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Nansemond River, study of leased oyster grounds in the vicinity of the US 17 bridge (before construction)

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Nansemond River:
Study of Leased Oyster Grounds in the Vicinity of the US 17 Bridge

(Before Construction)

Conducted for the
Virginia Department of Highways and Transportation
Project 6017-061-103, PE-101

by

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ABSTRACT

Leased oyster ground in the vicinity of the US 17 Bridge across the Nansemond River was sampled in September, October and November of 1978 and January of 1979 by the Virginia Institute of Marine Science. The purposes were: 1) to determine the extent of the shellfish resources on the leased areas; and 2) to estimate the value of those resources occurring within the proposed right-of-way. Other than one small, isolated lump, the only place oysters were found within the area studied was on three adjacent leases of Henry Parker.

INTRODUCTION

A study of leased oyster planting ground in the near vicinity of the US 17 bridge across the Nansemond River was made by the Virginia Institute of Marine Science in September, October and November 1978 and January 1979. The study was made at the request of the Virginia Department of Highways and Transportation in conjunction with Project 6017-061-103, PE-101.

The Nansemond River - A Review

Salinities in the study area average from 19°/oo in the fall to 13°/oo in spring. This is well above the minimum needed for satisfactory oyster growth. Records on file at VIMS since 1947 show that setting of young oysters has occurred at low to moderate levels during most years at the mouth of the Nansemond River. As a result of setting and favorable environmental conditions, wherever hard substrate was available naturally (as on Nansemond Ridge) or planted (by man) oysters set and grew. However, it is not known if a similar set is typical of the area around the bridge.

Diseases and predators can produce extensive mortalities in oyster populations. In the early 1960's the study area was subject to an annual mortality as high as 60% due to MSX. Since about 1970, however, there has been

a gradual increase in the survival rates of oysters setting in the nearby James River. The reason for this increased survival is not fully understood. It may be related to a decrease in the severity of MSX due to a succession of years of below average salinity, or an increase in the resistance to MSX of oysters setting in the area; possibly a combination of both factors is involved.

Prior to 1972 drills killed many small oysters in the lower Nansemond. In 1972 flood waters accompanying Tropical Storm Agnes killed drill populations in the study area. However, since 1972 populations of drills have been increasing.

While the impact of MSX and drills may have declined in recent years Dermocystidium still remains as a mortality producing factor in the lower Nansemond. This fungus may kill up to 20-30% of the oysters in localized areas in years when the salinity is above average.

The harvest of shellfish from the lower Nansemond River is not restricted by the Virginia Department of Health.

METHODS

Locating Leased Grounds

Locations of plots of leased oyster ground were taken from chart 195-2580 prepared by the Virginia Marine Resources Commission (Figure 1). In the river, leased plots

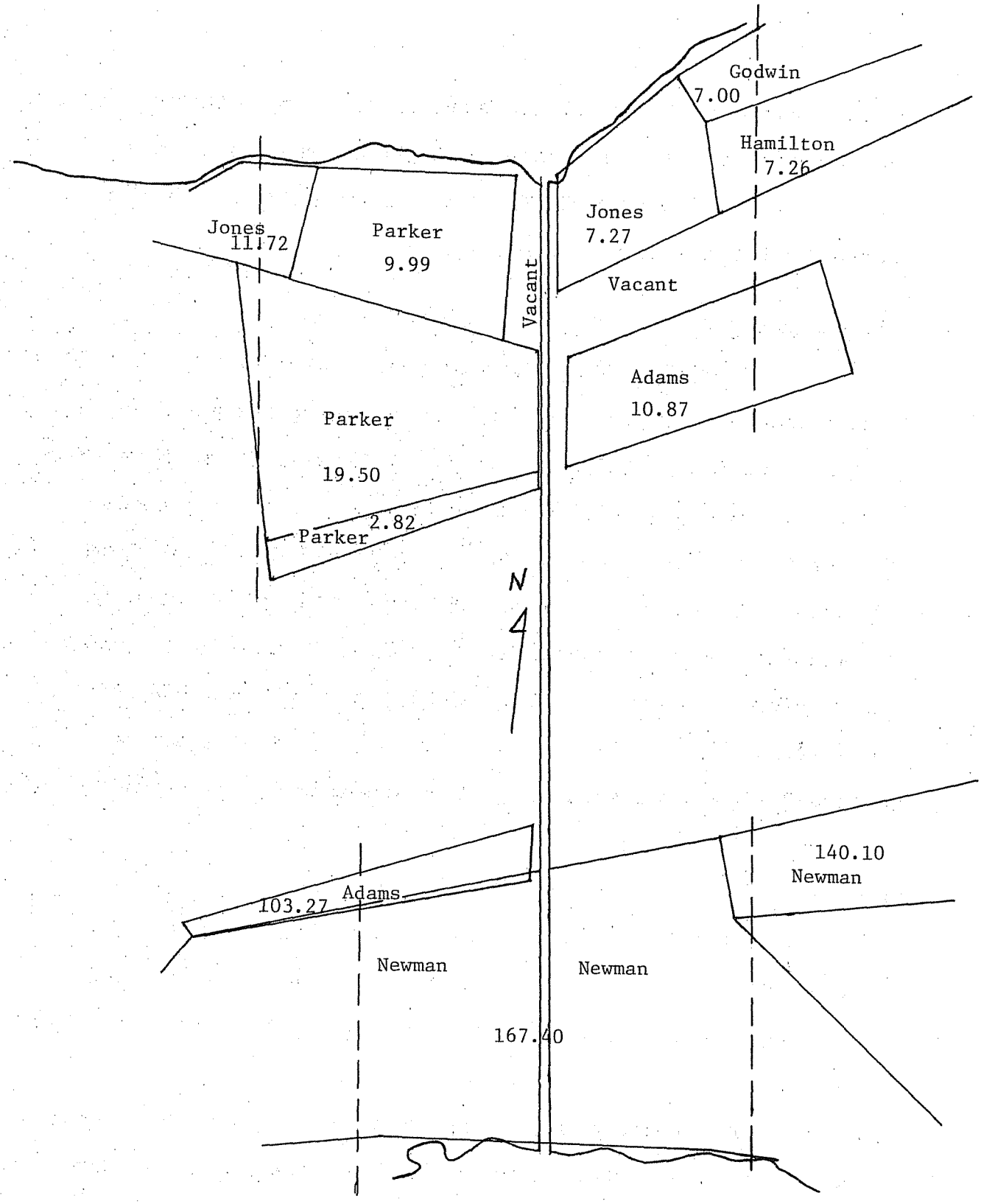

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Figure 1. U.S. 17 bridge across Nansemond River with boundaries of oyster ground leases shown. Dashed lines show extent of sampling (1978). Numbers show entire acreages of leases.

were located by reference to stakes placed by VMRC engineers on the corners of some leases. Right-of-way lines were staked by VIMS personnel after measuring with a line the correct distance from the bridge.

The Sampling Plan

Locations where samples were taken were laid off along transects in relation to the existing right-of-way lines on either side of the bridge. These distances between transects were measured with the aid of a floating line. Transects were parallel to and at selected distances from the right-of-way lines. Transects on both sides extended to a distance of approximately 600 feet from existing right-of-way lines; additional transects out to about 1,000 feet were sampled in the area to the northwest of the bridge. Figure 1 shows the area sampled. Transects outside the proposed right-of-way area were 200 feet apart; inside the proposed right-of-way they were much closer.

Stations were 100 feet apart along transects within 600 feet of the existing right-of-way boundaries. To the northwest of the bridge from 600 to 1000 feet stations along transects were 200 feet apart.

The leaseholders, acreages held, number of stations studied and the number of samples collected are shown for each lease (Table 1).

Table 1

Oyster Ground Leases Studied, Number of Stations and Samples Taken in the Vicinity of the Nansemond River Bridge - 1978.

Lessee's Name	Acreage in Lease	Area Studied (Acres)	Number of Stations	Number of Samples
Jones, Gordon W.	11.72	1.70	2	4
Parker, Henry D.	2.82	2.82	75	145
Parker, Henry D.	19.50	18.73		
Parker, Henry D.	9.99	9.99		
Jones, Gordon W.	7.27	7.27	26	26
Godwin, Mills E., Jr.	7.00	1.50	3	3
Hamilton, Jesse P.	7.26	1.35	3	3
Adams, Charles G., Jr.	10.87	7.28	17	17
Newman, Barbara R. & William R.	167.40	35.60	124	125
Adams Oyster Co.	103.27	2.40	11	11
Newman, Annie M.	140.10	0.77	2	2
Vacant Ground NE of Bridge	--	6.21	23	23
NW of Bridge	--	1.64	21	24

Locating Stations Relative to Leases and Bridge

Location of transects in the river were made with reference to stakes placed by VIMS personnel. The stakes were placed after measuring with a line the desired distances from the bridge.

Stations along the transects were located in reference to piers of the bridge since the distance between every second pier approximated closely the desired distance between sampling stations. Stations were located by moving the boat along the transects until it was opposite the desired pier.

Taking Samples

At each station two samples or licks of the oyster tongs were taken by an experienced oyster tonger. These were combined and the following observations made on the combined sample:

Number of large and small oysters;

Number of 1978 spat;

Volume of large and small oysters;

Volume of shell;

Type of bottom;

Vegetation (if any);

Fouling organisms; and

Other commercially valuable shellfish present.

Later, a portion of the oysters recovered in the samples were measured for length.

Fathometer Survey

A portable recording fathometer was used to trace profiles of the bottom along transects which were generally parallel to the axis of the current (Figure 2). Copies of these traces are contained in the appendix.

Estimates of Density and Quantity

Examples of calculations used to arrive at our estimates of oyster density and quantity are shown in Table 2.

RESULTS AND DISCUSSION

An area northwest of the bridge contained oysters in commercially harvestable densities while other areas did not. The detailed results of our sampling will be discussed according to the lessee of the ground on which they were found.

Three Adjacent Leases of Henry Parker

These three leases occupy most of the area sampled northwest of the bridge (Figures 1 and 3) and are treated in this report as one unit. The three leases total 32.3 acres. Our sampling extended 1,080 feet upriver of the existing

Table 2

Methods of Calculating Estimates of Densities and Quantities of Oysters and Shell.

1. Calculation of area covered by each grab of the tongs was done in the following manner:

   The distance which the tongs were opened and the length of the tong heads were measured and multiplied to yield the area of bottom covered per grab or lick. Because more than one pair were used and sampling was done at different stages of the tide, the area covered by a tong grab varied.

2. The following size distribution and number per bushel were seen on Henry Parker's ground:

	Number/ bushel	Percentage of catch	
		RW area	Other
Large (3" or longer) oysters	182	27	42
Small & yearling oysters	861	73	58

3. Estimated densities of oysters and shell were calculated as shown:

   Data from Station D' - 15 - on Henry Parker's lease - is used as an example. At the station 10 large oysters, 31 small oysters and 1.8 quarts of shell were tonged up from an area of bottom measuring 6.4 square feet.

   10 lg. oysters ÷ 6.4 square feet = 1.6 lg. oysters/sq ft

   31 sm. oysters ÷ 6.4 square feet = 4.8 sm. oysters/sq ft

   1.8 quarts shell ÷ 6.4 square feet = 0.28 qts/sq ft

4. Estimated quantities of oysters and shell were calculated as shown:

   Using data from the right-of-way portion of Henry Parker's lease (an area of 1.85 acres) for an example, combining data from all stations (Table 3) shows that a total of 50 large oysters, 136 small oysters and 12.3 quarts of shell were tonged from 117.2 square feet of bottom.

Table 2 (Contd.)

- 50 lg. oysters ÷ 117.2 ft^2 = 0.43 lg. oysters/ft^2

  0.43/ft^2 X 43560 ft^2/acre ÷ 182 lg. oysters/bu X 1.85 acres =

  190 bushels large oysters

- 136 sm. oysters ÷ 117.2 ft^2 = 1.16 sm. oysters/ft^2

  1.16/ft^2 X 43560 ft^2/acre ÷ 861 sm. oysters/bu X 1.85 acres =

  109 bushels small oysters

- 12.3 quarts shell ÷ 117.2 ft^2 = 0.10 qt/ft^2

  0.10/ft^2 X 43560 ft^2/acre ÷ 50 qts/bu X 1.85 acres =

  161 bushels shell

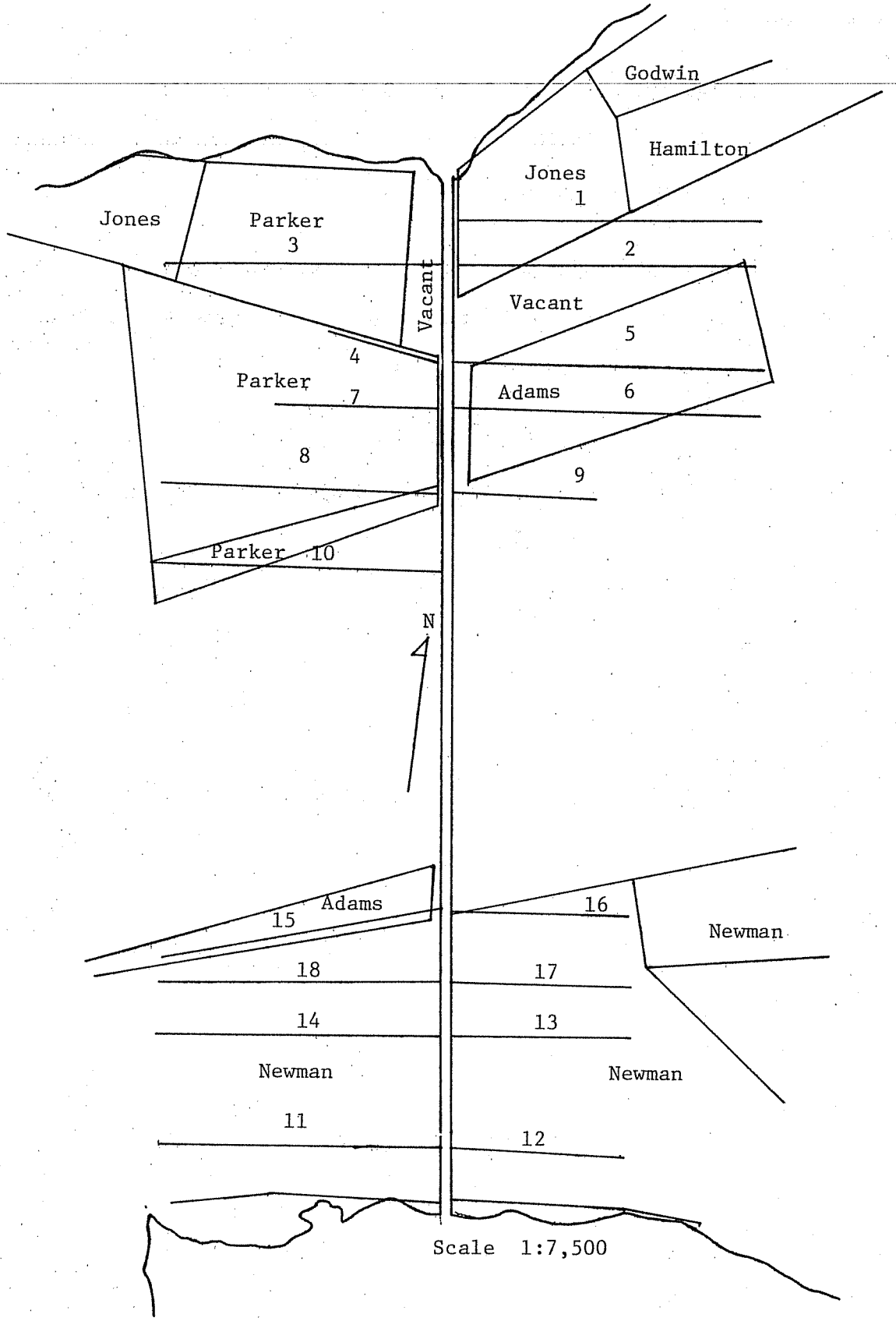


Figure 2. Fathometer Transects in Vicinity of US17 Bridge Across Nansemond River - January 1979.

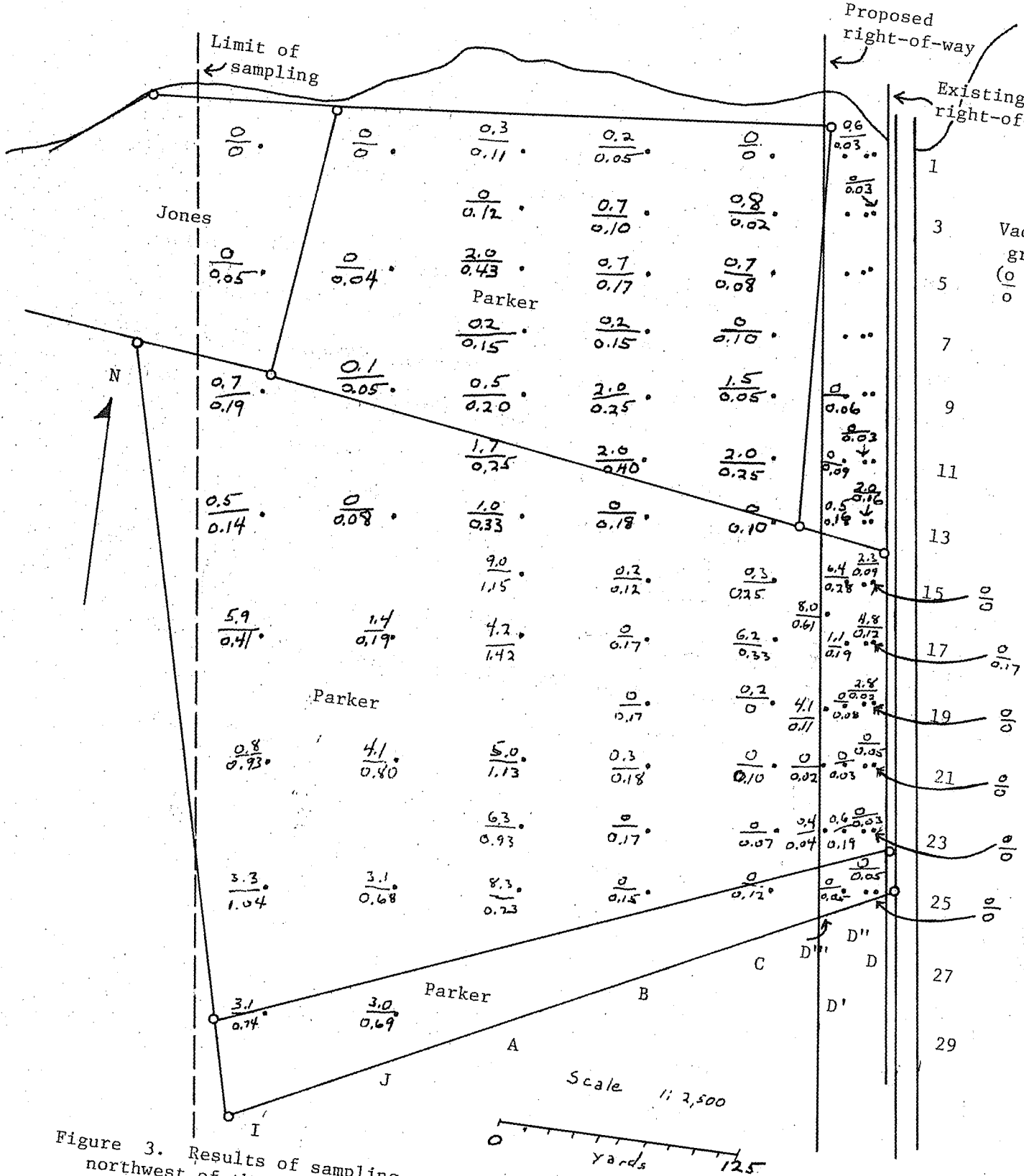


Figure 3. Results of sampling on leased oyster planting ground to the northwest of the bridge - 1978. Data for each station shown in the following manner; number of live oysters per square foot (top number); and number of quarts of shell per square foot (bottom number).

right-of-way and covered 31.54 acres of these three leases (Table 1).

Prior to the start of this study, Mr. Parker told us that he had been taking oysters from his grounds near the bridge. On some days, we observed boats taking oysters from these leases.

Large (market size) and small oysters and shell were found on all three leases, from close to the north shore to near mid-river where the bottom dropped off rapidly to the channel. No 1978 spat were observed (Figure 3; Table 3). The distribution of the oysters was patchy.

No hard clams were found on the three leases.

In the Proposed Bridge Right-of-Way:

The area of Mr. Parker's grounds which lay in the area of the proposed right-of-way was measured to be 1.85 acres. Within that area our sampling at 22 stations (Figure 3) recovered 50 large oysters, 136 small oysters and 12.3 quarts of shell. Using calculations shown in Table 2, we estimate quantities present as follows: 190 bushels of large oysters; 109 bushels of small oysters; and 161 bushels of shell (Table 3).

Mortalities, based on box counts, were less than 2% which is considered below average for the area (Table 3).

Table 3

Results of Sampling Three Plots of Oyster Planting Ground Leased by Henry D. Parker - 15 & 19 September, 25 October and 20 November 1978.

Station Designation	Bottom Type[1]	Area Covered (ft^2)	Live Oysters				Boxes		Shell	
			Number			Density (No./ft^2)	Number	Percent of Total	Volume (Qts)	Density (Qts/ft^2)
			Lg.	Sm.	Tot.	Total				
Transect I - 980 feet from the Existing Right-of-Way										
I- 9	MS	7.34	2	3	5	0.7	0	--	1.4	0.19
13	MS	7.34	2	2	4	0.5	0	--	1.0	0.14
17	MS	7.34	19	24	43	5.8	3	6	3.0	0.41
21	MS	7.34	4	2	6	0.8	2	25	6.8	0.93
25	MS	7.34	6	18	24	3.3	3	11	7.6	1.04
29	MS	7.34	9	14	23	3.1	1	4	5.4	0.74
Transect J - 780 feet from the Existing Right-of-Way										
J- 1	M	7.34	0	0	0	--	0	--	0.0	--
5	M	7.34	0	0	0	--	0	--	0.3	0.04
9	MS	7.34	1	0	1	0.1	0	--	0.4	0.05
13	MS	7.34	0	0	0	--	0	--	0.6	0.08
17	MS	7.34	7	3	10	1.4	0	--	1.4	0.19
21	MS	7.34	9	21	30	4.1	2	6	5.9	0.80
25	MS	7.34	12	11	23	3.1	2	8	5.0	0.68
29	MS	7.34	10	12	22	3.0	2	8	5.1	0.69
Transect A - 580 feet from the Existing Right-of-Way										
A- 1	M	9.0	2	1	3	0.3	2	40	1.0	0.11
3	M	6.0	0	0	0	--	1	100	0.7	0.12
5	MS	6.0	7	5	12	2.0	1	8	2.6	0.43
7	MS	6.0	0	1	1	0.2	1	50	0.9	0.15
9	MS	6.0	2	1	3	0.5	1	25	1.2	0.20
11	MS	6.0	6	4	10	1.7	1	9	1.5	0.25

Table 3 (Contd.)

Station Designation	Bottom Type[1]	Area Covered (ft^2)	Live Oysters				Boxes		Shell	
			Number			Density (No./ft^2)	Number	Percent of Total	Volume (Qts)	Density (Qts/ft^2)
			Lg.	Sm.	Tot.	Total				
A-13	MS	6.0	2	4	6	1.0	0	--	2.0	0.33
15	MS	6.0	21	33	54	9.0	7	11	6.9	1.15
17	MS	6.0	14	11	25	4.2	10	28	8.5	1.42
19	MS	6.0	0	0	0	--	0	--	0.8	0.13
21	MS	6.0	18	12	30	5.0	1	3	6.8	1.13
23	MS	6.0	27	11	38	6.3	4	10	5.6	0.93
25	MS	6.0	11	39	50	8.3	0	--	1.4	0.23
Transect B - 380 feet from the Existing Right-of-Way										
B- 1	M	6.0	0	1	1	0.2	1	50	0.3	0.05
3	MS	6.0	3	1	4	0.7	0	--	0.6	0.10
5	MS	6.0	2	2	4	0.7	3	43	1.0	0.17
7	MS	6.0	0	1	1	0.2	0	--	0.9	0.15
9	MS	6.0	6	6	12	2.0	1	8	1.5	0.25
11	MS	6.0	3	9	12	2.0	1	8	2.4	0.40
13	MS	6.0	0	0	0	--	0	--	1.1	0.18
15	MS	6.0	0	1	1	0.2	0	--	0.7	0.12
17	MS	6.0	0	0	0	--	0	--	1.0	0.17
19	MS	6.0	0	0	0	--	0	--	1.0	0.17
21	MS	6.0	2	0	2	0.3	2	50	1.1	0.18
23	MS	6.0	0	0	0	--	2	100	1.0	0.17
25	MS	6.0	0	0	0	--	1	100	0.9	0.15
Transect C - 180 feet from the Existing Right-of-Way										
C- 1	M	6.0	0	0	0	--	0	--	0.0	--
3	MS	6.0	1	4	5	0.8	1	17	0.1	0.02
5	MS	6.0	1	3	4	0.7	0	--	0.5	0.08
7	MS	6.0	0	0	0	--	0	--	0.6	0.10
9	MS	6.0	2	7	9	1.5	0	--	0.3	0.05
11	MS	6.0	4	8	12	2.0	1	8	1.5	0.25

Table 3 (Contd.)

Station Designation	Bottom Type[1]	Area Covered (ft^2)	Live Oysters				Boxes		Shell	
			Number			Density (No./ft^2)	Number	Percent of Total	Volume (Qts)	Density (Qts/ft^2)
			Lg.	Sm.	Tot.	Total				
C-13	MS	6.0	0	0	0	--	0	--	0.6	0.10
15	MS	6.0	0	2	2	0.3	0	--	1.5	0.25
17	MS	6.0	7	25	32	6.2	1	3	2.0	0.33
19	MS	6.0	1	0	1	0.2	0	--	0.0	--
21	MS	6.0	0	0	0	--	0	--	0.6	0.10
23	MS	6.0	0	0	0	--	0	--	0.4	0.07
25	MS	6.0	0	0	0	--	1	100	0.7	0.12
Transect D''' - 94 feet from the Existing Right-of-Way, and 10 feet Inside the Proposed Right-of-Way										
D'''-16	MS	5.6	9	36	45	8.0	1	2	3.4	0.61
19	MS	5.6	3	20	23	4.1	0	--	0.6	0.11
21	MS	5.6	0	0	0	--	0	--	0.1	0.02
23	MS	5.6	0	2	0	0.4	0	--	0.2	0.04
Transect D' - 80 feet from the Existing Right-of-Way and 24 feet Inside the Proposed Right-of-Way										
D'-15	MS	6.4	10	31	41	6.4	0	--	1.8	0.28
17	MS	6.4	2	5	7	1.1	0	--	1.2	0.19
19	MS	6.4	0	0	0	--	0	--	0.5	0.08
21	MS	6.4	0	0	0	--	0	--	0.2	0.03
23	MS	6.4	2	2	4	0.6	1	20	1.2	0.19
25	MS	6.4	0	0	0	--	0	--	0.3	0.05
Transect D'' - 40 feet from the Existing Right-of-Way and 64 feet Inside the Proposed Right-of-Way										
D''-15	MS	6.4	9	6	15	2.3	1	6	0.6	0.09
17	MS	6.4	9	22	31	4.8	0	--	0.8	0.12
19	MS	6.4	6	12	18	2.8	0	--	0.1	0.02
21	M	6.4	0	0	0	--	0	--	0.3	0.05
23	M	6.4	0	0	0	--	0	--	0.2	0.03
25	M	6.4	0	0	0	--	0	--	0.3	0.05

Table 3 (Contd.)

Station Designation	Bottom Type[1]	Area Covered (ft^2)	Live Oysters				Boxes		Shell	
			Number			Density (No./ft^2)	Number	Percent of Total	Volume (Qts)	Density (Qts/ft^2)
			Lg.	Sm.	Tot.	Total				
Transect D - 34 feet from the Existing Right-of-Way, and 70 feet Inside the Proposed Right-of-Way										
D-15	M	3.0	0	0	0	--	0	--	0.0	--
17	M	3.0	0	0	0	--	0	--	0.5	0.17
19	M	3.0	0	0	0	--	0	--	0.0	--
21	M	3.0	0	0	0	--	0	--	0.0	--
23	M	3.0	0	0	0	--	0	--	0.0	--
25	M	3.0	0	0	0	--	0	--	0.0	--
Proposed R/W Area		117.2	50	136	186	1.6	3	1.6	12.3	0.10
Remainder		339.76	223	302	525	1.5	59	10.0	106.1	0.31
Overall		456.96	273	438	711	1.6	62	8.0	118.4	0.25

Estimated Qty:	Lg oysters	Sm oysters	Shell
Proposed R/W area:	190 bu	109 bu	161 bu
Remainder:	4,690 bu	1,337 bu	8,018 bu

[1]M = Mud, MS = Muddy sand.

A high percentage (73%) of oysters observed here were small (3 inches or less - the mean was 1.78 inches), (Table 2). The bottom was a mixture of shell, shell fragments, mud and sand (which makes the bottom somewhat firm). The above factors help to make this good oyster ground. The portion immediately adjacent to the bridge was soft mud.

Fathometer recordings of the bottom profile in the proposed right-of-way area along transects 3, 4, 7 and 8 (Figure 2 & Appendix) indicate a fairly even bottom. No large holes in the bottom were observed. Depths here were between 4 and 5 feet with the offshore transect being 7 feet.

Outside the Proposed Right-of-Way Area:

Sampling upriver of the proposed right-of-way covered almost all (29.69 acres) of Parker's leases adjacent to the bridge. Sampling at 53 stations (Figure 3) yielded 223 large oysters, 302 small oysters, and 106.1 quarts of shell. From these data we estimate that 4,690 bushels of large oysters, 1,337 bushels of small oysters, and 8,018 bushels of shell were present in this area at the time we sampled (Table 3).

The majority of the oysters found (58%) were small oysters under three inches in length (mean = 1.78 in.), (Table 2).

The percent mortality, based on box counts, was 10% (Table 3) which is considered normal for the area.

The fathometer revealed a generally even bottom on the two inshore leases and a sloping bottom on the offshore lease (Figure 2; Appendix, Transects 3, 4, 7, 8 and 10). No large holes in the bottom were observed. Depths ranged from 4 to 6 feet on the inshore two leases, while on the offshore lease, the bottom sloped from 7 to 11 feet.

Vacant Ground

Vacant ground between Parker's inshore lease and the existing right-of-way was sampled (Figure 3). At 21 stations here we recovered a total of 8 large oysters, 10 small oysters and 2.5 quarts of shell for estimated quantities of 43 bushels of large oysters, 11 bushels of small oysters and 43 bushels of shell (Table 4). No hard clams were found. No fathometer transects were made in this area.

Two Leases of Gordon Jones

Northwest of the Bridge:

On Jones' 11.72 acre lease upriver from the bridge we studied 1.70 acres nearest the bridge. On these 1.7 acres, the bottom was mud; no oysters were recovered. Four samples at two stations collected only 0.35 quarts of shell (Table 5; Figure 3).

Table 4

Results of Sampling Vacant Ground Adjacent to the Nansemond River Bridge - 1 & 19 September 1978 and 20 November 1978.

Station Designation	Bottom Type[1]	Area Covered (ft^2)	Live Oysters				Boxes		Shell	
			Number			Density (No./ft^2)	Number	Percent of Total	Volume (Qts)	Density (Qts/ft^2)
			Lg.	Sm.	Tot.	Total				
Transect D' - 80 feet from the Existing Right-of-Way and 24 feet Inside the Proposed Right-of-Way										
D'- 1	M	3.2	2	0	2	0.6	0	--	0.1	0.03
3	M	3.2	0	0	0	--	0	--	0.0	--
5	M	3.2	0	0	0	--	0	--	0.0	--
7	M	3.2	0	0	0	--	0	--	0.0	--
9	M	3.2	0	0	0	--	0	--	0.2	0.06
11	M, Sh	6.4	0	0	0	--	0	--	0.6	0.09
13	M, Sh	6.4	2	1	3	0.5	0	--	1.0	0.16
Transect D" - 40 feet from the Existing Right-of-Way and 64 feet Inside the Proposed Right-of-Way										
D"- 1	M	3.2	0	0	0	--	0	--	0.0	--
3	M	3.2	0	0	0	--	0	--	0.1	0.03
5	M	3.2	0	0	0	--	0	--	0.0	--
7	M	3.2	0	0	0	--	0	--	0.0	--
9	M	3.2	0	0	0	--	0	--	0.0	--
11	M	3.2	0	0	0	--	0	--	0.1	0.03
13	M, Sh	6.4	4	9	13	2.0	1	7	0.4	0.06
Transect D - 34 feet from the Existing Right-of-Way and 70 feet Inside the Proposed Right-of-Way										
D- 1	M	3.0	0	0	0	--	0	--	0.0	--
3	M	3.0	0	0	0	--	0	--	0.0	--
5	M	3.0	0	0	0	--	0	--	0.0	--
7	M	3.0	0	0	0	--	0	--	0.0	--
9	M	3.0	0	0	0	--	0	--	0.0	--
11	M	3.0	0	0	0	--	0	--	0.0	--
13	M	3.0	0	0	0	--	0	--	0.0	--
Overall		75.4	8	10	18	0.2	1	5	2.5	0.03

Table 4 (Contd.)

Estimated Qty:	Large	Small
Live Oysters:	43 bu	11 bu
Shell:	43 bu	

[1]M = Mud, Sh = Shell.

[2]All this ground lies in the proposed right-of-way.

Table 5

Results of Sampling a Portion of a Lease of Gordon Jones - 25 October 1978

Station Designation	Bottom Type	Area Covered (ft^2)	Live Oysters		Boxes		Shell	
			Number	Density (No./ft^2)	Number	Percent of Total	Volume (Qts)	Density (Qts/ft^2)
Transect I - 980 feet from the Existing Right-of-Way								
I-1	Mud	7.34	0	-	0	-	0	-
5	Mud	7.34	0	-	0	-	0.35	0.05
Overall:		14.68	0	-	0	-	0.35	0.02

Estimated Qty:
Live oysters: 0 bu
Shell: 4 bu

Northeast of the Bridge:

Twenty-six locations were sampled over the entire area (Figure 4). Of this total 2.59 acres lay in the proposed right-of-way.

In the right-of-way area 10 stations were sampled. No oysters, shell or hard clams were recovered in the tongs. Sampling at 16 stations downriver of the proposed right-of-way yielded no oysters, shell or hard clams (Table 6; Figure 4).

Fathometer-traced profiles (Appendix, Transects 1 & 2; Figure 2) revealed a smooth, even bottom with depths of 3½ to 4½ feet.

Lease of Mills Godwin

Samples were collected at three locations on a 1.50 acre portion of this 7.00 acre lease (Table 1; Figure 4). No oysters, shell or hard clams were recovered by the tongs (Table 7).

Lease of Jesse Hamilton

A 1.35-acre portion of this 7.26 acre lease was sampled at three stations (Table 1; Figure 4). No oysters, shell or hard clams were found (Table 8).

Vacant Ground

This bottom which was sampled (6.21 acres) lay between the leases of Jones and Adams and between Adams'

Table 6

Results of Sampling a Lease of Gordon Jones - 1 & 19 September, 20 November 1978 and 11 January 1979.

Station Designation	Bottom Type[1]	Area Covered (ft^2)	Live Oysters		Boxes		Shell	
			Number	Density (No./ft^2)	Number	Percent of Total	Volume (Qts)	Density (Qts/ft^2)
Transect E" - 34 feet from the Downriver Side of the Bridge, Inside the Existing Right-of-Way								
E"- 1	MS	3.0	0	-	0	-	0	-
3	MS	3.0	0	-	0	-	0	-
5	MS	3.0	0	-	0	-	0	-
7	MS	3.0	0	-	0	-	0	-
9	MS	3.0	0	-	0	-	0	-
Transect E - 46 feet Inside the Proposed Right-of-Way								
E- I	MS	3.0	0	-	0	-	0	-
1	MS	3.0	0	-	0	-	0	-
3	MS	3.0	0	-	0	-	0	-
5	MS	3.0	0	-	0	-	0	-
7	MS	3.0	0	-	0	-	0	-
Transect E' - 82 feet from the Existing Right-of-Way, and 10 feet Inside the Proposed Right-of-Way								
E'- 1	Mud	2.8	0	-	0	-	0	-
4	Mud	2.8	0	-	0	-	0	-
7	Mud	2.8	0	-	0	-	0	-
Transect F - 194 feet from the Existing Right-of-Way								
F-III	Mud	3.0	0	-	0	-	0	-
I	Mud	3.0	0	-	0	-	0	-
1	Mud	3.0	0	-	0	-	0	-
3	Mud	3.0	0	-	0	-	0	-
5	Mud	3.0	0	-	0	-	0	-
7	Mud	3.0	0	-	0	-	0	-

Table 6 (Contd.)

Station Designation	Bottom Type[1]	Area Covered (ft^2)	Live Oysters		Boxes		Shell	
			Number	Density (No./ft^2)	Number	Percent of Total	Volume (Qts)	Density (Qts/ft^2)
Transect G - 394 feet from the Existing Right-of-Way								
G- VII	Mud	3.0	0	-	0	-	0	-
V	Mud	3.0	0	-	0	-	0	-
III	Mud	3.0	0	-	0	-	0	-
I	Mud	3.0	0	-	0	-	0	-
1	Mud	3.0	0	-	0	-	0	-
3	Mud	3.0	0	-	0	-	0	-
5	Mud	3.0	0	-	0	-	0	-
Overall		77.4	0	-	0	-	0	-

Estimated Qty:
Live oysters: 0 bu
Shell: 0 bu

[1]MS = Muddy sand.

Table 7

Results of Sampling a Portion of a Lease of Mills Godwin - 1 September 1978.

Station Designation	Bottom Type	Area Covered (ft^2)	Live Oysters		Boxes		Shell	
			Number	Density (No./ft^2)	Number	Percent of Total	Volume (Qts)	Density (Qts/ft^2)
Transect H - 594 feet from the Existing Right-of-Way								
H-IX	Mud	3.0	0	-	0	-	0	-
H-VII	Mud	3.0	0	-	0	-	0	-
H-V	Mud	3.0	0	-	0	-	0	-
Overall:		9.0	0	-	0	-	0	-

Estimated Qty:
Live oysters: 0 bu
Shell: 0 bu

Table 8

Results of Sampling a Portion of a Lease of Jesse Hamilton - 1 September 1978.

Station Designation	Bottom Type	Area Covered (ft^2)	Live Oysters		Boxes		Shell	
			Number	Density (No./ft^2)	Number	Percent of Total	Volume (Qts)	Density (Qts/ft^2)
Transect H - 594 feet from the Existing Right-of-Way								
H-III	Mud	3.0	0	-	0	-	0	-
H-I	Mud	3.0	0	-	0	-	0	-
H-1	Mud	3.0	0	-	0	-	0	-
Overall:		9.0	0	-	0	-	0	-

Estimated Qty:
Live oysters: 0 bu
Shell: 0 bu

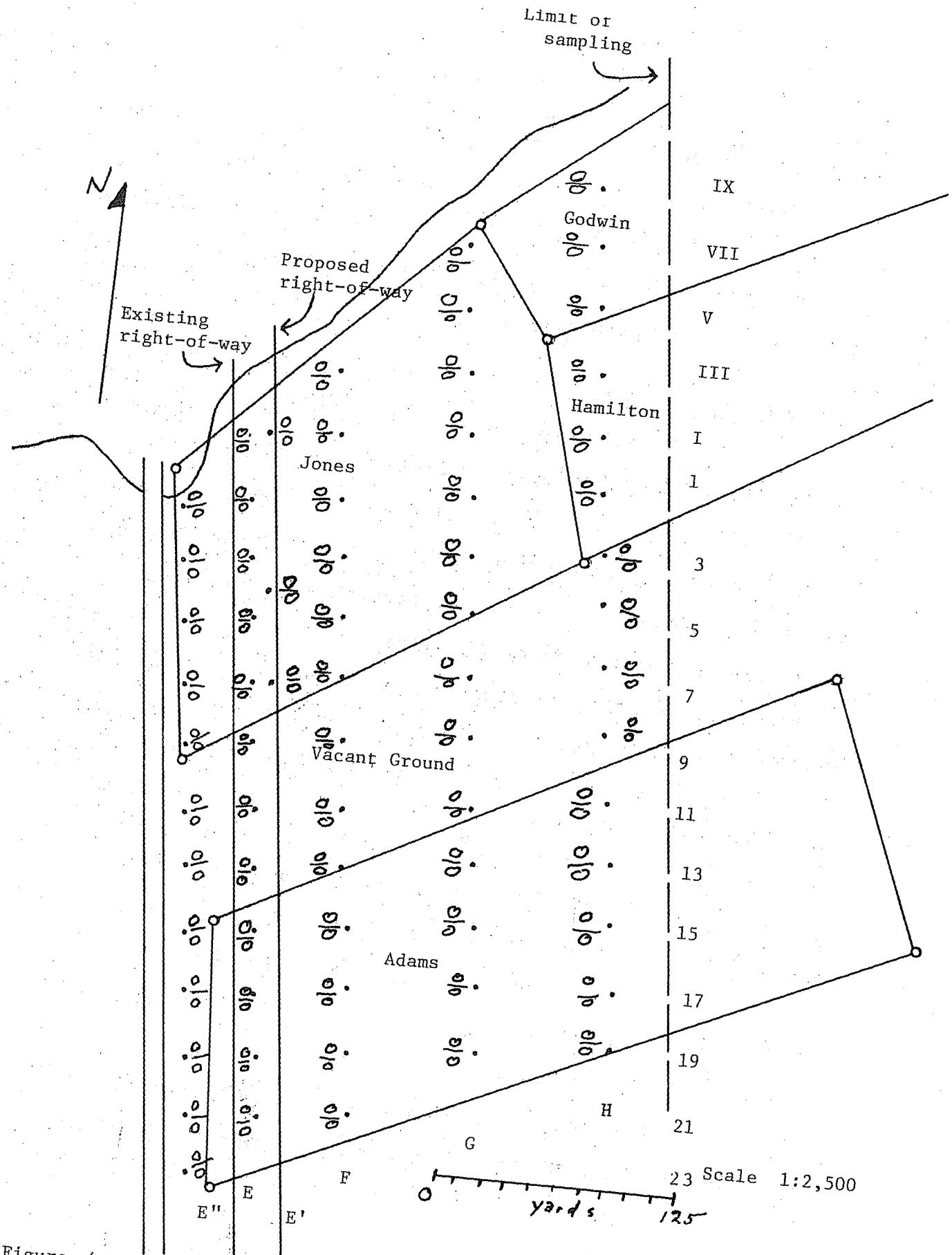


Figure 4. Results of sampling on leased oyster planting ground to the northeast of the bridge - 1978. Data for each station shown in the following manner: number of live oysters per square foot (top number); and number of quarts of shell per square foot (bottom number).

lease and the bridge (Figure 1). Here sampling was carried out at 23 stations without finding any oysters, shell or hard clams (Table 9; Figure 4). Fathometer records indicate a level bottom here with depths of 4 to 6 feet (Figure 2; Appendix, Transects 2, 5 & 6).

Lease of Charles Adams

A 7.28-acre portion of this 10.87 acre lease was studied; here 17 samples were taken at 17 stations (Table 1; Figure 4). Tonging recovered no oysters, shell or hard clams, either on the 1.97 acres which lay in the proposed right-of-way or in the remainder of the area (Table 10). The bottom on the lease was level, as indicated by the fathometer; the bottom did not begin to slope until farther offshore (Figure 2; Appendix, Transects 5, 6 & 9).

Lease of Adams Oyster Co.

Of this lease, 0.38 acre lay in the proposed right-of-way. Sampling at seven stations here yielded no oysters, shell or hard clams (Table 11; Figure 5). The fathometer indicated that the bottom on this portion of the lease sloped gently toward the bridge (Appendix, Transect 15; Figure 2).

Above the right-of-way line, an additional 2.02 acres of this 103.27 acre lease were sampled at four locations (Table 1; Figure 5). No oysters or hard clams were found.

Table 9

Results of Sampling Vacant Ground Adjacent to the Nansemond River Bridge - 1 September 1978 and 11 January 1979.

Station Designation	Bottom Type	Area Covered (ft^2)	Live Oysters		Boxes		Shell	
			Number	Density (No./ft^2)	Number	Percent of Total	Volume (Qts)	Density (Qts/ft^2)
Transect E" - 34 feet from the Downriver Side of the Bridge, Inside the Right-of-Way								
E"-11	MS	3.0	0	-	0	-	0	-
13	Mud	3.0	0	-	0	-	0	-
15	Mud	3.0	0	-	0	-	0	-
17	Mud	3.0	0	-	0	-	0	-
19	Mud	3.0	0	-	0	-	0	-
21	Mud	3.0	0	-	0	-	0	-
23	Mud	3.0	0	-	0	-	0	-
Transect E - 46 feet from the Existing Right-of-Way, and 46 feet Inside the Proposed Right-of-Way								
E- 9	Mud	3.0	0	-	0	-	0	-
11	Mud	3.0	0	-	0	-	0	-
13	Mud	3.0	0	-	0	-	0	-
Transect F - 194 feet from the Existing Right-of-Way								
F- 9	Mud	6.0	0	-	0	-	0	-
11	Mud	6.0	0	-	0	-	0	-
13	Mud	6.0	0	-	0	-	0	-
Transect G - 394 feet from the Existing Right-of-Way								
G- 7	Mud	6.0	0	-	0	-	0	-
9	Mud	6.0	0	-	0	-	0	-
11	Mud	6.0	0	-	0	-	0	-

Table 9 (Contd.)

Station Designation	Bottom Type[1]	Area Covered (ft^2)	Live Oysters		Boxes		Shell	
			Number	Density (No./ft^2)	Number	Percent of Total	Volume (Qts)	Density (Qts/ft^2)
Transect H - 594 feet from the Existing Right-of-Way								
H- 5	Mud	6.0	0	-	0	-	0	-
7	Mud	6.0	0	-	0	-	0	-
9	Mud	6.0	0	-	0	-	0	-
Overall:		84.0	0	-	0	-	0	-

Estimated Qty:
Live Oysters: 0 bu
Shell: 0 bu

1
MS = Muddy sand.

Table 10

Results of Sampling a Portion of a Lease of Charles Adams, 1 September 1978.

Station Designation	Bottom Type	Area Covered (ft^2)	Live Oysters		Boxes		Shell	
			Number	Density (No./ft^2)	Number	Percent of Total	Volume (Qts)	Density (Qts/ft^2)
Transect E - 46 feet from the Existing Right-of-Way and 46 feet Inside the Proposed Right-of-Way								
E-15	Mud	3.0	0	-	0	-	0	-
17	Mud	3.0	0	-	0	-	0	-
19	Mud	3.0	0	-	0	-	0	-
21	Mud	3.0	0	-	0	-	0	-
Transect F - 194 feet from the Existing Right-of-Way								
F-15	Mud	3.0	0	-	0	-	0	-
17	Mud	3.0	0	-	0	-	0	-
19	Mud	3.0	0	-	0	-	0	-
21	Mud	3.0	0	-	0	-	0	-
Transect G - 394 feet from the Existing Right-of-Way								
G-13	Mud	3.0	0	-	0	-	0	-
15	Mud	3.0	0	-	0	-	0	-
17	Mud	3.0	0	-	0	-	0	-
19	Mud	3.0	0	-	0	-	0	-
Transect H - 594 feet from the Existing Right-of-Way								
H-11	Mud	3.0	0	-	0	-	0	-
13	Mud	3.0	0	-	0	-	0	-
15	Mud	3.0	0	-	0	-	0	-
17	Mud	3.0	0	-	0	-	0	-
19	Mud	3.0	0	-	0	-	0	-

Table 10 (Contd.)

Station Designation	Bottom Type	Area Covered (ft^2)	Live Oysters		Boxes		Shell	
			Number	Density (No./ft^2)	Number	Percent of Total	Volume (Qts)	Density (Qts/ft^2)
Overall		51	0	-	0	-	0	-

Estimated Qty:
Live oysters: 0 bu
Shell: 0 bu

Table 11

Results of Sampling a Portion of a Lease of Adams Oyster Co. - 31 August 1978

Station Designation	Bottom Type[1]	Area Covered (ft^2)	Live Oysters		Boxes		Shell	
			Number	Density (No./ft^2)	Number	Percent of Total	Volume (Qts)	Density (Qts/ft^2)
Transect A - 580 feet from the Existing Right-of-Way								
A-22	Mud	3.0	0	-	0	-	0.5	0.25
Transect B - 380 feet from the Existing Right-of-Way								
B-22	Mud	3.0	0	-	0	-	0	-
24	Mud	3.0	0	-	0	-	0	-
Transect C - 180 feet from the Existing Right-of-Way								
C-24	Mud	3.0	0	-	0	-	0	-
Transect D''' - 94 feet from the Existing Right-of-Way, and 10 feet Inside the Proposed Right-of-Way								
D''' .24	MS	2.8	0	-	0	-	0	-
Transect D' - 80 feet from the Existing Right-of-Way, and 24 feet Inside the Proposed Right-of-Way								
D'-24	Mud	3.2	0	-	0	-	0	-
26	Mud	3.2	0	-	0	-	0	-

Table 11 (Contd.)

Station Designation	Bottom Type[1]	Area Covered (ft^2)	Live Oysters		Boxes		Shell	
			Number	Density (No./ft^2)	Number	Percent of Total	Volume (Qts)	Density (Qts/ft^2)
Transect D" - 40 feet from the Existing Right-of-Way, and 64 feet Inside the Proposed Right-of-Way								
D"-24	Mud	3.2	0	-	0	-	0	-
26	Mud	3.2	0	-	0	-	0	-
Transect D - 34 feet from the Existing Right-of-Way, and 71 feet Inside the Proposed Right-of-Way								
D-24	Mud	3.0	0	-	0	-	0	-
26	Mud	3.0	0	-	0	-	0	-
Overall:		33.6	0	-	0	-	0.5	0.01

Estimated Qty:
Live Oysters: 0 bu
Shell: 0.04 bu

[1]MS = Muddy sand.

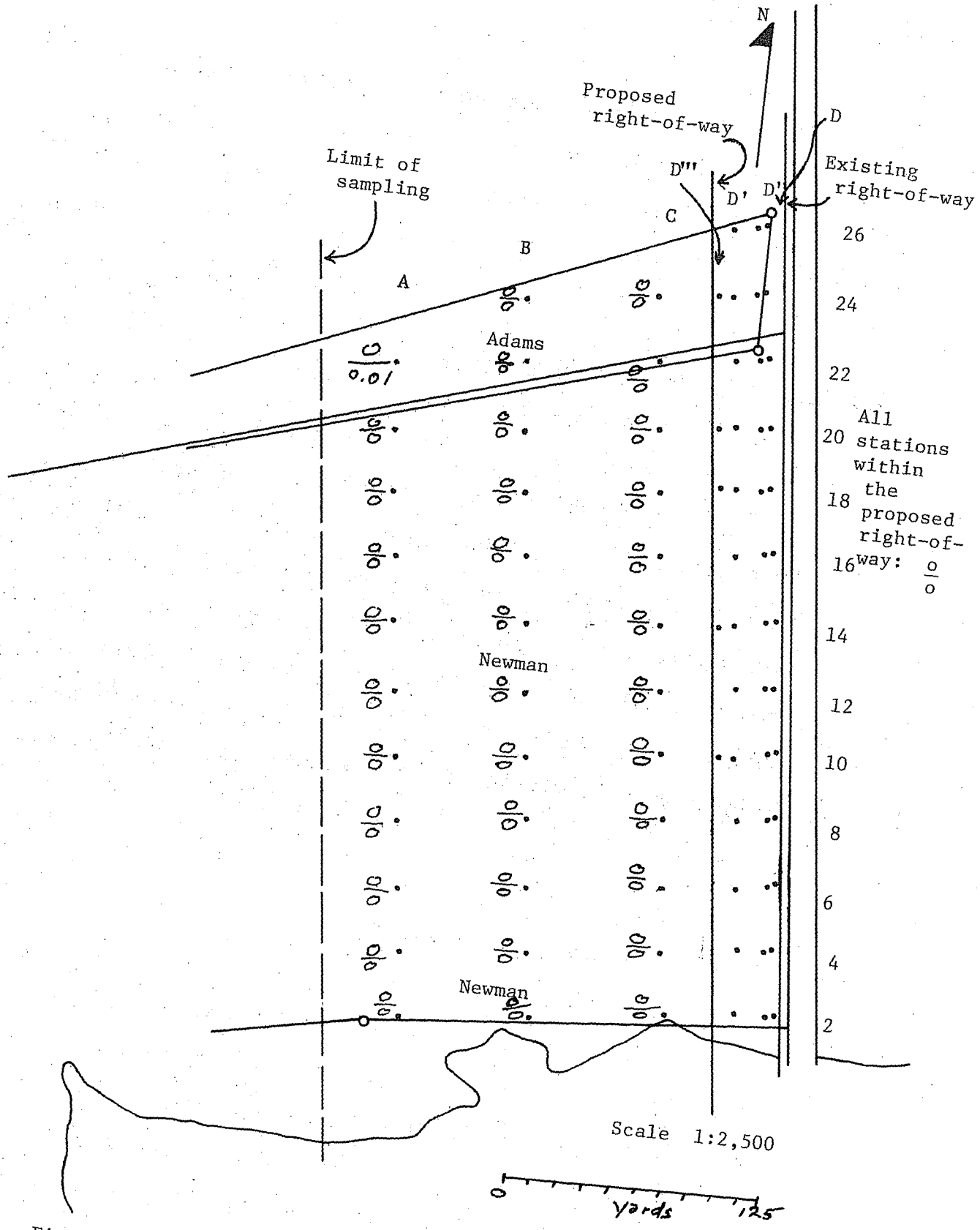


Figure 5. Results of sampling on leased oyster planting ground to the southwest of the bridge - 1978. Data for each station shown in the following manner: number of live oysters per square foot (top number); and number of quarts of shell per square foot (bottom number).

Shell was present only at the station farthest from the bridge; here one-half quart were taken by the tongs (Table 11). The bottom just offshore of the inshore line of stakes was level and had a depth of about 5½ feet (Appendix, Transect 15).

Lease of Barbara & William Newman

In the Proposed Right-of-Way:

About 6 and a half acres of this lease lay within the proposed right-of-way. Sampling at 59 stations here revealed no oysters, shell or hard clams (Table 12; Figures 5 & 6). The fathometer showed that the bottom was mostly flat and about four feet deep (Appendix, Transects 11, 12, 13 & 14); on the offshore portion a shallow (6-8 inch) depression was seen upriver of the bridge while a slight rise (4-6 inch) was noted on the opposite side of the bridge (Appendix, Transects 17 & 18).

Outside Proposed Right-of-Way:

Here an additional 29.07 acres were surveyed for a total of 35.60 acres in this 167.40 acre lease. Sampling at 69 locations revealed one small concentration of oysters (Table 12; Figures 5 & 6); the area of this rock was determined by sounding to be about 125 feet square (a small patch). Here 34 large oysters, 18

Table 12

Results of Sampling a Portion of a Lease of Barbara and William Newman - 31 August, 19 September, 20 November 1978, and 11 January 1979.

Station Designation	Bottom Type	Area Covered (ft^2)	Live Oysters		Boxes		Shell	
			Number	Density (No./ft^2)	Number	Percent of Total	Volume (Qts)	Density (Qts/ft^2)
I. West of the Bridge								
Transect A - 580 feet from the Existing Right-of-Way								
A- 2	Mud	3.0	0	-	0	-	0	-
4	Mud	3.0	0	-	0	-	0	-
6	Mud	3.0	0	-	0	-	0	-
8	Mud	3.0	0	-	0	-	0	-
10	Mud	3.0	0	-	0	-	0	-
12	Mud	3.0	0	-	0	-	0	-
14	Mud	3.0	0	-	0	-	0	-
16	Mud	3.0	0	-	0	-	0	-
18	Mud	3.0	0	-	0	-	0	-
20	Mud	3.0	0	-	0	-	0	-
Transect B - 380 feet from the Existing Right-of-Way								
B- 2	Mud	3.0	0	-	0	-	0	-
4	Mud	3.0	0	-	0	-	0	-
6	Mud	3.0	0	-	0	-	0	-
8	Mud	3.0	0	-	0	-	0	-
10	Mud	3.0	0	-	0	-	0	-
12	Mud	3.0	0	-	0	-	0	-
14	Mud	3.0	0	-	0	-	0	-
16	Mud	3.0	0	-	0	-	0	-
18	Mud	3.0	0	-	0	-	0	-
20	Mud	3.0	0	-	0	-	0	-

Table 12 (Contd.)

Station Designation	Bottom Type	Area Covered (ft^2)	Live Oysters		Boxes		Shell	
			Number	Density (No./ft^2)	Number	Percent of Total	Volume (Qts)	Density (Qts/ft^2)
Transect C - 180 feet from the Existing Right-of-Way								
C- 2	Mud	3.0	0	-	0	-	0	-
4	Mud	3.0	0	-	0	-	0	-
6	Mud	3.0	0	-	0	-	0	-
8	Mud	3.0	0	-	0	-	0	-
10	Mud	3.0	0	-	0	-	0	-
12	Mud	3.0	0	-	0	-	0	-
14	Mud	3.0	0	-	0	-	0	-
16	Mud	3.0	0	-	0	-	0	-
18	Mud	3.0	0	-	0	-	0	-
20	Mud	3.0	0	-	0	-	0	-
22	Mud	3.0	0	-	0	-	0	-
Transect D'''- 94 feet from the Existing Right-of-Way and 10 feet Inside the Proposed Right-of-Way								
D'''-10	Mud	2.8	0	-	0	-	0	-
14	Mud	2.8	0	-	0	-	0	-
18	Mud	2.8	0	-	0	-	0	-
20	Mud	2.8	0	-	0	-	0	-
Transect D' - 80 feet from the Existing Right-of-Way and 24 feet Inside the Proposed Right-of-Way								
D'- 2	Mud	3.2	0	-	0	-	0	-
4	Mud	3.2	0	-	0	-	0	-
6	Mud	3.2	0	-	0	-	0	-
8	Mud	3.2	0	-	0	-	0	-
10	Mud	3.2	0	-	0	-	0	-
12	Mud	3.2	0	-	0	-	0	-
14	Mud	3.2	0	-	0	-	0	-
16	Mud	3.2	0	-	0	-	0	-
18	Mud	3.2	0	-	0	-	0	-
20	Mud	3.2	0	-	0	-	0	-
22	Mud	3.2	0	-	0	-	0	-

Table 12 (Contd.)

Station Designation	Bottom Type	Area Covered (ft^2)	Live Oysters		Boxes		Shell	
			Number	Density (No./ft^2)	Number	Percent of Total	Volume (Qts)	Density (Qts/ft^2)
Transect D'' - 40 feet from the Existing Right-of-Way and 64 feet Inside the Proposed Right-of-Way								
D''- 2	Mud	3.2	0	-	0	-	0	-
6	Mud	3.2	0	-	0	-	0	-
8	Mud	3.2	0	-	0	-	0	-
10	Mud	3.2	0	-	0	-	0	-
12	Mud	3.2	0	-	0	-	0	-
14	Mud	3.2	0	-	0	-	0	-
16	Mud	3.2	0	-	0	-	0	-
18	Mud	3.2	0	-	0	-	0	-
20	Mud	3.2	0	-	0	-	0	-
22	Mud	3.2	0	-	0	-	0	-
Transect D - 34 feet from the Existing Right-of-Way and 70 feet Inside the Proposed Right-of-Way								
D- 2	Mud	3.0	0	-	0	-	0	-
4	Mud	3.0	0	-	0	-	0	-
6	Mud	3.0	0	-	0	-	0	-
8	Mud	3.0	0	-	0	-	0	-
10	Mud	3.0	0	-	0	-	0	-
12	Mud	3.0	0	-	0	-	0	-
14	Mud	3.0	0	-	0	-	0	-
16	Mud	3.0	0	-	0	-	0	-
18	Mud	3.0	0	-	0	-	0	-
20	Mud	3.0	0	-	0	-	0	-
22	Mud	3.0	0	-	0	-	0	-

Table 12 (Contd.)

Station Designation	Bottom Type	Area Covered (ft^2)	Live Oysters		Boxes		Shell	
			Number	Density (No./ft^2)	Number	Percent of Total	Volume (Qts)	Density (Qts/ft^2)
II. East of the Bridge								
Transect E" - 34 feet from the Downriver Side of the Bridge, Inside the Existing Right-of-Way								
E"- 2	Mud	3.0	0	-	0	-	0	-
4	Mud	3.0	0	-	0	-	0	-
6	Mud	3.0	0	-	0	-	0	-
8	Mud	3.0	0	-	0	-	0	-
10	Mud	3.0	0	-	0	-	0	-
12	Mud	3.0	0	-	0	-	0	-
14	Mud	3.0	0	-	0	-	0	-
16	Mud	3.0	0	-	0	-	0	-
18	Mud	3.0	0	-	0	-	0	-
20	Mud	3.0	0	-	0	-	0	-
22	Mud	3.0	0	-	0	-	0	-
Transect E - 46 feet from the Existing Right-of-Way and 46 feet Inside the Proposed Right-of-Way								
E - 2	Mud	3.0	0	-	0	-	0	-
4	Mud	3.0	0	-	0	-	0	-
6	Mud	3.0	0	-	0	-	0	-
8	Mud	3.0	0	-	0	-	0	-
10	Mud	3.0	0	-	0	-	0	-
12	Mud	3.0	0	-	0	-	0	-
14	Mud	3.0	0	-	0	-	0	-
16	Mud	3.0	0	-	0	-	0	-
18	Mud	3.0	0	-	0	-	0	-
20	Mud	3.0	0	-	0	-	0	-
22	Mud	3.0	0	-	0	-	0	-

Table 12 (Contd.)

Station Destignation	Bottom Type	Area Covered (ft^2)	Live Oysters		Boxes		Shell	
			Number	Density (No./ft^2)	Number	Percent of Total	Volume (Qts)	Density (Qts/ft^2)
Transect F - 194 feet from the Existing Right-of-Way								
F- 2	Mud	3.0	0	-	0	-	0	-
4	Mud	3.0	0	-	0	-	0	-
6	Mud	3.0	0	-	0	-	0	-
8	Mud	3.0	0	-	0	-	0	-
10	Mud	3.0	0	-	0	-	0	-
12	Mud	3.0	0	-	0	-	0	-
14	Mud	3.0	0	-	0	-	0	-
16	Mud	3.0	0	-	0	-	0	-
18	Mud	3.0	0	-	0	-	0	-
20	Mud	3.0	0	-	0	-	0	-
22	Mud	3.0	0	-	0	-	0	-
24	Mud	3.0	0	-	0	-	0	-
Transect G - 394 feet from the Existing Right-of-Way								
G- 2	Mud	3.0	0	-	0	-	0	-
4	Mud	3.0	0	-	0	-	0	-
6	Mud	3.0	0	-	0	-	0	-
8	Mud	3.0	0	-	0	-	0	-
10	Mud	3.0	0	-	0	-	0	-
12	Mud	3.0	0	-	0	-	0	-
14	Mud	3.0	0	-	0	-	0	-
16	Mud	3.0	0	-	0	-	0	-
18	Mud	3.0	0	-	0	-	0	-
20	Mud	3.0	0	-	0	-	0	-
22	Mud	3.0	0	-	0	-	0	-
24	Mud	3.0	0	-	0	-	0	-

Table 12 (Contd.)

Station Destignation	Bottom Type	Area Covered (ft^2)	Live Oysters				Boxes		Shell	
			Number			Density (No./ft^2) Total	Number	Percent of Total	Volume (Qts)	Density (Qts/ft^2)
			Lg.	Sm.	Tot.					
Transect H - 594 feet from the Existing Right-of-Way										
H- 2	Shell	6.0	34	18	52	8.7	0	-	2.0	0.33
4	Mud	3.0	0	0	0	-	0	-	0	-
6	Mud	3.0	0	0	0	-	0	-	0	-
8	Mud	3.0	0	0	0	-	0	-	0	-
10	Mud	3.0	0	0	0	-	0	-	0	-
12	Mud	3.0	0	0	0	-	0	-	0	-
14	Mud	3.0	0	0	0	-	0	-	0	-
16	Mud	3.0	0	0	0	-	0	-	0	-
18	Mud	3.0	0	0	0	-	0	-	0	-
20	Mud	3.0	0	0	0	-	0	-	0	-
Overall		375.4	34	18	52	8.7*	0	-	2.0	0.33*

Estimated Qty:	Large	Small
Live Oysters:	488 bu	55 bu
Shell:	103 bu	

*Density in the area (125 ft square) where oysters and shell were found.

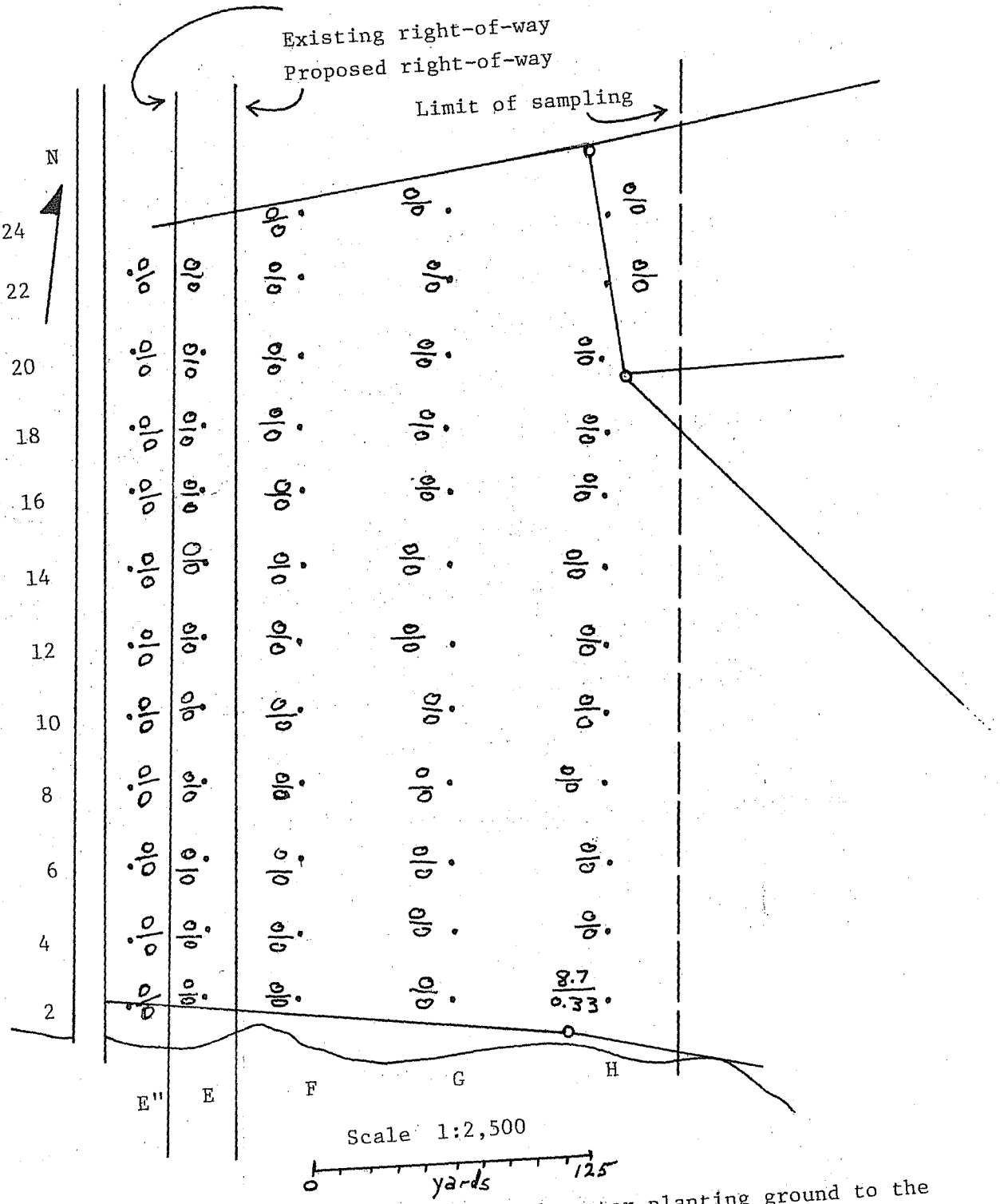


Figure 6. Results of sampling on leased oyster planting ground to the southeast of the bridge - 1978. Data for each station shown in the following manner: number of live oysters per square foot (top number) and number of quarts of shell per square foot (bottom number).

small oysters, 2 quarts of shell and no hard clams were found; the quantities estimated here were 488 bushels of large oysters, 55 bushels of small oysters, and 103 bushels of shell (Table 12). At other places on this area, there was mud and no oysters, shell or hard clams.

The fathometer indicated a fairly even, level bottom with no large holes over most of the area (Appendix, Transects 11, 12, 13 & 14). On the offshore portion there was some unevenness near the bridge, as noted above, and a shallow depression (6-8 inches) approximately 5-600 feet from the existing right-of-way (Appendix, Transects 16, 17 & 18). Also, two holes 1-1½ feet deep were seen on Transect 18. Depths were generally 3½-4 feet inshore and about 6 feet offshore.

Lease of Annie M. Newman

Sampling at two locations on 0.77 acre of this 140.10 acre lease (Table 1; Figure 6) revealed no oysters, shell or hard clams (Table 13).

SUMMARY

Value of the Oysters and Shell on the Various Leases

Outside the Proposed Right-of-Way

Estimated quantities of oysters and shell on leased areas outside the right-of-way are summarized in Table 14.

Table 13

Results of Sampling a Portion of a Lease of Annie M. Newman - 31 August 1978.

Station Designation	Bottom Type	Area Covered (ft^2)	Live Oysters		Boxes		Shell	
			Number	Density (No./ft^2)	Number	Percent of Total	Volume (Qts)	Density (Qts/ft^2)
Transect H - 594 feet from the Existing Right-of-Way								
H-22	Mud	3.0	0	-	0	-	0	-
24	Mud	3.0	0	-	0	-	0	-
Overall		6.0	0	-	0	-	0	-

Estimated Qty:
Live oysters: 0 bu
Shell: 0 bu

Table 14

Estimates of Quantities of Live Oysters and Shell in Sampled Portions of Leased Oyster Planting Ground Outside Proposed Right-of-Way.

Name of Lessee	Size of Above Area (acres)[1]	Live Oysters: Estimated Average Density (No./ft^2)[2]		Live Oysters: Estimated Quantity (bu)		Shell: Estimated Average Density (Qts/ft^2)[2]	Shell: Estimated Quantity (bu)
		Lg oysters	Sm oysters	Lg oysters	Sm oysters		
Parker	29.69	0.66	0.89	4,690	1,337	0.31	8,018
Jones							
NW of Bridge	1.70	0.0	0.0	0	0	0.0	0
NE of Bridge	4.68	0.0	0.0	0	0	0.0	0
Adams							
SW of Bridge	2.02	0.0	0.0	0	0	0.0	0
NE of Bridge	5.31	0.0	0.0	0	0	0.0	0
Newman, Barbara & William	29.07	5.67[3]	3.00[3]	488	55	0.33[3]	103
Newman, Annie	0.77	0.0	0.0	0	0	0.0	0
Godwin	1.50	0.0	0.0	0	0	0.0	0
Hamilton	1.35	0.0	0.0	0	0	0.0	0

[1]From Tables 1 & 15.

[2]Calculated from Tables 3 through 12.

[3]Density on the single place where oysters and shells were found.

On Parker's bottom there were estimated to be 4,690 bushels of large oysters and 1,337 bushels of small oysters; it is noted that this area was being harvested during the study. The lease of Barbara and William Newman was estimated to contain 488 bushels of large oysters and 55 bushels of small oysters, all on an area approximately 125 feet square. On other leases no oysters were found.

In the Proposed Right-of-Way

Quantities of oysters and shell estimated to be on leased grounds in this area are summarized in Table 15. The values of the above-mentioned oysters and shell are shown in Table 16.

Henry Parker:

On 1.85 acres this lessee had large oysters, small oysters and shell worth the following values, respectively: $2,280, $545, and $41.86 (Table 16). This area is considered a good oyster bottom.

Gordon Jones:

Of this lease adjacent to the bridge, 2.59 acres lay within the proposed right-of-way. No oysters or shell were found here (Table 16). However, the ground is fairly sandy and firm and could be adapted to growing oysters.

Table 15

Estimates of Quantities of Live Oysters and Shell in Portions of Leased Oyster Planting Ground Proposed to be Added to Right-of-Way.

Name of Lessee	Portion of Lease in Right-of-Way (acres)[1]	Live Oysters				Shell	
		Estimated Average Density[2] (No/ft^2)		Estimated Quantity (bu)		Estimated Average Density[2] (Qts/ft^2)	Estimated Quantity (bu)
		Lg oysters	Sm oysters	Lg oysters	Sm oysters		
Parker	1.85	0.43	1.16	190	109	0.10	161
Adams							
NE of Bridge	1.97	0.0	0.0	0	0	0.0	0
SW of Bridge	0.38	0.0	0.0	0	0	0.0	0
Newman	6.53	0.0	0.0	0	0	0.0	0
Jones	2.59	0.0	0.0	0	0	0.0	0

Notes:

[1] R/W lines plotted according to information from charts provided by the Va. Dept. of Highways and Transportation; acreages obtained from the same source.

[2] Calculated from Tables 3, 6, 10, 11 & 12.

Table 16

Estimated Value[1] of Oysters and Shells on Leased Ground in the Nansemond River in the Bridge Right-of-Way.

	Oysters						Shell	
	Large Oysters		Small Oysters		Total			
Lease	Quantity[2] (bu)	Value ($)	Quantity[2] (bu)	Value ($)	Quantity (bu)	Value ($)	Quantity[2] (bu)	Value ($)
Parker	190	2,280	109	545	299	2,825	161	41.86
Jones	0	0	0	0	0	0	0	0.0
Adams								
NE side	0	0	0	0	0	0	0	0.0
SW side	0	0	0	0	0	0	0	0.0
Newman	0	0	0	0	0	0	0	0.0

Notes:

[1]Calculation of value based on the following prices: for large (3 in. or longer) oysters $12/bu is a wholesale price for good quality oysters; for smaller oysters, $5/bu; and for shells, 26¢/bu is what the VMRC paid in 1977 to have shells planted.

[2]From Table 15.

Charles Adams:

The portion of this lease lying in the right-of-way is 1.97 acres. Here no oysters or shell were found (Table 16). The bottom here is soft, requiring a sizeable investment to prepare it for growing oysters.

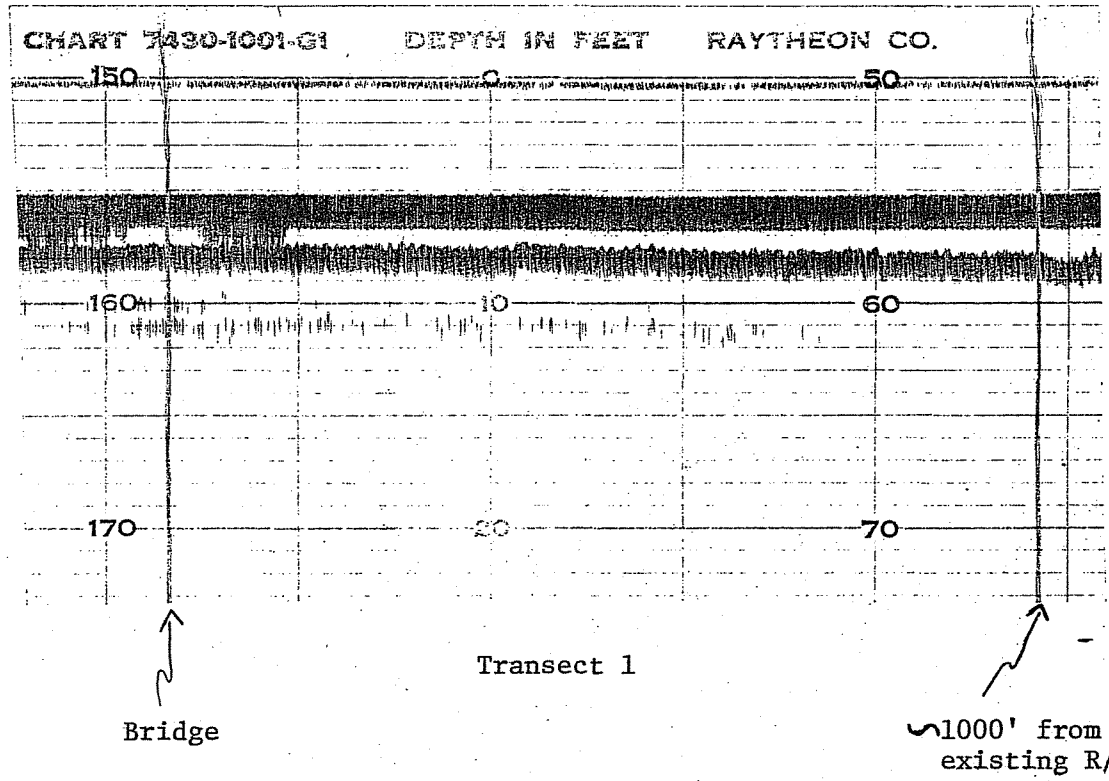
Adams Oyster Company:

This 0.38-acre portion contained no oysters or shell (Table 16). The bottom was soft mud.

Barbara and William Newman:

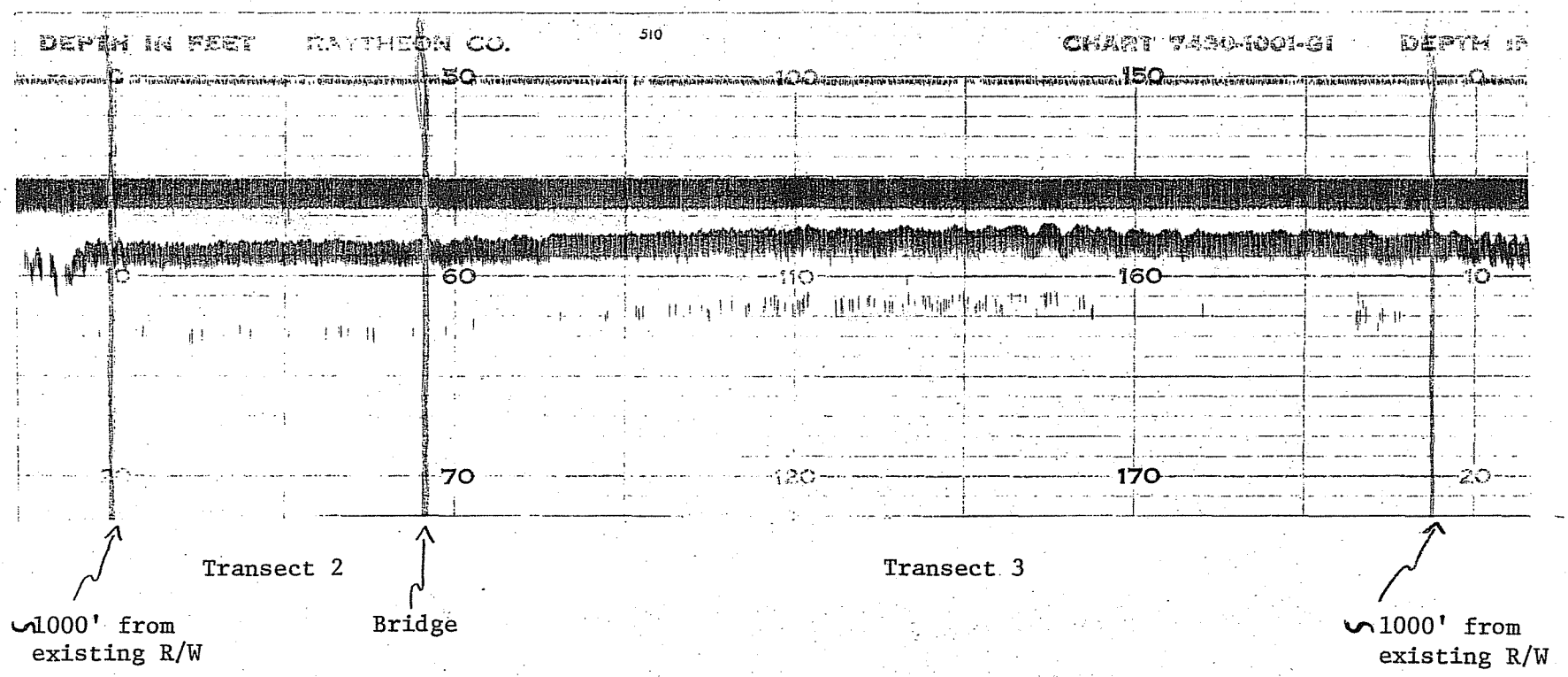
On this 6.53-acre area no oysters or shell were found (Table 16). The bottom was soft mud and would have to be firmed by the planting of shell.

APPENDIX



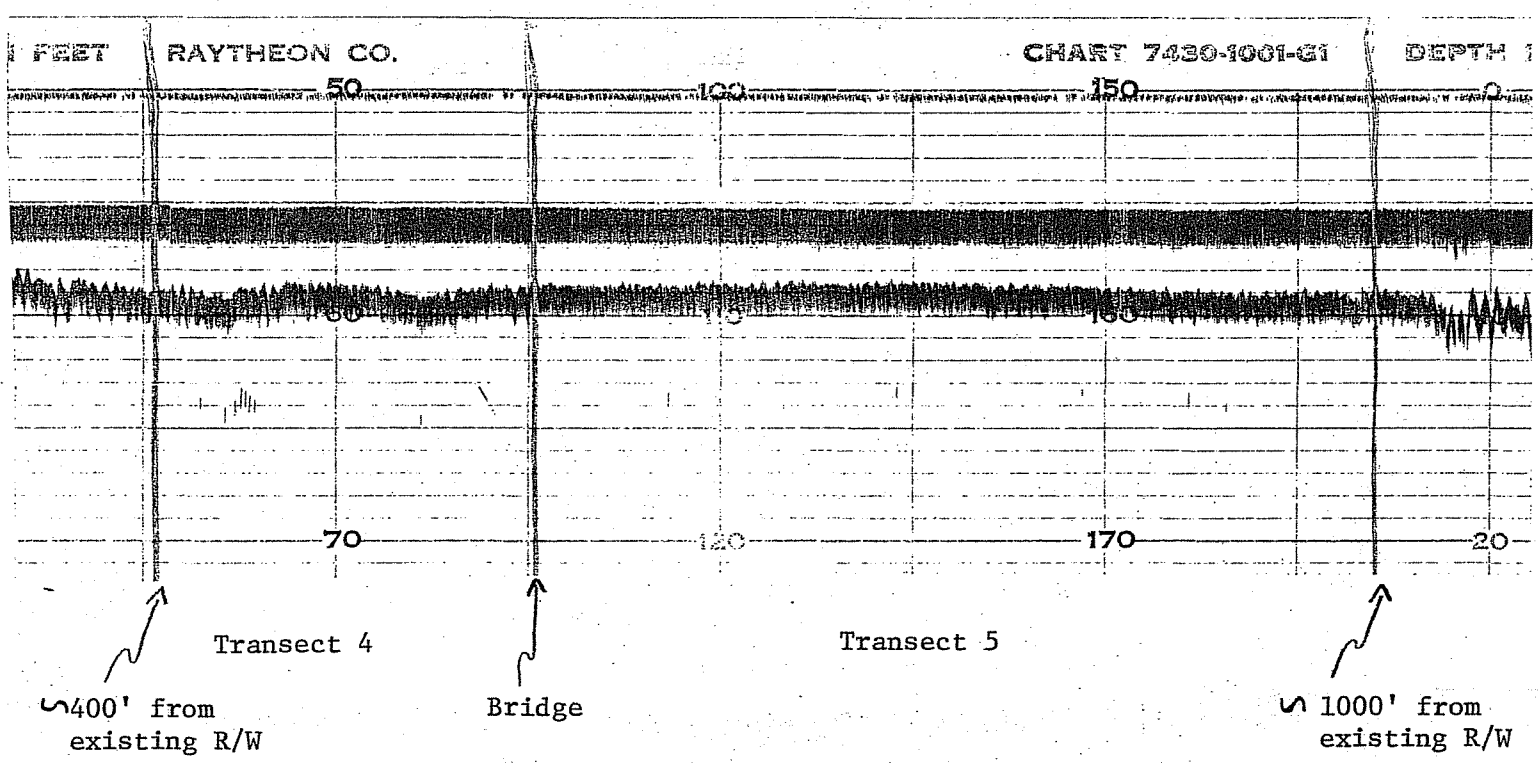
Transect 1 - Vacant and Jones

Bottom Profile Recorded by Fathometer - 12 Jan. 1979



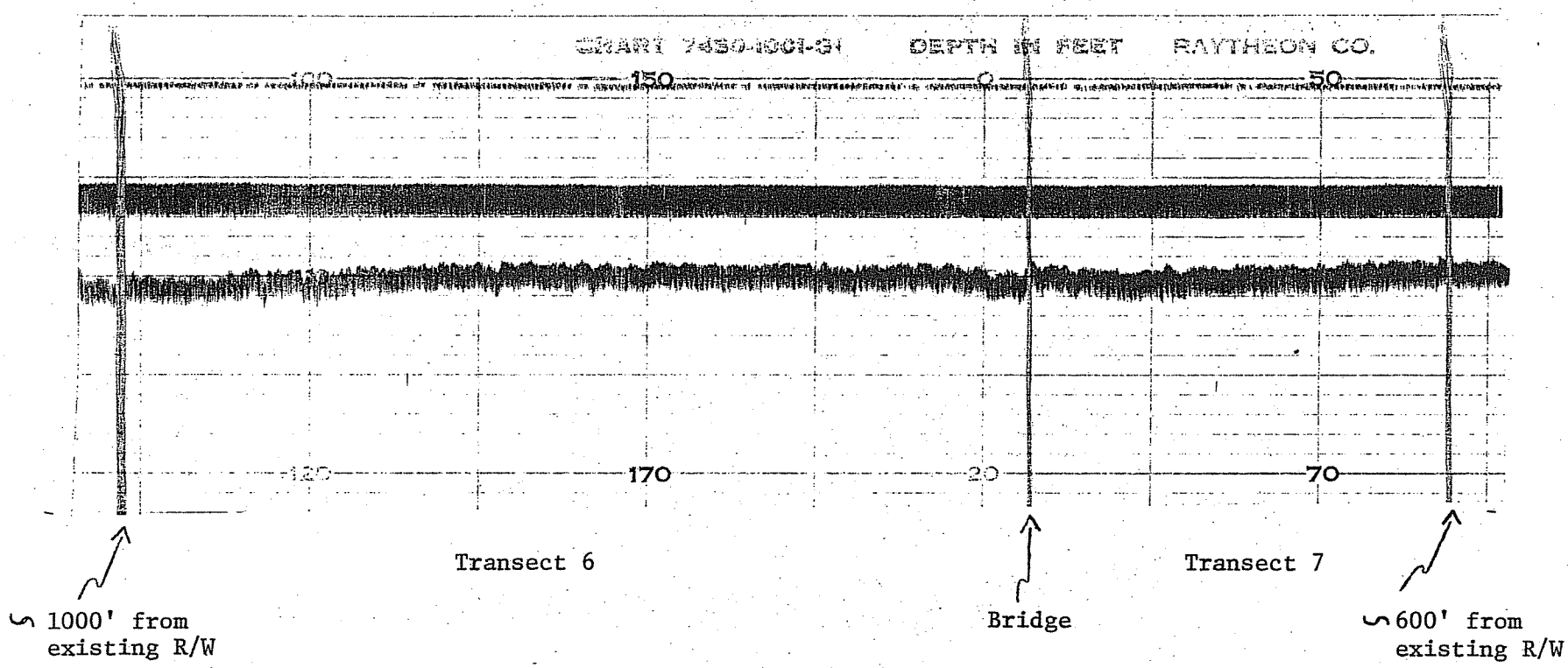
Transect 2 - Vacant & Jones and Transect 3 - Parker

Bottom Profile Recorded by Fathometer - 12 Jan. 1979



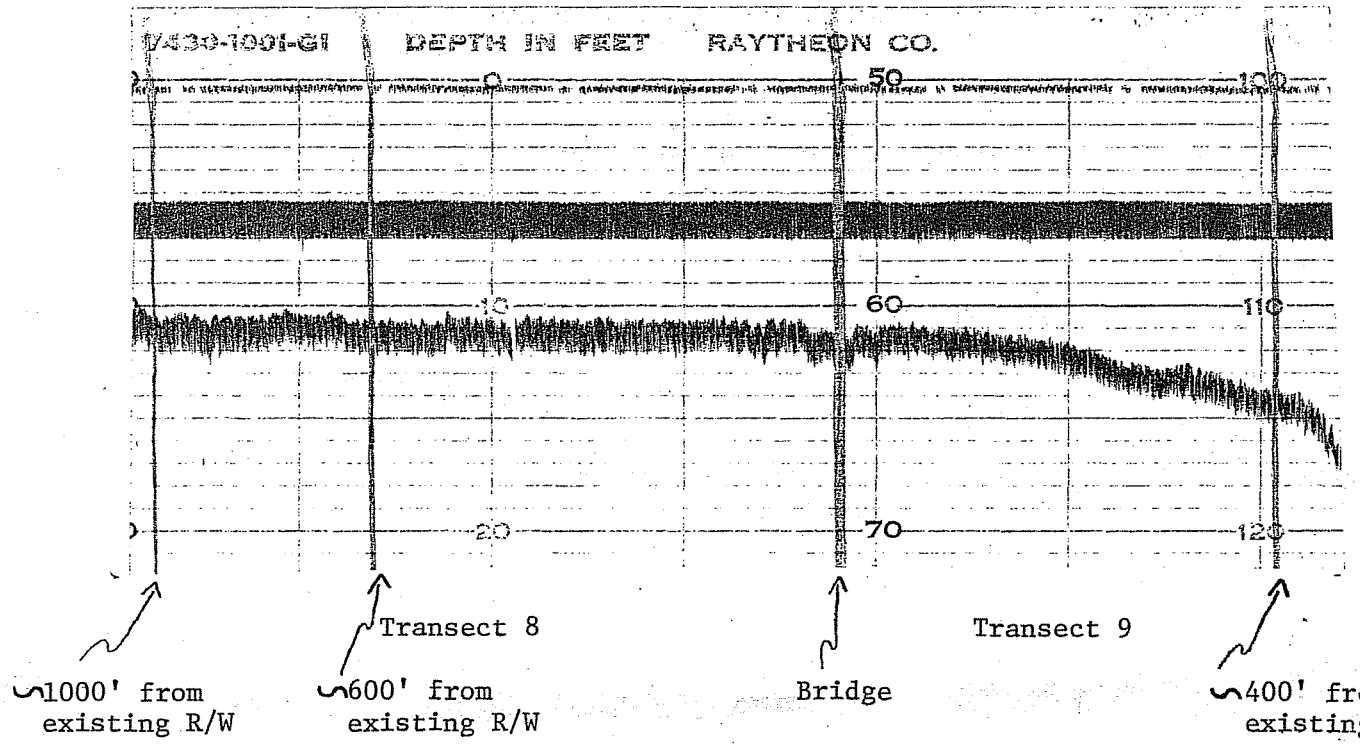
Transect 4 - Parker and Transect 5 - Adams

Bottom Profile Recorded by Fathometer - 12 Jan. 1979



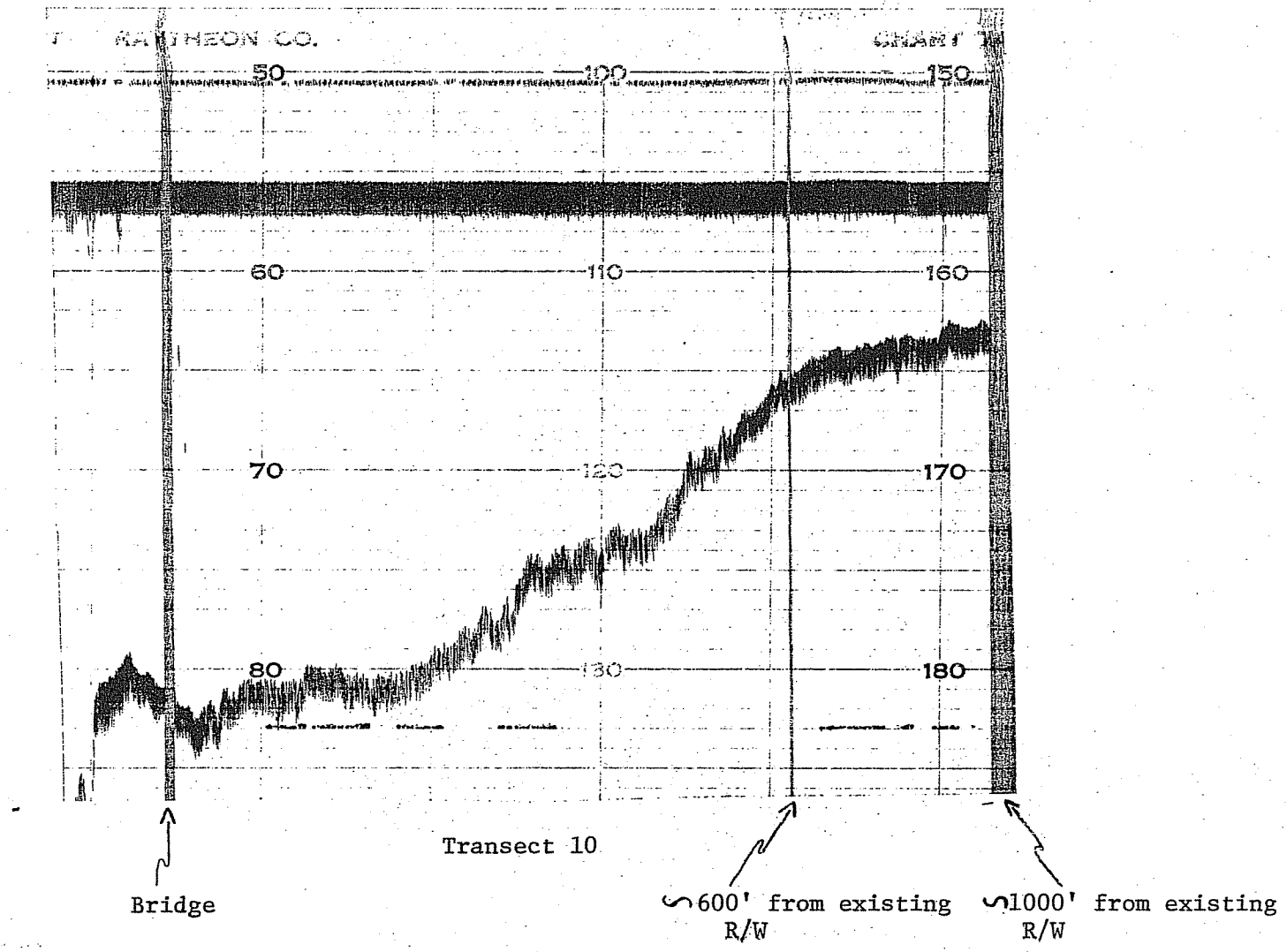
Transect 6 - Adams and Transect 7 - Parker

Bottom Profile Recorded by Fathometer - 12 Jan. 1979



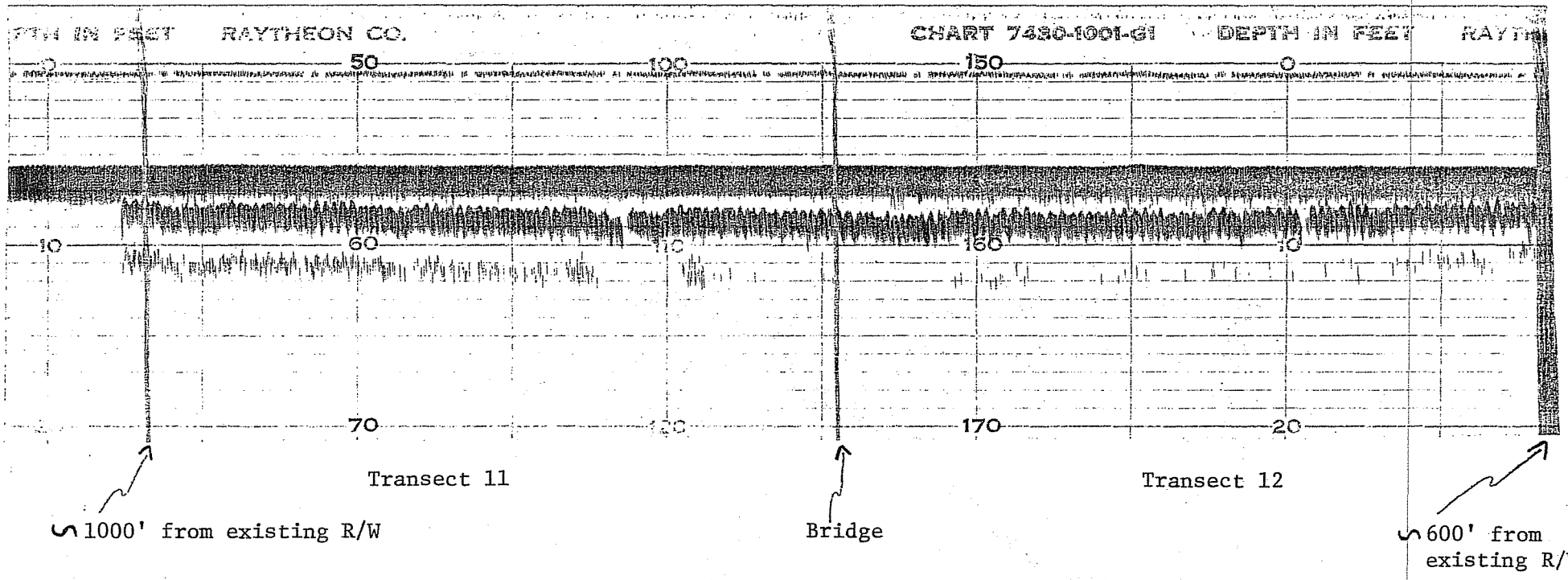
Transect 8 - Parker and Transect 9 - Vacant

Bottom Profile Recorded by Fathometer - 12 Jan. 1979



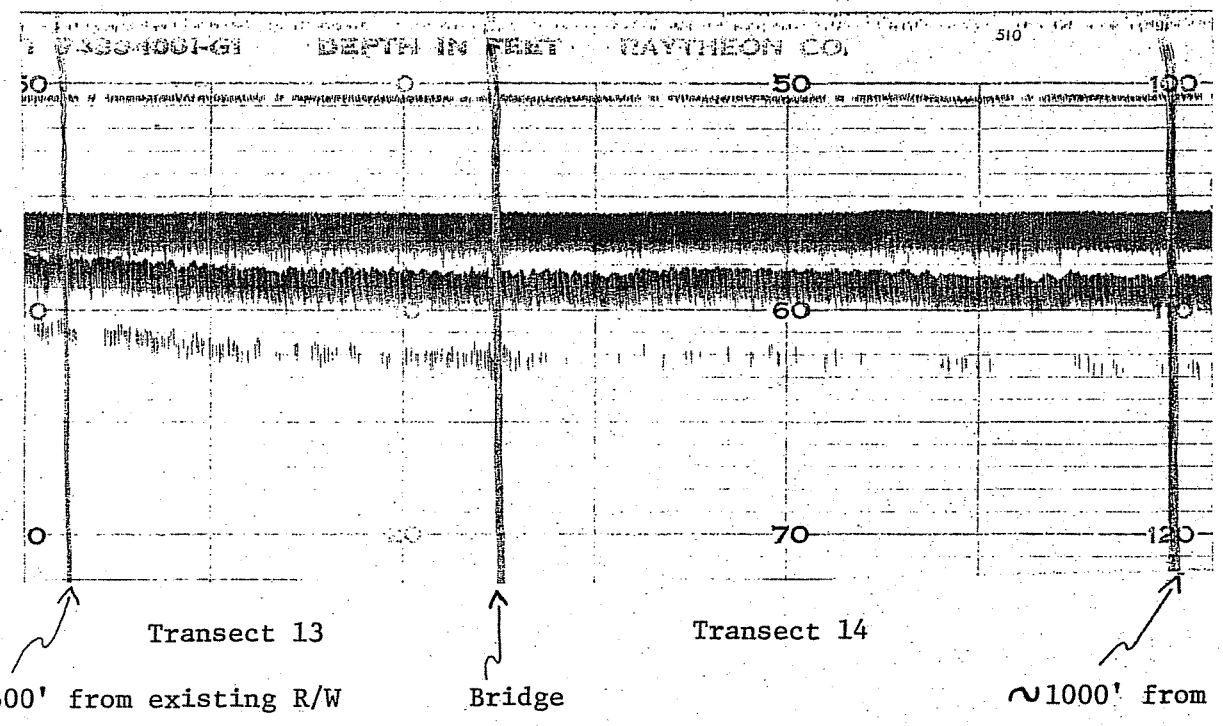
Transect 10 - Parker (between B & C) and Vacant (between A & B)

Bottom Profile Recorded by Fathometer - 12 Jan. 1979



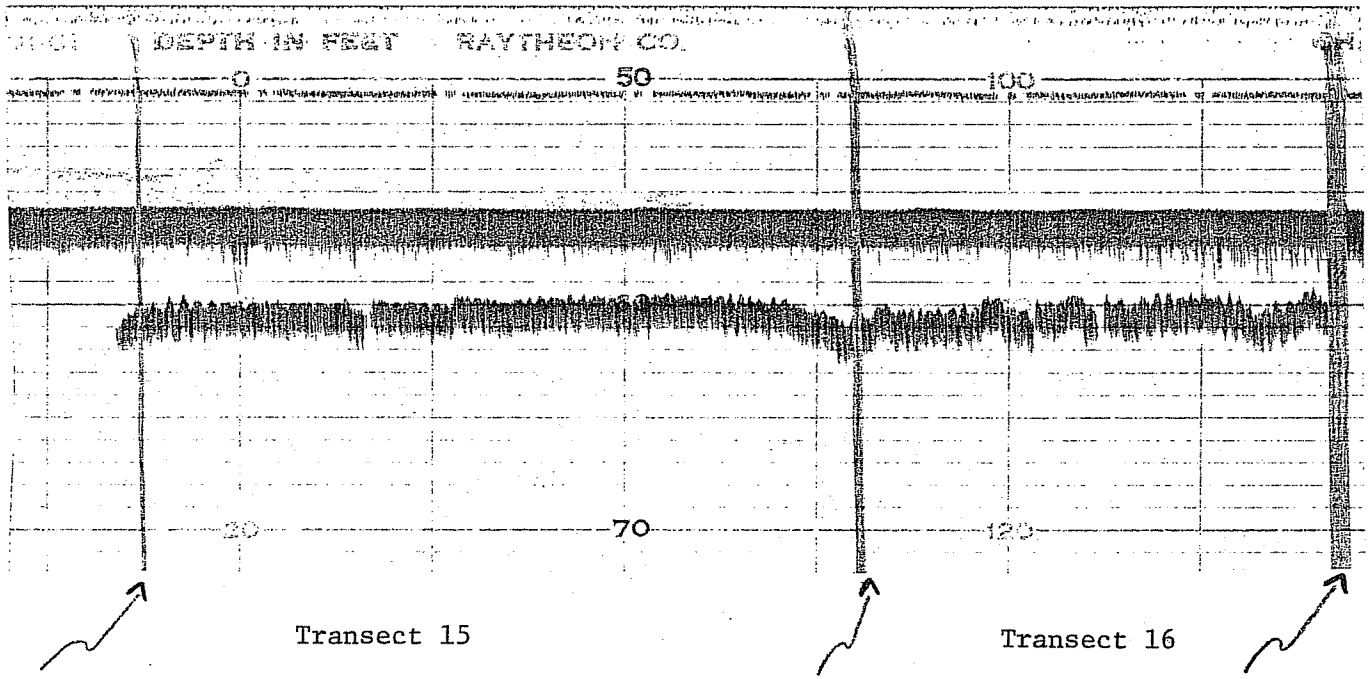
Transects 11 & 12 - Newman

Bottom Profile Recorded by Fathometer - 12 Jan. 1979



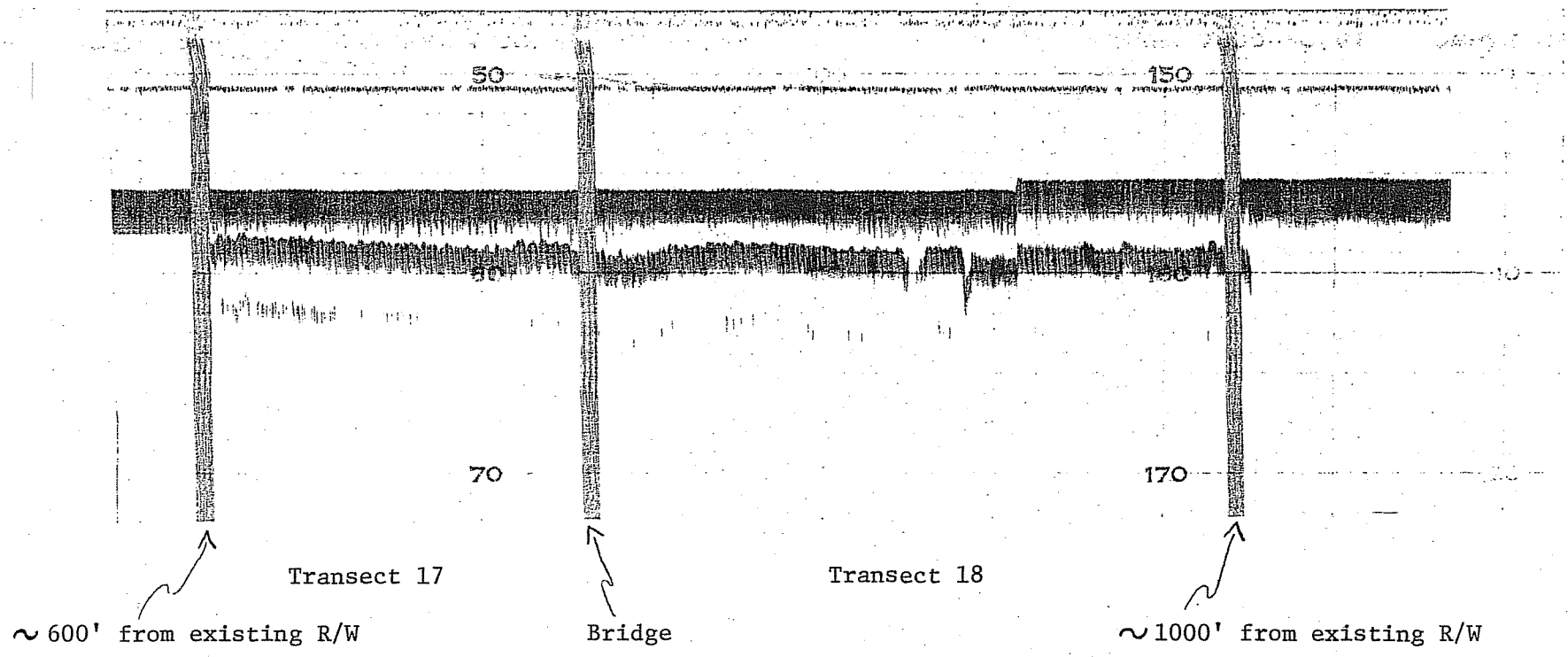
Transects 13 & 14 - Newman

Bottom Profile Recorded by Fathometer - 12 Jan. 1979



Transect 15 - Adams, and Transect 16 - Newman

Bottom Profile Recorded by Fathometer - 12 Jan. 1979



Transects 17 & 18 - Newman

Bottom Profile Recorded by Fathometer - 12 Jan. 1979