Guidelines for the Production of Development, Rehabilitation and Closure Plans for Quarry Leases in accordance with the **Mining Act** and the **Quarry Materials Act, 1998**.

A quarry operating under a quarry lease is considered a project and must meet the requirements of the **Mining Act** as well as the **Quarry Materials Act, 1998**. For a project to operate, the **Mining Act** requires that a development plan, a rehabilitation and closure plan, and financial assurance acceptable to the Minister be in place. This document outlines the information required in these plans under the Acts and their Regulations for quarry materials.

For quarries, the Development, Rehabilitation and Closure plans are to be combined into one document. In accordance with Section 8 of the Quarry Materials Act, Quarry Lease Development, Rehabilitation and Closure (DRC) Plans must be revised and updated at least once every five years. So as not to involve any non-compliant hiatus, DRC plans must be submitted at the end of the prior cycle in time to be reviewed, revised and accepted and the paid financial assurance adjusted. R&C only Plans may be relevant to final termination.

DRC Plans must include, but not necessarily be limited to, the following sections:

1. Introduction
2. Site Development
3. Quarry Operations
4. Rehabilitation and Closure
5. Cost Estimates and Financial Assurance

The DRC Plan must take into account certain important aspects of quarry leases and quarrying operations including:

- Rock quarry faces must not exceed 10 metres in height;
- Excavation faces in unconsolidated materials must not exceed 5 metres in height;
- Quarrying is not permitted to result in excavation of material below the water table without the prior written approval of the Minister or result in the accumulation of water (water-ponding)
- No building or structure, including structures with concrete foundations, campers and/or RV trailers, nor non-conforming use shall be permitted on the lease without the prior written approval of the Minister; and
- The area shall be kept free of refuse, abandoned vehicles and equipment, and any derelict structures.

Table of Contents – all parts of the report should be itemized in the Table of Contents, including text sections and subsections, tables, figures, plates, drawings and appendices, and everything in the Table of Contents must be referred to in the text.

1. Introduction including:-

(1) Report information:

a) List of Quarry Leases with file numbers and the area of the quarry in hectares;
b) Leaseholder +/- company details; and
c) List of Contributors and the sections for which they are responsible.

(2) Geography:

a. Location with page-size map of the local region;
b. Access with Site Location Plan (larger-scale image) showing
    - Entire Quarry Lease;
    - Local infrastructure / transportation network;
    - Access from local infrastructure / main transportation route;
    - Access from the nearest road to the quarry site. Note, access to the quarry must not require travel through other permitted/leased areas. Each quarry operator must have unobstructed access;
    - Access to the site must be restricted at the quarry boundary to prevent unauthorized access; and
    - Surrounding land use (to approximately 300 metres from lease boundary); and
c. Physiography and Drainage.

(3) Geology (description of the resource).

(4) Type of quarry:

a. Overburden or bedrock; and
b. Production methods.

(5) Purpose of quarry:

a. Production materials;
b. Market; and
c. Any other considerations; and

(6) Any other notes/preambles as desired, e.g., reference documentation.

2. Site Development:

(1) History (brief with dates):

a. Purchase (with small-scale, closest-time-available satellite image);

b. Site Development (clearing and preparation);
c. Production (up to start of present cycle); and
d. Previous Work (if any).

(2) Site Plan (large-scale map or image, approx. 1:500 or as appropriate) as of the start of the cycle showing in detail all areas of project activities including:

a. Pit outline with location of boundary/corner markers (the plan must extend to at least 10 metres beyond the lease boundary, and must include all off-lease ground disturbance);

b. All natural physiographic features including:
   - Topographic features (outcrop, hills, cliffs, steep slopes, etc.);
   - Water bodies (ponds, streams, etc.); and
   - Vegetation (forest, wetlands, etc.);

c. All non-natural features including:
   - Berms;
   - Stockpiles and dumps (e.g., overburden, grubbing/topsoil, oversize rock) with calculated volumes noted on the plan;
   - Areas of development/quarrying and reclamation completed under previous quarry permits/leases by the current operator or others;
   - Drainage/diversion/de-watering ditches and drains; and
   - Sedimentation ponds;

d. Operational infrastructure and associated approvals:
   - Internal boundary buffers for rehabilitation purposes;
   - Access roads with water crossings (culverts, bridges);
   - Access and haulage ramps;
   - Power/pole lines, pipelines, cables, generators;
   - Water and sewer, wells, septic fields, chemical toilets;
   - Buildings (office, warehouse, maintenance/garage, scale-house), trailers, C-cans, storage bins, etc.;
   - Fuel storage;
   - Explosives magazines/plant;
   - Plant (asphalt and/or concrete batch plants); and
   - Equipment (crushing, screening, washing, conveyors, scales).
   - Must include all features of the quarry that are greater than 1 metre across as of the date of the plan, even if some of them are temporary or mobile.

3. Quarry Operations:

(1) Description of the project including:

a. Overview and anticipated general timelines for the duration/completion of all stages of the project including:
   - Clearing/stripping;
   - Mining/excavation;
   - Rehabilitation and Closure; and
   - Life of Quarry:

b. Detailed discussion of projected elevation of the water table (+/- map) including the effects of topography and of variation in seasonal climate and local weather conditions;

c. Demonstration that the boundary buffers are adequate (with calculations) and, if not, explanation of from where the extra material will be sourced;

d. Details of the handling of:
   - Grubbing (trees, organics/topsoil/rusty layer);
   - Overburden;
   - Oversize rock, waste material and/or fines; and
   - Surface water accumulation;

e. Description of the quarrying process including:
   - Excavation;
   - Details of water usage and siltation/contamination controls;
   - Drilling and Blasting method (details of spacing, depth, blast size and frequency);
   - Mining blocks and/or benches on an annual basis;
   - Table of bench heights and rock resources per block (subtotalled by bench);
   - List of the major mining plant (e.g., crusher array, batch plants) and equipment;
   - Details of the plant (with dimensions, capacities, throughputs, etc.);
   - List of the planned onsite workforce;
   - Estimated/planned capital and operational expenditures; and
   - For seasonal operations, approximate start-up and shut-down

f. Plans and Sections (large-scale, approx. 1:500 or as appropriate) showing:
   - Pit boundary and location of boundary buffer zones;
   - The mining sequence in plan by block and/or bench;
   - All blocks and benches in cross- and longitudinal-section;
   - Access and haulage ramps; and
   - Any other important quarry features.

g. Non-compliance issues including, for example:
   - Off-lease ground disturbance;
   - Non-conforming usage of the quarry site (add permissions from the Department of Industry, Energy and Technology to the relevant appendix);

- Presence of disallowed structures, equipment or materials;
- Quarry faces exceeding 10 metre; unconsolidated excavation faces less than 5 metres;
- Surface water ponding;
- Time lines for redress of each non-compliance issue.

4. Rehabilitation and closure:

(1) Goals and objectives, e.g., common examples include:

a. To restore the affected area to a physically and chemically stable and safe state in order to protect public health and safety;
b. To reduce or eliminate potential adverse environmental effects;
c. To decommission and rehabilitate the project site to a land use similar to its original use or an acceptable alternative; and
d. To return the property to the Crown/Municipality for long term care or use after monitoring demonstrates that closure objectives have been met;

(2) Description of the rehabilitation process including:

a. Details of the rehabilitation method;
b. Description of any rehabilitation blasting and/or sloping;
c. Placement of oversize rock and/or imported construction materials;
d. Placement of overburden*;
e. Revegetation*;
f. Schedule of progressive rehabilitation with reference to the mining sequence; and
g. Plans and sections (large-scale, approx. 1:500 or as appropriate) including:
    - Location of all rehabilitation;
    - All fill (with fill type) and rehabilitation sloping in cross- and longitudinal-section; and
    - New Site Plan (large-scale) showing the projected configuration assuming that, at the end of the five years, operations have been terminated and the site remediated and closed;

(3) Removal of infrastructure, buildings, plant and equipment; and

(4) Statement describing any likely/required long term management of the site.

Note: it is not necessary to dress and vegetate pit wall slopes if the wall is adjacent to another quarry. Proceeding via natural re-generation, in lieu of assisted re- vegetation, requires the approval of the Manager of the Quarry Materials Section.

5. Cost estimates and financial assurance:

(1) Description of the derivation of the financial assurance**:

a. Logic behind the calculation methodology;
b. Justification/itemization of all numbers in the calculations including;
   - Areas and volumes (supported with graphics and formulae);
   - Removal of any plant, buildings, infrastructure or excess material; and
   - Unit costs (must include labour, materials and equipment at third party or independent rates in current year dollars and with no escalation, contingency or HST).

(2) Financial assurance table:

a. Numerical calculations used to generate the costs; and
b. columns for progressive rehabilitation, closure and total financia liability for the **entire** quarry at the end of each year or production block.

(3) Financial assurance comments:

a. "A qualified person" must provide a signed, stamped statement to the effect that the estimate of the cost of completing the work set out in the rehabilitation and closure section is reasonable and that they have an arms length relationship to the project and its principals;

b. Financial assurance in the amount of the highest annual financial liability during the 5-year period, without credit for planned progressive rehabilitation, must be provided in a form acceptable to the Minister

c. The amount of financial assurance is subject to annual review and possible adjustment:
   - Any substantial increase in barren/exposed ground must be covered by a corresponding increase in the financial assurance;
   - Any substantial decrease in barren/exposed ground due to remediation work may allow a corresponding decrease in the amount of financial assurance required; and
   - A quarry operator may request a reduction in the amount of financial assurance required by writing to the Minister and explaining the reason for a reduction (e.g., significant decrease in area to be utilized during this cycle or allowance for rehabilitation already completed). An inspection will be done to determine if the reduction in financial assurance is justified.

6). Closing comments/conclusions

7). References (if any)

Appendices, for example:

A. Copy of the Quarry Lease(s), and signed and stamped legal survey(s) and legal survey diagram(s);
B. Oversize drawings;
C. Environmental Assessment ("EA") documentation (e.g., EA Registration document, Environmental Preview Reports, EA Release Conditions). Copies of all additional permits, licences, approvals and authorizations;
D. Annual Reports (for the 5 years of the prior plan) with production forms;
E. Whatever else might be appropriate/needed to elucidate the operations text;
F. 3rd-party cost estimates, cost-derivation formulae, financial assurance calculations, financial assurance tables (if not in text), qualified-person cost approval (signed and stamped);
G. Author/contributor qualifications (signed and stamped) +/- limitations or statement of liability;
H. Contractor signed letter of approval including the understanding that:
    - Any deviation from the mining progression of the DRC Plan is a violation of the **Mining Act**;
    - Any changes to the DRC Plan must be described in an Annual Report; and
    - Any changes to the DRC Plan may result in an increase in the financial assurance.

Notes:

- There is nothing to stop one preparing a life of quarry and related final closure plan (though this may not be the time-saver expected as, due to the vagaries of the market, sticking to a long-term plan will be rare), however, there **must** be included complete termination details and costs for each year of the current 5-year cycle.

- It is recommended that the Guidelines be used like a checklist. Items not relevant or applicable to a particular DRC Plan could, perhaps, still be noted thus in the text to avoid the impression that they may have been overlooked.

- Add other items/features as required.