Appendix 19
Protocol for the determination of the acid sensitivity of Surface water in the context of Afforestatation

Applications for grant aid for afforestation in areas outlined on maps of acid-sensitivity as being acid-sensitive and included in the list of County O.S. maps, scale 1: 10560 require an assessment of acid sensitivity for all areas which are the subject of grant-aid applications.

This sensitivity of the water to acidic inputs is determined by the measurement of alkalinity.

Sampling and analysis shall be carried out on a minimum of four occasions at intervals not greater than four weeks in the period February to May inclusive. The analysis will be carried out by a laboratory, independent of the applicant, and currently participating in relevant national or international intercomparison exercises. Samples and measurements should be taken from all watercourses shown on Ordnance Survey 6" Maps within the area of the proposed afforestation.

Samples should be taken as indicated in the procedure on page 137.

Alkalinity should be measured using the Gran Titration Method.

The minimum acid-sensitivity measured in the above manner will determine the overall sensitivity of the site.

There will be no afforestation approved in areas where the minimum alkalinity of the run-off water, measured in the above manner, is <8 mg $CaCO_3$ l^{-1}.

Where the minimum alkalinity of the run-off water, measured in the above manner, is in the range 8 – 15 mg $CaCO_3$ l^{-1}, full, partial or no afforestation may be allowed following discussion and agreement between the Environmental Protection Agency, the Forest Service of the Department of the Marine and Natural Resources and the Regional Fisheries Board.

Afforestation will be allowed in areas where the minimum alkalinity of the run-off water, measured in the above manner, is >15 mg $CaCO_3$ l^{-1}.

Any attempt to change the chemical composition of the water taken, or to be taken, for analysis by the addition of material(s) will immediately render the application for Grant Aid void.

The results of the analysis of all samples carried out in the context of this protocol shall be available to the applicant, the Forest Service of the Department of the Marine and Natural Resources, relevant Fishery Board, Local Authority and the Environmental Protection Agency.

Potentially Acid Sensitive Areas.

The following list of 6 inch O.S. sheet reference areas have been identified as potentially acid sensitive.

Wicklow	O.S. sheet nos.	7 and 8 11 to 13 inclusive 17 to 19 …….. 23 to 25 ……. 29 to 31 ……. 33 to 36 ……. 39 and 40 ……..
Kerry	O. S. sheet nos.	56 62 to 64 inclusive 69 to 72 …….. 78 to 83 …….. 87 to 92 …….. 96 to 100 ……. 105 to 107 ……..
Clare	O.S. sheet nos.	Southern half 31 and 32 All 39 to 41 inclusive Northern half 48 and 49
Offaly	O. S. sheet nos.	Southern half 16 All 23 and 24
Galway	O.S. sheet nos.	9 to 13 inclusive 21 to 27 …… 34 to 40 …… 48 to 55 …… 62 to 68 …… 75 to 81 …… 89 to 93 …….
Sligo	O.S. sheet nos.	24 and 25
Donegal	O.S. sheet nos.	34 to 36 inclusive 41 to 44 ……. 49 to 51 ……. 57 to 60 ……. 67 to 69 ……. 77

Sampling procedure for Rivers and Streams

Equipment Required

1. Six inch (6") map, or equivalent, of area to be sampled
2. Waterproof notebook and record sheets
3. GPS, if available.
4. 2 L HDPE Plastic Sample bottles. The number of bottles determined by the number of sampling points plus some additional spare bottles. For the initial sampling run the sampler should examine the 6" map outlining the proposed development and count the number of sampling points, this should indicate the number of bottles required. For subsequent sampling runs samples should be taken at the same points as in the initial sampling run.
5. Sampling bucket with rope
6. Funnel
7. Disposable gloves
8. Waterproof markers
9. Adequate protective clothing and footwear.
10. Coolbox

Before leaving the work station or laboratory ensure that you:

1. Have sufficient information on location of sampling area to ensure that sample(s) is/are taken from correct watercourses at exact location.
2. Have map of the area to be sampled, of an adequate scale and detail sufficient to ensure easy direction to exact location where water sampling is to be carried out.
3. Request permission of land-owner to enter on to land, inform landowners of your purpose to take samples
4. Have an adequate number of new sampling bottles including some spare bottles.
5. Have enough field sheets to record details of sampling site.
6. Are familiar with safety regulations and procedures dealing with the taking of water samples.

On arrival at the sampling Area

1. Confirm correct location
2. Advise landowner of your presence and request permission to sample.
3. Confirm, with landowner(s), the area of the proposed plantation
4. Advise landowner of approximate time of return

On arrival at the sampling location

1. Observe area of proposed plantation, compare with map and identify sampling locations.
2. Proceed to first sampling location.
3. Record co-ordinates with GPS if available otherwise mark clearly on map.
4. Label sample bottle with the Stream/River name, sample number, location, date and time using a permanent water-resistant marker.
5. Using a plastic bucket (and rope to lower the bucket into the river where necessary) take up a sample. Rinse the bucket with the sample and empty it. Repeat this procedure at least twice, more times when necessary.
6. Facing upstream and in mid-channel where river/stream is shallow (less than 50 cm deep), otherwise at side of stream or off a bridge, lower the bucket into the water and take up a sample of the water. Make sure that water flowing into bucket does not contain sediment from river disturbed by feet. Sample should be taken upstream of point of entry into river.
7. Rinse the (2-litre) sample bottle and funnel thoroughly (three times) with the water from the bucket, then fill the bottle with the water remaining in the bucket. Ensure you fill the bottle leaving only 1 – 2 cm headroom.
8. Rinse the bottle thoroughly and place lid tightly on the bottle. Squeeze the bottle to ensure there are no leaks present.
9. Recheck that the labelling on the bottles is correct.
10. Place the sample bottles into their relevant crates.
11. Each time a water sample is taken a field sheet should be completed (Annex 2). Note the Stream/River name, if any, otherwise mark clearly on map, sample number, location, date and time that the sample was taken.
12. Between sampling and dispatch, all samples must be kept cool and in the dark. Do not leave samples in the car/van where they are liable to become warm. Dispatch samples together with field sheet(s) to laboratory for immediate analysis.

At all times use common sense.
Primarily use a course of action to ensure personal safety.
Be mindful not to contaminate sample by allowing sedimentary or material other than the water flowing in the river into the sampling bucket and the sample bottle. No smoking is allowed on site.
At all times avoid body contact with water intended for analysis.

Alkalinity Testing Laboratories

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Field Sheet

Applicant		Contract No.	
County		6” OS No.	
Townland			

Sample No.	Date Collected	Time of Collection	Water Temperature °C	Remarks

Weather conditions on date of collection

General Weather, recent conditions

Comments

Samples Collected by: _____

State Name: _____

Date: _____