

US ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF PESTICIDES PROGRAMS
REGISTRATION DIVISION (TS 767)
WASHINGTON, DC 20460

EPA REGISTRATION NO.

13806-7

DATE OF ISSUANCE

11/11/89

TERM OF ISSUANCE

NOTICE OF PESTICIDE:

REGISTRATION
 REREGISTRATION

(Under the Federal Insecticide, Fungicide,
and Rodenticide Act, as amended)

NAME OF PESTICIDE PRODUCT

Compound 1020 Livestock Protection
Collar

NAME AND ADDRESS OF REGISTRANT (Include ZIP code)

State of South Dakota
Department of Agriculture
Division of Regulatory Services
Anderson Building, 445 East Capitol
Pierre, SD 57501-3188

10/18
 $\frac{235,945}{2}$

NOTE: Changes in labeling formula differing in substance from that accepted in connection with this registration must be submitted to and accepted by the Registration Division prior to use of the label in commerce. In any correspondence on this product always refer to the above U.S. EPA registration number.

On the basis of information furnished by the registrant, the above named pesticide is hereby Registered/Reregistered under the Federal Insecticide, Fungicide, and Rodenticide Act.

A copy of the labeling accepted in connection with this Registration/Reregistration is returned herewith.

Registration is in no way to be construed as an indorsement or approval of this product by this Agency. In order to protect health and the environment, the Administrator, on his motion, may at any time suspend or cancel the registration of a pesticide in accordance with the Act. The acceptance of any name in connection with the registration of a product under this Act is not to be construed as giving the registrant a right to exclusive use of the name or to its use if it has been covered by others.

This product is conditionally registered in accordance with FIFRA section 3(c)(7)(A) provided that you:

1. Submit/cite all data required for registration/reregistration of this product under FIFRA section 3(c)(7) when the Agency requires additional data for similar products to submit a label.

2. Place the following change listed below on your revised label:

• Add the phrase "EPA Registration No. 13806-7."

3. The following comments apply to the revised Technical Bulletin:

- 1) References to pages where particular items are discussed must remain accurate through all editions of the Technical Bulletin.
- 2) In the first line of the second paragraph of section "I.v." (page 5), change "behavior" to "behaviors."
- 3) In section "I.D.1.d" (page 7), note that the reference to "Appendix P" has no meaning as there is nothing in the organization of the revised version of the Technical Bulletin.

ATTACHMENT IS APPLICABLE

SIGNATURE OF APPROVING OFFICIAL

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DATE

to suggest that there are any appendices. You may refer to the location of the sample warning sign by page number or you may construct a format which uses appendices. If appendices are to be used, they must appear last in the document, after the photographs and their captions. The table of contents must be amended as needed to preserve accuracy.

- 4) In the next-to-last paragraph of section "I.D.2." (page 8), the "Appendix B" problem appears again.
 - 5) The proposed merging of former Use Restrictions 13 and 14 into a new Use Restriction 13 is acceptable. We note that you now direct users to dispose of badly damaged collars themselves. All labeling must be consistent on this point.
 - 6) The new Use Restriction 15 does not address Endangered Species considerations in South Dakota, the only State where this product is to be used legally. As South Dakota is one of the few States where black-footed ferrets have been seen within the last two decades, we believe that the labeling needs some text addressing potential hazards to this species (as well as to any other threatened or endangered species potentially at risk in South Dakota). According to our records the only endangered species text for Use Restriction 15 should be "Do not use the livestock protection collar within one mile of a prairie dog colony where the presence of the black-footed ferret has been confirmed by U.S. Fish and Wildlife Service within the past 5-year period."
 - 7) In the caption for photograph 14, change "files" to "flies."
- c. The following comments apply to the revised container label:
- 1) The label text in the section on "COLLAR DISPOSAL" conflicts with the revised version of Use Restriction 13, which directs users to dispose of damaged collars themselves instead of returning such collars to the South Dakota Department of Agriculture. Modify the label language so as to be consistent with the Technical Bulletin. Such text might read:

COLLAR DISPOSAL: Damaged, irreparable and/or leaking collars must be disposed of by deep burial. Follow the procedures described above and in Use Restriction 13 in the Technical Bulletin.

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- 2) The second paragraph under "ENDANGERED SPECIES CONSIDERATIONS" is accurate for the currently proposed version of Use Restriction 15. As you have been required to modify Use Restriction 15, you must also modify your label text accordingly.

d. Information on the Collars

Each Livestock Protection Collar will bear the following information:

DANGER
PELIGRO
1080
EPA Registration No. 13808-7
Unique Serial Number for each collar

The labeled collar submitted appeared to be that for the State of Montana. Your collars must bear your registration number and serial numbers assigned by the South Dakota Department of Agriculture. On the labeled example submitted, some of the text is located near the free ends of the straps. As the User Instructions in the Technical Bulletin permit applicators to cut off the ends of straps that are too long for the animals selected to wear particular collars, it is important that any text that might be clipped off be repeated elsewhere on the same strap. In the labeled example provided, the text found near the free ends was repeated closer to the collar bladders. The practice should be followed for all collars.

3. The monitoring plan is acceptable at this time. The Agency may request modifications after reviewing the data that have been submitted.

The data resulting from the monitoring study must be submitted in a standard format according to PR Notice 86-5. This information should be submitted to:

Product Manager (16)
Insecticide-Rodenticide Branch
Registration Division (TS-767C)
Environmental Protection Agency
Washington, DC 20460

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.. Reports

- a. South Dakota Department of Agriculture submits to EPA^{1,2} by February 15 each year the number of collars sold by County and State. The reporting period is January 1 to December 31.

¹William H. Miller, Registration Division (TS-767C), EPA, Washington, DC 20460.
²Mike Wood, Office of Compliance Monitoring (FN-342), EPA, Washington, DC 20460.

- b. South Dakota Department of Agriculture submits production information (pounds or gallons produced) for this product for the fiscal year in which the use for predator control is conditionally registered, in accordance with FIFRA section 29. The fiscal year begins October 1 and ends September 30. Production information will be submitted to the Agency no later than November 15 following the end of the preceding fiscal year. This information is to be submitted to:

Registration Support Branch
Registration Division (TS-767C)
Environmental Protection Agency
Washington, DC 20460

5. Agents

Within 30 days of issuance of this registration, South Dakota Department of Agriculture shall submit to the Agency a list, subject to EPA and South Dakota Department of Agriculture approval, of agents authorized to sell and/or distribute the 1080 Livestock Protection Collars, and the locations where the 1080 Livestock Protection Collars will be sold and/or distributed. Any changes and/or amendments to the list must be submitted to, and approved by, the Agency prior to instituting these changes. The Agency reserves the right to subsequently disapprove a previously approved agent and South Dakota Department of Agriculture agrees to regain any remaining 1080 Livestock Protection Collars from the disapproved agent.

6. Data Requirements to Support Continued Registration of the 1080 Livestock Protection Collar

- a. On February 3, 1987, the Agency mailed a Data Call-In (DCI) Notice under FIFRA section 3(c)(2)(B) to the USDA/APHIS/ADC requesting that the following studies either be corrected or repeated (copy enclosed). Satisfaction of these data requirements, by the due dates for submittal of the data, is also a condition of this Registration Notice.

<u>Reference No.</u>	<u>Study</u>	<u>Date Due</u>
71-5	Estimated Doses of Sodium Fluoroacetate (Compound 1080) Delivered to Coyotes by Toxic Collars, November 15, 1984. EPA Accession No. 144402.	February 6, 1990
71-5	Primary Hazard of the 1080 Toxic Collars to Skunks and Golden Eagles, December 21, 1984. EPA Accession No. 144401.	February 6, 1990

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- b. On October 4, 1988, the Agency mailed a DCI Notice under FIFRA section 3(c)(2)(B) to the U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Animal Damage Control (USDA/APHIS/ADC) and the three other 1080 collar registrants that product chemistry data be submitted to the Agency (copy enclosed). Satisfaction of these data requirements by the due dates for submittal of the data is a condition of this Registration Notice.

7. Biological Opinion from the Office of Endangered Species

Within 30 days after receipt by the Agency of a final Biological Opinion from the Office of Endangered Species, you must amend the registration of your product to reflect any restrictions on the sale, distribution, or use of 1080 products required or recommended by the Biological Opinion and you must agree to carry out such other actions, including submission to EPA of additional data, as are required or recommended in the Biological Opinion.

If these conditions are not complied with, the registration will be subject to cancellation in accordance with FIFRA section 6(e). Your release for shipment of the product constitutes acceptance of these conditions.

Also, our staffs have agreed that USDA/APHIS/ADC personnel will facilitate efforts by collar users to contact local Endangered Species Offices in order to comply with the endangered species provisions of the labeling.

A stamped copy of the label is enclosed for you records.

William H. Miller
Product Manager (16)
Insecticide-Rodenticide Branch
Registration Division (TS-767C)

Enclosures

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RESTRICTED USE PESTICIDE

Collars shall be sold or transferred only by registrants or their agents and only to certified Livestock Protection Collar applicators. Collars may be used only by specifically certified Livestock Protection Collar applicators or by persons under their direct supervision.

**FOR USE ONLY IN THE STATE OF SOUTH DAKOTA
SODIUM FLUOROACETATE (COMPOUND 1080)
LIVESTOCK PROTECTION COLLAR**

For use on sheep or goats to kill depreparing boyates

ACTIVE INGREDIENT - SODIUM FLUOROACETATE	1.04%
INERT INGREDIENTS*	98.96%
TOTAL	100.00%

* This product contains the toxic inert dye Rodamine B as a marker.

KEEP OUT OF REACH OF CHILDREN

DANGER



POISON

STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED. Induce vomiting at once with an emetic such as syrup of ipecac, use as directed. If emetic is not available, drink 1-2 glasses of water and induce vomiting by touching back of throat with finger. Do not induce vomiting or give anything by mouth to an unconscious person. **PROMPT TREATMENT IS MANDATORY. GET MEDICAL ATTENTION IMMEDIATELY.**

IF ON SKIN. Wash the exposed area twice with soap and water.

IF ON EYES. Flush eyes with plenty of water for at least 15 minutes.

IF ON CLOTHING. Remove contaminated clothing and wash before reuse. Dispose of all contaminated leather, including shoes, boots, and gloves, according to the "Pesticide Disposal" section. See disposal instructions on the side panel.

SEE SIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS

MANUFACTURED FOR South Dakota Department of Agriculture, Pierre, SD 57501

U.S. PAT. 3,842,806 EPA ESTABLISHMENT NO. 13808 SD 1
EPA REGISTRATION NO. 13808-B

NET CONTENTS 30.4 grams (1.1 oz) per small collar

NOTICE

Seller makes no warranty, expressed or implied, concerning the use of this product other than indicated on the label. Buyer assumes all risks of use and/or handling of this product when such use and/or handling is contrary to label instructions.

**PRECAUTIONS
HAZARDS TO HUMANS**

May be fatal if swallowed. Avoid handling collars. Wash hands after handling animals that have been handled. Do not use contaminated water.

ENVIRONMENTAL HAZARDS

This product is highly toxic to birds feeding on carcasses of treated animals. Apply this product only to water. Do not contaminate any body of water.

ENDANGERED SPECIES

NOTICE: It is a Federal requirement that results in the endangerment of species.

The use of 1080 in the State of South Dakota is determined to pose a hazard to the environment. See technical bulletin (1080-1) where the 1080 collar is approved from the U.S. Environmental Protection Agency.

INFORMATION

WARNING SYMPTOMS: Fluoride transformation of fluorine to cyanide. Poisoning symptoms: symptom-free latent period, ingestion and onset of symptoms (vomiting, hyperactive behavior, cyanosis). Ventricular fibrillation is the primary cause of death. Symptoms: rapid heart sounds and premature heart sounds.

TREATMENT: No effect if swallowed. Treatment may be effective if artificial airway is necessary. Induce emesis. If patient is conscious, the gag reflex, endotracheal intubation, gastric lavage with activated charcoal and magnesium sulfate. Diazepam. Monitor cardiac rhythm. Glycerol monoacetate is effective, however, it is expensive. **CONSULT NEAREST VETERINARIAN FOR CURRENT INFORMATION.** Intoxication will usually be fatal. **CAUTION:** The use of technical grade material in dosages, may cause blindness and paralysis. If a nonsusceptible strain should be cultured to grow, sepsis develops. (USEPA, RECOGNITION OF POISONINGS 3rd Ed.)

DIRECTIONS FOR USE

It is a violation of State and Federal laws to use this product in a manner inconsistent with its labeling or the Compound 1080 cancellation order. Misuse may result in civil or criminal enforcement action.

DO NOT REMOVE TOXICANT FROM COLLARS. DO NOT USE TORN, DAMAGED OR LEAKING COLLARS. Dispose of damaged collars in accordance with the "Storage and Disposal" instructions on this label.

Put collars on the necks of sheep or goats in fenced pastures where coyote predation is occurring or is expected to occur. Use collars only in accordance with the User Instructions and Use Restrictions contained in the accompanying Technical Bulletin.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

STORAGE: Store Livestock Protection Collars only in original container, in a dry, locked place away from food, feed, domestic animals and corrosive chemicals. Do not store in any structure occupied by humans.

PESTICIDE DISPOSAL: Pesticide wastes are acutely hazardous. Improper disposal of such materials is a violation of Federal Law.

Dispose of wastes contaminated by 1080 (carcasses, wool hair, vegetation, soil, leather clothing, and water) under three feet of soil at a safe location, preferably on property owned or managed by the applicator and at least one half mile from human habitations and water supplies.

When snow or frozen ground make on-site disposal impractical, up to one cubic foot of wastes may be stored in a leakproof container, in a dry locked, place for up to 90 days.

Alternatively, contact your state pesticide Environmental Control Agency or the Hazardous Waste representative at the nearest EPA Regional Office for guidance in disposing of wastes at approved hazardous waste disposal facilities

COLLAR DISPOSAL: Return damaged, irreparable and/or leaking collars to the Animal Damage Control Officer, at Pierre, for disposal by the S. D. Department of Agriculture

CONTAINER DISPOSAL: Metal and plastic container - Triple rinse contaminated and uncontaminated containers with water. Then puncture and dispose of contaminated containers and rinse as above.

RE

Collars shall be sold or transferred as Livestock Protection Collar and not as Livestock Protection Collar application.

FOR USE ONLY SODIUM FLUORIDE LIVESTOCK PROTECTION COLLAR

For use on

ACTIVE INGREDIENT
INERT INGREDIENT
TOTAL

* This product contains

KEEP OUT OF

REACH OF CHILDREN
WARNING

STATEMENT

IF SWALLOWED: Induce vomiting immediately. If emetic is not available, rub back of throat with finger. Do not induce vomiting in a child or pregnant person. **PROMPT TREATMENT**

IF ON SKIN: Wash the exposed area with soap and water.

IF ON EYES: Flush eyes with water for at least 15 minutes.

IF ON CLOTHING: Remove or decontaminate contaminated leather. Include in "Disposal" section. See disposal instructions.

SEE SIDE PANEL FOR ADDITIONAL INFORMATION

MANUFACTURED FOR: South

U S PAT 3,842,806 EPA E
EPA F

NET CONTENTS: 30.4 grams

Seller makes no warranty, expressed or implied, other than that indicated on the label. Buyer assumes all liability for safe use and/or handling of this product.

101700

EPA

1080
with COLLARS
in EPA Letter 1080-1

JAN 11 1989

Under the Federal Insecticide, Fungicide, and Rodenticide Act, amended, for the pesticide registered under EPA Reg. No.

13808-7

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TECHNICAL BULLETIN

FOR APPLICATOR USE OF THE

LIVESTOCK PROTECTION COLLAR

SOUTH DAKOTA DEPARTMENT OF AGRICULTURE

REGULATORY SERVICES DIVISION

PIERRE, SOUTH DAKOTA 57501

DO'S AND DON'TS FOR LIVESTOCK PROTECTION COLLARS

2

DO

- read the label and Technical Bulletin before using collars
- plan how to target coyotes to your collared animals before using collars
- use appropriate size collars (small collars for 25 to 50 lb. animals; large collars* for larger animals)
- be sure to position collars correctly (see pages 7, 8)
- check and repair fences if necessary before putting collared animals in pasture
- notify neighbors that collars can be hazardous to free-ranging pets
- keep warning signs in place as long as collars are being used (see pages 15, 19)
- check collared animals weekly or more often to be sure that all are present and that collars are in position and not punctured (see pages 8, 15)
- properly dispose of all collars, animals, vegetation, soil, water, leather clothing, and containers contaminated by 1080 (see pages 9, 10, 15)
- report any suspected poisoning of nontarget animals or humans (see pages 9, 14)
- minimize human activity in pastures where collars are being used
- keep records up to date as directed in the labeling (see page 14)
- take collars off when predation has stopped or is not expected to occur
- store collars properly when not in use (see page 16)
- wear water-proof gloves when handling collars
- wash your hands with soap and water after handling collars

*The large (60 ml) collar was not approved in the original registration of July 1985, but may become available later.

DON'T

- waste time by placing collared animals where coyotes won't attack them
- use collars if your livestock can be protected more easily or economically by other measures
- use so few collared animals that coyotes won't find them
- use more than 20 collars in any 100-acre or smaller pasture, or more than 50 collars per section (640 acres) of pasture (see page 17)
- use collars on unfenced, open range (see page 14)
- use collars where their use is prohibited to protect endangered wildlife (see pages 16-17)
- use collars without required authorizations from the Fish and Wildlife Service Endangered Species Office (see pages 16-17)
- use contaminated animals for food or feed (see page 17)
- use leaking or damaged collars
- remove toxicant from collars

NOTE TO EDITOR: In final layout, "DO'S and DON'TS" should appear inside the front cover.

TECHNICAL BULLETIN FOR THE LIVESTOCK PROTECTION COLLAR

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Section I. USER INSTRUCTIONS

A. INTRODUCTION AND THEORY

The Livestock Protection Collar, invented by Roy McBride of Alpine, Texas, exploits the coyote's habit of killing sheep and goats by bites to the throat (photo 1). As described in McBride's U.S. Patent No. 3,842,806 (issued in 1974), coyotes that attack collared livestock usually bite through the collars and receive oral doses of the contents. When used with a toxicant such as sodium fluoroacetate (Compound 1080), Livestock Protection Collars kill the attacking coyotes. Collars may be used only by specifically certified Livestock Protection Collar applicators or persons under their direct supervision (see Section II. 2). This publication is intended for the instruction of collar applicators.

Coyotes' attacking and feeding behavior do not seem to be affected by the presence of Livestock Protection Collars. Attacking coyotes usually kill and feed upon collared animals just as they would if no collar were present. After a lethal dose of sodium fluoroacetate (Compound 1080) has been ingested, symptoms of intoxication typically do not appear for 2 or more hours. Death occurs from 2 to 7 hours (average 4 hr 20 min) after the collar is punctured.

When collars are used properly, coyotes may puncture them in 75 percent or more of their attacks. A 100 percent puncture rate is unlikely to be achieved because coyotes sometimes attack body sites other than the throat (photo 2).

Effective use of Livestock Protection Collars requires not only that collars be positioned correctly, but also that coyote attacks be directed or targeted to collared livestock. Targeting may be difficult or impossible under some conditions. If coyotes are killing less than once per week, the collar technique may be impractical. Collars are recommended for ranches with high rates of coyote predation and management conditions that permit effective targeting of predations to collared livestock.

Experienced persons usually can evaluate local conditions quickly to decide whether or not collars will be effective. In addition to the basic problem of targeting, other factors to consider in deciding whether or not to use collars include availability and effectiveness of other control methods; costs of collars; labor requirements to collar and monitor livestock; potential hazards of collars to humans, domestic animals including pets, and nontarget wildlife; and severity of predation.

B. TOXIC PROPERTIES OF SODIUM FLUOROACETATE (COMPOUND 1080)

Compound 1080 is highly toxic to warm-blooded animals, including man, when taken internally. Humans are not likely to be poisoned except by ingestion of collar contents. Based on available estimates of toxicity (0.7-2.1 mg/kg) a lethal dose for a 150-pound man would be contained in 5 to 14 ml of collar solution. One large collar (contents 60 ml) contains 4 to 12 lethal doses, and a small collar (contents 30 ml) contains 2 to 6 lethal doses. Before using collars, read the label (Appendix A) and the Use Restrictions in this Technical Bulletin (Section II) carefully.

The toxic solution in Livestock Protection Collars contains pink dye (Rhodamine B) as a safety marker. Punctured, damaged, or broken collars together with clothing, animal remains, vegetation, soil, or other materials marked by this dye must be cleaned or disposed of in accordance with the label and Section I. D. 5 and II. 13 of this Technical Bulletin. Collars with minor damage to straps or fastenings may be repaired by applicators as long as the toxicant reservoirs have not been punctured and do not leak.

Compound 1080 is hazardous to domestic animals including livestock and pets. Dogs are particularly susceptible. In field studies, dogs have died after they attacked collared livestock and punctured the collars. As little as 0.1 ml of collar contents may be fatal to a 25-pound dog. Dogs could be poisoned by scavenging the carcasses of collared livestock. Therefore, to minimize the potential hazard to dogs, promptly dispose of all livestock carcasses as well as coyote carcasses suspected of being poisoned by Compound 1080 according to instructions in this bulletin.

Pen studies have shown that an adult sheep can be fatally poisoned by eating forage containing as little as 1 ml of 1080 solution from Livestock Protection Collars. Although no livestock appeared to have been poisoned by eating contaminated vegetation during 5 years of field testing, it could happen. Therefore, contaminated forage must be disposed of as directed on the product labeling.

C. DESCRIPTION OF COLLARS

The Livestock Protection Collar is a rubber bladder that contains a solution of Compound 1080, with neck straps for attachment to a sheep or goat. The type of collar used most up to 1985 has two Velcro® neck straps (0.75 inches wide and 22-24 inches long on new collars). Three-strap models also are available and are intended for use on goats. Both two- and three-strap collars have two toxicant reservoirs and come in two sizes--small and large (photo 3). The small collar is intended for use on lambs and kids weighing from 25 to 50 pounds. Livestock protection collars are not recommended for small animals (under 25 lbs). A small collar, properly in place on a lamb, is shown in photo 4. The large collar is used on large lambs and kids, and on adult sheep and goats. A goat with a large collar is shown in photo 5.

D. MANAGEMENT OF COLLARS ON SHEEP AND GOATS

1. Things to do before putting collars on livestock:
 - a. Be sure you have enough collars of proper size.
 - b. Inspect all collars for leaks and inspect straps to be sure they are securely attached. Do not use leaking or torn collars (photo 7) or collars on which the straps are coming loose (photo 8). Loose straps may be reattached by sewing.

- c. Check the fence around the pasture where collared animals are to be placed and repair as necessary to keep animals within the pasture.
- d. Establish locations for warning signs (Appendix B), and be sure you have enough signs.
- e. Inform neighbors of your intent to use Livestock Protection Collars and advise them of the potential hazards to free-roaming dogs.
- f. If ear tags or other marks are to be used, have the tags and related equipment on hand.
- g. Have an emetic (1-ounce bottle of syrup of ipecac) available when collars are to be handled. Also have a few good quality plastic bags or other leakproof containers on hand for packaging damaged collars.
- h. Select and pen the target flock (animals to be collared).

2. Attaching collars

Hold collars up to the necks of target livestock to determine the size of collar needed for each animal (photo 9). The rubber portion of the collar should come up to the ear (photo 4). If the collar is too small, there will be an unprotected region below each ear (photo 10). This will result in a lower puncture rate than would be obtained with collars of proper size.

One person can put collars on livestock, but the task is much easier for a two-person team. One person holds each animal while the other attaches its collar. To attach a collar, hold it in position under the animal's throat. Tighten the rear strap over the animal's neck just behind the ears and fasten it temporarily. Then tighten the front strap over the head between the eyes and ears and fasten it securely. Straps should be positioned to keep the rubber part of the collar directly below the ear (photos 4, 5, 6). On goats with horns, the front strap may pass in front of both horns or in front of one horn and behind the other. If necessary, use string or twine to tie the front strap to one or both horns to keep the collar in position (photo 11). Once the front strap is in position, readjust the rear strap if necessary and then secure it. If the straps are longer than needed, a knife or scissors can be used to trim off the excess. Fasten the strap ends by stapling (photo 12).

Collar straps must be tight enough to prevent collars from slipping out of position (photo 13), but not so tight as to choke the animal or cause sores (photo 14). Each strap should be loose enough that the applicator can insert 2 fingers between the strap and the animal. Collars stay in place well on animals with wool or mohair, but may be difficult to keep in position on newly shorn or slick-necked animals, particularly goats (photo 11). Head and neck conformation varies among animals and it may be impossible to keep collars in place on some individuals. They should be taken out of the collared flock.

A suitable method of permanently identifying individual animals in a target flock is required to keep track of collared livestock. One such method is the use of numbered ear tags. Tags that can be read from a distance of 50 feet or more are most useful (photo 15). If you are using ear tags, attach them before the animal is collared.

When the collar is in place, release the animal into a corral or other confined area and observe it carefully. Listen for labored breathing that may indicate the collar is too tight. When first released, collared sheep and goats often shake their heads, rub or make other attempts to rid themselves of the collars. This behavior will stop within a few hours if collars are not too tight. After you are satisfied that the collars are properly attached, move collared animals to the desired location.

Place warning signs at logical points of access (see Section II. 10 and Appendix B).

After handling Livestock Protection Collars, wash your hands with soap and water.

3. Monitoring collared livestock

Once collared animals are in the desired location, the pasture should be checked every 7 days or more often if frequent predation is expected. During each check try to locate each animal and observe collars to be sure they are in position. If the collar has slipped out of position, catch the animal and reposition its collar. Inspect each animal's neck for pink dye, which could indicate a punctured or leaking collar. If dye is seen, catch the animal and check the collar. Replace any damaged or leaking collar. See the label and Section I. D. 5 and II. 13 of this Technical Bulletin. Collars on small kids or lambs may require periodic adjustment to allow for growth.

When searching for collared livestock, watch for both animal carcasses and congregations of scavenging birds that could indicate the locations of carcasses. Whenever you visit a pasture, record the identity of each collared animal seen. Check each warning sign weekly to ensure that it is in place and is legible.

Based on experience gained in research studies, you will not see each collared animal every time you visit large, brushy pastures. Any animal not accounted for in two consecutive checks may be dead. An intensive search for it must be made. In addition, if more than three collared animals are not accounted for during any one check, an intensive search for these animals is required. Pastures must be systematically searched in their entirety or until the missing animals are located.

If more than nine (9) collars and/or collared animals are unaccounted for during any 60 day period, remove all collars from animals and terminate their use. Seek technical advice if necessary to determine and correct

the cause(s) of collar loss. Collar use may be resumed after adequate steps have been taken to prevent further, excessive loss of collars. See Section II. 11.

Routine checks of collared livestock are difficult if the animals are secretive or wild. Feed concentrates can be used to train animals to come to you or your vehicle. This facilitates the identification and inspection of collared livestock (photo 16). It also helps to have a few tame animals in the collared flock. Binoculars may be useful for inspecting collared livestock from a distance.

Infrequently, collars may be missing from carcasses of sheep or goats killed by coyotes. In research studies, missing collars appeared to have been carried or dragged away by coyotes. Some were found as far as half a mile away from kill sites, but about half of the missing collars were never recovered. Coyotes sometimes cache (hide or bury) them. Whenever a collar is missing, make a reasonable effort to find it. See Section II. 11.

If you see an animal that you think may have been poisoned, report it promptly to the appropriate regulatory agency. Any suspected poisoning of threatened or endangered species must be reported immediately. See Section II. 6.

4. Handling collars and contaminated animal remains, vegetation, clothing, water and soil.

The toxic solution in the Livestock Protection Collar contains a pink dye, Rhodamine B, which is used as a marker for the presence of 1080 on punctured, damaged or broken collars; on clothing, animal remains, vegetation, soil, or other materials; and in water. Always use waterproof gloves when handling collars or any materials known to be contaminated by 1080.

Inspect carcasses of collared animals to determine the cause of death. When the carcasses are fresh (within 24 hours after death), coyote kills usually are obvious (photo 17). Remove punctured collars carefully and examine the punctures. Holes made by coyote teeth usually can be distinguished from accidental punctures. When collars are punctured by cactus thorns, the thorns sometimes remain in the holes (photo 18).

If the collar was punctured, remove it carefully to minimize leakage and place in a leakproof plastic bag or other container for transport to your disposal site. If necessary, doublebag to prevent leakage. Examine the carcass for contamination as indicated by pink dye. Cut away the contaminated parts for disposal along with the punctured collar. See Section II. 12-13. Dispose of the remainder of the carcass using your normal practice. Cut or dig up contaminated forage and soil and place them in a leakproof container for transport to the disposal site.

If the collar was not punctured, the applicator can reuse it on another animal. Dispose of carcass using your normal practice. No special handling is required. If an unpunctured collar has only minor damage to straps or fasteners, the applicator may repair it.

When predation has stopped, or when collars are to be taken off for other reasons such as shearing, gather the collared flock into a corral. Hold each animal and inspect its collar for punctures. Loosen the neck straps and pull them free. Do not pull so hard that you rupture the collar (photo 7). It may be necessary, particularly with Angora goats, to use a knife or scissors to free collar straps from the animals' hair. Clean unpunctured collars as necessary and return them to locked storage until you need them again.

If clothing becomes contaminated with 1080 solution, remove it promptly. Wash clothes before wearing them again. Contaminated leather clothing, including gloves and footwear, should be disposed of in the same manner as contaminated animal remains because pesticides cannot be easily cleaned from leather. See Section II. 13.

5. Disposal of damaged collars and other contaminated materials

Damaged, punctured, or leaking collars, contaminated animal remains, vegetation, soil, water and leather clothing must be properly disposed of. The preferred method is by deep burial under 3 feet of soil in a safe field location at least one-half mile from human habitations and water supplies. For disposal on the ranch, it may be convenient to drill several deep holes using a mechanized post hole auger, or to make a trench with a backhoe. Then, as waste materials are produced, they can be dropped into the hole or trench and covered with earth. Not more than 10 collars may be buried in any one hole. If buried in a trench, each group of ten collars must be at least 10 feet apart.

Alternatively, contact the South Dakota Department of Agriculture, Pierre, SD or the South Dakota Department of Water and Natural Resources, Pierre, SD, for guidance in disposing of wastes at approved hazardous waste disposal facilities.

When snow or frozen ground make on site disposal impractical, up to one cubic foot of wastes may be stored in a leakproof container, in a dry, locked place for up to 90 days.

E. DIRECTING COYOTE PREDATION TO COLLARED LIVESTOCK

1. General Comments

The process of directing coyote predation to collared livestock is called targeting. Knowledge of targeting is in its infancy and should improve as more people gain experience with Livestock Protection Collars. Three different approaches or targeting strategies are described here. Ranchers and predation control specialists are encouraged to apply these methods as necessary to achieve the best results in their own circumstances.

2. Targeting Strategies

a. Collar all vulnerable livestock

Collaring all sheep or goats on a ranch would solve the targeting problem. This strategy has not been tested due to the cost of collars (\$16.50-17.50 each in July 1985) and the large number that would be required in large flocks (over 100 animals). Nevertheless, in small flocks (50 or fewer animals) it may be practical to collar all the lambs or kids. In flocks with 50 to 100 lambs or kids, it may be worthwhile to collar the smallest 20 to 50 individuals. Do not use more than 20 collars in any pasture under 100 acres, or more than 50 collars per square mile of fenced pasture.

b. Use target (collared) flocks

When coyotes are killing in particular pastures, remove all vulnerable livestock. Place 20 to 50 collared lambs or kids with their mothers in the pasture while all other vulnerable animals are penned at night or moved elsewhere. Add uncollared adult sheep or goats to the target flock to increase its total size to 50 or 100 head. If coyotes have been killing adult sheep or goats in the area, both adults and kids in the target flock should be collared. Remove collars 30 days after predation ceases, or whenever the risk of predation has abated.

This was the strategy used in most field tests and is the usual approach when collars are introduced onto a ranch where depredation is in progress. This strategy also can be employed by placing collared flocks in vacant pastures 1 to 2 months before large bands of sheep or goats arrive.

c. Collar vulnerable individuals in large flocks

Coyotes usually prefer kids or lambs to adult goats or sheep. Experience with Angora goats has shown that if a few collared kids are placed in wether flocks (5-10 collared kids per 100 uncollared adults), coyotes will select the kids (photo 20).

This strategy has not been tested on sheep and is not recommended for sheep at this time.

3. Mistakes in Targeting

As with any new technique, one must learn how to use Livestock Protection Collars before optimum results can be expected. Following is a list of some mistakes commonly made by persons learning this technique:

- a. Collars may be placed where effective targeting cannot be expected. In one example, 20 lambs were collared in a ewe-lamb flock containing hundreds of lambs. Coyotes subsequently killed the uncollared lambs. Effective targeting did not occur because collared lambs were far outnumbered by uncollared lambs that were equally attractive to coyotes.
- b. Collars are placed where predation is too infrequent. In one such case, collared sheep were exposed for four weeks during which no predation occurred. The users then lost interest and removed the collars. There was no further predation on this ranch for several months. Collars cannot be used effectively where there is little or no predation.
- c. Target flocks are too small. In one example, six collared lambs were left alone in a one-section pasture. Coyotes passed through the pasture without finding the collared animals and then killed sheep from a large flock in an adjacent pasture. The larger the flock, the more likely it is to attract coyotes. The optimum size for target flocks has not been determined, but pastures of 100 acres or more should probably contain at least 50 head.
- d. Target flocks are not isolated sufficiently from uncollared livestock. On one small farm, a group of ewes and collared lambs was exposed while other sheep on the place were penned each night. Instead of killing in the collared flock, coyotes switched to a neighbor's unprotected flock half a mile away. With small farm flocks, adjacent land owners may have to work together to achieve effective targeting.
- e. Small collars are used on large sheep or goats, leaving the throat region inadequately covered (photo 10). Coyotes frequently kill these animals without puncturing the collars.
- f. Collars are attached improperly, or they slip out of position (photo 13). Coyotes will kill these animals but are unlikely to puncture the collars. Collars in proper position are shown in photos 4, 5, 6, 11 and 16.
- g. Collars are placed on sick or cull animals in an effort to avoid sacrificing more valuable livestock. This may be false economy, as coyotes may not attack ill or lethargic animals. Collars should be used only on animals of the size and kind that coyotes have been killing locally.

- h. Use of collars may be accompanied by increased human activity on the ranch. Coyotes often are wary of unusual activity and may temporarily stop killing because of it. Collars should be placed and monitored with a minimum of disruptive activity.

Section II. USE RESTRICTIONS

1. Use of collars shall conform to all applicable Federal, State, and local regulations.
2. Collars shall be sold or transferred only by registrants or their agents and only to certified Livestock Protection Collar applicators. Collars may be used only by specifically certified Livestock Protection Collar applicators or by persons under their direct supervision. 1/

The certified applicator is directly responsible for assuring that all use restrictions are met. The certified applicator will decide, in accordance with label directions, when and under what circumstances collars will be used. The certified applicator will either apply collars or be physically present where collars are applied by a noncertified person. However, a noncertified person who has received adequate instructions from the certified applicator may store collars, check collars in the field, remove collars, repair or dispose of damaged collars in accordance with use restrictions, retrieve collars laying in the field and properly dispose of contaminated material and animal carcasses.

3. Certification of applicators shall be performed by appropriate regulatory agencies. Prior to certification, each applicator shall receive training which will include, but need not be limited to:
 - (a) Training in safe handling and attachment of collars.
 - (b) Training in disposal of punctured or leaking collars, and contaminated animal remains, vegetation, soil, and clothing.
 - (c) Instructions for practical treatment of 1080 poisoning in humans and domestic animals.
 - (d) Instructions on record keeping.
4. Registrants or their agents shall keep records of all collars sold or transferred at their address of record. Records shall include the name, address, state where Livestock Protection Collar certification was issued, certification number of each recipient, and dates and numbers of collars sold or transferred.

1/ "Direct Supervision," as described in this restriction, conforms to the requirements established under 40 CFR 171.6.

5. Each applicator shall keep records dealing with the use of Livestock Protection Collars and the results of such use. Records shall be maintained in accordance with appropriate State or Federal regulations but for not less than two years following disposal or loss of collars. Such records shall include, but need not be limited to:
- (a) The number of collars attached on livestock.
 - (b) The pasture(s) where collars, livestock were placed.
 - (c) The dates of each attachment, inspection, and removal.
 - (d) The number and locations of livestock found with ruptured or punctured collars and the apparent cause of the damage.
 - (e) The number, dates, and approximate location of collars lost.
 - (f) The species, locations, and dates of all suspected poisonings of humans, domestic animals or non-target wild animals resulting from collar use.
6. Any suspected poisoning of threatened or endangered species must be reported immediately (within three days) to the South Dakota Department of Agriculture, as will each suspected poisoning of humans, domestic animals or non-target wild animals.
7. Only the registrant or collar manufacturer is authorized to fill collars with 1080 solution. Certified applicators are not authorized to fill collars. Compound 1080 solution may not be removed from collars and used for any other purpose.
8. Collars shall only be used to take coyotes within fenced pastures ^{2/} no larger than 2,560 acres (4 square miles). But where average annual precipitation does not exceed 20 inches and vegetation is sparse, consisting only of short to mid-height grasses and scattered shrubs, collars may be used in pastures up to a maximum of 10,000 acres (16 square miles) in size.
- In no case shall the applicator place collared livestock in pastures where compliance with other Use Restrictions, such as monitoring, is impossible; in fenced pastures larger than 10,000 acres; or in unfenced, open range.
9. Collars shall be used only where losses of sheep or goats due to predation by coyotes are occurring or, based upon prior experience, where coyote predation can reasonably be expected to occur.

^{2/} Fenced pastures include all grazing land that is enclosed by livestock fencing. This includes wire or other man-made fences such as rock walls, and natural barriers such as escarpments, lakes, and large rivers that will prevent escape of livestock.

10. Where collars are in use, each logical point of access (for example, roads gates, and trails) shall be conspicuously posted with a bilingual (English/Spanish or other second language appropriate for the region) warning sign not less than 8" X 10" in size. Signs shall be inspected weekly to ensure their continued presence and legibility and will be removed when collars are removed. The signs will have a minimum type size for "DANGER-POISON" of 24 point (1/4 inches), with remaining text at least 18 point (3/16 inches).
11. All collared livestock must be checked at least once every seven days and collars adjusted if needed.

If any collared animal is not accounted for in two consecutive checks, an intensive search for it must be made.

In addition, if more than three collared animals are not accounted for during any one check, an intensive search for these animals is required.

If more than nine (9) collars are unaccounted for during any 60 day period, remove all collars from animals and terminate their use. Do not resume use until adequate steps have been taken to prevent further, excessive loss of collars.

12. Damaged, punctured, or leaking collars shall be removed from the field for repair or proper disposal. Damaged collars shall be placed individually in leakproof containers while awaiting repair or proper disposal. Authorized collar repairs are limited to minor repairs of straps and fastenings. Leaking or punctured collars must be properly disposed.
13. Dispose of 1080 wastes (punctured, leaking, or otherwise unrepairable collars; contaminated leather clothing, animal remains, wool, hair, vegetation, water, and soil) under three feet of soil, at a safe location, preferably on property owned or managed by the applicator and at least 1/2 mile from human habitations and water supplies. No more than 10 collars may be buried in any one hole. If buried in a trench, each group of 10 collars must be at least 10 feet apart.

Alternatively, contact the South Dakota Department of Agriculture; Pierre, SD, or the South Dakota Department of Water and Natural Resources; Pierre, SD, for guidance in disposing of wastes at approved hazardous waste disposal facilities.

When snow or frozen ground make on-site disposal impractical, up to one cubic foot of wastes may be stored in a leak-proof container, in a dry, locked place for 90 days.

Metal Container: Triple rinse contaminated and uncontaminated containers with water. Puncture and dispose of contaminated container and rinse as above.

Plastic Container: Triple rinse with water. Then puncture and dispose of container and rinsate as above.

- 14 All persons authorized to possess and use Livestock Protection Collars shall store them under lock and key in a dry place away from food, feed, domestic animals, and corrosive chemicals and in outbuildings, or in outdoor storage areas attached to, but separate from human living quarters.

15. Provisions for protection of endangered species:

The Livestock Protection Collar may not be used in the following areas due to potential adverse effects to endangered species (California condor).

STATE	COUNTIES
California	Fresno, Kern, Kings, Los Angeles, Monterey, San Benito, San Luis Obispo, Santa Barbara, Tulare, and Ventura

The Livestock Protection Collar may not be used in the following areas without written approval from the nearest U.S. Fish and Wildlife Service Office (FWS, Endangered Species Specialists). If FWS or the user determines that use of collars may adversely impact an endangered species (San Joaquin kit fox, black-footed ferret, Northern Rocky Mountain wolf, or grizzly bear) in the specific areas requested, collars may not be used in these areas. Written approval must be obtained annually.

STATE	COUNTIES OR AREA	NEAREST FWS OFFICE AND PHONE NUMBER
California	Alameda, Contra Costa, Merced, San Joaquin, Santa Clara, and Stanislaus	Sacramento, California 916-484-4935
Idaho	Bonner, Boise (north of State Highway 21), Boundary, Clearwater, Custer (north of local road running from Sun Valley to Chilly and a corresponding line running northeast from Chilly to Patterson), Fremont, Idaho, Lemhi, Shoshone, and Valley	Boise, Idaho 208-334-1806

Michigan	Keweenaw (Isle Royal) and entire Upper Peninsula	Twin Cities, Minnesota 612-725-3576
Minnesota	Aitkin, Becker, Beltrami, Carlton, Cass, Clearwater, Cook, Crow Wing, Hubbard, Itasca, Kittson, Koochiching, Lake, Lake of the Woods, Mahnomen, Marshall, Pennington, Pine, Roseau, and St. Louis	Twin Cities, Minnesota 612-725-3576
Montana	Beaverhead, Carbon, Flathead, Gallatin, Glacier, Lake, Lewis and Clark, Lincoln, Madison, Missoula, Park, Pondera, Powell, Sanders, Stillwater, Sweet Grass, and Teton	Helena, Montana 406-449-5225
Washington	Pend Oreille, Okanogan (National Park and Forest Land), Skagit, and Whatcom	Boise, Idaho 208-334-1806
Wisconsin	Douglas, Florence, Lincoln, Oneida, and Price	Twin Cities, Minnesota 612-725-3576
Wyoming	Fremont, Park, and Teton, and Yellowstone National Park	Helena, Montana 406-449-5225

16. The number of collars used shall be the minimum necessary for effective livestock protection. For pastures of the following size classes, do not use more collars than the number indicated.

<u>Size (acres)</u>	<u>Number of Collars</u>
up to 100	20
101 to 640	50
641 to 10,000*	100

*See Section II. 8.

17. Each applicator will have a one-ounce bottle of syrup of ipecac (to induce vomiting in case of accidental poisoning) available when attaching, inspecting, removing, or disposing of collars.
18. No contaminated animal will be used for food or feed.

DIRECTIONS FOR USE

It is a violation of State and Federal laws to use this product in a manner inconsistent with its labeling or the Compound 1080 cancellation order. Misuse may result in civil or criminal enforcement action.

DO NOT REMOVE TOXICANT FROM COLLAR. DO NOT USE TORN, DAMAGED OR LEAKING COLLARS. Dispose of damaged collars in accordance with the "Storage and Disposal" instructions on this label.

Put collars on the necks of sheep or goats in fenced pastures where coyote predation is occurring or is expected to occur. Use collars only in accordance with the User Instructions and Use Restrictions contained in the accompanying Technical Bulletin

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal

STORAGE Store Livestock Protection Collars only in original container in a dry, locked place away from food, feed, domestic animals and corrosive chemicals. Do not store in any structure occupied by humans

PESTICIDE DISPOSAL Pesticide wastes are acutely hazardous. Improper disposal of such materials is a violation of Federal Law

Dispose of wastes contaminated by 1080 (carcasses, wool hair, vegetation, soil, leather clothing, and water) under three feet of soil at a safe location, preferably on property owned or managed by the applicator and at least one half mile from human habitations and water supplies

When snow or frozen ground make on site disposal impractical, up to one cubic foot of wastes may be stored in a leakproof container, in a dry locked, place for up to 90 days

Alternatively, contact your state pesticide Environmental Control Agency or the Hazardous Waste representative at the nearest EPA Regional Office for guidance in disposing of wastes at approved hazardous waste disposal facilities

COLLAR DISPOSAL Return damaged, irreparable and or leaking collars to the Animal Damage Control Officer, at Pierre, for disposal by the S D Department of Agriculture

CONTAINER DISPOSAL Metal and plastic container Triple rinse contaminated and uncontaminated containers with water. Then puncture and dispose of contaminated containers and rinse as above

RESTRICTED USE PESTICIDE

Collars shall be sold or transferred only by registrants or their agents and Livestock Protection Collar applicators. Collars may be used only by spe Livestock Protection Collar applicators or by persons under their direct supervision

FOR USE ONLY IN THE STATE OF SOUTH DAKOTA SODIUM FLUOROACETATE (COMPOUND 1080) LIVESTOCK PROTECTION COLLAR

For use on sheep or goats to kill depredating coyotes

ACTIVE INGREDIENT - SODIUM FLUOROACETATE	1.04%
INERT INGREDIENTS*	98.96%
TOTAL	100.00%

* This product contains the toxic inert dye Rodamine B as a marker

KEEP OUT OF REACH OF CHILDREN

DANGER



POISON

STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED Induce vomiting at once with an emetic such as syrup of ipecac, if directed. If emetic is not available, drink 1-2 glasses of water and induce vomiting by rubbing the back of throat with finger. Do not induce vomiting or give anything by mouth to a child or person. **PROMPT TREATMENT IS MANDATORY. GET MEDICAL ATTENTION IMMEDIATELY.**

IF ON SKIN Wash the exposed area twice with soap and water

IF ON EYES Flush eyes with plenty of water for at least 15 minutes

IF ON CLOTHING Remove contaminated clothing and wash before reuse. Wash contaminated leather, including shoes, boots, and gloves, according to the Disposal section. See disposal instructions on the side panel

SEE SIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS

MANUFACTURED FOR South Dakota Department of Agriculture, Pierre, S D

U.S. PAT. 3,842,906 EPA ESTABLISHMENT NO. 13808 SD 1
EPA REGISTRATION NO. 13808-7

NET CONTENTS 30.4 grams (1.1 oz) per small collar

NOTICE

Seller makes no warranty, expressed or implied, concerning the use of this product as indicated on the label. Buyer assumes all risks of use and/or handling of this product if such use and/or handling is contrary to label instructions

**TO CONTROL STOCK-KILLING COYOTES
SHEEP OR GOATS IN THIS AREA ARE WEARING
NECK COLLARS THAT CONTAIN A POISON, COMPOUND 1080
(Sodium Fluoroacetate)**

**DO NOT TOUCH COLLARED LIVESTOCK,
COLLARS, OR DEAD ANIMALS.
DO NOT RELEASE LIVESTOCK**



PELIGRO — VENENO



**PARA CONTROLAR COYOTES QUE ATACAN AL GANADO,
ALGUNAS OVEJAS O CABRAS EN ESTA AREA LLEVAN
COLLARES QUE CONTIENEN UN VENENO, COMPUESTO 1080 (FLUROACETATO DE SODIO)**

**NO TOQUE LOS ANIMALES, LOS
COLLARES, NI LOS ANIMALES
MUERTOS. NO SUELTE A LAS OVEJAS
O CABRAS.**

PHOTO CAPTIONS

1. When coyotes attack sheep or goats, they usually bite at the throat. The Livestock Protection Collar is an effective way to deliver chemicals selectively to depredating coyotes.
2. A coyote attacked this Angora goat at the rear, but did not puncture the collar. The goat had to be destroyed.
3. Large and small Livestock Protection Collars made by Ranchers Supply, Alpine, Texas. Each toxicant reservoir is 1.5 inches wide and 3.75 inches long on large collars (top) or 2.25 inches long on small collars (bottom). The beige Velcro® straps are 0.75 inches wide and 22-24 inches long.
4. Small Livestock Protection Collar on a 30-pound lamb. Note that the toxicant reservoir comes up almost to the ear.
5. Large Livestock Protection Collar on an adult Angora goat.
6. Small elastic-strap Livestock Protection Collar on a 50-pound lamb. In field tests on Angora goats the rate of collar puncture by attacking coyotes was lower for elastic-strap than for velcro-strap collars.
7. The corners of this small collar tore when the collar was being removed from an Angora goat. To avoid such damage, a knife or scissors can be used to free collar straps from hair or wool.
8. The rubber portion of this collar was poorly attached to the neck straps. Repairs can be made by sewing or stapling neck straps back in position. Only heavy thread or staples should be used.
9. The small collar is too small for effective coverage on this 100-pound lamb.
10. This lamb's collar is too small. Note the unprotected region below the ear. Large collars should be used on lambs of this size.
11. To keep the collar in position on this Angora goat, the forward collar strap was tied to a horn using butcher's twine. Any heavy string or cord will do.
12. An ordinary office stapler can be used to tack collar strap ends in place. These staples are inadequate for reattaching straps to collars (see photo 8).
13. The collar on this Angora goat has slipped back out of position. If the collar was in this position when a coyote attacked, the collar probably would not be punctured.

*Photo 2 by D.A. Wade, Texas Agricultural Extension Service; others by G. Connolly.

14. If collar straps are too tight, they will produce abrasions that become infected and attract flies, as shown on this Angora goat. This problem, which is more common with goats than sheep, can be avoided by frequently checking strap tension.
15. Numbered ear tags are a valuable aid in keeping track of collared livestock. The numbers on this tag can be read at a distance of 50 feet or more.
16. Checking of collared livestock is easy if the animals are trained to come for feed.
17. Typical remains of a collared lamb that was killed and fed upon by coyotes. The collar was punctured.
18. A Livestock Protection Collar punctured by prickly pear thorns. Thorn punctures are smaller than coyote tooth punctures. This damaged collar cannot be reused.
19. This coyote was found dead 0.4 miles from the spot where it attacked a collared lamb and punctured the collar. Laboratory analyses confirmed that it was killed by the collar toxicant, Compound 1080.
20. Flocks of adult Angora goats can be protected with Livestock Protection Collars by adding 5 to 10 collared kids per 100 uncollared adults. Two collared kids appear in this photograph (facing camera, left of center). Test statistics revealed a high rate of coyote selection for the kids.

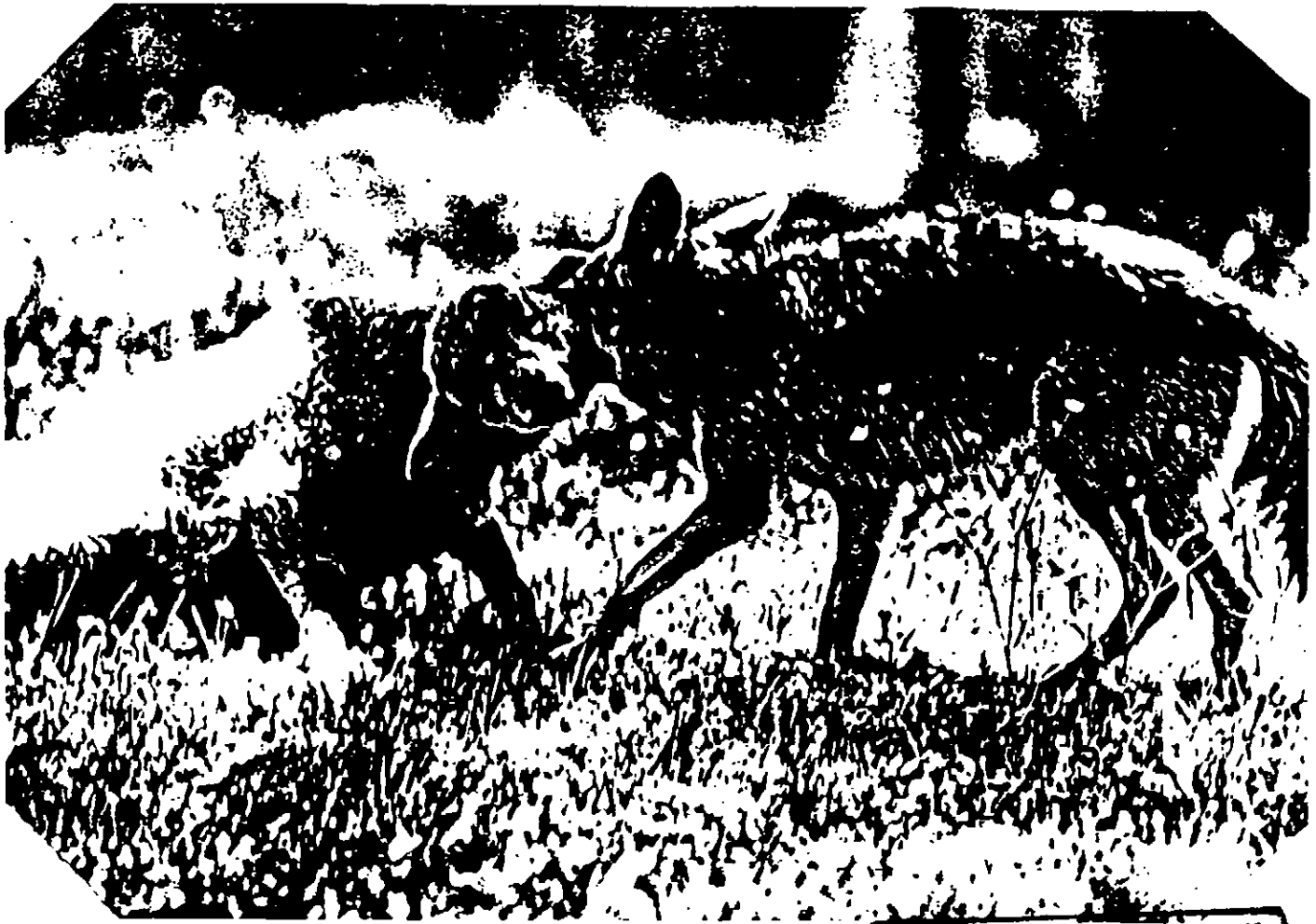
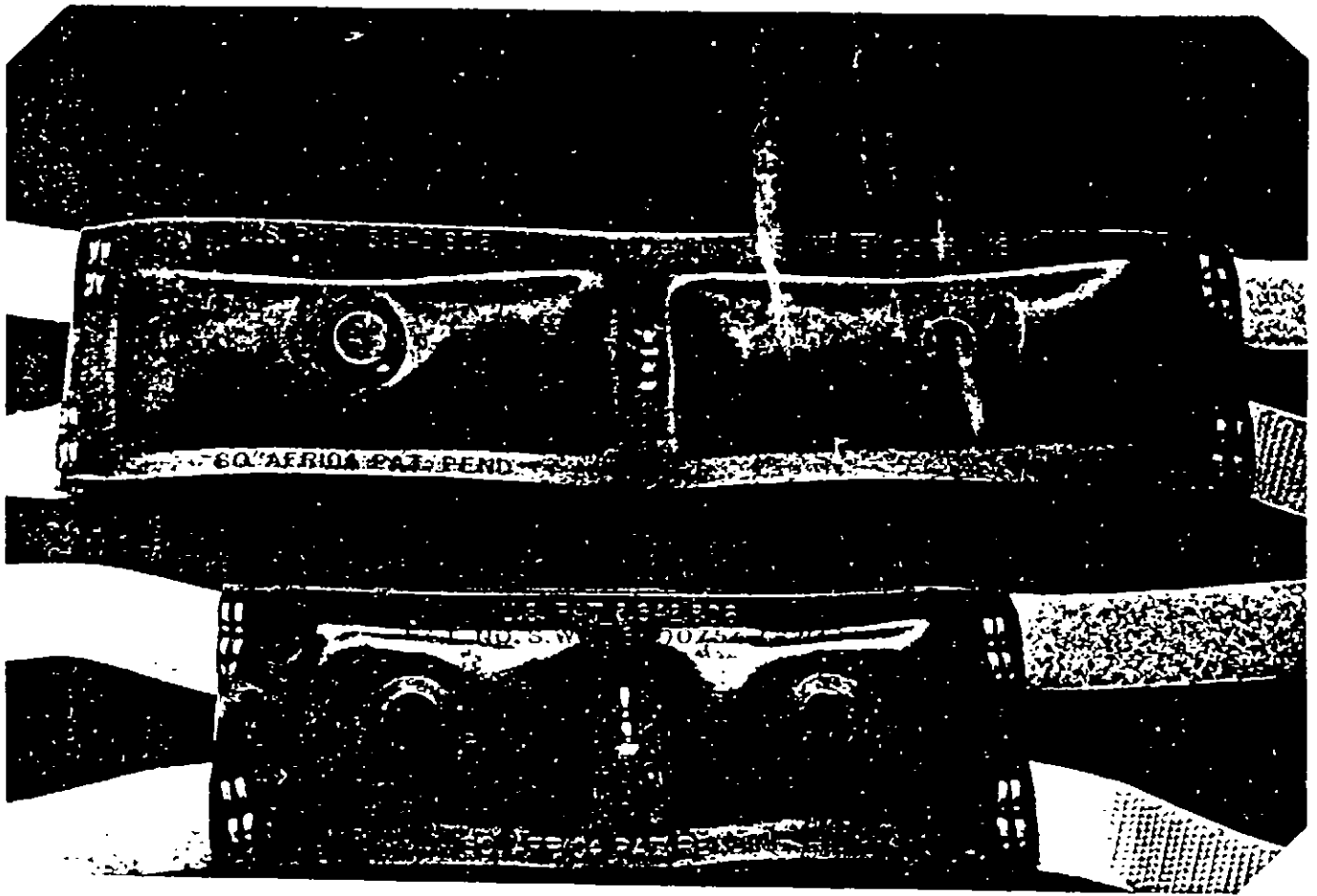


Photo 1

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Photo 2



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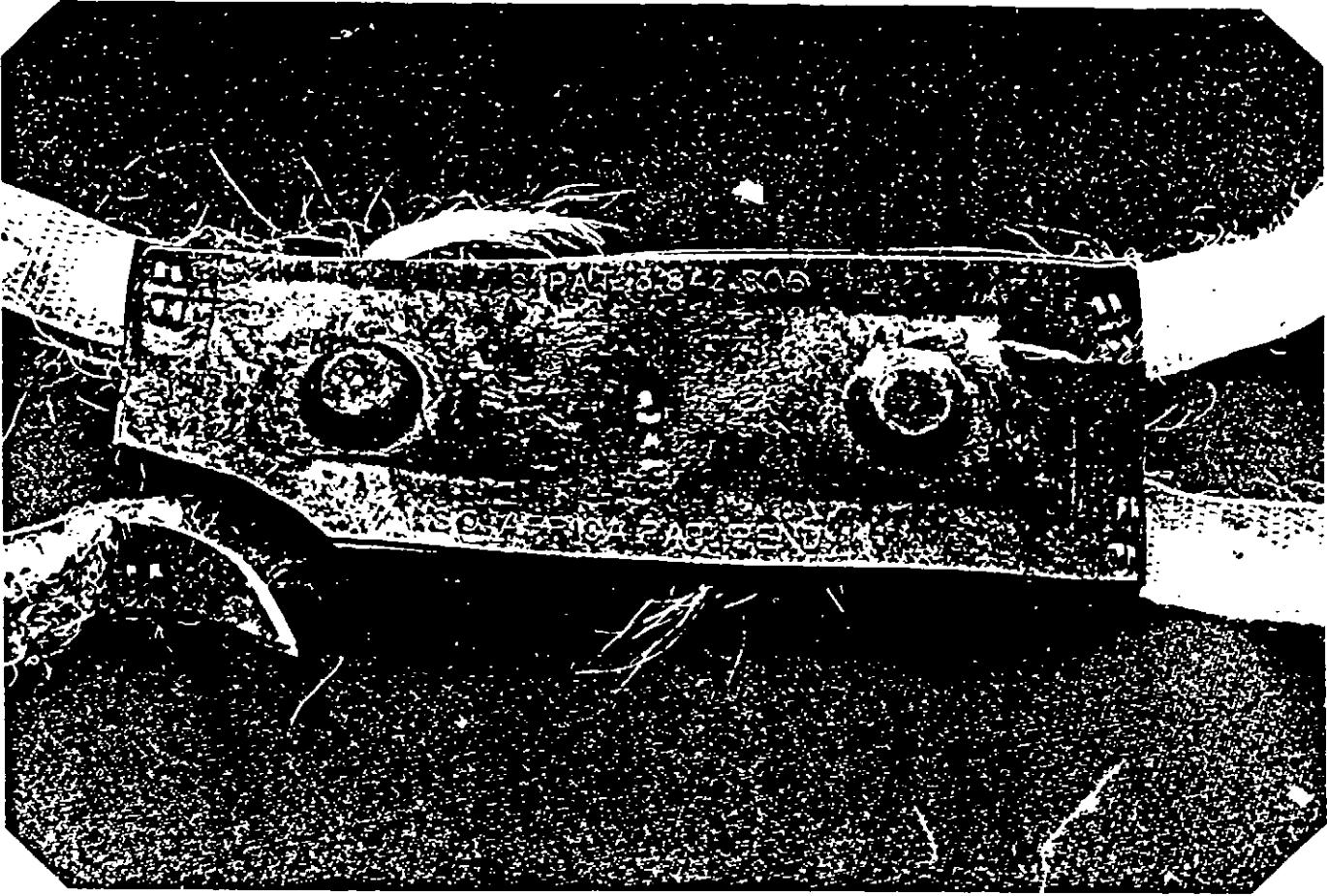


Photo 7





Photo 9



Photo 10



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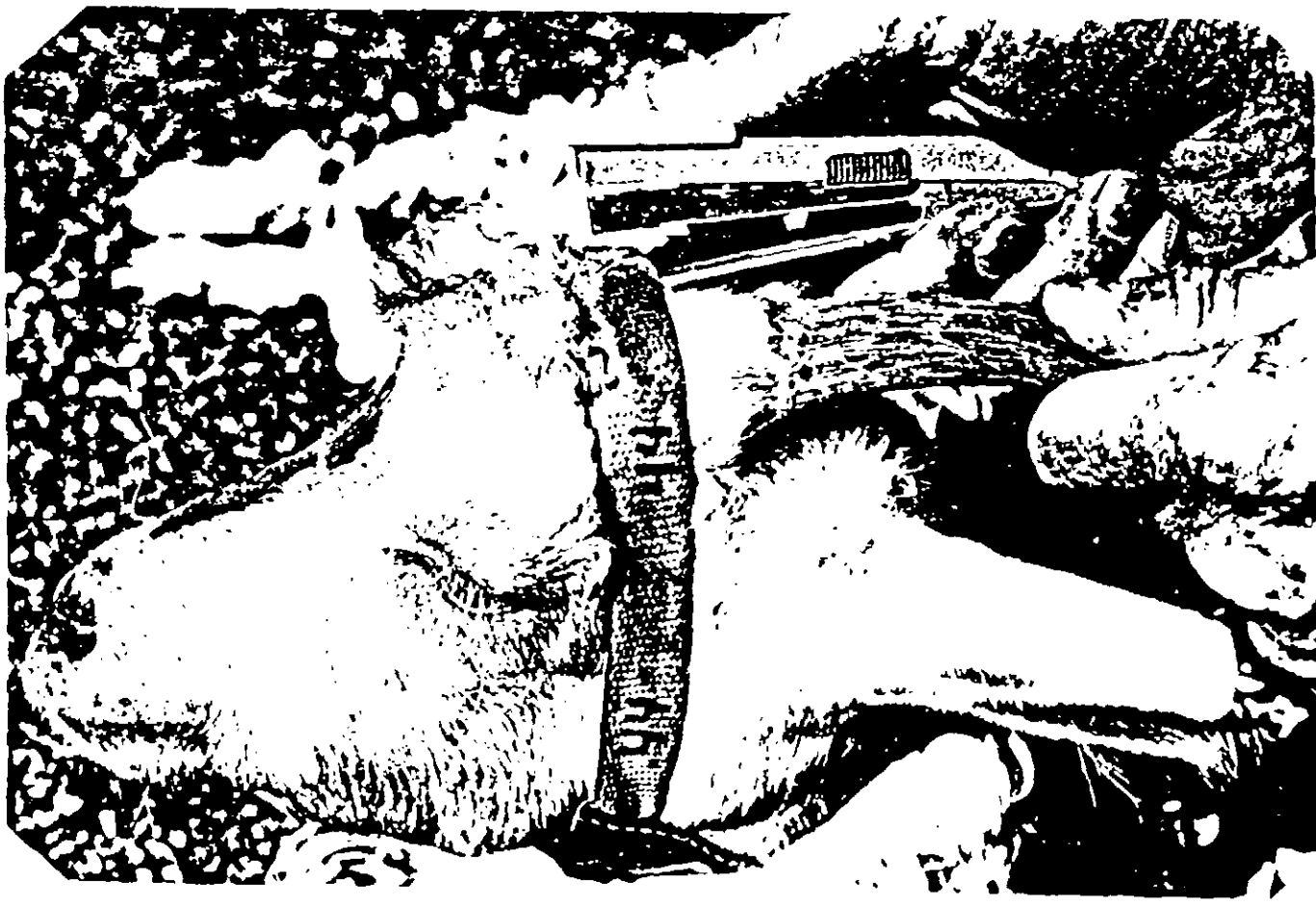




Photo 13

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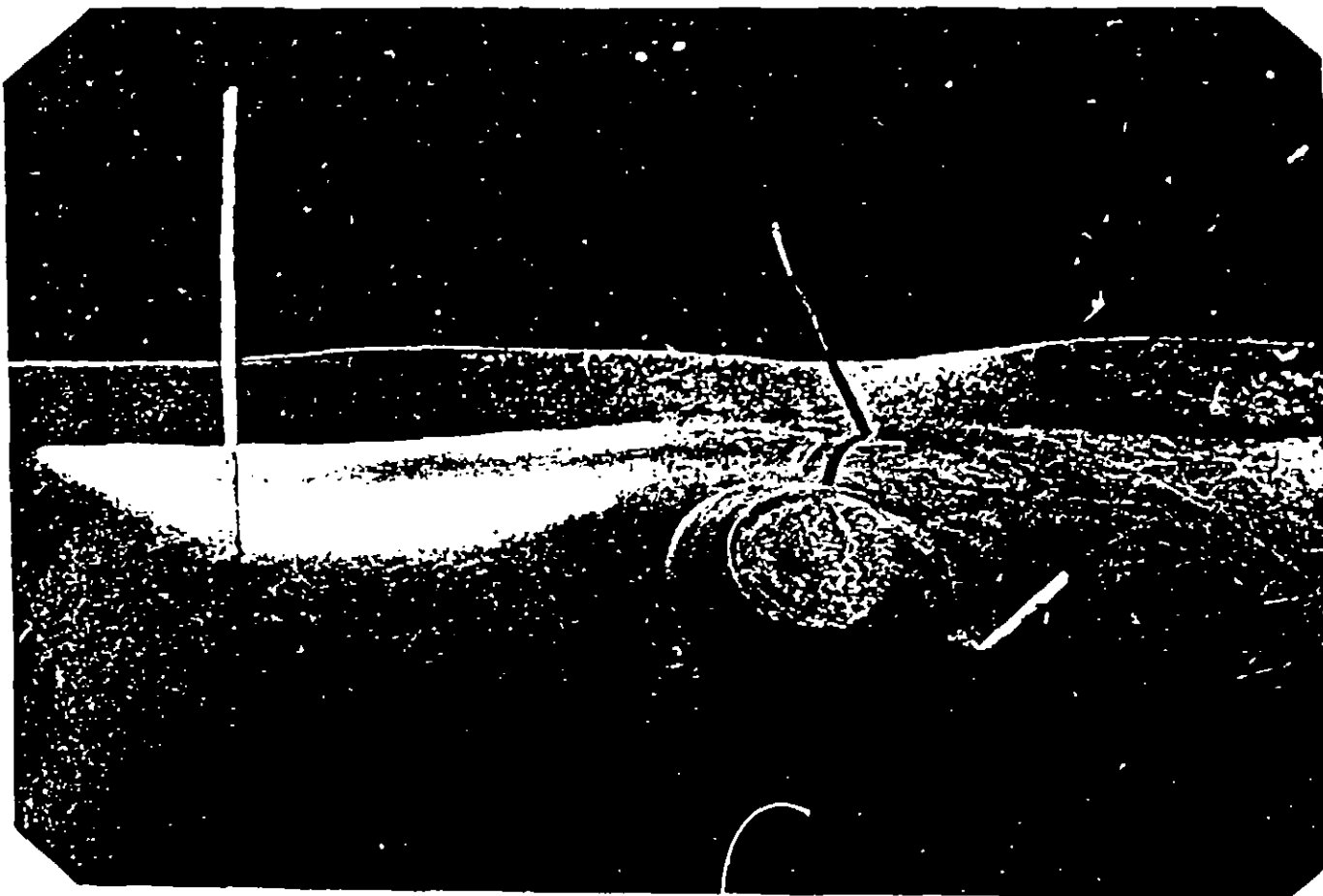
Photo 14



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Photo 17





SOUTH DAKOTA DEPARTMENT OF AGRICULTURE
Division of Regulatory Services
Anderson Bldg. 445 E. Capitol
Pierre, South Dakota 57501

PROTOCOL FOR DESIGN OF A STUDY TO MONITOR USE
AND PERFORMANCE OF COMPOUND 1080 LIVESTOCK
PROTECTION (LP) COLLARS.

I. OBJECTIVES

Use of LP collars will be monitored to:

- A. Determine whether collar use complies with use restrictions.
- B. Document effectiveness of LP collars.
- C. Record the level of collar use.
- D. Determine the frequency of events such as:
 - 1. Coyote attacks on collared livestock.
 - 2. Collar punctures during coyote attacks.
 - 3. Accidental punctures.
 - 4. Loss of collars.
 - 5. Nontarget species mortality due to collar use.
 - 6. Accidents incidental to collar use.
- E. Collect information to improve the effectiveness of LP collars in use.
- F. Provide information sufficient for annual reports required by EPA.
- G. Provide information needed by EPA to determine whether this monitoring study may be discontinued.

II. SCOPE AND RESPONSIBILITY

These monitoring requirements apply to all LP collars. All such use will be supervised by Department of Agriculture program officials. Responsibility for monitoring and reporting will be that of the Director, Regulatory Services Division, South Dakota Department of Agriculture. Distribution of the (LP) collars will be conducted by the South Dakota Department

of Game, Fish & Parks, Office of Animal Damage Control.

III. FORMS AND REPORTS

Monitoring will be accomplished by a series of standardized records or report forms (copies attached).

Brief descriptions of each form or report follow:

A. Routine monitoring of collared livestock

This form (Attachment 1) will be used for weekly or more frequent checking of collared sheep or goats. Each form will provide for listing of each collared animal (animal No. and collar No.), with provision for indicating each animal seen on each inspection date. All observations of collared livestock will be made on this form. This is the basic field form.

Each collar will have a unique serial number, with records kept to indicate collar size (large or small), kind of straps (velcro or elastic), number of straps (2 or 3), and configuration (1 or 2-piece).

This form will contain all data needed to compile such statistics as numbers of collars used by county, number of collar days by county, length of time (average and extremes) collars are in the field, frequency of collar puncture and loss, apparent causes for puncture, and disposal frequency.

In addition, an Individual Collar Summary Report (Attachment 2) will be completed at such time as the LP collar is either lost or returned to the South Dakota Department of Agriculture for refund or final disposal.

When the records are appropriately computerized, their data can be summarized for any desired time period and geographical region. The data will permit stratification by class of livestock (sheep and goats). Computerized records will be coded and secured as needed so as to protect the confidentiality of individual ranchers.

B. Monthly ranch report

This report, compiled from basic field forms (Item A above), will summarize collar use on the ranch. A separate form will be completed for each ranch for each month or part of a month collars are present on that ranch (even if collars are in storage and not on livestock).

C. Annual ranch report

One report per ranch will be compiled at the end of each calendar year. Information will be summarized from the monthly reports (Item B above).

D. Annual state report

This report will be compiled at the end of each calendar year from the annual ranch reports (Item C above) within the state.

E. Annual production of collars

This information will be reported to EPA each year by letter.

F. Disposition

Disposition of damaged, irreparable, and/or leaking collars will be handled by the South Dakota Department of Agriculture, in Pierre, South Dakota.

G. Accidents

Information will be compiled and incorporated into the monthly and yearly reports, concerning any accidents involving the use of LP collars. A specific reporting form (Attachment 3) is provided for this use.

SOUTH DAKOTA DEPARTMENT OF AGRICULTURE
LIVESTOCK PROTECTION COLLAR
INDIVIDUAL COLLAR SUMMARY REPORT

APPLICATOR'S NAME _____

LICENSE NUMBER _____

DATE REPORT FILED _____

COLLAR ID NUMBER _____

DATE OF LAST PLACEMENT ON ANIMAL _____

ANIMAL EARTAG NUMBER _____

LAND DESCRIPTION:

NAME OR PASTURE OR LOCATION (Legal Description)

DATES COLLAR CHECKED

(Minimum of Once a Week) _____

DATE COLLAR REMOVED OR LOST FROM ANIMAL _____

REASON FOR REMOVAL: _____

- 1. RETURNED TO SOUTH DAKOTA DEPARTMENT OF AGRICULTURE.
- 2. DAMAGE (Indicate type of damage and cause, if known.)

- A. If punctured, indicate side damaged. LEFT RIGHT BOTH
- B. If not punctured, indicate action taken.
 - Returned to SDDA.

- 3. LOST (Indicate last known or probable location.)

FINAL DISPOSITION OF COLLAR. Check appropriate answer.

- LOST
- RETURNED TO SOUTH DAKOTA DEPARTMENT OF AGRICULTURE.

FINAL DISPOSITION OF CONTAMINATED ANIMALS. (METHOD AND LOCATION)

SOUTH DAKOTA DEPARTMENT OF AGRICULTURE
REGULATORY SERVICE DIVISION
L P COLLAR ACCIDENT REPORT FORM

1) PESTICIDE APPLICATOR:
NAME: _____ Appl. Lic. No. _____
ADDRESS: _____
DATE OF ACCIDENT: _____
LOCATION: TWSHP _____ RANGE _____ SECTION _____ 1/4 _____
LANDOWNER/LEASEE: _____
ADDRESS: _____
WARNING SIGNS IN USE AT ACCIDENT SITE: YES _____ NO _____
NAME OF PERSON(S) INVOLVED IN ACCIDENT: _____

ACCIDENT RESULTED IN CONTAMINATION OF:
CLOTHING _____ FOOD _____ WATER _____ VEHICLE _____ BLDG _____
OTHER (SPECIFY) _____
WHICH OF THE FOLLOWING WERE INVOLVED:
STORAGE _____ USE _____ TRANSPORTATION _____ REMOVAL _____
DISPOSAL _____ OTHER (SPECIFY) _____

2) INJURED PERSON(S) :
NAME _____ AGE: _____
ADDRESS: _____
OCCUPATION: _____
DID PERSON(S) SEE A DOCTOR: YES _____ NO _____
DOCTOR'S NAME: _____
DOCTOR'S ADDRESS: _____
WAS PERSON(S) HOSPITALIZED: YES _____ NO _____
IF YES, WHERE: _____
DID PERSON(S) RECEIVE FIRST AID ON SITE: YES _____ NO _____
PERSON ADMINISTERING FIRST AID: _____
EXPOSURE ROUTE: ORAL _____ DERMAL _____ INHALATION _____ UNKNOWN _____
WHAT TREATMENT WAS GIVEN: ANSWER IN REMARKS SECTION

3) IF ACCIDENT INVOLVED NON-TARGET OR DOMESTIC ANIMALS:
SPECIES: _____
NUMBER OF ANIMALS FOUND: _____
LOCATION: _____
SUSPECTED CAUSE OF DEATH: _____
WAS ACTUAL CAUSE OF DEATH DETERMINED: YES _____ NO _____
IF YES, HOW WAS IT DETERMINED:
LABORATORY ANALYSIS _____ PHYSICAL EVIDENCE _____
AUTOPSY _____

REMARKS _____

DATE: _____

SIGNATURE: _____