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DATE: May 9, 1985

TITLE: SNOW CREEK SEDIMENT SAMPLING METHOD

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ABSTRACT:

A method is described for collection, preservation and shipment of sediment samples collected in Snow Creek, Anniston, AL. A total of 27 samples from 6 sites are to be collected in May or June of 1985 and will be split 3 ways (9 samples each) between Monsanto, Alabama Department of Environmental Management, and the Alabama State Attorney General's Office. All samples will be analyzed for polychlorinated biphenyls (PCBs) by each of the above parties.

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SNOW CREEK SEDIMENT SAMPLING METHOD

1. PURPOSE AND SCOPE

1.1 The purpose of this method is to describe a procedure, consistent with Good Laboratory Practices, for obtaining environmental sediment samples for analysis of polychlorinated biphenyls (PCBs) by Monsanto, The Alabama Department of Environmental Management (ADEM), and the Alabama State Attorney General's Office (SAGO).

1.2 In depth procedures for collecting, preserving, labeling and transporting the sediment samples are described.

1.3 Procedures are also described for all quality assurance and Good Laboratory Practices that are to be followed including procedures for custody of samples and record keeping.

1.4 Sediment samples are scheduled to be collected once during May or June, 1985 following the procedures outlined in this method.

2. SUMMARY OF METHOD

2.1 This method describes a procedure for collecting, labeling and shipping sediment samples from 6 sites located on Snow Creek, Anniston, AL.

2.2 Sediment core samples are collected using a 1 x 12" core tube whenever possible. When necessary a 2 x 20" core sampler with nose cone retainer will be used as second choice. If a core sample cannot be obtained a metal scoop will be used to obtain a grab sample. Each sample will be a composite of three core samples collected at each site. Each composite sample will be split into three distinct samples for analysis by Monsanto, ADEM, and SAGO.

2.3 A total of 18 samples (6 sites x 3 participants) will be collected.

2.4 Sediment samples are preserved by shipping on ice and storing at - 10°C until analyzed.

2.5 All samples are labeled with waterproof labels using a coded system which designates a log notebook page, type of sample, site, sample number, date and name of collector.

2.6 Good Laboratory Practices and quality assurance methods have been built into this method to insure sample integrity.

3. SIGNIFICANCE AND USE

3.1 This method is necessary to document all procedures that are to be followed when sediment samples are collected for PCB analyses.

3.2 This method will be used to insure that samples are collected in a reliable, consistent manner, that the chain of custody of the samples is easily understood, and that the integrity of the samples is maintained.

4. TERMINOLOGY (As used in this method)

4.1 Site - the specific area where a transect will be established on Snow Creek.

4.2 Transect - a straight line traverse across Snow Creek at each site.

4.3 Field Blank - a sample standard sediment passed through the sampling equipment and returned to the laboratory for analysis of PCBs. Field blanks are used to determine the amount of contamination associated with the collection, preservation and shipping of field samples.

4.4 Preservation Method - the procedure followed to insure that the chemical of interest is not biodegraded, transformed or contaminated during sample shipment and storage.

5. EQUIPMENT

5.1 Compass (hunter's compass is adequate)

5.2 Two rolls of electrician's tape and one roll of duct tape (duct tape optional)

5.3 Roll of aluminum foil (optional)

5.4 Jack knife or hunting knife

5.5 Heavy duty plastic bags

5.6 Camera and film

5.7 Knee high boots or hip boots and rain gear (optional)

5.8 Stainless steel core (1"x18") samplers and carrying bucket (28 core tubes will be provided by Monsanto)

5.9 Sediment core sampler (2"x20") with nose cone retainers (8 core tubes will be provided by Monsanto)

5.10 Sampling scoop (stainless steel or aluminum - will be provided by Monsanto)

5.11 Stainless steel tray (used to hold and mix the core samples; provided by Monsanto)

5.12 Sediment sample containers (30 wide mouth 8 oz. sample jars will be provided by Monsanto)

5.13 Stainless steel spatula (1" wide; for mixing sediment samples; provided by Monsanto)

5.14 Ice chest (for sample jars during collection and for shipment; each participating group must bring an ice chest)

5.15 Ice (obtained by each participating group)

5.16 Labels and tape for sample bottles (provided by Monsanto)

5.17 Ink pen with non water soluble ink

5.18 Range finder (optional)

5.19 Appropriate packaging material if samples are to be shipped

5.20 A log notebook for recording data (Monsanto will record pertinent field data in a Monsanto notebook, others may do the same if they so choose)

5.21 Teflon squirt bottle for acetone (provided by Monsanto)

5.22 Acetone for cleaning sampling equipment (provided by Monsanto)

5.23 Standard blank dirt containing non measurable quantities of PCBs (provided by Monsanto)

6. CLEANING OF EQUIPMENT

6.1 Clean the sediment sample bottles by rinsing new bottles with acetone three times. Pour the acetone directly from the glass bottle or from a Teflon squirt bottle. When the acetone has evaporated from the sample containers, place in a drying oven at 175°C for 24 hours, cool and cap.

6.2 Clean the stainless steel spatula used for mixing sediments and sediment scoop as described in 8.1. In the field, prior to use at each station, rinse once in the river and then rinse three times with acetone (use a Teflon squirt bottle). Transport both pieces of equipment between sample sites in a small cardboard box.

6.3 Wash the stainless steel sediment mixing tray with soap (Sparkleen) and water, rinse six times with deionized water, and then three times with acetone. This is done in the laboratory prior to sampling. The tray is not heated in an oven because of its large size. In the field, prior to use at each station, rinse the sediment mixing tray once with river water followed by three rinses with acetone. The tray can be lined with aluminum foil between sampling sites to help prevent contamination.

7. SAMPLE SITES

7.1 The following six sites were selected for sediment sampling (see Figure 1).

7.1.1. Site #01 - below Monsanto discharge to drainage ditch at the point where the water leaves the culvert and enters the ditch.

7.1.2 Site #02 - downstream 50 m from site #01 and upstream from railroad track in the drainage ditch.

7.1.3 Site #03 - downstream 20 m from confluence of the drainage ditch with Snow Creek.

7.1.4 Upstream 20 m from 10th Street in Snow Creek.

7.1.5 Site #05 - downstream 20 m from 9th Street in Snow Creek adjacent to Pine Avenue.

7.1.6 Site #06 - downstream 20 m from Glen Addie Rd. in Snow Creek.

7.1 Additional Considerations In Site Selection.

7.2.1 An effort will be made to collect sediment samples which consist of a fine soil type, with some organic material present.

7.2.2 Sediment samples will not be collected in stream channelled portion of Snow Creek.

7.2.3 Large rocks, sticks and debris should not be included in the sediment sample. In some cases, a core sample or grab may have to be thrown away and another sample taken if the sediment subsample is not satisfactory.

7.2.4 To accommodate the above considerations, it may be necessary to move short distances (5-10 ft.) upstream or downstream to find an area suitable for sampling.

8. SAMPLE COLLECTION METHODOLOGY

8.1 Three sediment core samples are collected at each site along a three point transect traversing Snow Creek. The three core samples are composited, mixed, and subdivided into three equal samples. One sample is retained by each of the three participating parties.

8.2 Sediment Sample Schematic for a typical site.

Snow Creek

1 2 3

X _____ X _____ X

3 cores per sample
6 sites=6 samples
3 blanks=3 samples
9 samples
x3 parties
27 total samples

8.3 Sediment samples will be collected as 1"x12" cores wherever the creek bed allows for collection by this methodology. If necessary a 2"x20" core sampler with a nose cone sample retainer will be used in loose sediment. In areas where the creek bed is all clay or big rock a metal scoop will be used to obtain a grab sample.

8.4 Procedure

8.4.1. Station 1: Rinse the inside of the stainless steel sediment collecting tray, spatula, and scoop once with creek water and three times with acetone.

8.4.2 Collect sediment from three separate core tubes in a stainless steel tray; a minimum of 200 grams is required.

8.4.3 Mix the sediments (with a stainless steel spatula) for 1 minute or until they appear to be homogenous.

8.4.4 Divide the three core samples into three equal aliquots after mixing. Place each aliquot in a sample bottle (previously) labeled, cap the bottle, and place in ice chest.

8.4.5 Collect a field blank by filling three separate core tubes with blank standard sediment and empty into the sediment tray, stir, and scoop back into a labeled sediment sample jar and place on ice.

9. SAMPLE LABELING

9.1 Each sediment sample will be labeled using a waterproof label and waterproof marking pen. Scotch brand labels protection tape (No. 635) is recommended to cover the labels.

9.2 The following sample information and code will be placed on the label of each sample.

9.2.1 Log notebook page number - the notebook page number which contains the information specific to a given site.

9.2.2. Sample description number - this is a number which describes the type of sample, date of collection, sample site, and sample number at the station.

For example: S-6-1-85-01-01

S = sediment sample (W = water sample)
6-1-85 = date of collection of the sample
01 = sample site #1
sample site numbers are listed in section 8.1
01 = first sample at site 1

9.2.3. The description code for sediment field blanks is SFB-6-1-85-01. The last digit for sample number is not needed since only one sample is prepared for a given date.

10. SAMPLE PRESERVATION

10.1 Collect sediment samples, place in wide mouth jars, label, and place on ice. Freeze the samples when they reach the analytical laboratories at - 10°C or lower.

11. SAMPLE SHIPMENT

11.1 Monsanto will ship all samples Federal Express (or equivalent delivery) to Monsanto Environmental Sciences Center, Dayton, Ohio, for analysis.

11.2 ADEM and SAGO will submit their samples to a laboratory of their choice.

11.3 Procedure - line an ice chest with a polyethylene bag, fill the bag one-half full of ice, tie a knot in the bag to contain the water, place the sediment sample bottles on the ice, fill with styrofoam kernels and ship the samples.

12. USE OF FIELD LOG NOTEBOOK

12.1 A notebook will be used to record field data including sample site identification, site description, river state, weather conditions sampling problems, sample description code, and water depth.

12.2 Quality Assurance forms (see Appendix I) for each site will be taped in the notebooks. The information which is collected at each site is recorded on these forms. If additional space is needed for notes, they should be written on the left hand page (back of previous page).

12.3 The log number which is written on each sample label is obtained from the upper right hand corner of the log notebook page which corresponds to a given site.

12.4 Each log notebook page must be signed and dated by two members of the sampling team.

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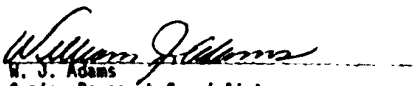

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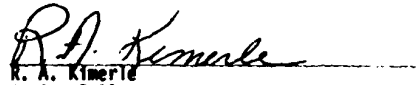

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