

 <p>Agricultural Land Commission</p>	<p>RECLAMATION PLANS FOR AGGREGATE EXTRACTION</p>	<p>POLICY P-13</p> <p>Adopted April 2021</p>
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Section 26 of the ALR Use Regulation permits aggregate extraction without application to the Agricultural Land Commission (the "Commission") provided the volume of aggregate extracted from a single parcel does not exceed a total volume of 500m³ and the land impacted by extraction is remediated in accordance with good agricultural practice, as soon as reasonably possible. Aggregate extraction in excess of 500 m³ per parcel must be approved by the Commission.

This policy is intended to provide information for those submitting proposals related to aggregate extraction as part of a soil or fill use application or Notice of Intent and to ensure that sufficient information and evidence is provided to the Commission in the form of a proposed reclamation plan.

Reclamation is a very important consideration when determining if an aggregate extraction activity is consistent with the Commission's mandate of preserving agricultural land for farming and ensuring that this use will not negatively impact future agricultural production. Those submitting proposals related to aggregate extraction should therefore be aware that failure to submit a reclamation plan may adversely affect the application.

CONTENT FOR RECLAMATION PLANS:

A reclamation plan submitted to the Commission should include the following:

1. A detailed soil survey and agricultural capability analysis of the land(s) impacted, including potential soil bound crop options, and any affected or potentially affected neighbouring properties at an appropriate scale (as per ALC Policy P-10). All existing resource information such as government soil survey and agricultural capability mapping must be included and discussed in the context of the detailed survey.
2. An inventory and description of the existing land use on the subject land(s) and surrounding lands.
3. Detailed site preparation, operating and reclamation activities in-line with the Agricultural Land Commission's Best Management Practices for Aggregate Extraction (Appendix A). This should include, but is not limited to, the following elements:
 - a. Plans and sections showing original undisturbed grades, current grades (if different from undisturbed grades), final grades in relation to adjacent natural grades, volume of aggregate to be removed, and proposed slope gradient (%) drawn at an appropriate scale and prepared by a Professional Engineer or Registered BC Land Surveyor;
 - b. A topsoil management plan addressing stripping, storage and replacement of soil;
 - c. A plan for phased operations and reclamation (if applicable);

- d. If backfilling pit areas with fill imported from offsite is being proposed, fill certification procedures and site control measures to ensure that only clean fill material is accepted;
- e. Erosion control measures;
- f. A weed management plan;
- g. A plan for crop/agronomic vegetation establishment;
- h. Detailed drainage plans for the rehabilitated site to ensure optimum surface and subsurface drainage conditions;
- i. Final proposed agricultural capability; and,
- j. Closure procedures and certification of the work.

Reclamation plans will be reviewed by the Commission staff for consistency with these requirements. Any reclamation plans that are deficient in information may be sent back for revision or may not be given the same weight as compliant reports. The application/Notice of Intent may be put on hold while the reclamation plan is being revised.

RELATED POLICIES:

ALC Policy P-10: Criteria for Agricultural Capability Assessments

APPENDIX A

BEST MANAGEMENT PRACTICES FOR AGGREGATE EXTRACTION ACTIVITIES OCCURRING IN THE AGRICULTURAL LAND RESERVE

Reclamation planning is essential to the successful reclamation of agricultural lands located in the Agricultural Land Reserve (the "ALR"). The following document is intended to provide best management practices for aggregate extraction to both private landowners and industrial operations operating on private and Crown land in the ALR. This information should be used to assist in the development, operation, and reclamation of various scales of aggregate extraction operations ranging from small gravel pits and rock quarries to large, long-term industrial operations with multiple phases.

This document provides recommendations on:

- General operating conditions
- Soil management techniques
- Recontouring and subgrade preparation
- Soil placement (Topsoil/Subsoil)
- Seedbed preparation and surface rehabilitation
- Drainage and water management
- Weed management
- Project closure

GENERAL OPERATING CONDITIONS

- Soil must not be salvaged, moved, stockpiled, or replaced during conditions of adverse soil moisture content including when the soil is frozen (to prevent slumping) or powdery dry.
- Compaction must be minimized by selecting soil materials with low clay contents for replacement in the root zone.
- The use of native material (salvaged topsoil and overburden) is preferable to the use of materials sourced from off site to avoid potential issues with drainage and excessive stoniness in the upper soil profile.
- Surface drainage from the reclaimed area must be maintained at all times in order to prevent erosion, flooding, siltation or other degradation of soils, adjacent lands or waterways.
- Any run-off must be diverted into catchment ponds or silt traps prior to discharge into natural watercourses or road ditches.
- On-site supervision by a qualified registered professional with expertise in soils and reclamation is required during the soil salvaging, stockpiling, storage and soil replacement process.

SOIL MANAGEMENT

Prior to any extraction, all existing topsoil must be salvaged under the direction of the qualified registered professional for use during reclamation. Additional salvaging of subsoil and overburden may be necessary on sites where backfill sourced from off-site is not readily available, topsoil is shallow or where there is limited overburden available. The recommendations for soil handling procedures are as follows:

- Soil must be salvaged from all of the following areas:
 - the proposed pit or quarry area;
 - the access roads; and,
 - the proposed stockpile areas for the subsoil and overburden.
- Topsoil, subsoil and any overburden must be salvaged and stored separately.
 - Separation between piles should be no less than 3 m.
- Topsoil must be salvaged using an excavator with a clean-out bucket.
- Materials must be transported to an appropriately designated storage area that will not be disturbed by extraction activities in order to avoid double handling of materials.
- A uniform layer of bark mulch or sawdust should be laid down on the storage surface prior to placement of any salvaged material.
- The areas required for stockpile storage must be based on estimates of initial soil salvaging volumes.
- Stockpiled soils must be windrowed and located in an area where they will not be disturbed and will not impede site drainage.
- Drainage from, onto and around the stockpiles must be controlled by ditches, drains or intercepts as required.
- Stockpiled soil must not be removed from the property without written permission from the Commission.
- Salvage piles should be limited in height (2 to 3 meters). Higher piles must not exceed a 3H:1V slope (horizontal: vertical).
- Stockpiles must be seeded and established with an appropriate plant cover or other suitable soil erosion control measure must be applied to protect the stockpiles from wind or water erosion.

SUBGRADE PREPARATION

The Commission frequently requires the backfilling of pits to ensure that the final elevation is consistent with adjacent land and the property's relative original elevation. Therefore, once all extraction activities are complete, the pit should be filled with suitable material that consists of either the stockpiled overburden and/or fill sourced from offsite. Subgrade preparation must proceed as follows:

- If imported fill is used to backfill, the fill must have the following characteristics:

- must be of mineral origin only (organic soils are not permitted as fill material but can be used as a top-dress);
 - have a coarse fragment content less than 5% with no boulders >25 cm in the top 1 metre of the soil profile; and,
 - the texture of the soil must be no coarser than loamy sand and no finer than silt loam.
- The following are prohibited materials in the ALR and must not be used as fill:
 - concrete or demolition waste, including masonry rubble, concrete, cement, rebar, drywall, and wood waste;
 - asphalt;
 - glass;
 - synthetic polymer;
 - treated wood; and,
 - unchipped lumber.
- The final contours of the subgrade must be gently sloping in such a manner as to conform to the surrounding landscape.
- Depending on the site topography, any permitted side slopes and/or benches should be recontoured so that slopes are no steeper than 3.5H:1V (horizontal: vertical) to allow for use of farm equipment on the slopes. Steeper slopes may be allowed in some cases depending on the configuration of the field in order to maximize the amount of flat land (e.g., long narrow extraction pits).
- To avoid severe erosion of topsoil, land that is intended for the production of annual crops should have slopes no greater than 20H:1V or 5% slope (Class 1).
- In the Lower Fraser Valley and Metro Vancouver, the slopes must be less than 1% on cropland to minimize sheet and rill erosion.
- If necessary, upon completion of backfilling, the subgrade should be chisel plowed to a minimum depth of 60 cm in two directions at right angles.

SOIL REPLACEMENT

Once the subgrade materials have been regraded, available topsoil and/or other suitable soil materials must be used to provide a rooting bed for crops.

General Recommendations

- Any stockpiled soils must be replaced in the reverse order from which they were removed.
- The recommended soil profile should consist of (from surface to at depth):
 - 20 – 30 cm of topsoil;
 - 30 cm of subsoil;
 - 50 cm of free draining subgrade; and,
 - Overburden or backfill (variable thickness).

- The placement of stakes, flagged to the desired replacement thickness, must be employed to assist the machine operator.
- Soil materials should be end dumped and leveled with low ground pressure equipment, such as tracked bulldozers.
- Vehicles and equipment must be restricted to designated roads or routes, so that ripping and subsoiling activities can be limited to these specific areas.
- Random, repeated running of equipment over leveled areas must be minimized wherever possible.

Subsoil Placement

- If subsoil has been retained, the subsoil must be replaced in one lift.
- If fill is used as subsoil, then the fill must have a coarse fragment (fragments >2 mm diameter) content of less than 5% and must not contain any boulders (rock fragments >25 cm).
- Once the subsoil is in place, roughening the subsoil surface is required to hold topsoil in place following initial placement.
- If compaction does occur, rip the affected areas to a depth of 60 cm or more with shanks spaced 60 cm apart and then cross rip perpendicular to the first direction.

Topsoil Placement

- Topsoil thickness should be equivalent to what was present before disturbance.
- Coarse fragments must not be introduced in the top 25 cm of the soil profile.
- Prior to replacement of the topsoil, soils must be screened separately to remove coarse fragments.
- Where the percentage of the coarse fragment content by volume is less than 5%, screening is not necessary. The qualified registered professional must determine if screening is necessary.
- Screening must be carried out under appropriate soil moisture conditions.
- Topsoil should not be replaced in areas such as roads or wet depressions that will not be used for productive agriculture unless required for grass establishment for erosion control.
- If the native topsoil has been removed, then a 20 - 30 cm lift of imported topsoil must be uniformly spread over the disturbance area. The texture of the soil must be no coarser than loamy sand or finer than silt loam.
- A suitable organic matter should be top-dressed over the reclamation area. This organic matter may be added in the form of animal or poultry manure or as a cereal or forage cover crop and turned into the soil.

SEEDBED PREPARATION/SURFACE REHABILITATION

If the disturbance area is not immediately returned to agricultural use upon completion, a seedbed must be prepared, and the area(s) seeded with an appropriate agronomic species, using cover crops when necessary to reduce erosion on slopes, and fertilized.

Seed preparation and surface rehabilitation must take place as follows:

- Till the seed bed just prior to seeding to minimize the time period in which the soil surface will be exposed to water and wind erosion.
- Tillage must be completed only under specific soil moisture conditions (not powdery dry or excessively wet).
- The following equipment is suitable depending on the specific soil conditions:
 - Tillage equipment – plows and discs that lift and invert the soil;
 - Cultivators and harrows that lift and stir without inverting the soil; and,
 - In situations where it is undesirable to mix thin topsoil with underlying subsoil (e.g. stony subsoil) use cultivators and harrows rather than plows and deep discs.
- Soil tillage should be carried out across (perpendicular to) slopes to reduce the runoff velocity and the potential for rill formation.
- The rate of application, type of seed mix, and fertilizer is to be determined by the qualified registered professional.
- Cereal cover crops such as spring barley, oats, winter wheat or fall rye germinate and develop rapidly. If seeded in mid to late summer, they provide cover by fall but will not generally set seed and will not take over the stand the following year if turned over before seed set.
- Fertilizer should be applied based on soil testing results.
- Use supplementary irrigation to establish and maintain a complete cover.

DRAINAGE/WATER MANAGEMENT

A drainage plan must be prepared for the site by a qualified registered professional to ensure that water is appropriately managed on and offsite. Prior to the installation, drainage plans must be submitted to the Commission for review and approval. The following drainage and erosion control measures should be considered when designing the plan; however, this will vary depending on specific site conditions:

- Interceptor drains and grassed water runs to slow the velocity of runoff water and prevent erosion.
- Placement of toe slope drains to collect and remove seepage from the subsoil.
- Use of temporary diversion drainage on new areas of topsoil and seeded areas.
- Sedimentation impoundments to protect water quality in downstream areas. The size and location of impoundments is determined by runoff volumes, erosion rates, and required retention times.
- Installation of a soil drainage system (subsurface drainage as needed). This will depend on the end use and agricultural capability.
- Installation of a layer of porous drainage material to reduce the amount of water in the soil.

- The drainage must be installed upon completion of rehabilitation of each phase and prior to establishing any perennial crops other than forage.
- The reclaimed area must be monitored by the qualified professional following re-seeding to determine if sufficient drainage has been provided. If poorly drained areas persist, it may be necessary to install additional drainage structures.

WEED MANAGEMENT

- Weed control must be practiced at all times.
- Weeds must be controlled before seed set. The most common practices include:
 - Cultural methods such as reseeded with an appropriate vegetative mix that can out-compete weeds;
 - Mechanical methods such as tillage, mowing, mulching or use of black plastic sheeting; and,
 - Chemical methods such as the use of herbicides.
- All newly reclaimed areas must be reseeded as soon as possible after soil replacement.

CLOSURE

A closure report must be submitted to the Commission upon the completion of all reclamation works to ensure that the final land objective has been achieved and the agricultural capability and suitability of the site has been restored or improved. The report must include photographs and a written description of all aspects of the reclamation. The report is required to ensure that the operation has complied with all the conditions of the ALC authorization. Reports must be completed by the qualified registered professional and must be completed after the second full growing season. The specific requirements of the closure report will be outlined in the conditions of the ALC authorization.