Guide for Surface Coal Mine Reclamation Plans

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NOVA SCOTIA
Environment

Policy and Corporate Services Division
Environmental Assessment Branch

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1.0 INTRODUCTION:

Coal has been mined in Nova Scotia for over 300 years. Surface and underground coal operations have made significant economic contributions to the province, including fuel, steel manufacturing and electrical generation. Excavation is the primary means for recovering coal resources, which produces environmental disturbances. The mining industry in Nova Scotia must continue to adapt to new standards and regulatory requirements for responsible development of mineral resources, which includes integrating environmental issues with economic planning.

Mine reclamation is an integral part of the mineral development process. It is designed to restore to an acceptable state the physical, chemical, and biological quality of land and water regimes disturbed by mining. This 'Guide for Surface Coal Mine Reclamation Plans' has been developed by Nova Scotia Environment in collaboration with the Department of Natural Resources. It includes best management practices for surface mine reclamation within Nova Scotia's coal mining industry. It will also provide communities with greater certainty regarding sustainable environmental practices with respect to reclamation of surface coal mines. A glossary of terms used in this guide is provided at the end of the document.

2.0 APPLICATION:

Both the Department of Natural Resources, and Environment, are accountable for specific responsibilities under the *Mineral Resources Act* and the *Environment Act* regarding reclamation of surface coal mines. Both Departments share responsibility for review and approval of surface coal mine reclamation plans submitted by industry. Common guidance is appropriate and should assist regulatory reviews by both agencies. Specifically, this guidance is intended to provide a framework for industry to use in their reclamation planning and during environmental assessments, industrial approval processing and submissions to the Departments of Natural Resources and Environment.

It is recognized that reclamation plans need to remain flexible and adaptable to changes in site characteristics, mine plans, geology, and long term end land use changes. Such plans should be practical, achievable and be prepared in conjunction with community input. Specific details may be readjusted consistent with good operations and industry best management practices. Plans should also be evaluated by proponents on a regular basis during operations and updated accordingly. Where guidance provided in this document differs from regulated requirements within the province, regulations shall prevail.

3.0 PRINCIPLES OF RECLAMATION:

The overall objective of a reclamation plan is to produce a landscape that is safe, stable and compatible with the surrounding landscape and final land use. While recognizing that each mine site has unique characteristics, there are principles that are applicable to all surface mining operations and serve as the foundation for planning and implementing reclamation plans for surface coal mines in Nova Scotia.

Best practices in reclamation planning and management

Mining operations are temporary land use activities and should be conducted with understanding and respect for the environment. Use of reclamation planning and environmental management that aims for sustainability is encouraged in all aspects of reclamation planning, design and implementation. Plans must be science-based, comprehensive in scope and mitigate against safety hazards and environmental effects. Reclamation should be conducted as the operation proceeds.

Applied principles of ecological restoration

A central purpose in reclamation planning should be to promote the ecological integrity of each site and surrounding landscapes. The application of ecological restoration principles requires that plans are developed consistent with regional or landscape level ecological objectives. At the local scale, this involves an examination of surrounding landscapes, in combination with determining predicted successional trends of vegetation communities appropriate to enhance local and regional ecosystems. At the site level, emphasis is placed on reclamation techniques such as land-form replication and planting species that will promote site stability and sustainability. Revegetation should use native species that contribute most to the compatibility of the local ecology.

Compatibility in land use, land cover and landscape design

Surface mining also has the potential to visually impact natural scenery, open landscape character and/or the cultural landscape of adjacent lands. Final reclamation plans and designs should ensure that post-mine or sequential land use or land cover objectives are identified, clearly described and compatible with surrounding landscapes. Landscape design and visual impact assessments should be incorporated into the reclamation planning process. After reclamation is completed and the operation closed, the site should be self sustaining and/or suitable for an identified or predetermined future land use.

Public consultation and Informed decision-making

While respecting landowner prerogatives, surface coal mining activities should provide consideration to community priorities, needs and interests. Reclamation projects can provide lasting benefits to local communities and interested stakeholders can provide important information for plans and decisions that determine reclamation objectives and final land use decisions. Communication and consultation among all parties should be comprehensive, meaningful and timely. Consultation tools can and should include citizen liaison committees and public information sessions.

4.0 STANDARD SUBMISSION REQUIREMENTS FOR A RECLAMATION PLAN

Proposed reclamation plans will include the following requirements:

- proposed life-span of the mine
- schedule for progressive mine reclamation[1]
- time-line for the completion of final reclamation and closure
- existing land use
- range of post mine land uses evaluated
- technical and socio-economic factors associated with the range of post-mine land uses evaluated
- the proposed post-mine land use (natural, conservation or redevelopment)
- existing features of environmental significance
- description of any planned biodiversity offsets (if applicable)
- scaled figures and maps depicting the projected maximum footprint of the proposed mining area over the life of the mine
- detailed plans for progressive mine reclamation
- a conceptual final reclamation plan for the final closure of the mine
- a mitigation and monitoring plan for subsidence, spontaneous combustion and acid rock drainage where appropriate
- summary of any public issues raised in relation to mine reclamation and how they have been addressed
- a detailed cost estimate associated with reclamation

[1] Progressive (or concurrent) reclamation that minimizes the extent of site disturbance by continually reclaiming disturbed sites as soon after the disturbance as practical.

5.0 PLANNING FOR RECLAMATION:

A clear objective for reclamation and final land use should be defined by mine proponents and/or the land owner. Taking the time to plan the various aspects of reclamation early in a project will be of benefit. Reclamation planning should reflect the four principles of reclamation and consider, but not be limited to, the following elements:

- *Community involvement:* Extraction is a temporary activity and as temporary occupiers of the land, mining proponents should conduct their business to facilitate post-extraction land use. In proposals for re-development, community and environmental stewardship should be included in the planning and operational stages of the plan. In either case, proponents are encouraged to engage the community during the planning process.

- *Progressive Reclamation:* Proponents are encouraged to use progressive reclamation whenever possible.

- *Visual impact assessment:* Surface mining has the potential to visually impact the natural landscape. A visual landscape assessment incorporated into reclamation planning should provide certainty that the final site design will be compatible with viewsheds within surrounding natural landscapes.

- *Compatible land-use/land cover*: Reclamation and mine closure should provide land that is restored to a condition that matches surrounding land cover or accommodates another land use identified in the final reclamation plan. Subsequent uses can be oriented toward conservation, recreation or development objectives or combinations of these. Final reclamation plans should ensure that subsequent land use/land cover objectives are clearly identified, described and are compatible with the surrounding land use and landscape.

- *Top Soil Management*: Sustainable practices applied to soil management and replacement are vital to establishing a self-sustaining cover of vegetation in reclaimed areas. Top soil should be preserved for reclamation wherever possible and soil quality should be protected during moving and storage. Soil management should consider issues such as:
  - quality assurance during excavation,
  - identifying stockpile locations to maintain soil quality
  - temporary seeding
  - permanent vegetation of stockpiles to control erosion and invasive plant species

Natural chemical fertilizers should be used in addition to considering moisture-holding

capacities, drainage, mulches, and compaction of the soil. Where little or no topsoil exists prior to mining, it may be necessary to amend, manufacture or import soils depending on the final land use and site conditions.

- *Revegetation Planning*: A key element of successful reclamation projects is the establishment of a self-sustaining, succession-based vegetation cover through the application of native seed mixtures and plant materials. This should include a "revegetation plan" to establish the goals for vegetation at the site at the start. Revegetation plans should mimic surrounding non-disturbed areas or encourage specific ecosystem establishment, incorporating strengths of both native and non-native species and strengths of natural and managed growth. This approach is referred to as successional reclamation, which refers to a multi-staged process that relies on different treatments over a period of time.

- *Ecological restoration using sucessional revegetation methods where appropriate:* This approach to reclamation planning is encouraged so that the eventual plant community promotes native species. Selection of native species is encouraged. Through this process the initial use of non-native species will be succeeded by native species. This cover is important as it is considered to be the bridge between initial colonizers and later developing vegetation. Protection of remaining patches of the original vegetation is encouraged to increase seed propagation and improve conditions for natural regeneration of native species.

- *Prevention of erosion and sedimentation*: Grasses and legumes may be required for temporary erosion control and soil rehabilitation. Reclamation plans that involve erosion protection with revegetation must aim to encourage native vegetation and describe appropriate seed recipes, seeding and transplanting techniques.

- *Prevention of acid rock drainage:* For sites that have been identified as acid generating, reclamation plans to avoid acid rock drainage must be considered at the start of mine planning and carried forward through final rehabilitation and monitoring.

- *Site disturbance:* Issues from past mining operations such as acid rock drainage, old infrastructure, subsidence, underground workings, spontaneous combustion of waste and open portals should be addressed in the reclamation plan. Remediation of historical mine features can be a positive result from surface mining and needs to be identified.

The various aspects of reclamation planning are discussed in detail in the following pages.

6.0 LANDSCAPE DESIGN

Landscape design or re-shaping a site is an essential aspect of the reclamation plan. Good mine planning and design can reduce the amount of re-shaping of waste or overburden piles that is required during or after completion of mining. The final land form must be stable and hydrologically compatible with the surrounding area. The objectives for land forming that should be included in the plan are as follows:

- provide stability by reducing slope angles. Slopes greater than 3:1 (18^0) should be kept shorter than 20 metres by means of breaks in the slope, such as uneven or irregular terraces, berms or basins.
- minimize erosion. Steeper slopes result in increased surface water runoff velocities. Long, uniform slopes should be avoided as they may erode severely during a single storm event.
- contour aesthetically pleasing landforms consistent with surrounding topography.
- promote successional reclamation.

7.0 REVEGETATION

Revegetation of disturbed lands from surface coal mining is essential for effective and successful reclamation. Planning revegetation requires a knowledge of the pre-existing conditions and a vision for the long term integrity of the system that remains after mining is completed. Reclamation plans will include specific strategies that are used to:

- stabilize surface materials and prevent erosion
- manage topsoil
- enhance natural vegetation growth and establish self-sustainable vegetation growth using native species
- ultimately support future land use identified in reclamation plan

When determining appropriate revegetation measures for a site, the following items should be considered:

- future land use or land cover (either natural, conservation or redevelopment)
- climatic conditions including mean daily temperature, the frost free period, the growing season, the amount and timing of precipitation and the prevailing wind
- size of the area requiring revegetation in order to assess material requirements (e.g. seed and soil amendment)
- contouring to mimic local topography and blend into surrounding landscape consistent with future land use or land cover
- presence of water bodies, wetlands, sensitive ecosystems or other special considerations both pre and post mining
- availability of stockpiled materials for revegetation
- success of natural revegetation and species present

- contouring or constructing works to ensure proper drainage or re-establish previous drainage
- presence of erosion prone areas, and the necessity for erosion control work, including the use of bio-engineering techniques.
- soil characteristics including texture, pH, moisture regime, soluble salts and content of nutrients and organic matter and required amendments that may affect revegetation success
- use of original or native species present on the site
- re-use of soils on the site that were shifted during mining activities
- timing of seeding to coincide with optimal germination times of April 15-June 1 and August 15- October 15
- timing of seeding to coincide with placing the final lift of soil

8.0 SITE PREPARATION

Reclamation plans should address the following :

- an overburden analysis of each major strata on the proposed mine site to determine rock type, texture and thickness and to analyse for chemical and mineral parameters in order to determine what strata is best suited for the top lift of mine soil for revegetation
- the identification early in the reclamation planning process where topsoil substitutes from deeper soils on the site are required and to store this material separately
- the application of top soil to a depth sufficient to maintain adequate root growth and nutrient requirements
- the incorporation of organic materials, mulches, pH adjustment, fertilizers and any other soil amendments based upon soil assessment
- the mixing of original topsoil with deeper topsoil substitutes at final grading to ensure proper inoculation of soil microbes and the slow release of nutrients
- minimize compaction of the final lift of soil by end dumping and placement with dozing equipment to avoid excessive compaction
- the scarification or ripping of flat surfaces which may have been compacted by heavy equipment
- providing appropriate site drainage to prevent ponding and water erosion on revegetated and other rehabilitated areas
- establishing windbreaks to prevent wind erosion on revegetated and other rehabilitated areas
- the use of annuals/perennials for quick cover and provision of soil nutrients for successional vegetation

When revegetating transportation or utility corridors or other disturbed areas, the following rehabilitation measures should be considered for implementation into the reclamation plan;

- scarifying or ripping corridors after they are no longer required for site inspection and monitoring, so that vegetation can be established
- grading and contouring to fit the surrounding landscape
- applying topsoil and other amendments where required to improve initial and sustainable growth
- any additional measures as required to promote adequate and sustainable revegetation

9.0 SITE MONITORING AND MAINTENANCE

Reclamation plans should include site monitoring, and schedules, by the proponent for the following:

- monitor progress of revegetated areas following initial planting until vegetation is successfully established
- regularly conduct soil analyses for nutrients and pH until vegetation is demonstrated to be successfully established
- take corrective action in areas showing evidence of erosion, sedimentation or slope failure
- take appropriate measures to address evidence of excessive vegetation stress, invasive species or poorly established areas
- a longer term monitoring schedule to determine any necessary site restoration repairs, and to review progress toward development of a self sustaining ecosystem

10.0 BACKFILLING

Backfilling of surface mines is highly recommended. Otherwise, methods that ensure public and wildlife safety must be identified in the reclamation plan. Backfilling is critical in or near areas populated by humans. If the post-mining land use includes structures located on backfilled excavations, the reclamation plan needs to specify how and when the backfill material is structurally sound and stable.

Considerations related to backfilling include:

- any contaminated materials such as spilled fuel oil, asphalt and solid waste must be removed from the site and disposed of at an approved facility prior to backfilling
- construction and demolition debris shall not be used as backfill
- the prevention of subsidence in backfilled material
- the estimation of compaction and settling rates and how these will affect future land use

11.0 FLOODED EXCAVATION MANAGEMENT

Flooding may be used to rehabilitate an open excavation if justified in the closure plan and such flooding is part of planned future land use. The reclamation plan to support a flooded pit must include:

- final maximum and minimum water elevations
- to prevent inadvertent walk off and safety issues, the shoreline should be graded to a gentle slope which extends 2 metres below the low water mark of the flooded pit
- if pit flooding is planned, the potential for acid mine generation or mitigation must be addressed in the reclamation plan
- shoreline and riparian revegetation should be established to enhance the development of aquatic or wetland habitat
- overflow from flooded excavations should be directed to a properly designed drainage ditch such that siltation and erosion are minimized, and remain below levels established in approvals and/or regulations

12.0 OTHER OPTIONS

Sloping the final pit walls may also be used to reclaim a surface mine if justified in the closure plan as being more appropriate than backfilling or flooding, and sloping “fits” with planned future site use.

If backfilling, flooding or sloping are not practical, then boulder fencing or berming may be used if fully justified in the closure plan and this option “fits” within the planned future use of the site.

Where a surface mine has a single vertical or near vertical drop of greater than 3 metres and a bench width of less than 3 metres and is not to be reclaimed by sloping or backfilling, a geotechnical study and report signed by a professional engineer shall be provided to state the long term stability of the structure.

13.0 DECOMMISSIONING OF EQUIPMENT AND INFRASTRUCTURE

All equipment and buildings erected on site for the mining operation should be dismantled and removed as part of the reclamation process, unless they form part of the future land use infrastructure.

13.1 Buildings

Buildings may be constructed to last a few years or several decades, depending on the anticipated life of the mine operation. Buildings for short term use should preferably be prefabricated structures that can be easily dismantled at the time of

closure and reclamation. Such structures should be totally removed from the site and may be disposed of at an approved facility or reused elsewhere. Foundations comprised of concrete should be broken up, buried or removed in accordance with applicable waste management regulations.

13.2 Equipment

Equipment may include items such as crushing and screening units and coal wash plants. All units must be removed from the site as part of reclamation. Fixed equipment and structures such as weigh scales may also have concrete pads or footings and these should be broken up, buried on site or removed in accordance with applicable waste management regulations.

13.3 Power Lines

If surface access is necessary during construction, efforts should be taken to minimize disturbance. During reclamation, all power lines, cables, towers and guy wires should be removed as well as any concrete footings or slabs where appropriate. If access roads were necessary for construction or decommissioning of power lines, they should be ripped and revegetated.

13.4 Roads

Access and on-site roads should be properly designed and constructed as part of the initial operating plan to minimize adverse environmental effects and facilitate reclamation. In the operating plan, roads should fit the topography to minimize unnecessary earth moving for road cuttings and embankments. All culverts and drains should be removed and original drainage restored as much as possible in accordance with future land use planning.

14.0 WATER RETENTION AND TREATMENT PONDS

During progressive and final reclamation, ponds and other water control and retention devices must be designed to retain all sources of flows (including flows from pumping and surface runoff). As a minimum, a 1 in 25 year storm event should be considered. Water control and retention devices must provide treatment as required for suspended solids removal, and general water chemistry, to comply with baseline local background water conditions and/or regulatory limits prior to water release from the site. Discharges must be designed to operate under controlled conditions, and the plan must reflect this. Flocculent can be used to enhance removal of suspended solids. Plans that propose the use of flocculent will specify the type and toxicological properties of the flocculent. Water control structures (e.g. spillways, weirs) must be designed to match anticipated life span of the ponds.

Note:
The design of water retention ponds/dams must be planned to eliminate the need for water treatment and structural maintenance in perpetuity. The plan should include the most probable duration that ponds or dams will be required and a maintenance schedule that

the proponent will undertake for these structures.

15.0 ACID ROCK DRAINAGE CONTROL AND MONITORING

Revegetation, discussed in Section 2.2, is an important step in the acid drainage management process.

Coal mine drainage ranges in composition from acidic to alkaline. Acid rock drainage (ARD) from mines can be formed by the oxidation of pyrite. Mine reclamation practices can influence post-mining water quality, including the extent to which ARD is generated. Rock geochemistry and lithology determine post-mining drainage chemistry. Therefore, it is essential that an initial operating plan contains an assessment of the potential for acid rock drainage from the site. Also, the reclamation plan must be designed to prevent or minimize formation of acid drainage post-mining. Implementation of effective prevention, mitigation and monitoring strategies post-mining must be integral to the reclamation plan where there is a likelihood of acid drainage occurring.

From the standpoint of preventing ARD, the use of vegetation, cover and capping with impermeable surfaces are beneficial for reducing the amount of water and atmospheric oxygen entering the mine soil/spoil environment and should be considered. The grading and revegetation of the surface can also have a substantial impact on the quantity of ARD generated. Prior to revegetation, a layer of non-acid generating material should be placed as a cover over potentially acid generating areas. Amendment of the fill material with limestone to provide additional alkalinity should be considered. A layer of nutrient-rich topsoil of appropriate thickness should then be placed to promote vegetation growth.

16.0 MONITORING

Reclamation plans will include a monitoring program with a schedule. Plans shall include, but not be limited to the following elements:

- a plan to monitor and report on the progress of reclamation throughout mining and post-mining phases
- a plan to monitor and report on the effectiveness of erosion and sediment control after reclamation
- a plan to monitor and report on the status of the future land use identified; post-reclamation
- a plan to monitor the physical stability of the site, to include inspection by the proponent of the following, as a minimum:
    - slope stability, including signs of new or ongoing slope failure
    - water levels in open pits for planned minimum and maximum water elevations
    - the physical stability of all stockpiles including rock, waste, or other

mine development stockpiles

- erosion, stability and health of vegetation
- the physical stability of all water management structures, including ditches and spillways
- blockage or potential blockage caused by sediment, ice, debris accumulation or animal activity at water management structures, and
- the deterioration of materials used in reclamation to manage site conditions

Note: The frequency of monitoring planned must be adequate to identify issues and be sufficient to ensure public safety and environmental integrity.

- a plan to monitor and report on potential ARD post mining. Reclamation monitoring for potential ARD should include an appropriate monitoring schedule to ensure that the cover is permanent and will afford the necessary buffering. Vegetative cover assessments should be conducted annually in July or August and should include photographic documentation as well as species assessment, distribution, type, diversity etc.
- a surface and groundwater monitoring program to be designed by a professional hydrologist or hydrogeologist

17.0 WATERCOURSE MANAGEMENT

Watercourses, waterbodies and wetlands must be identified on a site plan for reclamation planning. Watercourse management planning will follow this hierarchy, post-reclamation:

- ensure that reclamation does not impair water quality in existing watercourses
- any unavoidable relocation of watercourses and waterbodies must be planned in such a way that returns watercourses to their original location post mining, unless otherwise approved during an environmental assessment or industrial approval
- watercourse planning and restoration can be used provided those water features fit with intended future land use (ie. creation of ponds, aquatic/riparian habitat restoration or other water related features and instream structures)
- reclamation planning should incorporate the implementation of an environmental effects monitoring (EEM) program for fish and fish habitat to monitor such parameters as water quality, water quantity, fish and benthic organisms if deemed necessary by NS Environment

18.0 PUBLIC SAFETY

The proponent shall ensure that public safety is of paramount concern and is endorsed within the reclamation plan.

Glossary of Terms:

Baseline: information collected prior to the commencement of activities in order to focus the activities and describe the starting point against which future change can be measured.

Best Management Practices (BMP): standards and guidelines encouraging environmentally sustainable development of natural resources. They include innovative, dynamic, and improved environmental protection practices to help ensure that mineral resource development is conducted in an environmentally responsible manner during and after mining operation have closed. Some BMPs are more precise, such as progressive reclamation, methods to maintain water quality, control soil erosion, achieve compatibility in ecological restoration, reduce the amount of vegetation lost to development, speed the regrowth of vegetation using bioengineering techniques, or minimize wildlife habitat disturbance. Other BMPs are more subjective such as landscape design and visual aesthetics.

Biological diversity or biodiversity: means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems. [from Article 2 of the Convention on Biological Diversity].

Biodiversity offsets: means conservation actions intended to compensate for the residual, unavoidable harm to biodiversity caused by development projects, so as to ensure no net loss of biodiversity. Before developers contemplate offsets, they should have first sought to avoid and minimize harm to biodiversity.

Community liaison committee (CLC): is an advisory body to the project proponent and provides input on matters regarding operations or approvals/permits that have or are perceived to have environmental impacts. Community representatives provide an avenue for the exchanges of information on the project for interested individuals

Ecosystem: A biological community together with its environment, functioning as a unit.

Habitat: The total elements in an organism's physical surroundings which have a direct bearing on that organism's function and survival. The total of environmental conditions of a specific place that is occupied by an organism, by a population, or a community of interest. The "home" or place where animals live, reproduce, and die. A geographical niche. The natural or native environment of a plant or animal.

Land Capability: The ability of the land to support a given land use, based on an evaluation of the physical, chemical and biological characteristics of the land, including topography, drainage, hydrology, soils and vegetation.

Landscape: The composite of natural and human features that characterise the surface of the land at the base of the atmosphere; includes spatial, textural compositional and dynamic aspects of the land. Usually that portion of land or territory which the eye can see in a single view, such as fields, hills, forests, water, etc.,

Landscape design: The process of laying out land uses, facilities, water features, vegetation and related features and displaying the results in maps and drawings.

Land cover: corresponds to a (bio)physical description of the earth's surface. It is that which overlays or

currently covers the ground. This description enables various biophysical categories to be distinguished - basically, areas of vegetation (trees, bushes, fields, lawns), bare soil, thin till, and wet areas and bodies of water (watercourses, wetlands).

Land use: corresponds to the socioeconomic description (functional dimension) of areas: areas used for residential, industrial or commercial purposes, for farming or forestry, for recreational or conservation purposes, etc. It may be possible to infer land use from land cover and conversely. Contrary to land cover, land use is difficult to "observe". For example, it is often difficult to decide if grasslands are used or not for agricultural purposes.

Land Use Planning: The development of plans for the uses of land that, over long periods, will benefit the general welfare of communities, together with the formulation of ways and means, usually through policies and by-laws, for achieving such uses.

Mitigate: means, with respect to an undertaking, the elimination, the reduction or control of the adverse effects or the significant environmental effects of the undertaking, and may include restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means.

Native Vegetation: Any type of indigenous vegetation, species, subspecies, or lower taxon, occurring: a) within its historic range; or b) in an extension of that range bounded by the dispersal potential of the "taxon" and under the condition that the extension of that "taxon" is not known to be related to, and cannot be reasonably attributable to human activities.

Progressive reclamation: Any interim or concurrent reclamation of land undertaken during, following or in connection with construction, development and ongoing operations associated with surface mining.

Reclamation planning: A science-based process, conducted by site professionals or certified consulting expertise with scientific, technical, design and strategic planning skills to produce conceptual and final reclamation plans.

Reclamation (also Rehabilitation, Restoration): The process of reconverting disturbed land to its former or other productive uses. All practical and reasonable methods of designing and conducting an activity to ensure: (a) stable, non-hazardous, non erodible, favourably drained soil conditions, and (b) equivalent land capability. (i) The removal of equipment or buildings or other structures and appurtenances, (ii) The decontamination of buildings or other structures or other appurtenances, or land or water, (iii) The stabilization, contouring, maintenance, conditioning or reconstruction of the surface of land, (iv) Any other procedure, operation or requirement specified in the regulations. (Regulatory definition)

Revegetation: The establishment of vegetation that replaces original ground cover following land disturbance.

Succession: The natural sequence or evolution of plant communities, each stage dependent on the preceding one, and on environmental and management factors. Primary succession occurs on newly created surfaces, while secondary succession involves the development or replacement of one stable secessional species by another on a site having a developed soil. Secondary succession occurs on a site after a disturbance (fire, cutting, etc.) in existing communities.

Successional reclamation: Revegetation methods using native seed mixes and plants that will provide the necessary species to support and contribute to the natural process of succession.

Sustainability (Sustainable Development, Sustainable Living): Use of resources in a manner that allows the resources to be replenished by natural systems, as well as avoidance of pollution that damages biological systems. Use of resources in such a manner that they will never be exhausted.

Surface Coal Mining: Refers to a procedure of mining that involves the removal of material from over the resource to be mined in a series of pits.

Viewshed or view corridor: Areas which are visible from public rights-of-ways such as a roads, highways, railways, waterways or hiking-biking trail systems that provide aesthetic vistas over water, across expanses of land such as farmlands, wooded areas, across prominent landscape features such as lakes, coastal landscapes and ridge lines.

Visual Impact Assessment: An assessment of potential impacts to visual amenity and landscape character, predictions of their magnitude and significance to local "viewsheds" and landscape features. Recommendations on mitigation measures and implementation are made that are aimed to reduce long-term visual impacts by decreasing the amount of disturbed area and blending the disturbed area into the natural environment.