



Reclamation Guidelines for Sand and Gravel Operators

1.0 Reclamation Objectives

The objective of pit reclamation is to achieve an appropriate and productive after use of the disturbed site. Reclamation practices should ensure a physical stabilization of the soils and achieve a sustainable land use so that the land may be returned to a productive state as soon as possible. Depending on the area involved, this normally consists of some combination of the following: smoothing and contouring slopes, replacing overburden and topsoil, and revegetating.

Reclamation must be recognized as an integral part of extraction, and therefore must be included in pre-excitation planning. As part of this process, a practical after use of the site should be considered as early as possible. Factors to consider include: pit location and characteristics, availability of topsoil and water, the surrounding area, zoning and similar land-use restrictions, and practicality and cost-effectiveness. Reclamation operations should be carried out concurrently with extraction.

2.0 Sand and Gravel Extraction

Choices made with respect to machinery used, for example, can have a great effect on the ease or success of final reclamation. Choices favourable to reclamation are sometimes available which have few or no cost implications.

- Reclamation should be recognized as an integral part of sand and gravel extraction and therefore as one of the factors in the determination of extraction methods.
- The proponent should consider the feasibility of alternate approaches which will minimize the disturbance of land.

3.0 Progressive Reclamation

Progressive reclamation, in which depleted sections of a pit are reclaimed while extraction is ongoing in other sections of the same pit, is encouraged, particularly for large pits.

4.0 Post-Extraction Land Use Determination

In determining post-extraction land use, the following guidelines should be adhered to:

- In general, land should be restored to its pre-extraction uses.
- For new sites or major expansions to existing operations, Integrated Land Use Plans (where established) will be considered in developing the reclamation plan.

5.0 Re-Grading and Reclamation

The aim of re-grading is to shape the land in a manner appropriate to its post-extraction use. Re-grading is to take place with a view to minimizing erosion and hazardous slopes as well as enhancing stability and controlling drainage.

- When the extracted materials in an area have been depleted and prior to expiration of the disposition term, the proponent shall reclaim the area of excavation and all other disturbed areas in a manner satisfactory to the department.
- Reclamation will include trimming of any and all pits to a minimum side slope of 4 to 1, as well as leveling of any and all overburden in such a manner as to facilitate re-vegetation.
- The land will also be cleared of rubbish, surplus materials, temporary structures and equipment, and all parts of the land shall be left in a condition satisfactory to SE (as close as possible to the condition it was in prior to the permittee's use).
- Shallow pits shall be backfilled with clean fill. There shall be no material of deleterious nature (i.e. any material that would be classed as a hazardous substances or waste dangerous goods).
- Where the pit is backfilled to existing grade, the fill shall be capped with available topsoil.
- The site shall be graded to match or blend in with existing contours.
- Topsoil stripped from the surface shall be used for final cover where practicable.
- The pits shall not be used for deposition of domestic or industrial wastes.
- Once the site is reclaimed any fences, where they exist, shall be removed to permit re-vegetation.

6.0 Surface Drainage

Surface drainage should be provided for in reclaimed areas.

- At least 80 per cent of the surface area should be free of surface drainage water in a year of normal precipitation.
- Drainage should be such as to minimize the formation of ponds less than one acre (0.4 ha) in surface area.
- Drainage systems must be designed to minimize erosion during spring runoff and major rainfall events.

7.0 Coversoiling

- Under normal circumstances, coversoiling should be completed within a year of completion of re-grading.
- Salvaged material for coversoil placement should be applied to re-graded lands at an even depth.
- Where stripping of surface material for coversoil replacement is not possible or not beneficial to reclamation efforts, alternate soil stabilization and revegetation programs should be conducted.

- If stockpiling of coversoil is required, erosion of stockpiles should be minimized by establishment of a vegetative cover or other appropriate means, where necessary. Natural revegetation may suffice.

8.0 Rehabilitative Earthwork

Rehabilitative earthwork should normally include the covering of bare rock and subsoil. Non-useable or non-commercial material including overburden, screenings, and rocks should be placed in the pit bottom. Recontoured slopes generally should not be steeper than 4:1, where reasonably attainable and consistent with surrounding terrain and planned after use. Previously stripped topsoil should be applied to newly recontoured slopes. Where amounts are inadequate to cover the entire area (to a commonly recommended depth of 5 to 10 cm), side slopes should receive priority treatment.

9.0 Revegetation

Previously stripped and stockpiled topsoil should be applied as evenly as possible to newly recontoured slopes. Revegetation as soon as possible following recontouring of a pit is the best way to stabilize slopes, control weeds, minimize erosion and promote an aesthetic and productive after use. The most essential aspect of revegetation is rapid establishment of a ground cover to pre-development or adjacent site conditions. Grasses are usually the best species for doing this. The use of mulches, soil stabilizers, and fertilizers to establish plant growth and reduce erosion is acceptable. Spreading of slash on recontoured slopes will also speed revegetation.

The following revegetation principles apply throughout Saskatchewan, but site specific circumstances may require different or additional reclamation measures.

- The need to revegetate will depend on the nature of the area. For example, if the rates of natural vegetation are high, or if the area is predominantly rock, active revegetation may not be required.
- Native plant species are to be encouraged so that the eventual plant community will comprise only native species. All seed mixtures or plant materials to be used in reclamation must be approved by a SE.
- Non-native plant species must **NOT** be used for reclamation. The use of non-natives that are short lived, such as annuals, for the quick establishment of cover, where required, may be permitted.
- For best results, seeding of native species should occur in early spring or dormant seeded in late fall.
- Developers must ensure that any plant material used for reclamation is free of noxious weeds as specified under *The Seeds Act* (Canada) and *The Noxious Weeds Act* (Saskatchewan).
- In forested areas, where natural regeneration may be preferred, reseeding or other procedures necessary for site reclamation may not be required unless a site is erosion prone or other specific measures are identified by SE. In Forest Management Agreement

(FMA) areas where reforestation fees are collected, the establishment of tree species is the responsibility of the FMA holder. Therefore, the proponent is responsible only for the establishment of ground cover.

- Where reclamation sites are located within active grazing areas, they should be fenced.
- If site reclamation requirements are not being met by the developer, SE may complete reclamation at the developer's expense.
- For information about native plant suppliers, contact:
Native Plant Society of Saskatchewan
P.O. Box 21099 Saskatoon SK S7H 5N9
Telephone: (306) 668-3940 Fax: (306) 258-2244

10.0 Access and Haul Roads

The proponent must restore, in a mutually agreeable manner, access and haul roads to and from the pit, where these are considered unnecessary after sand and gravel extraction is complete.

11.0 Toxic or Polluting Materials

- Toxic or polluting materials shall **not** be dumped onto an area designated for pit development or into an excavated pit, but should be removed to an approved landfill or similar facility.
- Under *The Environmental Management Protection Act* and *The Environmental Spill Control Regulations*, where a spill has occurred, it shall be reported as soon as possible to SE:

Spill Report Line 1-800-667-7525

- Where the information is known or can be readily obtained: the location and time of the spill; the type and quantity of the pollutant spilled; and the details of any actions taken shall be reported.

12.0 Finalization of Reclamation

Reclamation should be finished within six months of completing excavation.