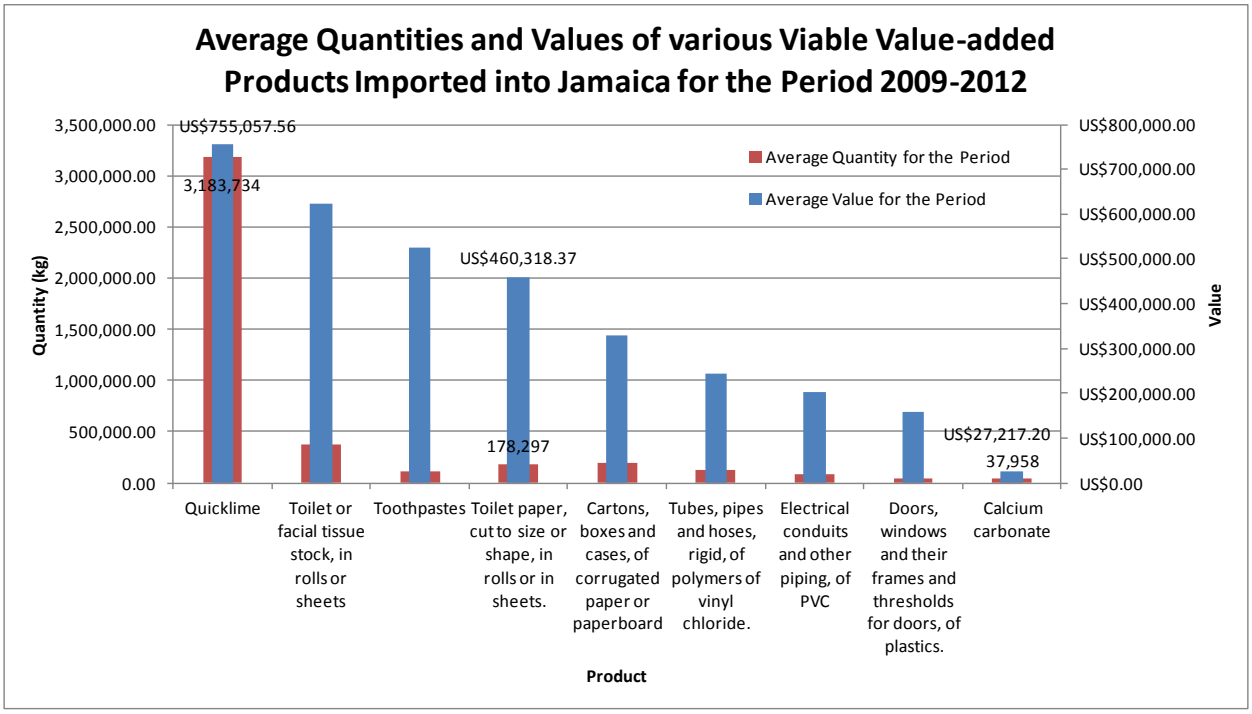
## Appendix 7: Elementary Qualitative Profiles on Selected Products

# Introduction

Opportunities that exist in the domestic market for the production of high value-added products should be further explored before expanding to the regional and extra-regional markets. Consideration should be given to products that are integral to the maintenance of building infrastructure, the facilitation of basic and/or necessary activities related to hygiene, manufacturing and packaging. In this regard, the following value-added products should be pursued:

1. Crushed/milled limestone and synthetic limestone, in particular:
   - Ground Calcium Carbonate (GCC)
   - Precipitated Calcium Carbonate (PCC)
2. Plastics, in particular:
   - Doors, windows and their frames and thresholds for doors, of plastics.
   - Electrical conduits and other piping, of PVC.
   - Tubes, pipes and hoses, rigid, of polymers of vinyl chloride.
3. Papers, in particular:
   - Toilet or facial tissue stock, in rolls or sheets.
   - Toilet paper, cut to size or shape, in rolls or in sheets.
   - Cartons, boxes and cases, of corrugated paper or paperboard.
4. Toothpastes

The average values and quantities of above mentioned products imported in Jamaica for the period 2009-20012 are shown below.



## Ground Calcium Carbonate (GCC) and Precipitated Calcium Carbonate (PCC)

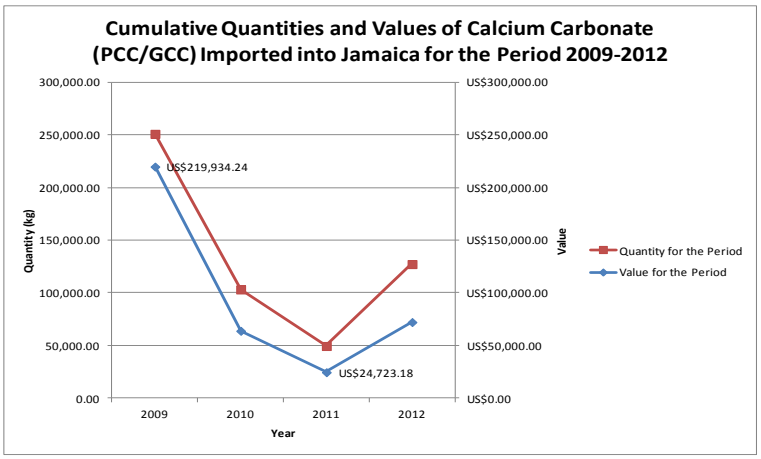
**Ground Calcium Carbonate (GCC)** is produced by crushing and screening quarried limestone material to within a range of particle sizes according to the specifications cited by the purchaser or target market. Because GCC requires only limited physical processing, the purity of the material is only as good as the source material. GCC is primarily used as a filler and extender in various types of materials such as certain types of paper, plastics and paints. Food and pharmaceutical grade GCC may also be used in the preparation of food supplements and antacids.

**Precipitated Calcium Carbonate (PCC)** is a synthetic material that is synthesized from the precipitation of calcium carbonate using hydrated lime (calcium hydroxide) and carbon dioxide. The precipitation process can be controlled to yield calcium carbonate of variable crystal structure depending on application and market demand.

Because PCC is synthetic, the purity of the material can be controlled within certain limits by appropriately processing the source material.

PCC can be used as a filler or extender in a similar way as GCC. However, its regular crystal structure and the narrow particle size distribution of its bulk material allows for more control in manipulating physical properties of the value added material such paints, premium papers, and especially plastics.

**Jamaica's PCC/GCC imports for the period 2009-2012 ranged from a maximum of US$220,000 in 2009 and a minimum of US$25,000 in 2011.**




**Some major manufacturers of GCC and/or PCC**

Lydford Mining | Huber Engineered Materials |Specialty Minerals Inc.| Omya | Schaefer Kalk | Imerys


Ground Calcium Carbonate | Precipitated Calcium Carbonate

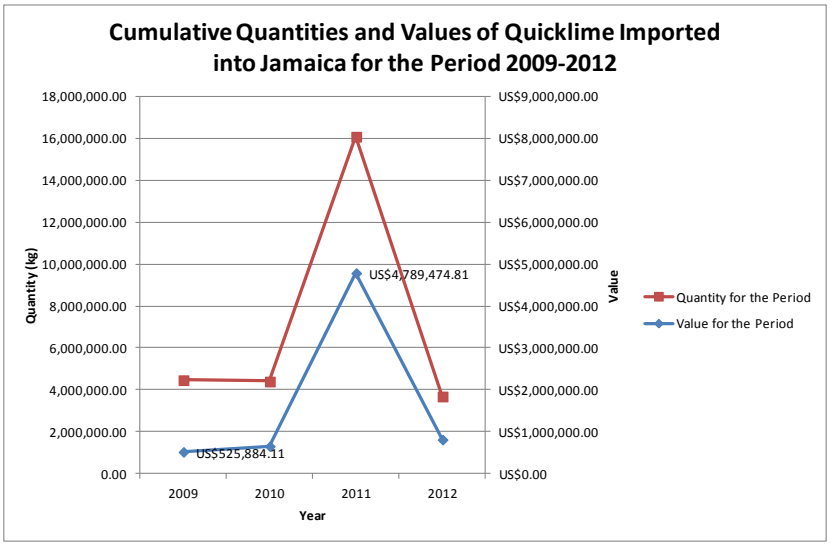
## Quicklime

Quicklime is known as one of the most versatile chemicals. It is produced by burning limestone below its melting point using a kiln. The process is called calcination. Quicklime reacts exothermically with water.

Quicklime is used as a key ingredient in the desulphurization of flue gas. It is also used extensively in the Bauxite-Alumina industry, the Pulp and Paper in the regeneration of caustic soda and a wide range of other operations, including the de-hairing of hides in the tanning of leather.

In Jamaica, quicklime is used primarily in the production of alumina in the bauxite-alumina industry, a pre-coat and filter aid in the sugar industry and in sanitation.

**Jamaica's Quicklime imports for the period 2009-2012 ranged from a maximum of US$4.8 million in 2011 and a minimum of US$526,000 in 2009.**




**Some major manufacturers of Quicklime**

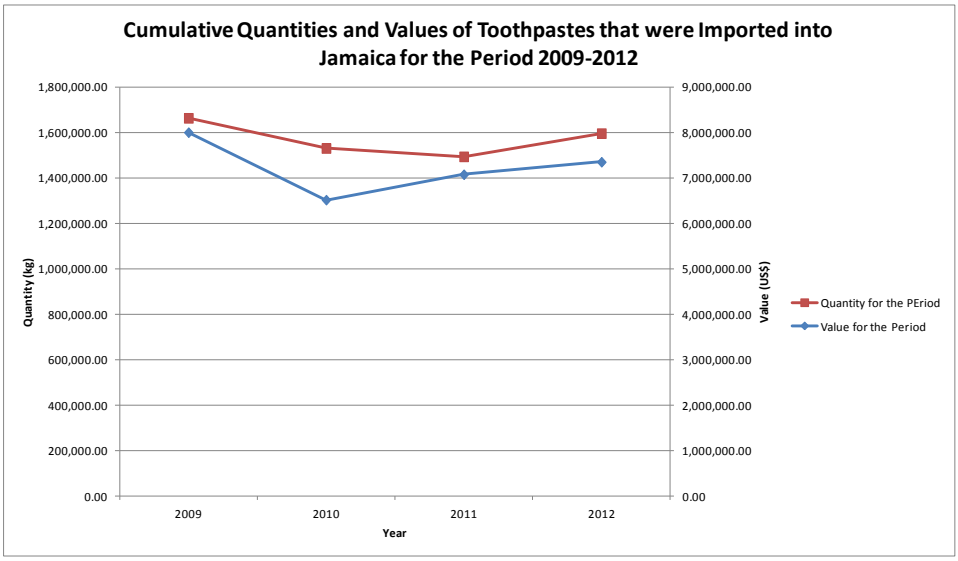
CEMEX | Lhoist | Specialty Minerals Inc. | United States Lime and Minerals Inc.

## Toothpaste

In certain types of toothpaste calcium carbonate is used as an abrasive. The abrasive functions as a scrub to remove plaque and other solid materials from the surface of teeth. The abrasive is also formulated to give the toothpaste a certain type of consistency which affects the behaviour of the paste as it is forcibly discharged from its tubing.

The figure below shows the trend in the quantities and values of toothpaste as they were imported for the period 2009-2012.

**Jamaica's toothpaste imports for the period 2009-2012 ranged from a maximum of US$8 million in 2009 and a minimum of US$6.5 million in 2010.**




### Some major manufacturers of Toothpaste

Colgate-Palmolive | GlaxoSmithKline | Procter & Gamble Company | Johnson & Johnson | Church & Dwight Company Inc. | Unilever

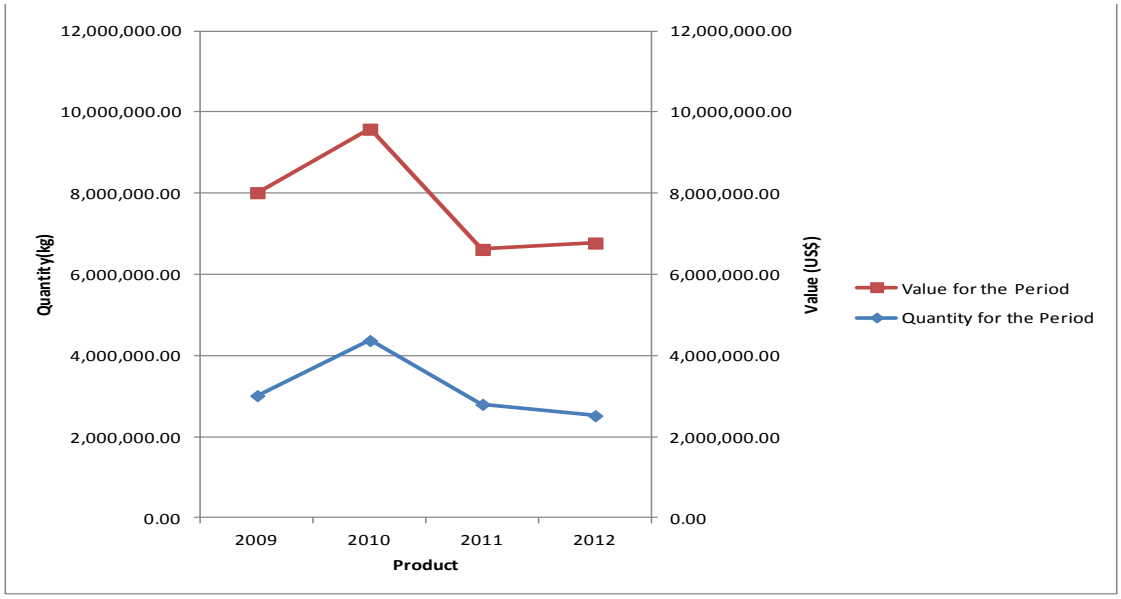
## Plastics

Plastics are synthetic materials made from polymers. They can be molded into structures of varying shapes, strengths, and flexibility depending on their intended application. They are used in the production of frames for windows and doors, electrical conduits, tubes, pipes and hosing.

Calcium carbonate is added as filler in plastics and is used, in part, to modify the materials physical behaviour for appropriate performance under certain impacts or loadings.

**Jamaica's plastic imports for the period 2009-2012 ranged from a maximum of US$9.8 million in 2010 and a minimum of US$6.2 million in 2011.**

**Quantity and Value of Plastics that was imported into Jamaica for the Period 2009-2012**




### Some Major Manufacturers of Plastic

Akro-Mils | Cast Nylons | Colder Products | Omni Industries | Den Hartog | Rubbermaid | Remco Products





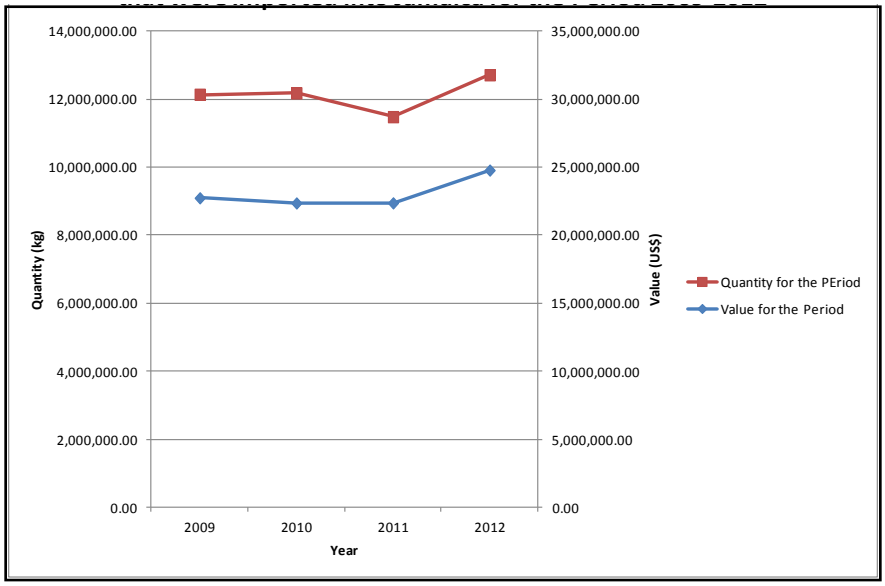
## Paper

Paper has diverse applications including printing, packaging, wrapping, covering, and various household applications related to cleaning and hygiene. It is produced from shredding and processing wood and/or other appropriate vegetative materials to form sheets that are made from the extracted cellulose fibres.

Calcium carbonate is used as a filler to fill the grooves in the sheets of cellulose produced, forming a smooth surface. It also used as a constituent in the pigments that are used to coat certain types of paper in order to give particular colour and gloss to the surface.

**Jamaica's paper products imports for the period 2009-2012 ranged from a maximum of US$25 million in 2012 and a minimum of approximately US$6.2 million in 2011.**

### Cumulative Quantities and Values of Paper Products that were Imported into Jamaica for the Period 2009-2012




### Some major manufacturers of Paper

ARAUCO | Bio-PAPPEL | CMPC | KLABIN | Appleton Coated | Cascades | Procter & Gamble Company





## Appendix 8: Completed Enterprise Fiche Forms

**Company Name**: James Quarry
**Contact Person**: Mr. Krishon James

### ENTREPRISE DATASHEET

| | | | | |
|---|---|---|---|---|
| **ACP COUNTRY: REGION:** Caribbean Region **LAST UPDATE** (Today's date.): 4/11/13<br>**CDE PROJECT OFFICER:**<br>**ANNUAL REPORT YEARS** | | | | |
| **FILE N°:** | **ENTERPRISE DESCRIPTION (in figures)** | | | |
| **PROJECT TITLE (main activity):** Sale of Rough Marl with intentions to produce aggregates later | | **Current** | **Additional (after project)** | **Ex-post ( to be completed after project during evaluation)** |
| **COMPANY NAME:** James Quarry<br>**Contact person:** Krishon James<br>**Address:** 50 Crane Rd Black River.<br>**Telephone:** 353-2444 / 965-2362<br>**Mobile:**<br>**Email:** krishon james @ gmail.com | Investment (€ 1000) ~~22,900.00~~<br>Turnover (€ 1000) ~~45,801.00~~<br>Of which Export (%) ~~0~~ | 22,900.00<br>45,801.00<br>0 | | |
| **Project type** (New or Existing Enterprise): Existing<br>**Structure of capital** (Private , State or Mixed (Public/ Private): Private<br>**Year of company registration:** 1999<br>**Project received via (code and name):** as part of Proposal Submission | Employees 4<br>**Net Value Added** (Earnings before interest and tax (EBIT) + salaries and wages) (€ 1000) | | | |
| **EU PARTNERS ( if any)** None<br>1)<br>2)<br>3) | **COUNTRY** | **TYPE** (Joint Venture (with equity participation); formal (legally binding) partnership agreement; Other non-legally binding co-operation (technical, marketing, training) | | |
| **OTHER ACP PARTNERS (( if any)** None<br>1)<br>2)<br>3) | **COUNTRY** | **TYPE** | | |
| **FINANCIAL INSTITUTIONS INVOLVED**<br>1) National Commercial Bank 2) 3) | | | | |

**DESCRIPTION & COMMENTS**

A. **Existing enterprise with improvement project**
   1. Short description of the enterprise (history, recent performance, main products/activities, market position, etc)
   2. Major issues and programme for improvement.

B. **Investment project**
   1. Outline of proposed investment (project concept, competitive strength, etc).
   2. Promoters/investors (competence, financial strength, etc).

**CDE ELIGIBILITY CRITERIA ( For Information only)**

**Basic eligibility:**

- Private company status
- Based in an ACP country
- In case of EU investment promoter: substantiated project for ACP country location
- Size of enterprise/investment in defined SME range
    - for existing enterprises: minimum total net asset value of € 80,000 or annual sales of € 250,000 (with lower exemptions possible for service companies);
    - for a new enterprise to be established the same amounts apply for planned total investment and expected annual sales, respectively;
    - in either case total net asset value or total investment generally not above € 10 million.

**The following administrative documents should normally accompany your fiche:**

- Proof of company incorporation

**Company Name**: John's Hall Aggregate
**Contact Person**: Paul Marchalleck

## ENTREPRISE DATASHEET

| | | | | |
|---|---|---|---|---|
| **ACP COUNTRY: REGION:** Caribbean Region **LAST UPDATE** (Today's date.): 31/10/13.<br>**CDE PROJECT OFFICER:**<br>**ANNUAL REPORT YEARS** | | | | |
| **FILE N°:** | **ENTERPRISE DESCRIPTION (in figures)** | | | |
| **PROJECT TITLE (main activity):**<br>AGGREGATE PRODUCTION | | Current | Additional (after project) | Ex-post (to be completed after project during evaluation) |
| **COMPANY NAME:** JOHNS HALL AGG.<br>**Contact person:** PAUL MARCHALLECK<br>**Address:** JOHNS HALL P.O. ST. JAMES<br>**Telephone:** 876 4690155<br>**Mobile:** 876 9957986<br>**Email:** paulmarchalleck@gmail.com | Investment (€ 1000) | £2,352,941 | £3,500,000 | |
| | Turnover (€ 1000) | £2,058823 | £4,000,000 | |
| | Of which Export (%) | — | £2,000,000 | |
| **Project type** (New or Existing Enterprise): NEW.<br>**Structure of capital** (Private , State or Mixed (Public/ Private): PRIVATE<br>**Year of company registration:** 1991<br>**Project received via (code and name):** as part of Proposal Submission | Employees | 75. | 100 | |
| | Net Value Added (Earnings before interest and tax (EBIT) + salaries and wages) (€ 1000) | £535,294 | £1,000000 | |
| **EU PARTNERS ( if any)**<br>1)<br>2)<br>3) — | **COUNTRY** — | **TYPE** (Joint Venture (with equity participation); formal (legally binding) partnership agreement; Other non-legally binding co-operation (technical, marketing, training) — | | |
| **OTHER ACP PARTNERS (( if any)**<br>1)<br>2) —<br>3) | **COUNTRY** — | **TYPE** — | | |
| **FINANCIAL INSTITUTIONS INVOLVED**<br>1) J.M.M.B 2) GROBAL LEASING 3) — | | | | |

**DESCRIPTION & COMMENTS**

A. Existing enterprise with improvement project
   1. Short description of the enterprise (history, recent performance, main products/activities, market position, etc)
   2. Major issues and programme for improvement.

B. Investment project
   1. Outline of proposed investment (project concept, competitive strength, etc).
   2. Promoters/investors (competence, financial strength, etc).

- to provide the CDE with an assessment report within the two weeks which follow the completion of the intervention;
- to reply as soon as possible and in the most complete and best possible way to any assessment request from the CDE, up to 24 months after the completion of the intervention.

**[I authorise/I do not authorise]** the CDE to use our name/our project for CDE's promotional purposes (publication in the CDE newsletter or in other specialised magazines).

Done at: **[Location]** JOHNS HALL ST. JAMES Date: 31/10/13

Name PAUL MARCHALLECK

Position CHAIRMAN MAN/DIR

Signature Paul Marchalleck

Company Stamp JOHN'S HALL AGGREGATES LIMITED SEAL

**Company Name**: MGRA Mining & Construction Limited
**Contact Person**: Robert Graham

## ENTREPRISE DATASHEET

| | | | | |
|---|---|---|---|---|
| **ACP COUNTRY: REGION:** Caribbean Region **LAST UPDATE** (Today's date.): 26/10/13<br>**CDE PROJECT OFFICER:**<br>**ANNUAL REPORT YEARS** | | | | |
| **FILE N°:** | **ENTERPRISE DESCRIPTION (in figures)** | | | |
| **PROJECT TITLE (main activity):** CONSTRUCTION AGGREGATE PRODUCTION | | Current | Additional (after project) | Ex-post ( to be completed after project during evaluation) |
| **COMPANY NAME:** MGRA MINING & CONSTRUCTION<br>**Contact person:** Robert Graham<br>**Address:**<br>**Telephone:** (876) 961 2556<br>**Mobile:**<br>**Email:** | **Investment** (€ 1000)<br>**Turnover** (€ 1000)<br>Of which **Export** (%) | 1<br>2<br>0 | 1<br>5<br>0 | |
| **Project type** (New or Existing Enterprise): EXISTING<br>**Structure of capital** (Private , State or Mixed (Public/ Private): PRIVATE<br>**Year of company registration:** 2007<br>**Project received via (code and name):** as part of Proposal Submission | **Employees**<br>**Net Value Added** (Earnings before interest and tax (EBIT) + salaries and wages) (€ 1000) | 10 | 16 | |
| **EU PARTNERS ( if any)**<br>1)<br>2) N/A<br>3) | **COUNTRY** | **TYPE** (Joint Venture (with equity participation) formal (legally binding) partnership agreement) Other non-legally binding co-operation (technical, marketing, training) | | |
| **OTHER ACP PARTNERS (( if any)**<br>1)<br>2) N/A<br>3) | **COUNTRY** | **TYPE** | | |
| **FINANCIAL INSTITUTIONS INVOLVED**<br>1) N/A 2) 3) | | | | |

**DESCRIPTION & COMMENTS**

A. **Existing enterprise with improvement project**
   1. Short description of the enterprise (history, recent performance, main products/activities, market position, etc)
   2. Major issues and programme for improvement.

B. **Investment project**
   1. Outline of proposed investment (project concept, competitive strength, etc).
   2. Promoters/investors (competence, financial strength, etc).

A1. MGRA is a company operating in King's Valley, Westmoreland. We have the best quality limestone in the area and the largest quantity. We have been in a state of dormancy as of late due to financial constraints.

2. Our only problem now is lack of capital. We've alligned ourselves with very knowledgable people in our industry and related industries and have a capable management team. Our equipment is antiquated and underpowered for the task at hand. We need updated machinery.

**Company Name**: South Coast Aggregate Limited
**Contact Person**: Ms. Mitzie Smith

## ENTREPRISE DATASHEET

| | | | | |
|---|---|---|---|---|
| ACP COUNTRY: REGION: Caribbean Region<br>CDE PROJECT OFFICER:<br>ANNUAL REPORT YEARS | LAST UPDATE (Today's date.): 15/11/13 | | | |
| FILE N°: | ENTERPRISE DESCRIPTION (in figures) | | | |
| PROJECT TITLE (main activity): | | Current | Additional (after project) | Ex-post ( to be completed after project during evaluation) |
| COMPANY NAME: South Coast Aggregate Ltd<br>Contact person: Mitzie Smith<br>Address: Brompton, St. Elizabeth<br>Telephone:<br>Mobile: 876-373-5659<br>Email: mitsuesons@yahoo.com | Investment (€ 1000)<br>Turnover (€ 1000)<br>Of which Export (%) | JA $100,000,000<br>JA $60,000,000<br>None | | |
| Project type (New or Existing Enterprise): Existing<br>Structure of capital (Private , State or Mixed (Public/ Private): Private<br>Year of company registration: 2007<br>Project received via (code and name): as part of Proposal Submission | Employees 20<br>Net Value Added (Earnings before interest and tax (EBIT) + salaries and wages) (€ 1000) | Existing | | |
| EU PARTNERS ( if any)<br>1) None<br>2)<br>3) | COUNTRY | TYPE (Joint Venture (with equity participation); formal (legally binding) partnership agreement; Other non-legally binding co-operation (technical, marketing, training) | | |
| OTHER ACP PARTNERS (( if any)<br>1) None<br>2)<br>3) | COUNTRY | TYPE | | |
| FINANCIAL INSTITUTIONS INVOLVED<br>1) None 2) 3) | | | | |

**DESCRIPTION & COMMENTS**

A. **Existing enterprise with improvement project**
   1. Short description of the enterprise (history, recent performance, main products/activities, market position, etc)
   2. Major issues and programme for improvement.

B. **Investment project**
   1. Outline of proposed investment (project concept, competitive strength, etc).
   2. Promoters/investors (competence, financial strength, etc).

Re: South Coast Aggregate Co. Ltd.
Brompton ST-Elizabeth, Jamaica.

AT present the Company makes six inch building blocks from the aggregate mined from the Quarry & we also sell a $\frac{5}{8}$ sized stone to the construction industry to mix concrete & fill block holes. We are the market leader in our region for this size of stone because of the quality of the stone. The other two products that are produced simultaneously with the $\frac{5}{8}$ stone is a $\frac{3}{8}$ sized stone & stone dust. We use these to make building blocks & sell a small amount for other purposes. Because these aggregate are so slow moving to sell, we have hundreds of tons of it piled up all over the quarry.

It is our intention to take the quarry to the next level by ① Washing the stone dust to get lime stone sand which can be used to mix concrete instead of the river sand ② Recrush the $\frac{3}{8}$ stone & sell it back as a pulperized grade ③ start producing ground Calcium Carbonate (GCC) & also precipitated Calcium Carbonate (PCC). Please bear in mind that in our region (which makes up nearly a third of the island) there is no river sand so there is a huge market for limestone sand. The GCC & PCC can be used in our local industries & can also be exported. Thanks for your interest in the South Coast Aggregate Co. Ltd.

**Company Name**: Lydford Mining Company
**Contact Person**: Mr. Leo Cousins

## ENTREPRISE DATASHEET

| | | | | |
|---|---|---|---|---|
| **ACP COUNTRY: REGION:** Caribbean Region **LAST UPDATE** November 20 2013<br>**CDE PROJECT OFFICER:**<br>**ANNUAL REPORT YEARS** | | | | |
| **FILE N°:** | **ENTERPRISE DESCRIPTION (in figures)** | | | |
| **PROJECT TITLE (main activity):**<br>Mining, Processing, High Purity Limestone | | Current | Additional (after project) | Ex-post ( to be completed after project during evaluation) |
| **COMPANY NAME:** Lydford Mining Company<br>**Contact person: Leo Cousins**<br>**Address:** 35 Millsborough Crescent, Kingston, Jamaica, W.I.<br>**Telephone:876 927 6306**<br>**Mobile: 876 383 1926**<br>**Email: lydmin@cwjamaica.com** | Investment (€<br>Turnover (€<br>*Of which*<br>Export *(%) 80%* | 1,485,000<br>3,000,000<br><br>2,400,000 | 3,000,000<br>3,000,000<br><br>4,800,000 | 4,485,000<br>6,000,000<br><br>7,200,000 |
| **Project type (Expansion of Existing**<br>**Structure of capital** Private<br>**Year of company registration:** 1992<br>**Project received via (code and name):**<br>as part of Proposal Submission | Existing Employees<br>Net Value Added (Earnings before interest and tax (EBIT) + salaries and wages) *(€ 1000)* | 45<br>717,000 | 10 | 55<br>2,151,000 |
| **EU PARTNERS ( if any)**<br>**1)** None<br>**2)**<br>**3)** | **COUNTRY**<br>Nil | **TYPE** (Joint Venture (with equity participation); formal (legally binding) partnership agreement; Other non-legally binding co-operation (technical, marketing, training)<br>Nil | | |
| **OTHER ACP PARTNERS (( if any)**<br>**1) None**<br>**2)**<br>**3)** | **COUNTRY**<br>Nil | **TYPE**<br>Nil | | |
| **FINANCIAL INSTITUTIONS INVOLVED**<br>**1)** None **2)** **3)** | | | | |

**DESCRIPTION & COMMENTS**

**Existing enterprise with improvement project**

A.

1. Short description of the enterprise (history, recent performance, main products/activities, market position, etc)

   Commenced in 1992 supplying raw limestone to US customers – expanding into high value added products in limestone – shipping in 45,000 tonnes carriers to USA, Chile and in containers to Caribbean area – using Port of Ocho Rios in Jamaica as export terminal

2.

Mining, Processing, Milling & Exporting High Purity Limestone for Paints, Plastics, Pharmaceutical and Food Products, Desulphurization Limestone for Scrubbing Carbon Dioxide from coal fired power stations

2. Major issues and programme for improvement.

Setting up a new Food & Drug, milling, classifying, plant with buildings, laboratory testing facilities, sterile packaging line at a cost of Euro $ 3,000,000. The money would be used to purchase 10 tonne per hour milling plant, dryer, and twin classifiers to fine grind the material to 200 and 400 mesh in bulk for industrial, food and pharmaceutical uses.

**B. Investment project**

Outline of proposed investment (project concept, competitive strength, etc).

The project is an extension of an existing mining, crushing, screening, milling operation at Saint Ann in Jamaica exporting 200,000 tonnes high purity raw limestone and detects an opportunity to expand into Latin America, USA and Europe to a total of 1,000,000 tonnes per annum in three to four years in food and drug, plastics, paints, pharmaceutical. Fertilizer pellets etc A/2 above describes the additional machinery required

2. Promoters/investors (competence, financial strength, etc).

Private Partnership – Leo Cousins, Mechanical Engineer & Vincent Hill, Geologist
Boldec Consulting Valuators Estimated current market value Euro 8,000,000
Debt Bank of Nova Scotia loan Euro 112,000 working capital
There are no other debts beside the bank loan
Projected Export sales for next three years,
2014 3,000,000 Euros
2015 5,000,000 Includes food and pharmaceutical grades
2016 7,200,000 Includes construction/and GCC to Latin America & Caribbean

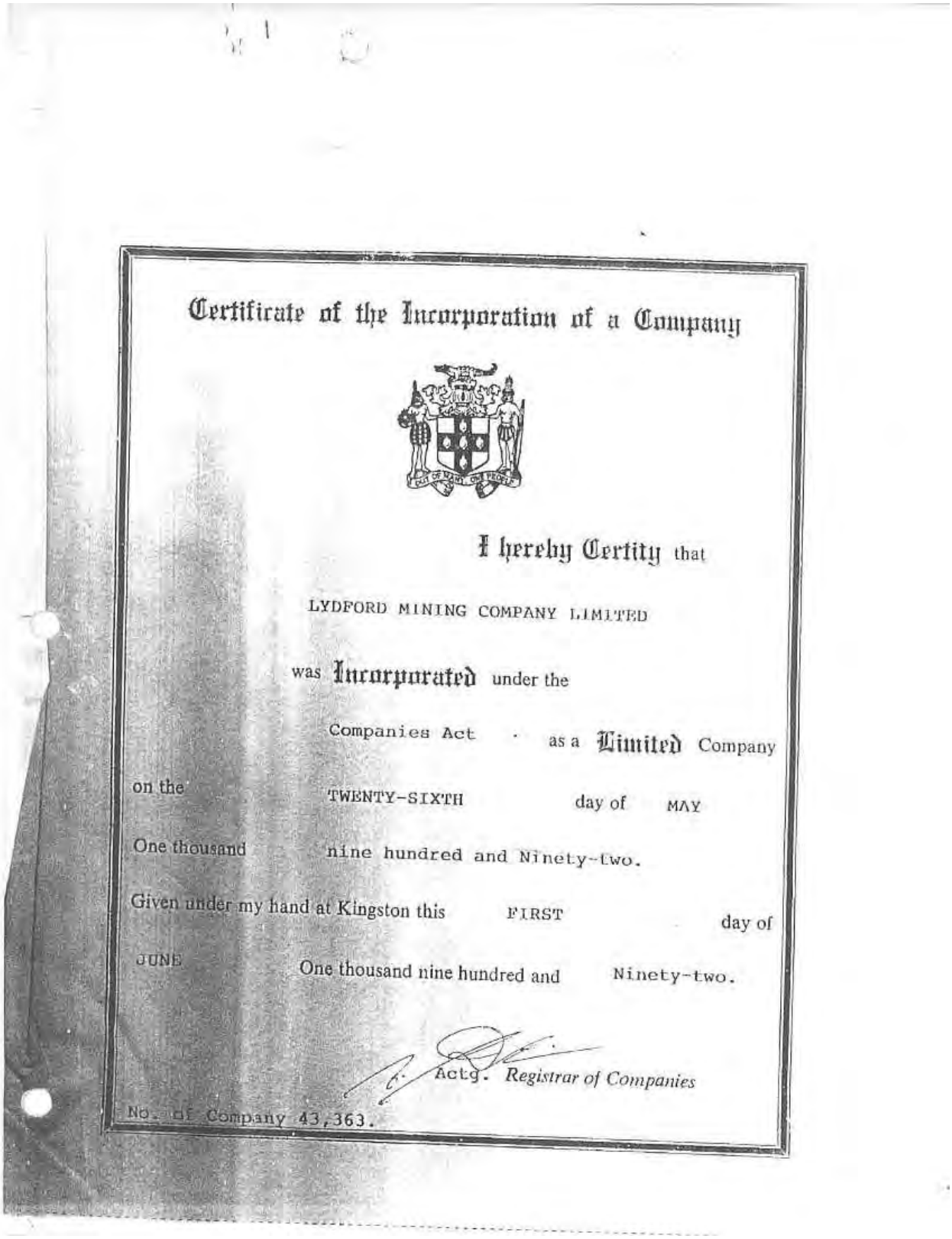
**CDE ELIGIBILITY CRITERIA ( For Information only)**

**Basic eligibility:**

- Private company status
- Based in an ACP country
- In case of EU investment promoter: substantiated project for ACP country location
- Size of enterprise/investment in defined SME range
  - for existing enterprises: minimum total net asset value of € 80,000 or annual sales of € 250,000 (with lower exemptions possible for service companies);
  - for a new enterprise to be established the same amounts apply for planned total investment and expected annual sales, respectively;
  - in either case total net asset value or total investment generally not above € 10 million.

**The following administrative documents should normally accompany your fiche:**

- Proof of company incorporation



Certificate of the Incorporation of a Company

I hereby Certify that

LYDFORD MINING COMPANY LIMITED

was Incorporated under the

Companies Act as a Limited Company

on the TWENTY-SIXTH day of MAY

One thousand nine hundred and Ninety-two.

Given under my hand at Kingston this FIRST day of

JUNE One thousand nine hundred and Ninety-two.

Actg. Registrar of Companies

No. of Company 43,363.

## Appendix 9: Photo Inventory


**Plate 1: Drilling in Preparation for Blasting**


**Plate 2: Breaking of boulders**


**Plate 3: Drilling in the process of establishing benching**


**Plate 4: Quarry benched**


**Plate 5: Quarry site showing minimal benching**


**Plate 6: Quarry Site Showing No Benching**


**Plate 7: Material Stockpiled for Crushing**


**Plate 8: Conventional Crushing and Screening Systems**


**Plate 9: Conventional Crushing and Screening Systems**


**Plate 10: Conventional crushing and screening systems in need of upgrade**


**Plate 11: Crushing and Screening System in Series**


**Plate 12: Crushing and Screening System Fed by Excavator**


**Plate 13: Multiple products screening**


**Plate 14: Material Stockpiled**


**Plate 15: Material Stockpiled**


**Plate 16: Palletized Products Stored in Warehouse**


**Plate 17: Agricultural Grade Limestone Products Stored in Warehouse**


**Plate 18: Weigh Station**


**Plate 19: Maintenance Area**


**Plate 20: Machinery (Excavator) used at Quarry**


**Plate 21: Machinery and Equipment out of Service**


**Plate 22: Block Stored outside for Drying**


**Plate 23: Typical Block Making Factory integrated within Quarrying Operations**