DPST-76-358

FIELD MANUAL FOR STREAM SEDIMENT RECONNAISSANCE

SAVANNAH RIVER LABORATORY
NATIONAL URANIUM RESOURCE EVALUATION PROGRAM

SAVANNAH RIVER LABORATORY
AIKEN, SOUTH CAROLINA 29801

PREPARED FOR THE U.S. ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION UNDER CONTRACT AT(07-2)-1

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ERDA OPEN FILES TWO FIELD MANUALS FOR HYDROGEOCHEMICAL AND STREAM SEDIMENT RECONNAISSANCE

The Grand Junction (Colorado) Office, Energy Research and Development Administration (ERDA), has placed on open file two reports entitled "Field Manual for Ground Water Reconnaissance," and "Field Manual for Stream Sediment Reconnaissance."

The reports, prepared by R. B. Ferguson, Van Price, and E. I, Baucom, of ERDA's Savannah River Laboratory (SRL), Aiken, South Carolina, are intended to direct and coordinate field operations, site selection, sample collection, and information for SRL's contribution to the National Uranium Resource Evaluation (NURE) program. SRL, operated for ERDA's Savannah River Operations Office by E. I. duPont de Nemours and Company, is responsible for completing a water and stream sediment survey in 25 states in the eastern United States.

NURE is an ongoing program of ERDA's Grand Junction Office which includes the development and compilation of geologic and other information with which to assess the magnitude and distribution of uranium resources and determine areas favorable for the occurrence of uranium in the United States.

The 71-page Ground Water Reconnaissance report, GJBX-26(77) [SRL No. DPST-76-416], dated January 1977, and the 56-page Stream Sediment Reconnaissance Report, GJBX-30(77) [DPST-76-358], dated July 1976, have been placed on open file at the following locations:

DPST-76-358

FIELD MANUAL FOR STREAM SEDIMENT RECONNAISSANCE

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NATIONAL URANIUM RESOURCE EVALUATION PROGRAM

by

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Analytical Chemistry Division

Publication Date: July 1976

E. I. DU PONT DE NEMOURS AND COMPANY
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FOREWORD

This manual is intended to direct and coordinate field operations, site selection, sample collection, and information codes for the Savannah River Laboratory (SRL) contribution to the National Uranium Resource Evaluation (NURE) program. The manual provides public relations information for field sampling teams as well as technical direction.

The NURE program was begun in the spring of 1973 to evaluate domestic uranium resources in the continental United States and to identify areas favorable for commercial exploration in response to the rapidly increasing national demand for uranium. The Grand Junction Office of the Energy Research and Development Administration (ERDA) is responsible for administering and coordinating NURE program efforts. Inputs to the NURE program come from ERDA prime contractors, ERDA-sponsored research and development, the uranium industry, U. S. Geological Survey (USGS), U. S. Bureau of Mines (BuMines), other government agencies, and independent sources.

In 1975, SRL accepted responsibility for hydrogeochemical and stream sediment reconnaissance surveys of twenty-five states in the eastern United States. Oak Ridge Gaseous Diffusion Plant (ORGDP), Los Alamos Scientific Laboratory (LASL), and Lawrence Livermore Laboratory (LLL) have accepted responsibility for similar reconnaissance surveys in the rest of the continental United States including Alaska.

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INTRODUCTION

The Energy Research and Development Administration (ERDA) was created by Congress in January 1975 to consolidate various energy programs funded by the Federal Government. ERDA is conducting or funding research and development work in a number of fields including solar energy, wind energy, geothermal energy, nuclear fission, breeder reactors, and nuclear fusion. ERDA is also evaluating the United States reserves of fuels for energy sources and methods of containing or disposing of their wastes.

Current domestic uranium reserves fall far short of meeting requirements projected to the year 2000. An estimated eight-year lag occurs between discovery and production of uranium (Figure 1).

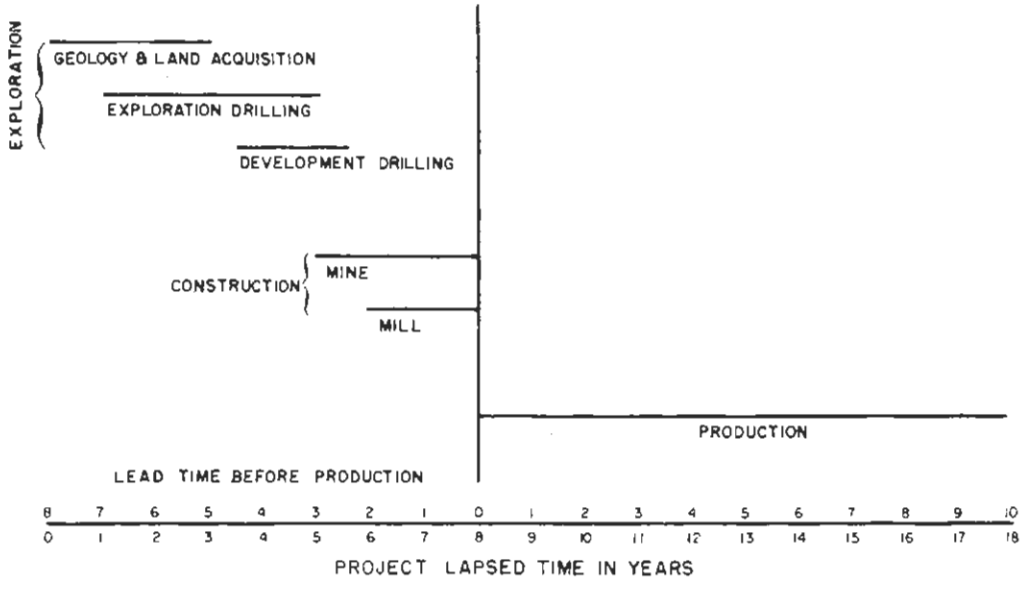


FIGURE 1. Typical Lead Time from Discovery to Production of Uranium

To stimulate commercial uranium exploration, the Atomic Energy Commission (AEC) initiated the National Uranium Resource Evaluation (NURE) program in the spring of 1973. NURE is a comprehensive program to evaluate domestic uranium resources and to identify areas favorable for uranium exploration.

The overall objectives of the NURE program are:

- To achieve a preliminary evaluation, based on existing data, of domestic uranium resources and favorable exploration areas by January 1976.
- To conduct a more comprehensive evaluation of domestic uranium resources and favorable areas by October 1981.
- To develop new and improved procedures, equipment, and technology for uranium search and assessment.
- To disseminate information on new exploration concepts and technology, and to identify new areas favorable for uranium exploration at the earliest possible date through publications, open files, and seminars.

The Grand Junction Office of the Energy Research and Development Administration (ERDA-GJ) has completed the first objective* and is responsible for administering and coordinating efforts to meet the other objectives. Inputs to the NURE program come from ERDA prime contractors, ERDA-sponsored research and development, the uranium industry, U. S. Geological Survey (USGS), U. S. Bureau of Mines (BuMines), other government agencies, and independent sources.

There are seven major areas within the NURE program:

- Aerial radiometric reconnaissance.
- Hydrogeochemical and stream sediment reconnaissance.
- Surface geologic investigation projects.
- Geologic drilling projects.
- Remote sensing projects.
- Geophysical technology development
- Low-grade (<500 ppm U) study project.

* The report was issued by the Grand Junction Office as document GJO-111(76).

The Savannah River Laboratory (SRL), Oak Ridge Gaseous Diffusion Plant (ORGDP), Los Alamos Scientific Laboratory (LASL), and Lawrence Livermore Laboratory (LLL) have accepted responsibility for hydrogeochemical and stream sediment reconnaissance of the United States as shown in Figure 2. The objective of this portion of the program is to accomplish a systematic determination of the distribution of uranium in surface and underground waters and in stream sediments in the continental United States, including Alaska. The significance of the distribution of uranium in natural waters and stream sediments will be assessed as an indicator of favorable areas for the discovery of uranium deposits.

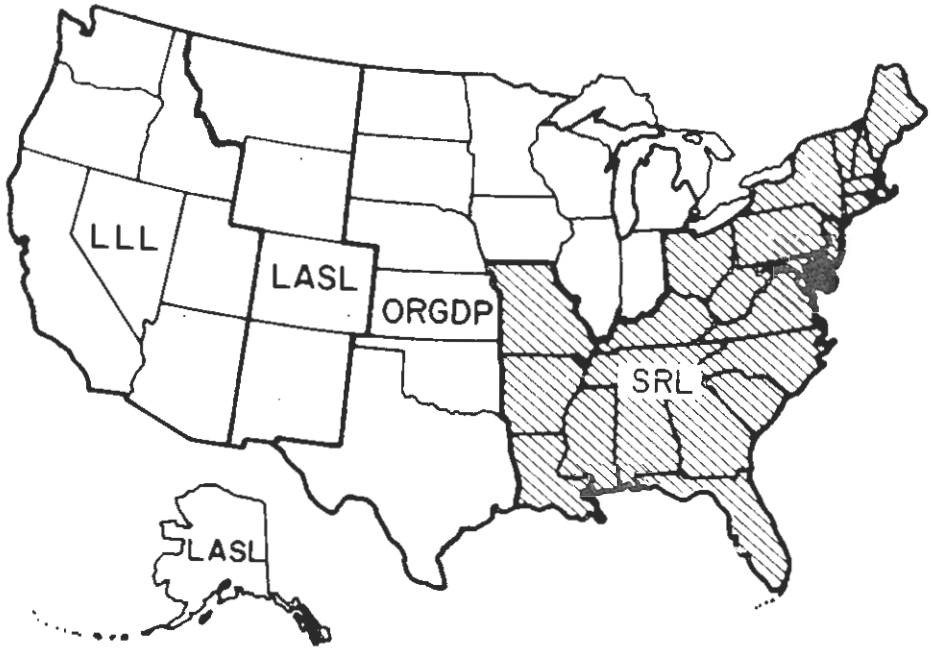


FIGURE 2. Areas of Responsibility for Hydrogeochemical Reconnaissance

The areas of responsibility are based on geologic provinces normalized to state boundaries (Figure 2). Assignments are based on geologic provinces because similar geochemical factors should control both the occurrence of uranium deposits and the hydrogeochemical expression of uranium. For administrative reasons, areas of responsibility are coincident with state boundaries.

The area of responsibility for SRL includes all of the Atlantic and Gulf Coastal Plain states except Texas, all of the Appalachian Highlands, most of the Interior Low Plateaus (Kentucky, Tennessee), and most of the Interior Highlands (Missouri, Arkansas).

Before entering the reconnaissance phase of the NURE program, SRL conducted an extensive development program (see References 1-5 for planning and progress reports). Techniques were developed to obtain great precision and accuracy for analyzing uranium concentrations from <0.020 parts per billion (ppb) in natural waters to >600 parts per million (ppm) in rocks and sediments. Field orientation studies were conducted in a variety of geologic and geographic settings to develop technical and operational experience applicable to the reconnaissance program. Seasonal variability studies are in progress from South Carolina to Maine. Variability of sampling techniques was studied to ensure that a representative sample can be taken at a given site. Sampling instructions in this manual are derived in part from SRL experience and in part from standard geochemical sampling practices.

Samples collected in the NURE program will be archived for future study. Geochemical samples collected systematically over broad areas will constitute a significant national resource. Even though SRL will currently analyze samples only for uranium and geochemically related elements, every effort will be made to preserve the integrity of the samples for possible additional analyses in the future.

The NURE program is being conducted with public funds for the equal benefit of all Americans. Contractors participating in the NURE program have an obligation to protect the public interest. All samples, sample splits, duplicates, data, observations, and all other items of information obtained during the course of operation under a contract to participate in the SRL/NURE program are to be provided only to SRL. None are to be retained for private use or communicated to others without the prior written consent of SRL and ERDA.

All data, theories, speculations, and conclusions derived from operations under an SRL/NURE contract are the property of ERDA and are to be communicated only to SRL. The Grand Junction (Colorado) Office of ERDA will release data and reports simultaneously at a number of sites across the country as rapidly as these releases can be processed. SRL will notify individual land owners of results obtained on samples from their property at the time of the ERDA release, if their request for such information has been noted on a field data form.

A number of individuals and companies, both domestic and foreign, are currently exploring for uranium in the eastern United States. The field supervisor should stress to his personnel that ANY information released may result in proprietary benefit not in the public interest. It should be stressed to individual land owners who inquire that a contractor's presence at a given site is in no way related to the presence or absence of a uranium deposit at that site, and that this sampling is part of a program to cover the entire nation.

FIELD OPERATIONS

A. LOGISTICS AND PUBLIC RELATIONS

1. Notification of Public Officials

Prior to team operation in a given county, it is recommended that the field supervisor visit the county seat, present proper identification, and notify the county sheriff's office of the sampling program in that county. A few minutes spent in a public relations effort in various county offices could prove of immense benefit.

2. Access to Property

a. Private Property

Most NURE samples will be collected on private property. In some cases, it may not be practical to secure a land owner's permission to visit every site. Care should be taken to avoid any damage to private property. (Even snakes and briars are private property.)

b. Military Bases

The commanding officer of each base enjoys a great deal of autonomy in controlling access to the base. The field supervisor should attempt to contact this person well in advance of any planned sampling on the base. Problems in gaining access should be reported promptly to SRL.

c. Forest Service Lands

The Forest Service of the United States Department of Agriculture manages, protects, and conducts research on many thousands of acres of timberland in the SRL area of responsibility. We have been assured the cooperation of the Forest Service in our program as long as our activities are no detriment to the forest environment or resources. A representative of the Forest Service has agreed to provide contractors with lists of the appropriate personnel to contact in each

forest area. In general, each Forest Supervisor should be consulted some time in advance of field operations and MUST be notified at least a week in advance of actual sampling so that he can advise District Rangers of the presence of authorized ERDA sampling teams in an area. The field supervisor MUST contact District Rangers when sampling teams actually arrive and before sampling is begun. Commercial exploration on Forest Service lands requires the issuance of a mineral exploration permit. The Forest Service has agreed to waive this requirement for the NURE program, and the greatest care must be taken to respect Forest Service requests.

District Rangers may be of assistance in arranging contacts with private land owners and other persons having a proprietary interest in lands within the District.

d. Indian Reservations, Parks, Wildlife Refuges, and Other Public Preserves

The field supervisor should contact the local agent, tribal representative, ranger, warden, or other official-in-charge several days prior to anticipated sampling. No problems in gaining access are anticipated.

3. Identification

ERDA identification cards are to be issued to all sampling team personnel. A short brochure giving some highlights of the NURE program has been prepared so that sampling teams will have something tangible to leave with property owners. In no case is false identification or misrepresentation of purpose to be used.

4. Rejection

Most land owners will be more than happy to cooperate and may volunteer much useful information. Some may forbid access to their property, and at least one will be downright hostile during the course of operation. LEAVE WHEN ASKED!

5. Team Numbers

Each field supervisor will assign team codes to his teams and furnish SRL a list of the team members and codes. A team code consists of a letter designating the field supervisor and a number which is unique for each person or pair on a team.

EXAMPLE: Team KO7
Field Supervisor: King
Team Seven: J. Doe, M. Brown

6. Liaison with SRL

The field supervisor will contact SRL at least once weekly by telephone or messenger. SRL is to be apprised in advance of the general area being sampled and is to be given a motel or boarding house address and a telephone number where the field supervisor can be contacted at SRL initiative during any twenty-four-hour period.

The field supervisor is expected to be abreast of team activities at all times; under normal circumstances, SRL will communicate with field teams only through the supervisor.

Routine maintenance of equipment is the responsibility of the field supervisor. SRL will perform major repairs or replacements of equipment, but turn-around time may be on the order of several weeks. The field supervisor should try to detect failing instruments and anticipate needed repairs. It is suggested that a daily log of instrument checks be kept to aid in identifying failing meters or probes.

B. SAMPLING SITE SELECTION AND SITE OPERATIONS

1. Sampling Density

Orientation studies indicate that stream sediment sampling at an average density of one site per five-square-miles is adequate to define most geologic features expected in the southeastern Piedmont and Blue Ridge areas.

2. Site Selection Procedure

The procedure suggested for site selection is given in Appendix A.

3. Sample Collection

Detailed instructions for sample collection are given in Appendix B.

4. Coding of Field Data Forms

Detailed instructions for coding of field data forms are given in Appendix C.

C. RETURN OF SAMPLES TO SRL

The contractor is responsible for all samples until these are received by SRL in usable form. Payment will be made only for samples which are clearly labeled and which are accompanied by completed and correct data forms and collected sample maps.

1. Maps

Coordinates of sampling points will be measured directly from the map returned with each group of samples. Maps must be clean, unfolded (rolled in protective tubes), and labeled with sampling sites precisely indicated as points within circles.

Care must be taken to assure that each site identifier is unique to only one sample. Two samples with the same identifier are both worthless.

2. Data Forms

Data forms, in a moisture-proof enclosure, must accompany samples. Detailed instructions for completing these forms are given in Appendix C.

3. Samples

Samples should be dried before shipping in the prescribed Kraft paper collection bags. They are to be arranged in serial order within each map unit (normally a county) and packaged together by map unit. The paper bags may weaken and burst during shipment if samples are damp. Neatness in packaging will facilitate sample check-in at SRL and thereby facilitate payment.

4. Cartons

Each shipping carton should contain samples and forms from only one map unit. If multiple map units are shipped together, they must be separated or compartmentalized within cartons.

A packing list must be attached to the exterior of each carton shipped. The packing list should include: (a) a tabular listing of each sample and the total numbers of on-road and off-road samples contained in the carton, (b) any data forms enclosed, (c) any maps accompanying the shipment, and (d) the order numbers (AX number) of the contract. A duplicate packing list should be enclosed in the carton.

5. Shipping

Samples are to be delivered or shipped to SRL at approximately two(2)-week intervals. The recommended method of shipping is by motor freight to E. I. du Pont de Nemours and Company, 300/700 Receiving Department, Dunbarton, South Carolina. Air freight to Augusta, Georgia, via Delta or Eastern Air Lines has also been satisfactory. These air lines have no air freight forwarders.

APPENDIX A: SITE SELECTION PROCEDURE

This site selection procedure was developed for the Southern Appalachians, which are being sampled (1976-1977) at a nominal density of one site per five square miles. Other areas may be sampled at different densities, but similar logic applies. The procedure is meant to serve as a guideline to assure a degree of uniformity in site selection. It should be kept in mind that the primary objective is to obtain coverage that is, as nearly as possible, uniform, complete, and representative.

1. Adequate maps are required to pinpoint the sampling sites. Duplicate maps must be delivered to SRL. County road maintenance maps at a scale of approximately 1:125000 appear to be the most generally useful maps. They are current and show all road-stream intersections. Topographic maps, U. S. Forest Service maps, and other special maps will be useful in some areas and may be necessary where counties do not maintain roads.

2. A drainage overlay should be prepared on drafting film with all road-stream intersections marked.

3. The drainage overlay is then placed over a sampling density grid having regular polygons each representing a five (5) square mile area, and sites are selected.

4. The sample is intended to represent about a 5-square-mile area drained by the stream. Most streams draining 3 to 10 square miles should be sampled. In general, the largest stream in a 5-square-mile area which originates in that area or in an adjacent 5-square-mile area should be selected. It is generally better to select two or three sites on a stream draining 10 to 15 square miles than to select a dry stream bed or a stream draining less than ~2 square miles. Very few streams draining over 20 square miles should be sampled. Occasionally, a five-square-mile area may not contain a stream suitable for sampling. In other cases, two or three sampling sites, representing different drainage areas from separate grid units may be within the same grid unit.

5. We have considered arguments for completeness of our survey and for invalidation of samples by severe pollution. It is not practical to sample within major metropolitan areas (such as Atlanta, Georgia), but many small towns may afford pristine sampling sites. As a guideline, we suggest that samples not be taken within the statutory limits of towns with populations over 2000. We recognize that city limits bear no set

relation to land-use patterns within them, and the judgment of the sampling team must be relied upon to maximize coverage while minimizing strongly biased samples.

6. In planning the sampling program, it was anticipated that about 10% of the area would be inaccessible by motorized four-wheel vehicle. Off-road sites are costed at a different rate than on-road sites. A definition of "off-road" versus "on-road" sites is difficult to formalize. Ease of access is certainly a factor in the definition. SRL will accept as "off-road" those sites where it is certified that 100 yards of hostile terrain had to be traversed before first gaining access to the sampled stream. Several hundred yards of grassy meadow should not be charged as an inaccessible site; conversely, twenty yards down a cliff might fairly be charged at the higher rate.

7. Selection of sampling sites is the responsibility of the field supervisor and should be completed well in advance of sampling in an area. SRL will normally inspect and approve site locality maps at least two (2) weeks before samples are collected in an area. Sampling teams may collect from an alternate site when it is impractical to collect a valid sample from the pre-selected site. Alternate sites should be clearly indicated on the sampling maps in waterproof ink.

APPENDIX B: SAMPLE COLLECTION

PART I. DAILY PREPARATION

Several tasks must be completed prior to each day's field work. These tasks are discussed in this section, and are summarized in a checklist at the end of this appendix.

The sampling team in the field will normally comprise two people. One person (designated in this discussion as Team Member 1) will be primarily responsible for water sampling and analysis. His equipment will be a portable field laboratory packed in an instrument case (Figure B-1). A second person, Team Member 2, will be primarily responsible for sediment sample collection. His equipment is carried in a normal backpack. Both team members should assist one another to check supplies and equipment, and to perform sampling and record-keeping tasks.

Specific supplies, equipment, and instructions are:

Team Member 1

- *Maps and Data Forms* — Enough data forms should be kept in the lid of the instrument case to provide one for each site to be visited plus several spares. THESE MUST BE KEPT DRY.

  The SRL sampling site map(s) showing exact sample site locations must also be readied for each day's work and stored in the instrument case or other suitable container. Each map should be individually checked to see that all needed are present. Spare wooden or mechanical #2 soft lead pencils should also be carried in the instrument case.

- *Syringe Filter Assembly* — A syringe filter assembly consists of a 50-ml glass or plastic syringe, a slip-on plastic filter holder, and a piece of 37-mm diameter filter paper (Figure B-2). The syringe filter assembly is used to filter 50 ml of water at the sample site to be titrated for alkalinity. The syringe is cleaned, condition checked, and the complete assembly placed in the instrument case. Adequate 37-mm filter papers are also stored dry in the instrument case.

FIGURE B-1. Instrument Case for Portable Field Laboratory

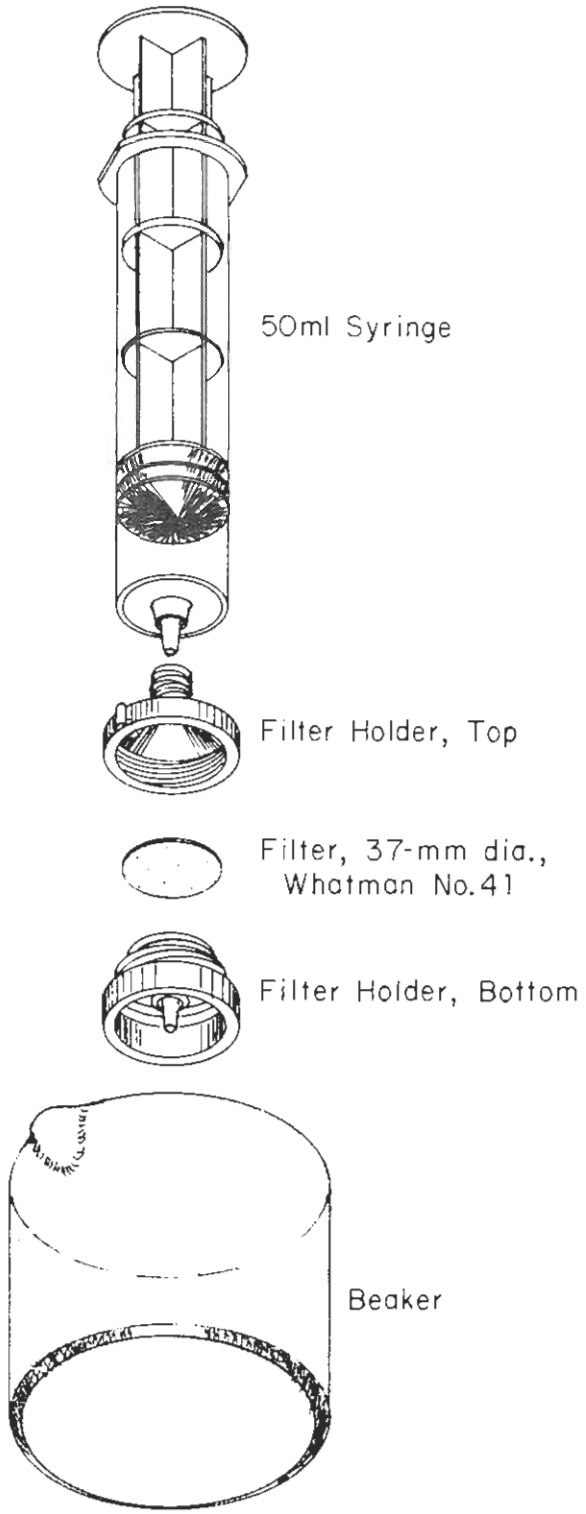


FIGURE B-2. Syringe Filter Assembly

- *Bromo-Cresol Green/Methyl Red Indicator* — A plastic dropping bottle of bromo-cresol green/methyl red indicator solution (hereafter called "indicator") is securely closed in a plastic bag and placed in the instrument case. A 125-ml Ehrlenmeyer flask is cleaned, condition checked, and placed in the instrument case.

- *Acid Bottle 0.02N* — A plastic dropping bottle full of 0.02N sulfuric acid is SECURELY CLOSED in a plastic bag and placed in the instrument case (Figure B-3).

- *Equipment Check* — The plastic bags in which the instruments are sealed should be checked daily for holes or leaks. The silica gel desiccant should be blue. The instruments generally are not dependable if they are operated in a damp environment. The conductivity meter and pH meter are shown in Figures B-4 and B-5, respectively. The pH meter, packaged in plastic to guard against moisture, is shown in Figure B-6.

  The batteries in the conductivity meter and pH meter should all be checked, using the procedures described later. Batteries found weak should be replaced by the FIELD SUPERVISOR only. The pH calibration should be checked in pH 4, 7, and 10 buffers each morning. The conductivity meter should be checked with 0.001M KCl solution each morning. The temperature circuit in the conductivity meter should be checked once a week against a standard thermometer. All instrument repairs should be done by the FIELD SUPERVISOR, who has been issued a manual for the instruments. The field supervisor must be thoroughly familiar with the manual and the instruments.

  The field instrument case should be emptied and cleaned daily, carefully removing the plastic foam protective liner each time. If any stream sediment or noticeable amount of dust or dirt have accumulated in or on the foam, it should be cleaned.

Team Member 2

- *Sample Paper Bags* — An adequate supply of Kraft paper sediment bags must be set aside, ready for the day's collection. A ball of white cotton cord is also set aside to tie the bags shut. A pocketknife or other cutting tool should be available to cut the cord. The bags and cord should be stored in the backpack. A felt-tip pen with indelible ink (*Flowmaster* or equivalent) should be carried in the backpack for marking the sediment sample paper bag (Figure B-7).

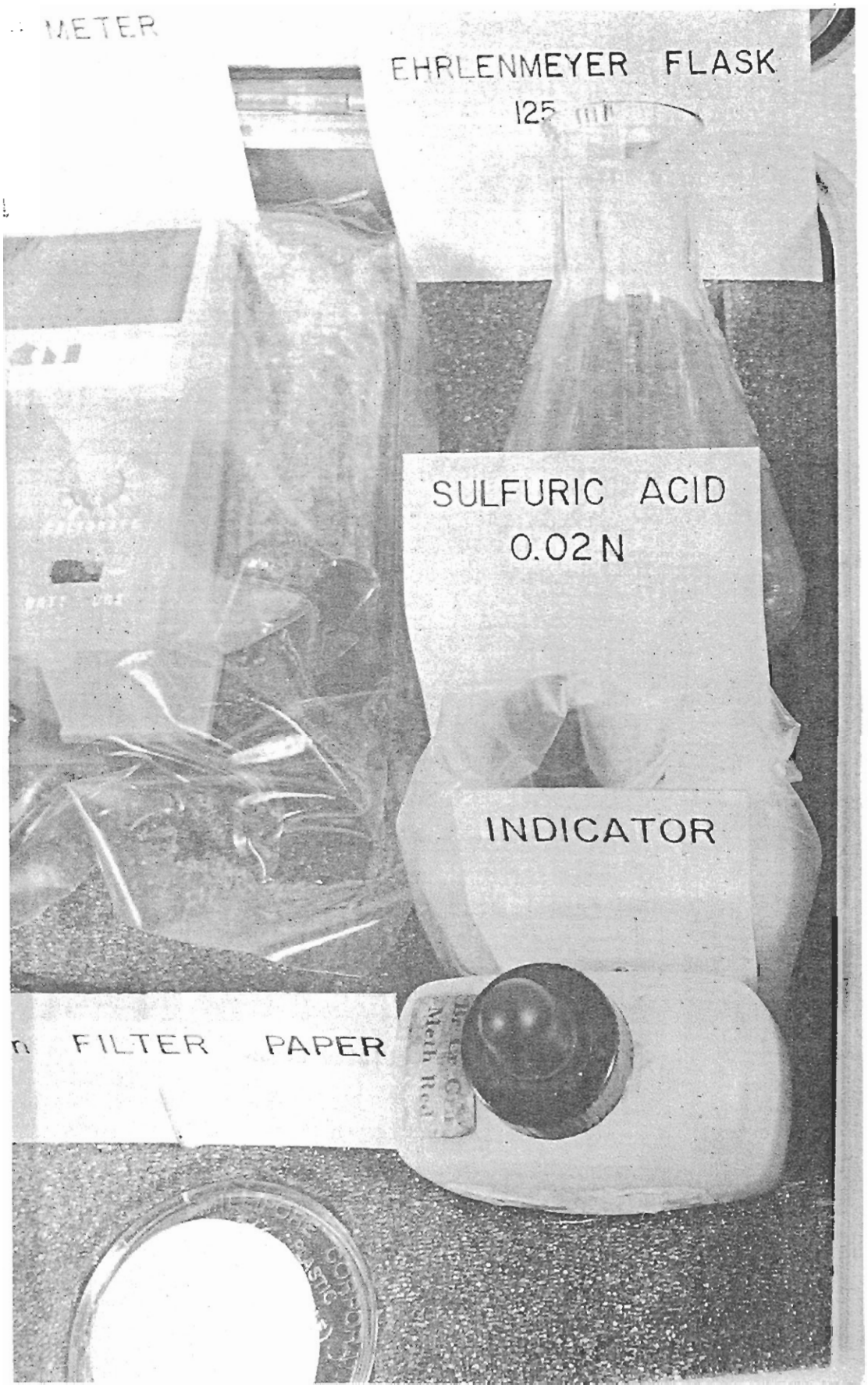


FIGURE B-3. Stowage of Acid Bottle in Instrument Case

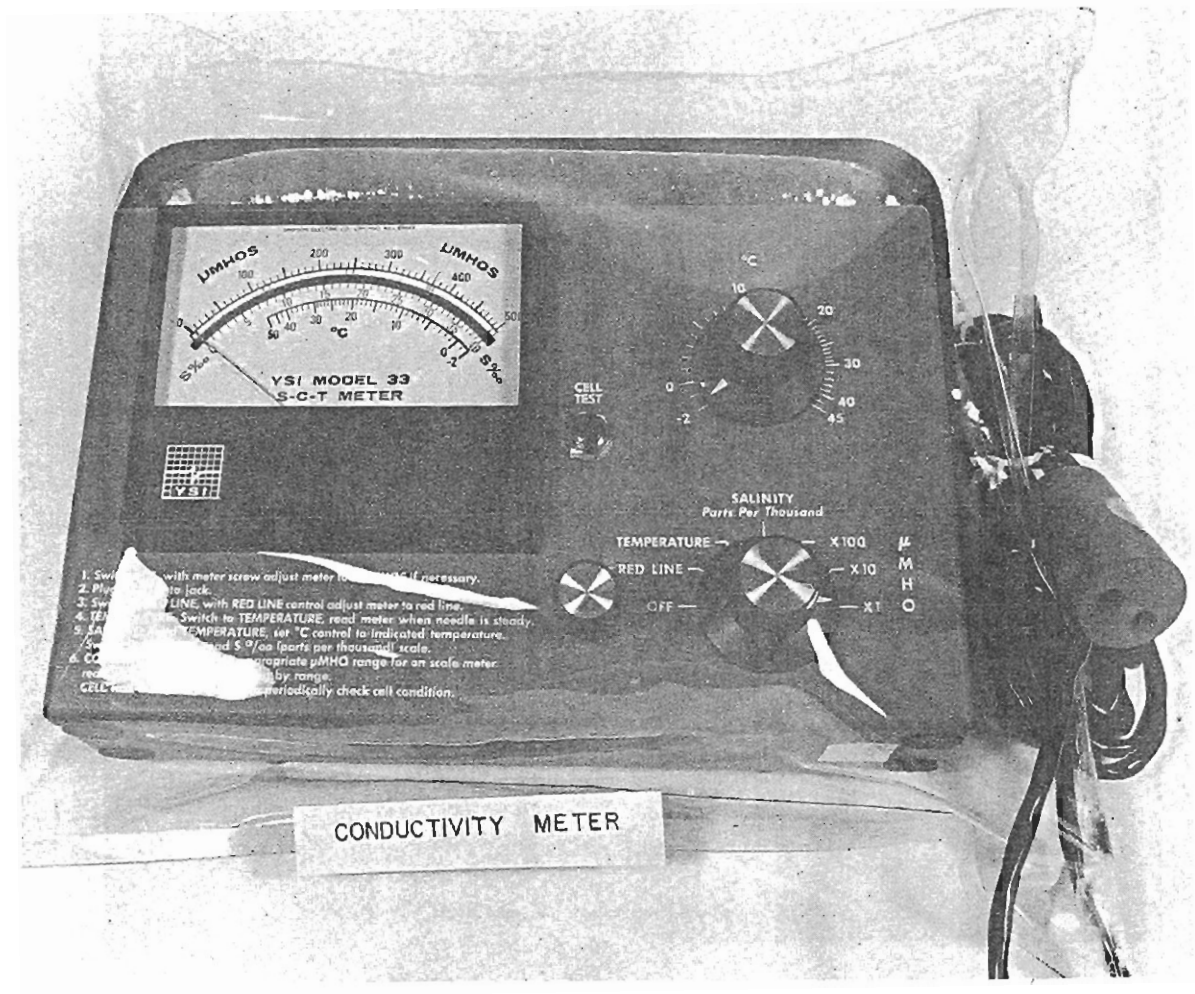


FIGURE B-4. Conductivity Meter

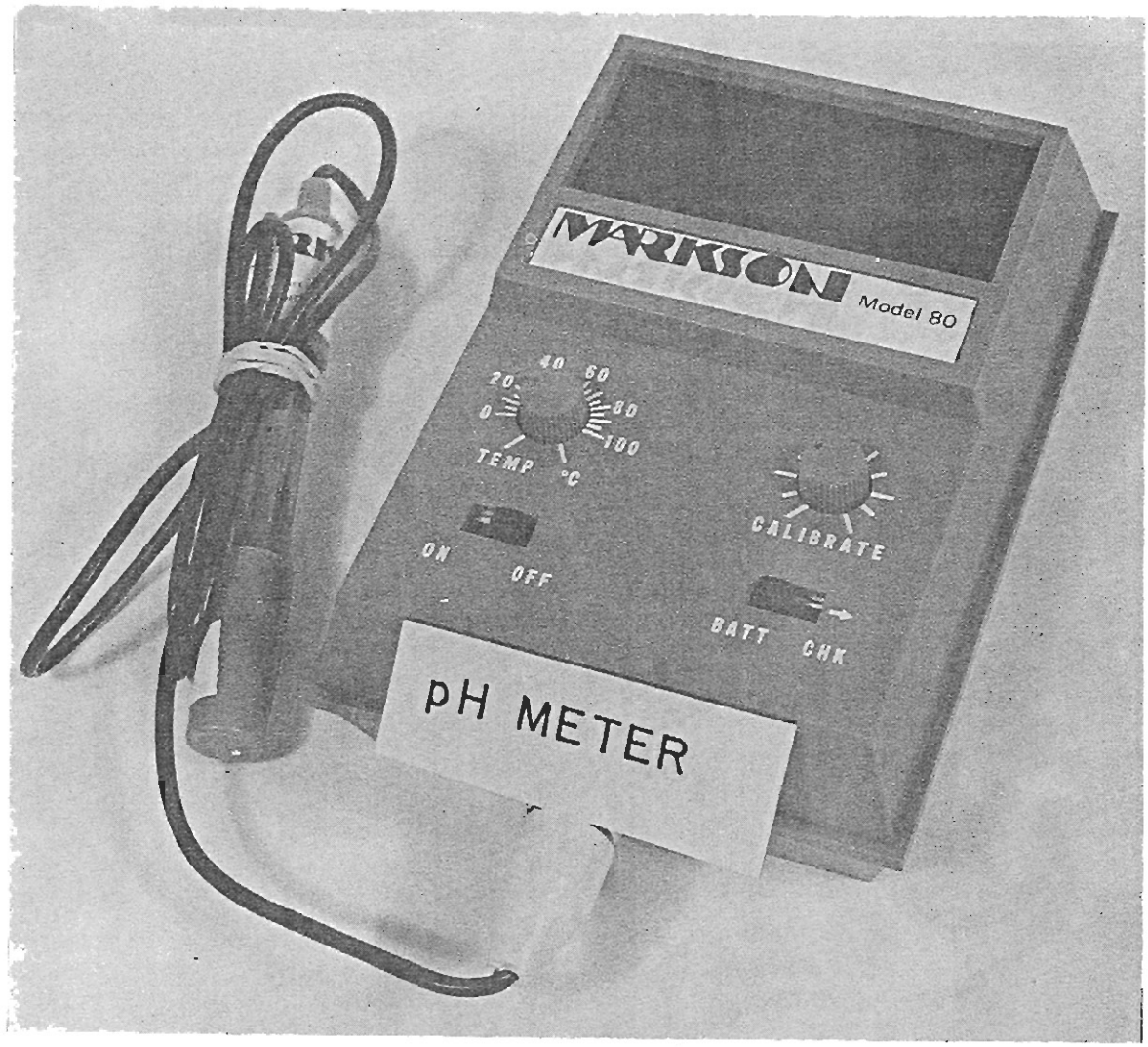


FIGURE B-5. pH Meter

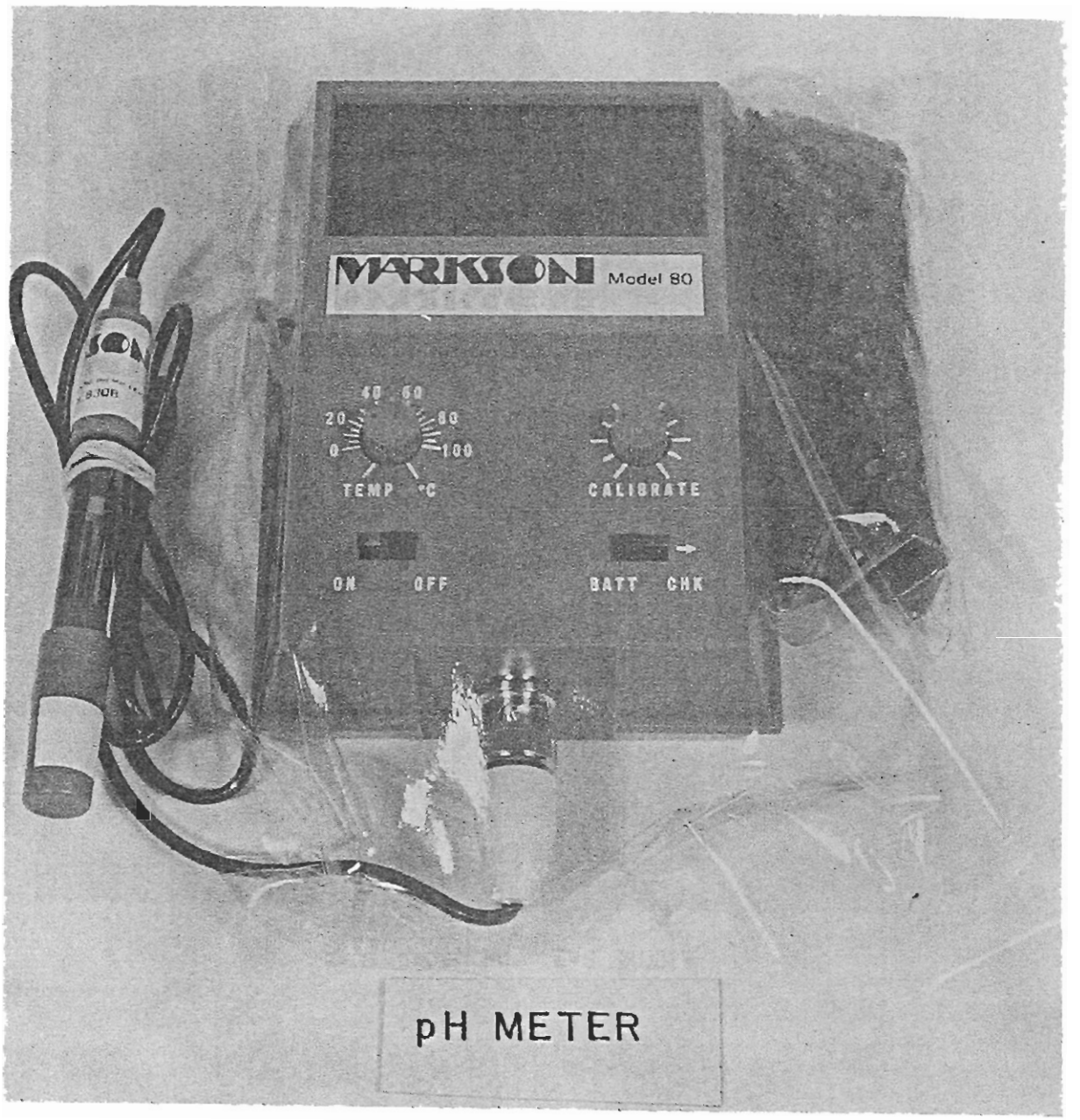


FIGURE B-6. Packaged pH Meter

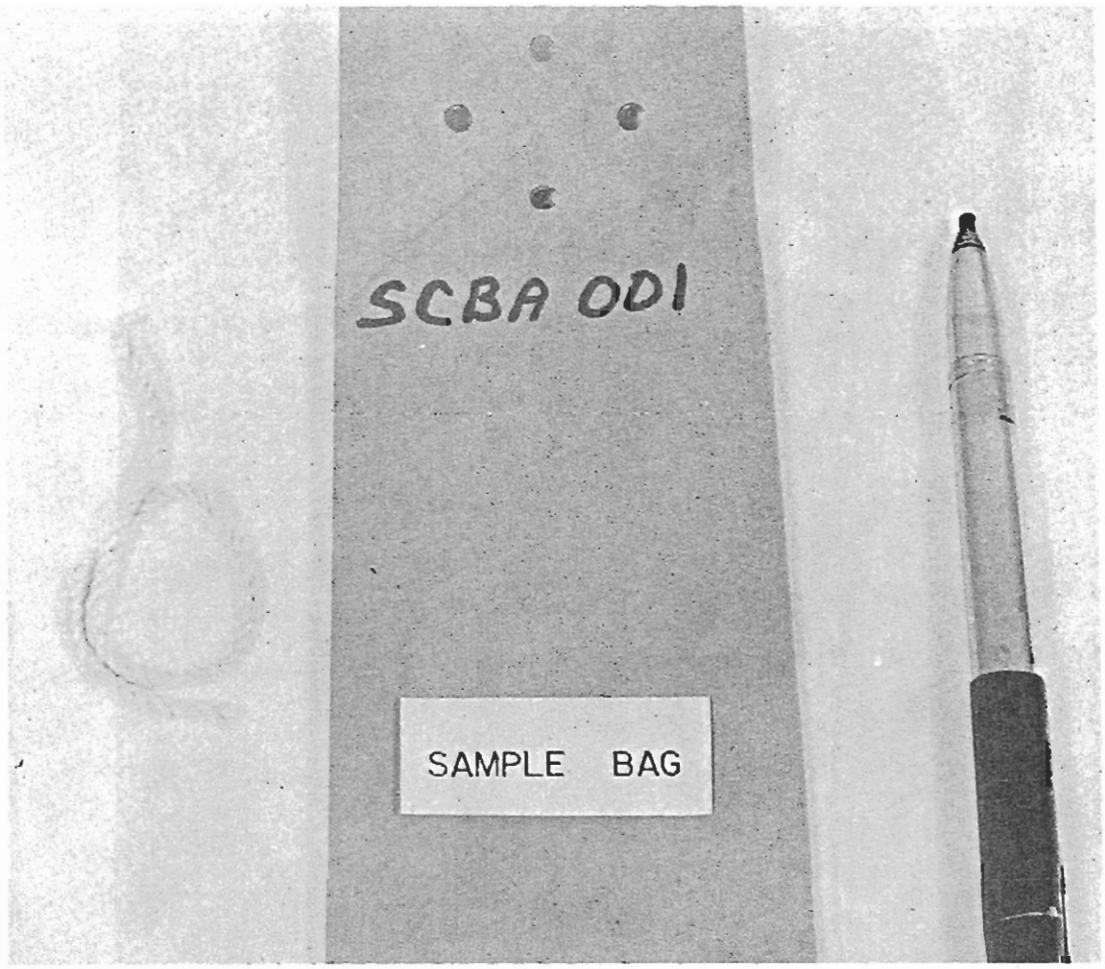


FIGURE B-7. Kraft Paper Bag for Sediment Sample

- *Sediment Samplers* — The bag sampler (Figure B-8) and scoop sampler (Figure B-9) should be checked DAILY to ensure they are in sound working order, e.g., loose nuts, etc. should be tightened; samplers cleaned, etc. The rope on the bag sampler should be checked to see it is securely attached. Enough cloth bags for the bag sampler for the day's sampling should be placed in the backpack. The bag sampler and scoop samplers are placed in the backpack.

- *Stainless Steel Sieve* — The 40-mesh sieve, pan, and cover are cleaned. A brush is used to remove all trapped sand grains from the sieve mesh. This must be done AT LEAST DAILY. The clean sieve assembly is stored in the backpack.

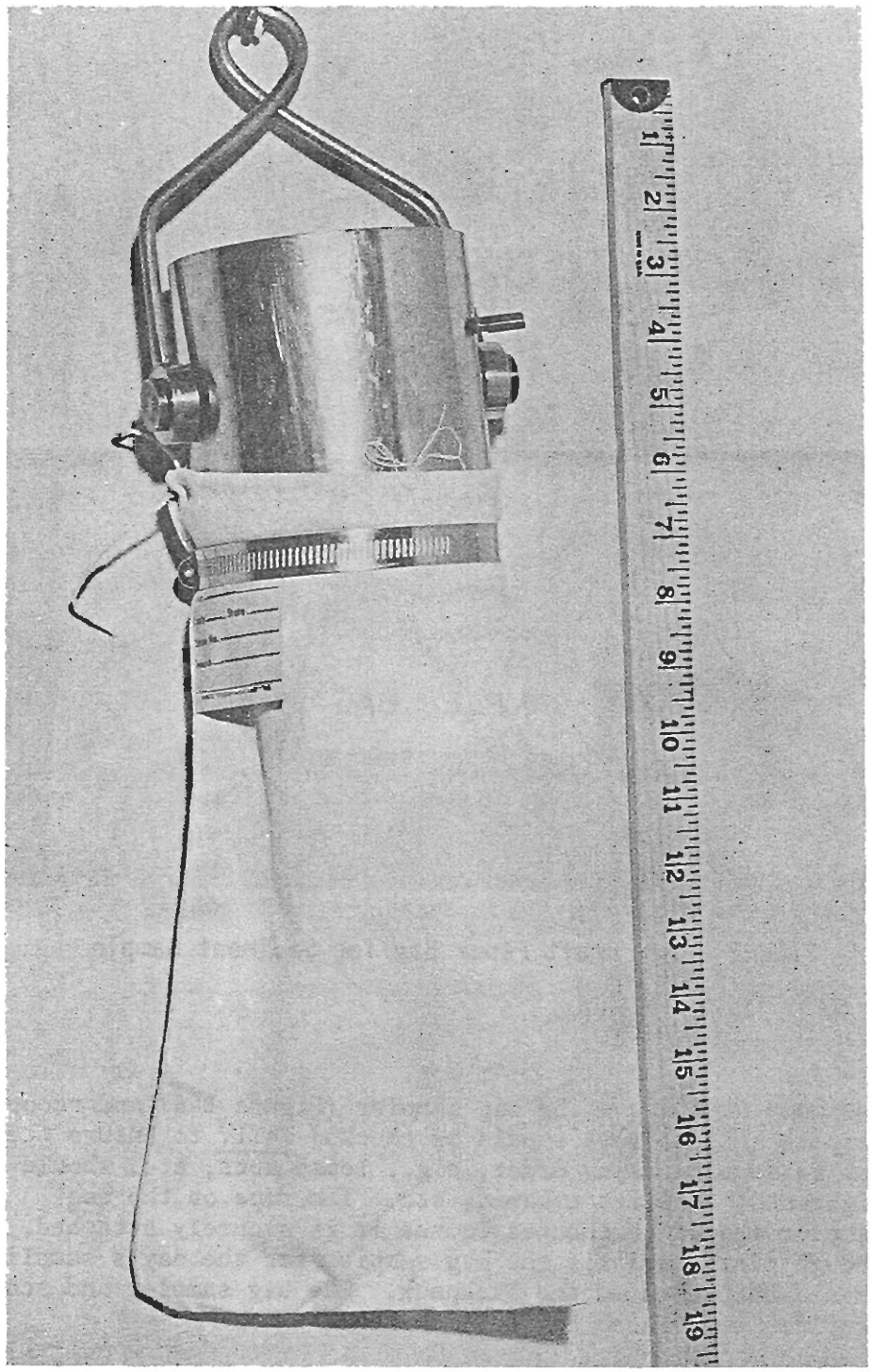


FIGURE B-8. Bag Sampler for Collecting Loose, Fine, Bottom Sediments

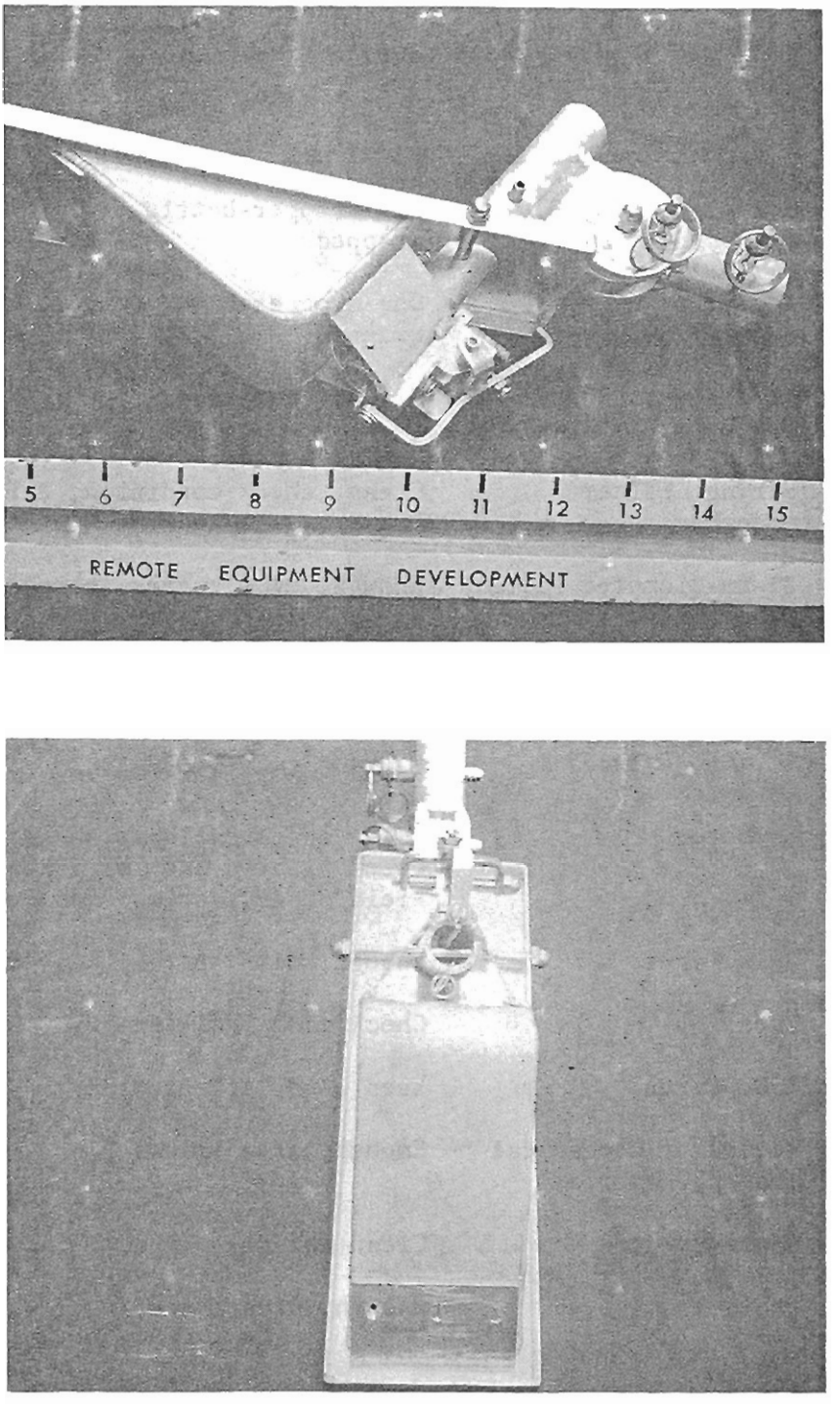


FIGURE B-9. Scoop Sampler for Collecting Confined or Coarse Bottom Sediments

DAILY WORK CHECKLIST — Team Member 1

(Equipment Stored in Instrument Case)

Item Number	*Equipment*	*Amount and Condition*
1	Sulfuric Acid, 0.02N	One dropper-bottle, full, carefully wrapped
2	Indicator	One dropper-bottle, full, carefully wrapped
3	Ehrlenmeyer Flask, 125 ml	Clean, check condition
4	Syringe Filter Assembly	Clean, check condition, carry spare
5	37-mm-diameter Filter Papers (for syringe filter)	Enough, plus spares, keep dry
6	Conductivity Meter	Daily check calibration and batteries, check plastic bag for holes; call Field Supervisor for repair
7	pH Meter	Daily check calibration and batteries, check plastic bag for holes; call Field Supervisor for repair
8	Data Forms	Enough, plus spares, keep dry
9	Maps	Check each individually
10	I.D. Cards	Keep handy at all times
11	Wooden or Mechanical (No. 2) Pencils	Enough, plus spares
12	Aluminum Case	Clean and dry
13	Paper Towels	Enough, plus spares

DAILY WORK CHECKLIST — Team Member 2

(Equipment Stored in Backpack)

Item Number	*Equipment*	*Amount and Condition*
1	Bag Sampler and Rope	Clean, check condition
2	Cloth Bags	Enough, plus spares
3	Scoop Sampler	Clean, check condition
4	Stainless-Steel Sieve Assembly	Check condition, clean out trapped particles
5	Stainless-Steel Spatula	Check condition
6	Paper Sediment Bags	Enough, plus spares
7	White Cord	Enough, plus spares
8	Cutting Tool	Keep sharp
9	*Flowmaster* Pen	Full of ink, plus spare pen
10	Plastic Beaker and Cord Cradle	Clean, check condition

PART II. OUTLINE AND SEQUENCE OF FIELD PROCEDURES (2-Member Sampling Team)

General Instructions

Where a stream is crossed by a road or trail, the sample site must be UPSTREAM, beyond the range of road litter or rainwater, dirt, mud, or snow thrown by automobiles, trucks, road-graders, or snow plows. Directions (i.e., right or left) are defined looking downstream.

Bear in mind that stream sediment is the sampling target; NOT dirt from nearby banks. Sample ONLY from the active portion of the stream.

To reduce the sampling error always take a MINIMUM of FIVE (5) different samples from along 100 to 500 feet of stream bottom. All of these samples are to be only from the active portion of the stream. These 5 or more subsamples are combined to yield one site-sample.

Sample validity is crucial. While SRL has check points, the integrity of individual samplers must be relied upon in this program. Please make every effort to ensure that the samples you collect are correctly located, treated, and labeled.

Take care to see that land owners' misgivings or questions are satisfied. We may want to come back. Public relations are the contractor's responsibility.

A primary concern throughout the sampling program will be respect for the land owner's property and wishes. This includes obtaining permission for access, respecting any restrictions, following any special routes, and generally exhibiting a courteous and careful manner. There should be absolutely no littering; and gates, streams, and land must be carefully left as found.

Sampling Kit Set-Up

The sampling kit should be carried to a clear, level area as close to the sample site as possible, where snow, mud, dirt, leaves, or other debris will not fall or be blown into it, and where it will not slide into the water or be tipped over during use.

Normal Field Procedures

Sampling Procedures - Team Member 1

The primary duty of Team Member 1 is to measure the pH, specific conductance, temperature, and alkalinity of the stream water. He also records various site descriptions on the data forms.

Water Collection

Using the plastic beaker and cord cradle obtain 1 to 2 liters of water from the active, flowing portion of the stream (Figure B-10).

Water Filtration

Place a new 37-mm-diameter filter paper into the syringe filter assembly (Figure B-2) and filter ~50 ml of water from the plastic beaker. Remove the filter assembly from the end of the syringe. Using the syringe, measure 50 ml of water into the 125-ml Ehrlenmeyer flask. Record the volume of water put into the flask on the data form.

Alkalinity Titration

Into the 125-ml Ehrlenmeyer flask containing 50 ml of filtered water, add 4 to 6 drops of bromo-cresol green/methyl red indicator solution and mix. Add 0.02N sulfuric acid solution dropwise, while gently swirling the flask. Count the number of drops required to cause the solution to turn light pink and record this on the data sheet. Occasionally, particularly in limestone areas, alkalinity may be quite high. If the solution has not shown signs of changing to light pink after the addition of twenty (20) drops of 0.02N sulfuric acid, discard the solution. Repeat the titration on 10 ml of filtered stream water. Pour the titration solution on the ground away from the stream. Shake the flask dry.

Conductivity - Temperature Measurement

Immediately after filtering water from the alkalinity titration, place the conductivity probe into the beaker of unfiltered water (Figure B-11). The probe should be completely submerged in water and suspended about 2 in. above the bottom center of the beaker. Metal objects should be kept at least 6 in. away from the probe. Measure the temperature and conductivity as described below.

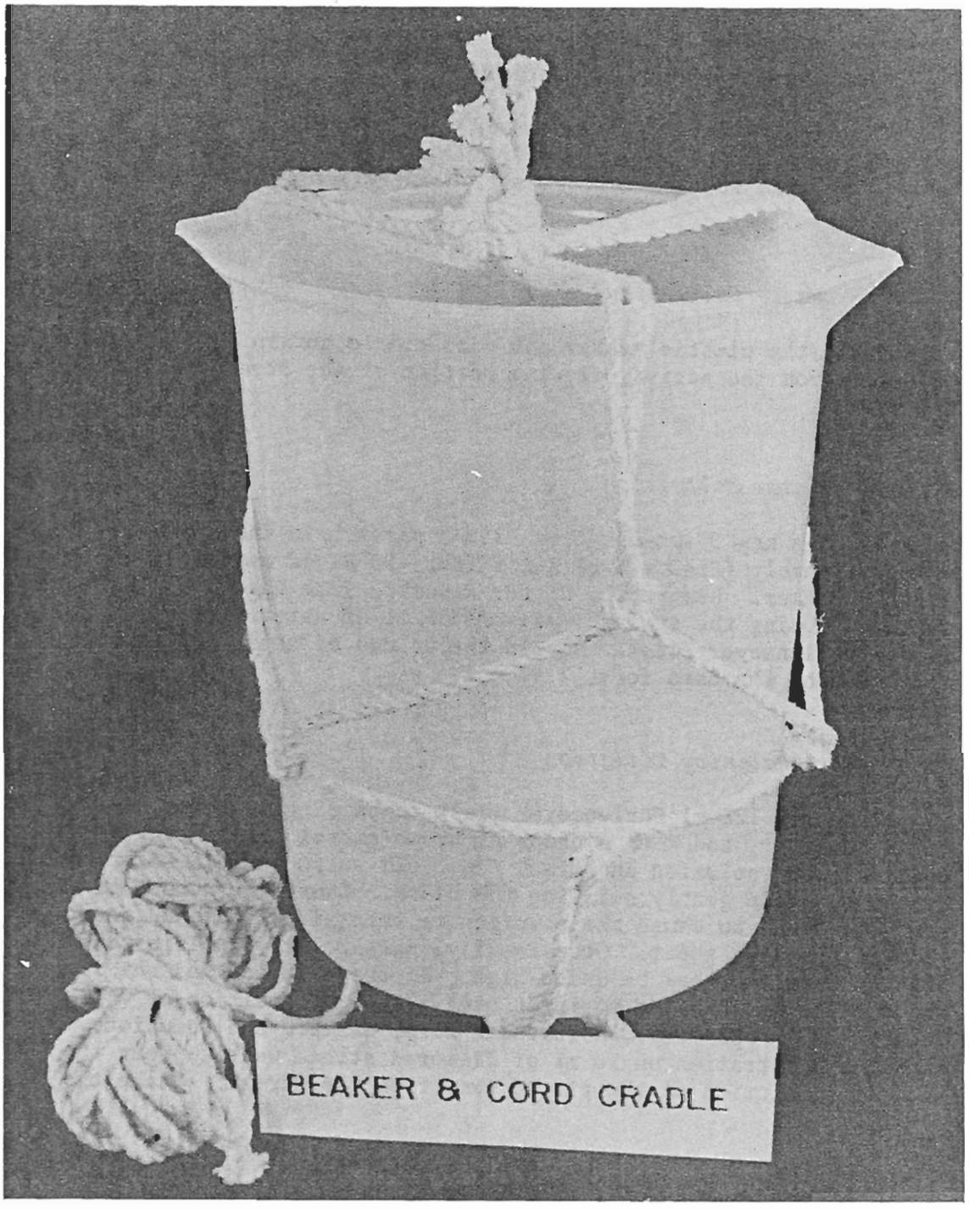


FIGURE B-10. Collector for Stream Water Samples

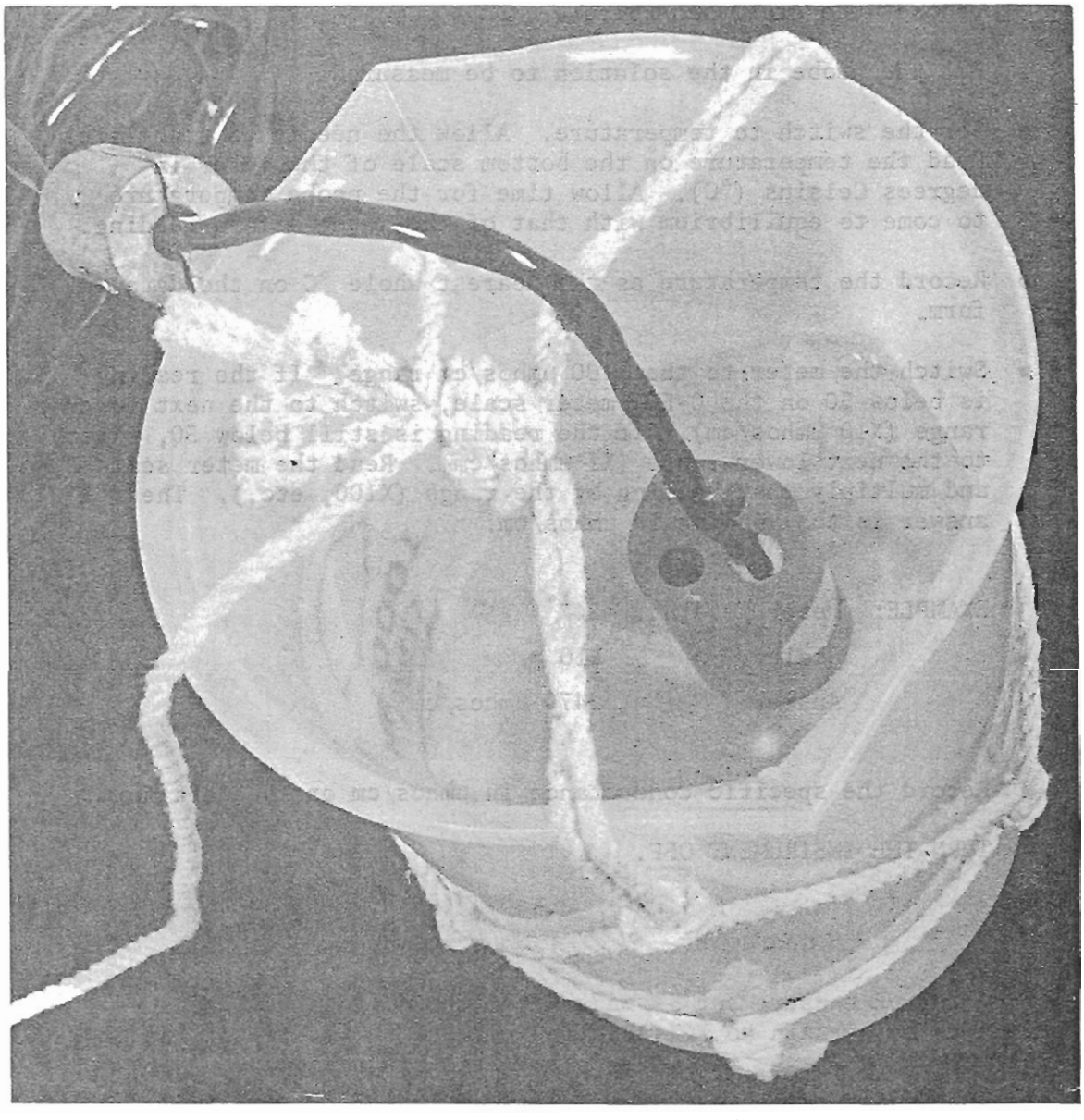


FIGURE B-11. Measuring Conductivity of Stream Water Sample

- Check meter zero. If not zero contact the field supervisor.

- Calibrate the meter by turning the switch to "Redline" and adjusting the meter needle with the redline control to the red line on the scale. If this cannot be accomplished, contact the field supervisor.

- Put the probe in the solution to be measured.

- Set the switch to temperature. Allow the needle to stabilize. Read the temperature on the bottom scale of the meter in degrees Celsius (°C). Allow time for the probe temperature to come to equilibrium with that of the water before reading.

- Record the temperature as the nearest whole °C on the data form.

- Switch the meter to the X100 µmhos/cm range. If the reading is below 50 on the 0-500 meter scale, switch to the next lower range (X10 µmhos/cm). If the reading is still below 50, switch to the next lower range (X1 µmhos/cm). Read the meter scale and multiply that reading by the range (X100, etc.). The answer is the reading in µmhos/cm.

EXAMPLE:	Meter Reading:	247
	Scale:	X10
	Answer:	2470 µmhos/cm

- Record the specific conductance in µmhos/cm on the data form.

- TURN THE INSTRUMENT OFF.

pH Measurement

The pH measurement is made after the conductivity measurement to be certain no KCl solution remains on the tip of the pH electrode to change the water's specific conductance.

- Slide power switch to "ON". NOTE: Decimal point will light; however, digital display is operational only when "push-to-read" switch is depressed. The display is difficult to read in direct sunlight and may appear to be inoperable. Shield the dial to obtain a reading.

- Slide "BATT-CHK" switch to right. A red dot to the right of display should light. With "BATT-CHK" switch to right, depress "push-to-read" switch -- if right hand dot goes out, contact field supervisor.

- Remove plastic boot from electrode prior to use.

- Immerse the electrode in the unfiltered water. Swirl the electrode around for one to two minutes to allow it to reach equilibrium (Figure B-12).

- Depress the "push-to-read" switch on the side of the pH meter; read the pH display.

- Repeat the swirling step and re-read the pH to verify equilibrium has been reached.

- Record the pH to the nearest 0.1 pH unit on the data forms.

- TURN THE pH METER OFF.

- Store the WET pH electrode in its plastic boot.

- Discard the beaker of unfiltered water.

Data Form Completion

Before leaving the sample location, fill in the site description on the data form according to the standard coding instructions provided. Make a final check to be sure that the appropriate sample location number has been written on the sediment sample bag.

Clean-Up and Storage

The syringe filter assembly, beakers, and all other gear should be wiped dry with clean towels and replaced in the field kit. Be sure that sand grains or other debris sticking to the equipment are carefully removed.

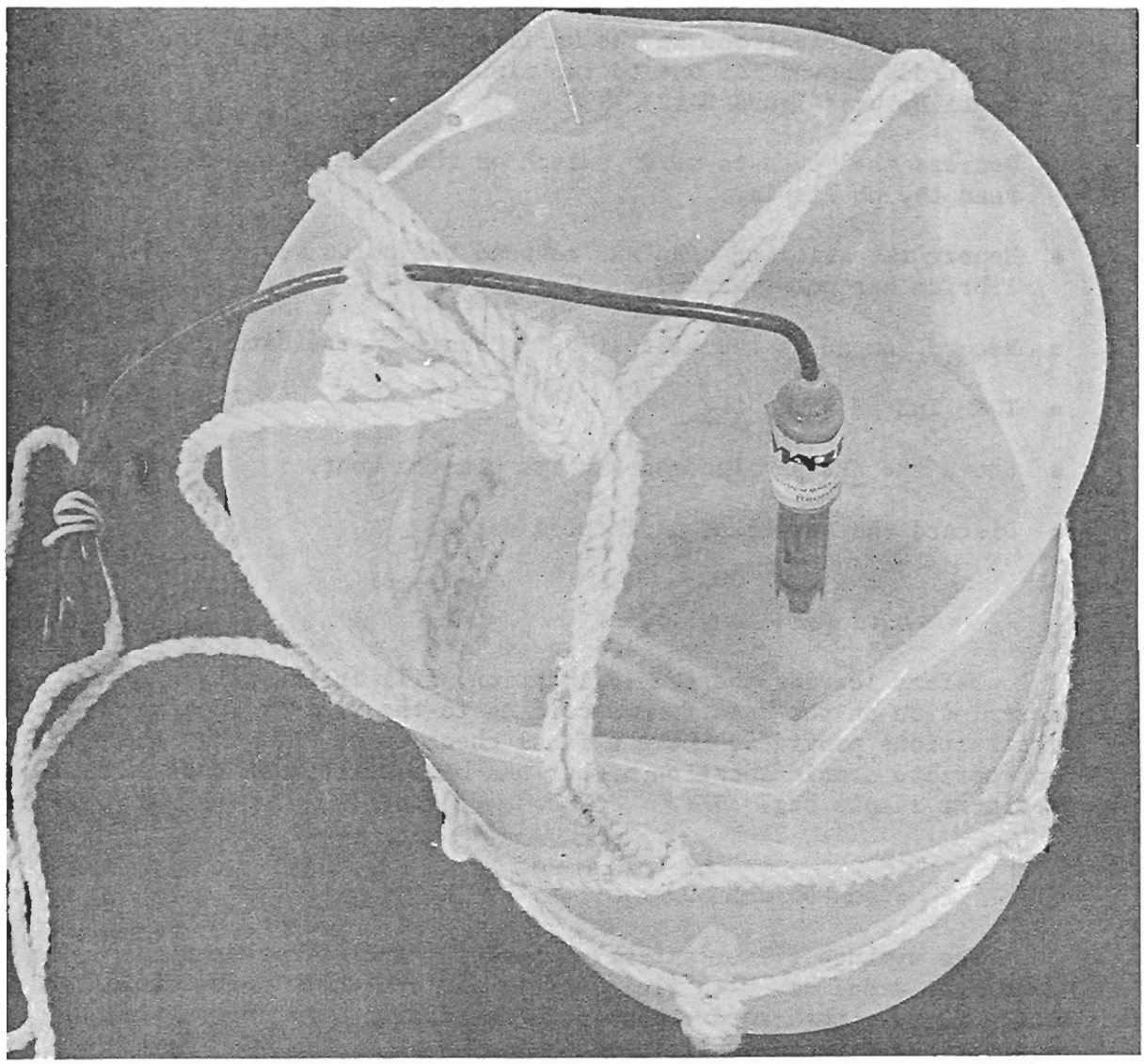


FIGURE B-12. Measuring pH of Stream Water Sample

Sampling Procedures - Team Member 2

The duty of Team Member 2 is to collect, sieve, and package correctly a multi-composited stream sediment sample. He will also assist Team Member 1 in site descriptions of sediment type, color, and water flow.

Description of Sediment Samplers

- Scoop Sampler

A jaw scoop sampler is provided for reaching sediment in small inaccessible areas (Figure B-9). This sampler is spring-loaded and should be used with care. The sampler attaches to the fiberglass walking staff. The attachment angle of the scoop can be varied from 90° to 180° for use under conditions ranging from clay through silt and sand to rocky bottoms.

- Bag Sampler

The bag sampler consists of a stainless steel tube with an attached bail, band clamp, and removable drill bag (Figure B-8). The attachment point of the bail was carefully selected to force the sampling element down into the sediment as the bail rope is pulled. The bag sampler was designed primarily for sampling sand or silt sediments. It is thrown slightly across- and downstream and then dragged UPSTREAM against the flow. This technique keeps even very fine silt in the bag and effectively samples the mid-channel of the stream. Make certain the knot holding the sampler is strong and the free end of the rope is secure. Use a new cloth bag for each NEW site. The bag should be turned inside-out (seams out) before attaching to the bag sampler.

Collection of Sediment Sample

Using either the bag sampler or the scoop sampler, collect sediment samples from the active portion of the stream. Bear in mind that stream sediment is the sampling target; NOT dirt from nearby banks. Sample ONLY from the active portion of the stream.

To reduce the sampling error, always take a MINIMUM of FIVE (5) different samples from along 100 to 500 feet of stream bottom. All of these samples are to be only from the active portion of the stream. These 5 or more subsamples are combined to yield one site sample.

Where a stream is crossed by a road or trail, the sample site must be upstream, beyond the range of road litter or rainwater, dirt, mud, or snow thrown by automobiles, trucks, road-graders, or snow plows.

Using stream water, rinse the samples onto the assembled 40-mesh sieve and bottom pan. Cover the screen, and sieve the -40 mesh sediments into the bottom pan.

Separate the sieve from the bottom pan and allow the suspended solids to settle. VERY CAREFULLY decant off the water losing as few fines as possible.

Using the spatula transfer the -40 mesh sediment (Figure B-13) into a new Kraft paper sediment bag.

SPECIAL NOTE A minimum of 150 cm^3 (~9 $in.^3$ or ~1 lb) of -40 mesh sediment must be collected at each site. THIS IS A MINIMUM.

Label the top fold of the paper sediment bag using ONLY a *Flowmaster* pen. The site code is written on both sides of the top fold. It is suggested that the bag be labeled before the sediment is put in it.

SPECIAL NOTE All writing must be VERY LEGIBLE AND CORRECT.

Tie a piece of white cord through the folded top of the paper sediment bag. Allow the sample to air-dry.

Clean-Up and Storage

Brush off sediment sample, clean sieve assembly and replace in backpack.

Police the area. Leave area as clean OR CLEANER than you found it.

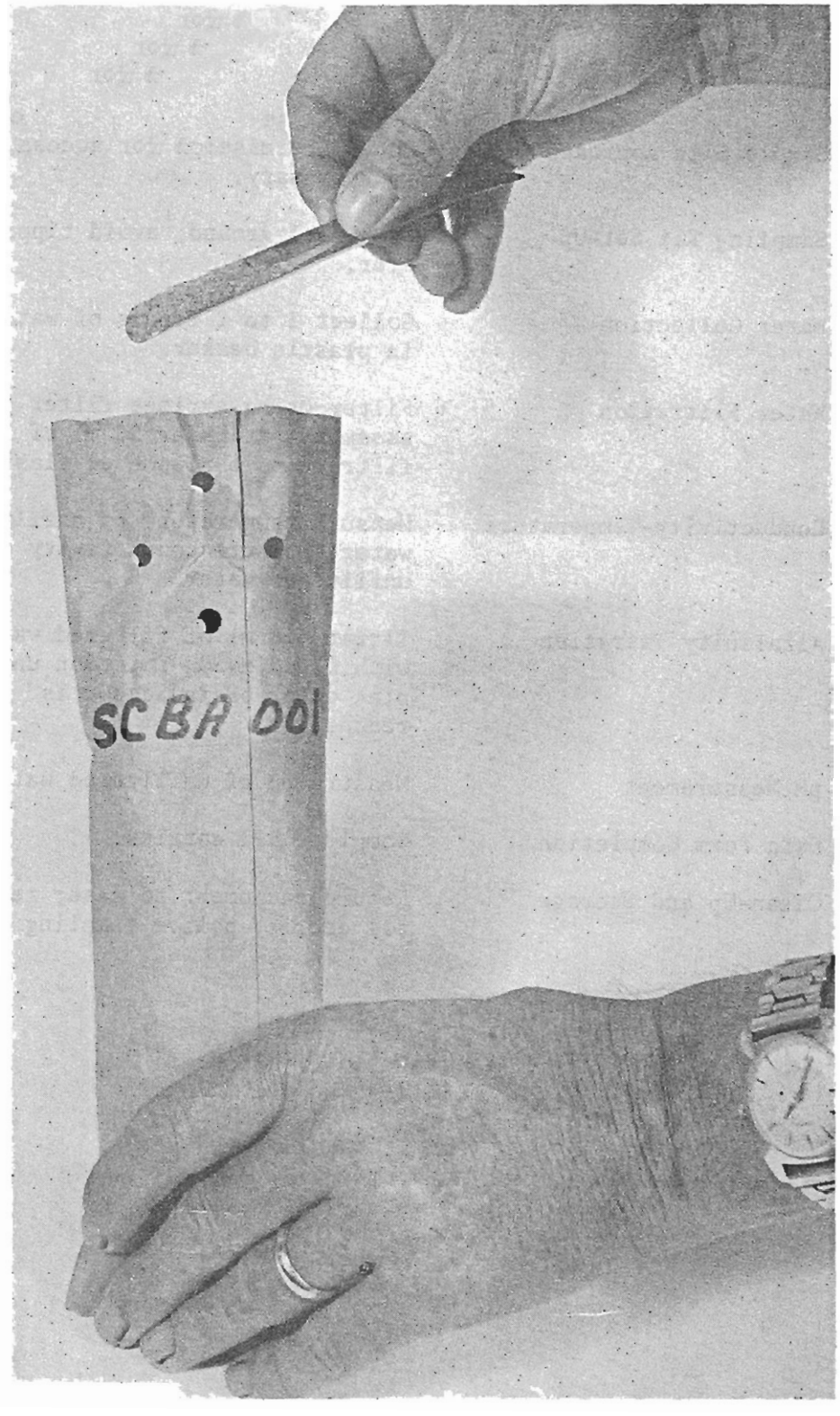


FIGURE B-13. Transfer of Sediment Sample, -40 Mesh

SAMPLING PROCEDURE CHECKLIST

(Team Member 1)

1.	Sample Site Approach	Obtain permission for access, if necessary.
2.	Sampling Kit Set-Up	Use level ground; avoid tipping over.
3.	Water Collection	Collect 1 to 2 liters of water in plastic beaker.
4.	Water Filtration	Filter using syringe filter assembly; transfer 50 ml of filtrate to Ehrlenmeyer flask.
5.	Conductivity-Temperature	Measure temperature of unfiltered water; measure conductivity of unfiltered water.
6.	Alkalinity Titration	Titrate 50 ml of filtered water with 0.02N H_2SO_4 solution until pink color of indicator is reached.
7.	pH Measurement	Measure pH of unfiltered water.
8.	Data Form Completion	Complete all entries.
9.	Clean-Up and Storage	Return equipment to case; remove all debris; police sampling area.

SAMPLING PROCEDURE CHECKLIST

(Team Member 2)

1.	Sample Site Approach	Obtain permission for access, if necessary.
2.	Sampling Backpack Kit Set-Up	Use level ground; avoid tipping over.
3.	Sediment Sample Collection	Collect 5 or more subsamples from along 100 to 500 feet of stream.
4.	Sediment Sample Sieving	Sieve sample up to -40 mesh; retain fines.
5.	Sediment Sample Packaging	Package a minimum of 150 cm^3 of -40 mesh sample; label correctly.
6.	Clean-Up and Storage	Return samplers to backpack; remove all debris; police sampling area.

APPENDIX C: STANDARD CODING INSTRUCTIONS

SAVANNAH RIVER LABORATORY GEOCHEMICAL STREAM
SEDIMENT SURVEY FIELD DATA FORM (Card Code No. 2)

General Statements

A copy of the data form is shown in Figure C-1. All data to be entered on the SRL Field Data Form MUST be entered CORRECTLY and RIGHT JUSTIFIED in the appropriate columns of the 80-column form. The form MUST be completed using ONLY a No. 2 soft-lead wooden or mechanical pencil. All data forms and associated samples must be CHECKED for accuracy, correct format, and legibility. All letters and numbers will be formed ONLY as shown below and at the bottom of each form:

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
0 1 2 3 4 5 6 7 8 9

Only those choices given on the form are acceptable. DO NOT IMPROVISE.

PAYMENT TO CONTRACTORS WILL BE MADE ONLY FOR THOSE SAMPLE LOCATIONS WHERE ALL APPROPRIATE DATA ARE UNAMBIGUOUSLY PROVIDED ON THE FIELD DATA FORM AND SAMPLE SITE LOCATION MAP.

Specific Coding

Columns 1-8

Site Code — Columns 1-2 are coded with the two-letter designator for the state in which the sample is collected, e.g., NC for North Carolina, GA for Georgia, etc. Columns 3-4 are coded with the two-letter designator for the map from which the sample is collected. Official map codes are furnished with each county map. Only the official codes are acceptable. Site numbers, which are premarked on each map, are entered in Columns 5-7. Columns 1-7 should be filled. None should be blank. Column 8 is left BLANK.

SRL STREAM SITE FIELD DATA FORM

SITE CODE								DATE								TEAM NO.			GENERAL SITE DATA																ACTIVITIES-CONTAMINANTS (List up to Four)								COMMENTS	ROAD-STREAM SITE
State		Map Code		Site Number				Mo.		Day		Yr.		Hr.					Sed.		Water						Veg.															
																			Type	Color	Width	Depth	Flow	Level	Color	Channel	Type	Density	Relief	Weather												
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Have a Good Day ☺																																								
		◆																																						2
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
pH		SPECIFIC CONDUCTANCE µmhos/cm						WATER TEMP (°C)		Drops H_2SO_4		ml Water		NO. OF SAMPLE COMPOSITES		SAMPLER TYPE	INSTRUMENT I.D. — pH		pH PROBE I.D.		COND. INSTR. I.D.		COND. PROBE I.D.		SPARE (DO NOT USE)															CARD CODE
										ALKALINITY																															

IN THE CASE OF EACH CIRCLED ENTRY SPACE, ENTER MOST APPROPRIATE DESIGNATORS LISTED BELOW

20
1 Boulders
2 Cobble
3 Pebble
4 Sand
5 Silt
6 Clay
7 Organic Muck
8 Others (use comments)

21
1 White/Buff
2 Yellow
3 Orange
4 Pink/Red
5 Green
6 Brown
7 Gray
8 Black
9 Others (use comments)

39 Enter "C" when comments are made

40 Enter "R" when site is road stream site
"O" when site is off-road

57 B — Bag S — Scoop

22 & 23
1 <1/2 ft
2 1/2 – 1 ft
3 1 – 2 ft
4 2 – 4 ft
5 4 – 8 ft
6 8 – 16 ft
7 16 – 32 ft
8 >32 ft
9 Dry

24
1 Stagnant
2 Slow
3 Moderate
4 Fast
5 Torrent
6 Dry

25
1 Dry
2 Low
3 Normal
4 High
5 Flood

26
1 Clear
2 Brown–Clear
3 Cloudy
4 Muddy
5 Algal
6 Others (use comments)

27
1 Depositing
2 Eroding
3 Unknown

28
1 Conifer
2 Deciduous
3 Brush
4 Grass/Pasture
5 Marsh/Swamp
6 Peat Bog
7 Other (use comments)

29
1 Barren
2 Sparse
3 Moderate
4 Dense
5 Very Dense

30
1 Flat
2 Low, 0–50'
3 Gentle, 50–200'
4 Moderate, 200–400'
5 High, >1000'

31
1 Sunny/Clear
2 Overcast
3 Light Rain
4 Heavy Rain
5 Snowy
6 Other (use comments)

32 35
1 Chemical
2 Smelting
3 Mining
4 Sewage
5 Dumps
6 Farming
7 Power Generation
8 Urban
9 Other Industrial
A Recreational
B Residential

40 Road-Stream Site Description
(Type, material, size, etc.) _____

39 Comments (Explain all "other" designators used above, plus describe all unusual or significant conditions such as proximity of contaminants, general rock type, formation when known, problems with instruments, etc. Use back of form for additional space). _____

I certify that the above sample was taken by SRL procedures at the indicated site and the information listed is correct at time of sampling. _____ Sampler(s) Signature(s)

I have checked this form and associated samples for accuracy, correct format, and legibility. _____ Field Supervisor (initials)

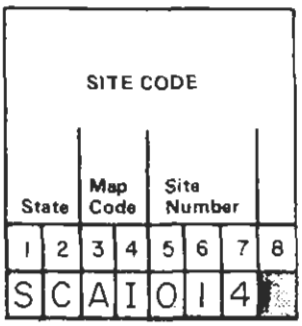
Standard Letters and Numbers

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

0 1 2 3 4 5 6 7 8 9

FIGURE C-1. SRL Field Data Form

EXAMPLE: Sample is taken from Aiken County, South Carolina; site is marked on the Aiken County map with code AI; the site has been pre-numbered as 14:



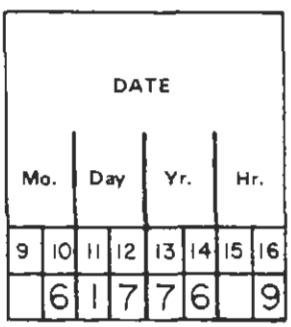
Columns 9-16

Date

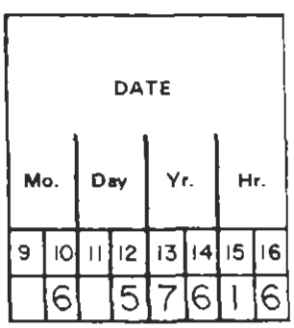
The month, day, and year are to be coded in Columns 9-14 using one or two digits (right justified) as necessary, so that any unused columns are left blank.

The time (hour) will be coded in Columns 15-16 using the 24-hour clock, and rounding to the nearest whole hour. The hour entry will also be right justified so that Column 15 will remain blank when only one digit is appropriate.

EXAMPLE: Sample taken on June 17, 1976, at 9:27 a.m.



Sample taken on June 5, 1976, at 3:35 p.m.



Columns 17-19

Team Number

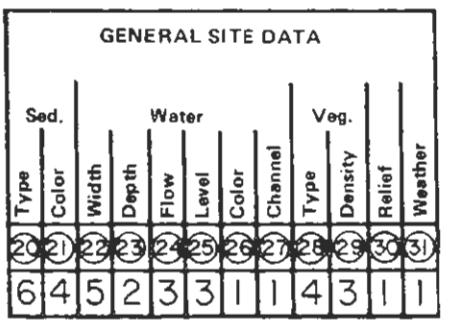
The assigned team number is coded in Columns 17-19.

Columns 20-31

General Site

Data

The general site data columns are to be coded using only the most appropriate indicator descriptor listed on the form. Good judgment is requisite to these evaluations.



Columns 20-21

Sediment:

Type, Color

The sediment entry should reflect the nature of the loose sediment material sampled at the site. In cases where the sampled material differs markedly from the surrounding sediment, this fact should be noted in the comments (remembering to see that a "C" is entered in Column 39).

20
1 Boulders
2 Cobble
3 Pebble
4 Sand
5 Silt
6 Clay
7 Organic Muck
8 Others (use comments)

21
1 White/Buff
2 Yellow
3 Orange
4 Pink/Red
5 Green
6 Brown
7 Gray
8 Black
9 Others (use comments)

Columns 22-23

Water:

Width, Depth

22 & 23
1 <1/2 ft
2 1/2 – 1 ft
3 1 – 2 ft
4 2 – 4 ft
5 4 – 8 ft
6 8 – 16 ft
7 16 – 32 ft
8 >32 ft
9 Dry

Estimate the AVERAGE width and depth of the stream over the 100 to 200 feet of stream length where the sample is taken. Good judgment is extremely important. Please estimate CAREFULLY.

Columns 24-26

Water:

Flow, Level, Color

24
1 Stagnant
2 Slow
3 Moderate
4 Fast
5 Torrent
6 Dry

25
1 Dry
2 Low
3 Normal
4 High
5 Flood

26
1 Clear
2 Brown–Clear
3 Cloudy
4 Muddy
5 Algal
6 Others (use comments)

The water description should provide an indication of the general condition of the water at the time of sampling. Column 24 is to indicate the rate of flow using the listed descriptors at the sampled location [i.e., if a stream is sampled in rapids the 4 (Fast) or 5 (Torrent) may apply, but if the same stream were sampled above or below the rapids, the 2 (Slow) or 3 (Moderate) descriptors might be more accurate]. Column 25 describes the water level relative to its apparent normal level. A degree of good judgment will usually suffice to make this determination. Column 26 reflects the amount and type of dissolved or suspended load in the water on the basis of color. If a large amount of algae is suspended in the water, enter 5 (Algal). If only the stream, spring, or lake bottom is covered with algae or other plant life, note this fact in the comments. If the water is transparent, but has a definite brown or black color, then use 2 (Brown-Clear) designator.

Column 27

Water:

Channel

27
1 Depositing
2 Eroding
3 Unknown

The column labeled "stream channel" should be coded with the appropriate descriptor listed on the form. A steeply inclined stream bed with fast-moving water can usually be considered as eroding; whereas a nearly-level, slow-moving stream may indicate a depositing channel (i.e., the stream is depositing its

load of sand, silt, etc. in the calm water areas). The chosen descriptor should apply to the general nature of the stream.

Columns 28-29

Vegetation:

Type, Density

28
1 Conifer
2 Deciduous
3 Brush
4 Grass/Pasture
5 Marsh/Swamp
6 Peat Bog
7 Other (use comments)

29
1 Barren
2 Sparse
3 Moderate
4 Dense
5 Very Dense

This description should reflect the amount and type of plant growth in the immediate area of the sample location. The density is a subjective observation made in relation to visibility, ease of access, etc. The type of vegetation should reflect the dominant plant type at or near the sample location. Conifers are broadly classed as evergreen trees and shrubs such as pine trees, etc. Deciduous plants are broadly classed as trees and shrubs that seasonally lose their leaves such as cottonwoods, maples, oaks, hickory, etc. Brush denotes relatively low-growing plants (which may or may not be deciduous) such as thorny bushes, etc. Grass denotes grasses of all types including natural and/or crops such as alfalfa, wheat, etc.

Column 30

Relief

30
1 Flat
2 Low, 0–50'
3 Gentle, 50–200'
4 Moderate, 200–400'
5 High, >1000'

Relief is an indicator of local surface expression. The area to be included around a sampled location will usually not exceed a few hundred yards in mountainous terrains, but may exceed up to ~1/2 mile in relatively flat areas. Where it appears noteworthy to include an area much larger or smaller than implied in the general guidelines above, a note should be included in the comments.

Column 31

Weather

31
1 Sunny/Clear
2 Overcast
3 Light Rain
4 Heavy Rain
5 Snowy
6 Other (use comments)

The weather entry is a general indicator of the prevalent conditions at the time of sampling. In addition, it is important to note in the comments any evidence of recent precipitation up to a few days prior to sampling.

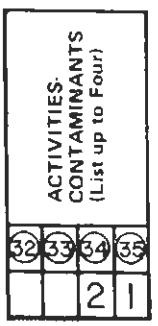
Columns 32-35

Activities:

Contaminants

The activities/contaminants column is to indicate those nearby activities which may influence the analytical results. It is a very important entry, and should be carefully chosen from the list of numerical designators provided on the data form. In addition to the numerical entry, details such as proximity to the sample site, type and status of mine (i.e., gold, silver, lead-zinc, coal, etc.), type of fertilizer used, if known, or type of power plant (i.e., hydroelectric, coal-fired, nuclear, etc.) should be indicated in the comments. The major activity and/or contamination is always listed in Column 35. A second activity, if you consider it important, is listed in Column 34. A third activity, if necessary, in Column 33, etc. Columns 32, 33, and 34 if not used are to be left blank.

EXAMPLE:



32 35

1 Chemical
2 Smelting
3 Mining
4 Sewage
5 Dumps
6 Farming
7 Power Generation
8 Urban
9 Other Industrial

A Recreational
B Residential

Columns 36-38

Blank

Leave these columns blank.

Column 39

Comments

Any time there are comments entered at the bottom of the data form, enter a "C" in Column 39. If there are no comments, leave Column 39 blank. It should always be remembered that there can never be too many comments. Every observation made at a sample site pertaining to geology, geography,

hydrology, climate, vegetation, possible contamination, etc. should be entered. This information may be important for evaluating the data which is developed for each sample and sample site. All comments must be written legibly.

39

Comments (Explain all "other" designators used above, plus describe all unusual or significant conditions such as proximity of contaminants, general rock type, formation when known, problems with instruments, etc. Use back of form for additional space).

Visible pyrite outcrop near stream; pH meter bag has a hole; black shale is general rock in area; lead smelter located upstream.

Column 40

Road-Stream Site

Enter an "R" in Column 40 if the site is classified as a road-stream intersection site. Enter an "O" or "Ø" if the site is classified as an off-road site. This entry is important for payment purposes. All entries with "R" in Column 40 REQUIRE a unique description of the road-stream site on the lines provided on the form. This description should include the type of bridge, etc.; the material of construction; approximate size, etc. Any additional information to uniquely describe the site should be provided.

EXAMPLE:

40 Road-Stream Site Description (Type, material, size, etc.) Wooden bridge over dirt road. Barbed wire fence along left bank, large brick house 200 yards to the right.

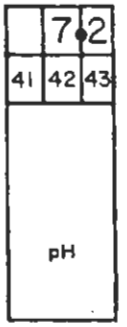
Columns 41-43

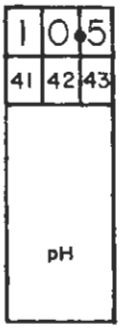
pH

The pH of the sampled water is to be measured using the pH meter provided, and will be recorded to the nearest tenth (0.1) of a pH unit.

If the pH is less than 10, only Columns 42 and 43 will be coded, and Column 41 will be left blank (only rarely will the pH be greater than 10, thus Column 41 will normally remain blank). A stationary decimal point occurs between Columns 42 and 43 and it must be respected.

EXAMPLES:



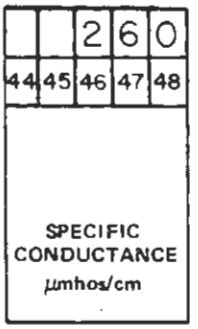


Columns 44-48

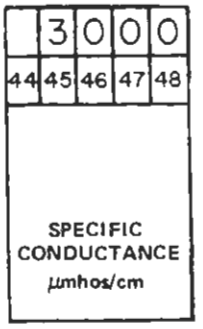
Specific Conductance, µmhos/cm

The specific conductance measurement is recorded in Columns 44-48 as read on the meter, or as some multiple of the meter reading which is determined by the scale range setting used. The specific conductance reading must always be right justified so that any of the appropriately designated (but unused) columns will be left blank.

EXAMPLES:



Meter reads 260 with scale X1, record 260



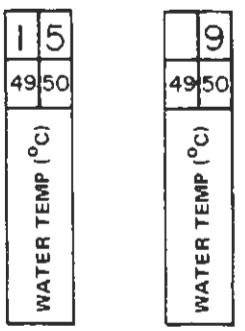
Meter reads 300 with scale X10, record 3000

Columns 49-50

Water Temperature, °C

The water temperature, taken at the time of sampling, will be coded in Columns 49-50. The water temperature will be recorded in degrees Celsius (°C) to the nearest whole degree (1.0°C). Any time the water temperature is between 0°C and 9°C, the temperature will be coded in Column 50, and Column 49 will remain blank.

EXAMPLES:

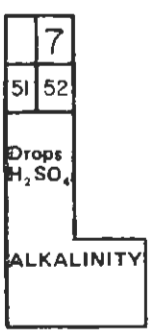


Columns 51-52

Alkalinity, drops of acid solution

Record in Columns 51-52 the number of drops of 0.02N sulfuric acid solution necessary to reach the end point of the alkalinity titration. If 9 or less drops are used, then Column 51 is left blank.

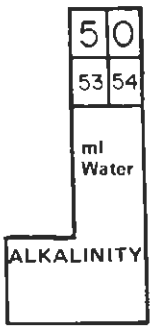
EXAMPLE:



Columns 53-54

Alkalinity, ml of water

Record in Columns 53-54 the actual number of milliliters of water which is titrated with the sulfuric acid. This is normally ~50 ml, but might be as few as 1-2 ml in limestone areas.



Columns 55-56

Number of Sample Composites

In Columns 55-56, record the number of sub-samples taken at each site that are composited together to give the sieved sample for that site. There should be a minimum of 5 sub-samples. If Column 55 is not needed, then leave it blank.

EXAMPLE:

Column 57

Sampler Type

57 B – Bag S – Scoop

Enter a "B" in Column 57 if the bag sampler is used to collect the sediment sample. Enter an "S" if the scoop sampler is used. If both samplers are used, then enter the letter of the one which collected the majority of the sample.

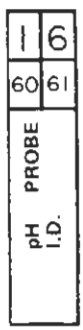
Columns 58-59

pH Meter, I.D.

Enter in Columns 58-59 the identification number of the pH meter used at the site. If Column 58 is not needed, then leave it blank.

Columns 60-61

pH Probe, I.D.



Enter in Columns 60-61 the identification number of the pH probe used at the site. If Column 60 is not needed, then leave it blank.

Columns 62-63

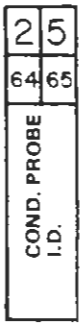
Conductivity Instrument, I.D.

Enter in Columns 62-63 the identification number of the conductivity meter used at the site. If Column 62 is not needed, then leave it blank.

Columns 64-65

Conductivity Probe, I.D.

Enter in Columns 64-65 the identification number of the conductivity probe used at the site. If Column 64 is not needed, then leave it blank.



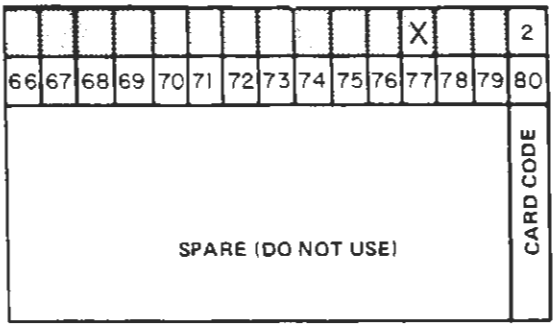
Columns 66-79

Leave blank except in the following case:

Column 77

Spare

If you have to agree to send analytical information to a person in order to gain access to his property, then enter an X in Column 77. Write the mailing address on the back of the form if you have entered an X in Column 77.



CERTIFICATION: Sign the form where designated to certify that the sample(s) was(were) taken and treated as described, and that the information shown is as true and complete as possible. ALL members of the sampling party will sign the form. The field supervisor will also sign or initial the form to show that he has checked the form AND ASSOCIATED SAMPLE for accuracy, correct format, and legibility.

I certify that the above sample was taken by SRL procedures at the indicated site and the information listed is correct at time of sampling.

John D. Doe / Mary Brown
Sampler(s) Signature(s)

I have checked this form and associated samples for accuracy, correct format, and legibility.

C. D. P.
Field Supervisor (initials)

REFERENCES

Savannah River Laboratory Quarterly Report. Hydrogeochemical and Stream Sediment Reconnaissance – Eastern United States National Uranium Resource Evaluation Program.

No.	*Quarter*	*SRL Doc. No.*	*ERDA-GJO Doc. No.* *
1	January-March 1975	DPST-75-138-1	GJB-X-5(76)
2	April-June 1975	DPST-75-138-2	GJB-X-6(76)
3	July-September 1975	DPST-75-138-3	GJB-X-7(76)
4	October-December 1975	DPST-75-138-4	GJB-X-8(76)
5	January-March 1976	DPST-76-138-1	GJB-X-17(76)

* Order from:

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