



Alaska Commercial Divers, Inc.

P.O. Box 9351 • Keetchikan, AK 99901 • e-mail: aad@akn.net • Phone (907) 247-0771 • Fax (907) 225-0771

TLF Location: Fire Cove
Subject: Bark Monitoring Survey
Survey Date: June 13, 2001
Report Date: July 9, 2001

Survey Protocol and Analytical Methods:

Tim Scanlon, of Alaska Commercial Divers, Inc; dove at this site to determine the extent of bark debris cover. The diver also recorded the depths and substrate types where organisms were found.

Five transect lines were established from the center of the DGPS at 55 46.042 N and 131 33.031 W. ACD, Inc acquired this DGPS from the mark found on the beach next to the bulkhead. Each transect radiated seaward with all transects arranged 30 degrees apart from one another. The bearings of these transects were 75, 45, 15, 345, and 315 degrees. The compass bearing was established at the beginning of each transect, and followed until the end of that transect.

Measurements of bark deposition depth, and percent of bark coverage was measured by the diver at 15 foot intervals along each transect. Bark depth was measured to the nearest inch at each station with a three-foot metal ruler. The percent of bark coverage was estimated within a 3' x 3' area in the immediate vicinity of the measuring station. At measuring stations where cover was less than 10 percent the area covered was recorded as "trace". Measurements were made along each transect until bark deposits were no longer visible, or until water depth exceeded 60 feet MLLW.

Observations and Conclusions:

The substrate type at this site mostly consisted of sand and gravel with a few rocks. This site has a steep gradual slope. There was not a lot of foreign or metal debris at this site, the diver did find large metal debris on the 45 degree transect in 21 feet of water. Marine life recorded included baby halibut, sea cucumbers, sea stars, sun stars, barnacles, bullhead, crabs, sea algae, kelp, seaweed & crab grass. There were signs of an octopus in the area. The diver covered a total of 30,543.75 square feet. Continuous cover is 10575, discontinuous cover is 18731.25 and Trace is 1237.50 square feet. Total acreage .70 continuous acreage .24.

0.24 ac.

0.43 ac

Reports Prepared by: Jeani Purdy

[Signature]

Dives Performed by: Tim Scanlon

[Signature]

## SURVEY SITE: FIRE COVE

**COMPASS BEARING: 315 Degrees**

**SURVEY DATE: 6/13/2001**

Station	Water Depth @ MLLW	% Bark cover	Bark depth	Substrate Type	# & Types of Marine organisms	Metal & foreign debris
15	2 ft	0	0	Rock	Algae	None
30	4 ft	0	0	Rock	Algae	None
45	8 ft	0	0	Rock/Gravel	Sun star	Cable
60	8 ft	50	2 ½	Gravel	None	None
75	8 ft	90	2	Silt Gravel	Sun Star	None
90	9 ft	90	2	Silt Gravel	Rock Fish	Cable
105	7 ft	60	1	Silt Gravel	Sun Star	None
120	8 ft	10	-1	Sand	Algae/box crab/sun star	None

**COMPASS BEARING: 345 Degrees**

**SURVEY DATE: 6/13/2001**

Station	Water Depth @ MLLW	% Bark cover	Bark depth	Substrate Type	# & Types of Marine organisms	Metal & foreign debris
15	0 ft	0	0	Rock	Algae	None
30	6 ft	0	0	Gravel/Sand	Algae	None
45	13 ft	50	2	Silt/Gravel	Sun Star/Scallop	None
60	16 ft	50	3	Sand/Silt	Halibut	None
75	19 ft	90	4 ½	Silt/Gravel	None	Bark
90	23 ft	90	9	Bark	Halibut	None
105	25 ft	95	9	Bark/Silt	Sea Cucumber	None
120	27 ft	90	8	Silt/Bark	Kelp/Sea Cucumber	None
135	29 ft	90	6	Silt/Bark	Kelp	None
150	32 ft	80	3	Silt/Bark	Kelp	Branches
165	37 ft	50	25	Silt/Bark	None	None
180	52 ft	60	5	Silt/Bark	None	Tire, Cable, Large metal Debris
195	60 ft	100	7	Silt/Bark	None	None

**COMPASS BEARING: 15 Degrees SURVEY DATE: 6/13/2001**

Station	Water Depth @ MLLW	% Bark cover	Bark depth	Substrate Type	# & Types of Marine organisms	Metal & foreign debris
0	0 ft	0	0	Rock	Algae	None
15	1 ft	0	0	Rock	Algae	None
30	5 ft	0	0	Rock	Box Crab, Lobster, Halibut	None
45	14 ft	50	8	Silt/Gravel	Sun Star, Halibut	None
60	18 ft	50	11	Silt/Gravel	Sun Star	None
75	23 ft	100	9	Silt/Gravel	None	None
90	32 ft	100	7	Silt/Gravel	None	None
105	34 ft	60	3 ½	Silt/Gravel	Sea Star	None
120	37 ft	20	0	Rock	Sea Cucumber	None
135	48 ft	0	0	Rock/Gravel	Sea Star	None
150	57 ft	0	0	Gravel/Sand	None	None

## SURVEY SITE: FIRE COVE

**COMPASS BEARING: 45 Degrees**

**SURVEY DATE: 6/13/2001**

Station	Water Depth @ MLLW	% Bark cover	Bark depth	Substrate Type	# & Types of Marine organisms	Metal & foreign debris
15	0 ft	0	0	Rock	Barnacles/Algae	None
30	4 ft	0	0	Rock	Barnacles/Algae	None
45	12 ft	60	7	Gravel/Silt	Jelly fish/Halibut	None
60	16 ft	50	10	Gravel/Silt	Jelly fish/Halibut	Metal Debris
75	23 ft	100	12	Gravel/Silt	None	None
90	26 ft	100	9	Gravel/Silt	None	None
105	32 ft	100	5	Gravel/Silt	None	None
120	37 ft	100	5	Gravel/Silt	Sea Star	None
135	42 ft	100	4	Gravel/Silt	Sea Cucumber	None
150	47 ft	100	5	Gravel/Silt	Sea Cucumber	None
165	53 ft	100	5	Gravel/Silt	Sea Cucumber	None
180	57 ft	100	7	Gravel/Silt	Sea Cucumber	None
195	63 ft	80	4	Gravel/Silt	None	None

**COMPASS BEARING: 75 degrees**

**SURVEY DATE: 6/13/2001**

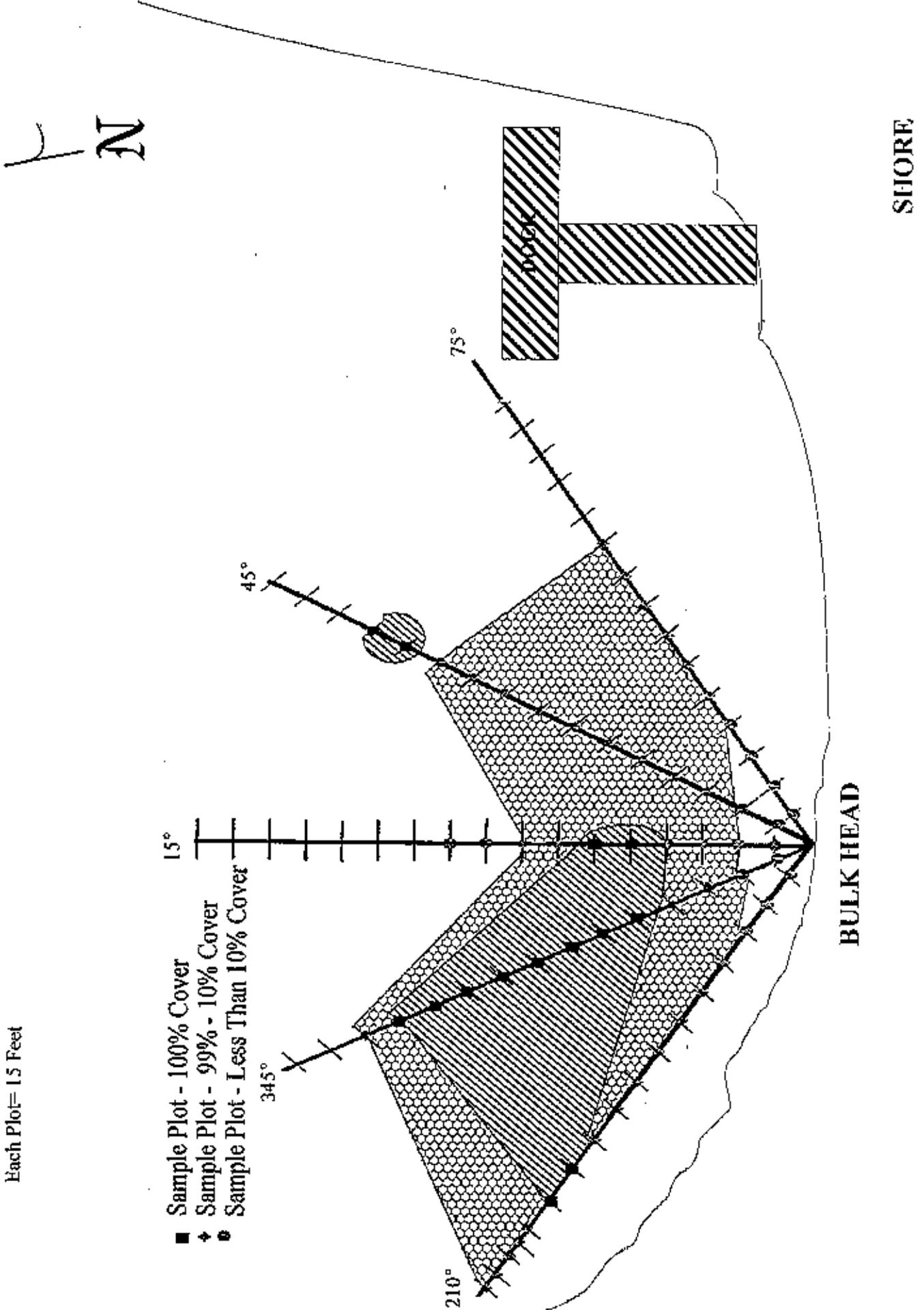
Station	Water Depth @ MLLW	% Bark cover	Bark depth	Substrate Type	# & Types of Marine organisms	Metal & foreign debris
15	1 ft	0	0	Rock	Barnacles/Fish	None
30	3 ft	0	0	Rock	Barnacles/Fish	None
45	6 ft	0	0	Gravel/Sand	None	None
60	11 ft	50	1	Gravel/Sand	Box Crab/Sun Star	None
75	13 ft	50	3	Gravel/Sand	Sun Star/Jelly fish	None
90	18 ft	50	3	Gravel/Silt	Sun Star	Tire
105	22 ft	50	9	Silt/Wood	Sun Star	None
120	24 ft	75	5	Silt/Wood	None	Tire
135	27 ft	75	5	Silt/Wood	Jelly Fish	None
150	32 ft	75	5	Silt	None	None
165	33 ft	100	5	Silt	None	None
180	35 ft	100	7	Silt	None	None
195	37 ft	90	7	Silt	None	None
210	38 ft	90	6	Silt	Halibut	None
225	42 ft	70	4	Silt	None	None
240	43 ft	60	3	Silt	Sun Star	Cable
255	47 ft	50	3	Silt	None	None

**FIRE COVE Debris Survey**  
 Survey Date: 6/13/01

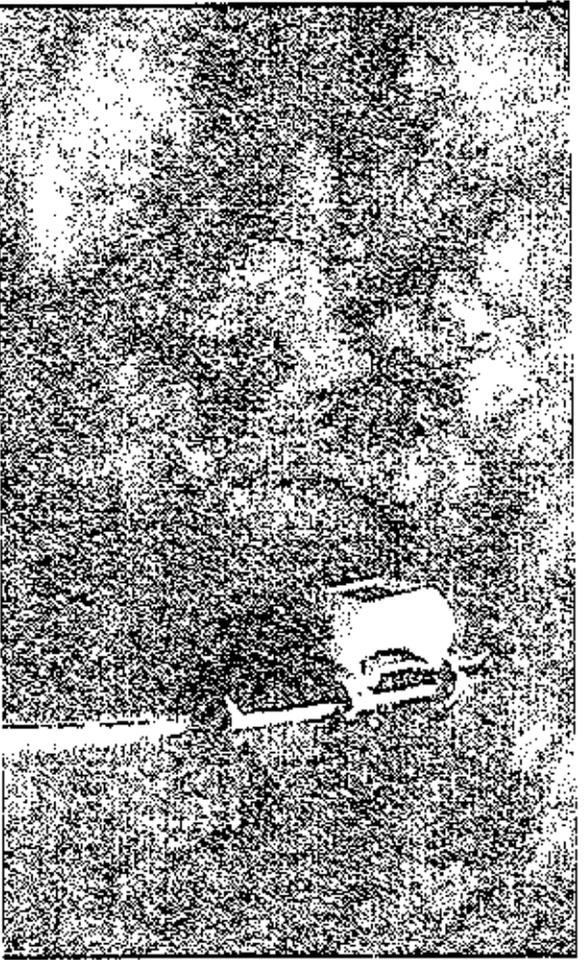
Continuous Coverage  
 Discontinuous Coverage

Each Plot = 15 Feet

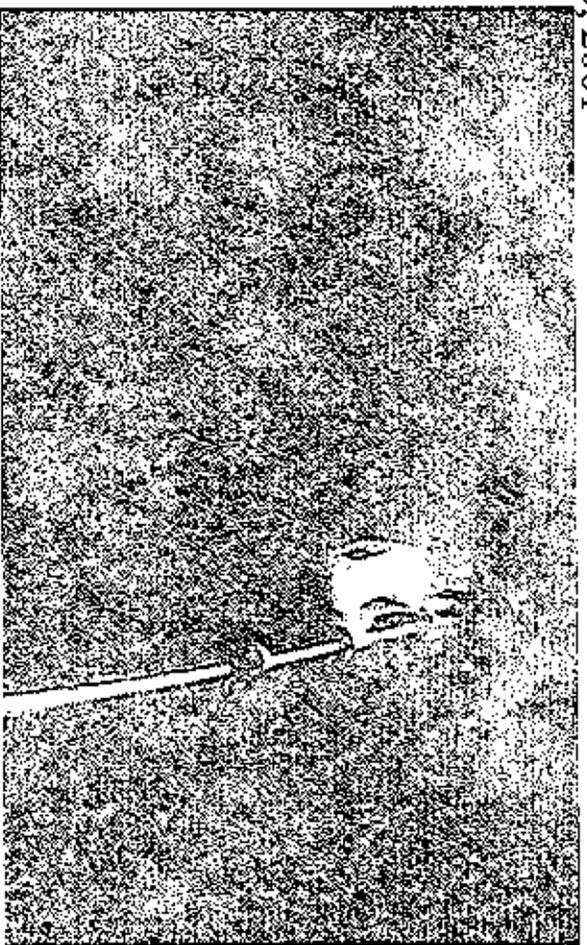
- Sample Plot - 100% Cover
- ◆ Sample Plot - 99% - 10% Cover
- Sample Plot - Less Than 10% Cover



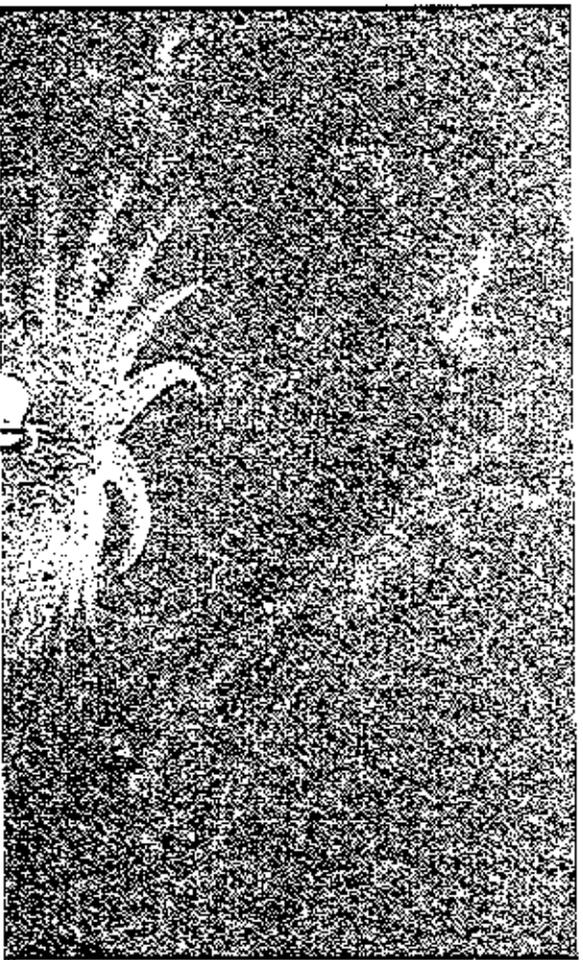
315 DEGREE FIRE COVE  
JUNE 13, 2001



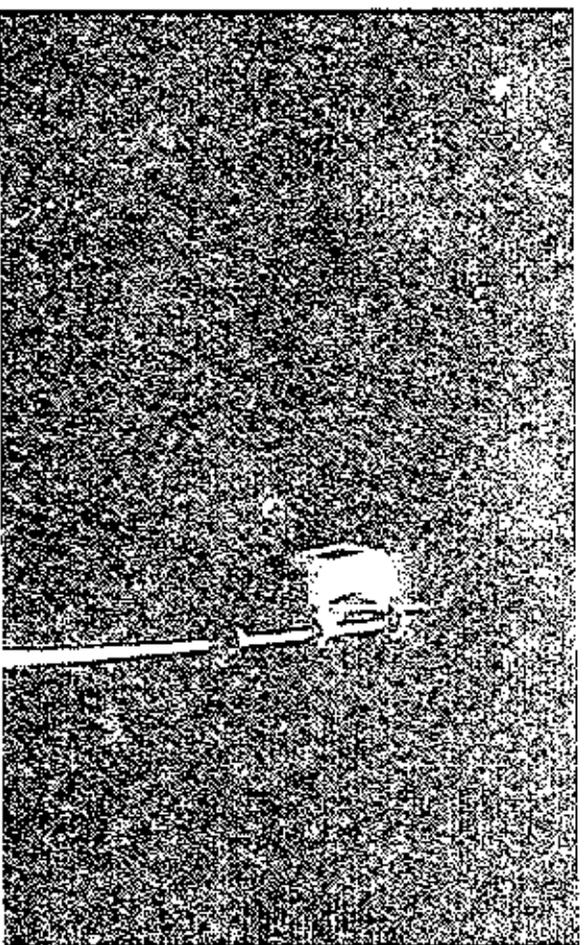
15 foot measuring station



30 foot measuring station

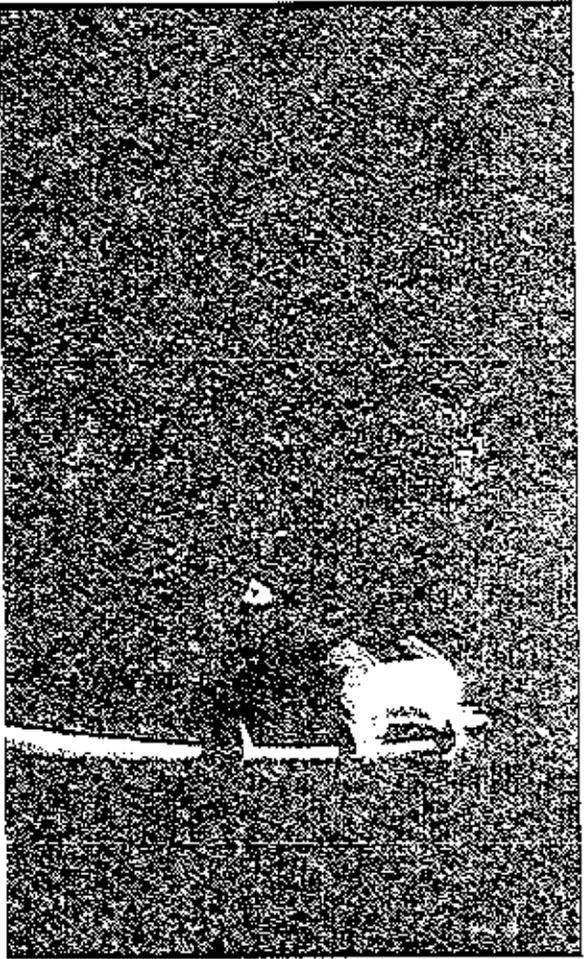


60 foot measuring station

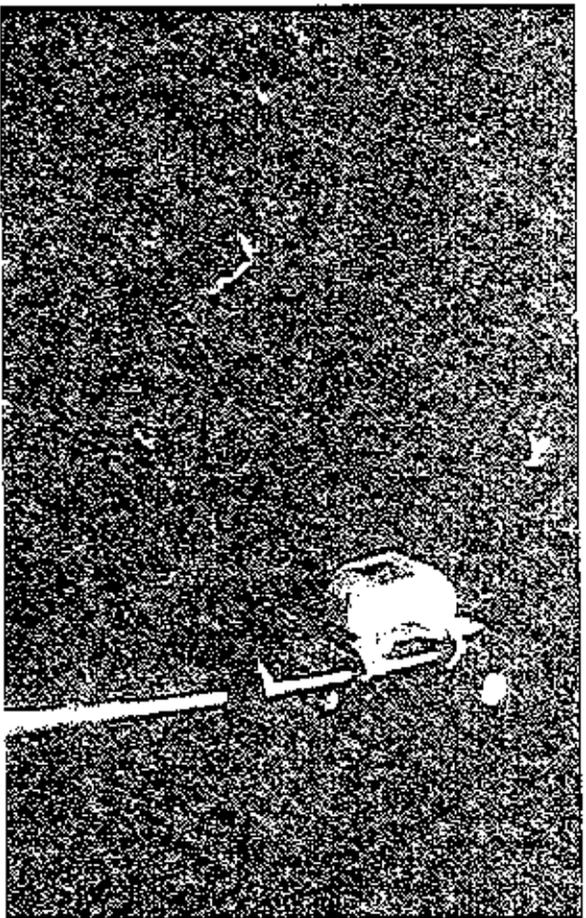


45 foot measuring station

315 DEGREE FIRE COVE  
JUNE 13, 2001



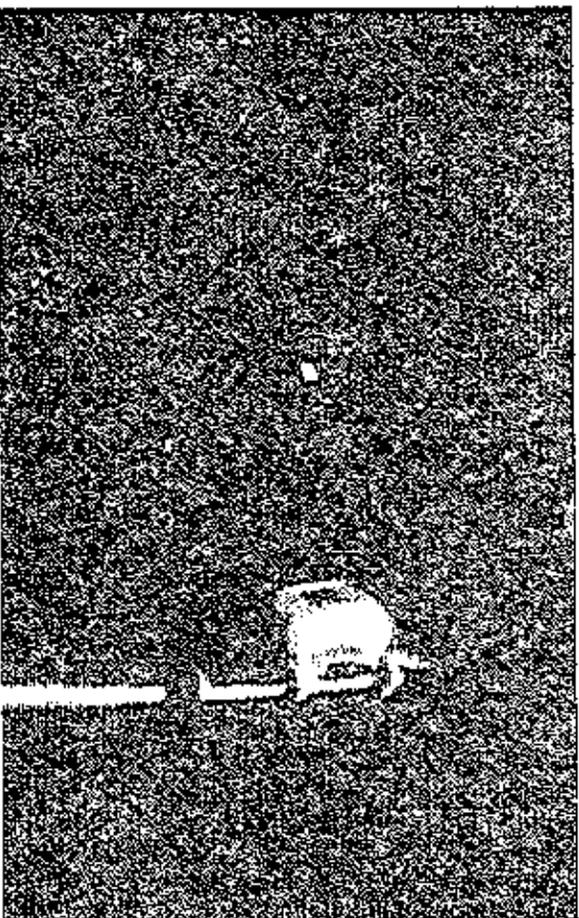
75 foot measuring station



90 foot measuring station



105 foot measuring station



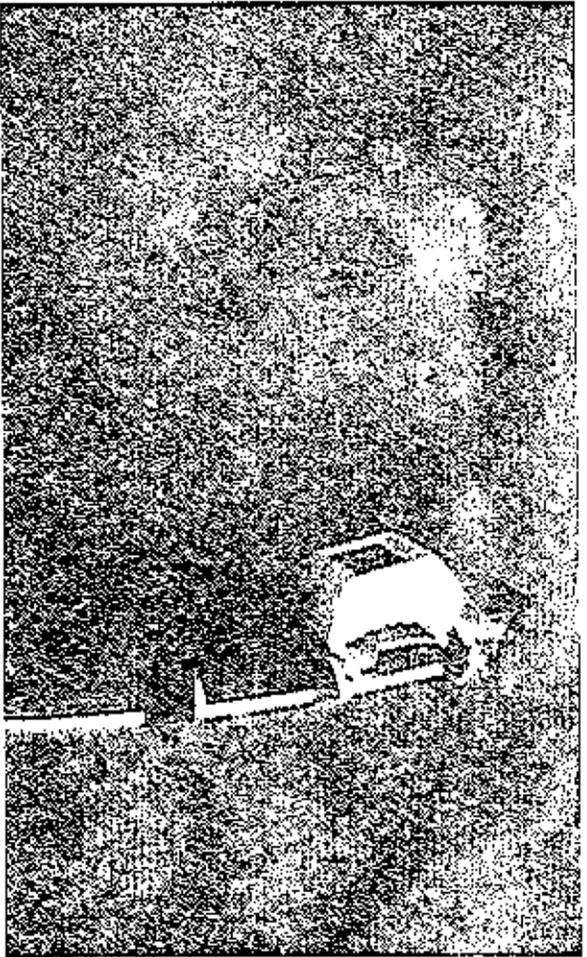
120 foot measuring station

315 DEGREE FIRE COVE  
JUNE 13, 2001

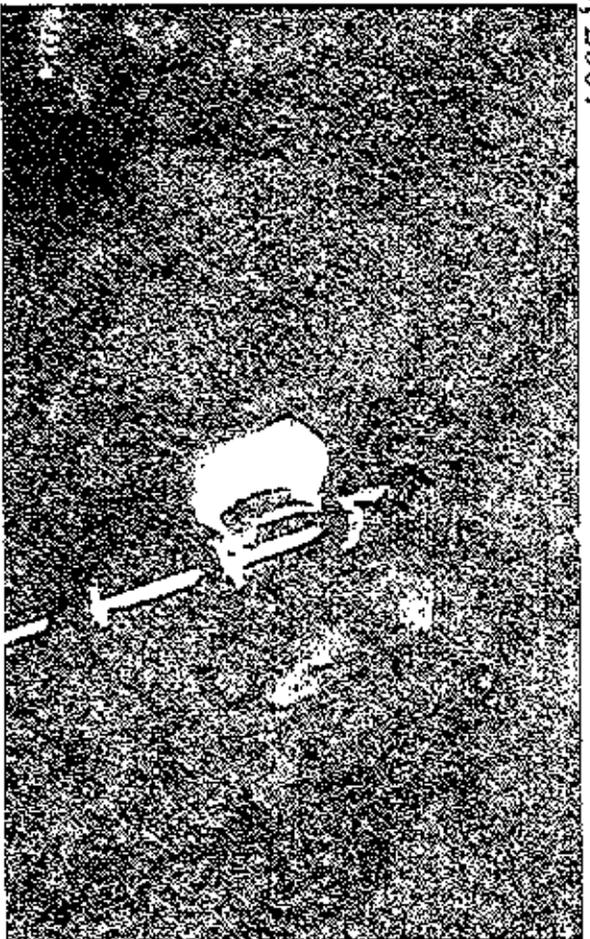


Box Crab and Sun Star @ 120- foot measuring station

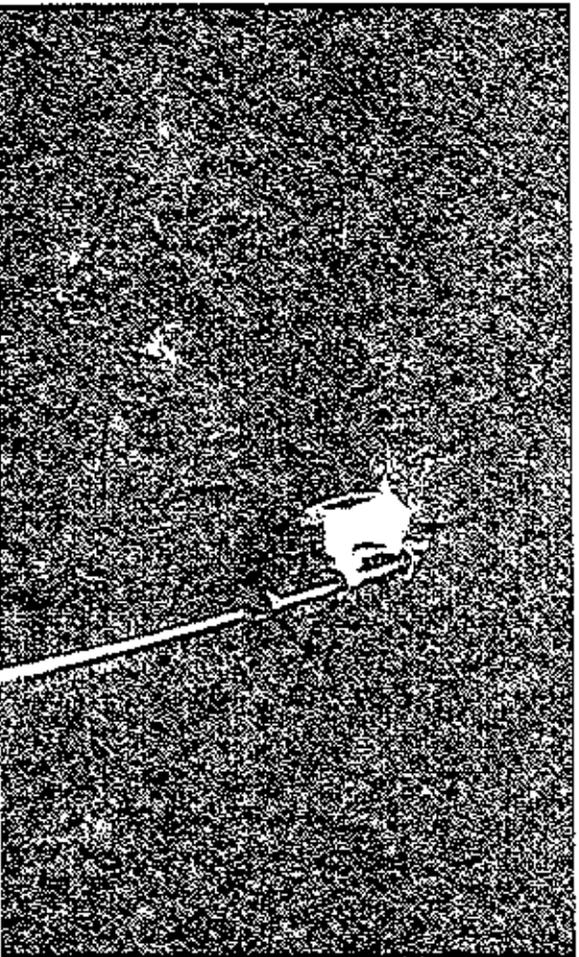
345 DEGREE FIRE COVE  
JUNE 13, 2001



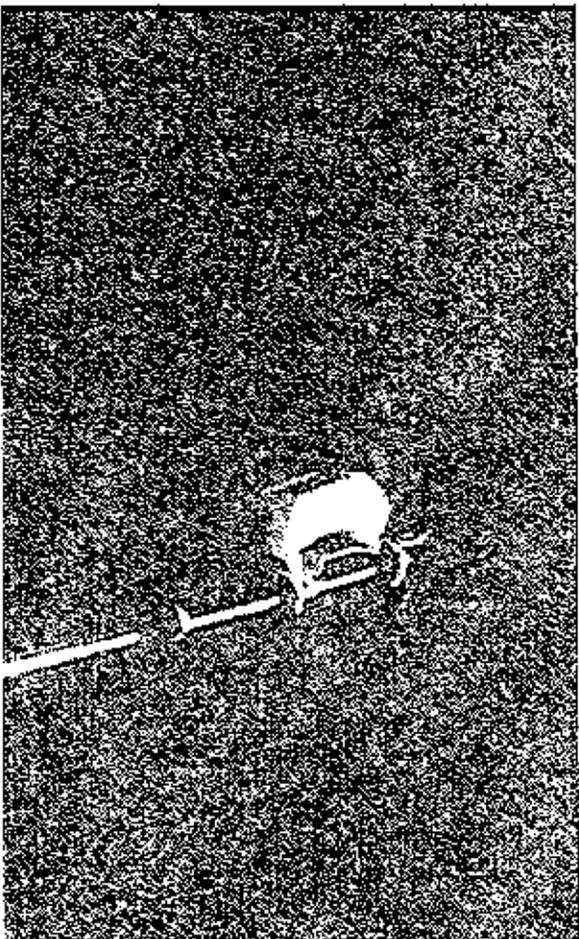
15 foot measuring station



30 foot measuring station

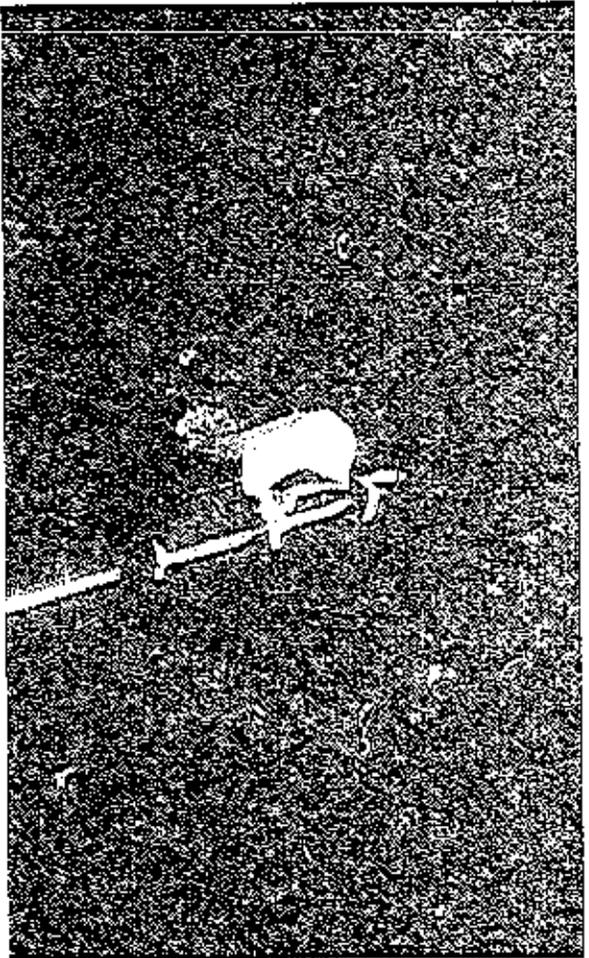


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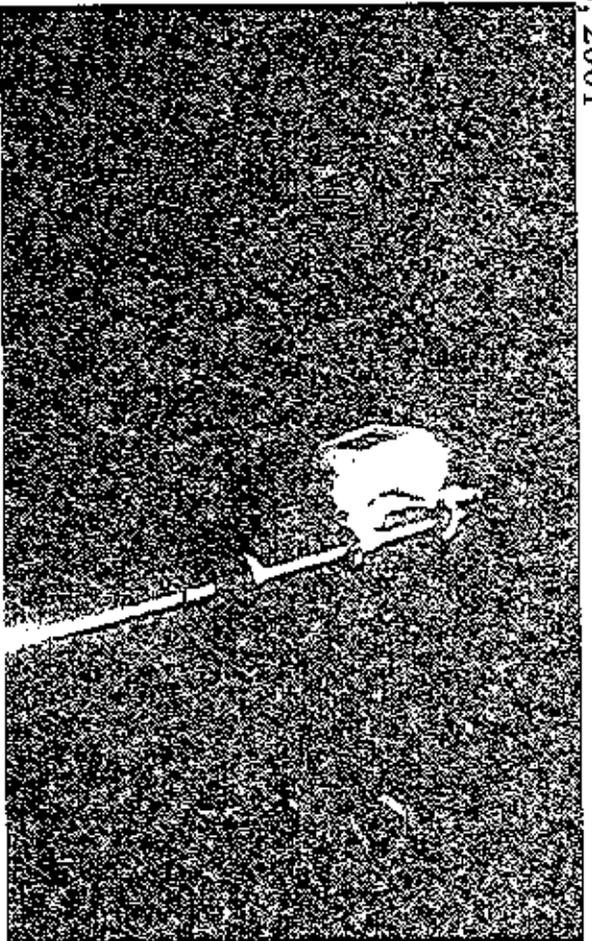


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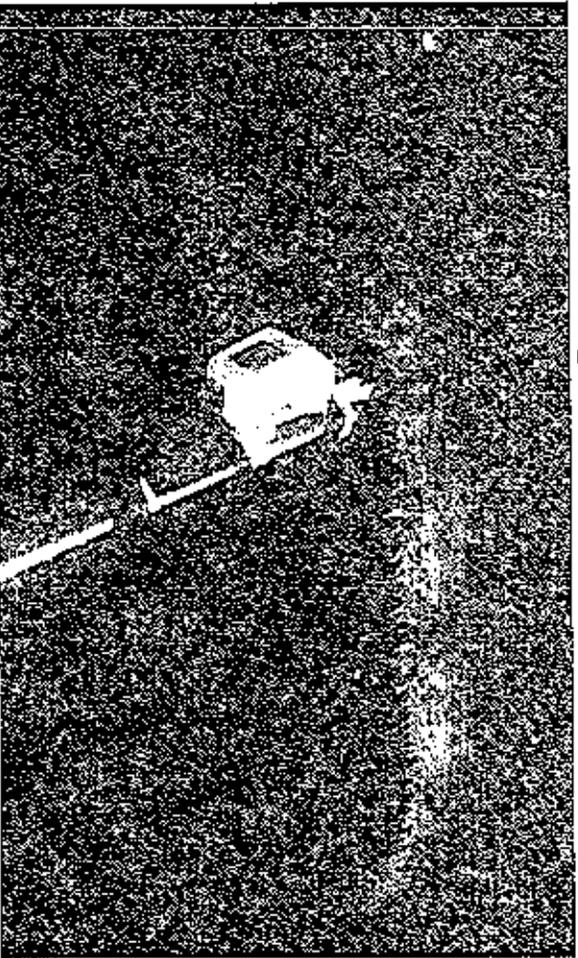
345 DEGREE FIRE COVE  
JUNE 13, 2001



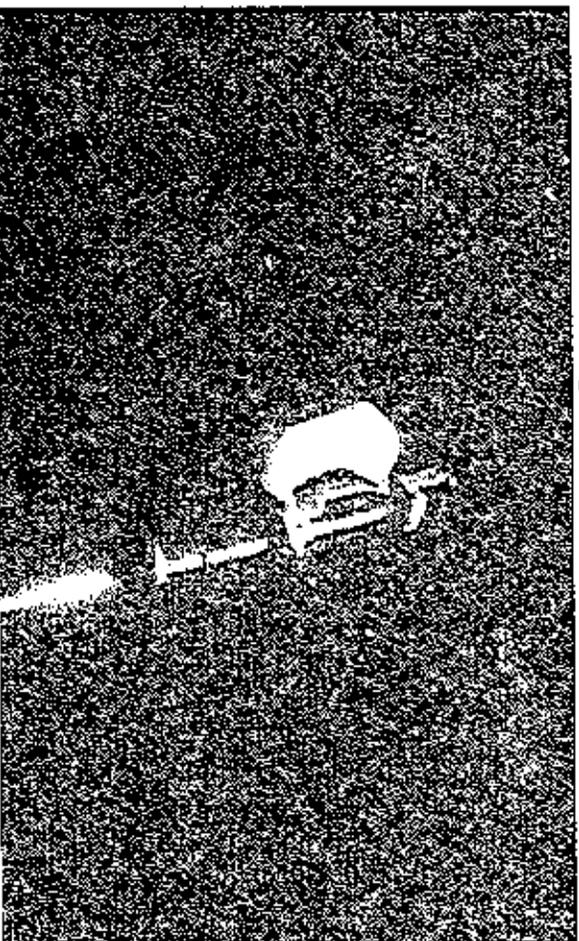
75 foot measuring station



90 foot measuring station

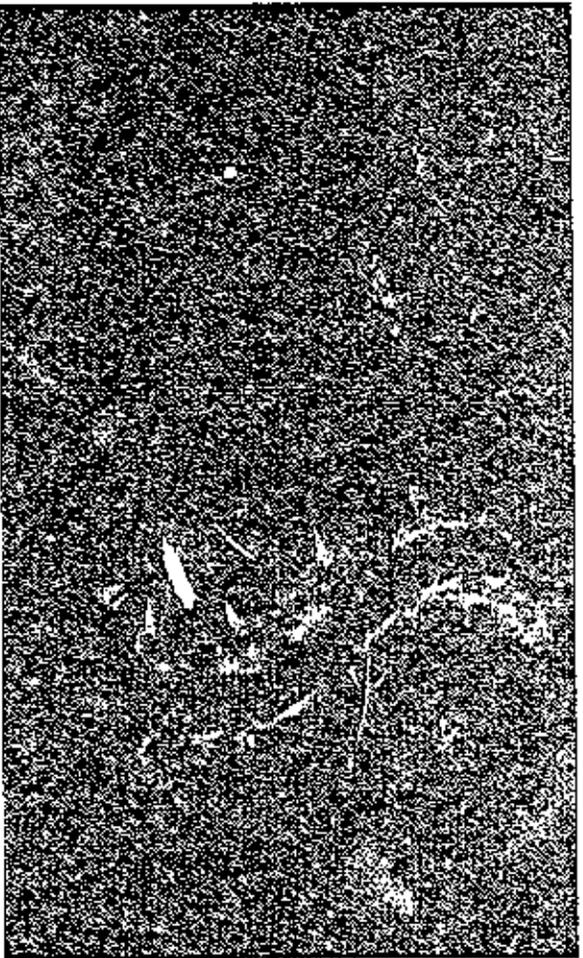


105 foot measuring station



120 foot measuring station

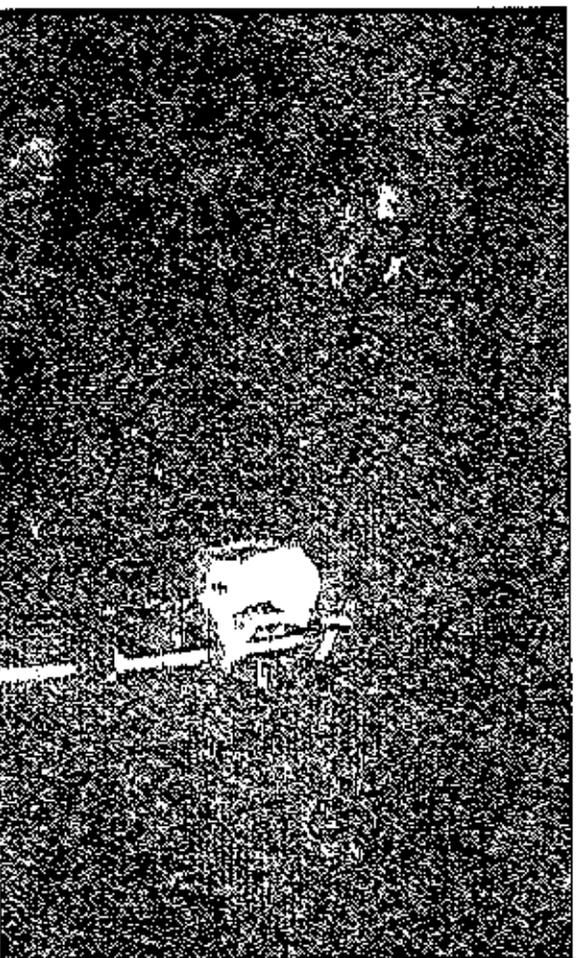
345 DEGREE FIRE COVE  
JUNE 13, 2001



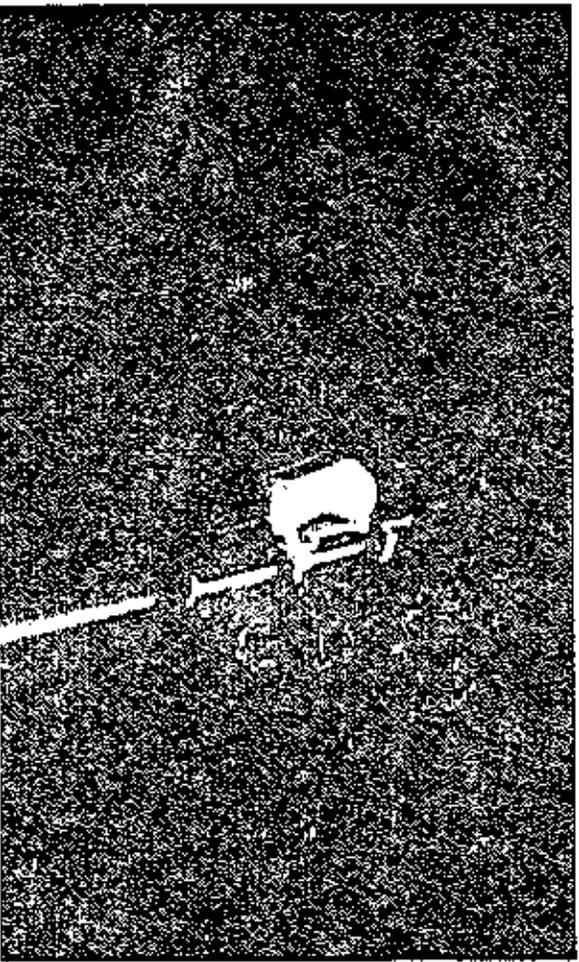
135 foot measuring station



150 foot measuring station

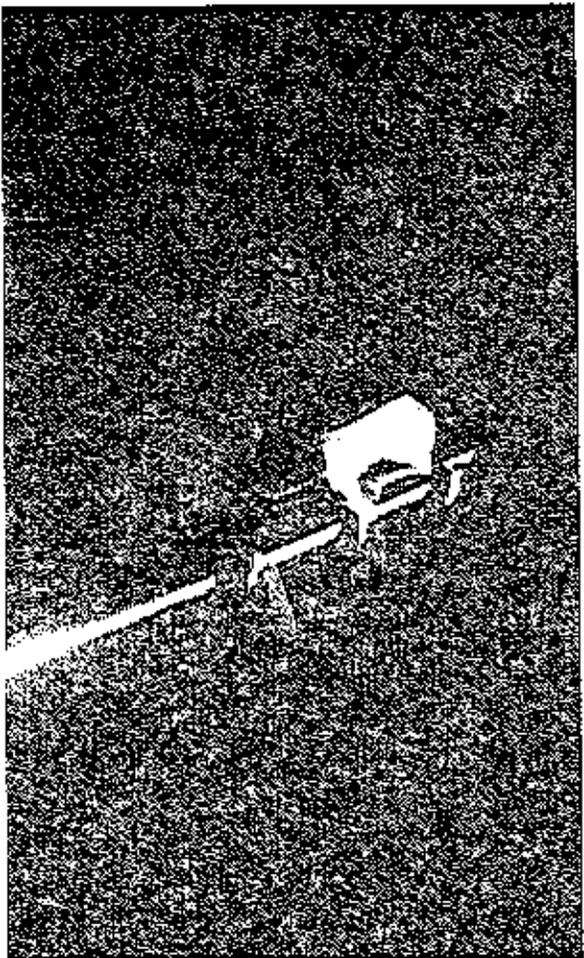


165 foot measuring station

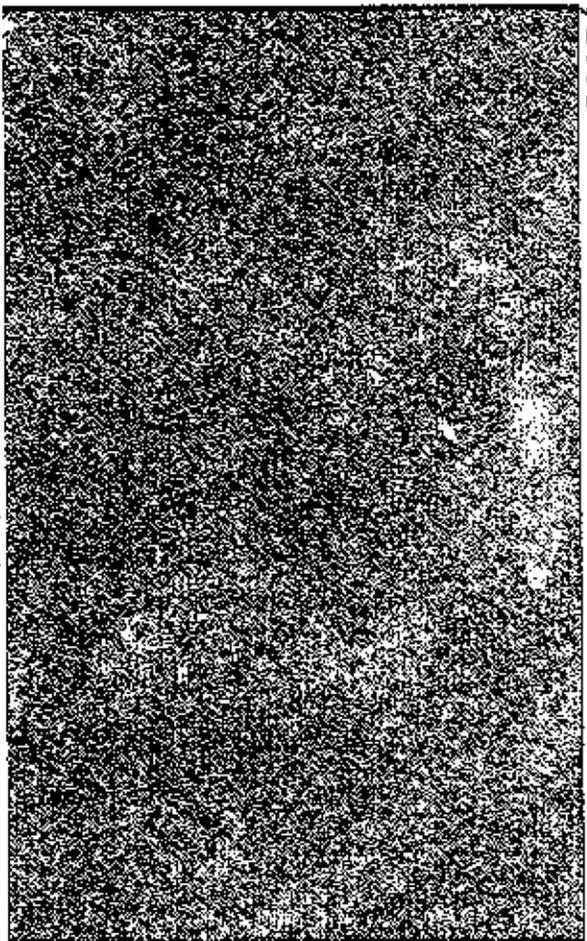


180 foot measuring station

345 DEGREE FIRE COVE  
JUNE 13, 2001



195 foot measuring station



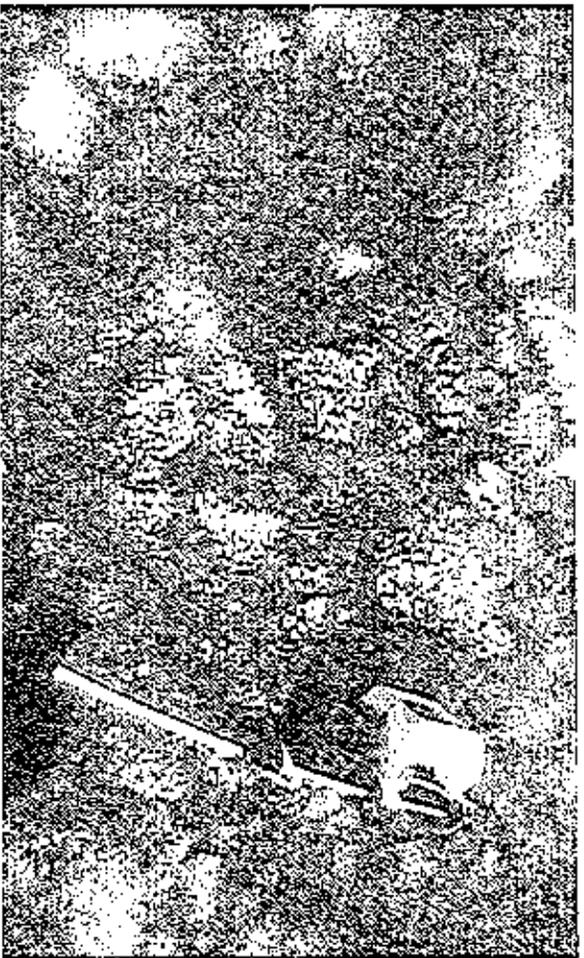
Halibut & Sea Cucumber in the area



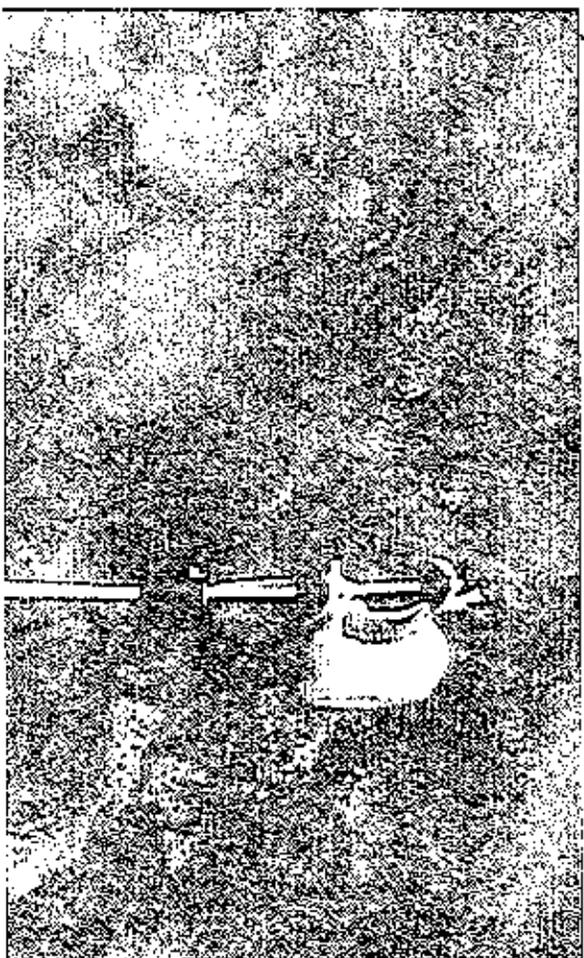
Metal Debris found around the 180 195 foot measuring station in 50 feet of water.



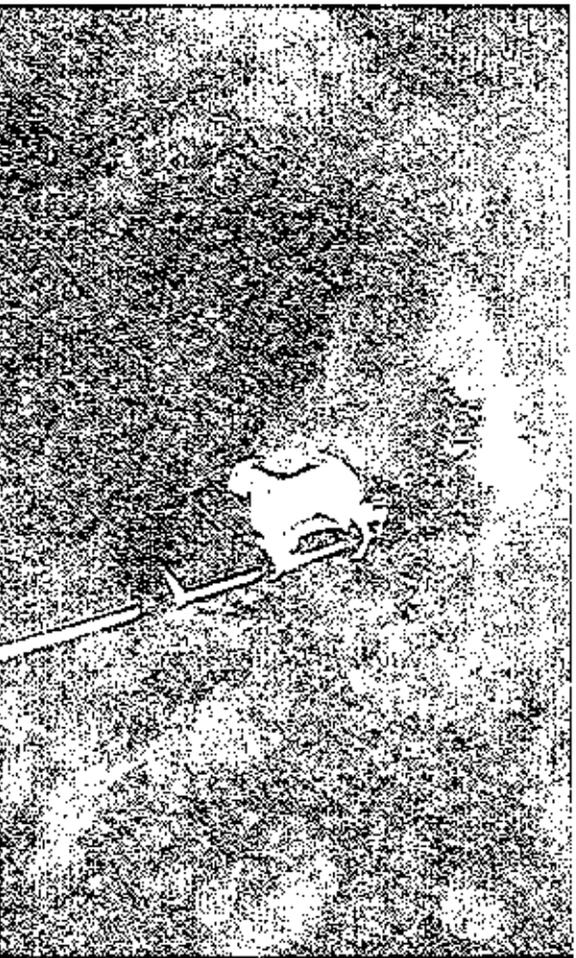
15 DEGREE FIRE COVE  
JUNE 13, 2001



0 foot measuring station



15 foot measuring station

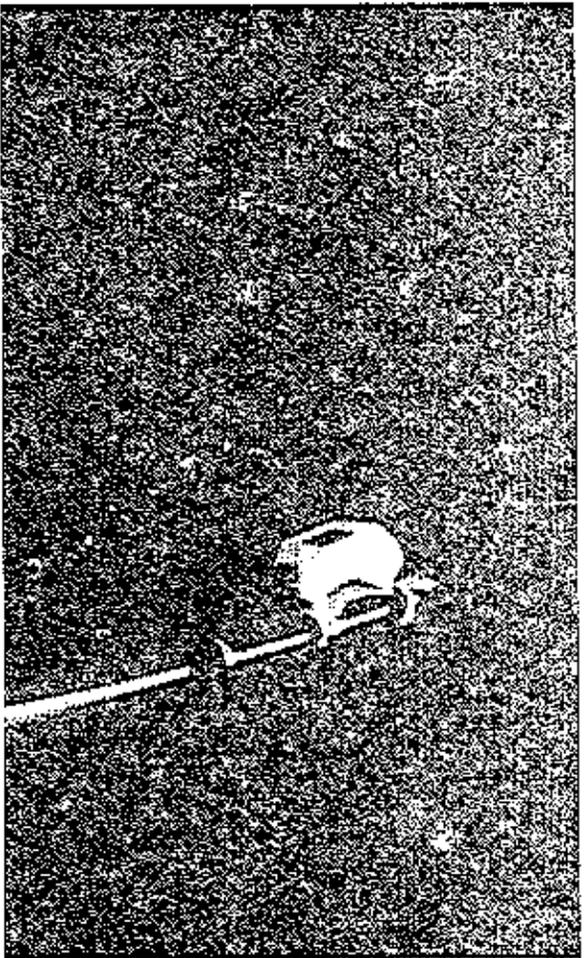


30 foot measuring station

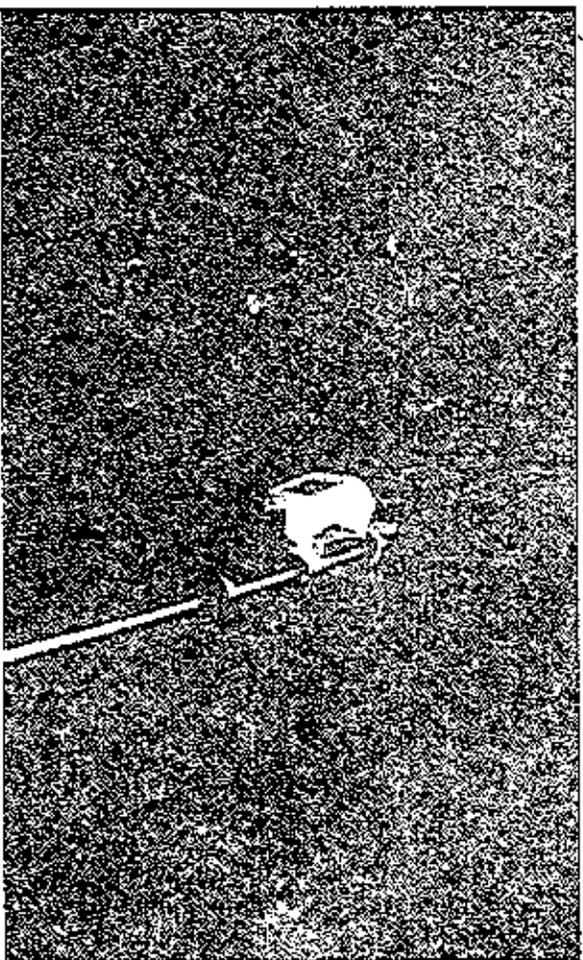


Sun Stars found by 30 foot measuring station

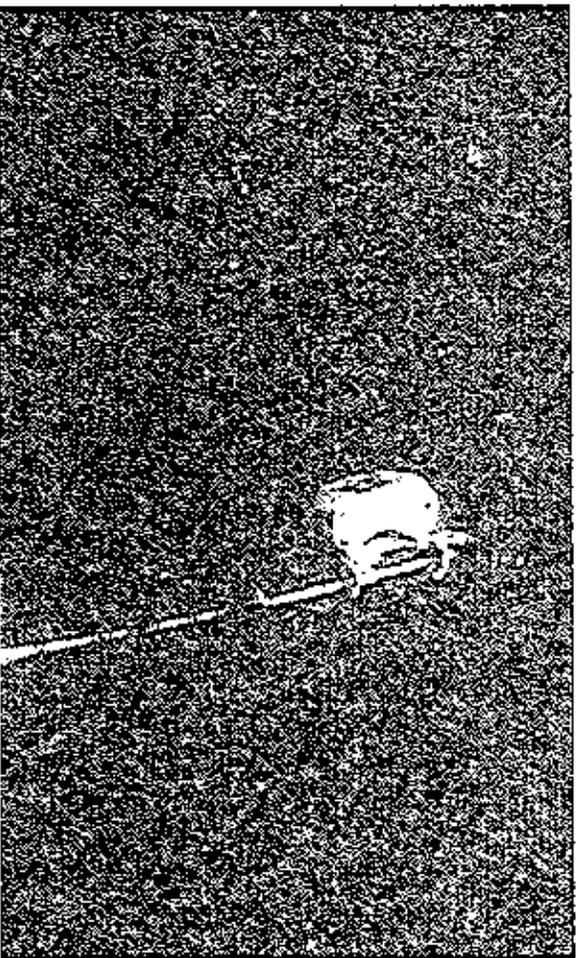
15 DEGREE FIRE COVE  
JUNE 13, 2001



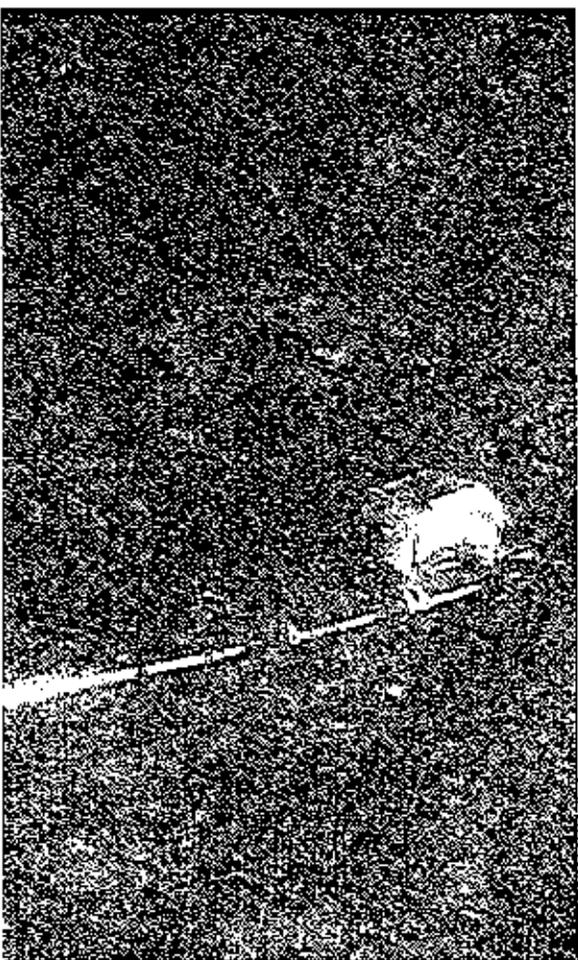
45 foot measuring station



60 foot measuring station

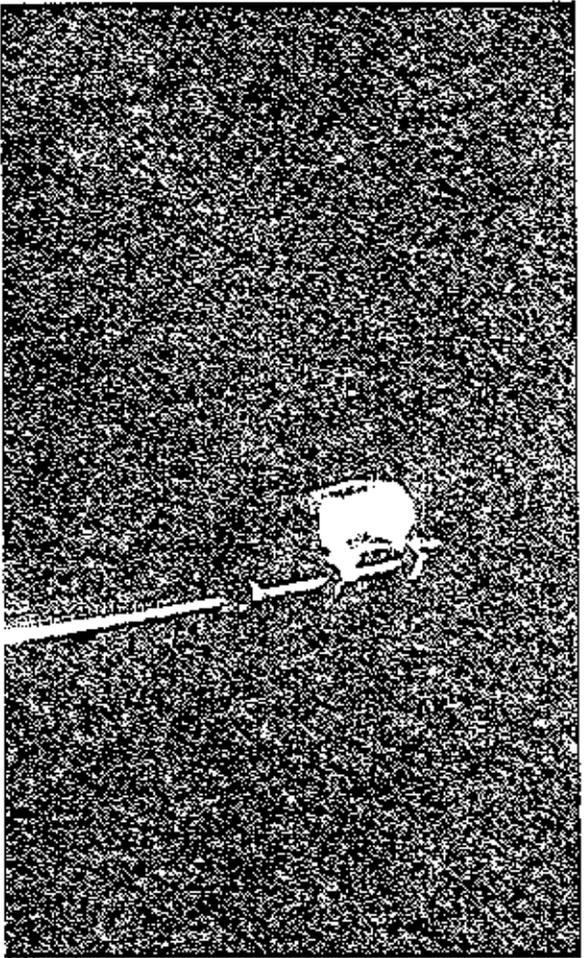


75 foot measuring station

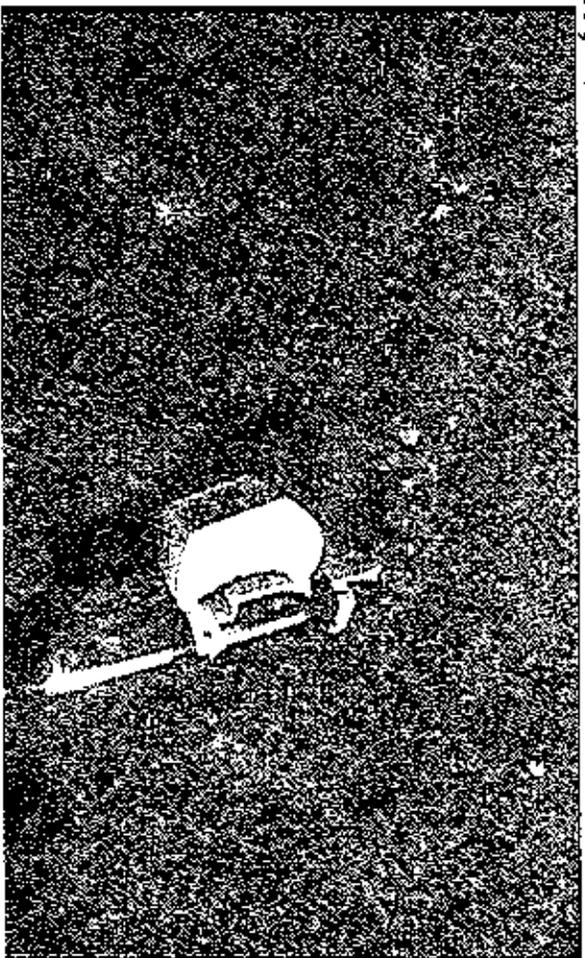


90 foot measuring station

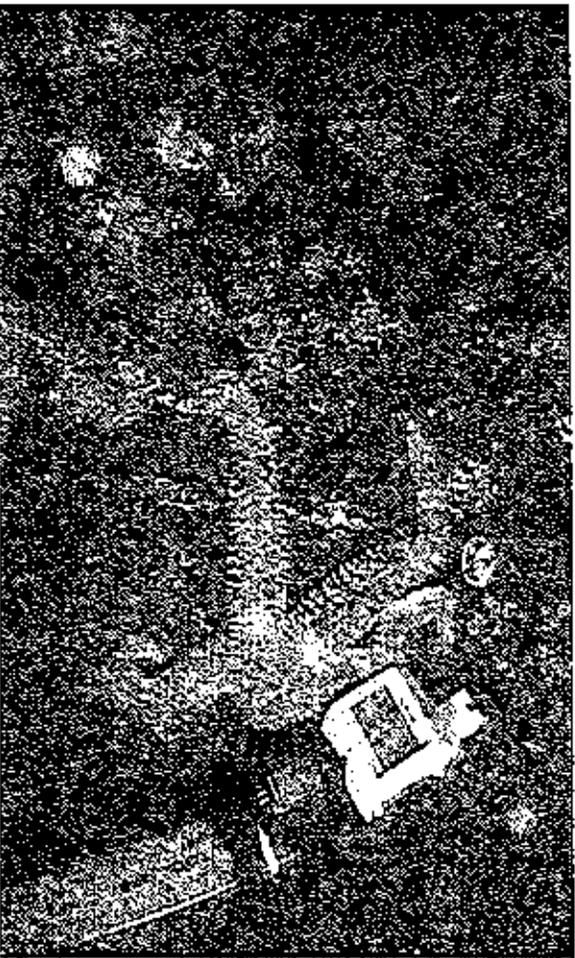
15 DEGREE FIRE COVE  
JUNE 13, 2001



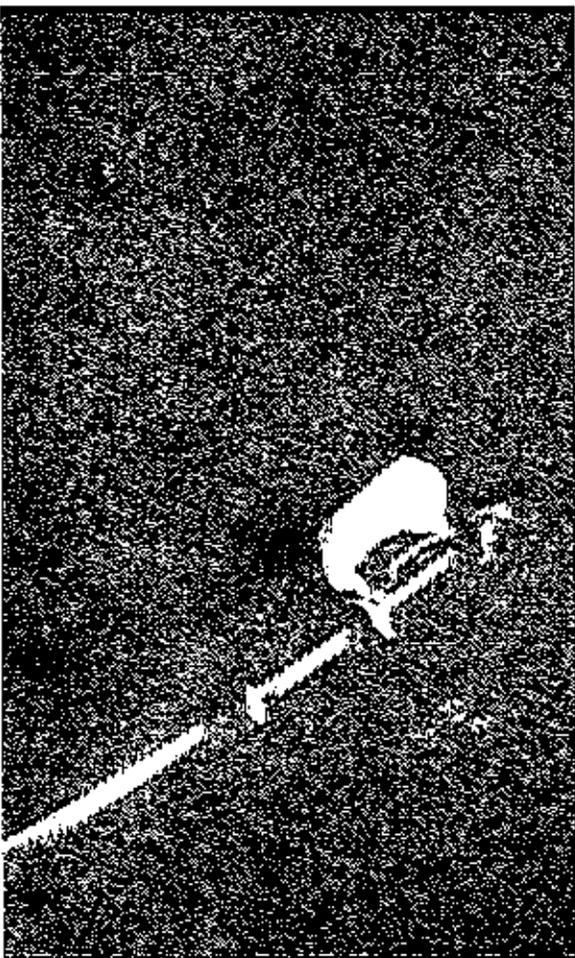
105 foot measuring station



120 foot measuring station



135 foot measuring station

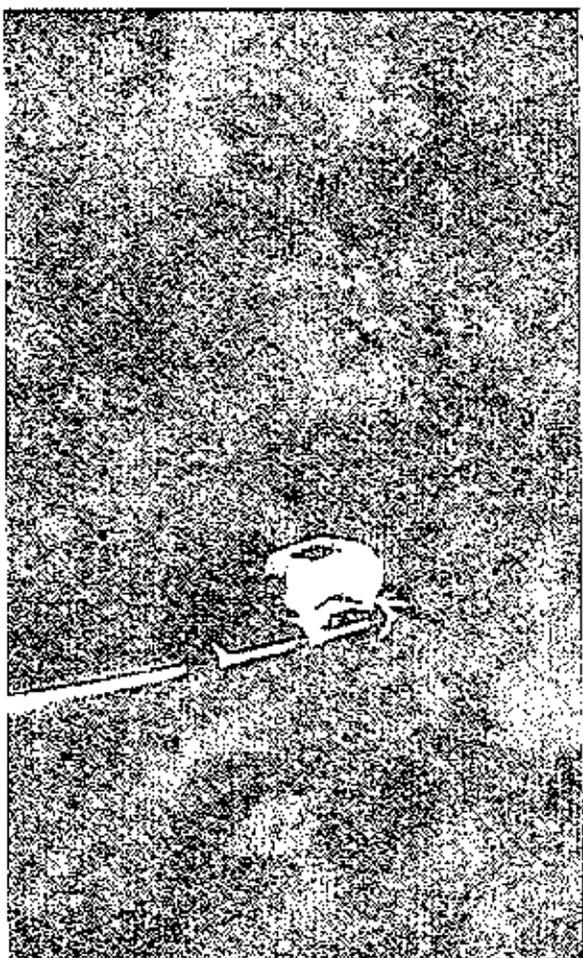


150 foot measuring station

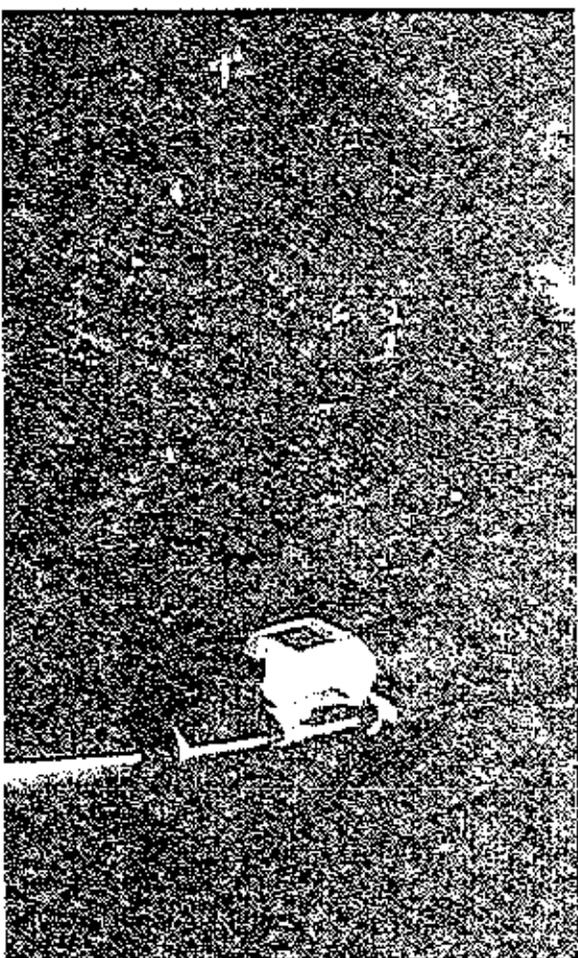
45 DEGREE FIRE COVE  
JUNE 13, 2001



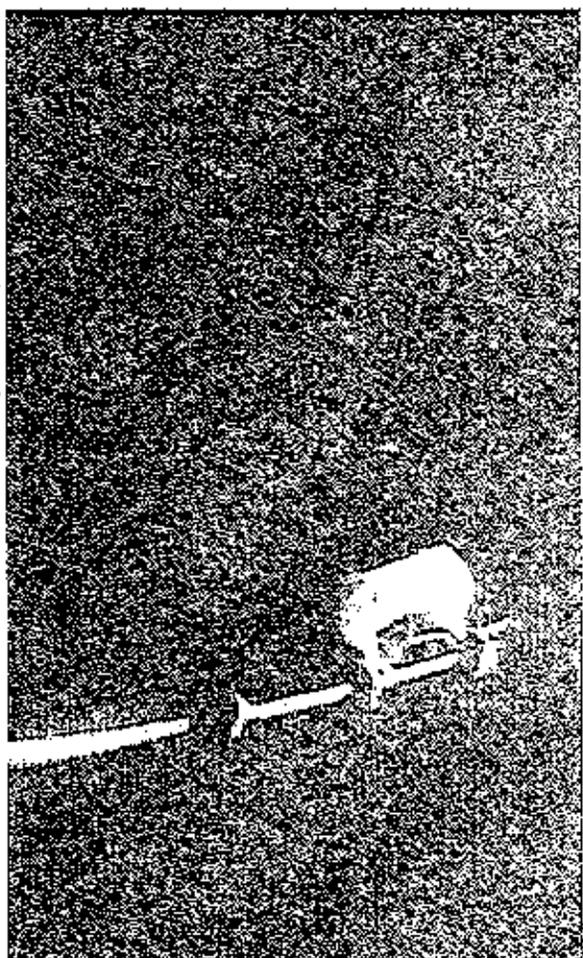
15 foot measuring station



30 foot measuring station

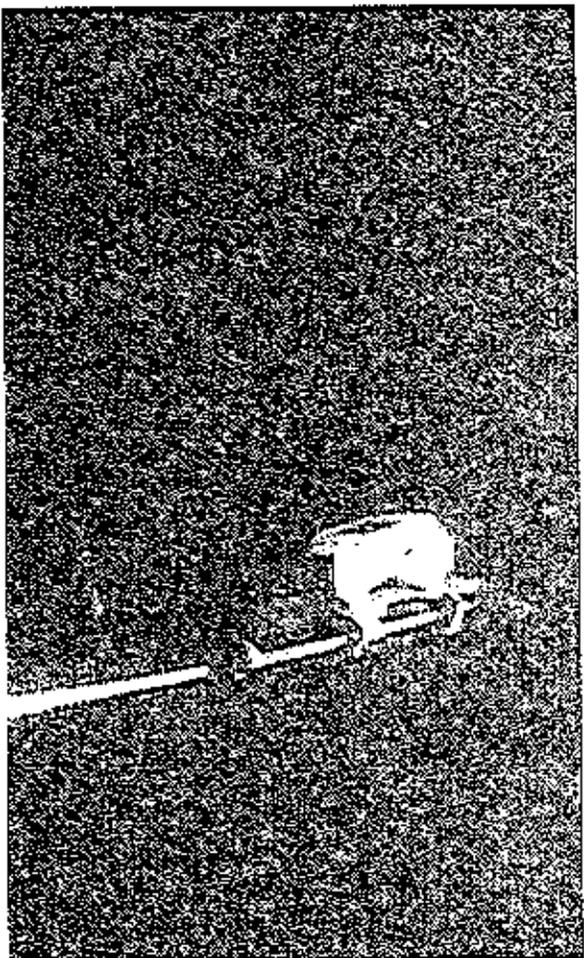


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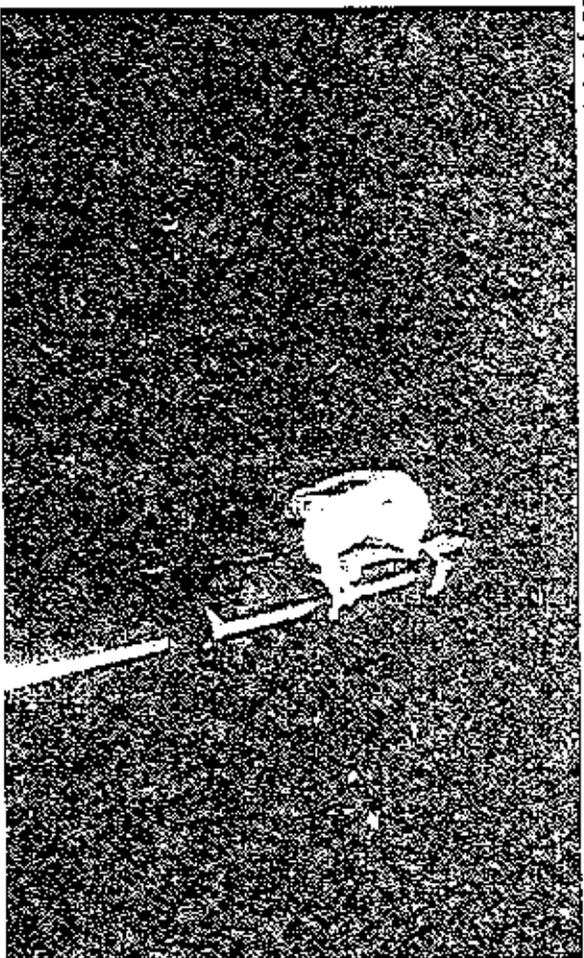


60 foot measuring station

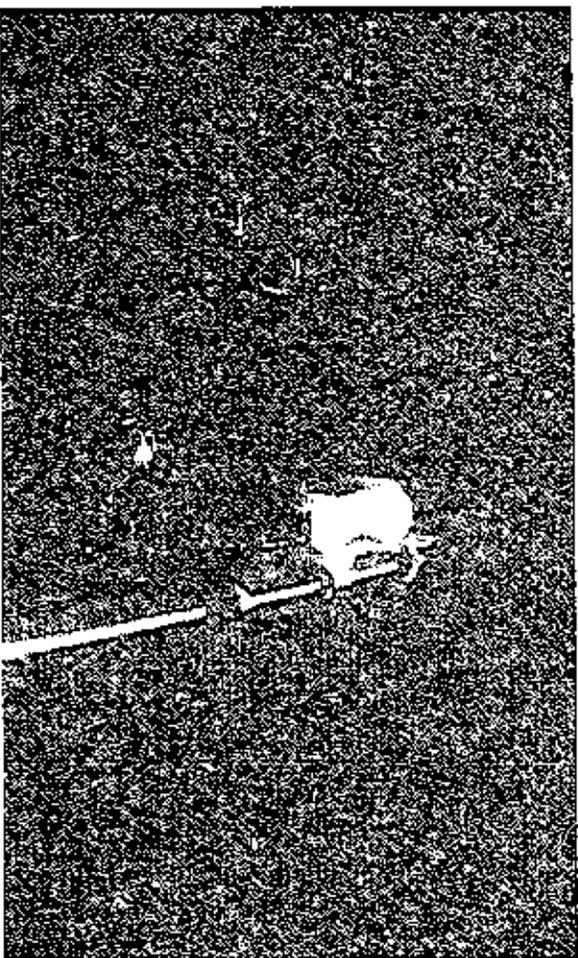
45 DEGREE FIRE COVE  
JUNE 13, 2001



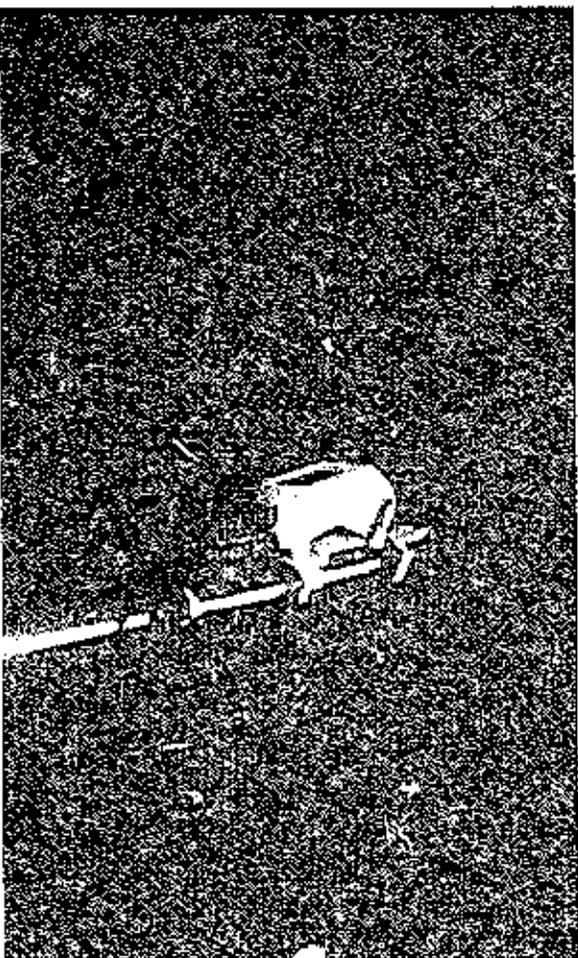
75 foot measuring station



90 foot measuring station

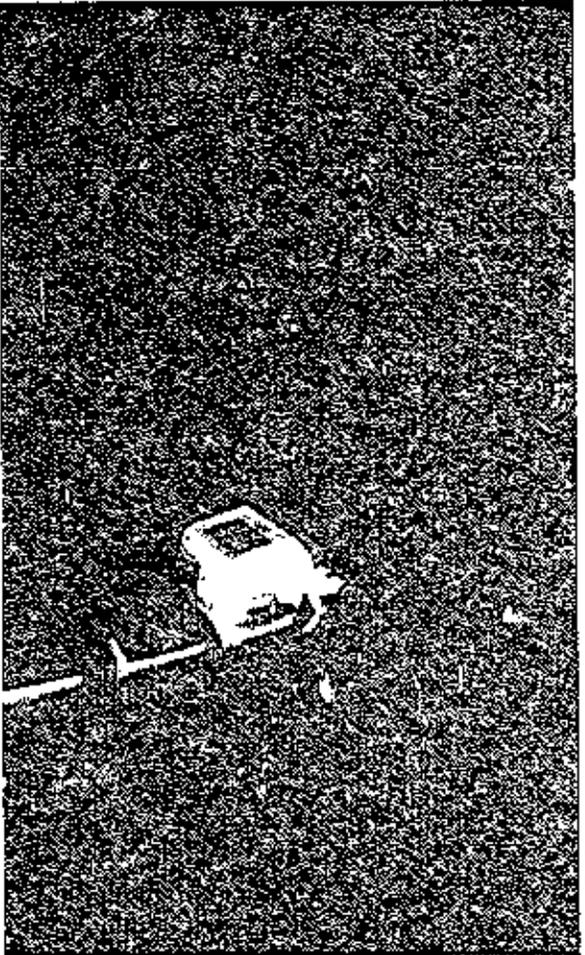


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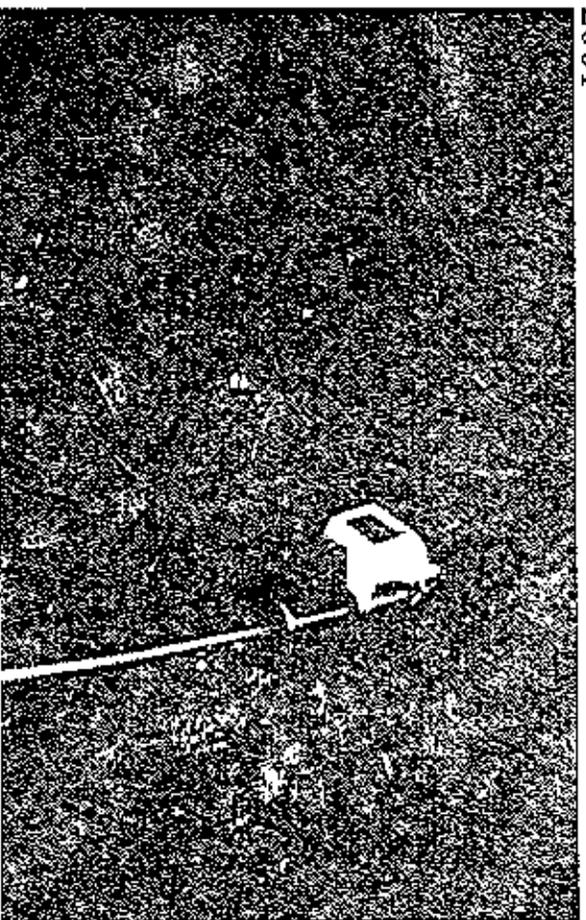


120 foot measuring station

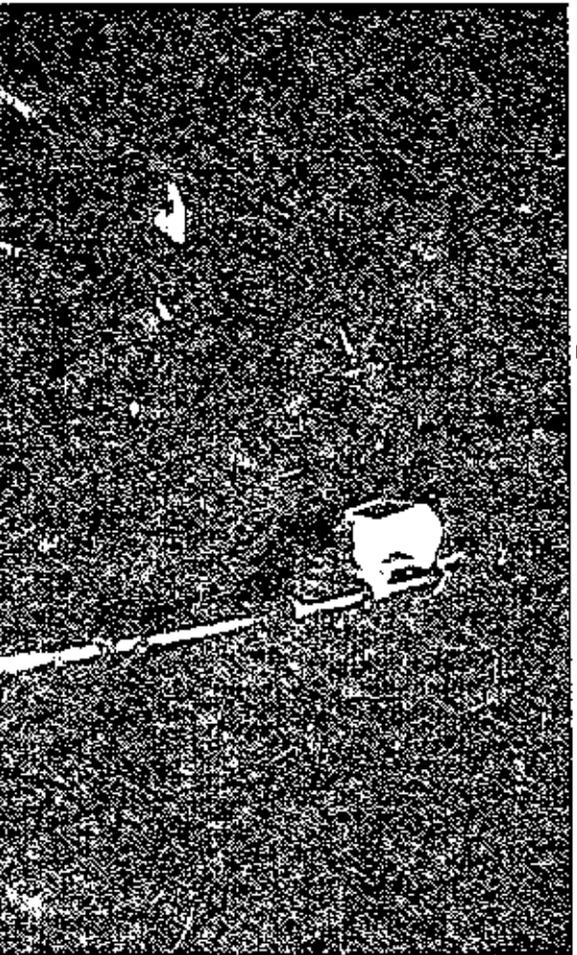
45 DEGREE FIRE COVE  
JUNE 13, 2001



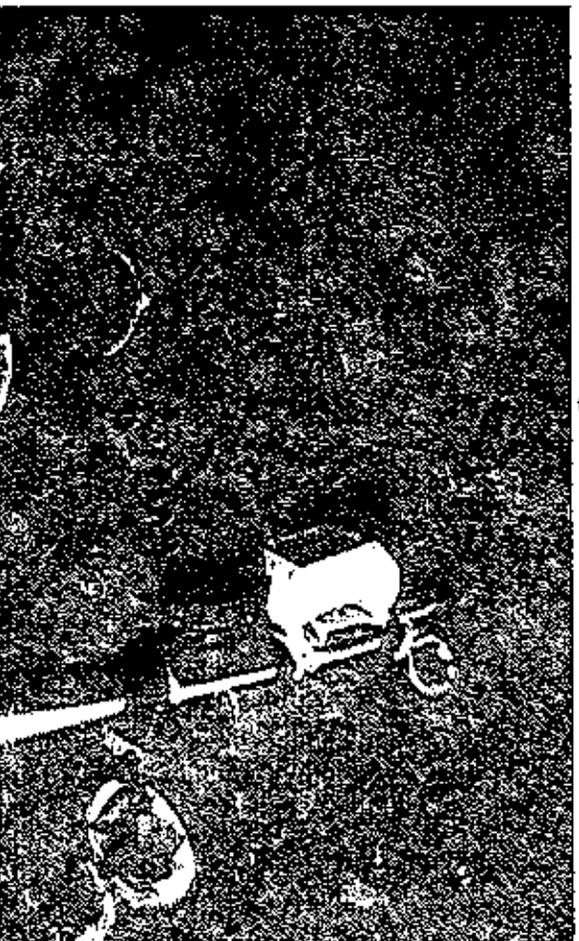
135 foot measuring station



150 foot measuring station



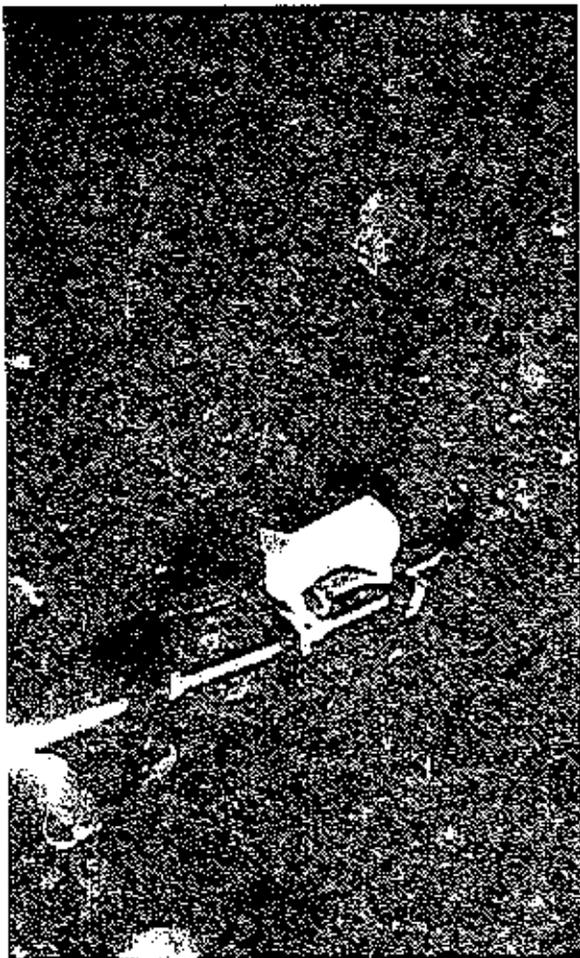
165 foot measuring station



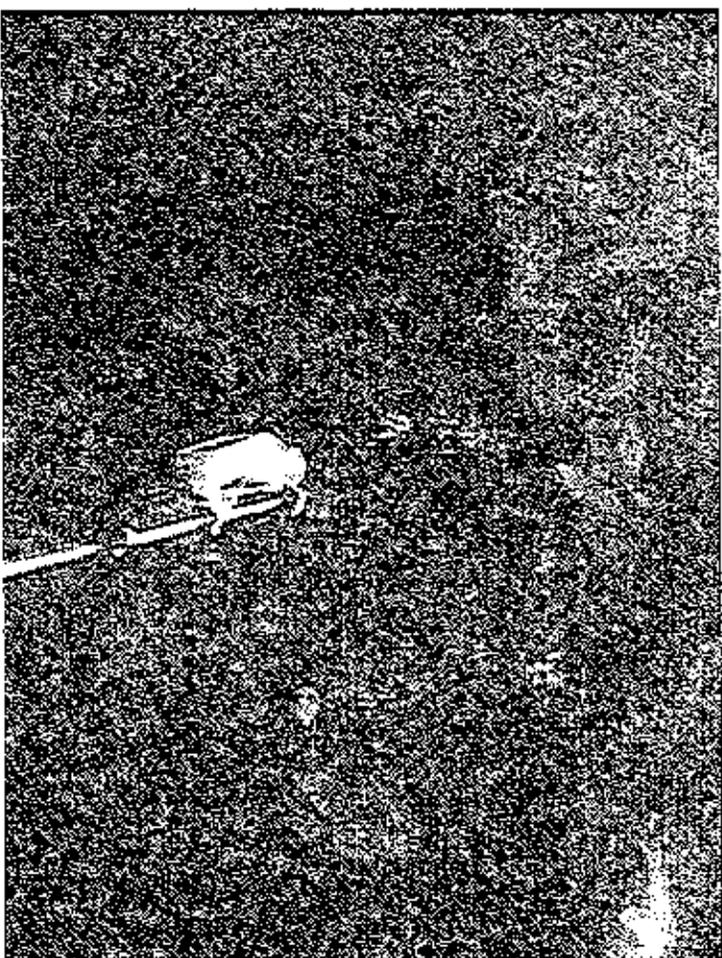
180 foot measuring station

45 DEGREE FIRE COVE  
JUNE 13, 2001

195 foot measuring station



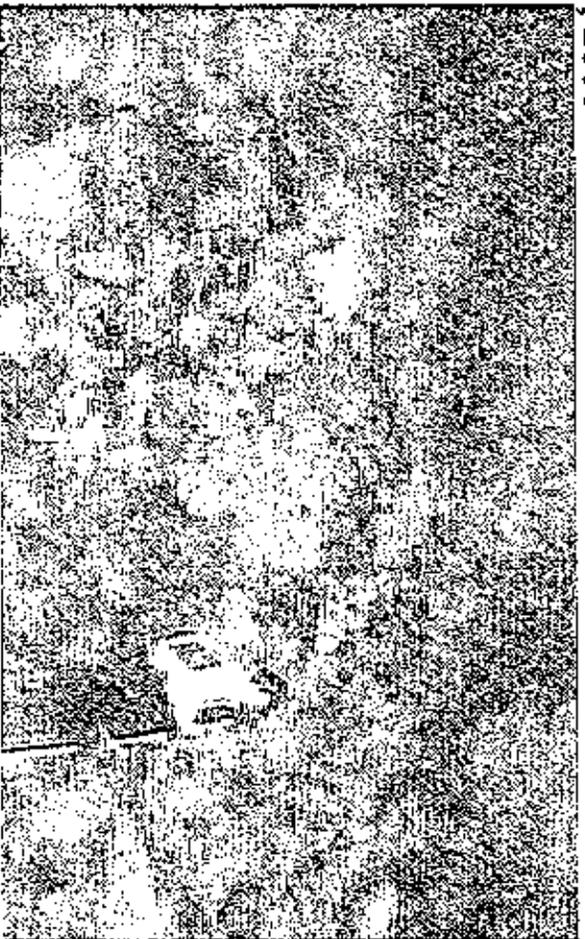
Metal Debris observed @ 60 foot measuring station in 21 feet of water.



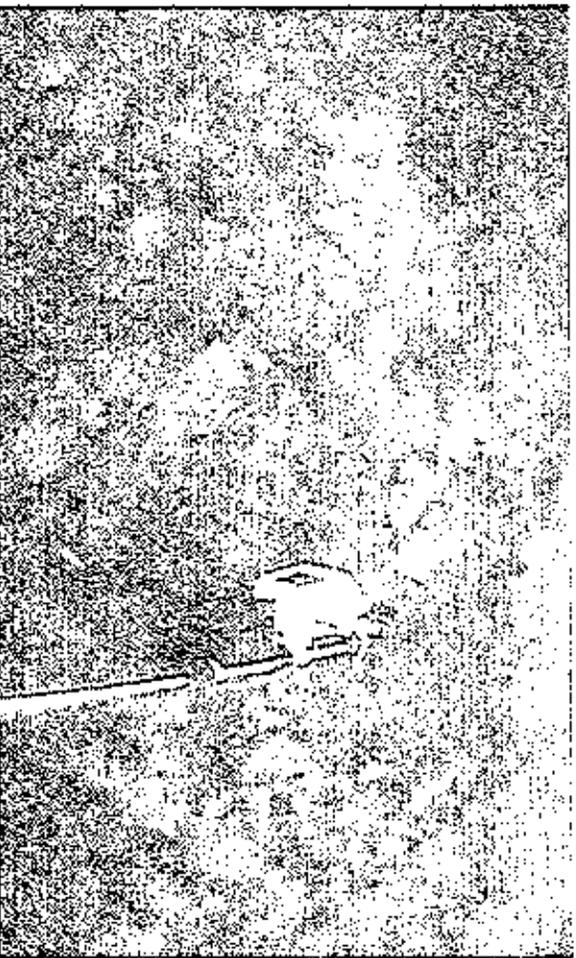
75 DEGREE FIRE COVE  
JUNE 13, 2001



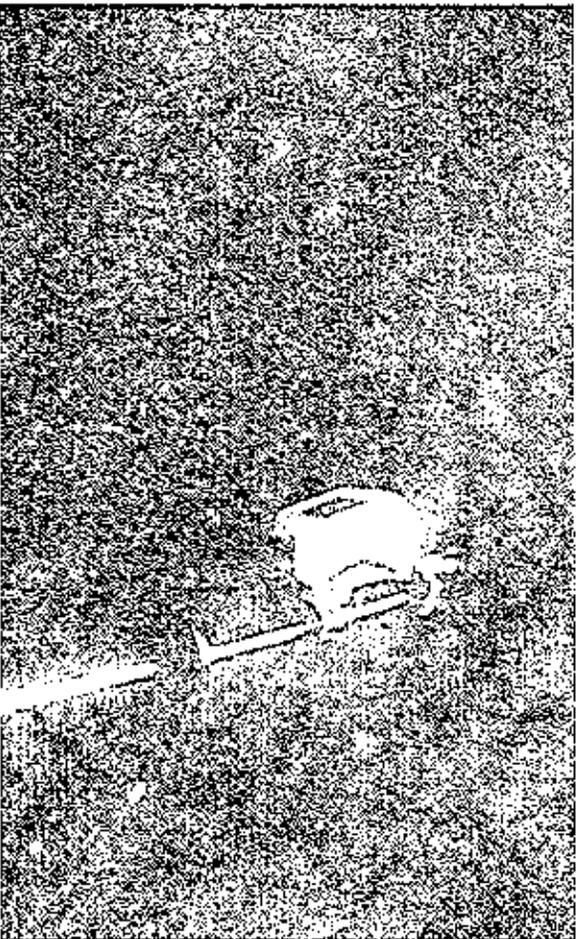
15 foot measuring station



30 foot measuring station

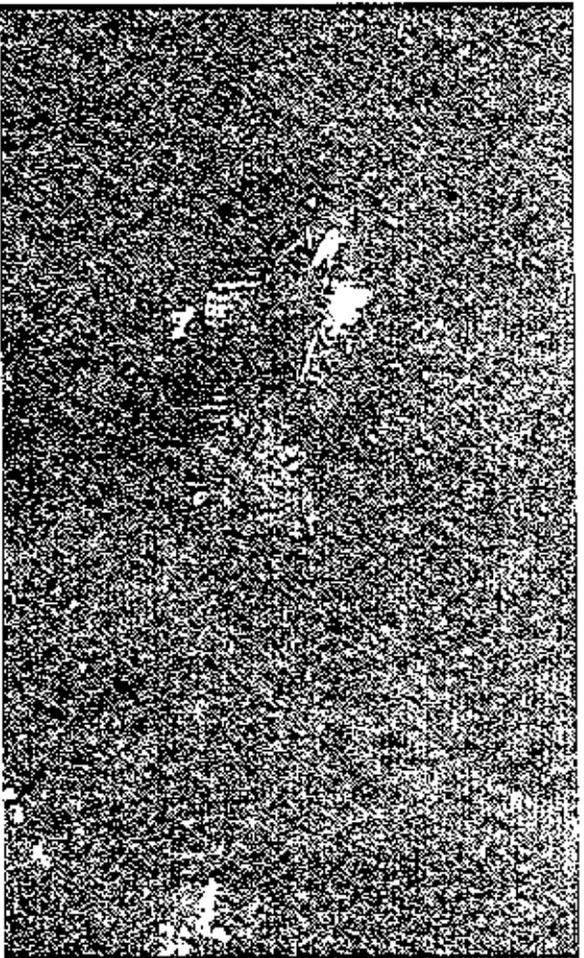


60 foot measuring station

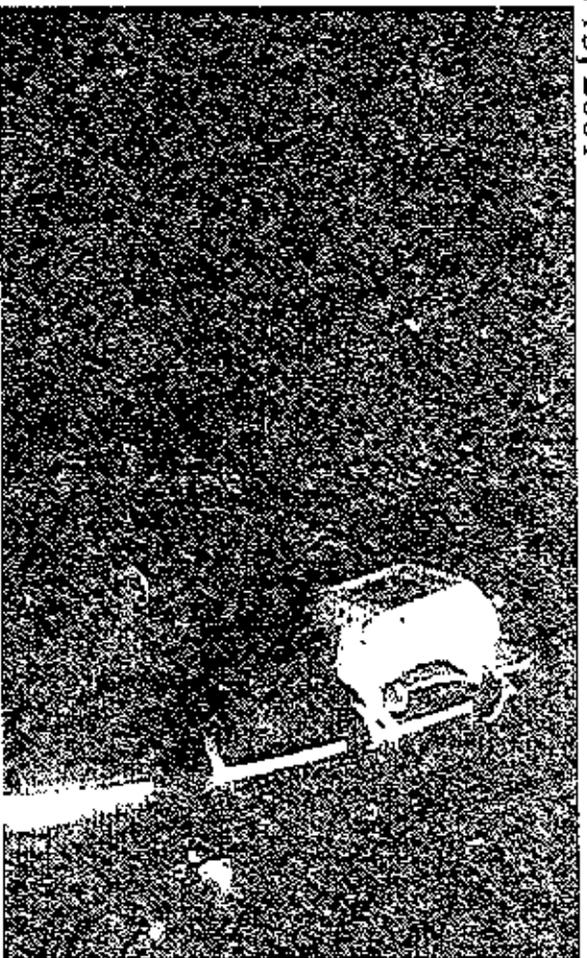


45 foot measuring station

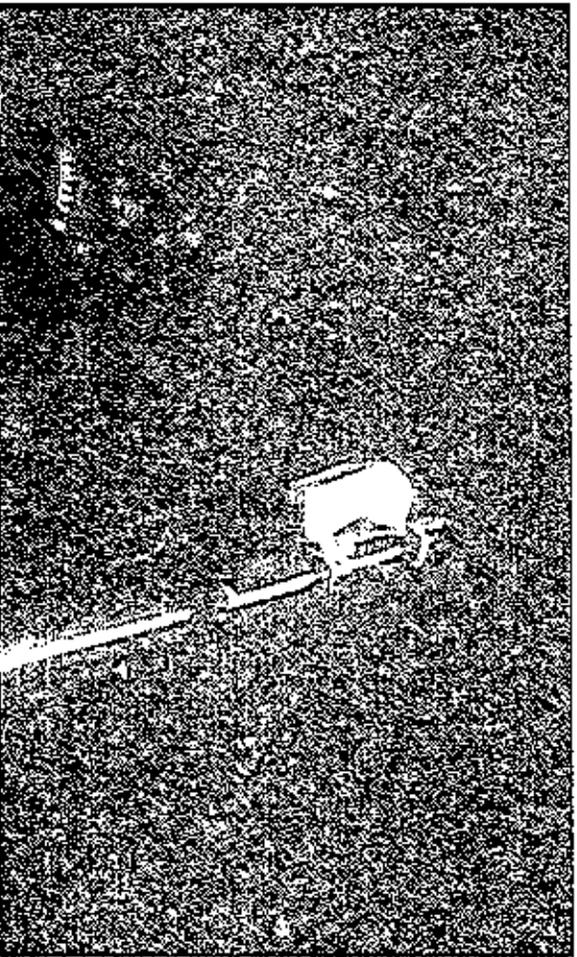
75 DEGREE FIRE COVE  
JUNE 13, 2001



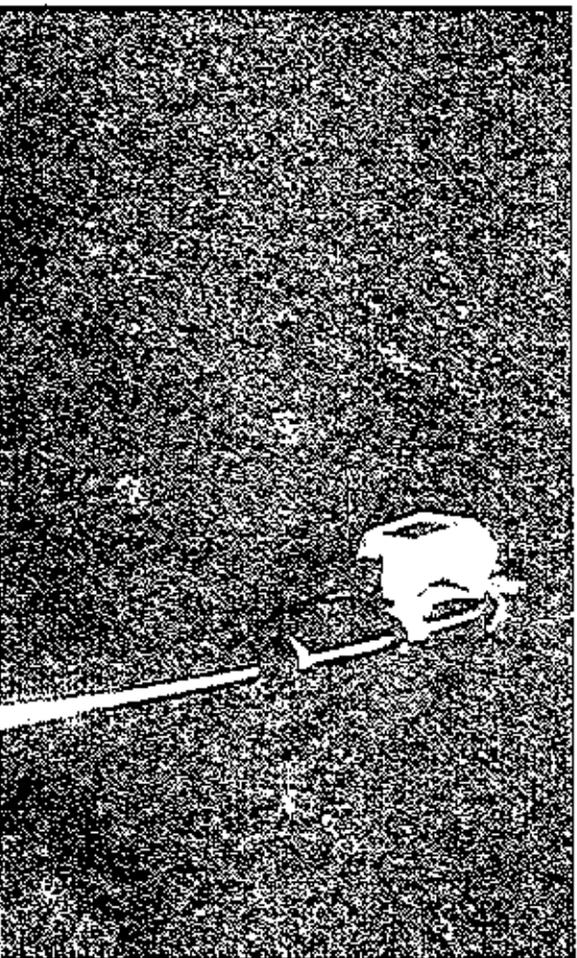
75 foot measuring station



90 foot measuring station

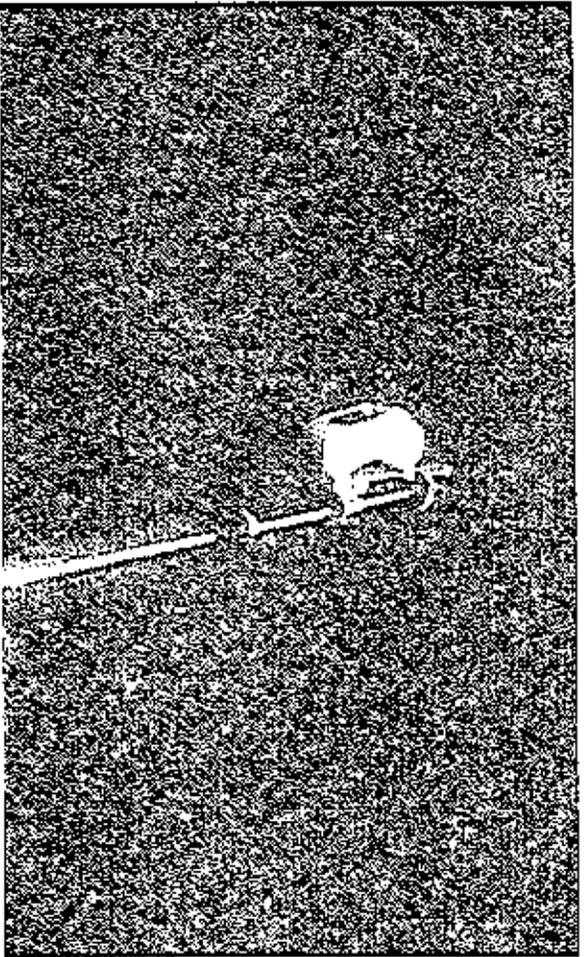


105 foot measuring station

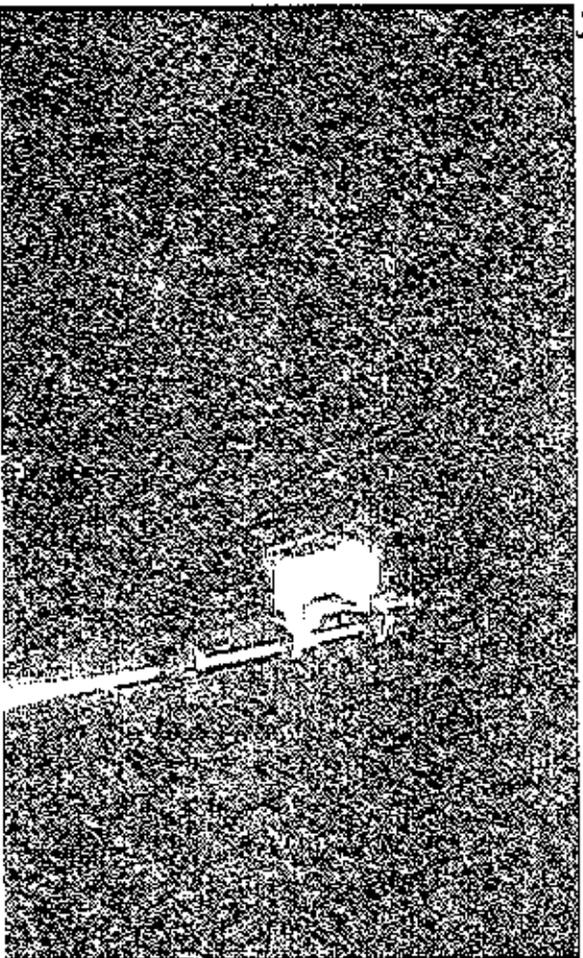


120 foot measuring station

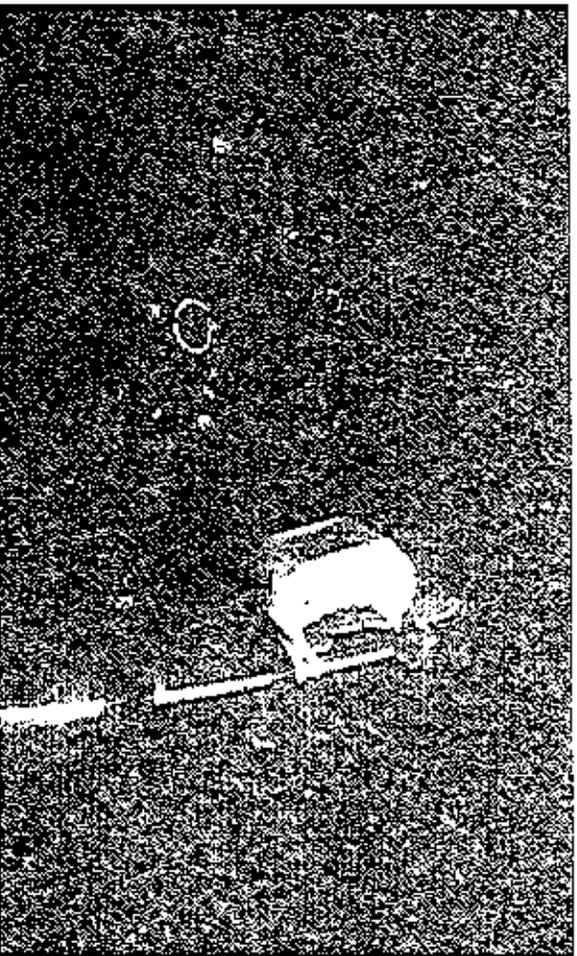
75 DEGREE FIRE COVE  
JUNE 13, 2001



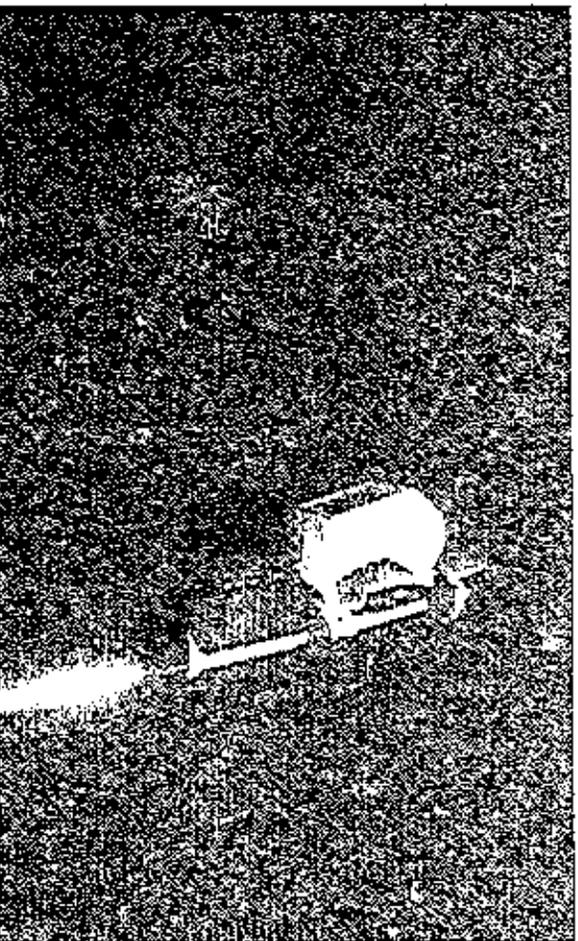
135 foot measuring station



150 foot measuring station

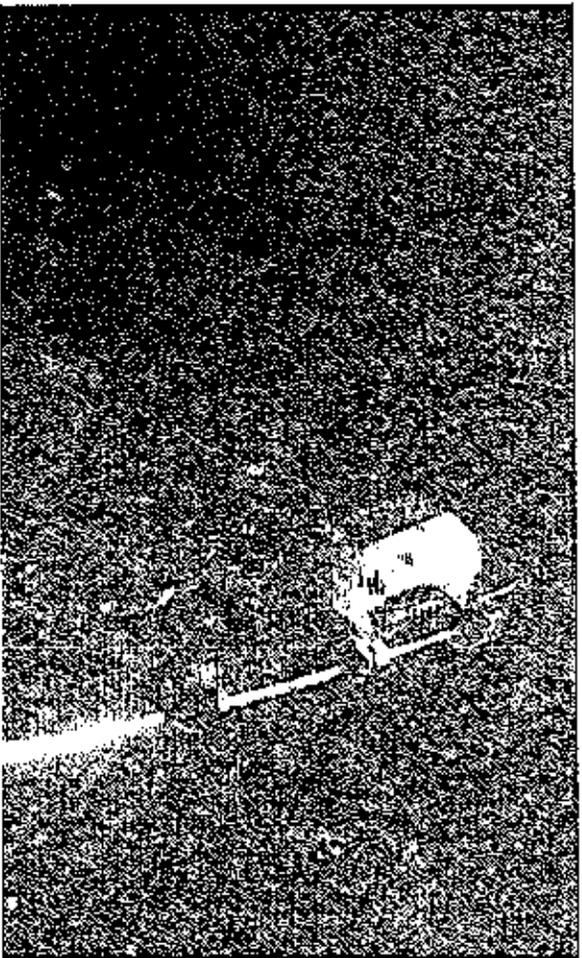


165 foot measuring station

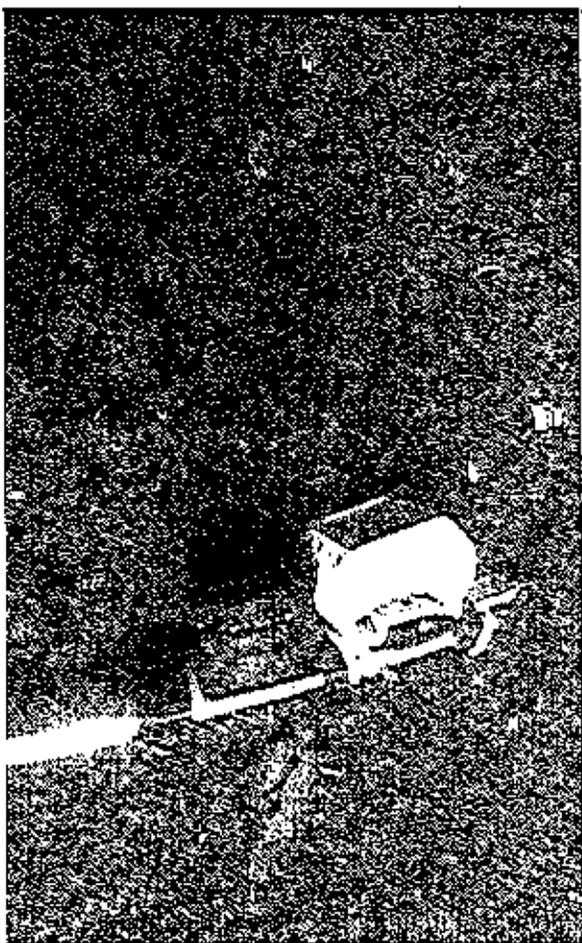


180 foot measuring station

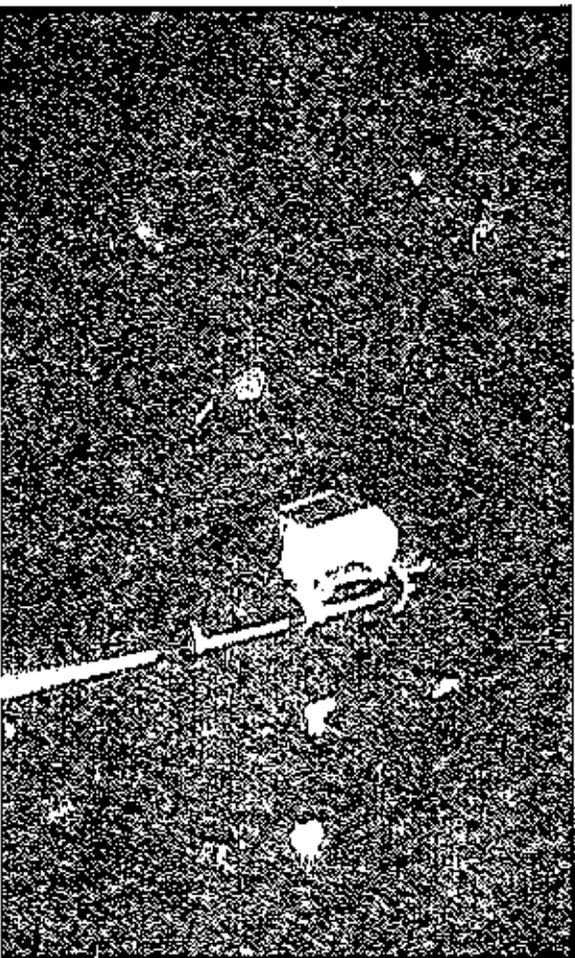
75 DEGREE FIRE COVE  
JUNE 13, 2001



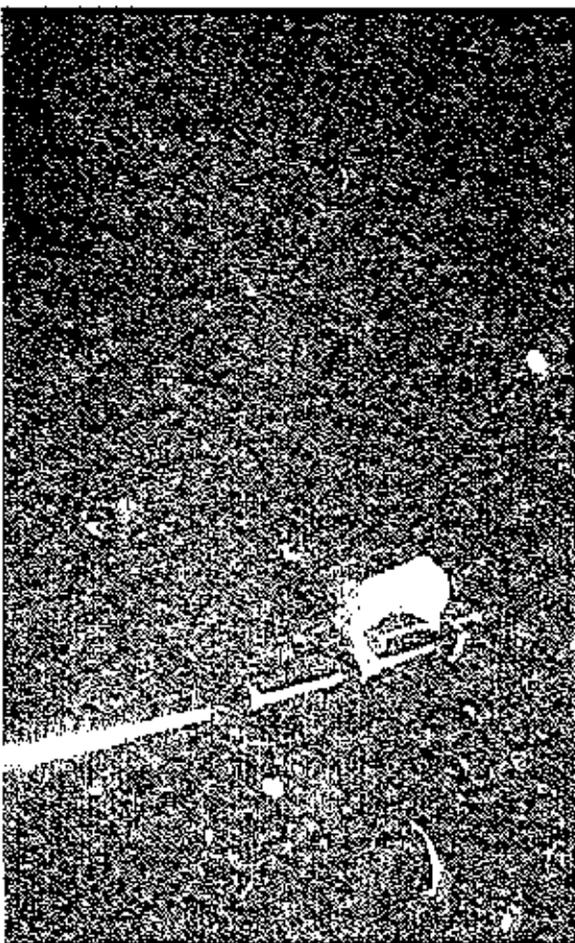
195 foot measuring station



210 foot measuring station

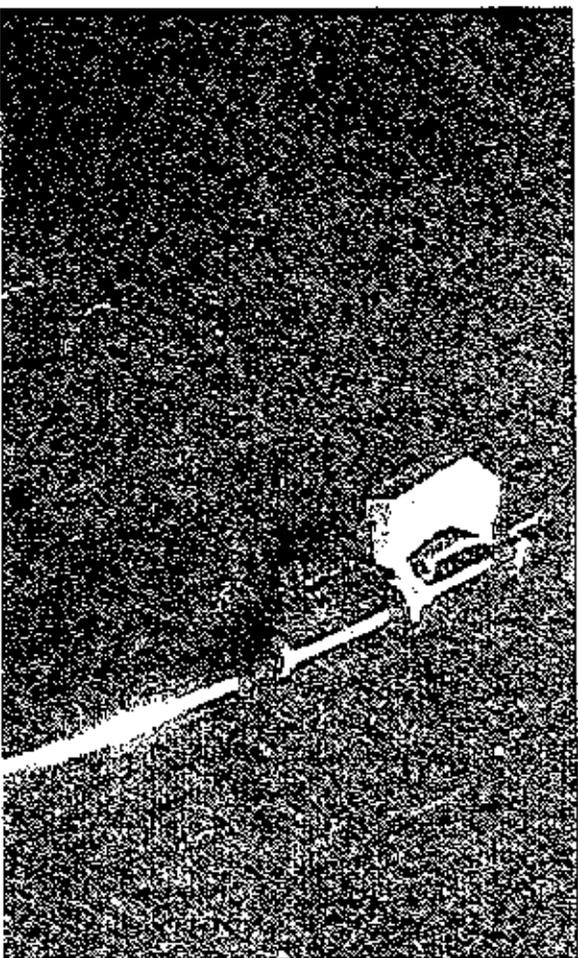


225 foot measuring station

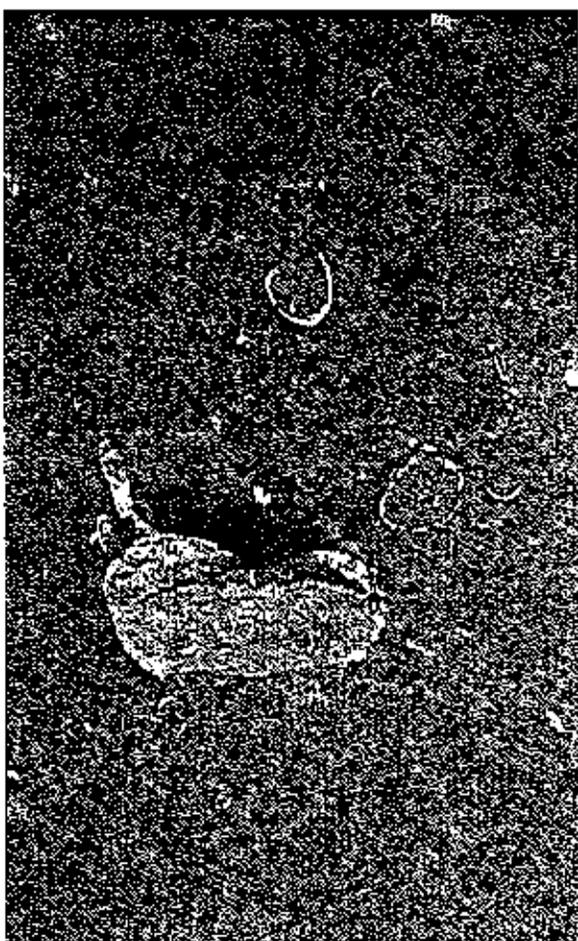


240 foot measuring station

75 DEGREE FIRE COVE  
JUNE 13, 2001



255 foot measuring station



Crab in The Area

# QUALITY ASSURANCE PROJECT PLAN

Our objectives for measurement data are to determine depth, total area, and outer boundary of continuous and discontinuous cover by bark and wood debris on the ocean bottom, in water depths to 60 feet MLLW.

## Sampling Procedures

1. Conduct a preliminary dive to identify the approximate area of bark accumulation.
2. Determine center point of entry
3. Acquire a GPS Coordinate
4. Establish radial transect lines using a surveyors tape extending seaward from a permanent shore marker. The radial transect line shall extend beyond bark debris or 60 feet at MLLW.
5. Transects will be no more than 30° apart extending from one side of the facility to the other.

## Analytical Procedures

1. Measure and record depth of bark to nearest centimeter.
2. Estimate and record percentage of area covered by bark within each transect.
3. Measuring stations will be every 15 feet and measurements will be taken within a three foot square area.
4. Still photographs will be included that depict the nature and coverage of bark and wood debris on the ocean bottom at representative measuring stations along each transect.
5. Water depth will be adjusted to MLLW.
6. The diver will record any presence of metal or other debris.

We will conform to the June 9, 2000 publication from Alaska Department of Environmental Conservation for data reduction.

All data collected will be sent to our office for review before being forwarded to the proper departments.

We will be using a generic form to collect our data that is comprised of the same information as appendix 4a and 4b in our contract.

On each transect the diver will be checking distance and bearings.

Every site will be completed using the same methodology and procedures. The same diver will construct transects at each site and obtain data.