



Ministry of Forests,
Lands and Natural
Resource
Operations

Fertilization Standard – Hand Application for Fdc

Effective April, 2013

These standards apply, in addition to the General Standards for Ministry Funded Programs (FS 1001) or FS1000 for internal Ministry contracts, to all fertilization activities carried out under Ministry Funded Programs.

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1.0 DEFINITIONS

1.1 In this document, the following words shall have the following meanings.

“**Approved Fertilization Quality Inspection System**” means the Fertilization Quality Inspection system contained in this document or another similar system approved in writing by the District Manager prior to the commencement of Work.

“**Broadcast Fertilization**” even distribution of fertilizer over the entire treatment area.

“**Buffer Zone**” means an area established between an area to be fertilized and an area which must not be fertilized or have fertilizer enter into it.

“**Contingency Plan**” means a plan prepared in accordance with Article 4 of this document, to be implemented in the event of a fertilizer spill, accident or misapplication.

“**Individual Tree Application**” fertilizer is applied as evenly as possible to target trees throughout the area formed by the crown drip line and the tree stem.

“**No Treatment Zone**” means an area within which no fertilizing takes place.

“**Water Quality Limits**” means

- (a) 10 ppm nitrate nitrogen in a stream immediately below the area where fertilizer has been applied;
- (b) 2 micrograms/litre of chlorophyll in a lake;
- (c) 50 milligrams/square metre of chlorophyll in a stream; or
- (d) any known water quality standard or objective which is or can be expressed in terms of a maximum

“**Work**” means the work described and funded under a Recipient Agreement;

“**Work Area**” means the areas or locations where Work is to be undertaken or any area of Crown Land occupied for purposes of the Work.

2.0 WORKER SAFETY

- 2.1 The Recipient bears all responsibility for safe operations and the required safety equipment for all persons engaged in this work shall be provided at the Recipient’s expense.
- 2.2 To minimize health risks associated with handling fertilizer, the following precautions have to be taken.
 - (a) Use suitable gloves to handle the fertilizer and ensure workers have been informed and follow all requirements of the Material Safety Data Sheet (MSDS) or information sheet of the fertilizer being applied
 - (b) Change or wash gloves regularly to avoid residue build-up
 - (c) Wash hands before handling food, drinking, urinating, or smoking
- 2.3 A person is authorized to fall snags or other trees on a Work Area to meet safety or operational requirements as per the purpose of carrying out a forest practice that is funded under a vote of the legislature (FRPA 52 (2)) under the Forests for Tomorrow Program.
- 2.4 The Recipient is responsible to provide a Certified Wildlife Danger Tree Assessor and Faller for Harvesting and Silviculture as well as a Qualified Falling Supervisor as required by WorkSafe BC.
- 2.5 The Recipient must assess all work areas for hazards, including danger trees, before commencement of work in the area. A full assessment is required of the suspect danger trees by a certified Wildlife/Danger Tree Assessor, where these trees are to be retained. The recommendations made in the assessment, in the consideration of applicable site plans, must be implemented before the work referred to in that area starts. Recommendations may include felling the danger tree, creating a no-work zone around the danger tree or a modified work plan including but not limited to working only in low wind conditions, utilizing a spotter and minimizing worker exposure to the hazard.

3.0 ENVIRONMENTAL SAFETY

- 3.1 The Recipient will store, load and apply the fertilizer in accordance with the laws and regulations of Canada and British Columbia.
- 3.2 The Recipient is responsible for the safe and secure transport of the fertilizer in the Recipient’s possession.
- 3.3 The Recipient shall provide a means of securing the fertilizer at the work site or loading site to prevent unauthorized access to the fertilizer and have spill clean-up equipment on site at all times.
- 3.4 The loading of fertilizer into the dispensing equipment shall be done at a designated location, such that any spilled fertilizer shall not enter any water source or other non-target area.
- 3.5 The Recipient must have on site at all times:
 - (a) A copy of these standards
 - (b) Treatment area(s) map(s)
 - (c) The Material Safety Data Sheet (MSDS) of the fertilizer being applied
- 3.6 The Recipient shall carefully note all buffer zones marked on the map(s) and shall notify the Administrator immediately, if areas outside of the designated treatment areas were treated.

- 3.7 Any spills of fertilizer are the responsibility of the Recipient and shall be cleaned up the same day and disposed of in accordance with provincial laws and regulations prior to the resumption of fertilizer application.
- 3.8 Tanks, buckets and other dispensing equipment shall not be washed in or near streams, rivers or lakes.

4.0 PRE-OPERATIONS REQUIREMENTS

- 4.1 The Recipient shall arrange for the supply of the fertilizer.
- 4.2 The Recipient shall be responsible for the cost of the entire transport of the fertilizer to the work site.
- 4.3 The obligation of the Recipient under these standards is not fulfilled until the proper disposal of all waste materials has been completed.

Work Plans

4.4 Where any of the following is not specified in a Treatment Plan for fertilization it must be specified in a Work Plan:

- (a) by Treatment Unit
- i) the type and total amount of fertilizer to be applied,
 - ii) the fertilizer application rate by tree and/or by unit area,
 - iii) the season or timing of application;
- (b) a written fertilizer operations plan which must include
- i) the location of loading sites,
 - ii) a schedule of fertilizer application to the Work Areas,
 - iii) staging areas and the Work Areas that minimize impacts to aquatic systems and to avoid human residences,
 - iv) the location of Buffer Zones around watercourses, water bodies, No-treatment Zones, or other specified areas to be avoided, sufficient to ensure fertilizer does not enter them, and provide protection as required under sections 57 and 59 of the *Forest Planning and Practices Regulation*.
 - v) a water quality monitoring plan, if appropriate to the water resource of the Work Area,
 - vi) the requirement, if any, to mark boundaries of the Work Areas or Buffer Zones,
 - vii) the need for and methods of controlling public access,
 - viii) disposal procedures for fertilizer containers, bags and other waste material;
 - ix) the requirement for water quality sampling in accordance with the *Forest Fertilization Guidebook* where fertilization is to take place in a community watershed.
- (c) a Contingency Plan in the event of fertilizer spill, accident or misapplication which must include, but is not limited to:
- i) a description of the types of spill or events requiring immediate action,
 - ii) the names and telephone numbers of emergency contacts,
 - iii) the requirement for water quality monitoring to be instituted in the event of a spill or misapplication in or near a water body,
 - iv) accident clean up procedures, and
 - v) disposal of spill materials;
- (d) other scheduling requirements and conditions as deemed necessary by the District Manager.

Layout

4.5 Ensure boundaries are easily identifiable by workers either by using natural/operational boundaries or by flagging of Work Areas, Buffer Zones and No Treatment Zones.

5.0 FERTILIZER APPLICATION

General Requirements

5.1 All fertilizer application shall be in accordance with the Ministry Standards, including any standards or specifications stated or implied in the Approved Fertilization Quality Inspection System which forms part the Ministry Standards.

5.2 Despite any requirement that is specified on a per hectare basis, all fertilizing requirements must be met throughout the entire Work Area either by a Broadcast or individual tree fertilization application. For example where individual tree fertilization is prescribed, fertilizer must be applied as evenly as possible to target crop trees throughout the area formed by the crown drip line and the tree stem.

5.3 The equipment, including vehicles for hauling fertilizer, must not cause unacceptable site disturbance to a Work Area or road.

5.4 Fertilizer must not be applied to a No Treatment Zone, a Buffer Zone or outside a Treatment Unit.

Notification of Operations Start-up

5.5 The Recipient must notify the District Manager of its intended commencement of operations within a community watershed at least one Work Day in advance.

Roads

5.6 When fertilizing near a road, all necessary precautions must be taken to ensure the safety of road users. Where necessary, information signs must be posted along roads and flag persons supplied to coordinate traffic.

Requirement to Stop Operations

5.7 Fertilizer application operations must be stopped when:

- (a) weather conditions arise which could adversely affect worker safety or treatment effectiveness (see the Forest Fertilization Guidebook); or
- (c) a leak and/or spill of chemicals occurs (such as fertilizers, oils and fuel);

Leakage, Spills and Accidents

5.8 In the event of a fertilizer spill or misapplication into non-target areas (e.g. water bodies), operations must be stopped and the Contingency Plan immediately implemented.

5.9 Leaks and/or spills of chemicals (such as fertilizers, oils and fuel) must be cleaned up and disposed of in accordance with provincial laws and regulations prior to the resumption of fertilizer application.

5.10 Fertilizer spilled at the loading or worksite in the normal course of operations and not considered an emergency under the Contingency Plan must be cleaned up the same day.

Site Clean-up & Repair

5.11 Upon completion of fertilizer operations:

- (a) all unused fertilizer must be removed from Crown land;
- (b) fertilizer containers or bags and any other waste material must be removed from Crown land and disposed of in accordance with the Work Plan;
- (c) any damage to a Work Area must be repaired; and
- (d) any remaining spilled fertilizer must be removed.

6.0 INSPECTION SYSTEM AND PAYMENT CALCULATION

6.1 The Recipient shall:

- (a) ensure adequate record keeping to track fertilization application rate (kg/ha) for each unit or sub-unit treated
- (b) engage an Inspector to inspect the Work (the "Inspector") who is
 - i. the Registered Professional Forester (RPF), or operates under the direction of the RPF, who will sign and professionally seal reports for the Work,
 - ii. experienced and competent in conducting inspections of fertilization operations,
 - iii. familiar with the approved Plans and Work Plans for the Work Areas, and not engaged in the direct conduct of the fertilization;
- (c) inspect the Work in a timely manner while the fertilizer is still visible to ensure all Work is performed as Specified; and
- (d) inspect all Work Areas in accordance with the Inspection System below.

6.2 The Inspector may be an employee of the Recipient. For clarity of function, however, this schedule treats the Inspector and the Recipient as two separate entities.

6.3 The Inspector shall:

- (a) visually check No-treatment Zones and water bodies for the presence of fertilizer, and
- (b) undertake such checks and observations as are necessary to be able to declare an area satisfactorily treated as described in the following section.

6.4 (a) Full payment

Where inspections indicate fertilizer application quality in a Work Area is at least 92.6%, the Province will pay the full Basic Payment.

For Individual Tree application, Inspections will consist of a series of plots distributed over the entire unit with each plot examining the findings on the items below:

- a) Number of trees that should have been fertilized
- b) Number of trees that were fertilized
- c) Number of satisfactory fertilized trees
- d) Number of unsatisfactory fertilized trees

Upon inspection of all plots for a unit, the quality of fertilizing shall be calculated as follows:

$$\frac{(\# \text{ of satisfactorily fertilized trees})}{(\# \text{ of trees required to be fertilized})} \times 100 = \text{Application Quality percentage}$$

In no case shall the Province pay more than 100% of the Basic Payment.

For Broadcast Fertilization, Inspections will consist of an evaluation of Application rate (kg/ha); the Application Quality % (AQ%) is determined as follows; AQ% is $100 \times (\text{prescribed rate (PR)} - \text{absolute value of [PR-actual applied rate]}) / \text{PR}$

(b.) Payment reduction for low quality application where inspection indicates fertilizer Application Quality % (AQ%) in a Work Area is equal to or greater than 70%, but less than 92.6%, the Province

shall reduce the Basic Payment by multiplying the Basic Payment by the AQ% using the following formula: $\text{Payment \%} = (\text{AQ\%} \times 1.08) - ([100 - (\text{AQ\%} \times 1.08)]^2)/8$

(c.) No Payment will be made if the performance quality on all or a portion of a Work Area is less than 70% and, in the opinion of the Province, cannot be improved to at least this level by reworking, the Province shall make no payment for the unsatisfactorily treated area. No payment will be made for application outside the Work Area.

Wasted fertilizer

6.5 The Basic Payment will be reduced in an amount equal to the cost of fertilizer applied outside the prescribed treatment area.

7.0 NOTIFICATION

Requirement to Notify the District Manager

7.1 Further to the notification requirements contained in the General Standards for Ministry funded Programs (FS 1001), a Recipient must immediately notify the District Manager whenever:

- (a) an inspection indicates an area greater than one (1) hectare has not been satisfactorily treated (or other minimum area that may be Specified by the District Manager) and the Recipient is unable to rectify the deficiency;
- (b) fertilizer has been applied, has entered, or is likely to enter a water body, a No-treatment Zone, or an area outside of a Work Area;
- (c) fertilizer is spilled, other than minor spills in the normal course of operations and which are not considered under the Contingency Plan as requiring immediate action;
- (d) a Water Quality Limit has been exceeded

7.2 Any notification must be followed by written notice within one Work Day.