

SCHEDULE B

SITE RECLAMATION REQUIREMENTS:

This report is used to assess if the development site has been appropriately reclaimed and meets the criteria that demonstrate that reclamation is complete prior to a Certificate of Restoration being obtained for a well site or other oil and gas activity and within 24 months of installation and reclamation of a pipeline.

All sites constructed since 1995 must meet the following criteria. Sites that were developed prior to 1995 must also submit a Schedule B report containing the same information but will not be as rigorously reviewed.

The purpose of the following requirements is to ensure that the soil, topography, and vegetation of surface leases and pipelines are restored to an equivalent condition and capability after wells have been decommissioned and pipelines have been installed. Surface lease means all leases, easements, and rights-of-way that may be required for a well site, access road, pipeline, camp, workspace, sump, borrow pit and/or any other area related to oil and gas production. The requirements do not address site contamination and the disposal of wastes as these matters are the responsibility of other government agencies.

These reclamation requirements are intended to provide the flexibility to respond to practical realities of differing site characteristics and soils. There is room for interpretation of the Schedule B assessment criteria based on site specific issues and the professional judgement of the specialist hired to carry out the assessment.

Schedule A reports will be used as part of this review process as a baseline for pre-development information.

A report which documents that the following minimum requirements (in **bold**) have been met must be filed with the Oil and Gas Commission and the surface landowner prior to a Certificate of Restoration or approval to abandon is issued by the Oil and Gas Commission, or within 24 months of installing a pipeline:

NOTE: site development should NOT occur when the soil is extremely wet

Site Information:

- well name/legal and well site approval number or pipeline location (well to well)
- date of construction
- petroleum company name contact information
- location and legal description of property(s)
- name and contact information of surface landowner or specify if Crown land
- date of site inspection
- name and address of person conducting the site assessment

Definition of Surface Soil:

For the purposes of Schedule B, surface soil means the soil that has been salvaged, amended, and replaced onto the surface lease.

Sampling Procedures:

a. Well Sites, camps, borrow pits

No soil sampling is required for portions of the surface lease where soil disturbance has not occurred. Disturbance includes, but is not limited to, stripping, rutting, trenching, compaction, and erosion.

The quantity and quality of the replaced surface soil on a surface lease must be sampled using a 20 metre x 20 metre sampling grid. The edges of the grid should correspond to the boundaries of the surface lease, and grid should be adjusted to evenly cover the entire lease. A soil sample must be taken from the middle of each 20 m X 20 m grid, for each grid in the surface lease.

A minimum of four control samples must be taken from adjacent undisturbed ground; one each from the center point of each side of the surface lease.

b. Access Roads and Pipelines

The quantity and quality of the replaced surface soil must be sampled at 250 metre intervals for roads and pipelines > 250 m in length, and a minimum of two sampling locations is required for roads and pipelines less than 250 m in length (one at the terminus and one at the midpoint). This is the minimum number of samples; more may be necessary based on site conditions.

Two samples are required for each sampling location. One sample must be taken from the centerline of the access road or one sample must be taken from the disturbed ground over a pipeline, and one sample must be taken from undisturbed ground 10 m outside the boundary of the surface lease.

Soil Assessment:

Each soil sample must penetrate 20 cm below the surface soil, or to a maximum depth of 50 cm. A visual analysis of each sample of the surface soil must include the following information:

Sample Number	Surface Soil Depth (cm)	Description	Admixing %	Aggregate Size

The description of each sample must include its texture class, based on the Canadian System of Soil Classification, Third Edition 1998. The extent of admixing (i.e. mixing of the B horizon into the A horizon) must be recorded. The admixing classes are: 0-10%, 10-20%, 20-30% 30-40%, 40-50% and >50%.

The aggregate size distribution for each sample of the surface soil must be recorded. The aggregate size classes are: <2 cm, 2-5 cm, and >5-10 cm. **No soil aggregates greater than 10 cm are allowed.**

The surface soil from five representative samples from a wellsite, camp, borrow pit, etc. must be combined and thoroughly mixed. A portion of this combined sample must be sent to a laboratory for an analysis of its organic content, pH, and texture. A laboratory analysis for pipelines is not required.

A visual analysis of each sample from undisturbed ground must include the following information:

Sample Number	A Horizon Depth (cm)	Description	B Horizon Depth (cm)	Description

The description of each sample must include its texture class, based on the Canadian System of Soil Classification, Third Edition 1998.

Soil Reclamation Requirements:

The following minimum reclamation standards must be met:

a. Depth of Surface Soil

- the required replacement depth (RRD) of surface soil is 80% of the depth of the average A horizon on the adjacent undisturbed ground.
- the average replacement depth (ARD) is the average depth of all the surface soil samples. The ARD must be equivalent to or greater than the RRD.
- the minimum replacement depth (MRD) is 80% of the RRD. **All surface soil samples must be \geq the MRD, except for surface leases which were originally covered by native trees or shrubs or where the average A horizon depth on the undisturbed ground is <10 cm,**
 - Sites which were covered by trees or shrubs may have three surface soil samples, which are not adjacent, that are \geq 40% of the RRD.
 - The MRD requirement does not apply where the average A horizon depth on the undisturbed ground is <10 cm, but the available surface soil must be replaced as evenly as possible across the entire surface lease.

b. Mixing of Soil Horizons

- **the average admixing of all the surface soil samples must not be greater than 30%.** That is, the average of the samples must be composed of less than 30% of non-surface soil (B horizon).

c. Soil Structure

- **the average aggregate class of the surface soil samples must be the same as the average aggregate class of the samples from the undisturbed ground.**
- the bulk density of the subsoil of the disturbed ground for each sampling location must not be more than 120% of the average bulk density of the subsoil of the undisturbed ground.

Topographic Requirements:

The topography of the surface lease must be restored to its original or better condition. The reclamation of the surface lease is to be assessed by comparing the reclaimed site, as a whole, with adjacent undisturbed ground. The following requirements must be met:

Criteria:	Requirement:
Drainage	<ul style="list-style-type: none"> • Surface drainage must be consistent with the original natural drainage patterns, directions, and capacity, or be compatible with the surrounding landscape. • Facilities and structures left in place must not impede natural surface drainage and water flow.
Erosion	<ul style="list-style-type: none"> • The frequency and extent of erosion features must be similar to adjacent undisturbed land.
Contour	<ul style="list-style-type: none"> • The contour of the surface lease must conform to adjacent land or be consistent with present or intended land uses.

Stability	<ul style="list-style-type: none"> • No visible evidence of slope movement, slumping, subsidence, or tension cracks are allowed.
Gravel and Rocks	<ul style="list-style-type: none"> • May not be piled, windrowed, or concentrated in one area unless it improves the agricultural capability of the surface lease.
Debris	<ul style="list-style-type: none"> • No industrial or domestic debris is allowed. • No large wood debris that could be removed with a brush rake is allowed, unless permitted in writing by the landowner.

Vegetation Requirements:

Reclamation of a surface lease includes restoring vegetation by either replanting native vegetation or applying a suitable seed mixture. Preventing soil erosion, and preventing an increase in the distribution of weeds, should be the main criteria when choosing a seed mixture.

The reclamation of the surface lease is to be assessed by visually comparing the reclaimed site, as a whole, with adjacent undisturbed ground. The following requirements must be met within 24 months of applying the seed mixture or introducing vegetation:

Criteria:	Requirement:
Species	<ul style="list-style-type: none"> • Seed mixtures must not increase the frequency or distribution of any weed species on the surface lease or on adjacent undisturbed ground. • Seed mixtures must include species that are adapted to the climate and soil conditions of the Peace River region of British Columbia. (contact your local Ministry of Agriculture office if you require information or assistance) • Native species must be similar to vegetation which would occur naturally on the undisturbed ground.
Density	<ul style="list-style-type: none"> • ≥ 80% of the density on adjacent undisturbed ground.
Height	<ul style="list-style-type: none"> • ≥ 80% of height on adjacent undisturbed ground.
Health	<ul style="list-style-type: none"> • Plants should be healthy based on a visual inspection of their vigour, height, and colour.
Cover	<ul style="list-style-type: none"> • the vegetation must cover ≥ 80% of the soil surface if the species on the reclaimed site are similar to the vegetation on the adjacent undisturbed ground. • where the species composition on the reclaimed site is different from the vegetation on the undisturbed ground, or the undisturbed ground has been cultivated, vegetation on the reclaimed site must cover ≥ 80% of the soil surface. • vegetation on the reclaimed site must be evenly distributed, or be similar to the distribution on the undisturbed ground.

Photographs:

Photographs must be taken which show the condition of the surface lease, associated developments and pipelines after reclamation. Each photograph should have noted with it the location, direction and any comments.

Overall Summary:

A short summary statement suggesting a pass or fail, comments on where criteria have not been met and if this will have a negative impact on the use of the land for agriculture and/or what should be done to remedy the problem areas. Any landowner/occupant comments or requests should be noted.

Report author sign off/signature and date.