1996

Evaluation of dredge fishing activity on the seaside of Virginia's Eastern Shore, December 1994 - November 1995

Mark W. Luckenbach
Virginia Institute of Marine Science

James E. Wesson

FINAL REPORT

Evaluation of Dredge Fishing Activity on the Seaside of Virginia's Eastern Shore, December 1994 - November 1995

Submitted to:

Laura McKay
Coastal Projects Coordinator
Virginia Department of Environmental Quality
Richmond, Virginia 23219

By

School of Marine Science
Virginia Institute of Marine Science
College of William and Mary

Principal Investigators:

Mark W. Luckenbach
Virginia Institute of Marine Science
Wachapreague, Virginia 23480

James E. Wesson
Virginia Marine Resources Commission
Newport News, Virginia 23607

This report was funded, in part, by the Department of Environmental Quality's Coastal Resources Management Program through Grant #NA47OZ0287-01 of the National Oceanic and Atmospheric Administration, Office of Ocean and Coastal Resource Management, under the Coastal Zone Management Act of 1972, as amended.

Disclaimer

This report was funded, in part, by the Department of Environmental Quality's Coastal Resources Management Program through Grant #NA47OZ0287-01 of the National Oceanic and Atmospheric Administration, Office of Ocean and Coastal Resource Management, under the Coastal Zone Management Act of 1972 as amended. The views expressed herein are those of the authors and do not necessarily reflect the views of NOAA or any of its subagencies.

Acknowledgment

We are grateful for the assistance of numerous people in the conduct of this work. Sid Adams flew the plane throughout the study; Paul Rogers, Rudy Cashwell and Jake Taylor assisted in the collection of data during the flights. Paul Rogers and Hank Badger of VMRC and David Wilcox of VIMS prepared the maps with locations of fishing boats. Jake Taylor, Randy Cutter, Janet Nestlerode, Beth Hinchey, Giancarlo Cicchetti and Eric Wooden participated in the collection and identification of benthic invertebrates. Tamara Hurlock, Nancy Lewis, Jean Watkinson and Diana Bonniwell helped in the preparation of the report.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Introduction

The system of barrier islands, coastal bays and salt marshes along the Atlantic coast of Virginia's Eastern Shore support natural resources which are invaluable assets to the Commonwealth and its citizens. The system is unique along the U.S. Atlantic seaboard in its extent of undeveloped barrier islands and pristine marsh habitats. These habitats serve as nursery sites for nearshore species and support resident species, including numerous commercially important finfish and shellfish. This region (subsequently termed the Seaside) differs from Chesapeake Bay in many important aspects, including tidal regime, habitat landscapes and living resource distributions, and these differences have implications for fisheries management. This uniqueness is reflected in fisheries practices and regulations on the Seaside which often differ significantly from those in the Bay. In some cases the regulations have evolved without a full appreciation of the impacts of the fishery's activities on the habitats and their living resources. Recently concerns have been raised related to the impacts of clam (*Mercenaria mercenaria*) and crab (*Callenectes sapidus*) dredge fishing activities in this area on habitat integrity and living resources.

Dredging has a long history in Virginia's commercial fisheries. In general, dredges are scraping or digging apparatuses that harvest as they are towed behind boats under power. Mechanical dredges have been used with sail power to harvest oysters since the mid-1800's. Crabs have been harvested by power dredges since at least 1900, while dredge fishing of clams, which reside deeper in the substrate, began somewhat later. Individual crab dredges in Virginia can be a maximum of 8 ft wide and are usually pulled in pairs for a maximum total width of 16 ft. The dredge has a scraping or combing forward bar with 4 to 6 inch-long teeth that dig crabs out of the bottom sediment. The crabs then move across the bar into a chain or mesh bag. In the dredging process many materials may become dislodged from the bottom (e.g. rocks, macroalgae, vascular plants and other shellfish); those greater than the bag mesh will be retained throughout the towing period. Oyster dredges are similar in design to the crab dredge; however, they are usually only 4 ft wide. Clam dredges were originally similar to oyster dredges, but over the years as clam populations have declined, the teeth in the clam dredge have been lengthened to dig deeper, and the bag is sometimes replaced with a heavy metal cage constructed of welded reinforcing bar.

Crabs can legally be dredged in Virginia in the mainstem of the Bay and on the Seaside from December 1 to March 31. Bycatch of horseshoe crabs (*Limulus polyphemus*), conchs (*Busycon* spp.), rock crabs (*Cancer irroratus*) and clams from this fishery can also be sold. Clam harvests, as by-catch in the crab dredge fishery in the Bay, are limited to 250 per boat per day, but a special permit on the Seaside allows an unlimited bycatch.

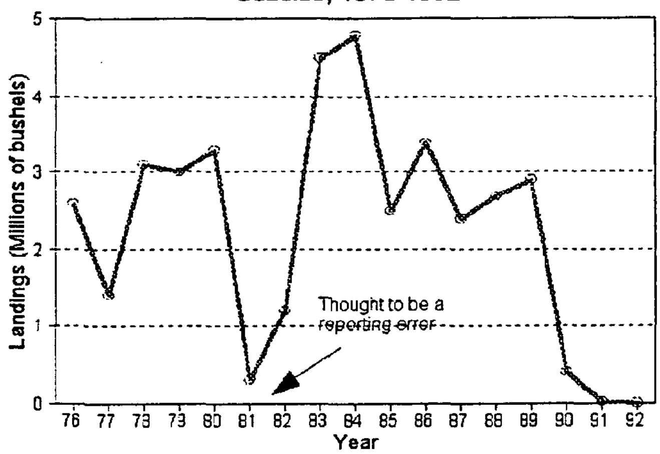
It is unlawful to harvest clams with a clam dredge from public grounds in the Bay; however, dredges can be used on private or leased bottoms. Again regulations differ for the Seaside where clam dredging is permitted year-round on private or leased grounds and from December 1 to March 31 on public and unassigned grounds. Approximately 21,000 acres of submerged bottomland on the Seaside currently are leased privately from the State and dredging permits are held for about 10,000 acres. By-catch from the clam dredge fishery is not regulated on Seaside except for crabs from April 1 through November 30.

There has been concern by researchers, fisheries managers and some watermen for many years of possible detrimental effects of dredging in the Bay and on Seaside; however, systematic studies of the impacts from these fisheries have not been conducted. On the Seaside detailed data are not available on present dredge practices and impacts. Anecdotal information suggests that clam dredging is increasing, especially as the oyster harvest has declined.

One source of concern in the clam dredge fishery is a recent pattern in lease holdings. Normally, shellfish grounds are leased for 10 year periods, but some clam leases are being dredged for a few years until most clams are caught and then the lease is abandoned and returns to the state. The State leases bottomlands for the "purpose of planting or propagating oysters" (later amended to include other shellfish) (Code of Virginia, Section 28.2-603), but it appears that this is being abused by some in the dredge fishery, who are making no effort to propagate shellfish or sustain the resource.

The reported crab dredge harvest on Seaside has plummeted from 3 - 4 million pounds annually ten years ago to almost zero during 1992 - 1993 (Fig. 1). Crab dredging still occurs on Seaside, however, because of the unlimited legal by-catch of clams. Presumably, this has added further pressure on clam populations.

Figure 1. Hard crab landings on the Seaside, 1976-1992



Another concern about these practices arises from anecdotal evidence of damage and destruction to clams and crabs during the harvesting process. Comments from some harvesters suggest that as high as 50% of the clams in the path of a dredge may be damaged. Furthermore, observational evidence suggests significant habitat damage, often dramatically altering bottom topography (M. Castagna, pers. comm.). Reports received by VMRC staff allege that dredging is occurring on public oyster rocks and in areas less than 4 feet deep (both of which are illegal). Additionally, new efforts in aquaculture of clams, oysters and scallops are potentially threatened by nearby dredging.

Sufficient concerns regarding these dredge practices were raised to the VMRC staff by late 1993 that the issue was brought before the Commission at monthly meetings in November

1993 and January 1994. At the November meeting the issue of clam dredging practices on leased grounds on the Seaside was addressed, but there were insufficient data related to resource or habitat damage to deny a lease applicant. In January 1994 the Commission held a public hearing regarding a moratorium on crab dredging on Seaside. Despite apparent continued dredging activity even when crab landings were near zero, sufficient supporting data to close the fishery were not available.

With these concerns in mind we undertook a cooperative project between VIMS and VMRC to address some of the most pressing issues related to the environmental impacts of commercial dredge fishing on the Seaside of Virginia's Eastern Shore. Our primary objectives were to assess the scope of the activity and some of its impacts. Of particular interest was determining the temporal and spatial patterns of dredging activity along the Seaside in relation to the various seasonal restrictions on both public and leased bottom habitat.

Methods

Aerial observations

We quantified the number of boats working and their locations throughout the year using aerial reconnaissance. On the Seaside individual geomorphic features are small and interspersed on spatial scales considerably smaller than throughout most of the Bay. Mid-channel and creek banks are seldom separated by more than a few yards; intertidal oyster rocks and mudflats emerge in the middle of creeks adjacent to channels. Thus, accurately determining the position of dredge boats is essential to assessing activity patterns. We wished to establish not only large-scale patterns of dredging activity (from Chincoteague Bay to Magothy Bay) but also the small-scale patterns (channels vs flats, bays vs creeks). For this reason, we used aerial observations assisted by a Global Positioning System (GPS). Throughout the project year we attempted to make weekly flights along the entire length of the Seaside and establish the location and activity of all dredge boats. In addition, we noted the locations of all boats operating patent tongs, an alternative fishing approach for clams.

The locations of all observed fishing boats were plotted onto highly detailed shoreline maps constructed by the VMRC's Surveying and Engineering Division. These maps show the locations of shorelines, channels and tidal flats, and indicate areas of public and leased bottom. Summary maps of dredging activity were produced by plotting the coordinates of all boats onto USGS maps of the region. The locations of boats using patent tongs to harvest clams were also mapped.

Impacts of Dredge Fishing

The impacts of dredging are apt to be numerous, perhaps long-term, and many are no doubt subtle. A complete accounting of these impacts was beyond the scope of this study. We addressed a few specific concerns regarding the fisheries' practices and their impacts which had been raised by the VMRC staff and by working watermen. First, by-catch from both the crab and clam dredge fisheries and the condition of animals brought onboard needed to be quantified. We accomplished this by placing observers on commercial boats and recording areas of operation, patterns of dredging, by-catch and condition of organisms caught in the dredges. There are, of course, limitations inherent in this approach. Commercial fisherman do not necessarily display normal activity when an observer is onboard (e.g., illegally pulling a crab dredge in less than 4 ft of water).

The impact of dredge fishing on bottom communities, including the target commercial species cannot be assessed in a single season. Annual patterns of population responses to repeated dredging activity would have to be addressed in a multi-year study. We attempted a first-order evaluation of the impacts of dredging by characterizing bottom communities before and after varying levels of dredging. Our first task in this evaluation was to identify a suitable experimental site which met several criteria: (*i*) it needed to have commercial quantities of clams; (*ii*) it must not have been dredged recently; and (*iii*) it either had to be leased bottom to which we could get access or public bottom which the Marine Resources Commission would be willing to close for the study duration. After considerable effort we managed to locate a site meeting all of these criteria. It is located in Hog Island Bay in a region called Spider Crab Bay. An area within Spider Crab Bay, approximately 142 acres, is leased by Mr. Buddy Bell, who has not permitted dredging at the site for over 10 years. He agreed to permit us to use the site for our study and to conduct controlled dredging experiments for us.

In June, 1995, we identified and demarcated four experimental plots in Spider Crab Bay. Each plot was a 1256 m^2 circle (20 m radius) marked with a center stake. Preliminary sampling was conducted using a Smith-MacIntyre grab, a mechanical dredge, a hydraulic dredge and a suction sampler to determine which gear provided the best quantitative sample of hard clams. The suction sampler, when used to extract the upper 15 cm of sediment within a 1.5 m diameter ring, proved to be the best for small- and medium-sized clams (shell height <2.5 inches); however, none of the methods proved adequate for quantitatively sampling larger clams. For sampling large clams we leased a hydraulically-operated escalator aboard a 45' vessel, the *Captain Josh*. This device allowed us to adjust the pressure of a hydraulic head as it moves along the bottom and jets water to extract sediment and fauna. Sample materials then move up a conveyor belt to the boat.

Three replicate suction samples were taken from randomly selected sites within each of the four plots during the second week of June, 1995. The contents of the samples were sieved through a 3 mm mesh and tranported live to the laboratory. All clams and other macrofauna were sorted live and preserved in 10% buffered formalin. During July we obtained estimates of initial density for large clams (shell height > 2.5 inches) from each of the 1256 m^2 plots by taking 3 2.79 m^2 (.46 m x 6.1 m) samples from each using the hydraulic escalator. Clams were collected from the conveyor belt as it moved along side the boat, placed into mesh bags and returned to the laboratory for enumeration and measuring.

We contracted the commercial fishing vessel *Three Brothers* to dredge these plots for clams in the manner typically used in the fishery. In this approach, the vessel first makes several loops around the center stake, travelling in concentric circles and using its propeller wake to dislodge macroalgae and hydroids. The fishermen term this "washing the bottom" and use it to reduce clogging of their dredge. The *Three Brothers* used a typical 4 ft wide clam dredge with a mesh bag attached. The teeth on this dredge were modified from the historical oyster dredge to about 6 inches for greater penetration into the sediment. This dredge had a standard mesh bag, rather than the modified cage, attached (see description of modified dredge on pg. 14). The dredge was deployed over the side of the boat and was then pulled in concentric circles around the center stake. Typically a single circular area of this size (radius approximately 20 m) will be dredged from 1 - 3 hours, depending upon the clams it is yielding and the stage of the tide. Although we contracted the *Three Brothers* to dredge only two of the four plots (leaving two as undredged controls), when few clams were found in the first two plots, the operator dredged the remaining two. As Table 1 indicates, the dredging time and numbers of clams recovered from each plot varied.

Table 1. Dredging time, clam landings and bycatch for each of the experimental plots.

Plot	Dredging time (min)	Clams Caught	Clams Damaged	Bycatch
A	53	8	2	20 blood clams, blue crabs, spider crabs, conch, horseshoe crabs
B	54	11	3	11 blod clams, blue crabs, spider crabs
C	27	30	0	5 blood clams
D	62	975	11	32 blood clams, 4 conch

Shortly after the dredging of the plots was completed, we returned to the site and repeated the sampling with the suction sampler. As before three replicate suction samples were taken from each of the four plots. The contents of the samples were sieved through a 3 mm mesh screen and tranported live to the laboratory. All clams and other macrofauna were sorted live and preserved in 10% buffered formalin. These samples were followed by another sampling with the hydraulic escalator to estimate post-dredging densities of large clams. As before 3 replicate 2.79 m^2 samples were taken from each of the 4 plots.

Underwater still photographs and video were taken of selected locations in all plots before and after dredging. Unfortunately, water clarity at that time of the year was very poor and little of the bottom was visible.

Results

Dredging Activity

Over the period from December 1, 1994 - November 30, 1995 we made a total of 39 flights along the entire length of the Seaside of Virginia's Eastern Shore and recorded the position and activity of all observed commercial fishing vessels (Table 2). Flights were necessarily restricted to times of good weather and visibility, and they were generally timed to correspond to high tides when fishing activity was presumed to be the greatest in these habitats. The precise locations of all clam dredging, crab dredging and patent tonging boats and the dates on which they were observed are shown in Appendix I plotted on the VMRC shoreline maps. These small-scale maps show the fishing activity in relation to shorelines, channels, leased bottom and public grounds. These plots are summarized on USGS shoreline maps for the entire Seaside (Figure 2) and smaller regions extending from Fisherman's Island in the south to Chincoteague Bay in the north (Figures 3-7). These results show that these fishing activities extend throughout the coastal bay system and indicate some regions where they are concentrated. We will discuss these results separately for crab and clam dredging activities.

<u>Crab dredging</u> - Crab dredge season extends from December 1 through March 31 during which time crabs may be legally dredged from public bottoms greater than 4 ft in depth. Crab dredge boats are easily recognized by the stern deployment of their dredge (in contrast to clam dredges which are deployed over the side of the boat). The average number of crab dredge boats observed in this study declined over the course of the season from approximately 7 boats/day in December to 2 in March; no crab dredge boats were observed after the close of the season in April (Fig. 8). Most of the observed activity was on public and unassigned ground with only an occasional crab dredger observed on leased grounds (Fig. 9). We observed crab dredgers widely distributed along the seaside (Fig. 2). Though we cannot determine precisely whether or not all boats were in 4 ft or greater water depth, crab dredgers were not generally observed in shallow water and many mapped to channels on the USGS shoreline maps (Figs. 3-7).

Table 2. Observations of fishing activity from overflights of the Seaside, Dec. 1994-Nov. 1995. Numbers of boats crab dredging, clam dredging and patent tonging are indicated.

Date	# Crab dredgers	#Clam dredgers	#Patent tongers
12/02/94	0	6	4
12/16/94	10	7	3
12/21/94	10	8	6
12/22/94	16	11	4
1/03/95	19	9	10
1/06/95	6	7	2
1/09/95	9	9	5
1/25/95	4	5	1
1/27/95	1	4	3
1/31/95	8	6	7
2/24/95	4	4	2
3/03/95	7	2	2
3/10/95	1	0	2
3/24/95	0	0	1
3/27/95	1	2	1
4/27/95	0	5	2
5/03/95	0	4	1
5/12/95	0	1	3
5/17/95	0	3	0
5/23/95	0	1	0
6/02/95	0	6	0
6/5/95	0	4	0
6/16/95	0	5	2
7/06/95	0	2	1
7/13/95	0	3	0
7/20/95	0	2	1
7/24/95	0	1	1
8/04/95	0	1	1
8/10/95	0	3	1
8/23/95	0	2	0
8/31/95	0	0	1
9/12/95	0	0	0
9/25/95	0	2	0
10/11/95	0	3	5
10/25/95	0	4	4
11/06/95	0	5	4
11/17/95	0	4	2
11/21/95	0	0	2
11/30/95	0	1	2

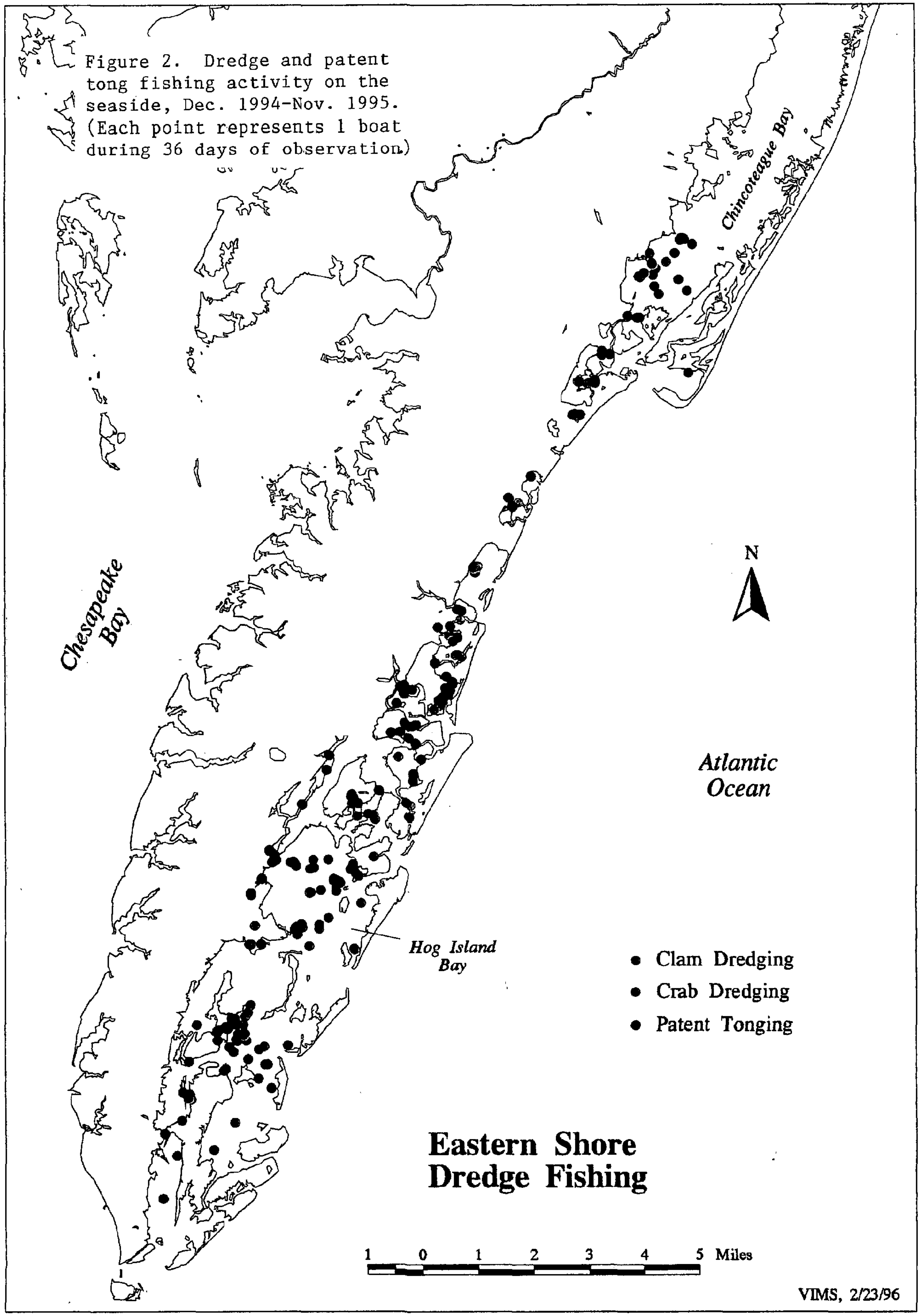
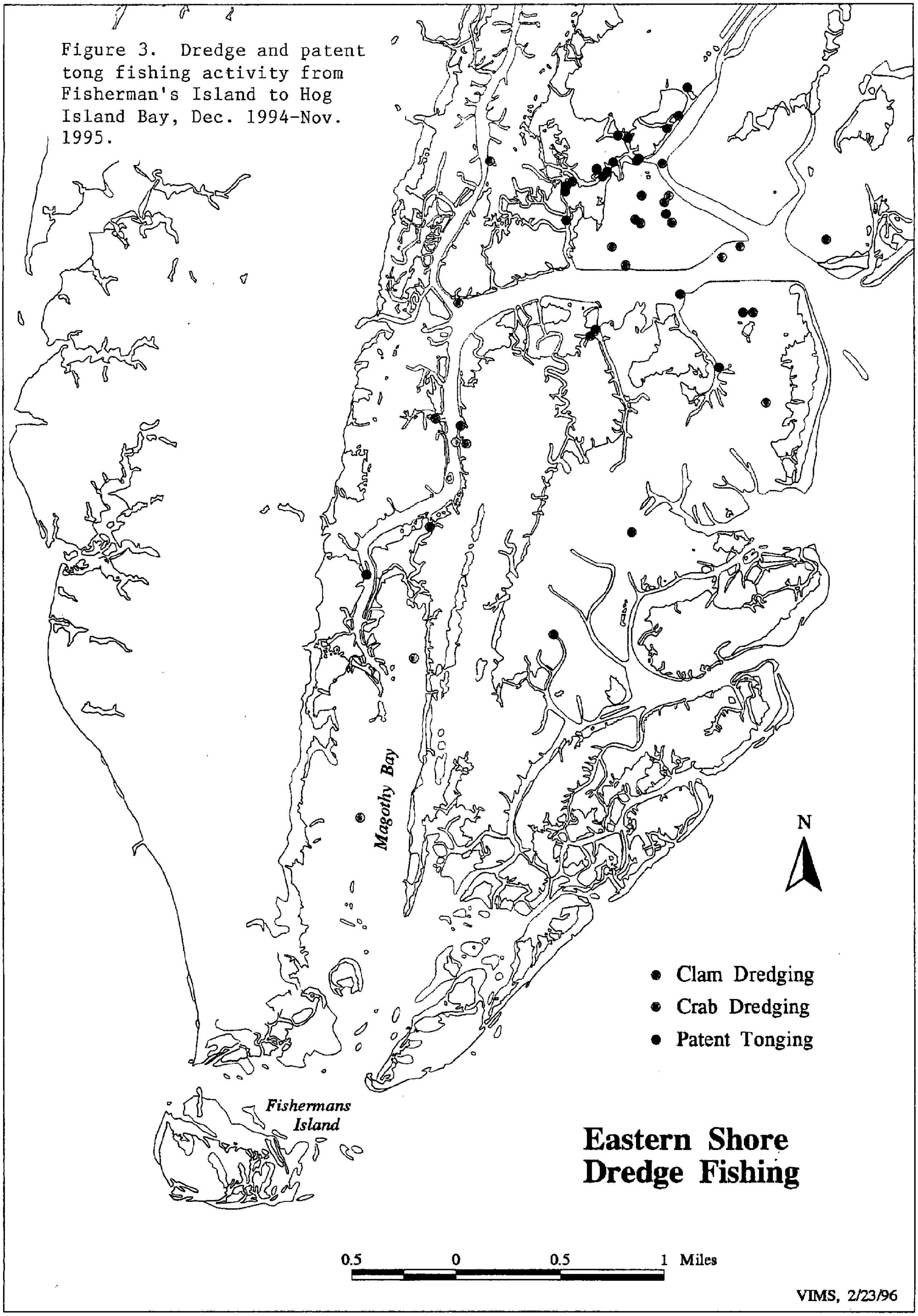


Figure 2. Dredge and patent tong fishing activity on the seaside, Dec. 1994-Nov. 1995. (Each point represents 1 boat during 36 days of observation)
Chincoteague Bay
Chesapeake Bay
N
Atlantic Ocean
Hog Island Bay
Clam Dredging
Crab Dredging
Patent Tonging
Eastern Shore Dredge Fishing
1 0 1 2 3 4 5 Miles
VIMS, 2/23/96

Figure 3. Dredge and patent tong fishing activity from Fisherman's Island to Hog Island Bay, Dec. 1994-Nov. 1995.



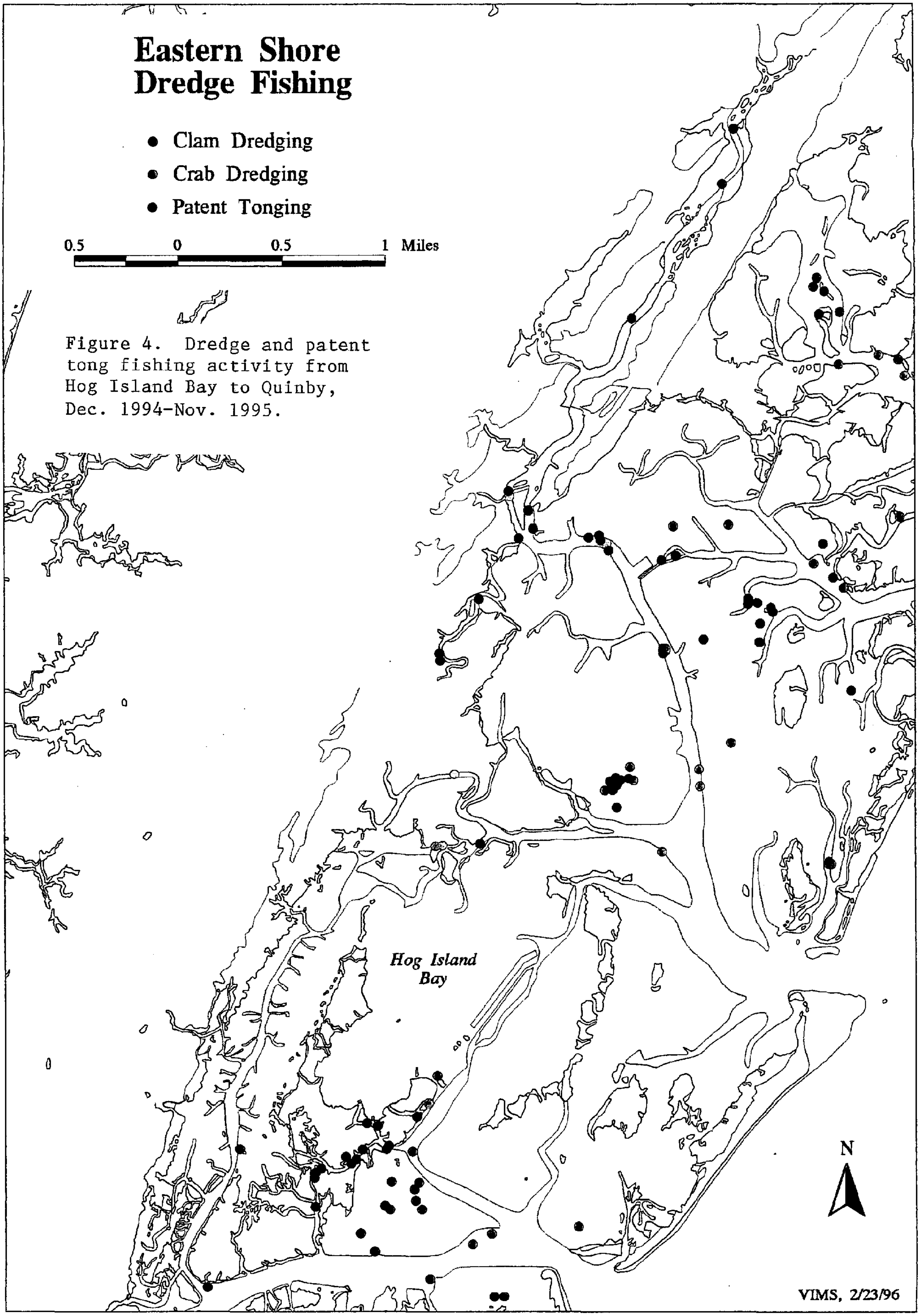


Figure 4. Dredge and patent tong fishing activity from Hog Island Bay to Quinby, Dec. 1994-Nov. 1995.

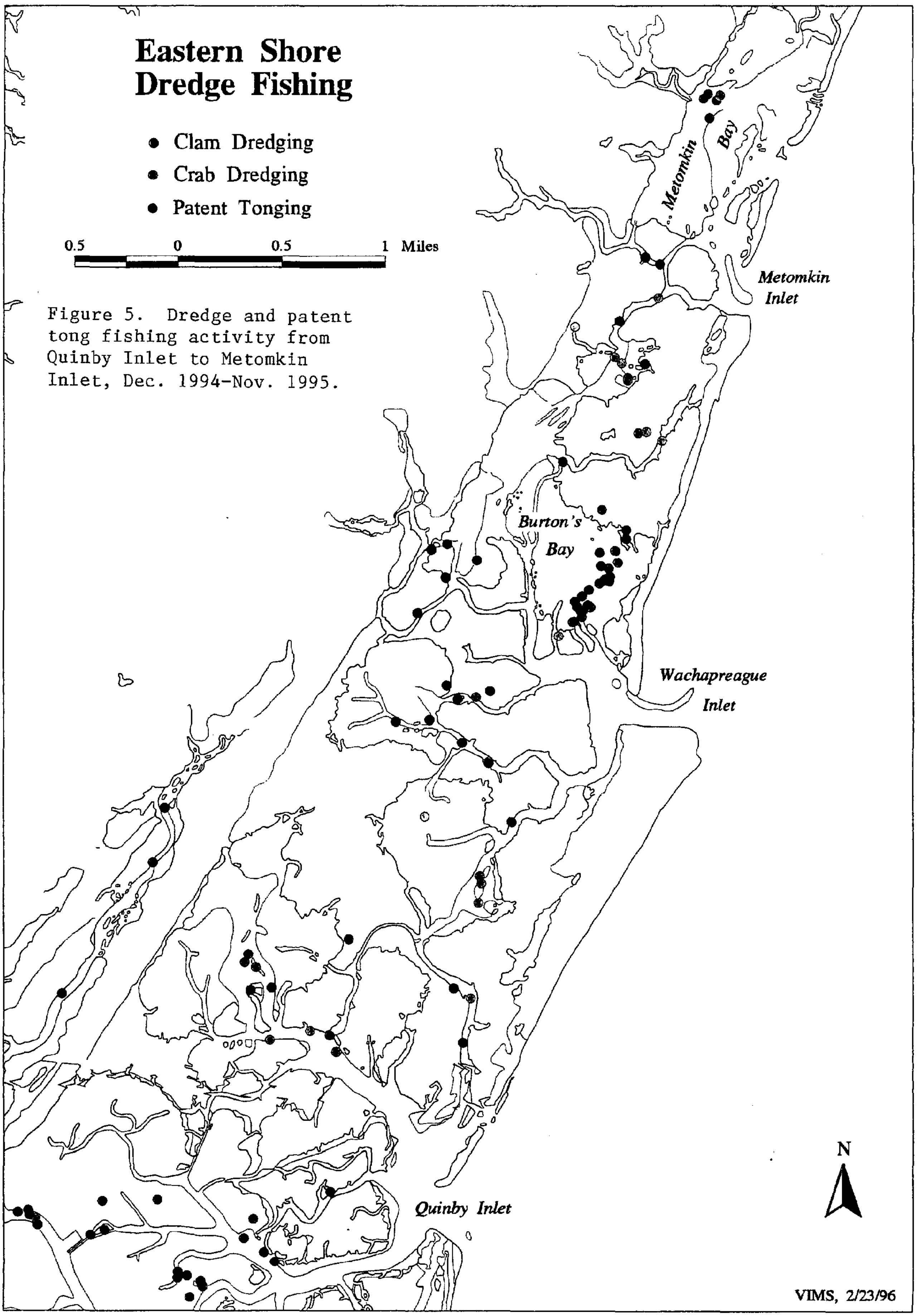


Figure 5. Dredge and patent tong fishing activity from Quinby Inlet to Metomkin Inlet, Dec. 1994-Nov. 1995.

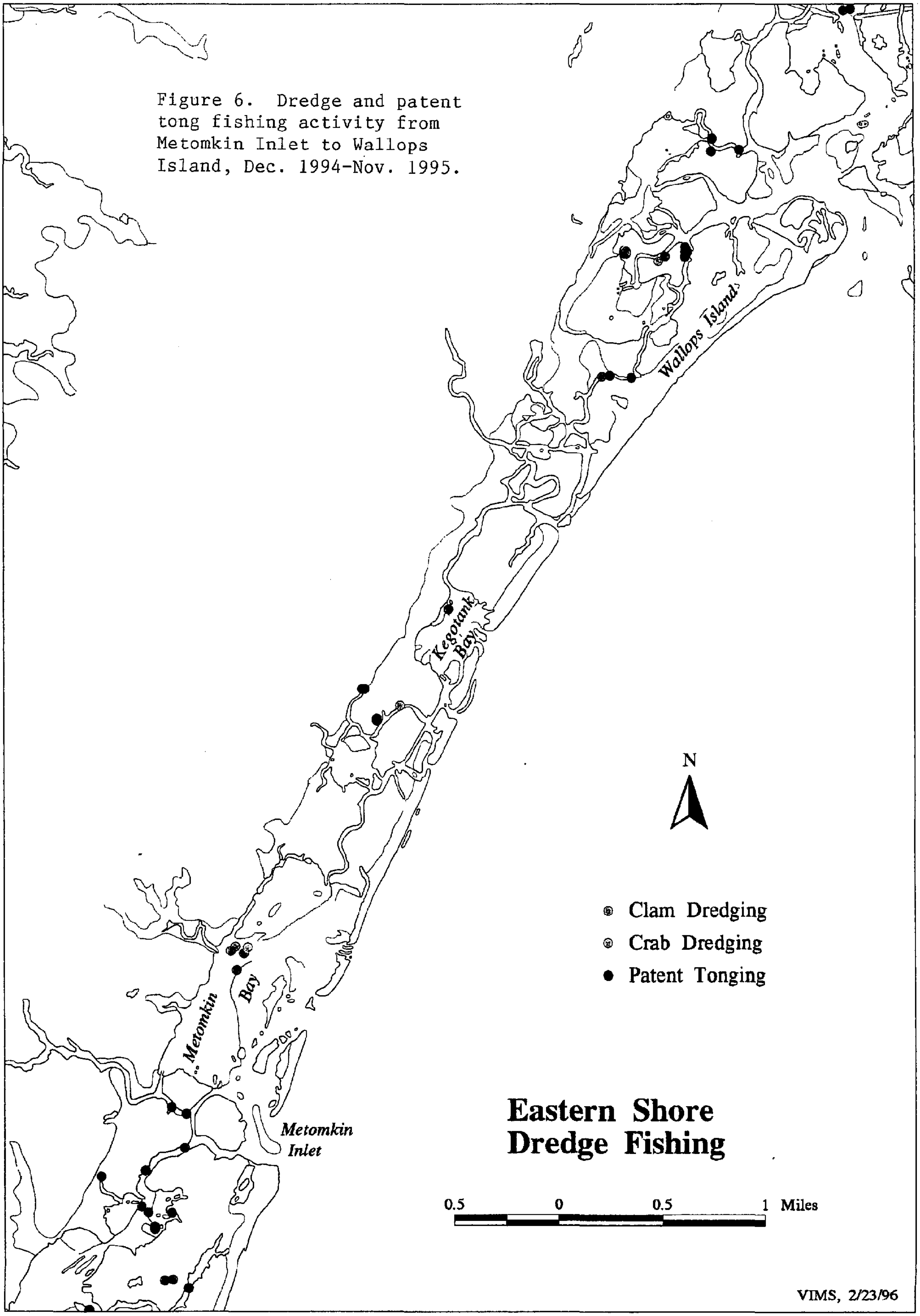


Figure 6. Dredge and patent tong fishing activity from Metomkin Inlet to Wallops Island, Dec. 1994-Nov. 1995.

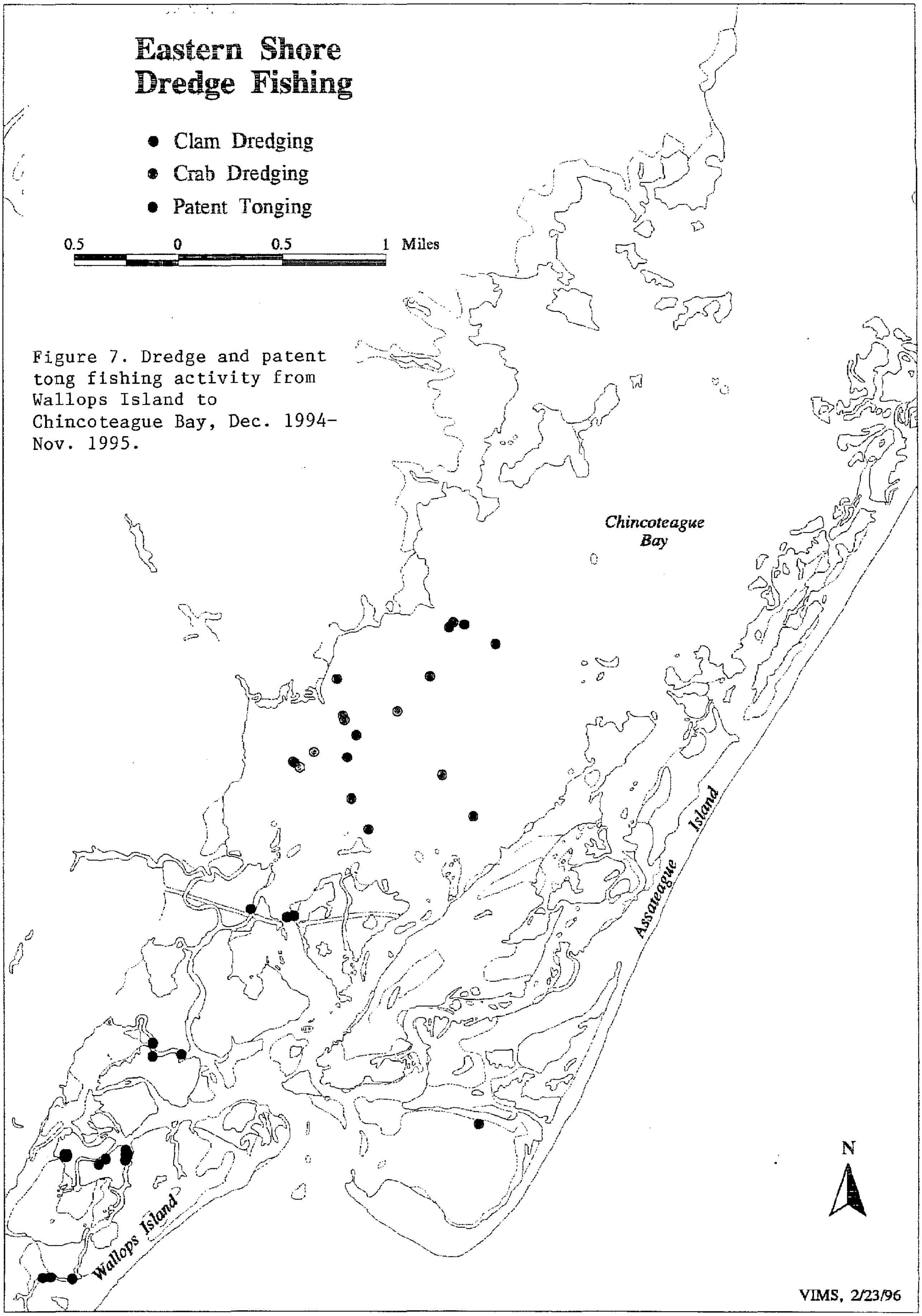


Figure 7. Dredge and patent tong fishing activity from Wallops Island to Chincoteague Bay, Dec. 1994-Nov. 1995.

Clam dredging - On the Seaside clam dredging is permitted on public and unassigned grounds from December 1 through March 31 and on private grounds year round. Clam dredge boats were observed throughout the year, but the number of boats was never high; monthly averages ranging from 8 boats/day in December 1994 to near 1 boat/day in March and September 1995 (Fig. 10) and the largest number of clam dredge boats observed on 1 day was 11 (Table 2). Our data reveal the greatest proportion of clam dredging activity on public grounds during November through February (Fig. 11). Clam dredging was distibuted along the entire length of the Seaside (Fig. 2), but was clearly concentrated on a few shallow water habitats in Hog Island Bay (Figs. 3 & 4), Burton's Bay (Fig. 5) and Chincoteague Bay (Fig. 7).

Two types of dredges are presently used by clam dredgers on the Eastern Shore. The basic design is taken from the historically-used oyster dredge; it is generally 4 ft wide and has a forward scraping bar with 6 - 8 inch teeth. One type uses a mesh bag at the end to catch the clams and the other uses a heavy metal cage which allows the dredge to dig deeper into the bottom. Recently this design has become so exaggerated that in some cases the dredge acts as an anchor that allows the power boat propeller to stir and fluidize the bottom, thereby digging or "kicking" the clams out of the bottom. Using a boat's propeller to hydraulically fluidize the bottom is illegal if done with an anchor, but this regulation is now circumvented with the use of these heavy dredges. We did not obtain data on the number of boats using each type of dredge or on the relative amount of area dredged by each. Conversations with dredge fishermen indicate that dredges with bags are preferred in habitats with soft mud bottoms and dredges with cages are preferred in habitats with sand or clay bottoms.

Impacts of dredge fishing

Crab dredging - We sought to position an observer onboard a commercial crab dredge boat on several occasions during the entire season, December through March. Initially we received good cooperation from some fishermen and we collected data aboard three boats during December 1994 and January 1995. After that period, we had difficulty gaining access, particularly aboard other dredge boats. We were expressly denied access aboard any boats during spring high tides, when the shallow flats (presumably with good clam resources) were accessible. Table 3 summarizes our findings with regard to crab harvest, crab damage and by-catch from the dredge boats we were permitted aboard. During our observations all dredging was conducted in waters with greater than 4 ft depth. Crab landings during these observations ranged from 1 - 14 bushels and the percentage of damaged from 0 to 100%. Also, the number of clams caught varied considerably, from as few as 20 to 1200. On two occasions during which we were aboard the dredge boat *Samantha* was clearly targeting blood clams (*Noetia ponderosa*).

Figure 8. Crab dredging activity. Monthly average number of boats per day, Dec. 1994-Nov. 1995.

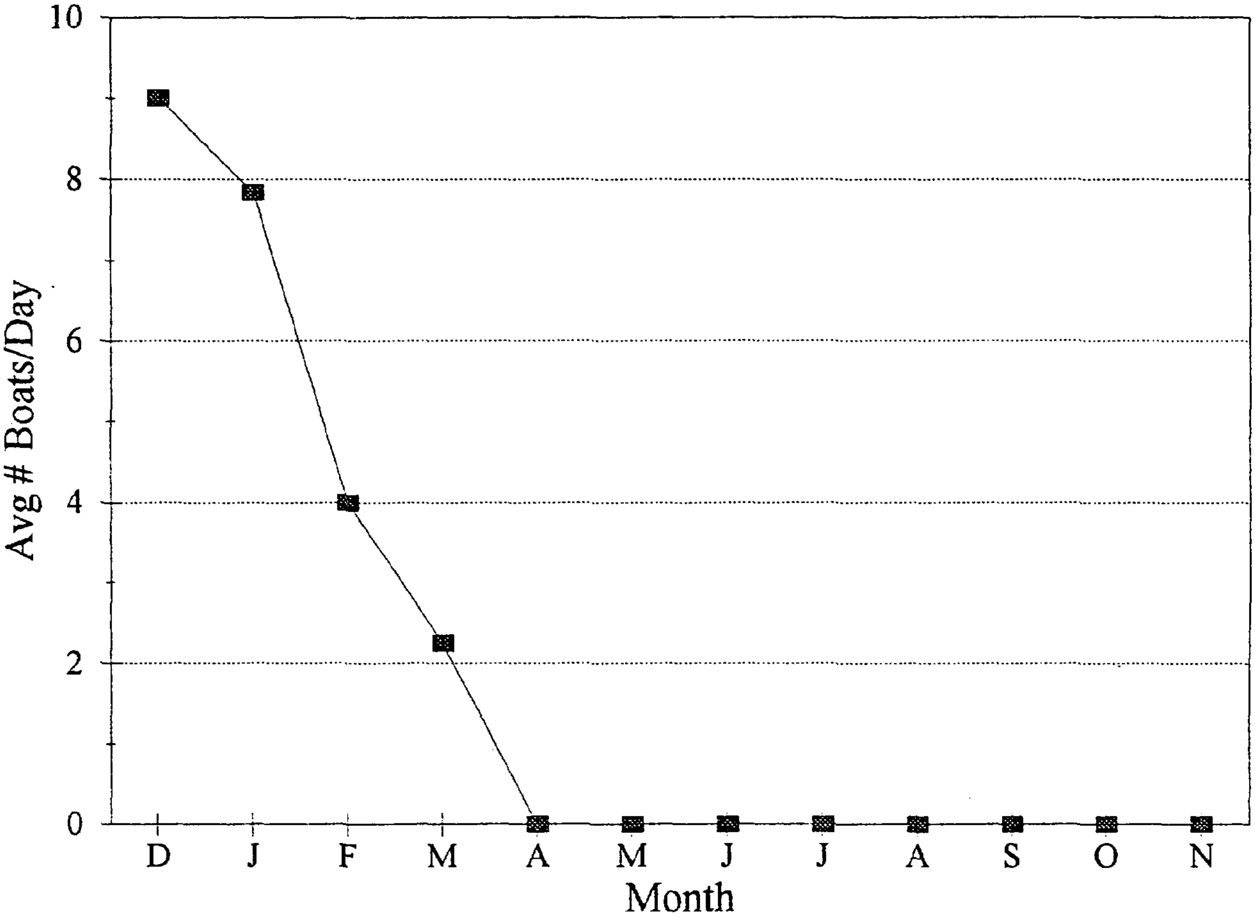


Figure 9. Crab dredging activity by lease status, Dec. 1994-Nov. 1995.

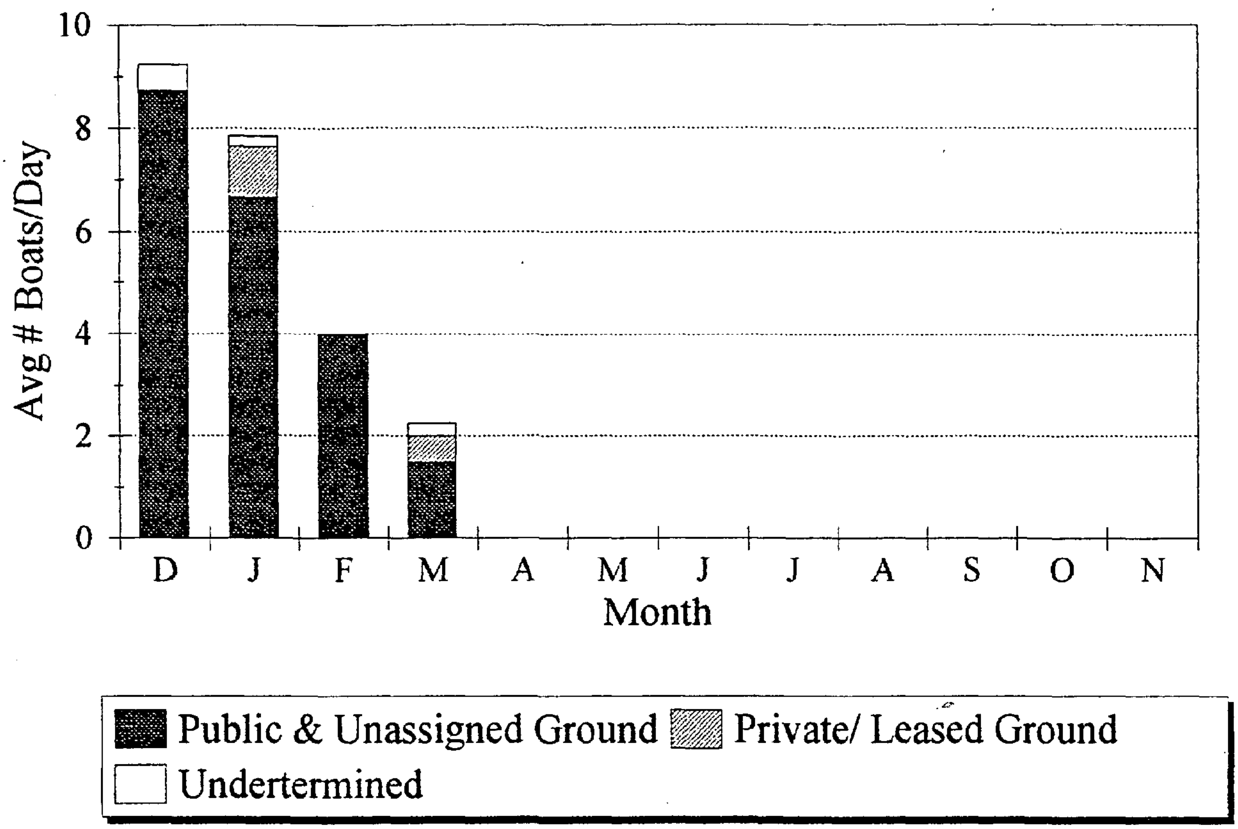


Figure 10. Clam dredging activity. Monthly average number of boats per day, Dec. 1994-Nov. 1995.

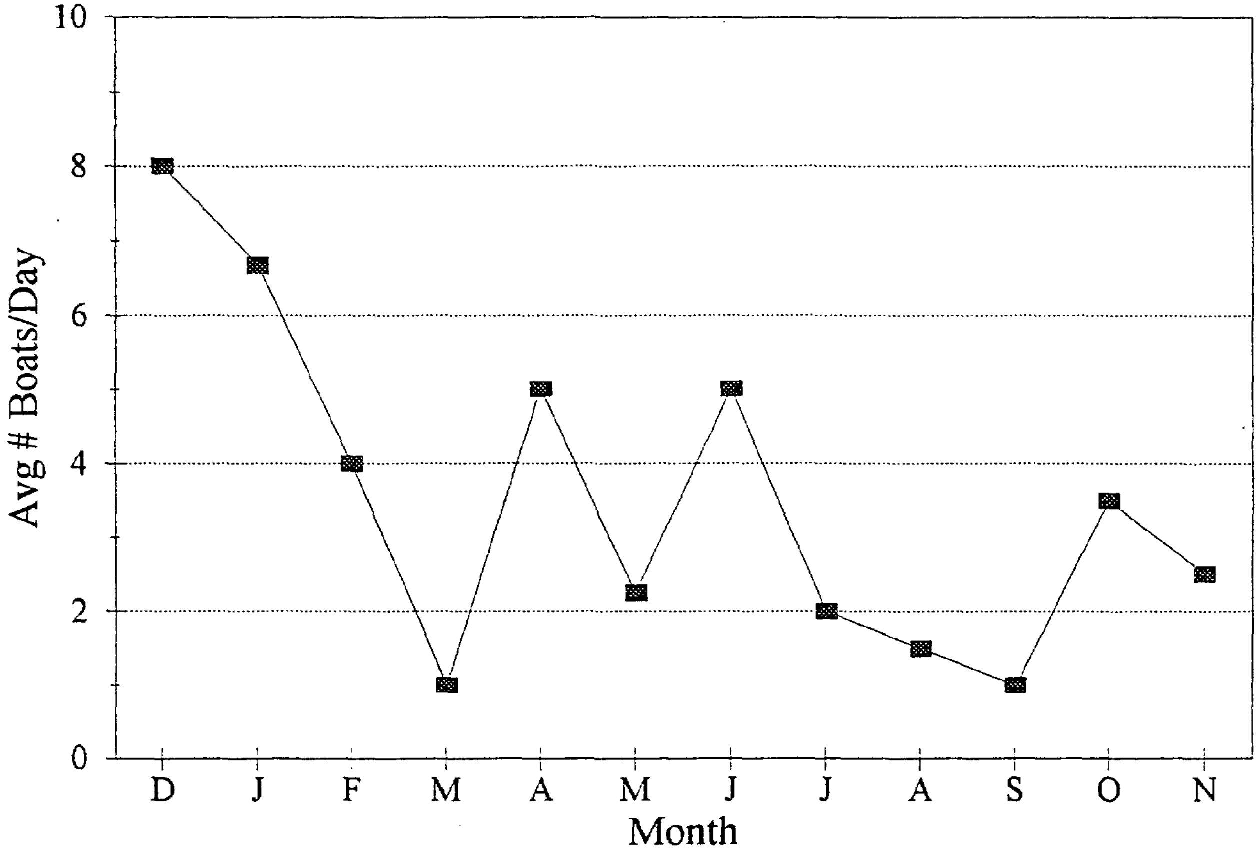


Figure 11. Clam dredging activity by lease status, Dec. 1994-Nov. 1995.

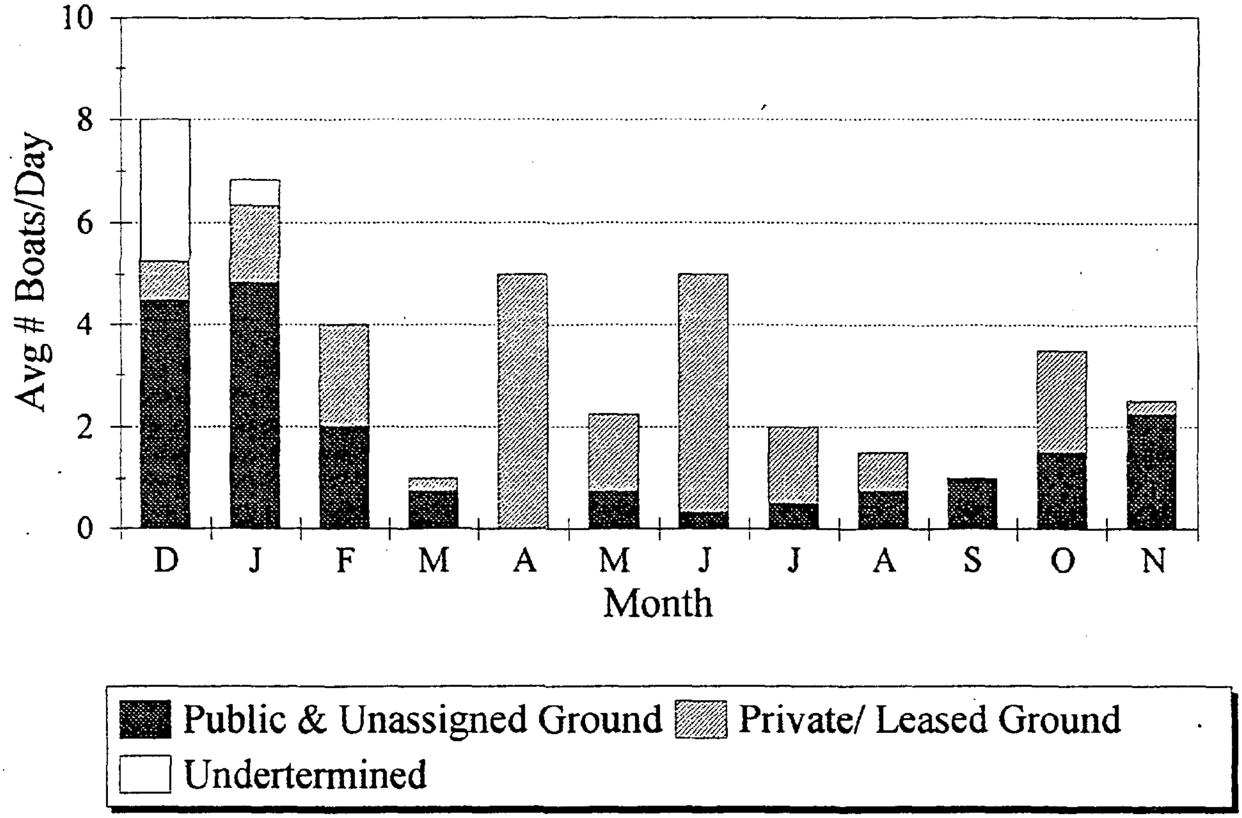


Table 3. Crab landings and bycatch from observations onboard commercial dredge boats.

Date	Boat	Area of Operation	Crabs Caught	Crabs Damage	Clams Caught	Clams Damage	Other Bycatch
12/20/94	*Ellen Marie*	Wachapreague Channel	11 bushels	<2%	150 indiv	3 indiv	45 flounder 6 windowpane rock crabs
12/21/94	*Samantha*	Machipongo River	10 bushels	none	20 indiv	none	3200 blood clams 50-100 rock crabs/tow
12/22/94	*Ellen Marie*	Hog Island Bay	1 bushel	20%	20 indiv	none	10 blood clams rock crabs
1/10/95	*Barbara J*	Chincoteague Bay	6 bushels	6 bushels	1200	1-2/tow	holothurians
1/25/95	*Samantha*	Machipongo River	14 bushels	none	115	none	3000 blood clams, 15-20 rock crabs/tow, 1 window-pane, 2 summer flounder

<u>Clam dredging</u> - During the course of the study we became aware of the potential for difference in damage to clams among dredge types. Though we did not conducted a replicated experiment to compare dredge effects a few *post hoc* comparisons can be made (Table 4). These data are confounded by several factors, including boat, dredge size and area of operation; however, they reveal a pattern consistent with that expressed to us by some watermen: The modified dredge with the cage resulted is significant damage to clams when used in a sandy habitat.

Table 4. Clam landings and bycatch from observations onboard commercial dredge boats.

Boat	Bottom Type	Dredge type	Dredge Width (ft)	Area of operation	Dredge Time (hr:min)	Clams Caught	Clams Damaged	Ratio Damaged/Caught	Bycatch
Three Brothers	Mud	Bag	4	Drum Hole	3:19	6025	117	0.019	200 blood clams, conch
Billie Crystal	Sand	Cage	2.7	South Bay	2:37	2245	286	0.127	4 conch
Billie Crystal	Mud	Cage	2.7	South Bay	1:08	230	6	0.026	2 conch

The number of clams in the experimental plots declined after dredging, but the observed pattern was not consistent with the time spent dredging or the numbers of clams caught by the dredger (see Table 1 and Fig. 12). The declines which we observed may have been related to the dredging activity or other undetermined factors. Infaunal biomass from the suction sampling showed declines in 3 of the 4 plots after dredging (Table 5 and Figs. 13-16), but the decline was statistically significant in only one case. The one plot which had increased infaunal abundances was subjected to the least amount of dredging (see Tables 1 & 5). Again, because all plots were inadvertently dredged, we are unable to confirm that this change is related to the dredging itself. (See Appendix II for a complete listing of the infaunal abundances and biomass by species).

Table 5. Average biomass of benthic infauna other than *M. mercenaria* before and after dredging in each plot in Spider Crab Bay. Values are means and (SD). [* indicate significant differences at p≤ 0.05.]

	Total Infaunal biomss (g wet wt/m^2)	
Plot	**Before Dredging**	**After Dredging**
A	42.31 (18.45)	34.29 (21.95)
B	38.75 (26.03)	2.18 (1.46)*
C	25.44 (14.17)	74.84 (17.37)*
D	23.87 (17.51)	4.18 (3.29)

Figure 12. Clam densities determined by hydraulic escalator before and after dredging. (Dredging time per plot given in Table 1)

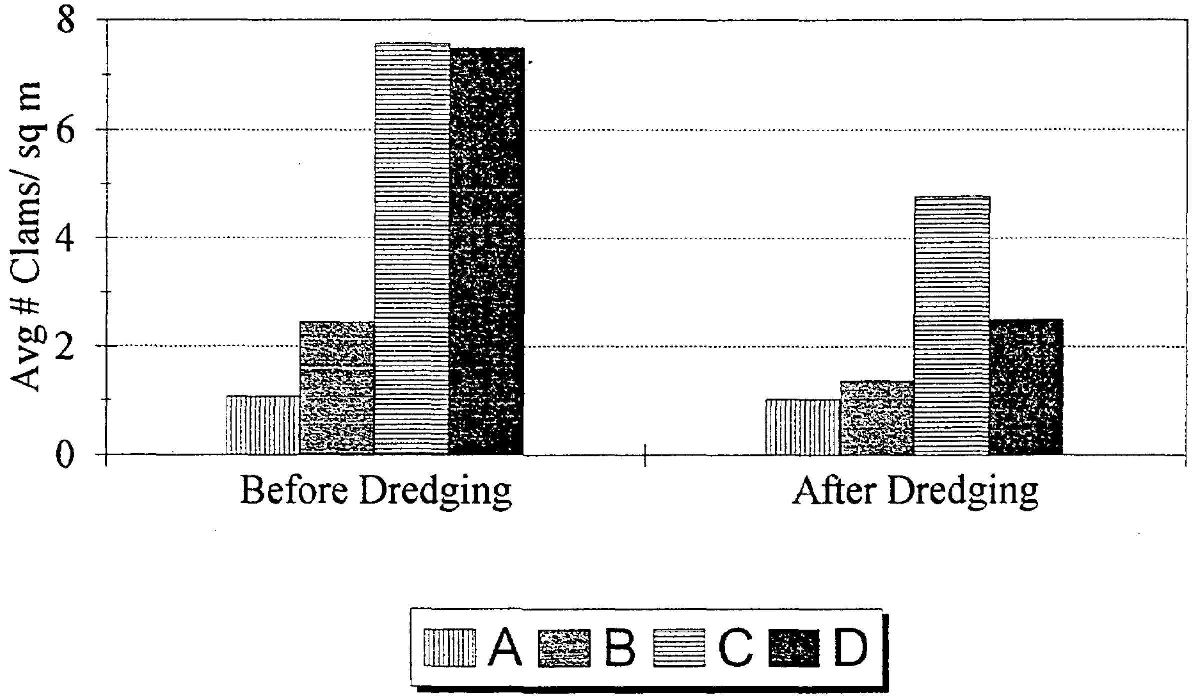


Figure 13. Infaunal biomass, other than *M. mercenaria*, before and after dredging for Plot A

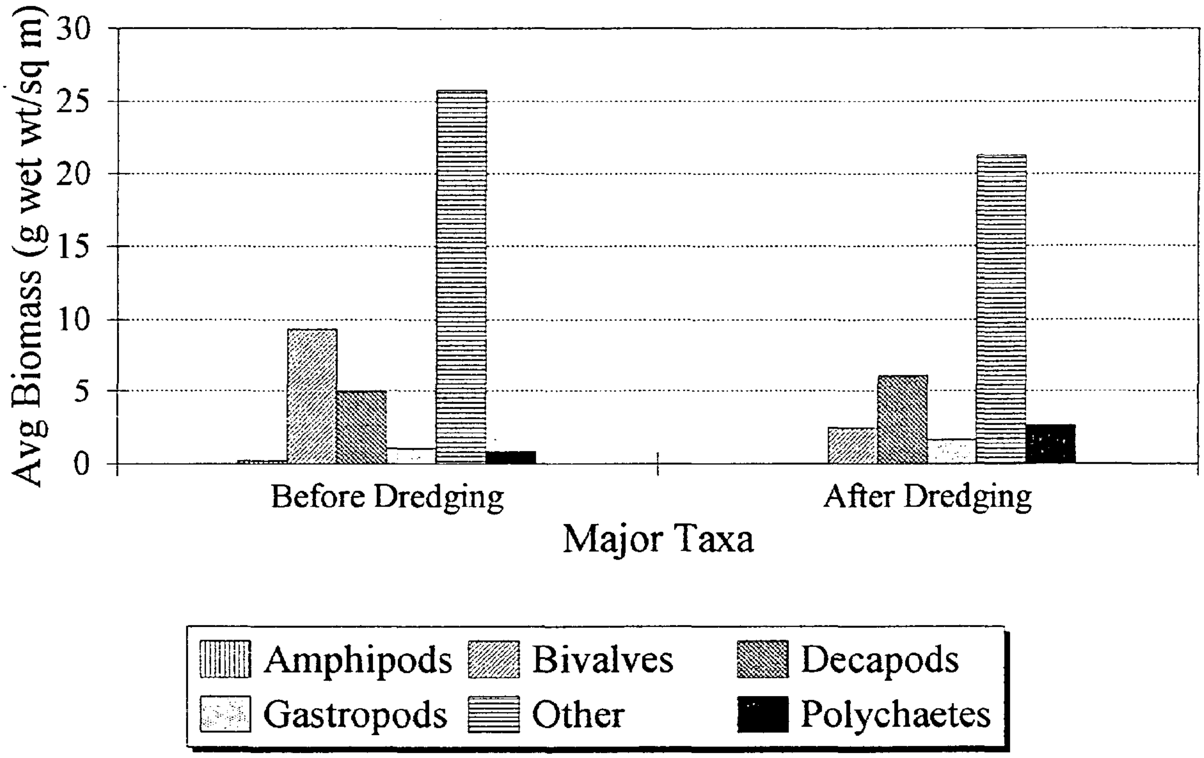


Figure 14. Infaunal biomass, other than *M. mercenaria*, before and after dredging for Plot B

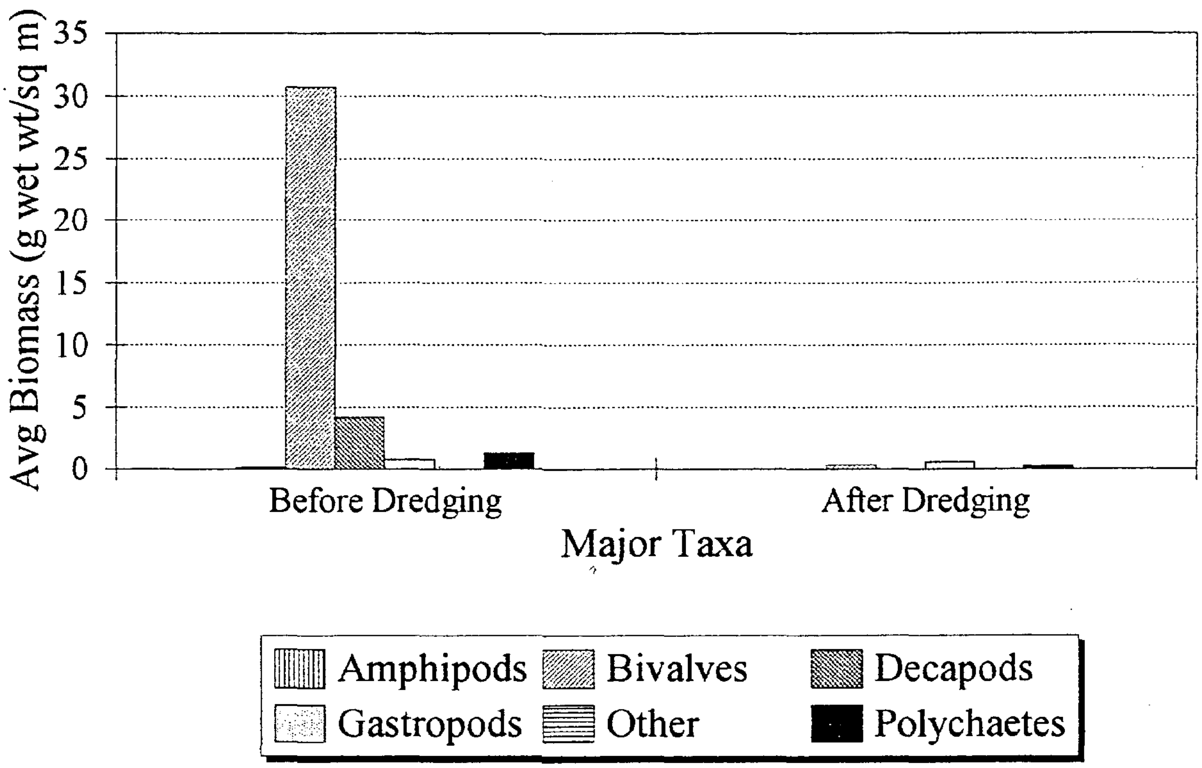


Figure 15. Infaunal biomass, other than *M. mercenaria*, before and after dredging for Plot C

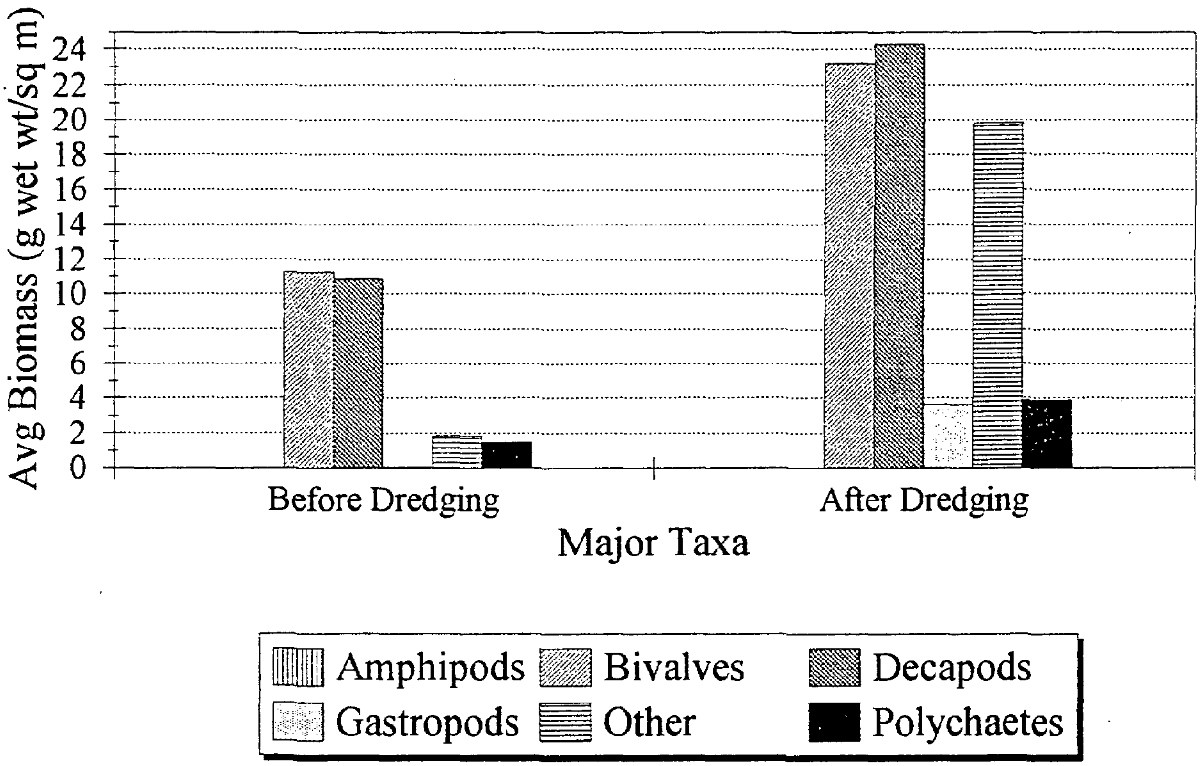
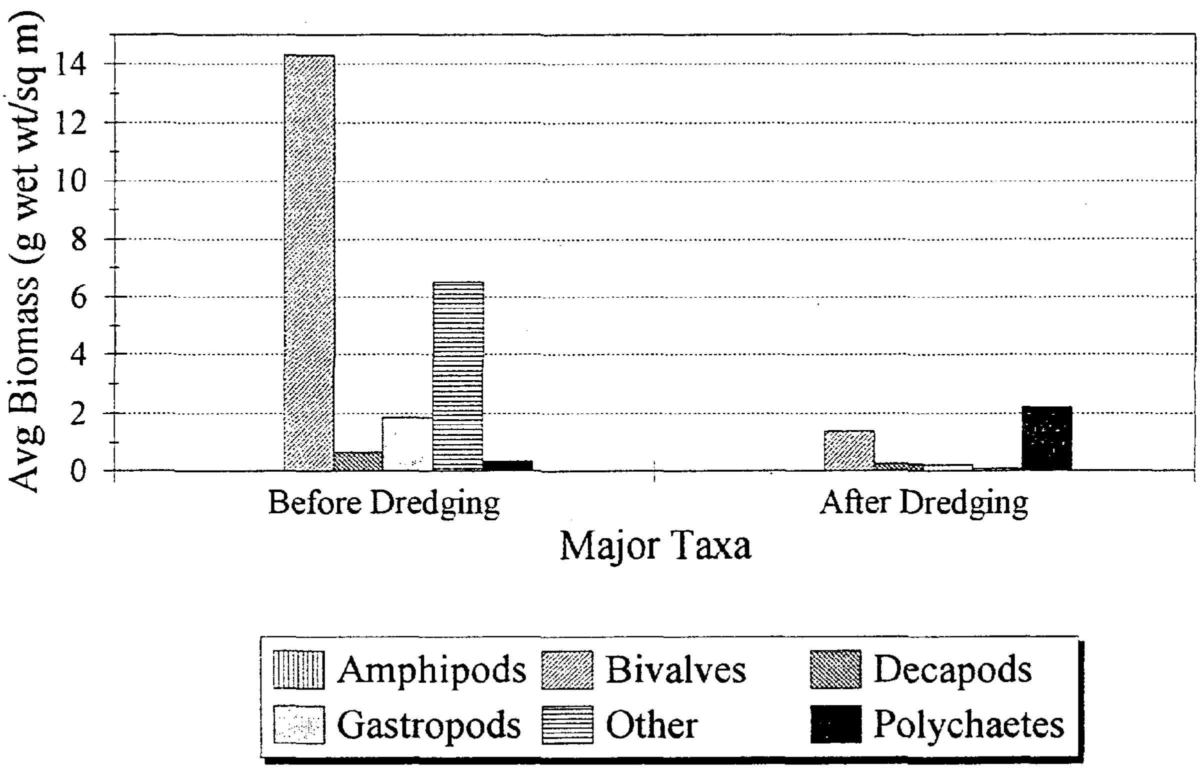


Figure 16. Infaunal biomass, other than *M. mercenaria*, before and after dredging for Plot D



Discussion

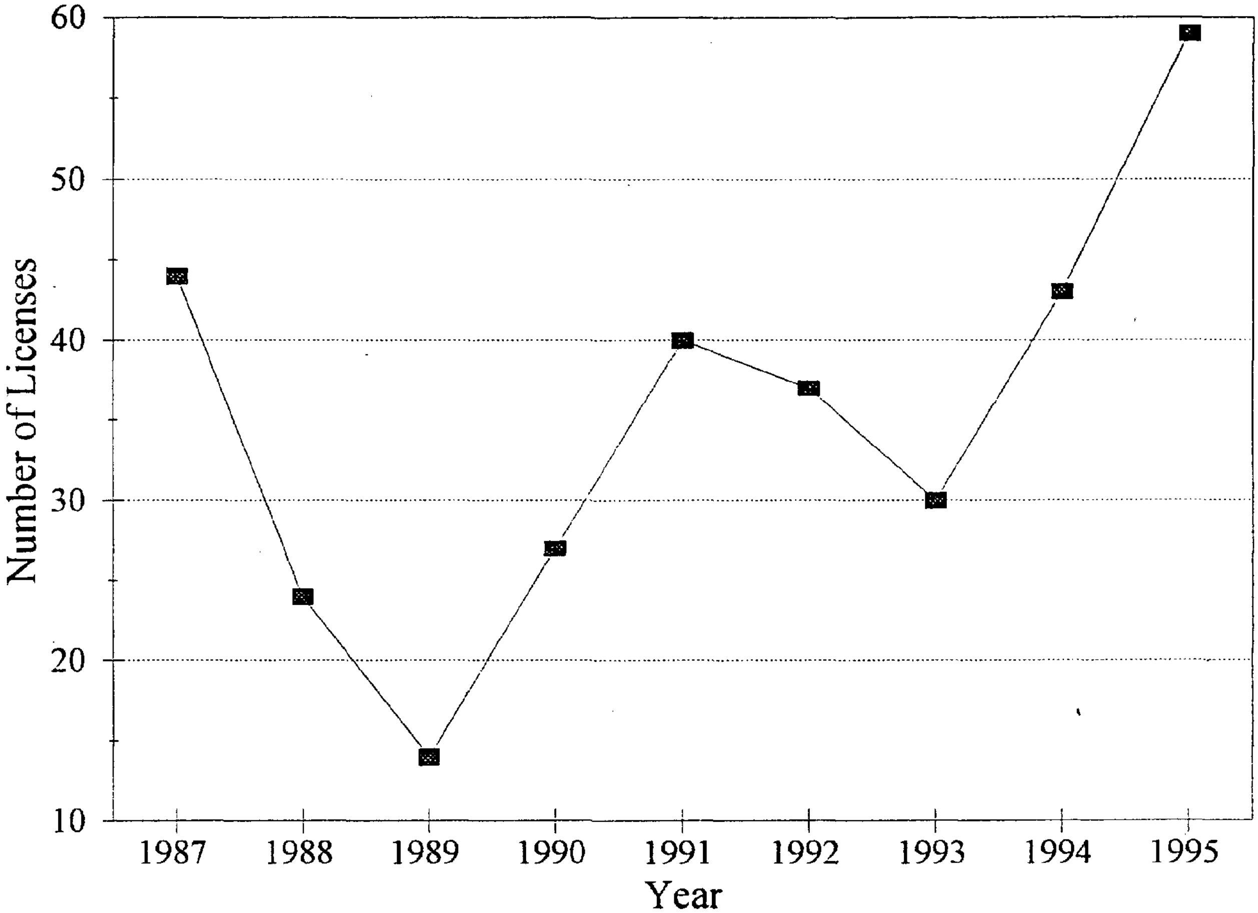
Our findings indicate an extensive dredge fishery for crabs and clams on the Seaside of the Eastern Shore. These are the first data of their kind for the region, and we have little basis for comparing the level of this fishing effort to other times or regions. Comparable historical data on dredge fishing efforts on the Seaside are not available. By comparison to the Chesapeake Bay, the availability of bottom area at greater than 4 ft depth for crab dredging is quite limited. Without a systematic survey of crab resources and the development of stock-recruit relationships, we are unable to comment on whether this level of effort is excessive. For a nominal fee crab dredgers may purchase a clam dredge license which grants unlimited by-catch opportunity for clams. Our data and experience (of being excluded from boats on high spring tides) indicate that the "crab" dredge fishery is in fact a diverse fishery which targets blue crabs (*Callinectes sapidus*), hard clams (*Mercenaria mercenaria*) and blood clams (*Noetia ponderosa*) depending upon availability and tides. The unlimited by-catch which is permitted under crab dredging regulations on the Seaside favors this practice of targeting multiple species.

Clam dredging on public grounds in Virginia occurs only on the Seaside and a license is required to dredge clams from public grounds during the season from December 1 through March 31. Each license is associated with one operator/boat. Over the past 9 years the numbers of licenses issued has varied from a low of 14 in 1989 to 59 in 1995 (Figure 17). Throughout our aerial survey, we rarely observed more than 10% of the licensed boats dredging on any one day. A sharp increase in licenses issued in the past 3 years is evident in these data, but the reason for this increase is unknown.

Clam dredging on private grounds requires a separate permit for each lease which is dredged. Thus, a single operator/boat may be associated with several permits. During the period of this study there were 34 operators who held permits to dredge 116 leases on the Seaside (held by 60 people). (See Appendix III for a complete listing of operators, leases and boats associated with clam dredge permits for the period of this study.) Historical data are lacking, but anecdotal evidence suggests that there are fewer clam dredgers and dredge boats operating on the Seaside now than within the past few decades. However, since many operators hold permits for dredging for more than one lease, it is not evident that less ground is being dredged, merely that fewer boats are apparently involved in that dredging. Moreover, the involvement of fewer boats may be a temporary aberration. Many of the individuals formerly involved in the clam dredge fishery, including most of the operators listed in Appendx III, are presently conch potting. If this fishery fails to continue to support them, many are likely to return to clam dredging.

The impacts of dredging on clam stocks cannot be determined from a short-term study such as this. Effects on recruitment and growth rate as well the losses from harvest and damage would need to be determined. We observed high rates of harvest aboard some boats (over 6000 clams harvested in little over 3 hrs, see Table 4) and we have reports from watermen of catches ranging from 8,000 to 10,000 clams per day, but we do not have comparable data on rates using

Figure 17. Clam dredge licenses for public ground, 1987-1995



patent tongs. There appears to be an interaction between dredge type and sediment type which affects the extent of damage to clams. Our data and reports from watermen suggest that use of the metal cage dredge on firm bottom increases the harvest efficiency, but results in greater damage to clams.

Quantitative sampling revealed some reductions in benthic invertebrates other than hard clams associated with a single dredging event; however, there was some inconsistency in our results and we lack adequate controls. We have not established the longer-term impacts of repeated dredging on benthic resources.

Aerial observations made throughout the study revealed dramatic increases in turbidity in the vicinity of clam dredging activity. Resuspension of large amounts of sediment, presumably from both the dredge and boat's propeller, resulted in telltale signs of dredging, even after boats had left the site. It has been reported to us that clam aquaculturists are particularly concerned with this resuspension, which they associate with reduced growth and, in some cases, burial of cultured clams. In this study we did not collect any data to support or refute this contention.

Conclusions and Recommendations

The unlimited by-catch allowable under regulation of the crab dredge fishery on the Seaside has resulted in a fishery which targets multiple species. This has the effect of extending the crab fishery beyond the time when it would ordinarily cease for economic reasons. In addition, it permits a dredge fishery on blood clams and could be used to target conch (*Busycon carica* and *Busycoptus canniculatum*). This regulation seems incongruous with effective management of these stocks and we believe that it should be carefully scrutinized.

A relatively large number of individuals are involved in the clam dredge fishery on, at least, a part-time basis. Our findings indicate, however, that the average number of boats operating on a daily basis equals only about 10% of the licenses for public ground or as many as 25% of the permits for leased grounds. This study documented only limited damage to clam stocks and benthic communities associated with this fishery, and it suggests habitat-specific effects for the different dredge types. Justified concerns persist among many watermen and aquaculturists regarding overfishing and habitat degredation resulting from clam dredging practices. Further effort should be made to evaluate the short- and long-term impacts of this practice on turbidity, bottom topography, clam resources and benthic community dynamics.

Modifications to the standard oyster dredge--the lengthening of the teeth and the replacement of the mesh bag with a heavy metal cage--have been made to increase the effectiveness of the dredge in areas with coarse sediment and cohesive clays. The result has been that dredging in this manner is often effectively "kicking" clams; that is, using the propeller to wash clams out of the bottom. Our data indicate that damage to clams caught in this manner may be significant, but the results are inconsistent. Anecdotal evidence suggests that clams harvested in this manner have shorter shelf lives than those taken by other means. VMRC Regulation #450-01-0013 [*Pertaining to the taking of clams on the seaside of the Eastern Shore*] should be clarified, and the status of this harvest practice using the modified dredge should be specifically addressed by the Commision.

The practice of acquiring or using leased bottom primarily for the purpose of dredging hard clams is inconsistent with **§28.2-603** of the Code of Virginia which authorizes leasing of state-owned bottom for the "purpose of planting and propogating shellfish." As recently indicated in a report prepared for the Virginia General Assembly (House Document 16, 1996) by VMRC, VIMS and the shellfish aquaculture industry, the lack of available bottom for leasing is a major impediment to the continued expansion of the shellfish culture industry.

A few individuals hold most of the permits to dredge private leases. The total acreage permitted for dredging at present is 10,080 acres; however, 7 individuals hold the dredge permits for 4,796 acres (47.6%) of this ground. The indirect effects of this activity extend beyond the bounds of the permitted dredge sites. Inadequate staking of grounds prior to dredging leads to errors in the sites being dredged. We mapped dredge boats working on public ground and nonpermitted private grounds in the vicinity of legitimately permitted sites. This practice appears to result in entire areas of a bay being subject to dredging, not merely the permitted lease. For example, note the region of Burton's Bay (Fig. 5) near the Wachapreague Inlet; dredging was observed on public ground and several private leases, although only one lease in the area is permitted for clam dredging.

Concern has been expressed by clam aquaculturists, regarding both the straying of dredges from permitted leases and the increased turbidity associated with dredging. A consequence of this concern has been that aquaculturists often feel compelled to hold larger leases than would otherwise be necessary, to provide a buffer between their operations and dredging activity. This has a negative impact on the availabilty of leased bottom for the expansion of aquaculture.

Finally, within the past few years new leases have been issued for the primary purpose of dredging clams from the site. These leases are granted without a survey of existing clam stocks to determine if a public resources exist. In effect, the lessee buys exclusive rights to the wild stocks of clams at the site. In a similar situation involving oysters, private leases would not be granted.

In summary, clam dredging on private grounds, as it is currently practiced on the Seaside of the Eastern Shore, appears inconsistent with (*i*) the statute authorizing leasing, (*ii*) regulations related to harvest practices (kicking and dredge types), (*iii*) the policy related to the availability of public resource and (*iv*) recommendations made in the Commission report House Document 15, 1996. Careful reconsideration of this practice by the Virginia Marine Resources Commission is clearly warranted and strongly recommended.

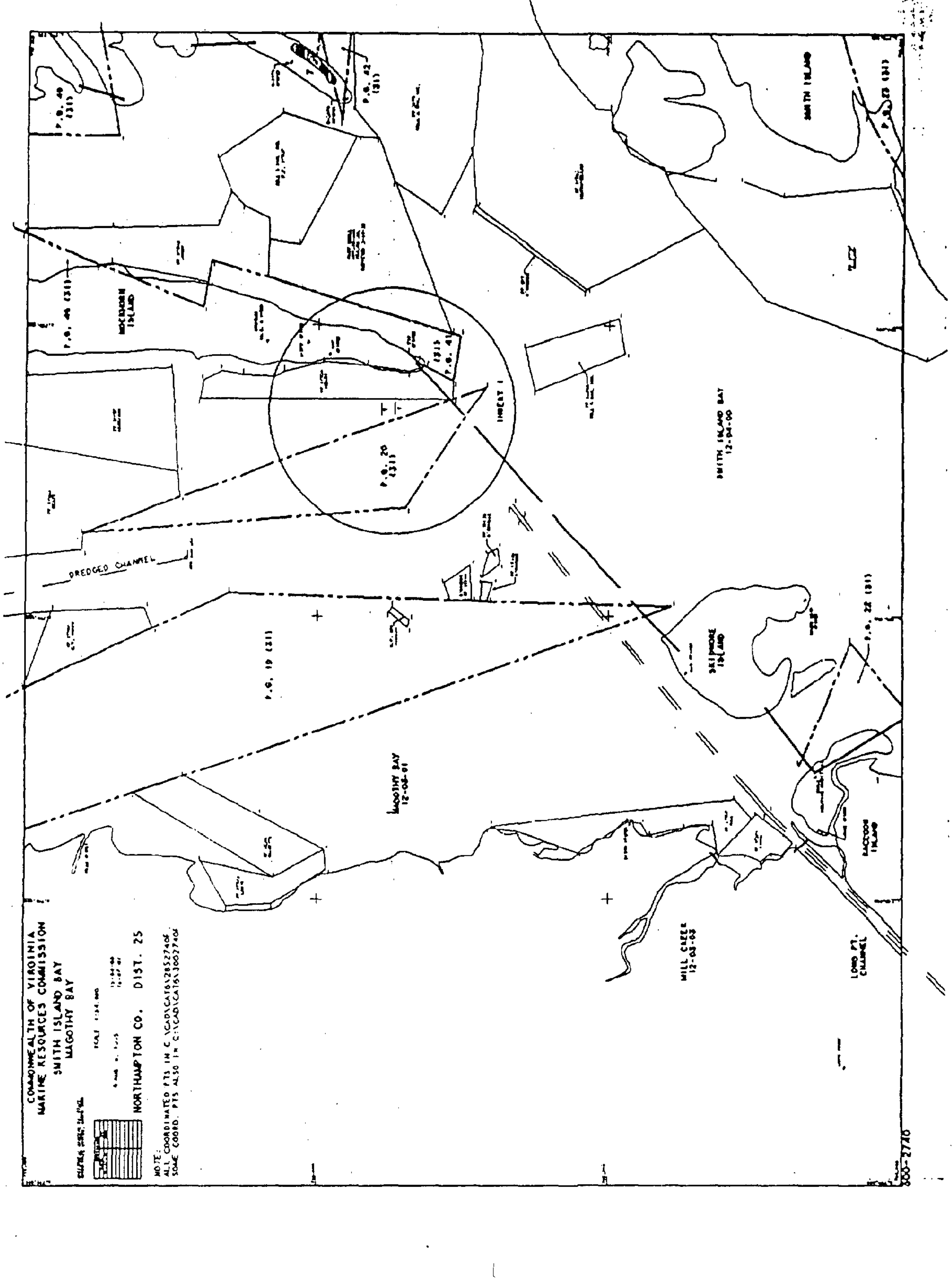
Appendix I. Locations of all commercial fishing boats observed during the study period, December 1994 - November 1995. Shoreline map is from VMRC Surveying and Engineering Division. The locations of private leases, public and unassigned bottom are indicated. Area maps contain one or more inserts which are shown in close up on succeeding pages.

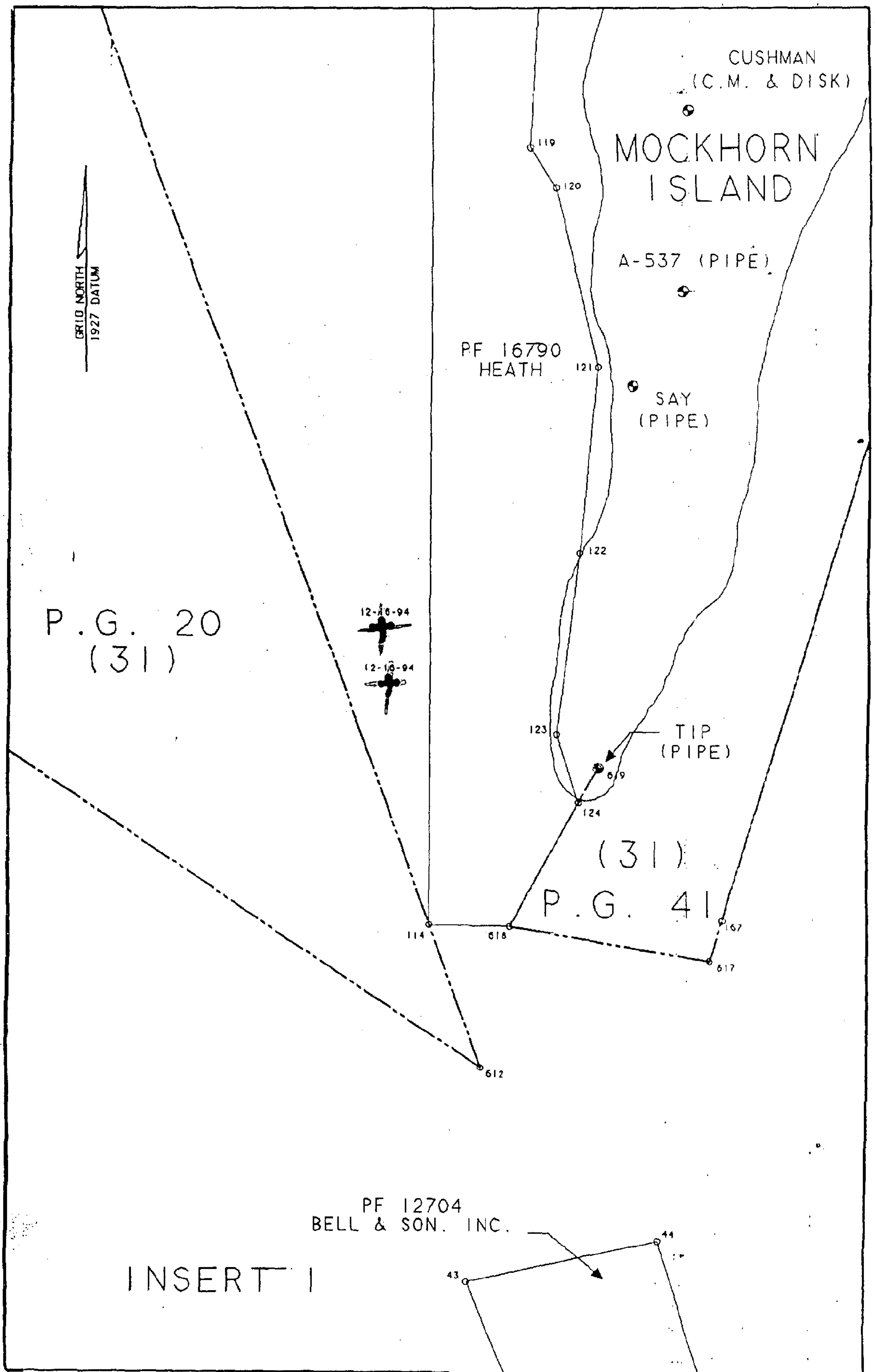
Legend

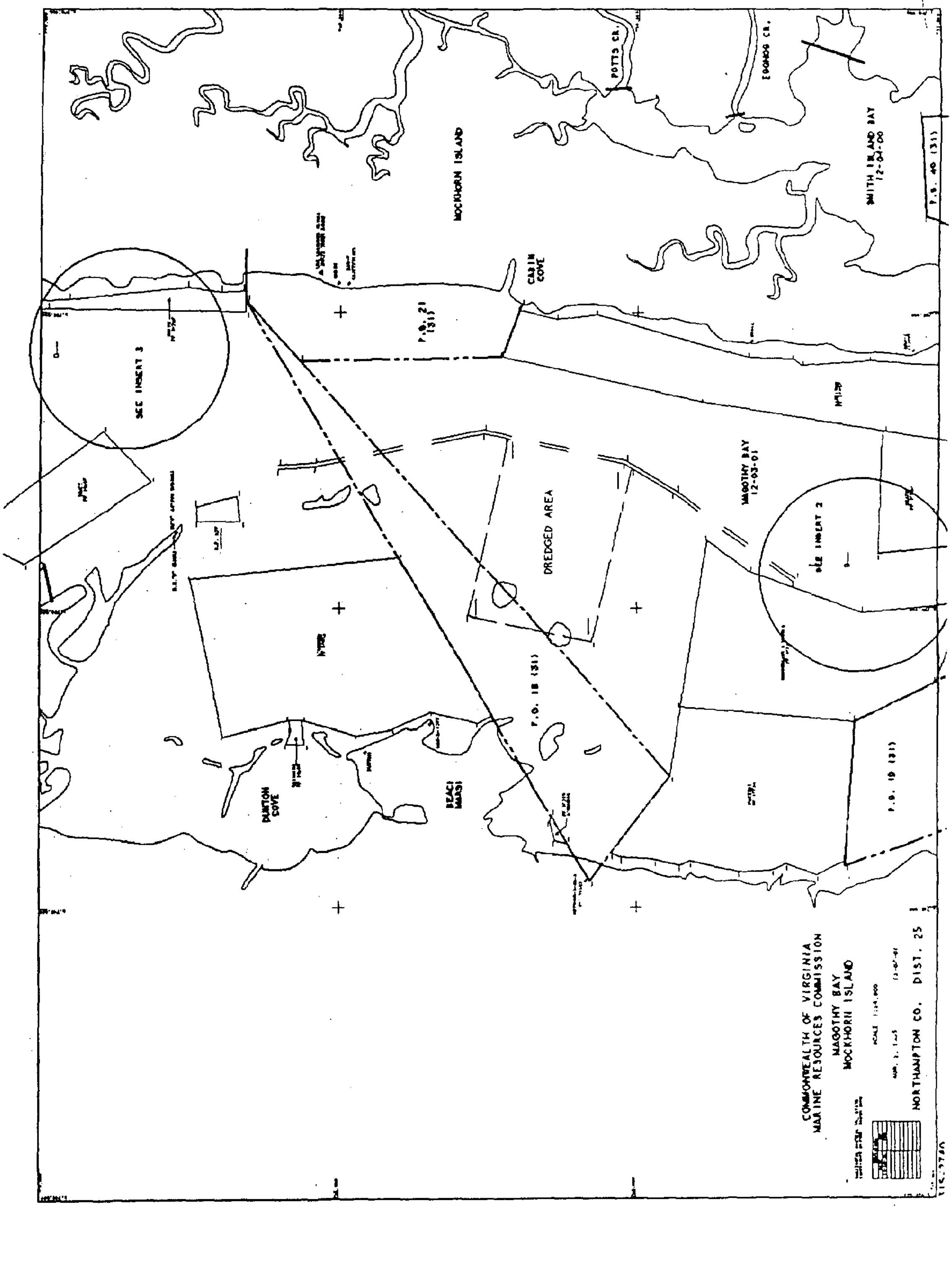
* - Clam Dredge

■ - Crab Dredge

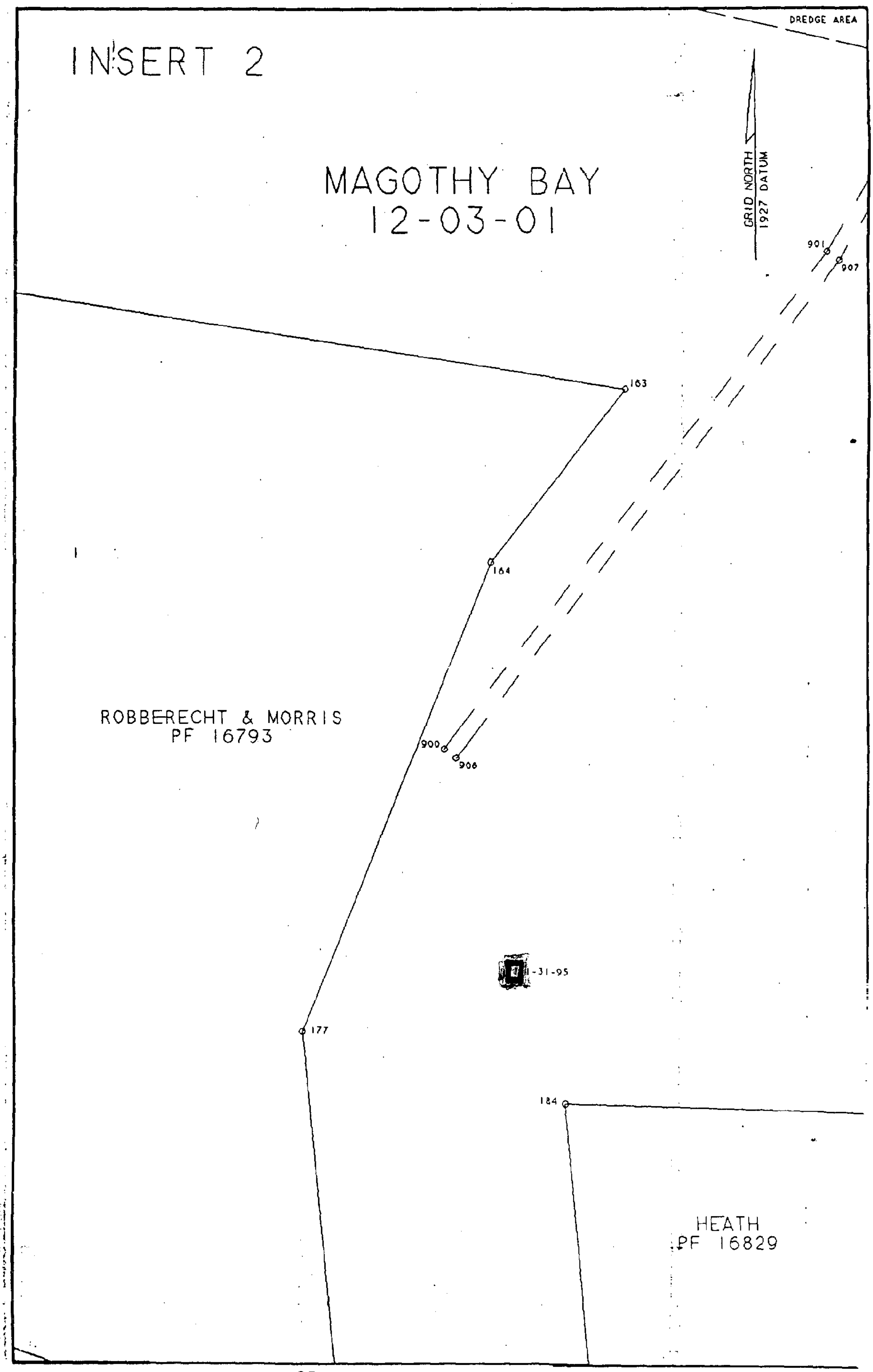
◆ - Patent Tong

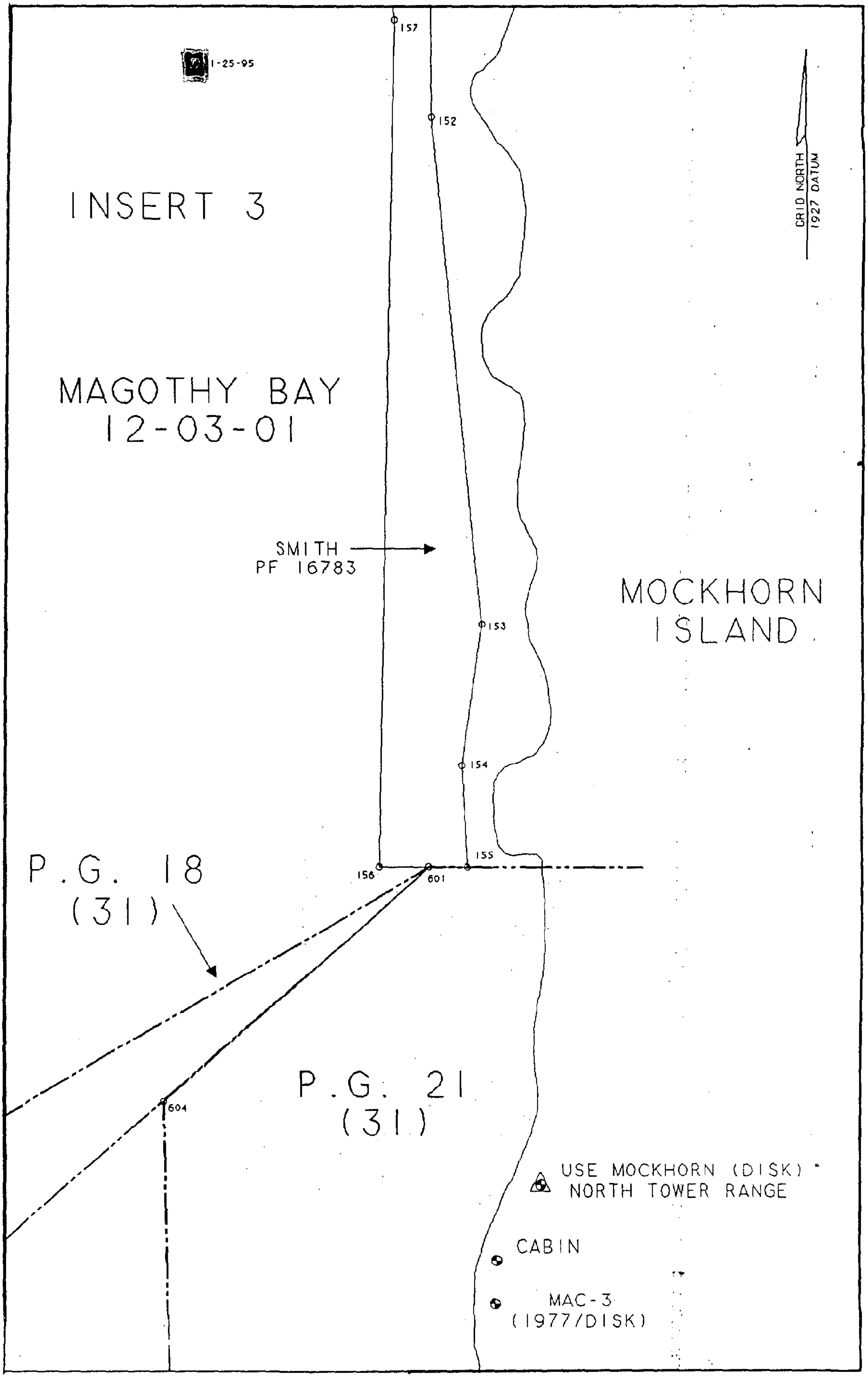

COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
SMITH ISLAND BAY
MAGOTHY BAY
NORTHAMPTON CO. DIST. 25
NOTE:
ALL COORDINATED PTS IN C:\CADS\CAT6\2852740E
SOME COORD. PTS ALSO IN C:\CADS\CAT6\3002740E
SMITH ISLAND BAY
12-04-00
MAGOTHY BAY
12-08-01
MILL CREEK
12-03-03
LONG PT.
CHANNEL
RACCOON
ISLAND
SKIDMORE
ISLAND
SMITH ISLAND
MOCKHORN
ISLAND
DREDGED CHANNEL
P.O. 20
(311)
P.O. 19 (311)
P.O. 22 (311)

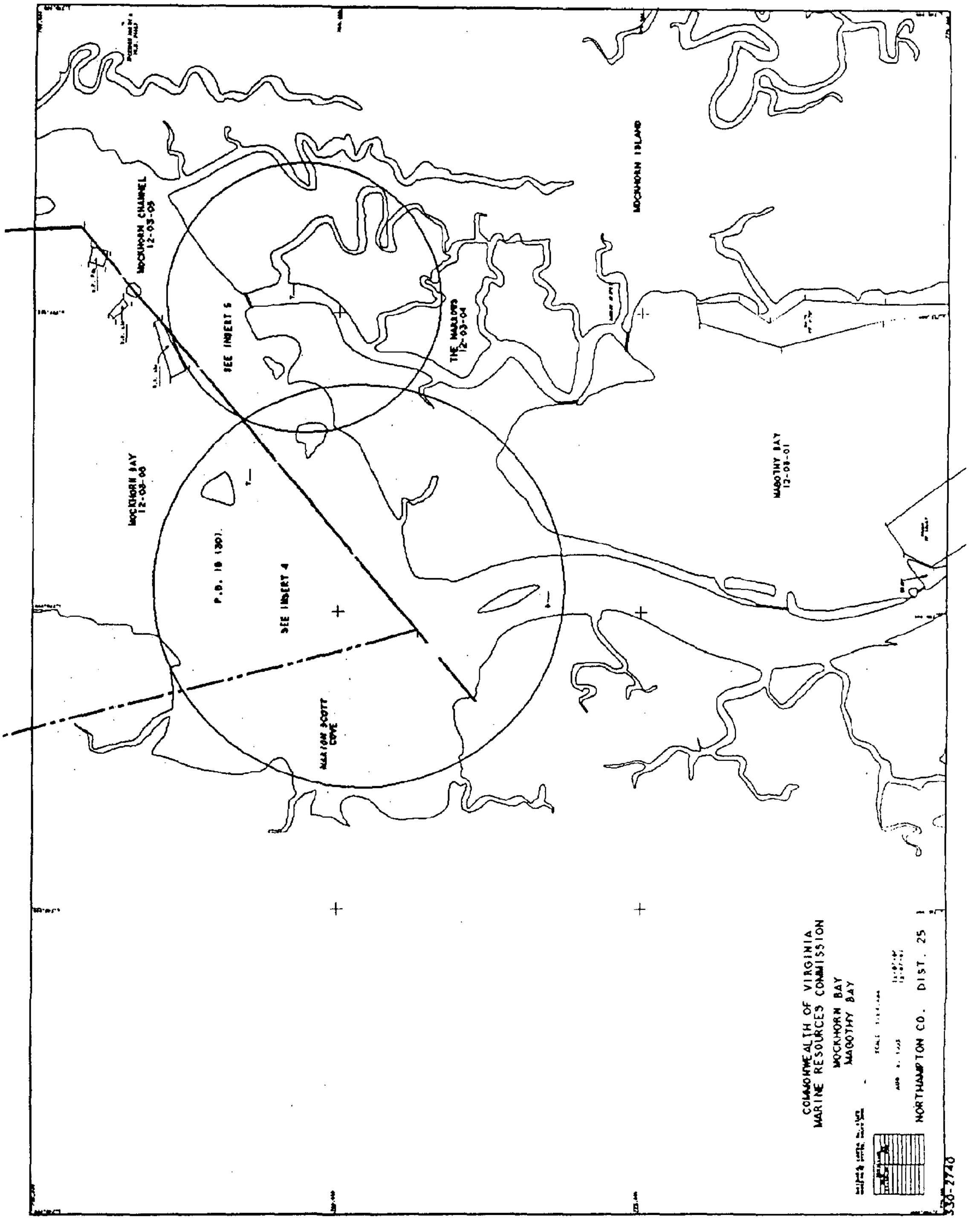

CUSHMAN
(C.M. & DISK)
MOCKHORN
ISLAND
A-537 (PIPE)
PF 16790
HEATH
SAY
(PIPE)
GRID NORTH
1927 DATUM
P.G. 20
(31)
TIP
(PIPE)
(31)
P.G. 41
119
120
121
122
123
124
114
618
617
167
612
PF 12704
BELL & SON. INC.
43
44
INSERT 1



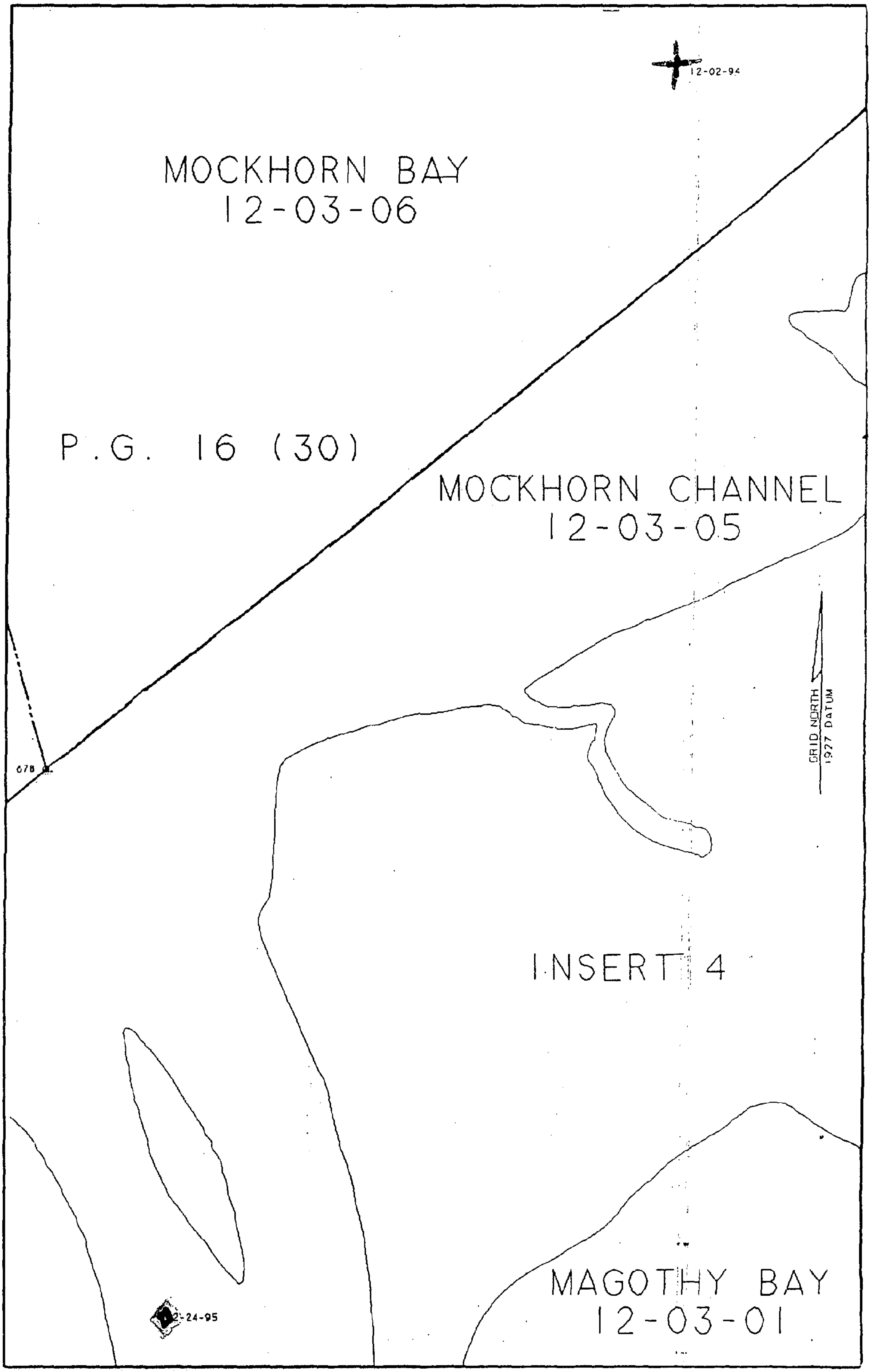
COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
MAGOTHY BAY
MOCKHORN ISLAND
NORTHAMPTON CO. DIST. 25
MOCKHORN ISLAND
SMITH ISLAND BAY
12-04-00
P.S. 40 (31)
POTTS CR.
CABIN COVE
P.O. 21 (31)
SEE INSERT 3
DREDGED AREA
MAGOTHY BAY
12-03-01
SEE INSERT 2
P.O. 18 (31)
P.O. 19 (31)
DUNTON COVE
BEACH MARSH

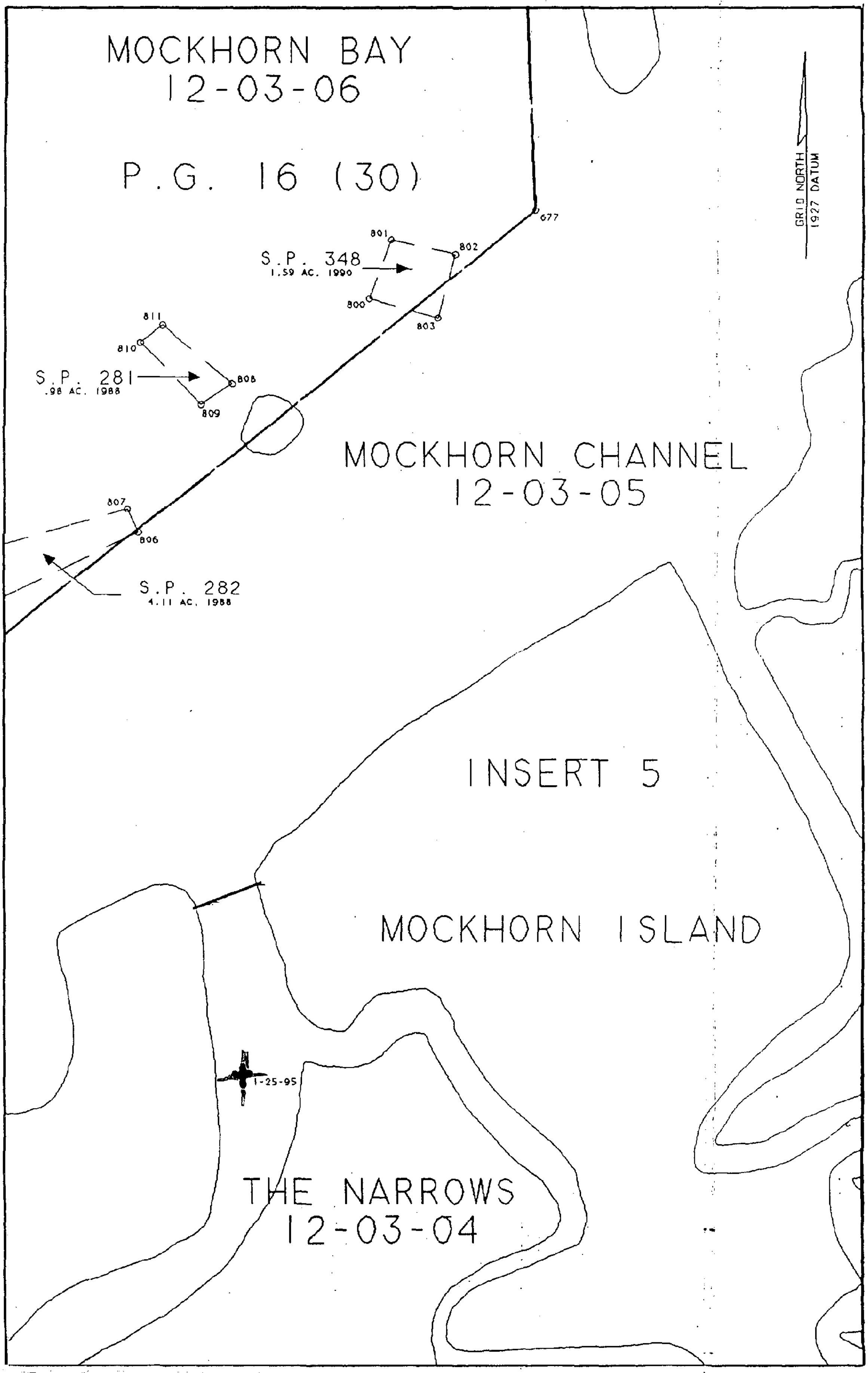

INSERT 2
MAGOTHY BAY
12-03-01
DREDGE AREA
GRID NORTH
1927 DATUM
901
907
163
164
ROBBERECHT & MORRIS
PF 16793
900
906
1-31-95
177
184
HEATH
PF 16829


1-25-95
INSERT 3
MAGOTHY BAY
12-03-01
GRID NORTH
1927 DATUM
157
152
SMITH
PF 16783
MOCKHORN
ISLAND
153
154
155
156
601
P.G. 18
(31)
604
P.G. 21
(31)
USE MOCKHORN (DISK)
NORTH TOWER RANGE
CABIN
MAC-3
(1977/DISK)

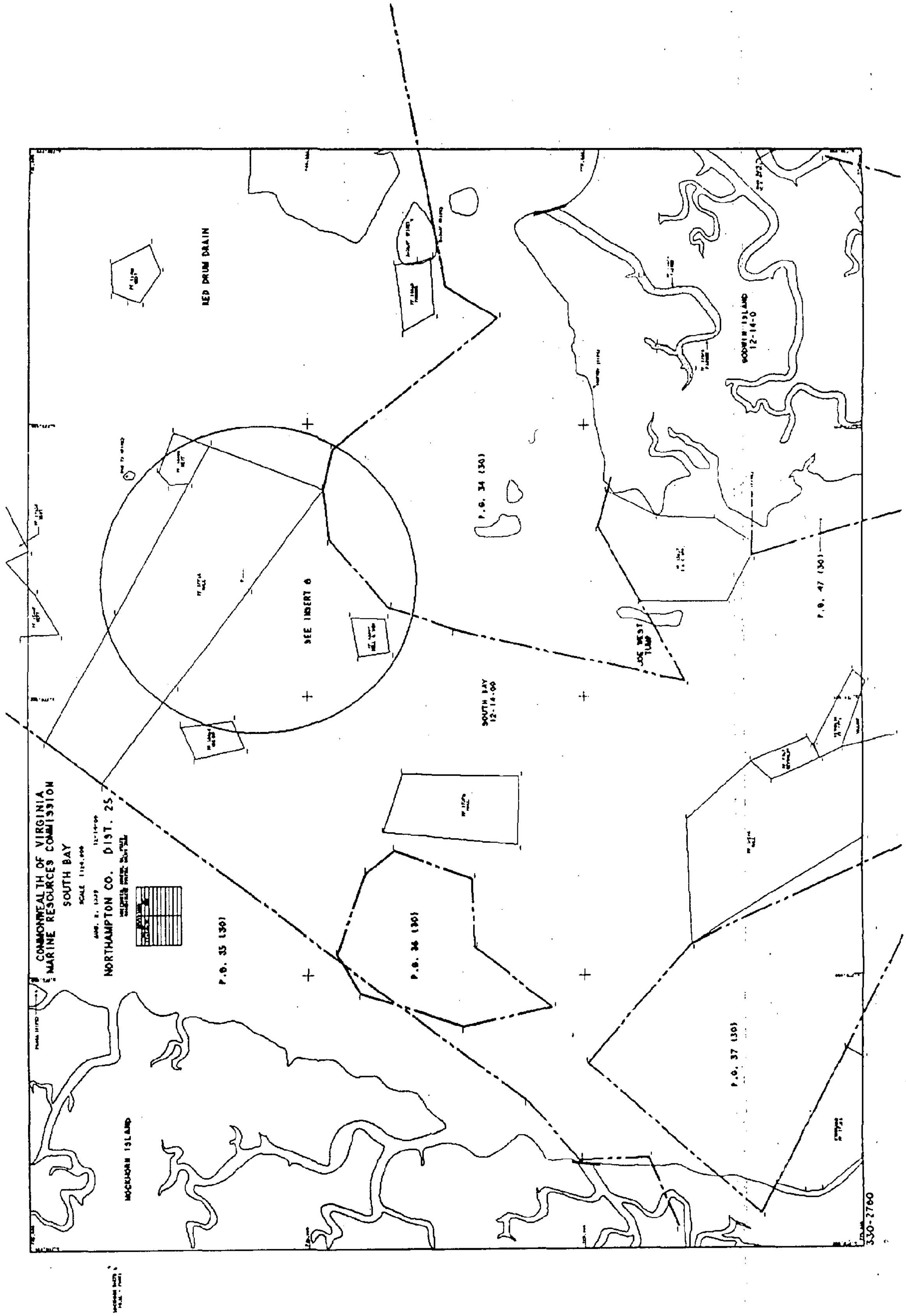


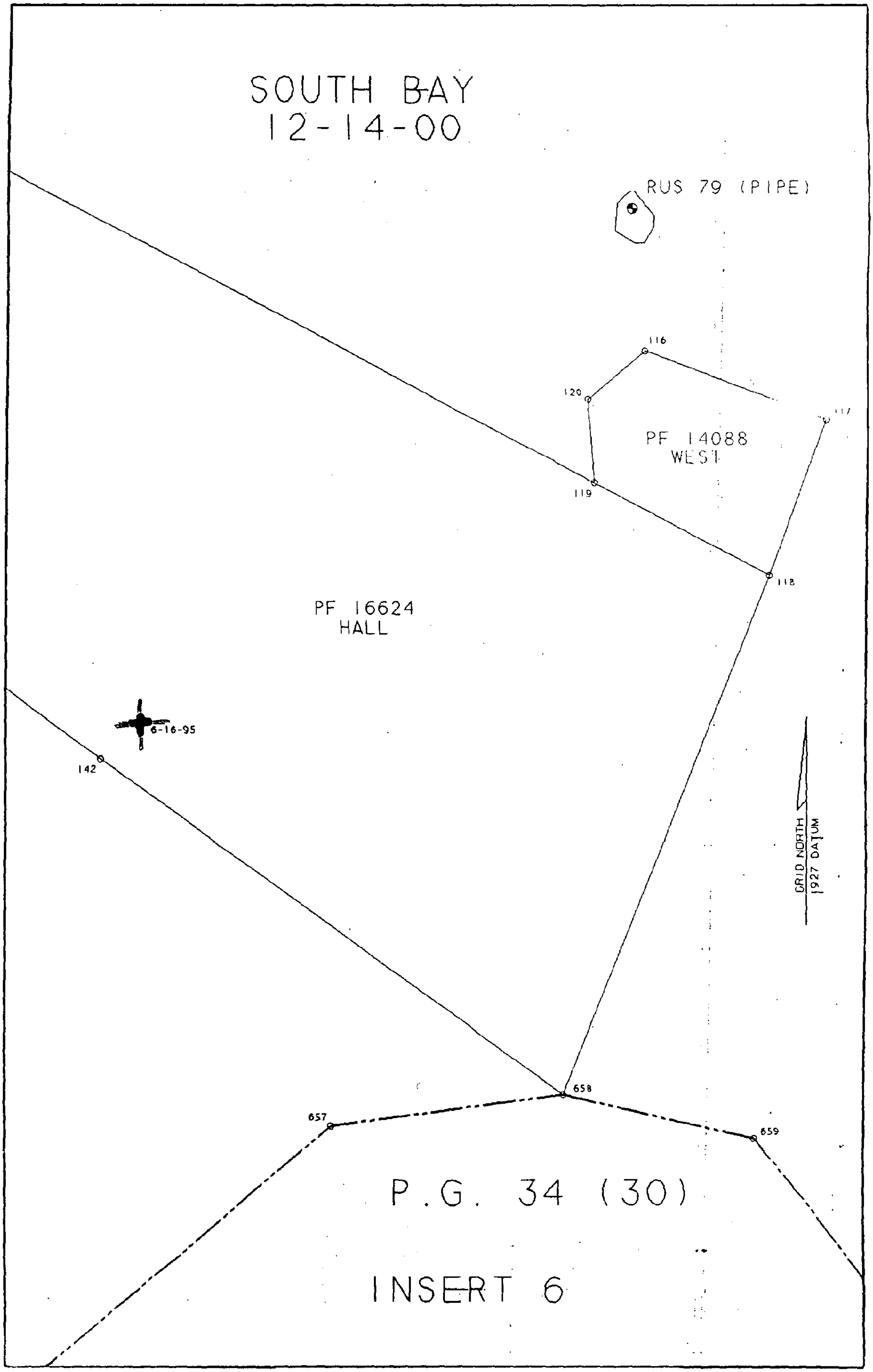
COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
MOCKHORN BAY
MAGOTHY BAY
NORTHAMPTON CO. DIST. 25
MOCKHORN CHANNEL
12-03-05
MOCKHORN ISLAND
MAGOTHY BAY
12-08-01
SEE INSERT 5
SEE INSERT 4
330-2740

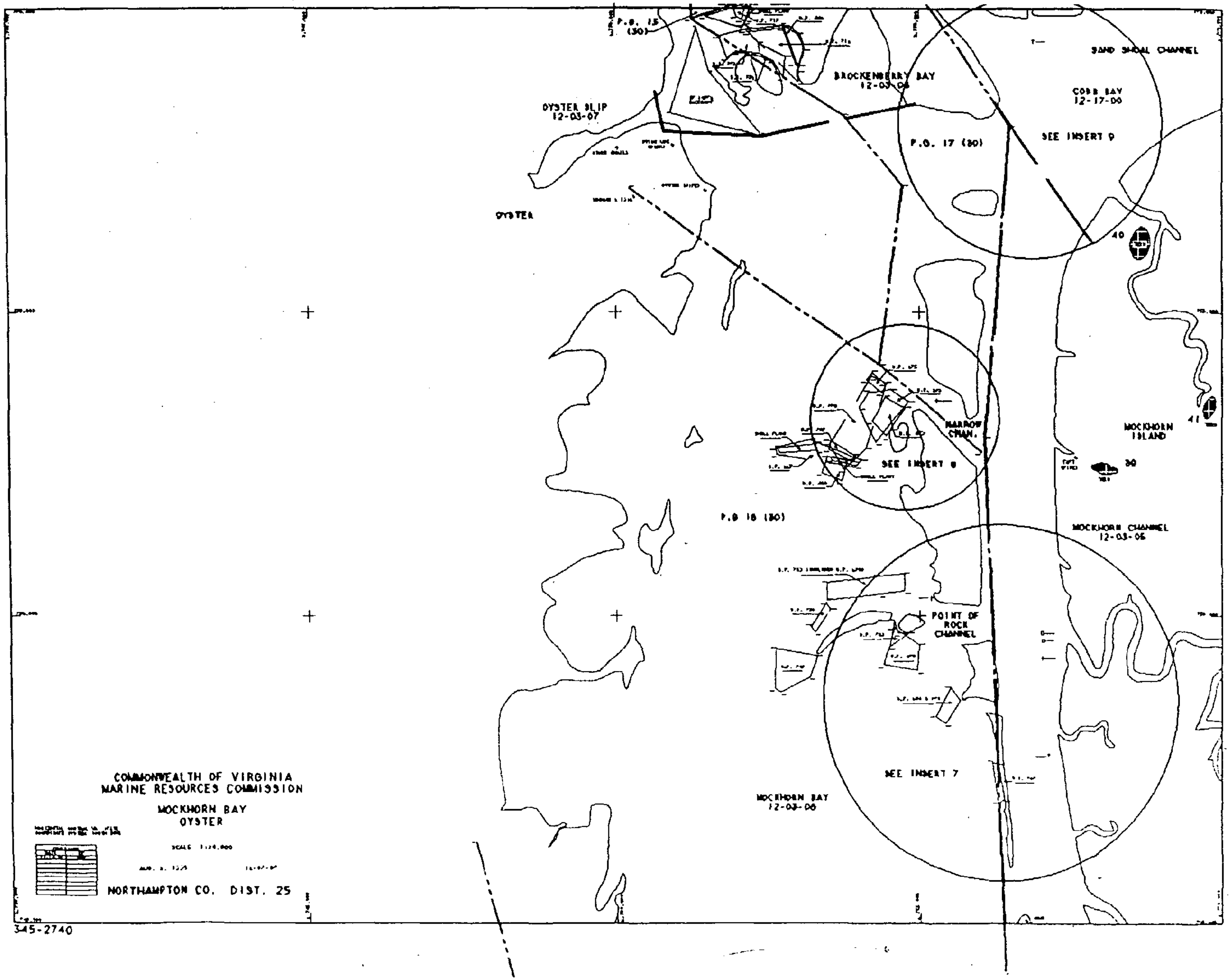

12-02-94
MOCKHORN BAY
12-03-06
P.G. 16 (30)
MOCKHORN CHANNEL
12-03-05
GRID NORTH
1927 DATUM
678
INSERT 4
MAGOTHY BAY
12-03-01
2-24-95

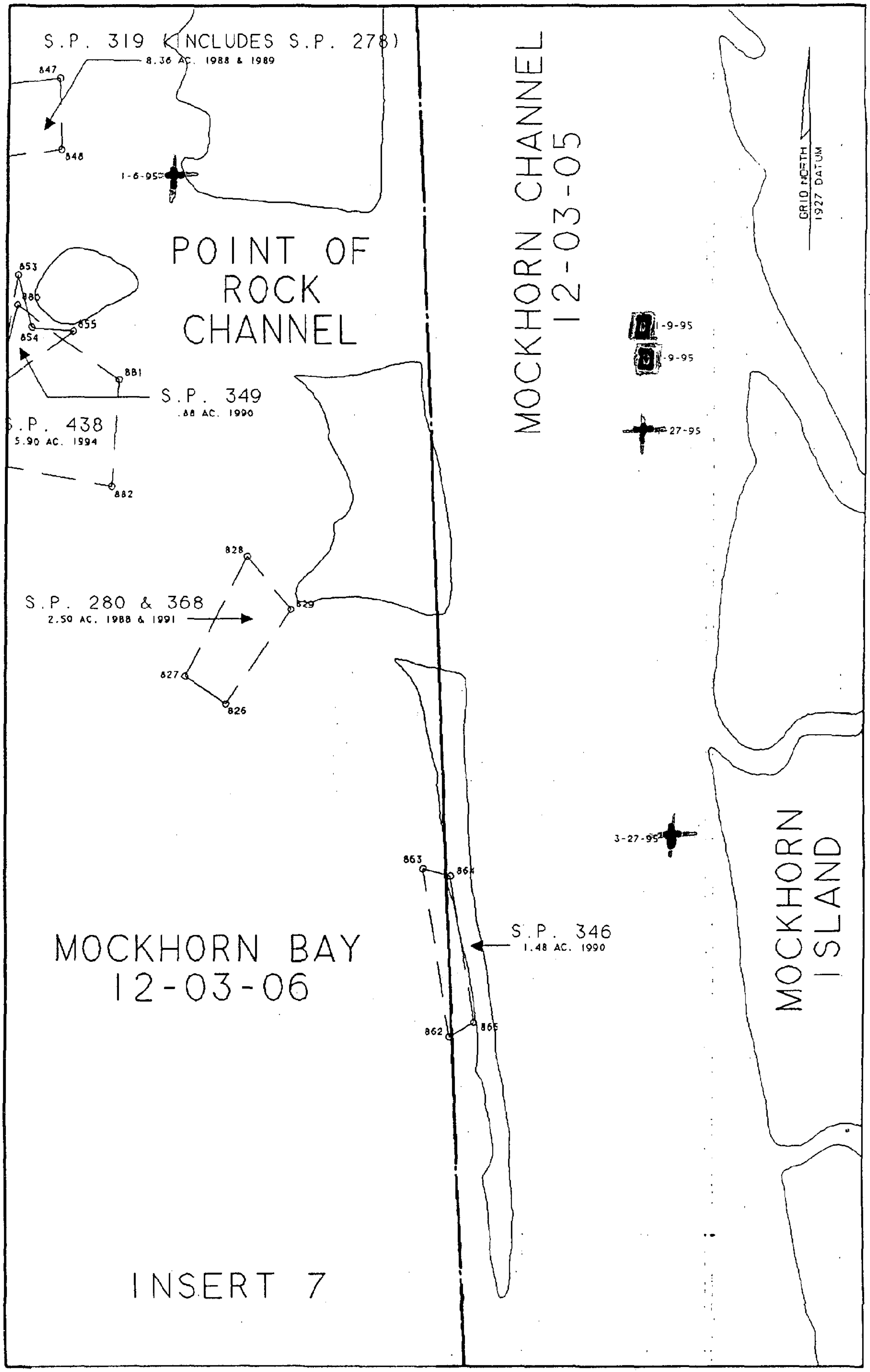


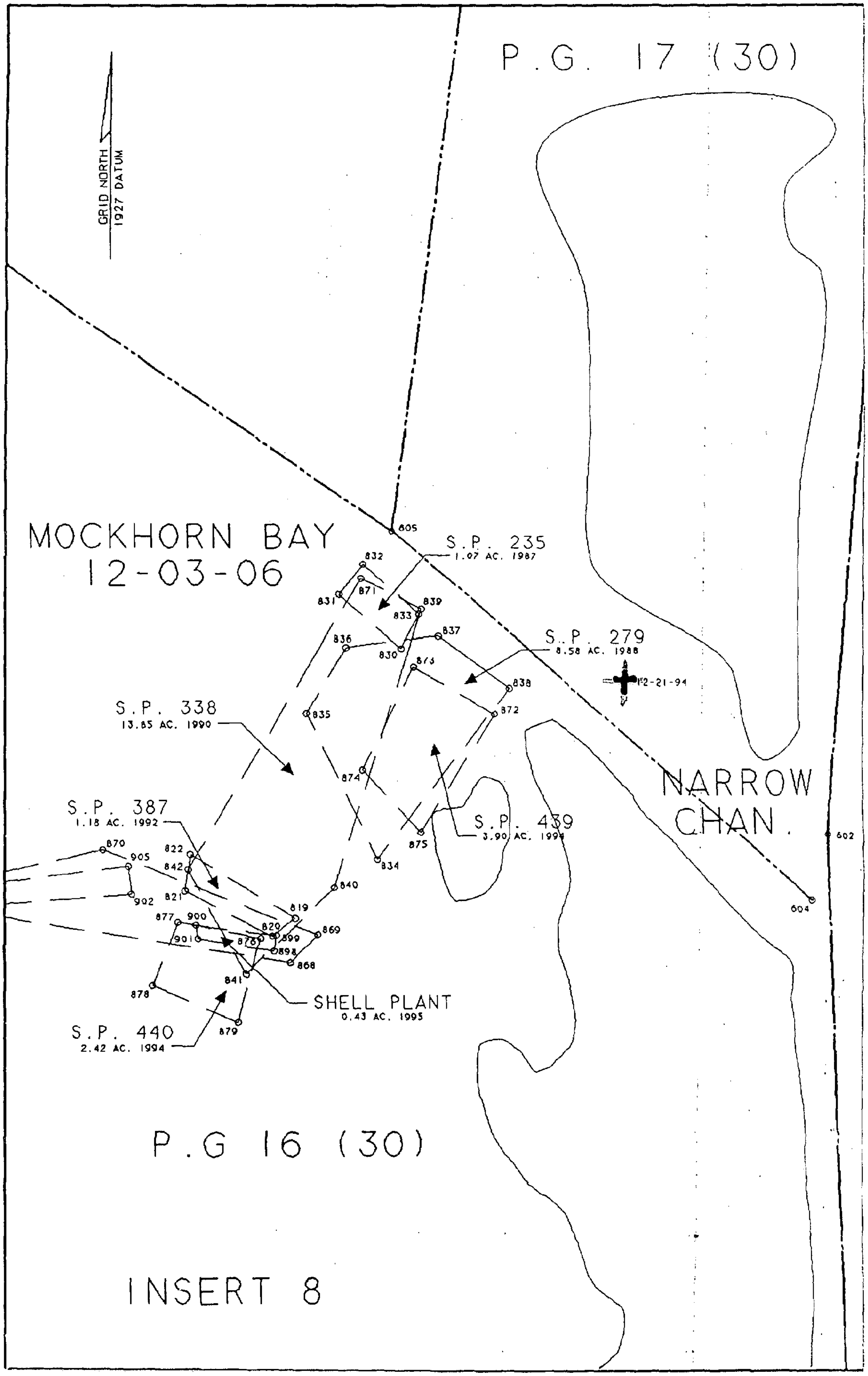
MOCKHORN BAY
12-03-06
P.G. 16 (30)
GRID NORTH
1927 DATUM
677
801
802
S.P. 348
1.59 AC. 1990
800
803
811
810
S.P. 281
.98 AC. 1988
808
809
MOCKHORN CHANNEL
12-03-05
807
806
S.P. 282
4.11 AC. 1988
INSERT 5
MOCKHORN ISLAND
1-25-95
THE NARROWS
12-03-04


COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
SOUTH BAY
NORTHAMPTON CO. DIST. 25
RED DRUM DRAIN
SEE INSERT 6
P.G. 34 (30)
SOUTH BAY
12-14-00
JOE WEST LUMP
BOOKER ISLAND
12-14-0
P.G. 47 (30)
P.G. 35 (30)
P.G. 36 (30)
P.G. 37 (30)
MOCKHORN ISLAND
330-2760


SOUTH BAY
12-14-00
RUS 79 (PIPE)
116
120
117
PF 14088
WEST
119
118
PF 16624
HALL
6-16-95
142
GRID NORTH
1927 DATUM
658
657
659
P.G. 34 (30)
INSERT 6

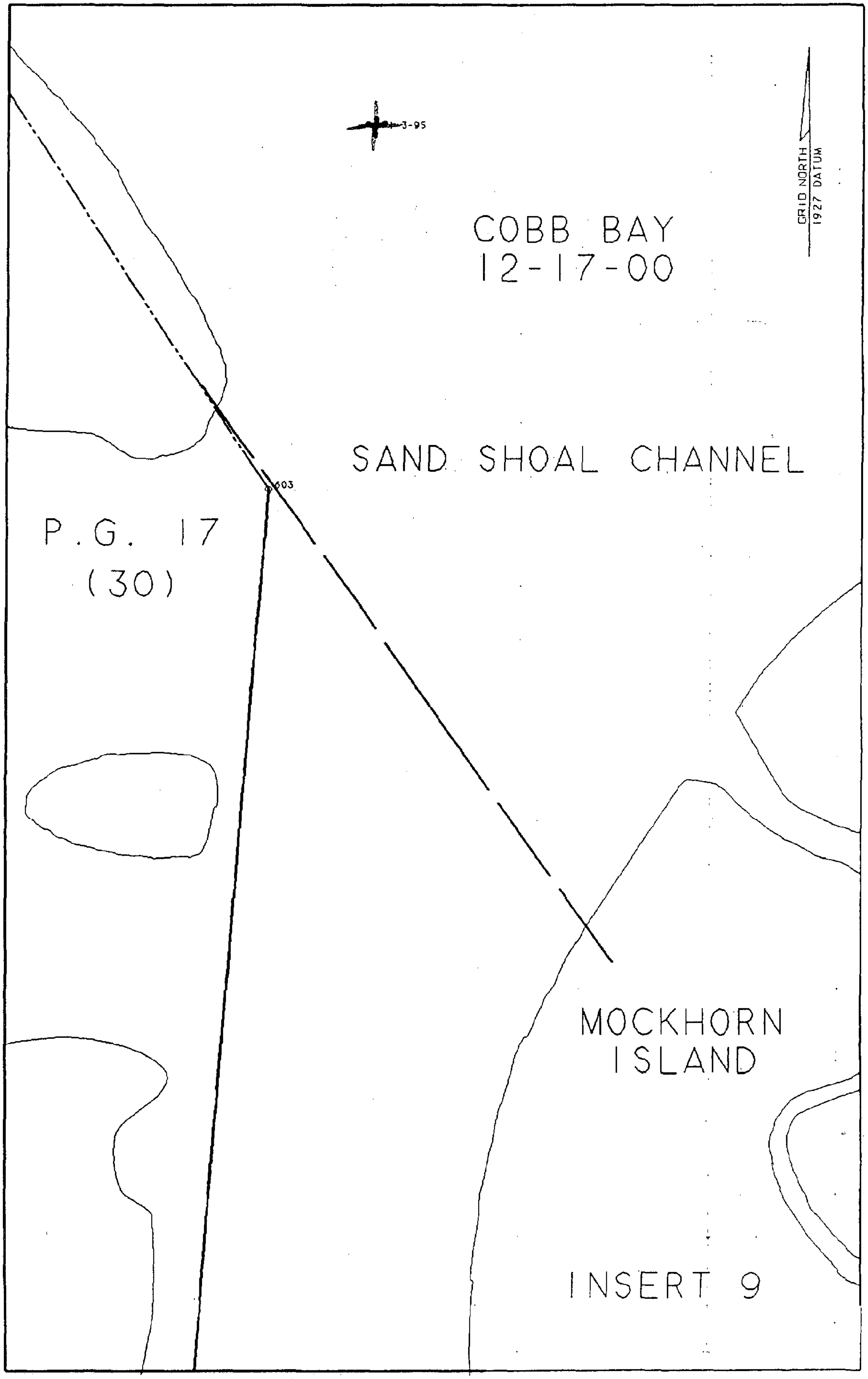

P.G. 15 (30)
BROCKENBERRY BAY 12-03-06
SAND SHOAL CHANNEL
COBB BAY 12-17-00
SEE INSERT 9
P.G. 17 (30)
OYSTER SLIP 12-03-07
OYSTER
NARROW CHAN.
SEE INSERT 8
MOCKHORN ISLAND
P.G 18 (30)
MOCKHORN CHANNEL 12-03-05
POINT OF ROCK CHANNEL
SEE INSERT 7
MOCKHORN BAY 12-03-00
COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
MOCKHORN BAY
OYSTER
NORTHAMPTON CO. DIST. 25
345-2740

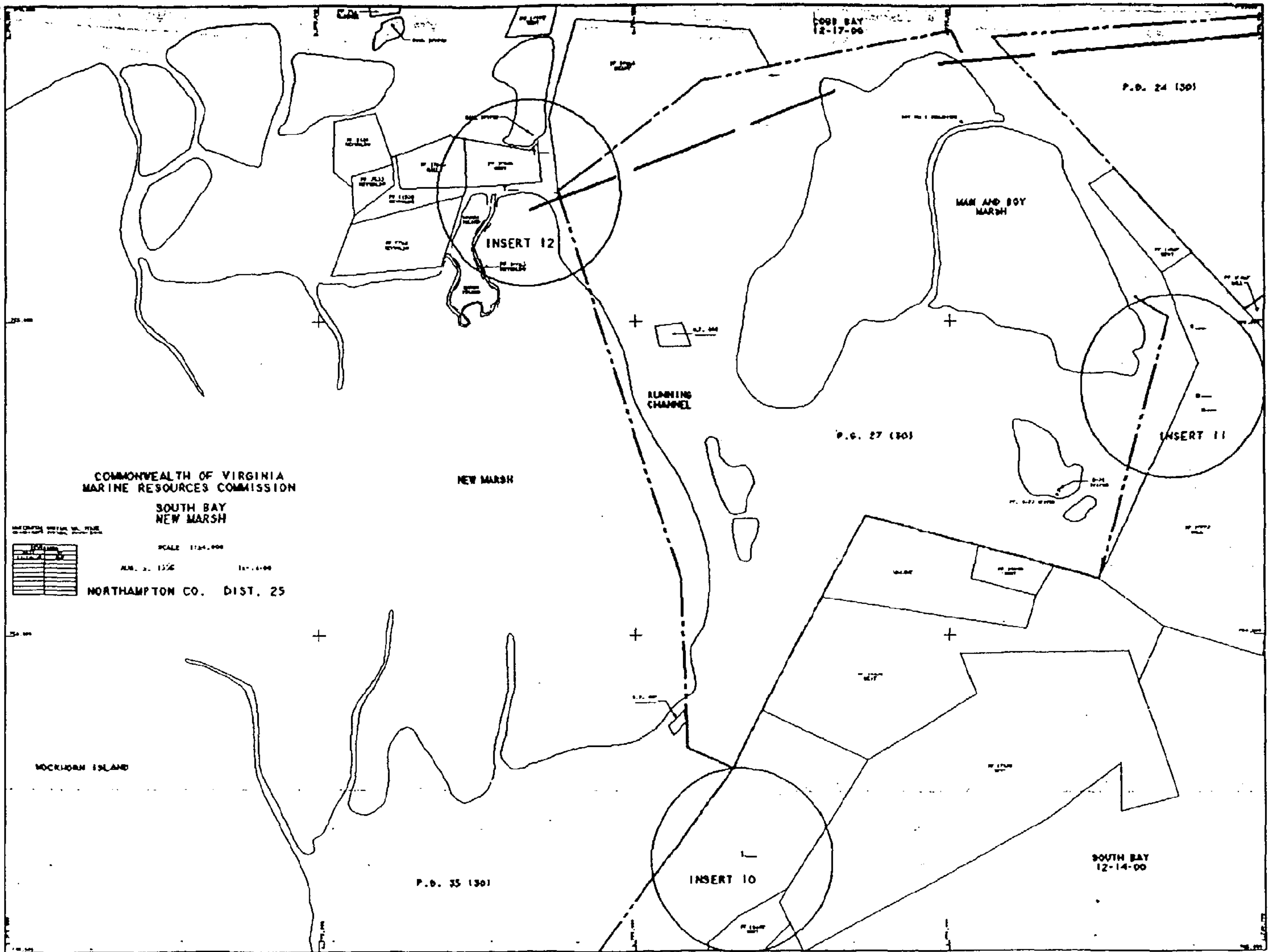

S.P. 319 (INCLUDES S.P. 278)
8.36 AC. 1988 & 1989
847
848
1-6-95
POINT OF ROCK CHANNEL
853
880
855
854
881
S.P. 349
.88 AC. 1990
S.P. 438
5.90 AC. 1994
882
828
S.P. 280 & 368
2.50 AC. 1988 & 1991
829
827
826
863
864
S.P. 346
1.48 AC. 1990
862
865
MOCKHORN BAY
12-03-06
INSERT 7
MOCKHORN CHANNEL
12-03-05
1-9-95
1-9-95
27-95
3-27-95
MOCKHORN ISLAND
GRID NORTH
1927 DATUM



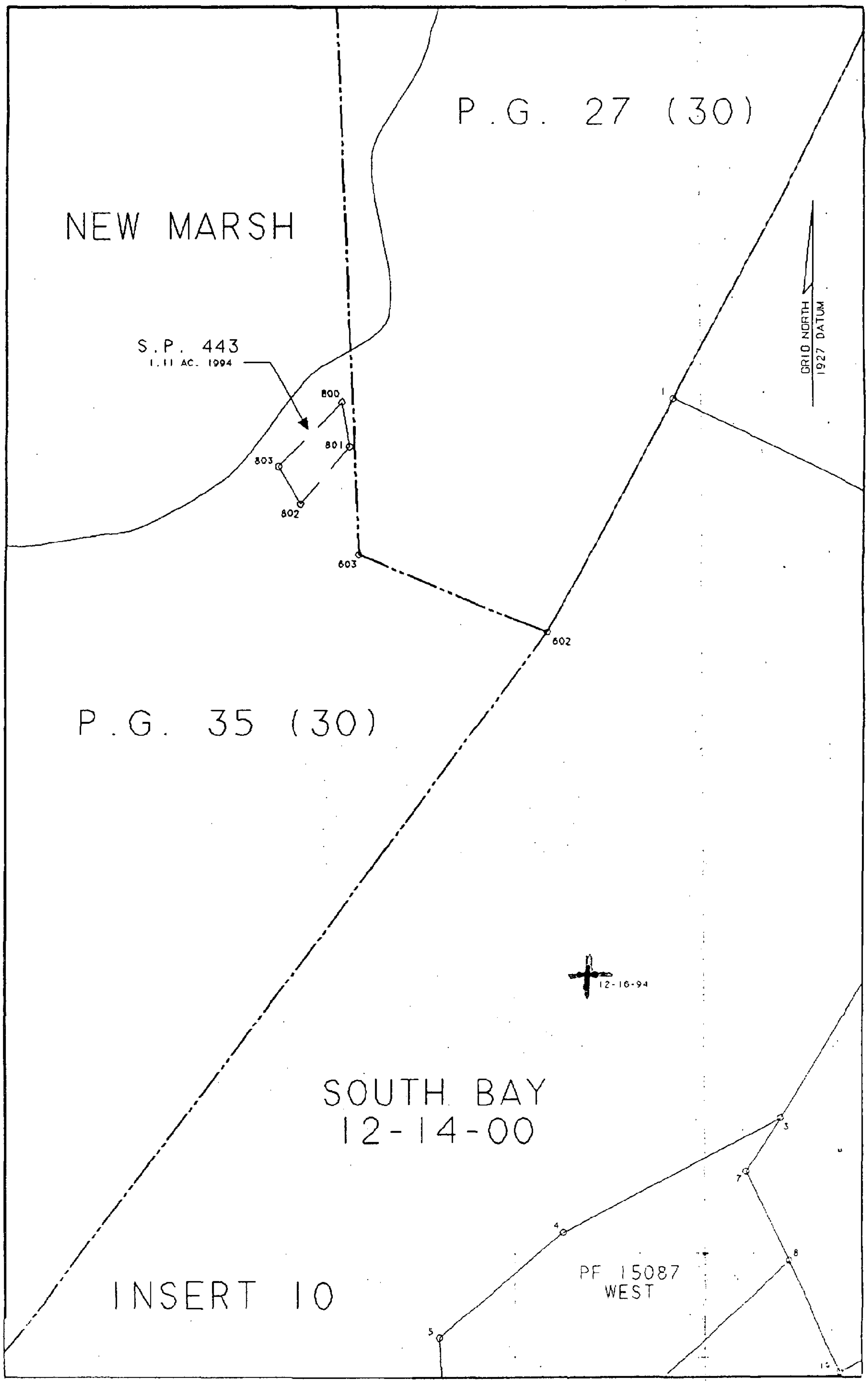
P.G. 17 (30)
GRID NORTH
1927 DATUM
MOCKHORN BAY
12-03-06
S.P. 235
1.07 AC. 1987
S.P. 279
8.58 AC. 1988
12-21-94
S.P. 338
13.85 AC. 1990
S.P. 387
1.18 AC. 1992
S.P. 439
3.90 AC. 1994
NARROW
CHAN.
SHELL PLANT
0.43 AC. 1995
S.P. 440
2.42 AC. 1994
P.G 16 (30)

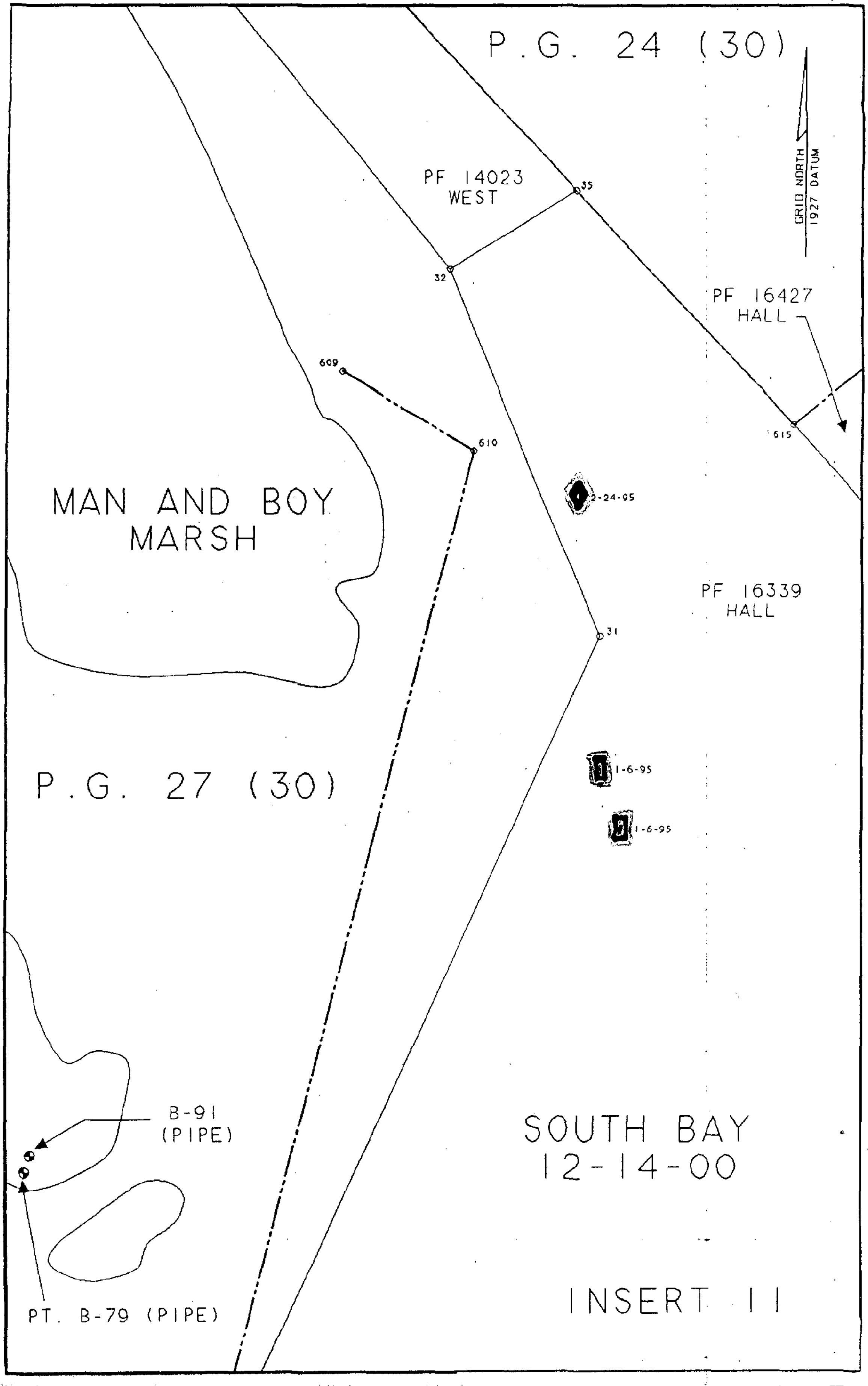
INSERT 8

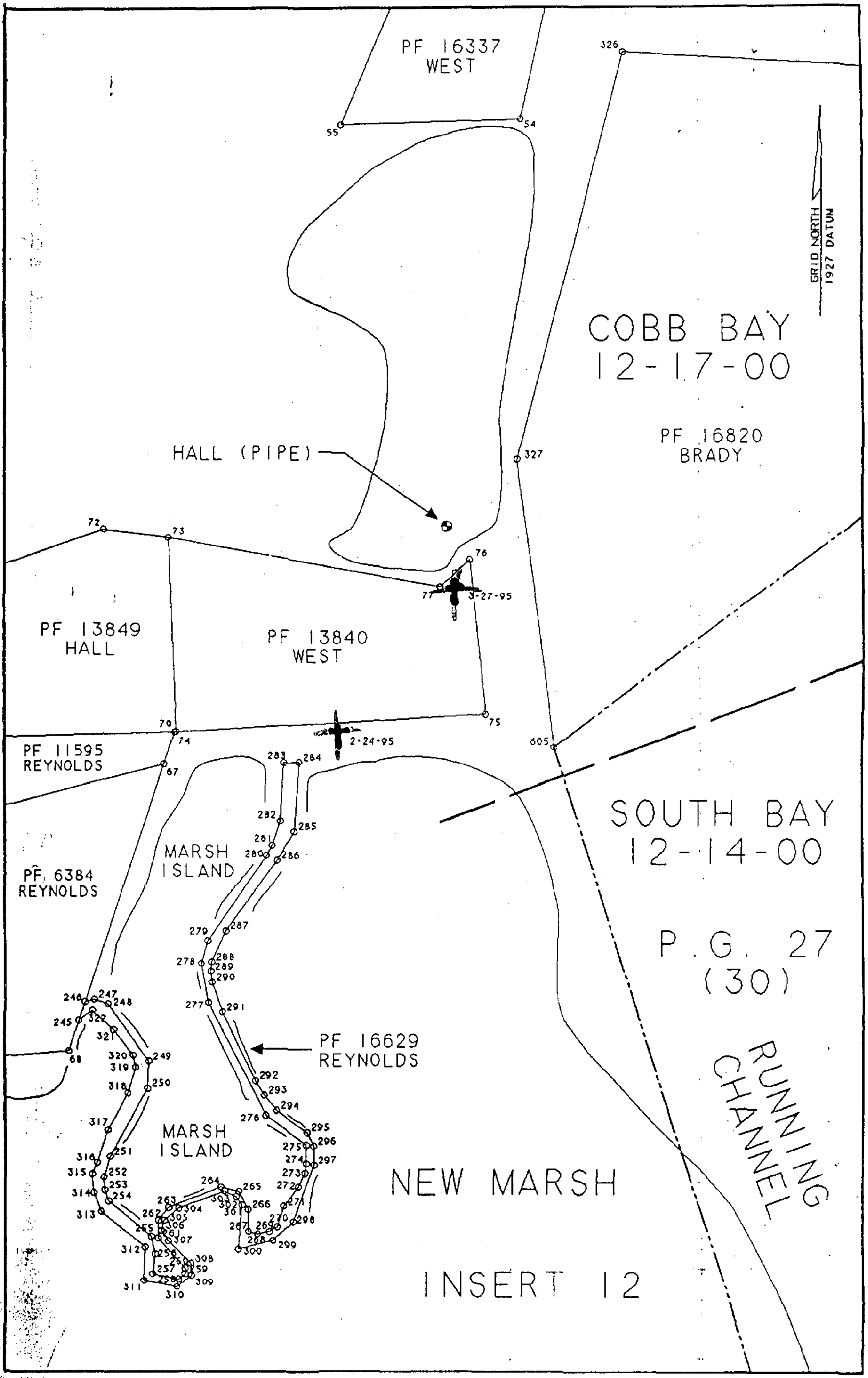

3-95
GRID NORTH
1927 DATUM
COBB BAY
12-17-00
SAND SHOAL CHANNEL
603
P.G. 17
(30)
MOCKHORN
ISLAND
INSERT 9

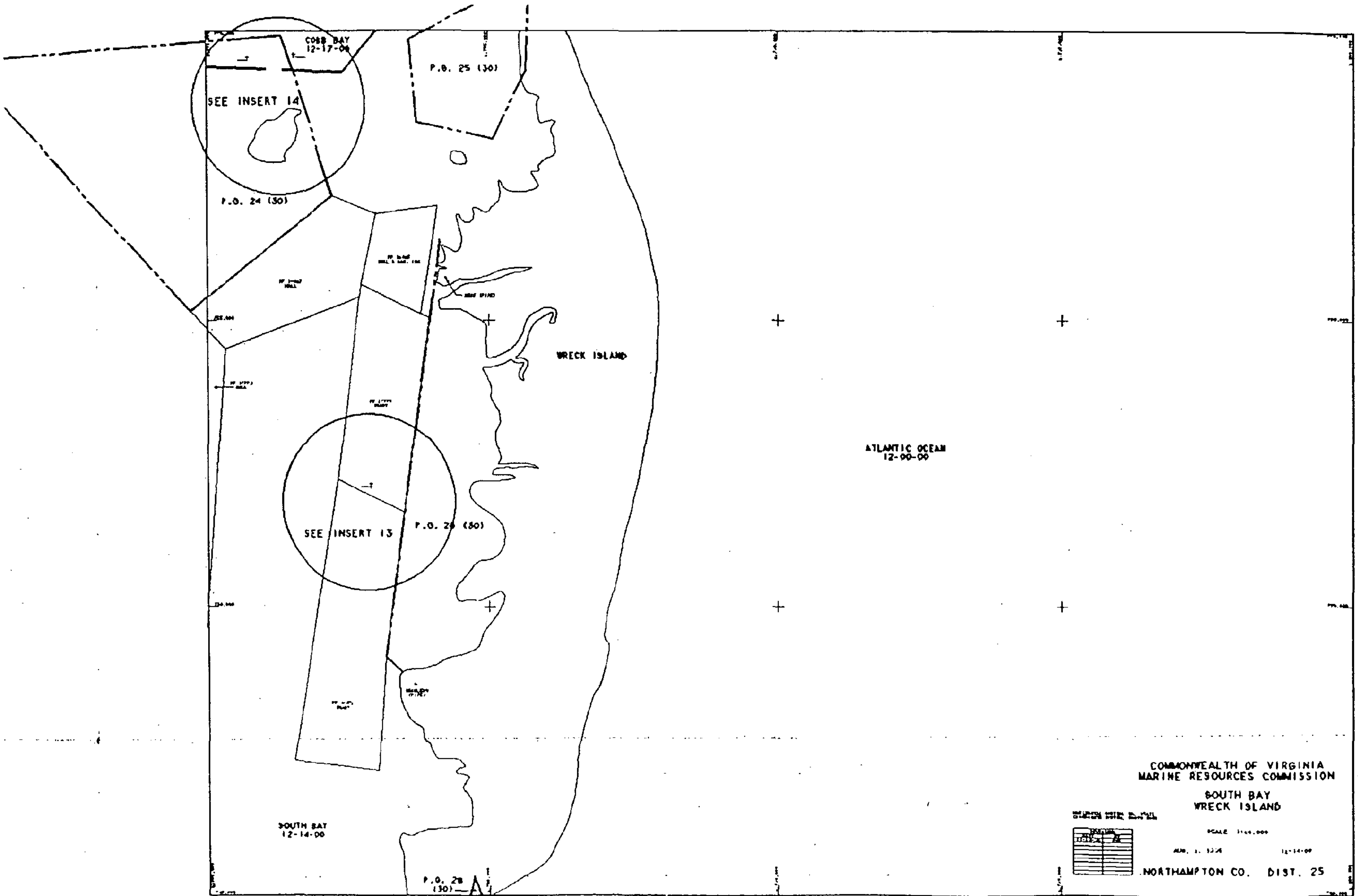

COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
SOUTH BAY
NEW MARSH
NORTHAMPTON CO. DIST. 25
NEW MARSH
RUNNING CHANNEL
MAN AND BOY MARSH
P.G. 24 (30)
P.G. 27 (30)
P.G. 35 (30)
COBB BAY 12-17-00
SOUTH BAY 12-14-00
MOCKHORN ISLAND
INSERT 12
INSERT 11
INSERT 10

545-2760

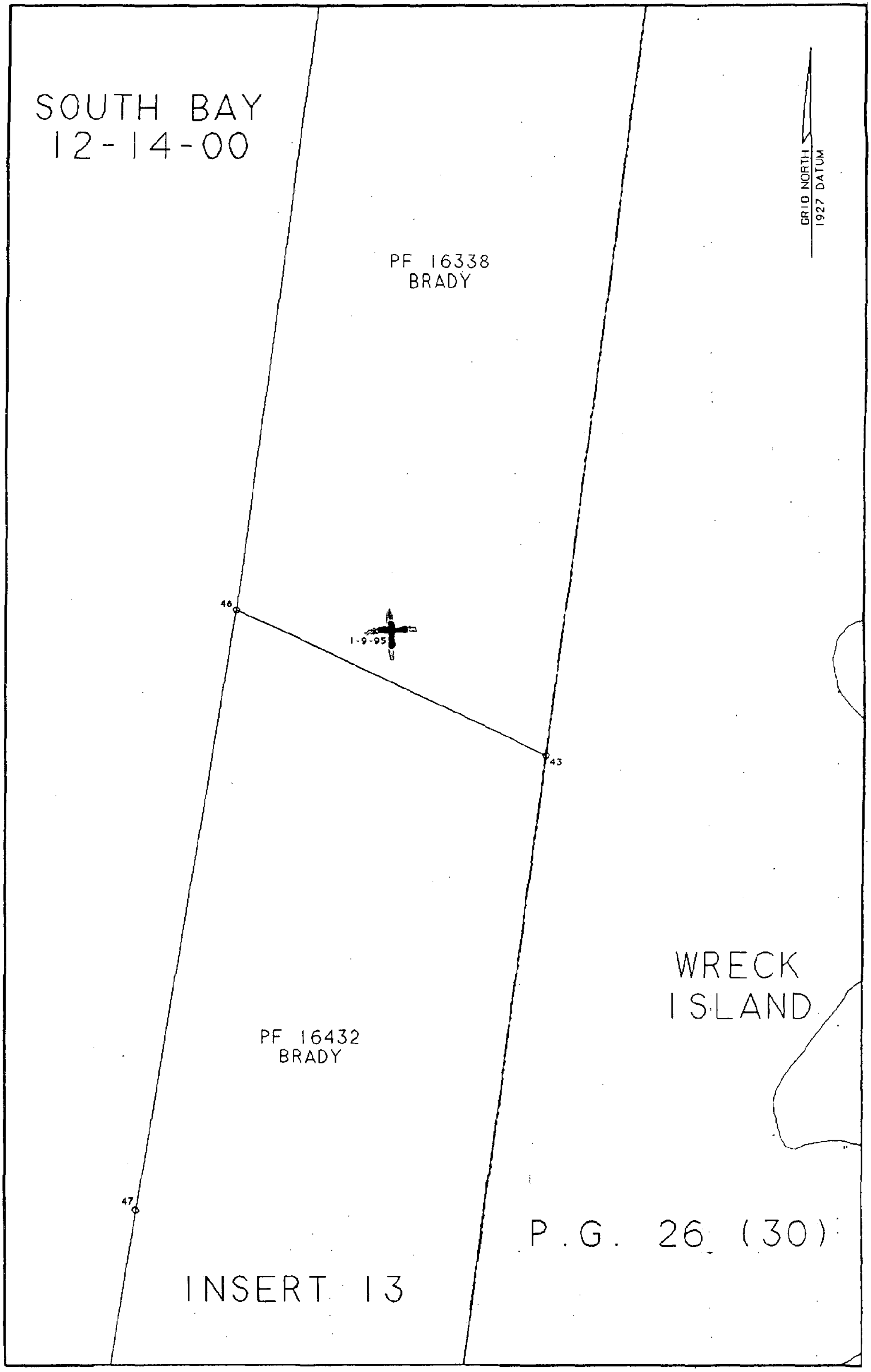

P.G. 27 (30)
NEW MARSH
S.P. 443
1.11 AC. 1994
800
801
803
802
603
602
1
GRID NORTH
1927 DATUM
P.G. 35 (30)
12-16-94
SOUTH BAY
12-14-00
3
7
4
8
PF 15087
WEST
INSERT 10
5

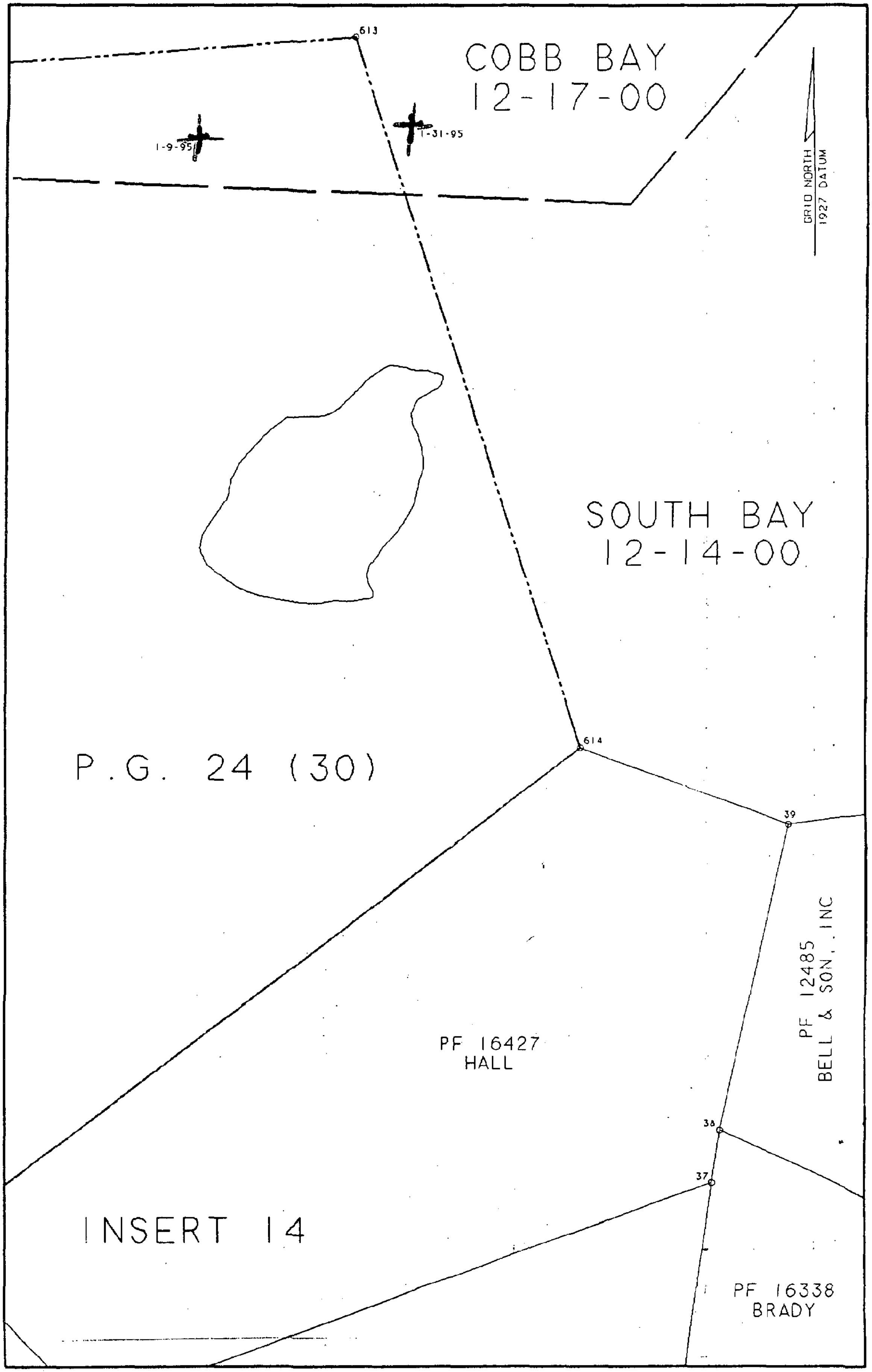

P.G. 24 (30)
GRID NORTH
1927 DATUM
PF 14023
WEST
35
32
PF 16427
HALL
609
610
615
MAN AND BOY
MARSH
2-24-95
PF 16339
HALL
31
P.G. 27 (30)
1-6-95
1-6-95
B-91
(PIPE)
SOUTH BAY
12-14-00
PT. B-79 (PIPE)
INSERT 11

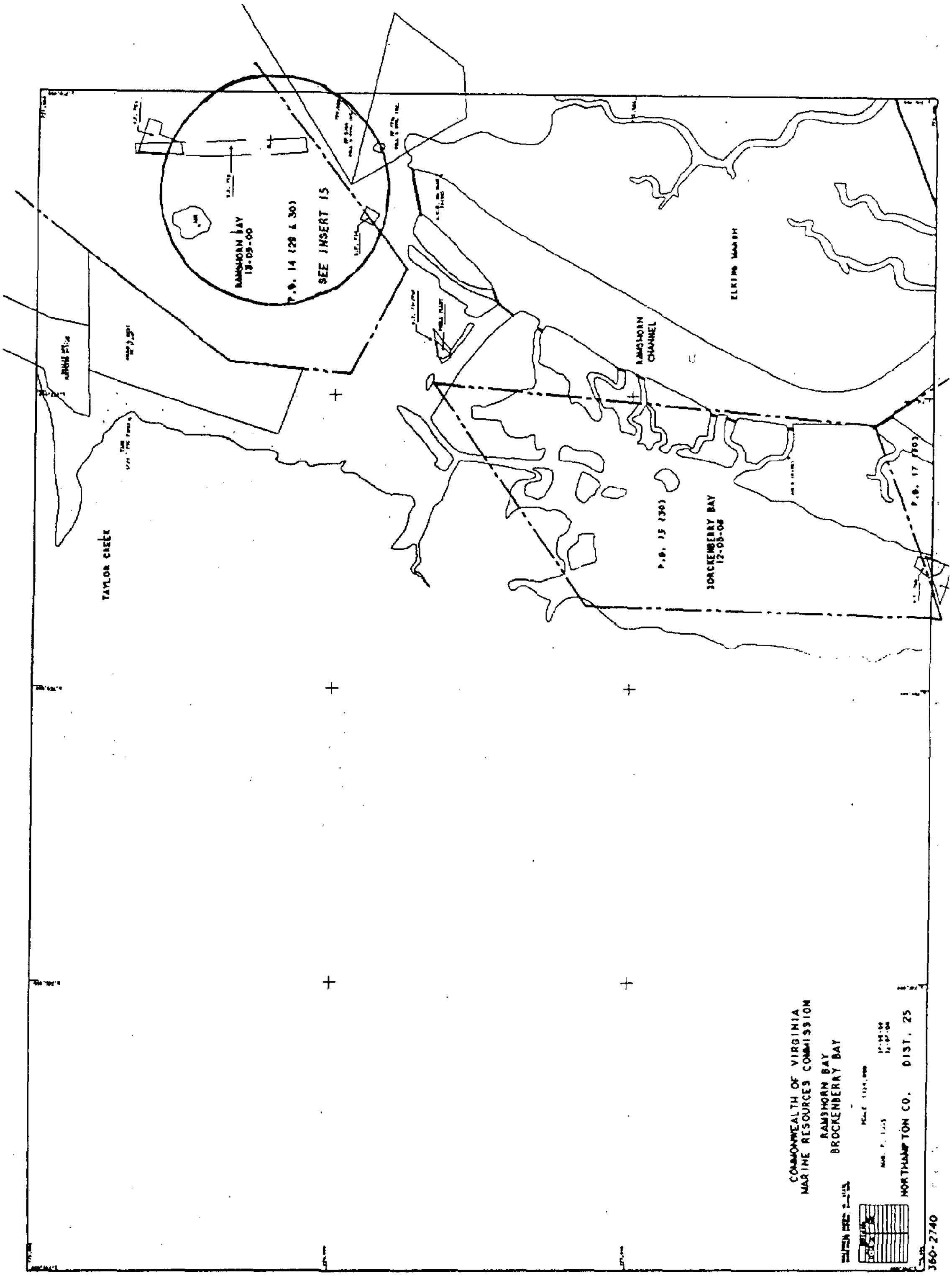

PF 16337
WEST
COBB BAY
12-17-00
GRID NORTH
1927 DATUM
HALL (PIPE)
PF 16820
BRADY
3-27-95
PF 13849
HALL
PF 13840
WEST
2-24-95
PF 11595
REYNOLDS
SOUTH BAY
12-14-00
MARSH
ISLAND
PF 6384
REYNOLDS
P.G. 27
(30)
PF 16629
REYNOLDS
MARSH
ISLAND
RUNNING
CHANNEL
NEW MARSH
INSERT 12

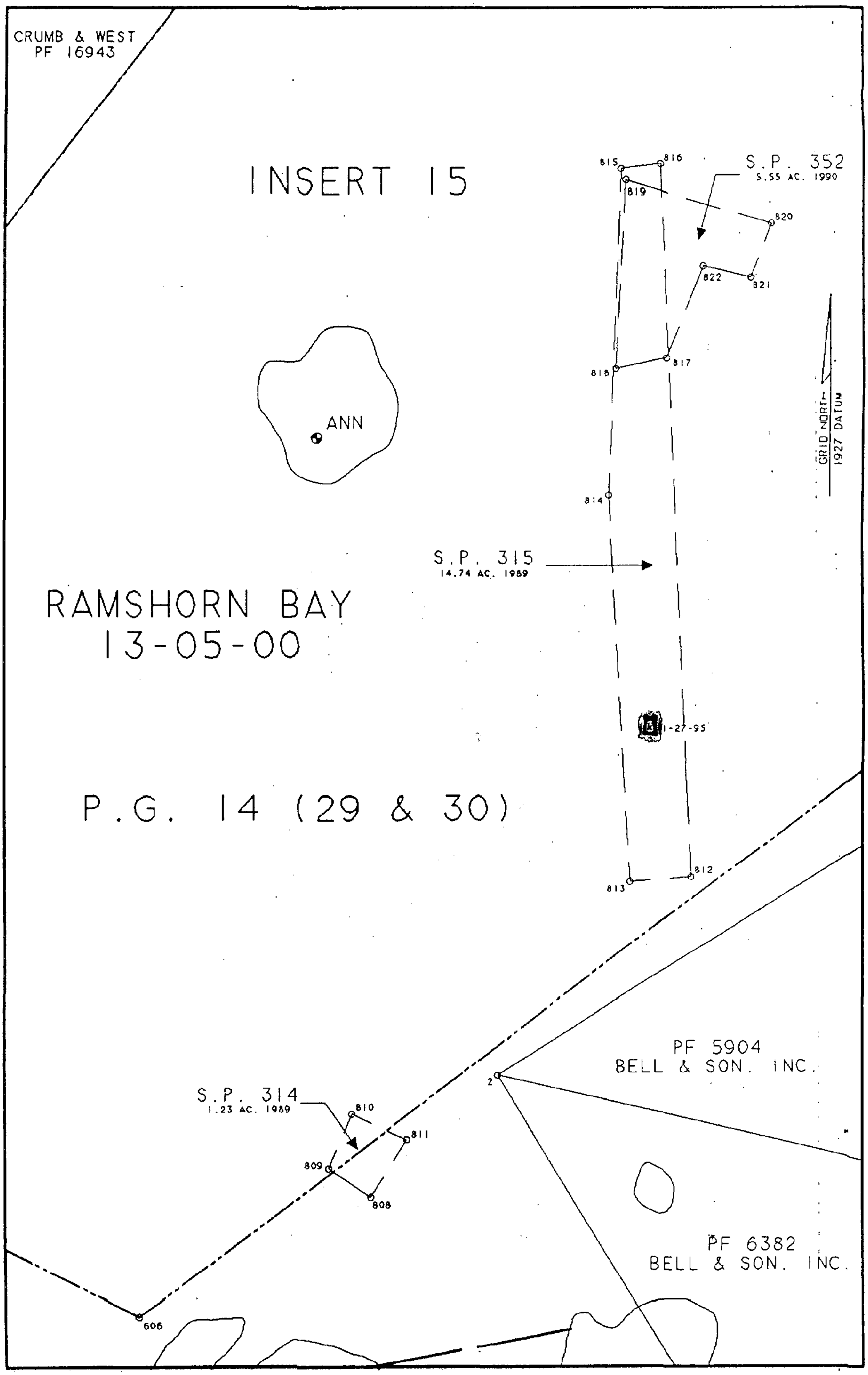

COBB BAY
12-17-00
P.O. 25 (30)
SEE INSERT 14
P.O. 24 (30)
WRECK ISLAND
ATLANTIC OCEAN
12-00-00
SEE INSERT 13
SOUTH BAY
12-14-00
P.O. 28
(30)
COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
SOUTH BAY
WRECK ISLAND
NORTHAMPTON CO. DIST. 25

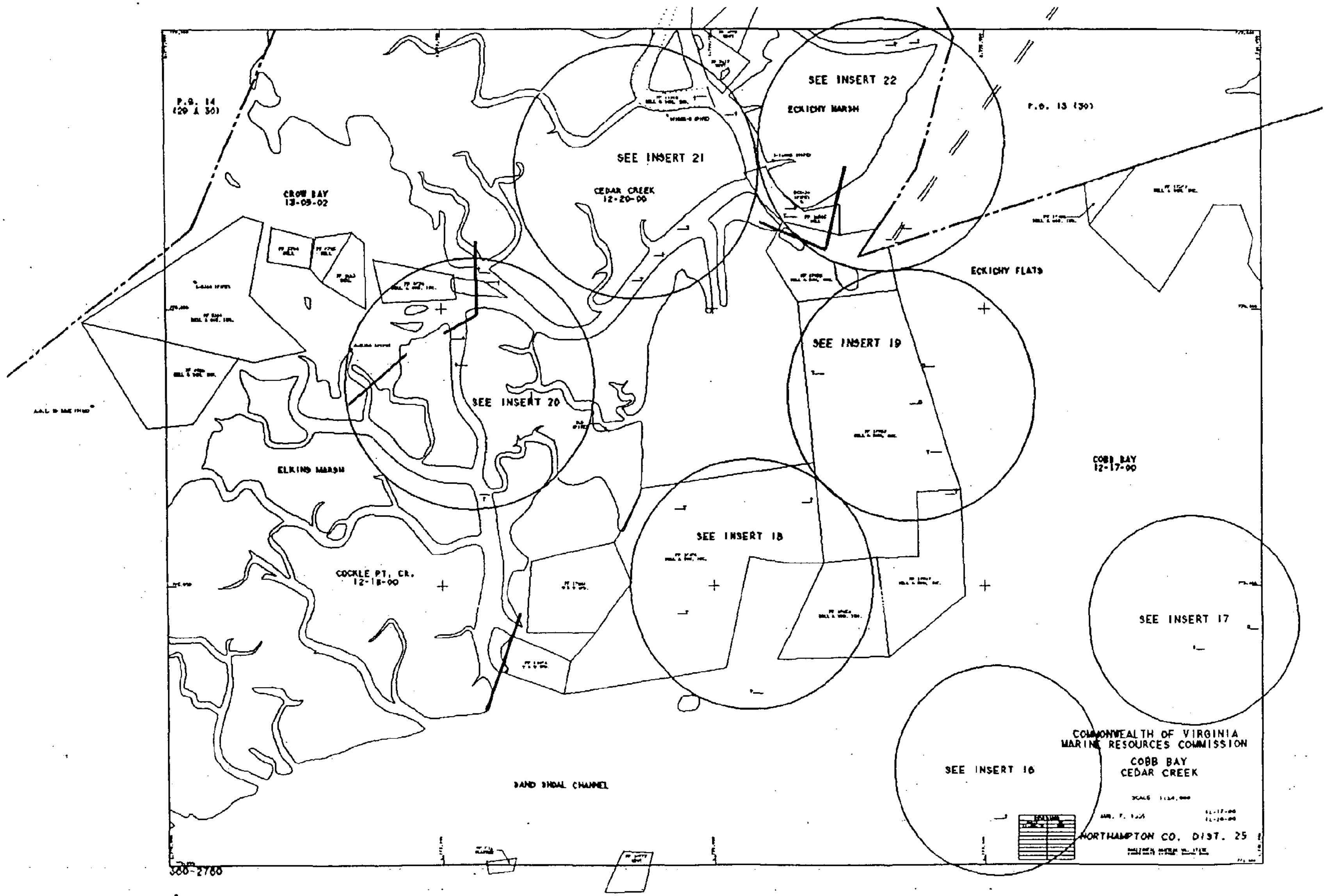
345-2780

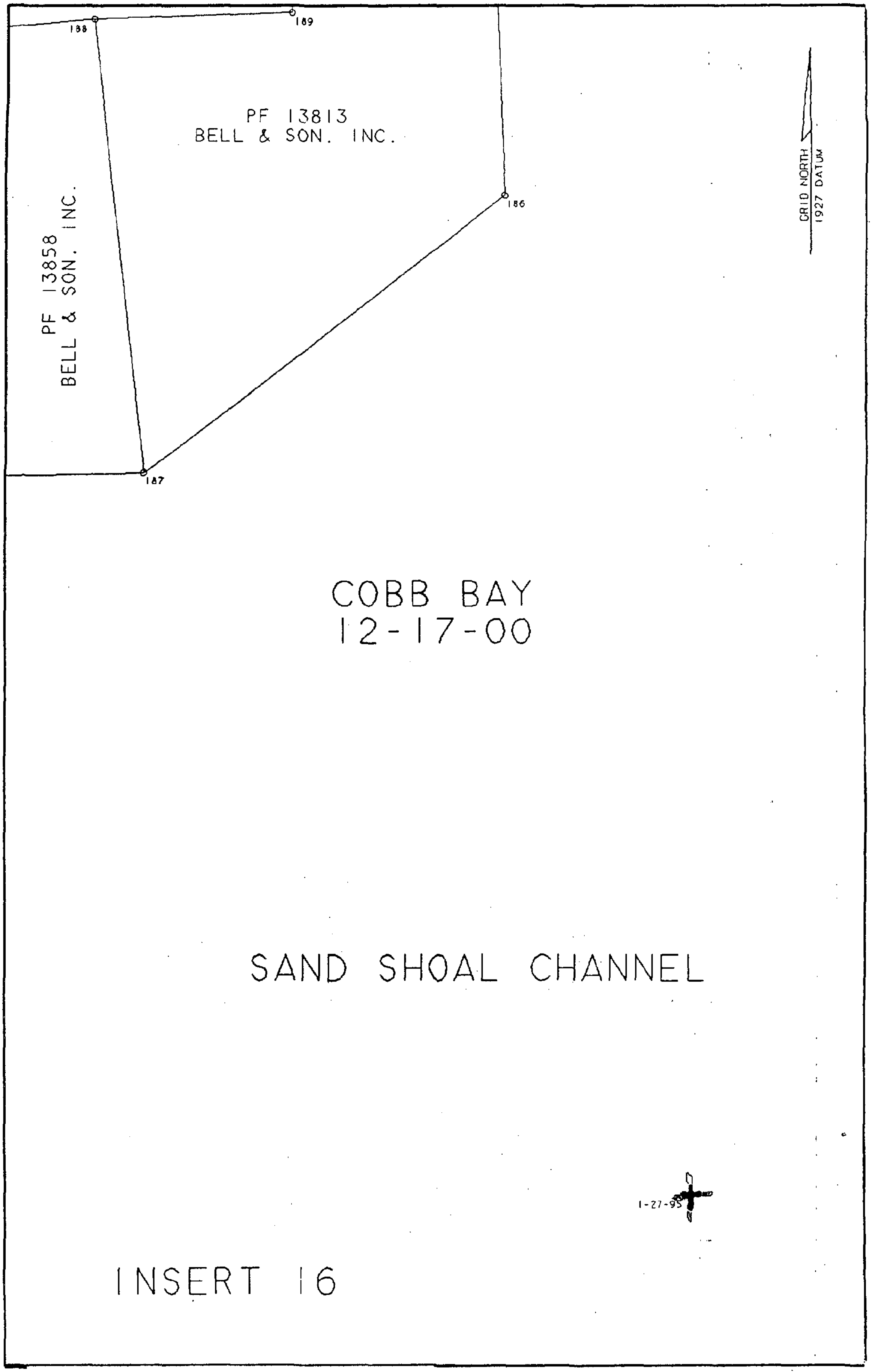

SOUTH BAY
12-14-00
GRID NORTH
1927 DATUM
PF 16338
BRADY
46
1-9-95
43
PF 16432
BRADY
47
WRECK
ISLAND
P.G. 26 (30)
INSERT 13

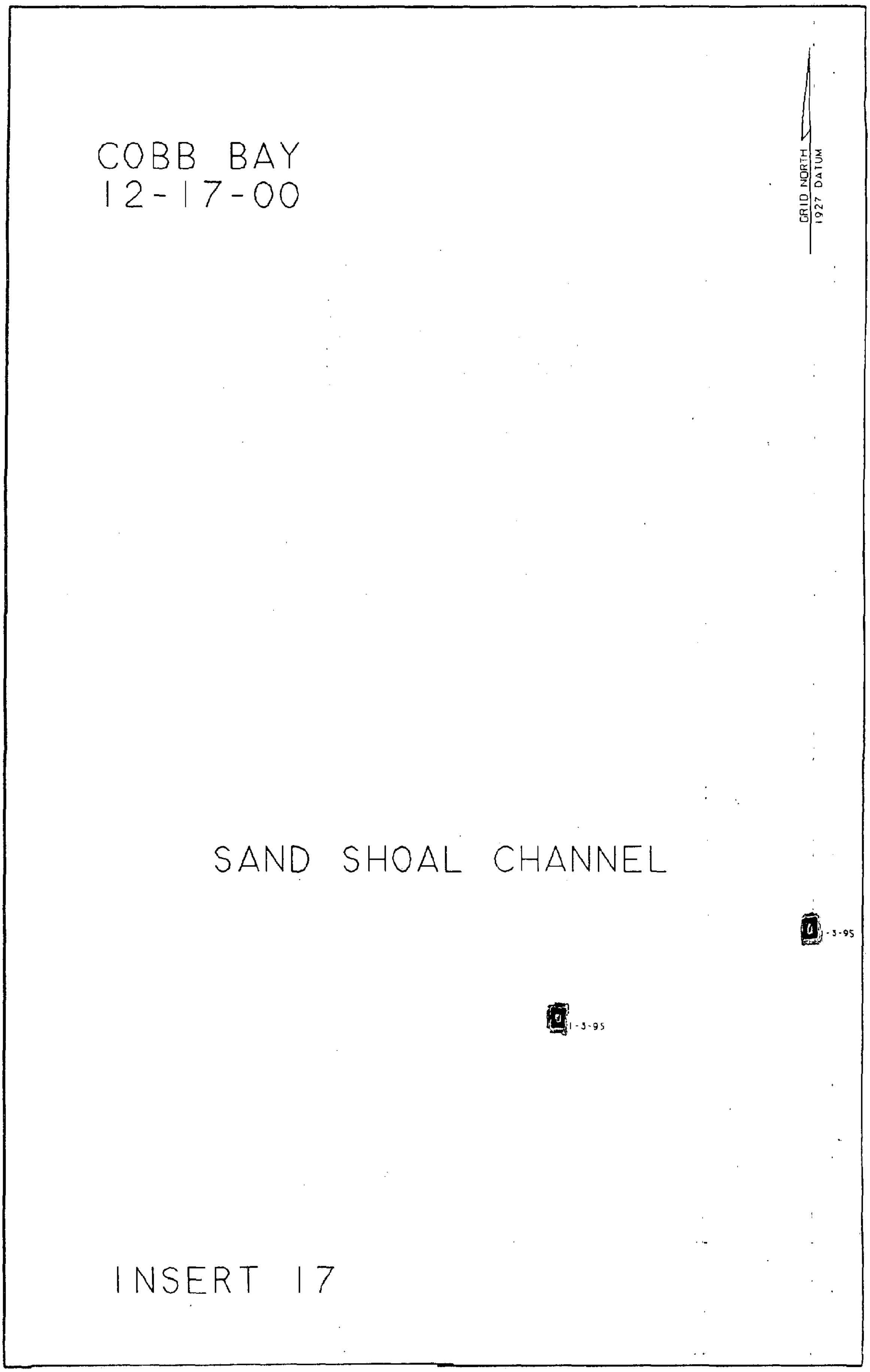

613
COBB BAY
12-17-00
1-9-95
1-31-95
GRID NORTH
1927 DATUM
SOUTH BAY
12-14-00
614
P.G. 24 (30)
39
PF 12485
BELL & SON, INC
PF 16427
HALL
38
37
INSERT 14
PF 16338
BRADY

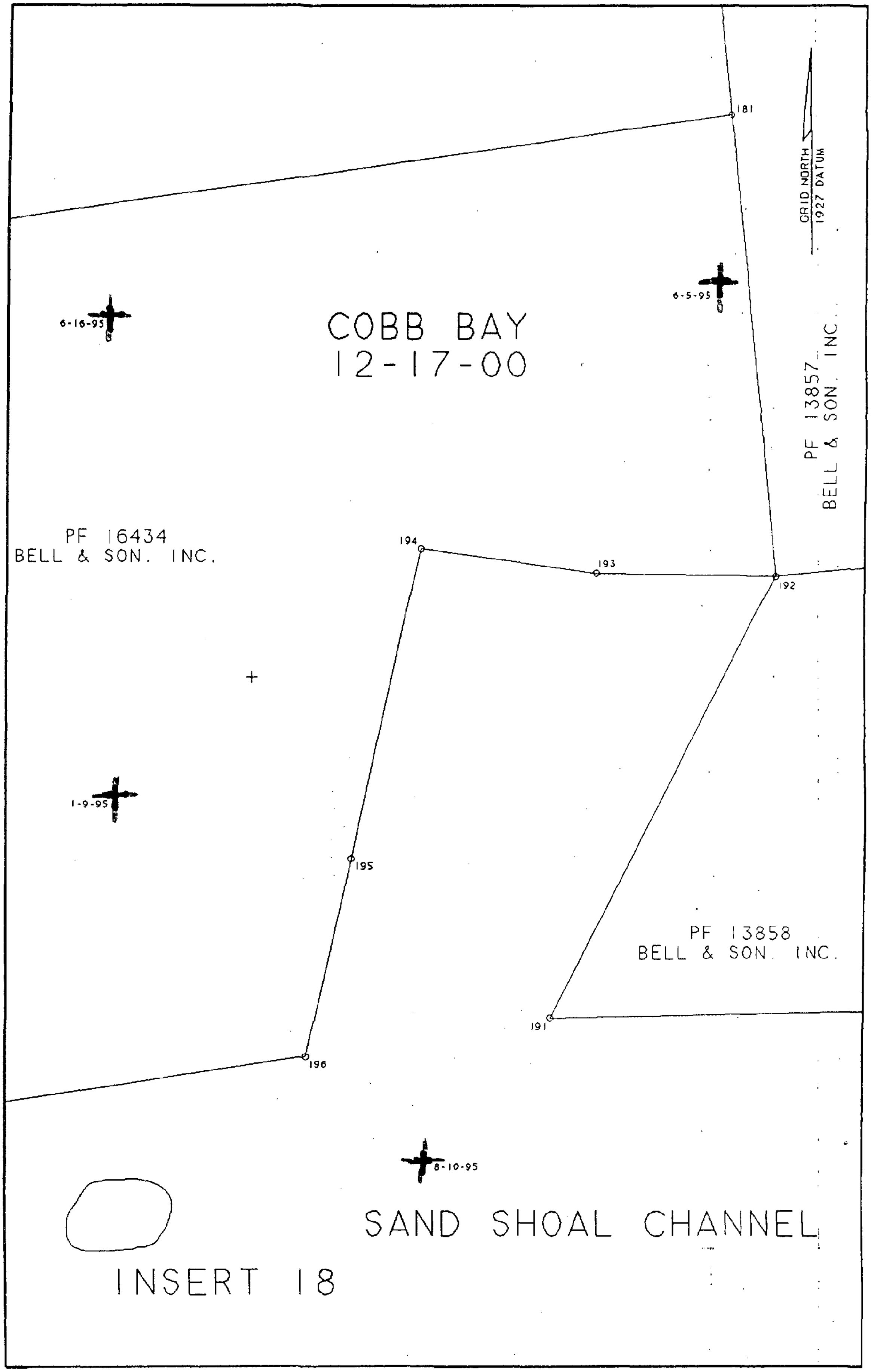

RAMSHORN BAY
13-09-00
P.O. 14 (29 & 30)
SEE INSERT 15
ELKINS MARSH
RAMSHORN CHANNEL
TAYLOR CREEK
P.O. 15 (30)
BROCKENBERRY BAY
12-08-08
P.O. 17 (30)
COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
RAMSHORN BAY
BROCKENBERRY BAY
NORTHAMPTON CO. DIST. 25
360-2740

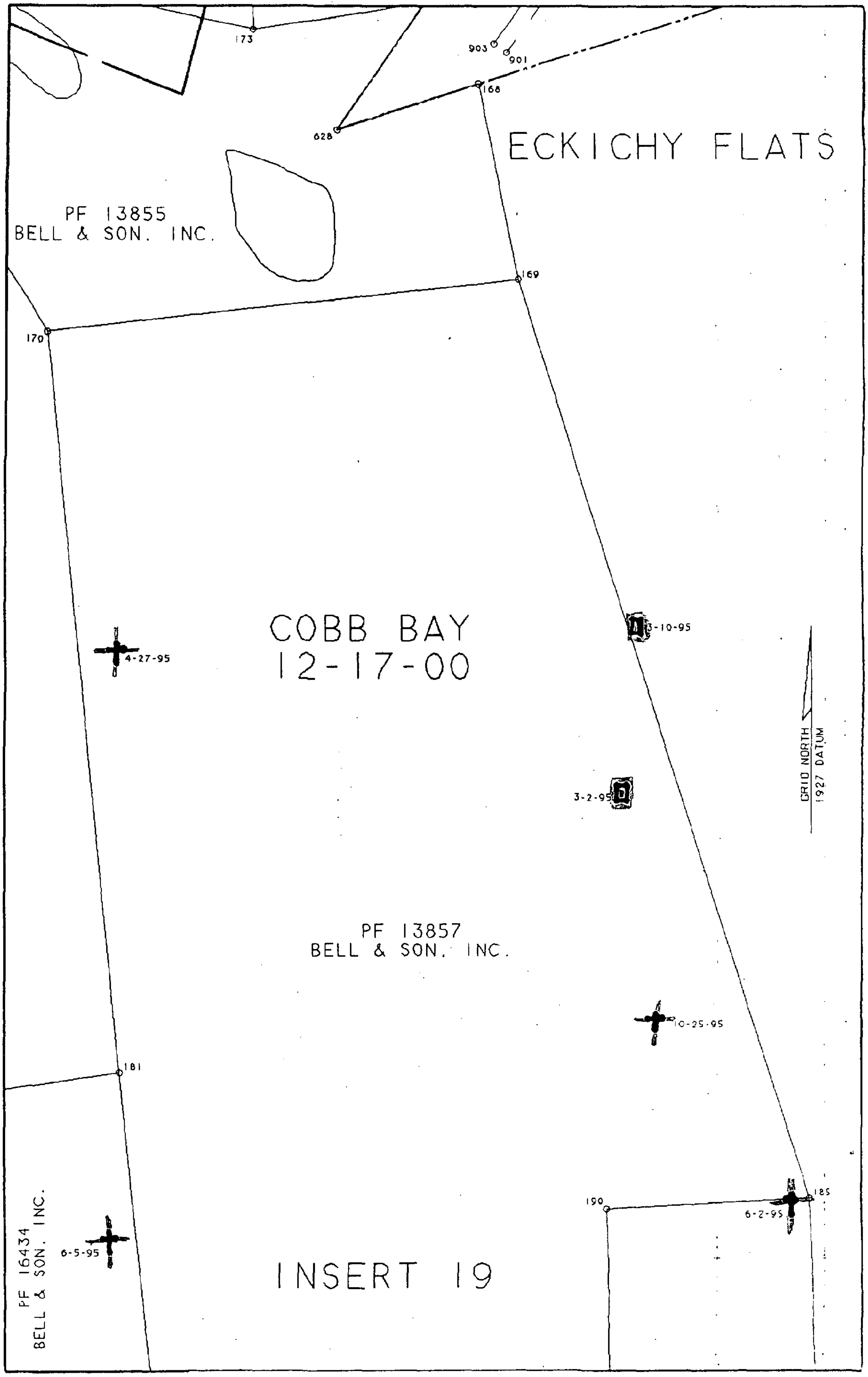

CRUMB & WEST
PF 16943
INSERT 15
S.P. 352
5.55 AC. 1990
815
816
819
820
822
821
GRID NORTH
1927 DATUM
818
817
ANN
814
S.P. 315
14.74 AC. 1989
RAMSHORN BAY
13-05-00
1-27-95
P.G. 14 (29 & 30)
812
813
PF 5904
BELL & SON. INC.
2
S.P. 314
1.23 AC. 1989
810
811
809
808
PF 6382
BELL & SON. INC.
606

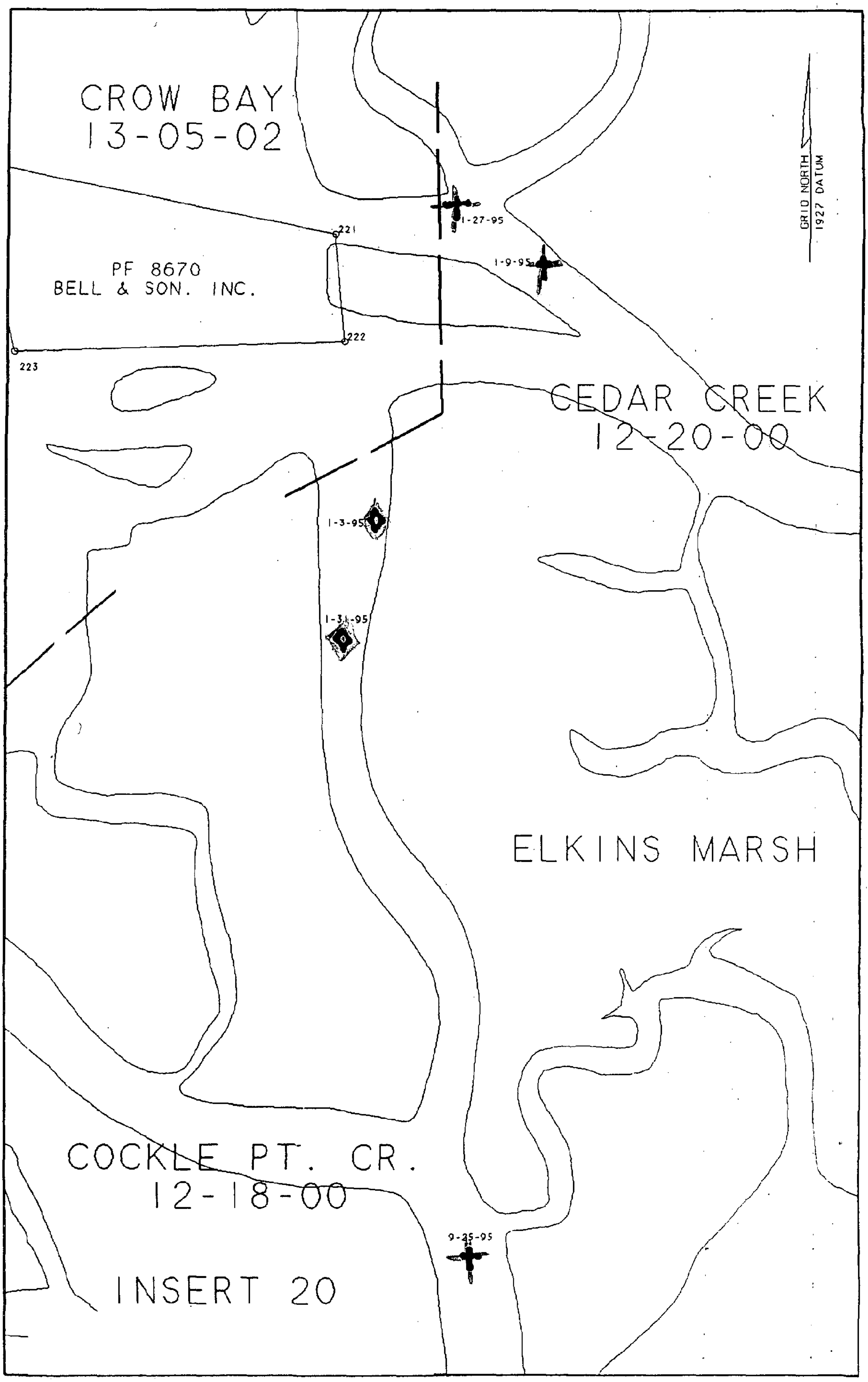

P.G. 14 (29 & 30)
CROW BAY 13-09-02
SEE INSERT 21
CEDAR CREEK 12-20-00
SEE INSERT 22
ECKICHY MARSH
P.G. 13 (30)
ECKICHY FLATS
SEE INSERT 20
SEE INSERT 19
ELKINS MARSH
COBB BAY 12-17-00
SEE INSERT 18
COCKLE PT. CR. 12-18-00
SEE INSERT 17
SEE INSERT 16
SAND SHOAL CHANNEL
COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
COBB BAY
CEDAR CREEK
NORTHAMPTON CO. DIST. 25
300-2760

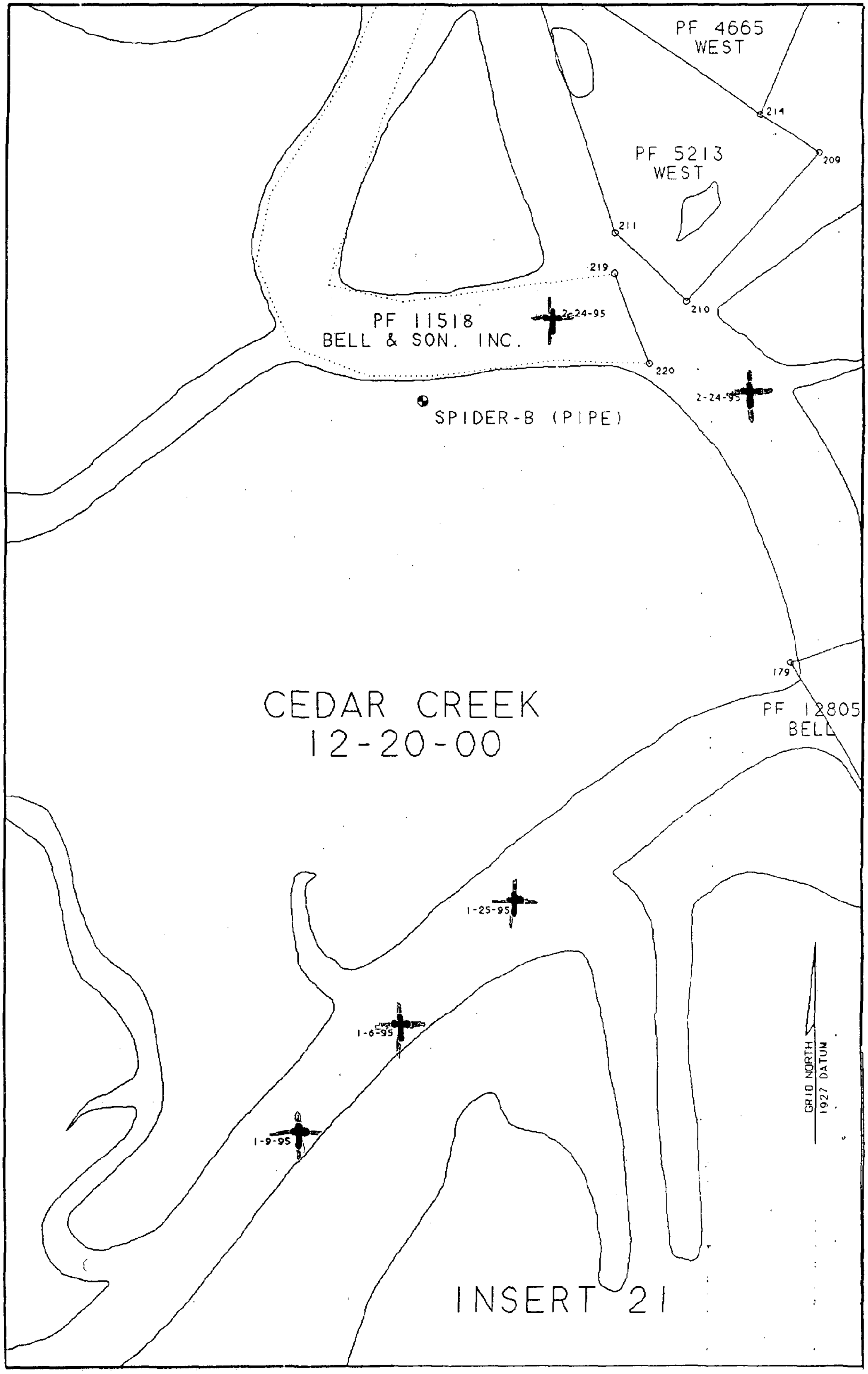

188
189
PF 13813
BELL & SON, INC.
PF 13858
BELL & SON, INC.
186
187
GRID NORTH
1927 DATUM
COBB BAY
12-17-00
SAND SHOAL CHANNEL
1-27-95
INSERT 16

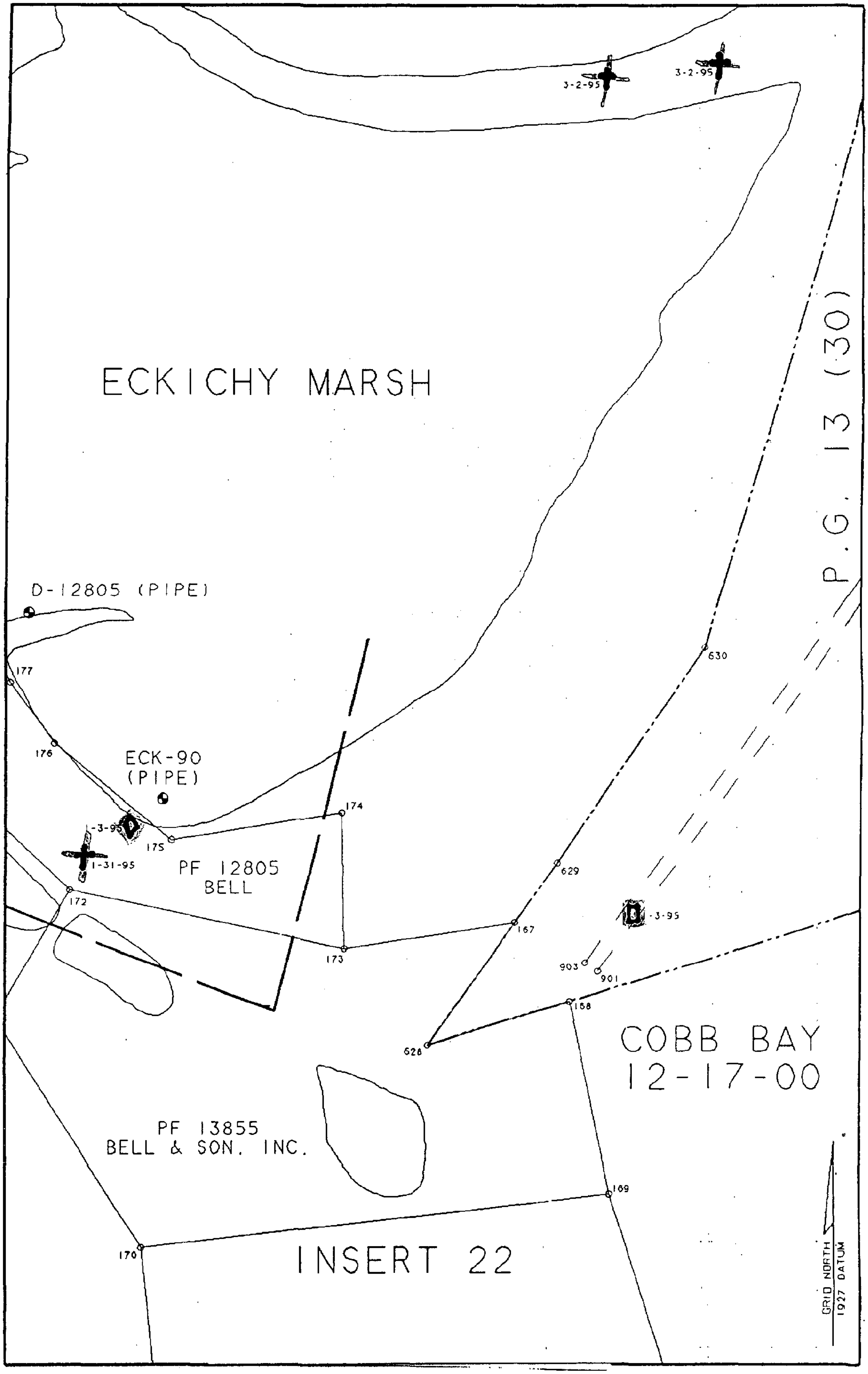

COBB BAY
12-17-00
GRID NORTH
1927 DATUM
SAND SHOAL CHANNEL
-3-95
1-3-95
INSERT 17

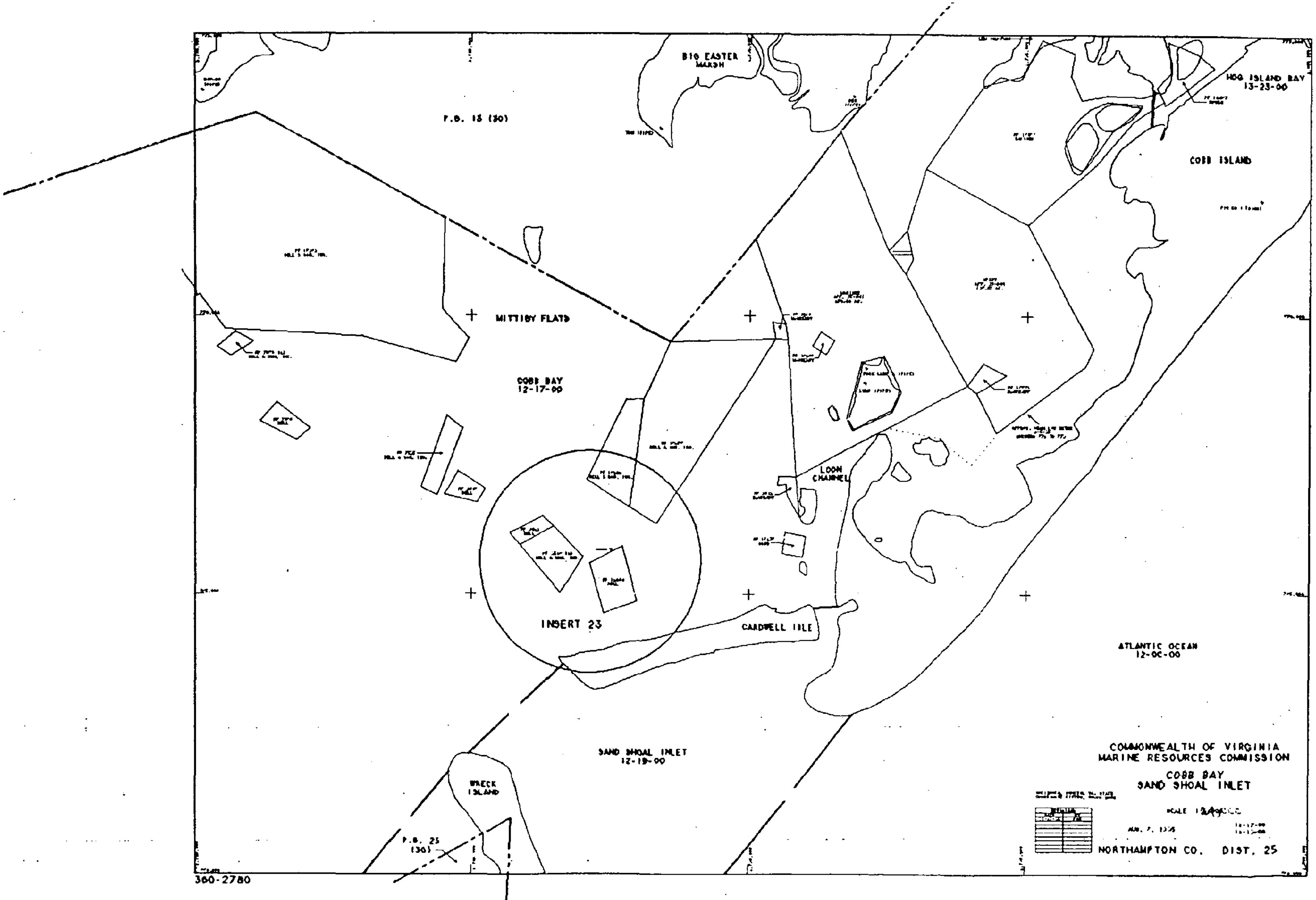

COBB BAY
12-17-00
GRID NORTH
1927 DATUM
181
6-16-95
6-5-95
PF 13857
BELL & SON. INC.
PF 16434
BELL & SON. INC.
194
193
192
1-9-95
195
PF 13858
BELL & SON. INC.
191
196
8-10-95
SAND SHOAL CHANNEL
INSERT 18


ECKICHY FLATS
PF 13855
BELL & SON. INC.
173
903
901
168
628
169
170
COBB BAY
12-17-00
4-27-95
3-10-95
3-2-95
GRID NORTH
1927 DATUM
PF 13857
BELL & SON. INC.
10-25-95
181
185
190
6-2-95
PF 16434
BELL & SON. INC.
6-5-95
INSERT 19

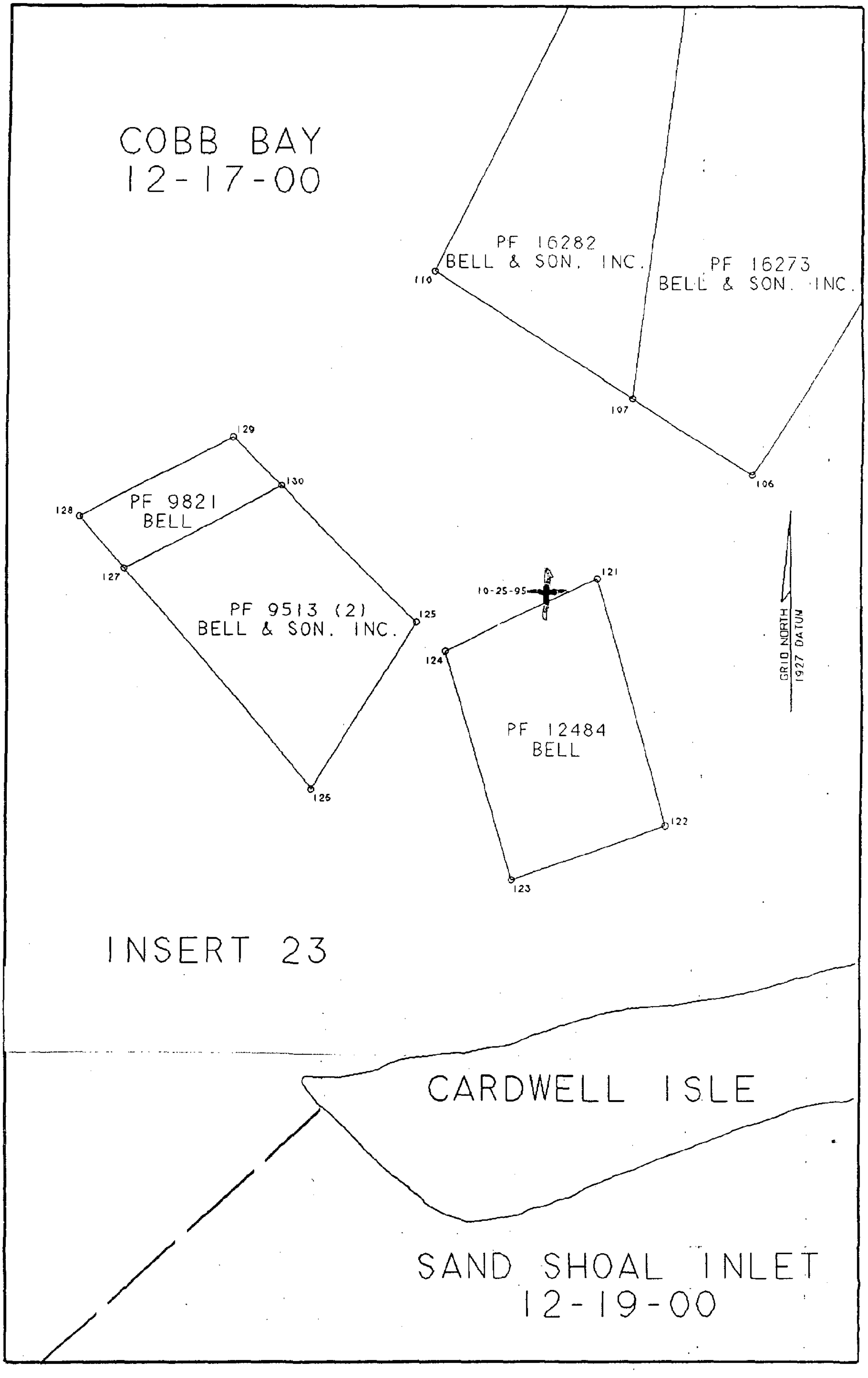

CROW BAY
13-05-02
PF 8670
BELL & SON. INC.
221
222
223
1-27-95
1-9-95
CEDAR CREEK
12-20-00
1-3-95
1-31-95
ELKINS MARSH
COCKLE PT. CR.
12-18-00
9-25-95
INSERT 20
GRID NORTH
1927 DATUM

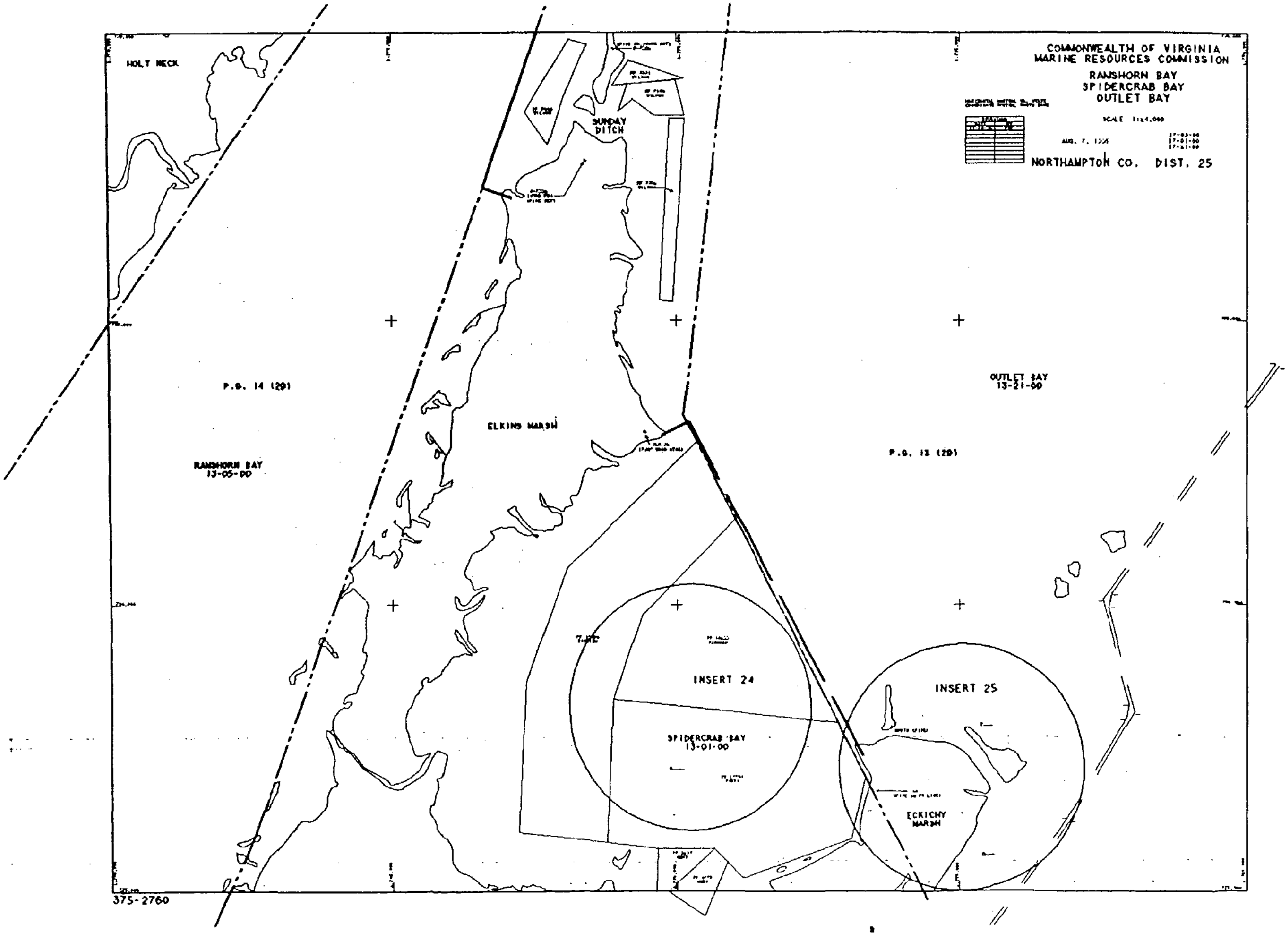

PF 4665
WEST
214
209
PF 5213
WEST
211
219
210
PF 11518
BELL & SON, INC.
2-24-95
220
2-24-95
SPIDER-B (PIPE)
179
CEDAR CREEK
12-20-00
PF 12805
BELL
1-25-95
1-6-95
1-9-95
GRID NORTH
1927 DATUM
INSERT 21


ECKICHY MARSH
P.G. 13 (30)
3-2-95
3-2-95
D-12805 (PIPE)
ECK-90
(PIPE)
177
176
175
174
173
172
1-31-95
PF 12805
BELL
630
629
167
903
901
168
628
169
170
COBB BAY
12-17-00
PF 13855
BELL & SON, INC.
INSERT 22
GRID NORTH
1927 DATUM


BIG EASTER MARSH
P.B. 13 (30)
HOG ISLAND BAY 13-23-00
COBB ISLAND
MITTIBY FLATS
COBB BAY 12-17-00
LOON CHANNEL
INSERT 23
CARDWELL ISLE
ATLANTIC OCEAN 12-00-00
SAND SHOAL INLET 12-19-00
WRECK ISLAND
P.B. 25 (30)
COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
COBB BAY
SAND SHOAL INLET
NORTHAMPTON CO. DIST. 25

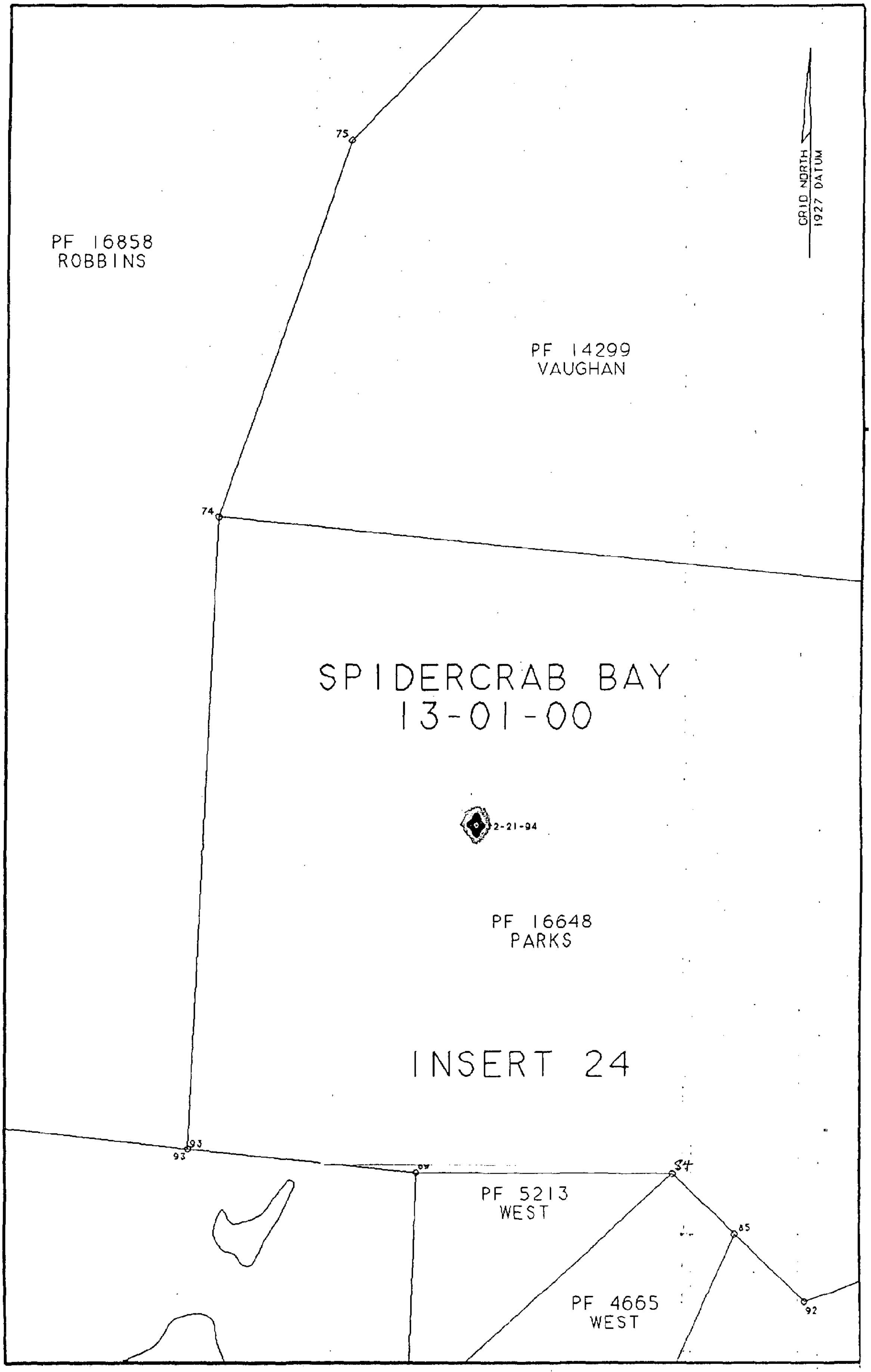
360-2780

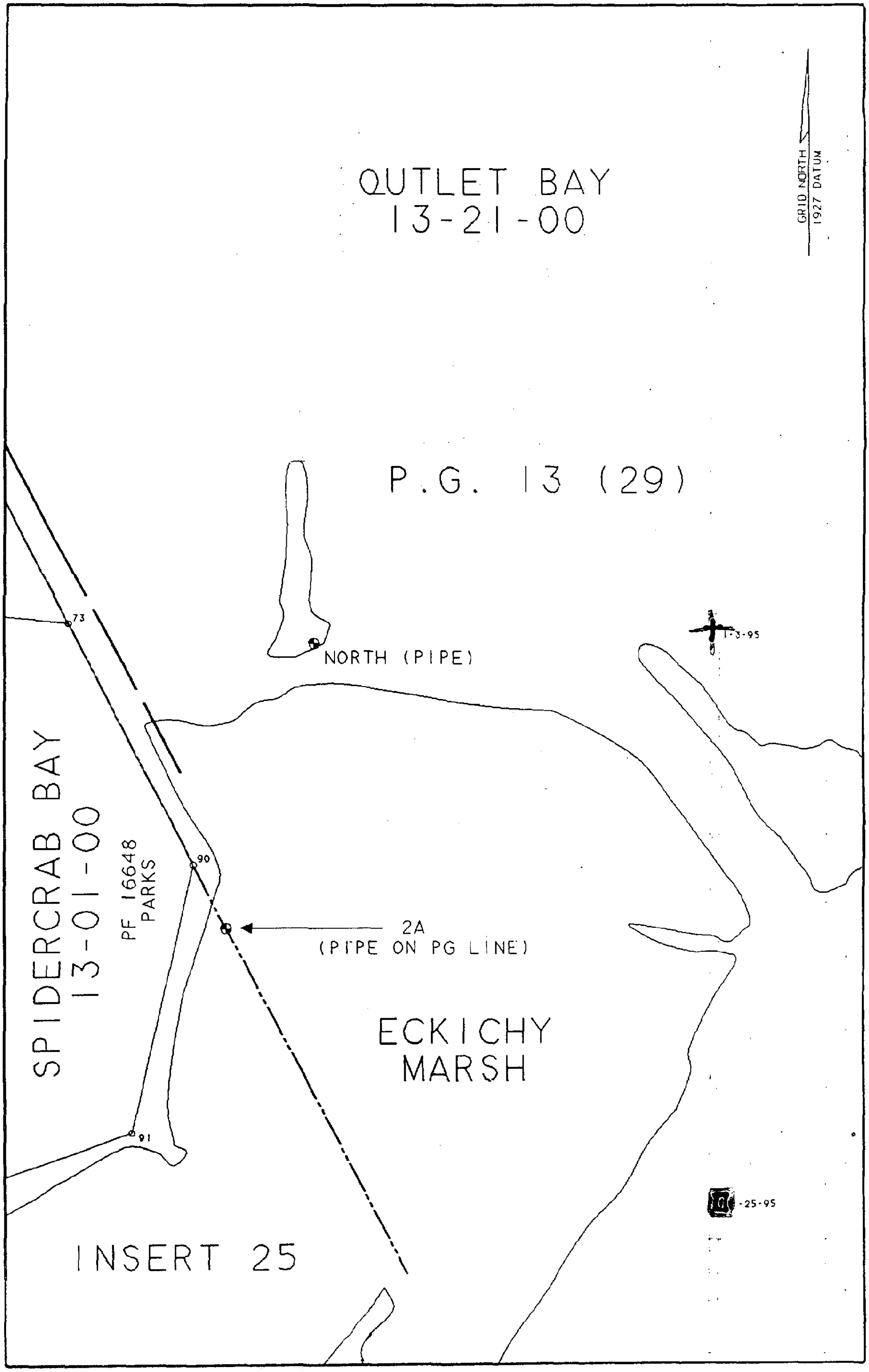

COBB BAY
12-17-00
PF 16282
BELL & SON, INC.
PF 16273
BELL & SON, INC.
110
107
106
129
130
128
PF 9821
BELL
127
PF 9513 (2)
BELL & SON, INC.
125
126
10-25-95
121
124
PF 12484
BELL
122
123
GRID NORTH
1927 DATUM
INSERT 23
CARDWELL ISLE
SAND SHOAL INLET
12-19-00



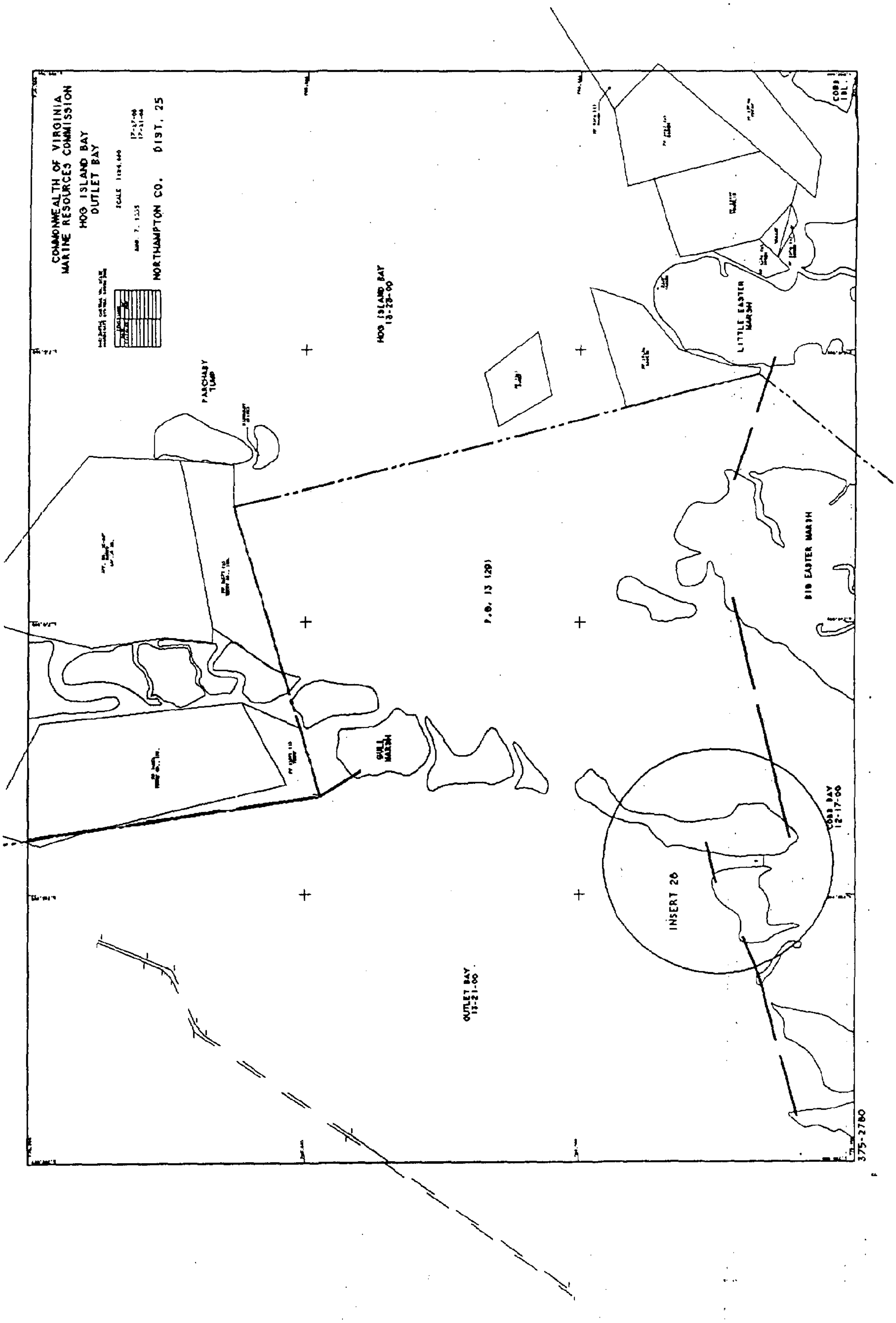
COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
RANSHORN BAY
SPIDERCRAB BAY
OUTLET BAY
NORTHAMPTON CO. DIST. 25
HOLT NECK
SUNDAY DITCH
ELKINS MARSH
P.G. 14 (29)
RANSHORN BAY
13-05-00
OUTLET BAY
13-21-00
P.G. 13 (29)
INSERT 24
SPIDERCRAB BAY
13-01-00
INSERT 25
ECKICHY MARSH

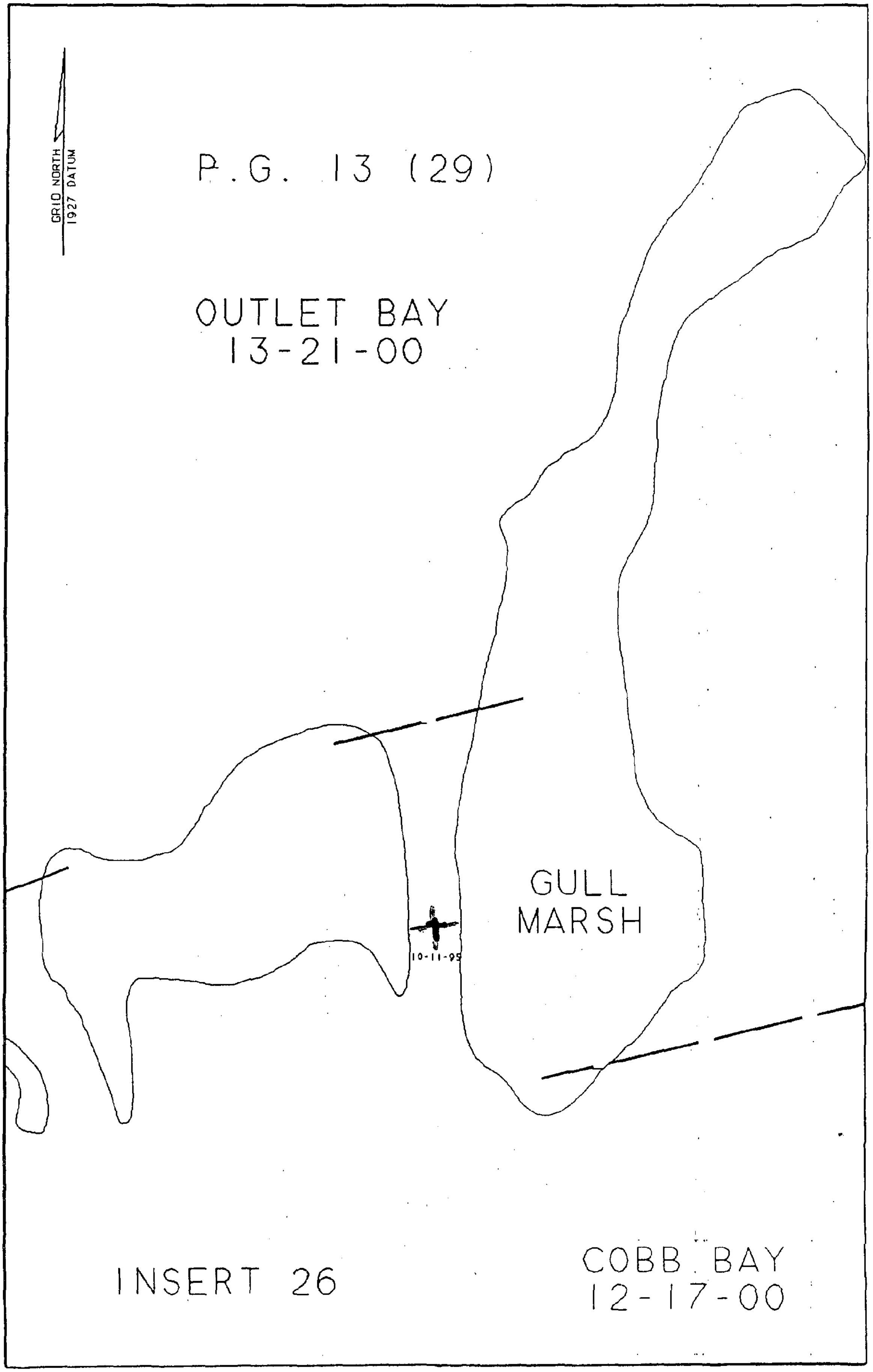
375-2760

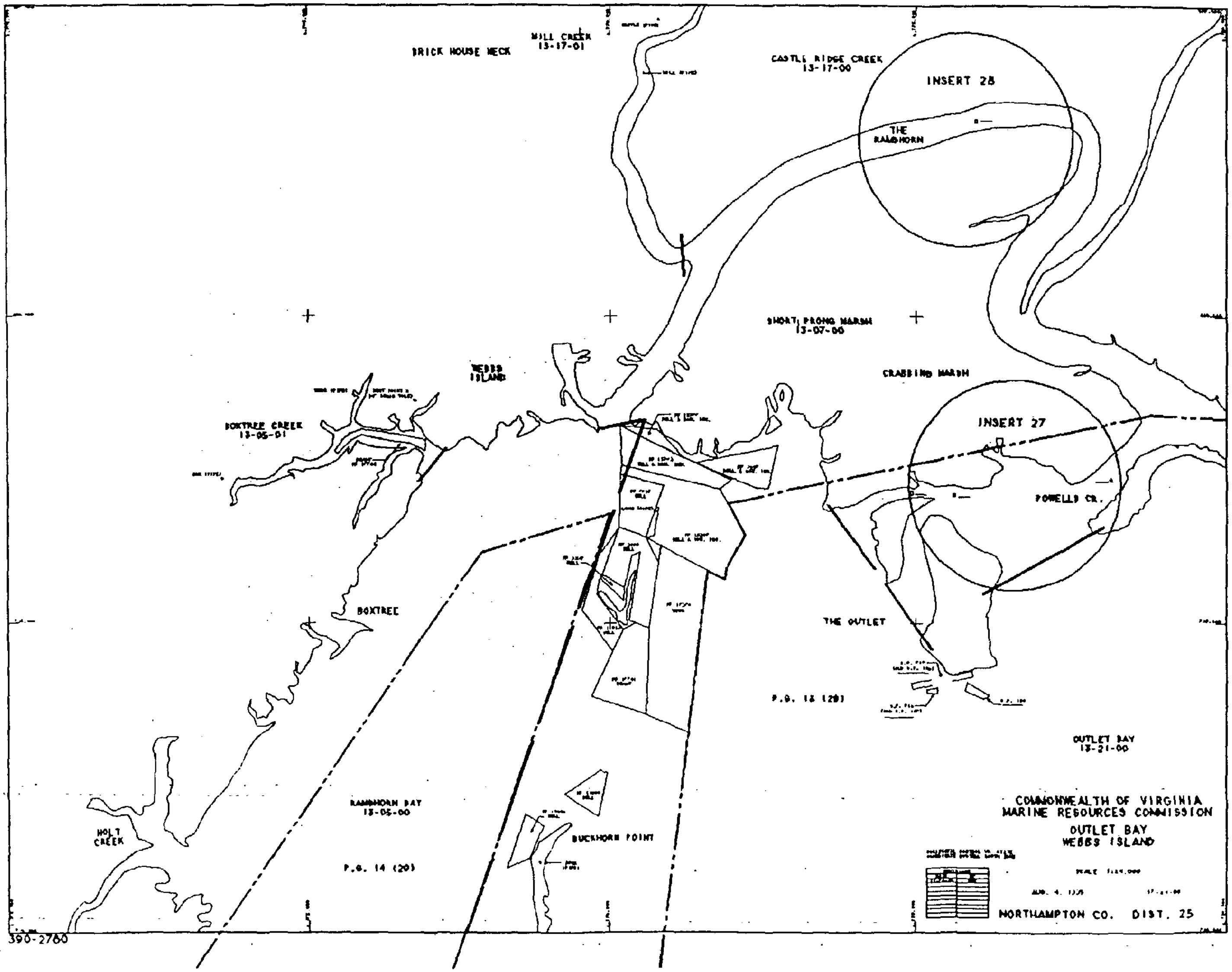

PF 16858
ROBBINS
GRID NORTH
1927 DATUM
PF 14299
VAUGHAN
SPIDERCRAB BAY
13-01-00
2-21-94
PF 16648
PARKS
INSERT 24
PF 5213
WEST
PF 4665
WEST
75
74
93
85
92



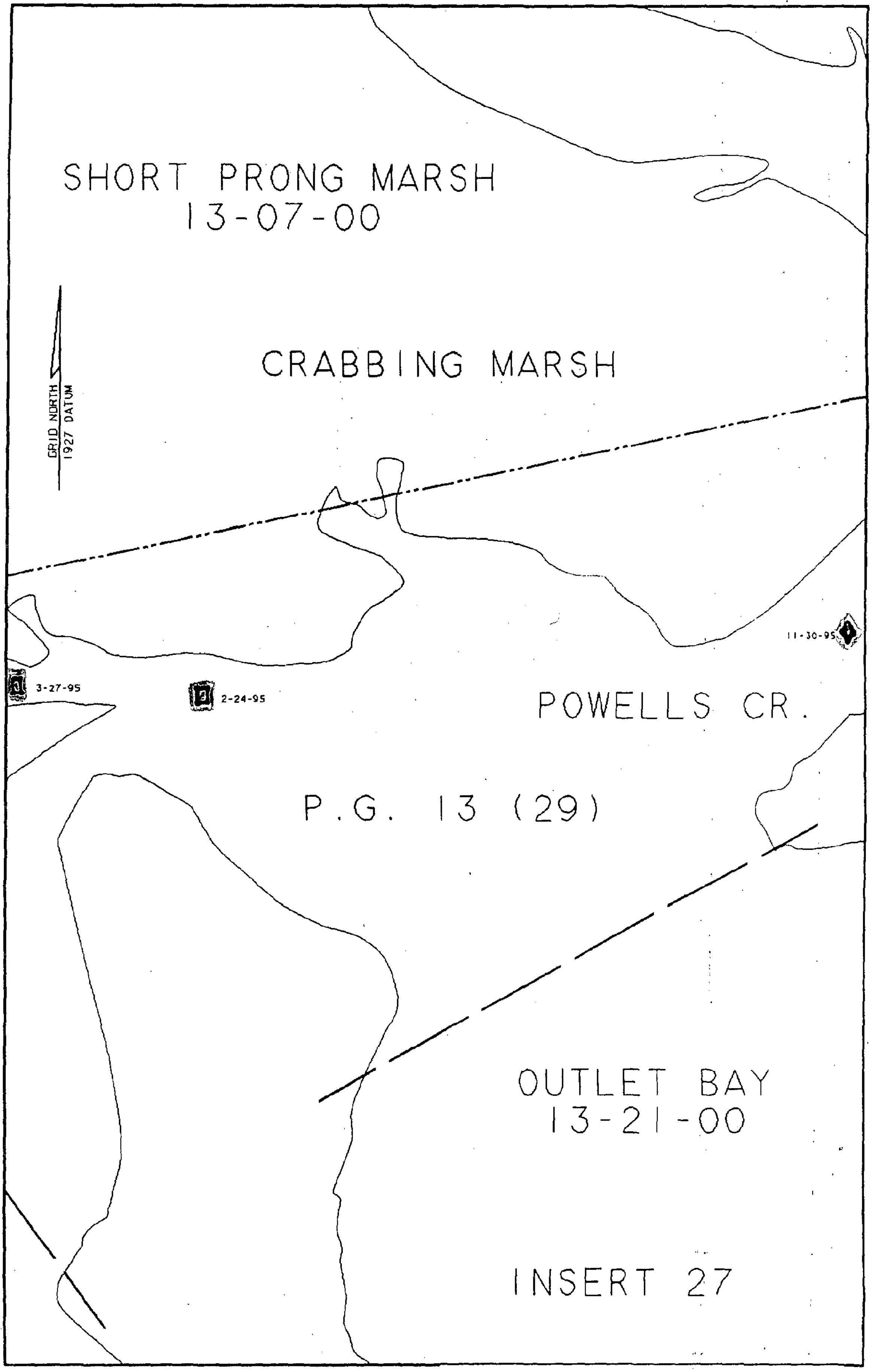
GRID NORTH
1927 DATUM
OUTLET BAY
13-21-00
P.G. 13 (29)
73
NORTH (PIPE)
SPIDERCRAB BAY
13-01-00
PF 16648
PARKS
90
2A
(PIPE ON PG LINE)
ECKICHY
MARSH
91
INSERT 25

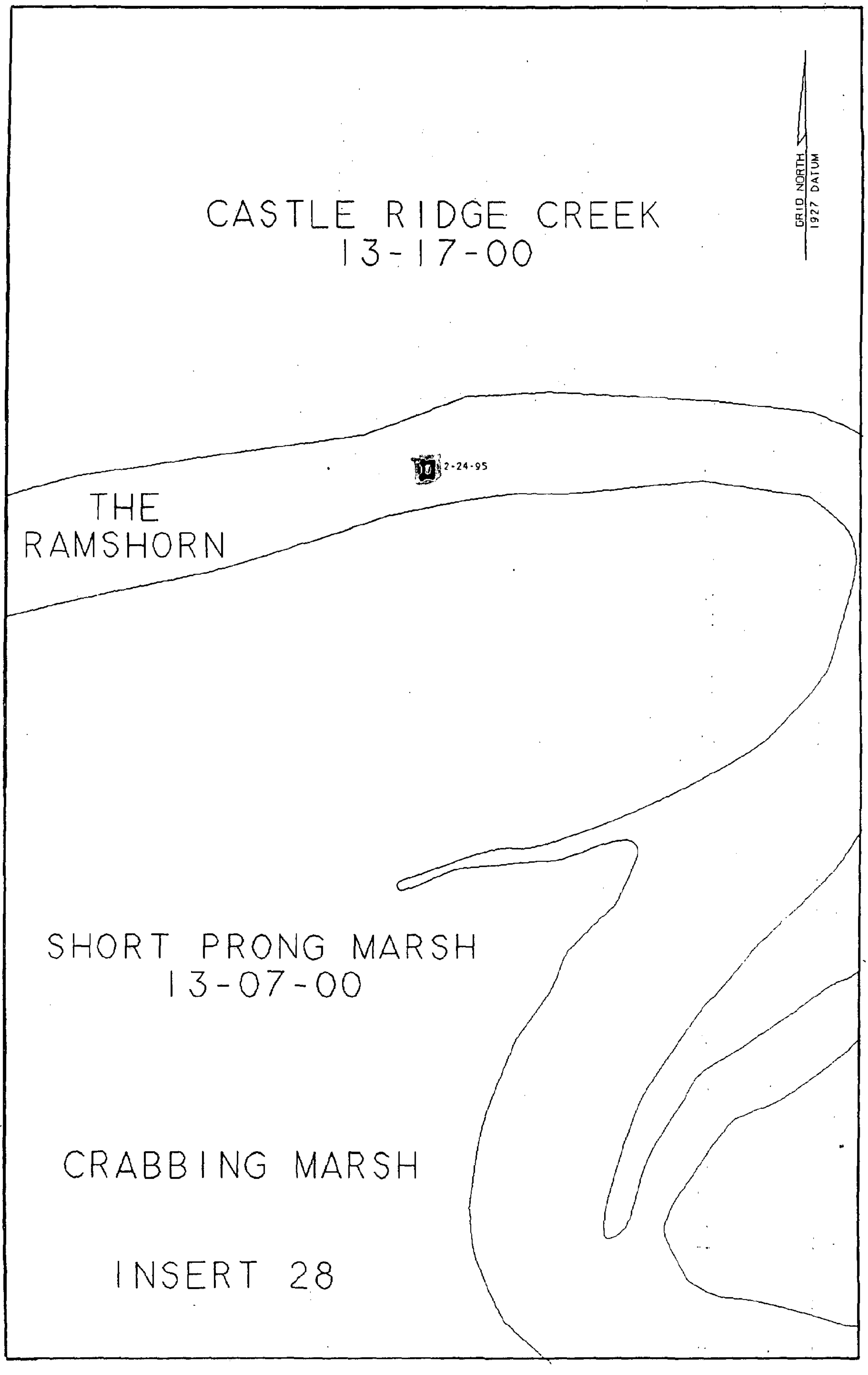

COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
HOG ISLAND BAY
OUTLET BAY
NORTHAMPTON CO.
DIST. 25
HOG ISLAND BAY
13-23-00
P.O. 13 (29)
OUTLET BAY
13-21-00
INSERT 26
COBB BAY
12-17-00
BIG EASTER MARSH
LITTLE EASTER MARSH
GULL MARSH
375-2780

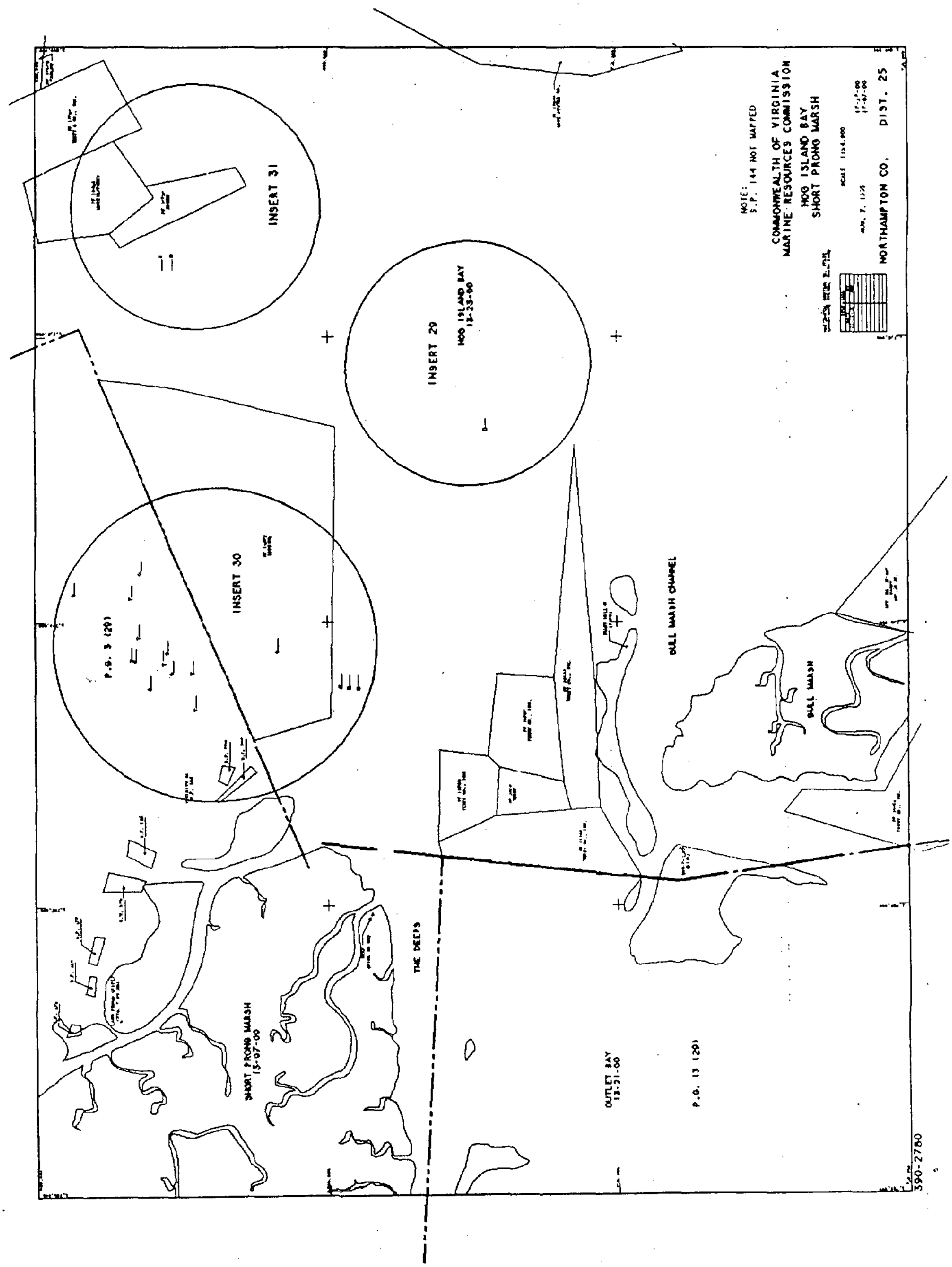

GRID NORTH
1927 DATUM
P.G. 13 (29)
OUTLET BAY
13-21-00
GULL
MARSH
10-11-95
INSERT 26
COBB BAY
12-17-00

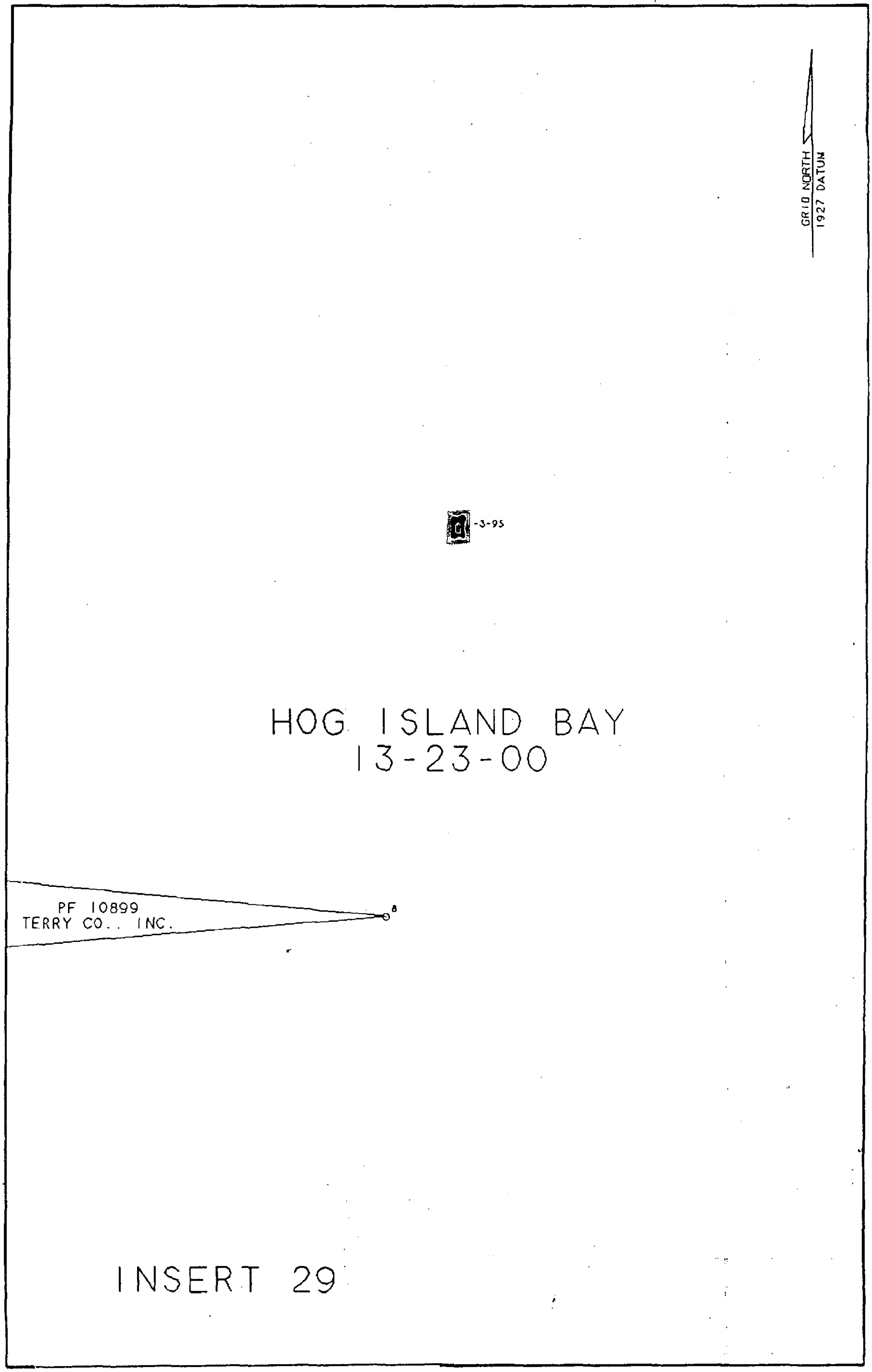


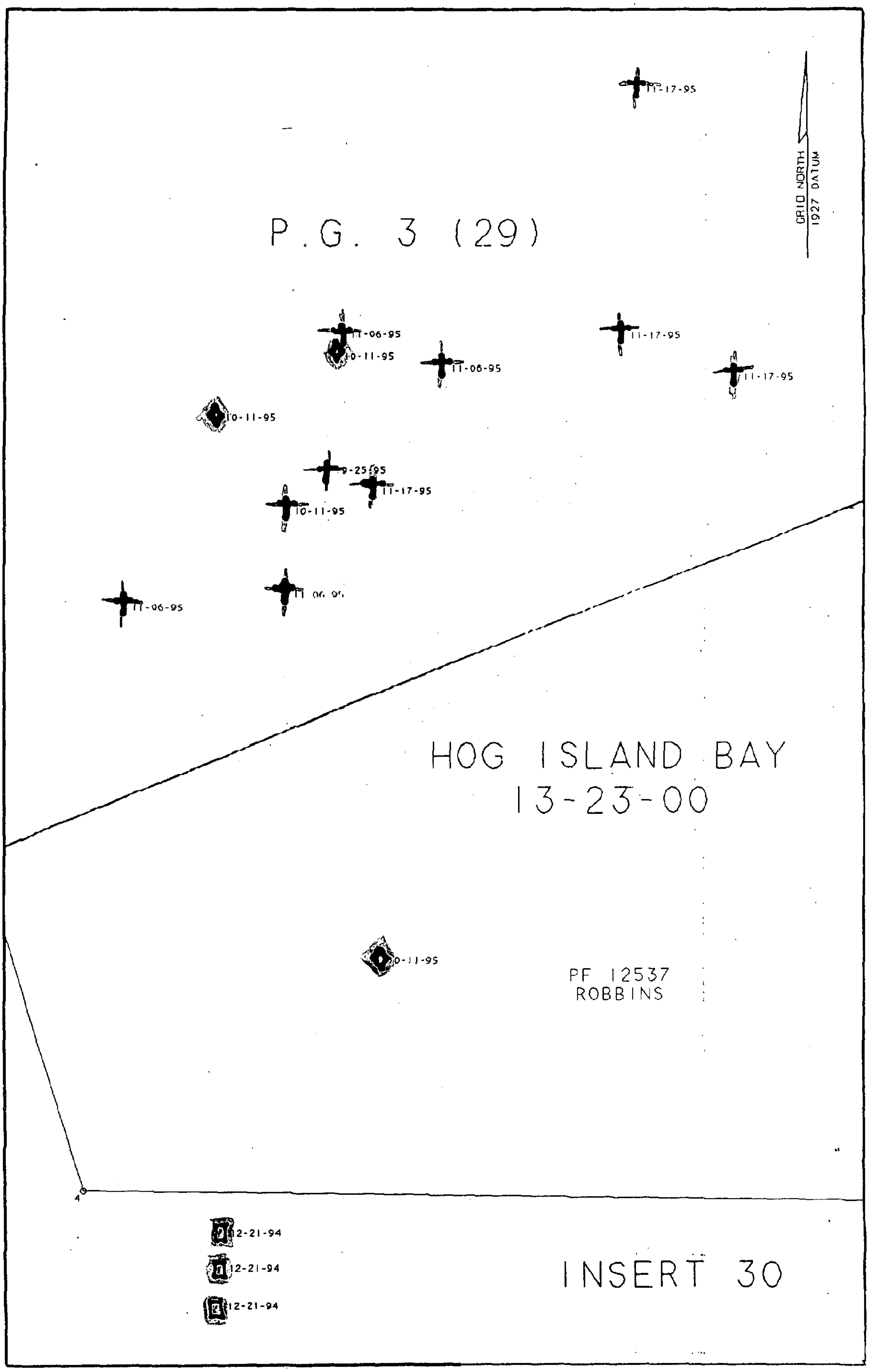
BRICK HOUSE NECK
MILL CREEK
13-17-01
CASTLE RIDGE CREEK
13-17-00
INSERT 28
THE RAMSHORN
SHORT PRONG MARSH
13-07-00
CRABBING MARSH
WEBBS ISLAND
BOXTREE CREEK
13-05-01
INSERT 27
POWELLS CR.
BOXTREE
THE OUTLET
P.G. 14 (29)
OUTLET BAY
13-21-00
RAMSHORN BAY
13-05-00
BUCKHORN POINT
P.G. 14 (20)
HOLT CREEK
COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
OUTLET BAY
WEBBS ISLAND
NORTHAMPTON CO. DIST. 25
390-2760

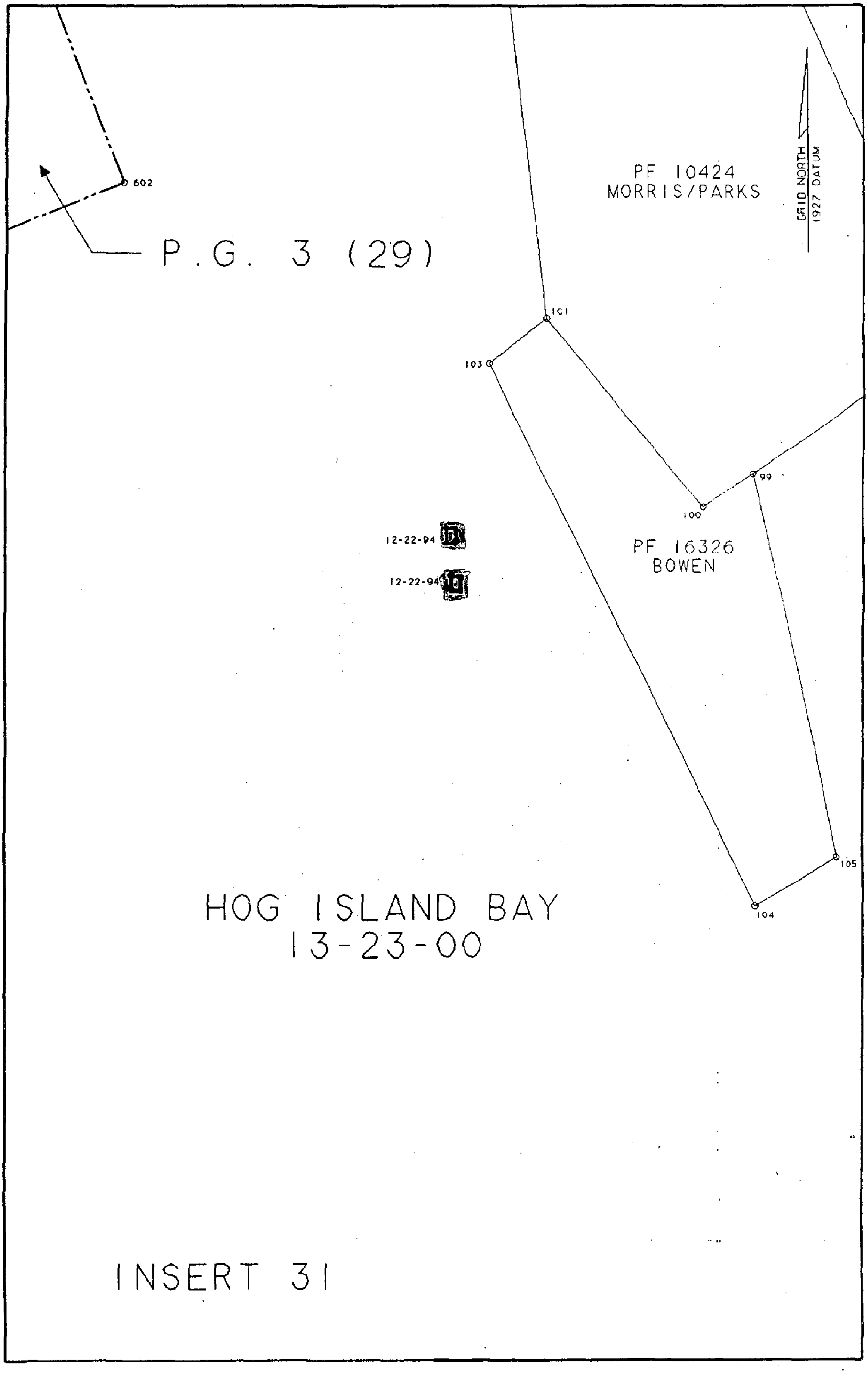

SHORT PRONG MARSH
13-07-00
GRID NORTH
1927 DATUM
CRABBING MARSH
11-30-95
3-27-95
2-24-95
POWELLS CR.
P.G. 13 (29)
OUTLET BAY
13-21-00
INSERT 27

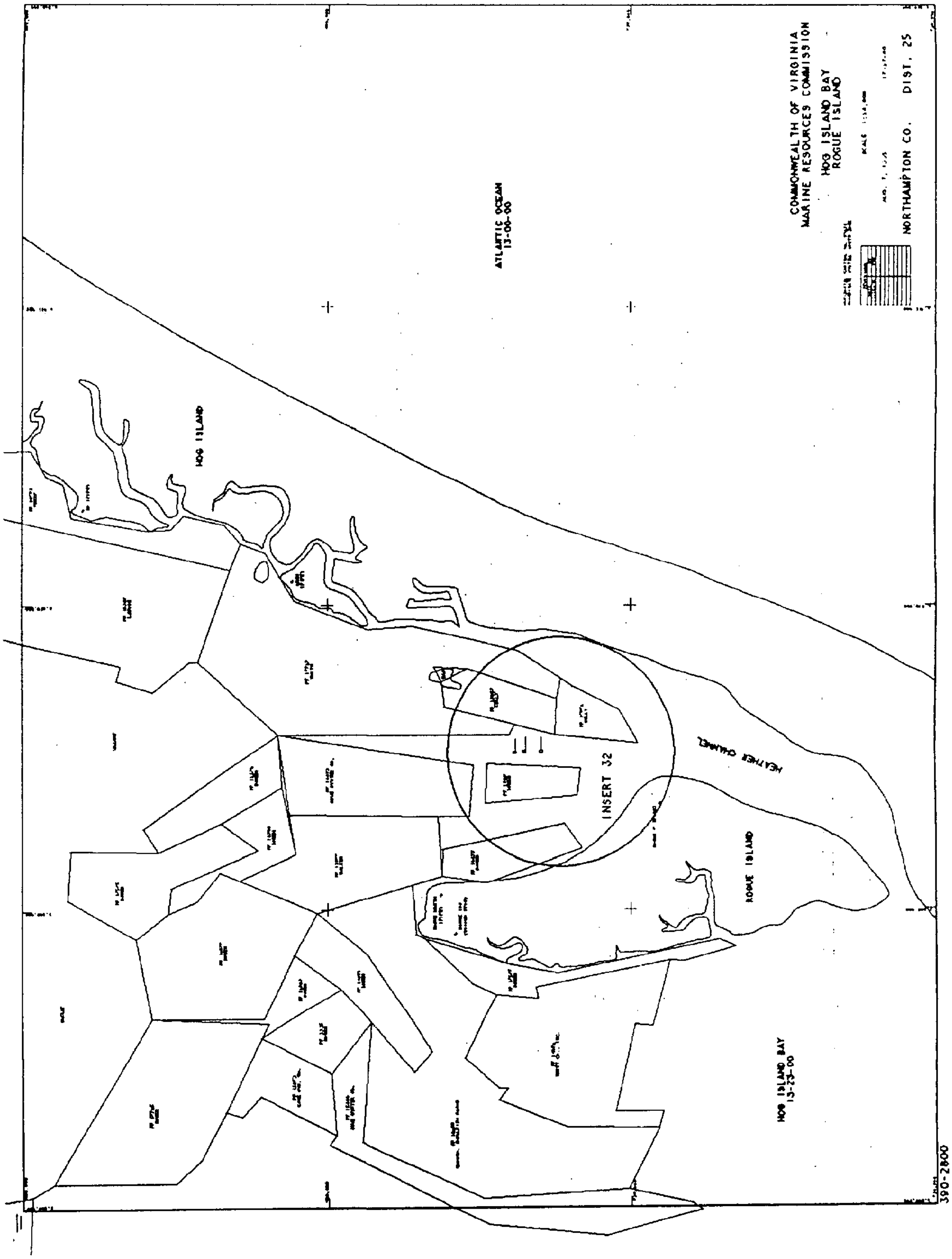

GRID NORTH
1927 DATUM
CASTLE RIDGE CREEK
13-17-00
2-24-95
THE
RAMSHORN
SHORT PRONG MARSH
13-07-00
CRABBING MARSH
INSERT 28

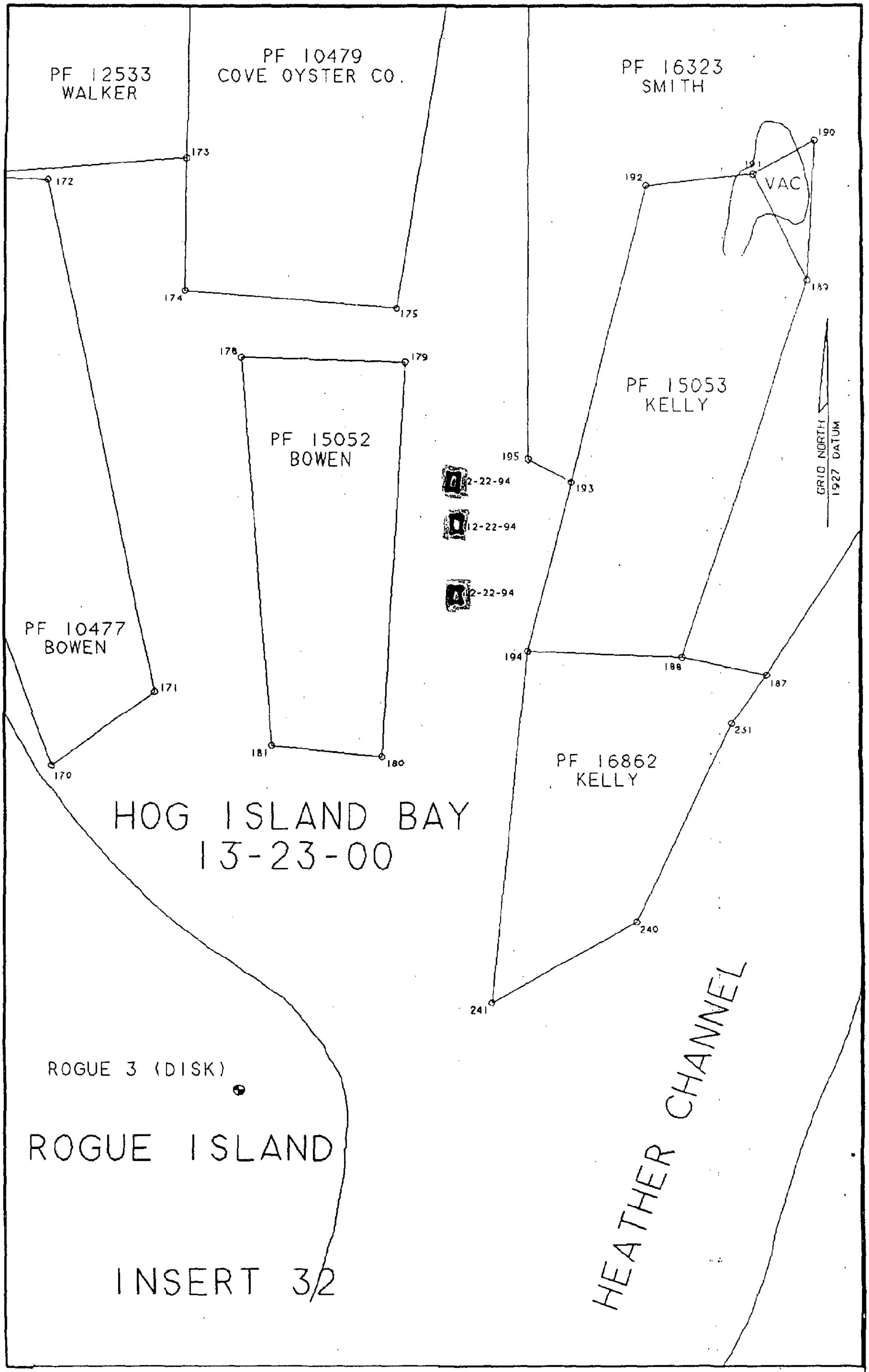

NOTE:
S.P. 144 NOT MAPPED
COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
HOG ISLAND BAY
SHORT PRONG MARSH
NORTHAMPTON CO.
DIST. 25
INSERT 31
INSERT 29
HOG ISLAND BAY
13-23-00
INSERT 30
P.O. 3 (29)
BULL MARSH CHANNEL
BULL MARSH
THE DEEPS
SHORT PRONG MARSH
13-07-00
OUTLET BAY
13-21-00
P.O. 13 (29)
390-2780

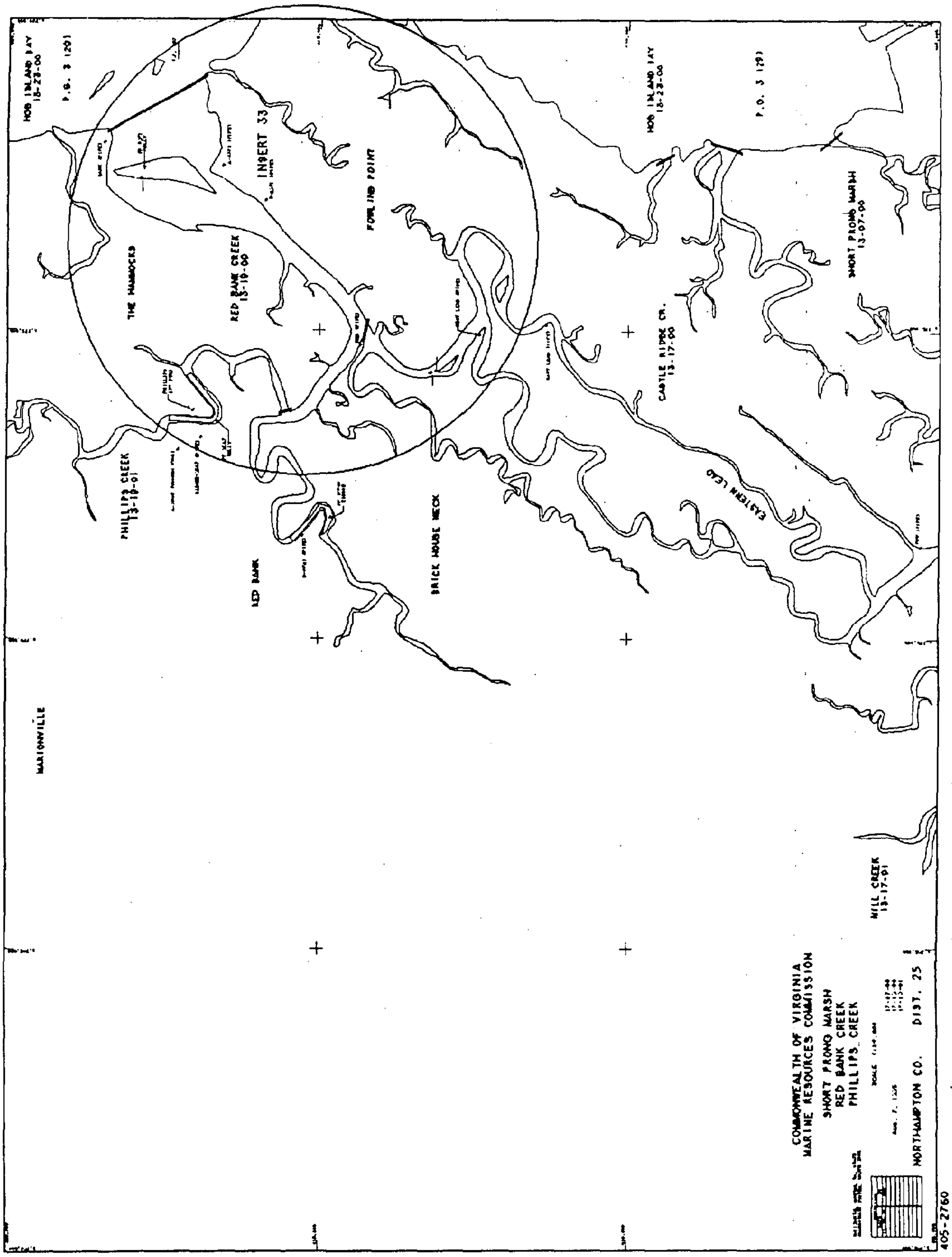

GRID NORTH
1927 DATUM
-3-95
HOG ISLAND BAY
13-23-00
PF 10899
TERRY CO., INC.
8
INSERT 29

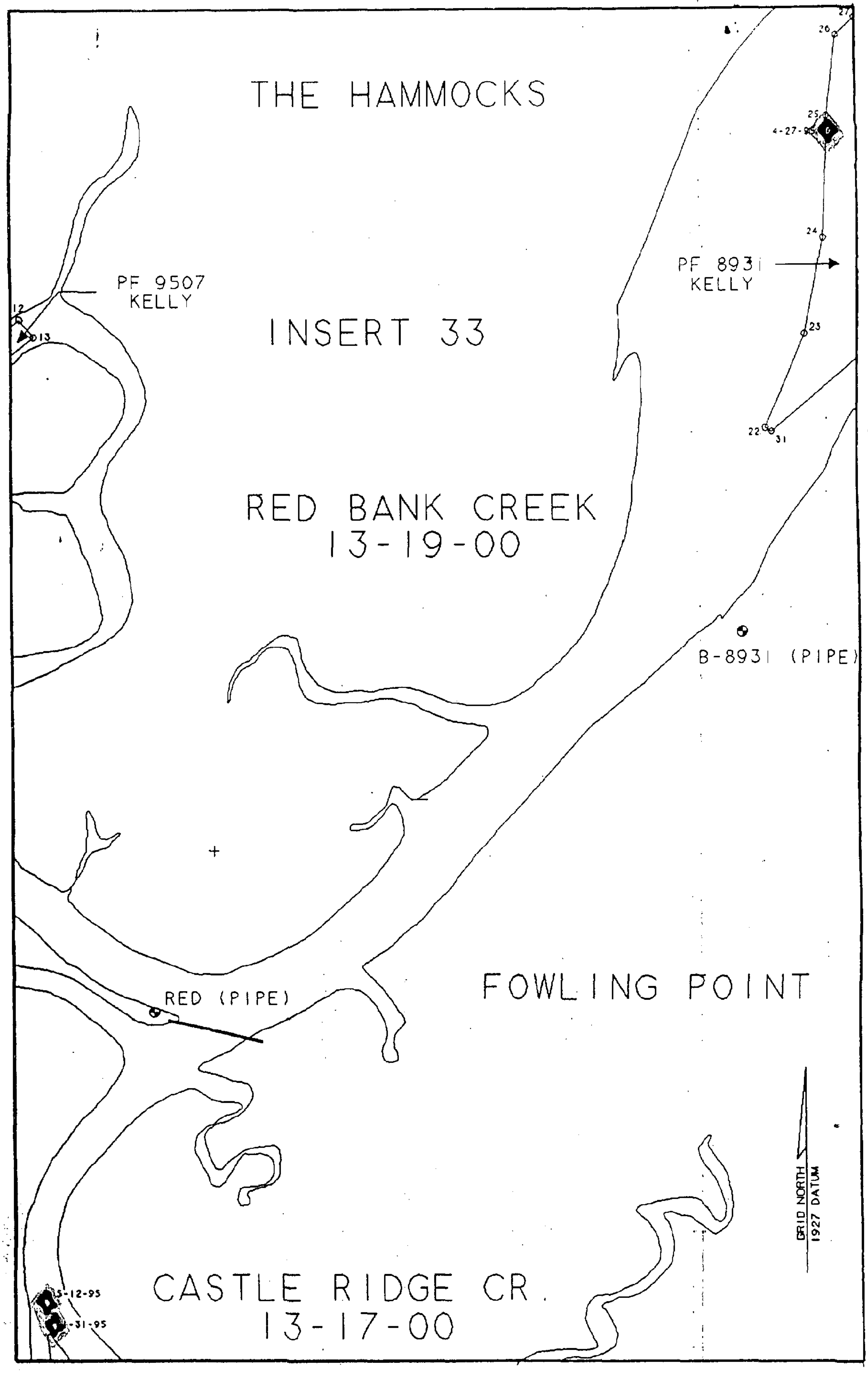

GRID NORTH
1927 DATUM
11-17-95
P.G. 3 (29)
11-06-95
10-11-95
11-06-95
11-17-95
11-17-95
10-11-95
9-25-95
11-17-95
10-11-95
11-06-95
11-06-95
HOG ISLAND BAY
13-23-00
10-11-95
PF 12537
ROBBINS
12-21-94
12-21-94
12-21-94
INSERT 30

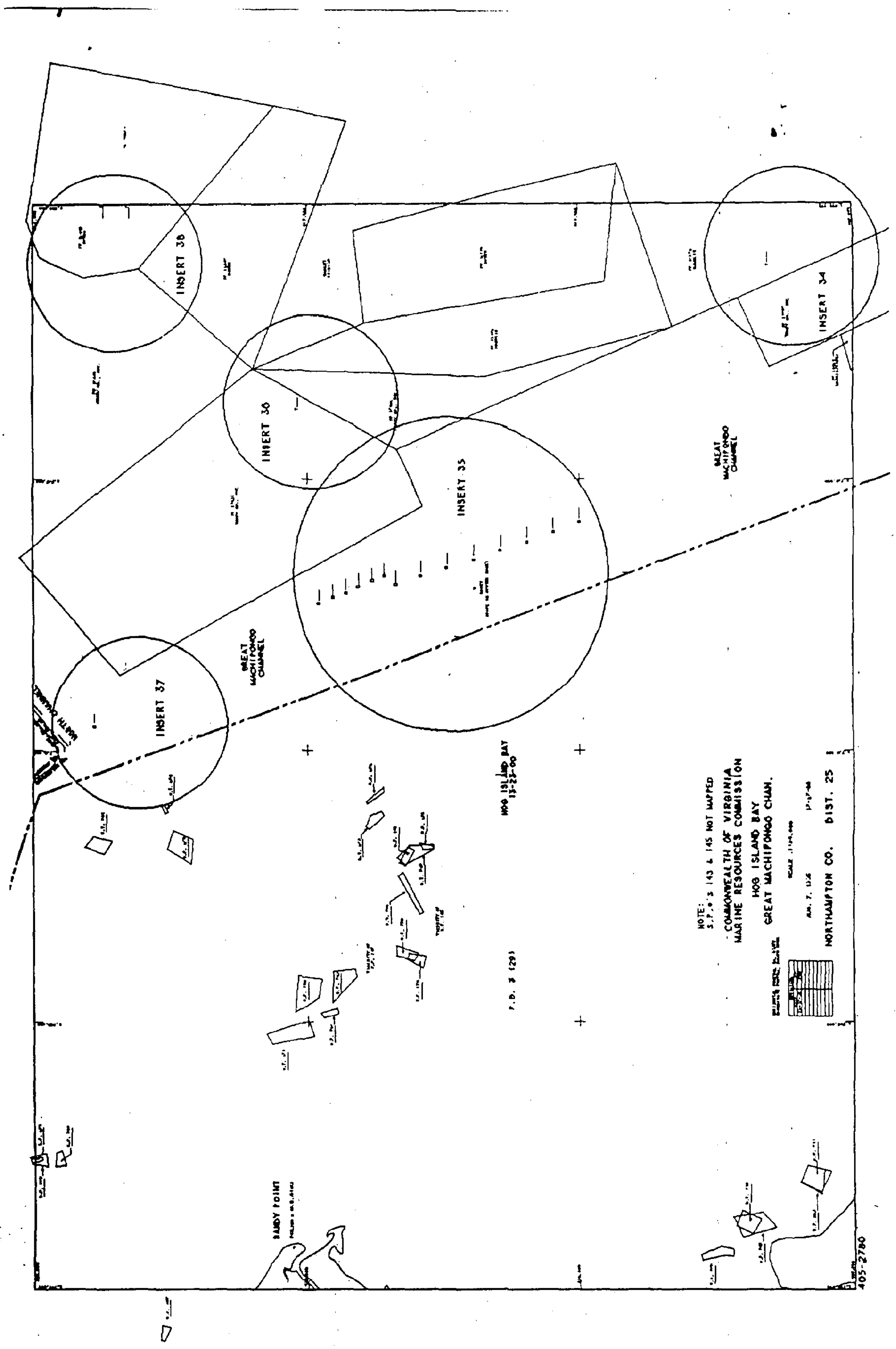

602
P.G. 3 (29)
PF 10424
MORRIS/PARKS
GRID NORTH
1927 DATUM
101
103
99
100
PF 16326
BOWEN
12-22-94
12-22-94
HOG ISLAND BAY
13-23-00
105
104
INSERT 31

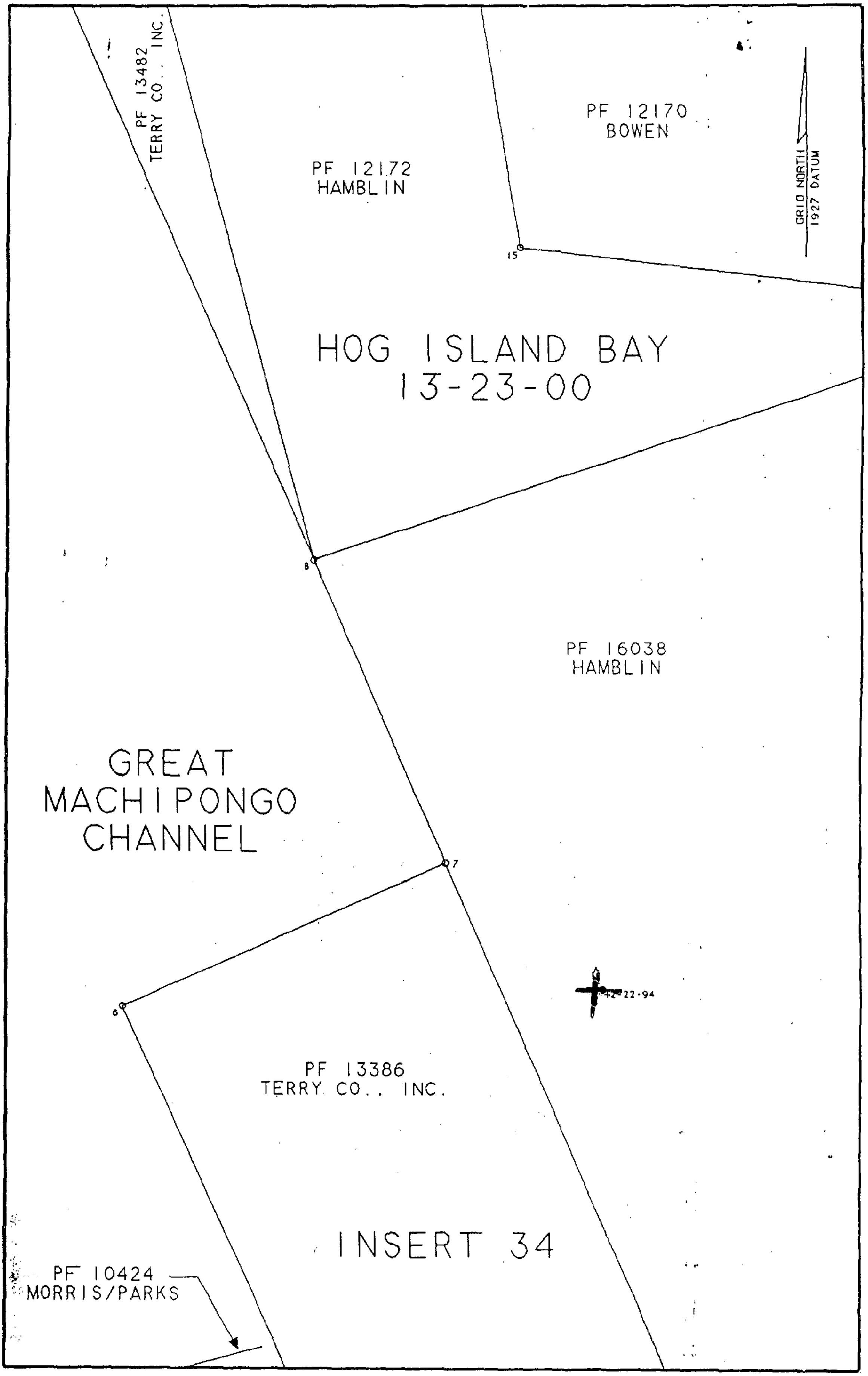

COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
HOG ISLAND BAY
ROGUE ISLAND
NORTHAMPTON CO.
DIST. 25
ATLANTIC OCEAN
13-00-00
HOG ISLAND
HEATHER CHANNEL
INSERT 32
ROGUE ISLAND
HOG ISLAND BAY
13-23-00
390-2800

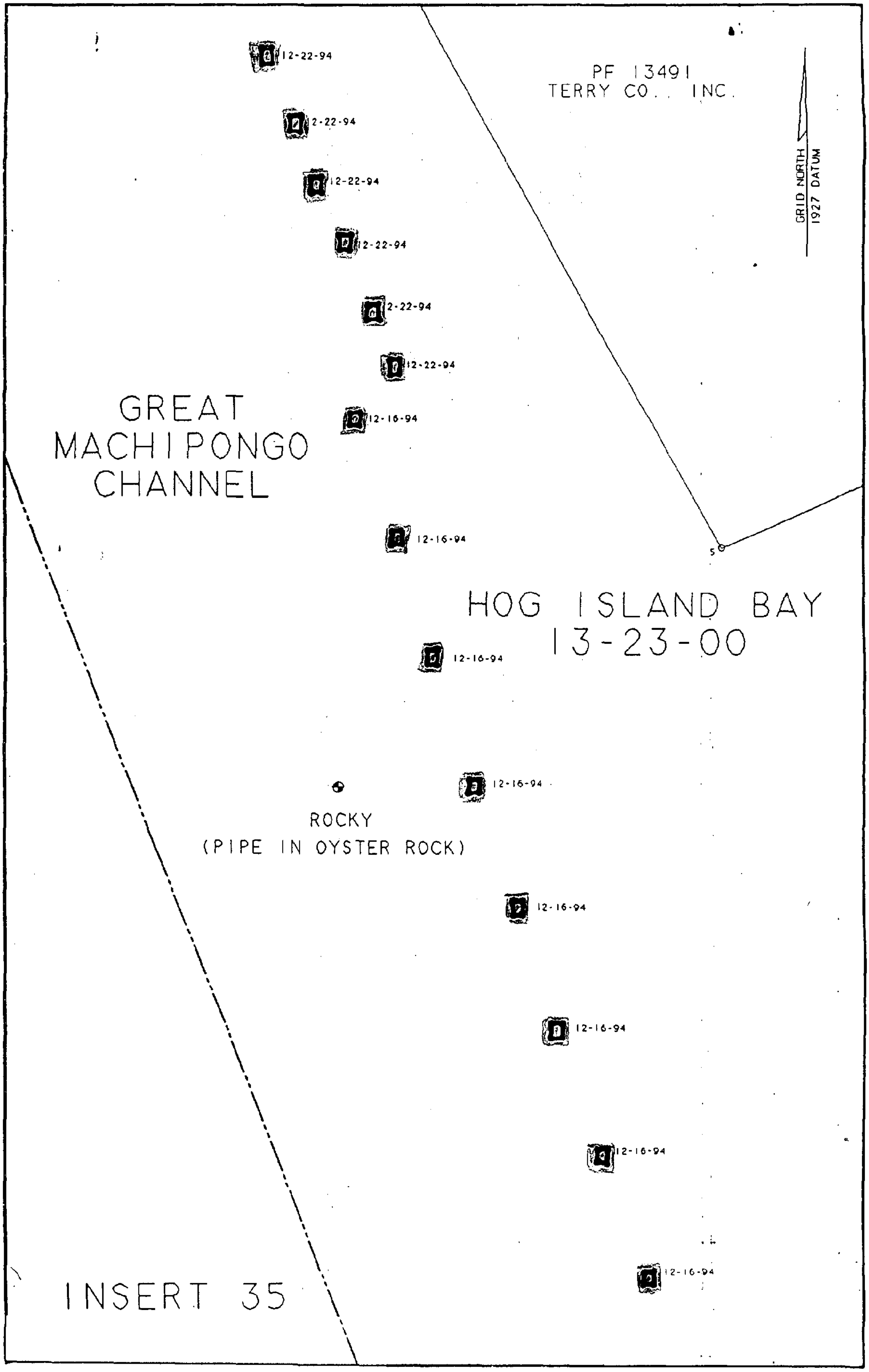

PF 12533
WALKER
PF 10479
COVE OYSTER CO.
PF 16323
SMITH
VAC
173
172
174
175
178
179
190
192
PF 15053
KELLY
GRID NORTH
1927 DATUM
PF 15052
BOWEN
195
193
2-22-94
12-22-94
2-22-94
PF 10477
BOWEN
171
170
181
180
194
188
187
251
PF 16862
KELLY
HOG ISLAND BAY
13-23-00
240
241
ROGUE 3 (DISK)
ROGUE ISLAND
INSERT 3/2
HEATHER CHANNEL

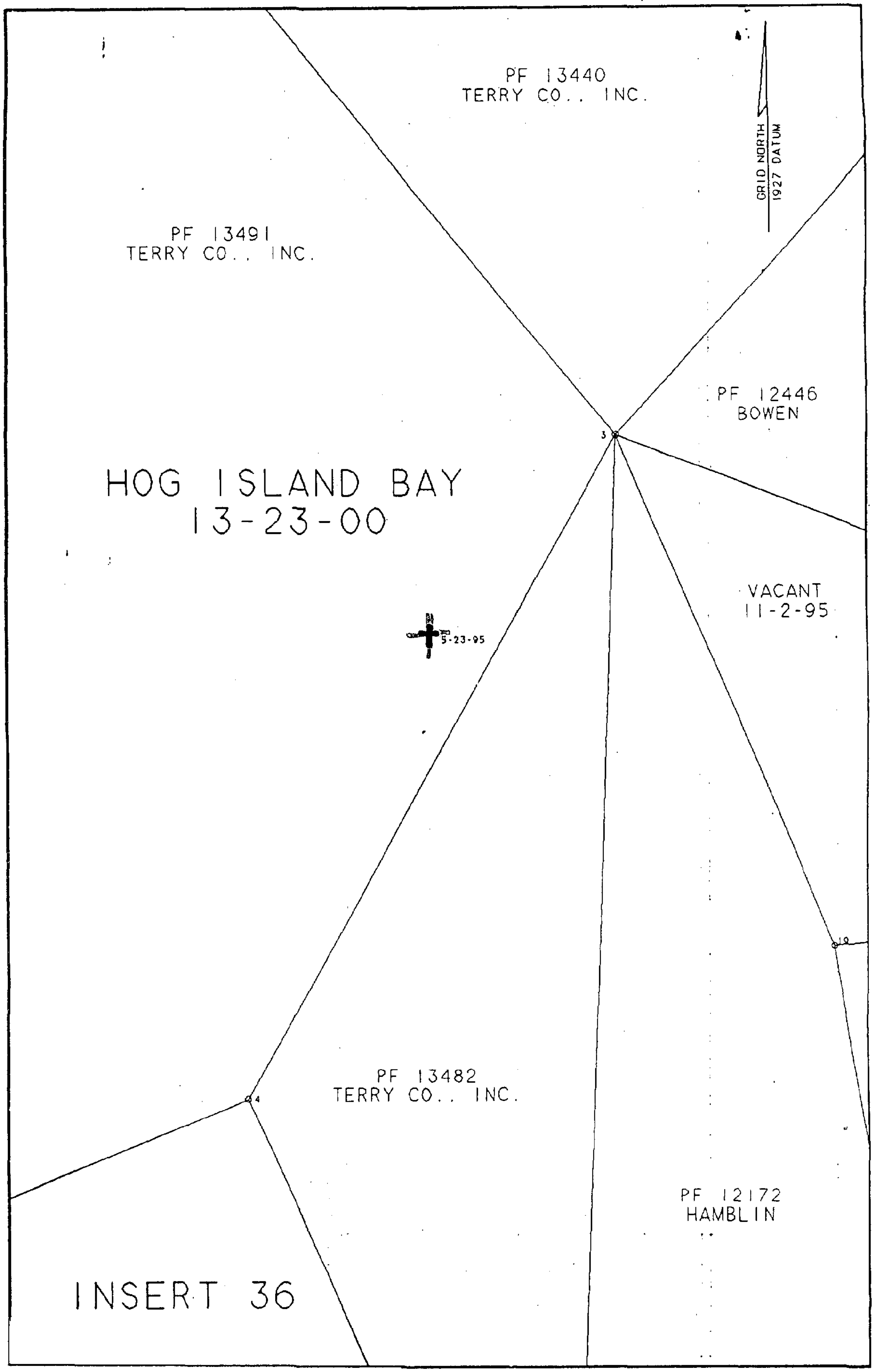

HOG ISLAND BAY
18-28-00
INSERT 33
THE HAMMOCKS
RED BANK CREEK
13-19-00
FOWLING POINT
PHILLIPS CREEK
13-18-01
RED BANK
BRICK HOUSE NECK
MARIONVILLE
CASTLE RIDGE CR.
13-17-00
EASTERN LEAD
SHORT PRONG MARSH
13-07-00
MILL CREEK
13-17-01
COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
SHORT PRONG MARSH
RED BANK CREEK
PHILLIPS CREEK
NORTHAMPTON CO.
DIST. 25
405-2760

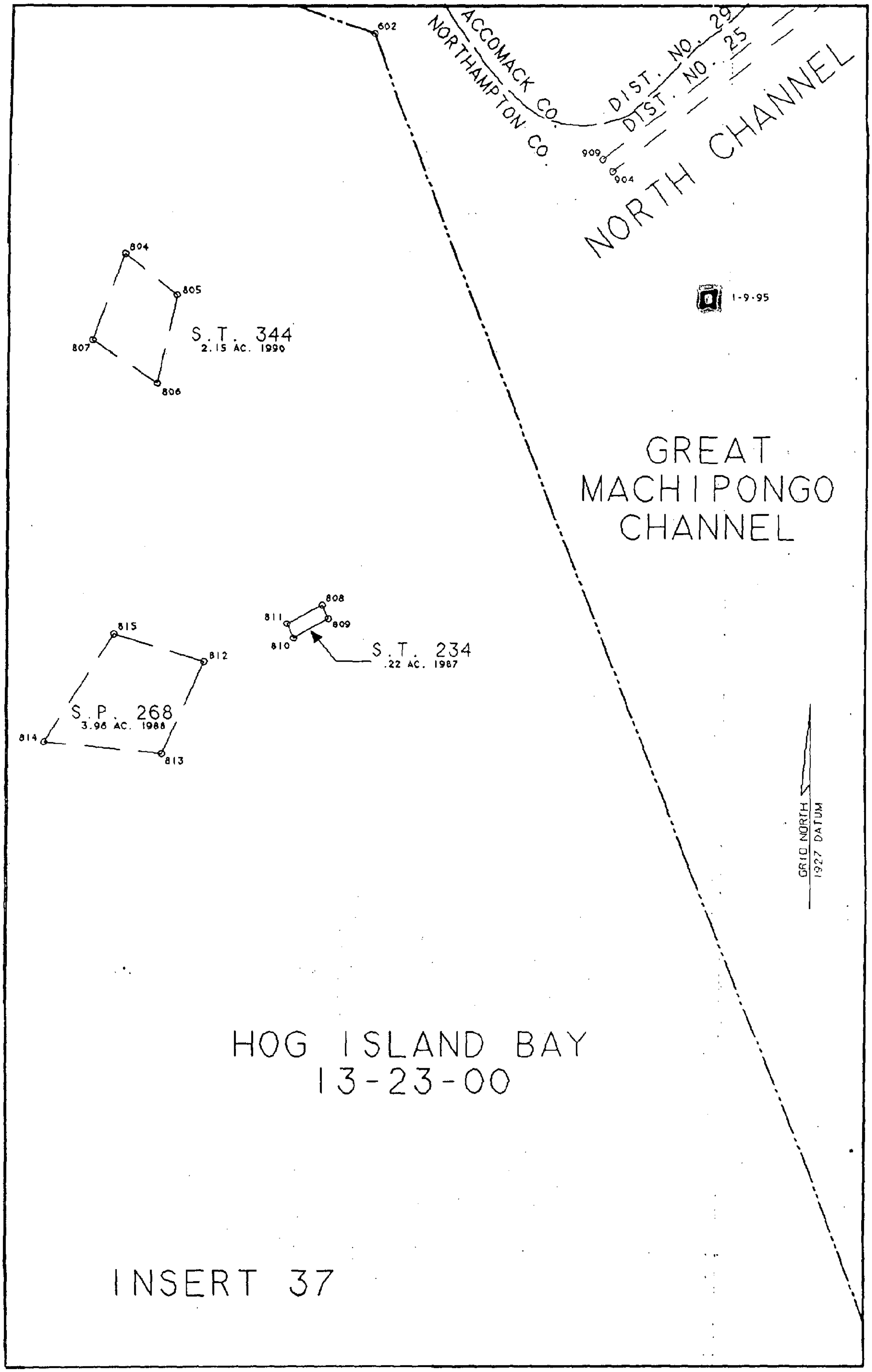

THE HAMMOCKS
PF 9507
KELLY
INSERT 33
PF 8931
KELLY
4-27-95
RED BANK CREEK
13-19-00
B-8931 (PIPE)
FOWLING POINT
RED (PIPE)
GRID NORTH
1927 DATUM
CASTLE RIDGE CR.
13-17-00


INSERT 38
INSERT 34
INSERT 30
INSERT 35
INSERT 37
GREAT MACHIPONGO CHANNEL
GREAT MACHIPONGO CHANNEL
HOG ISLAND BAY
13-28-00
P.D. 3 (29)
NOTE:
S.P.G.'s 143 & 145 NOT MAPPED
COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
HOG ISLAND BAY
GREAT MACHIPONGO CHAN.
NORTHAMPTON CO. DIST. 25
SANDY POINT
405-2780

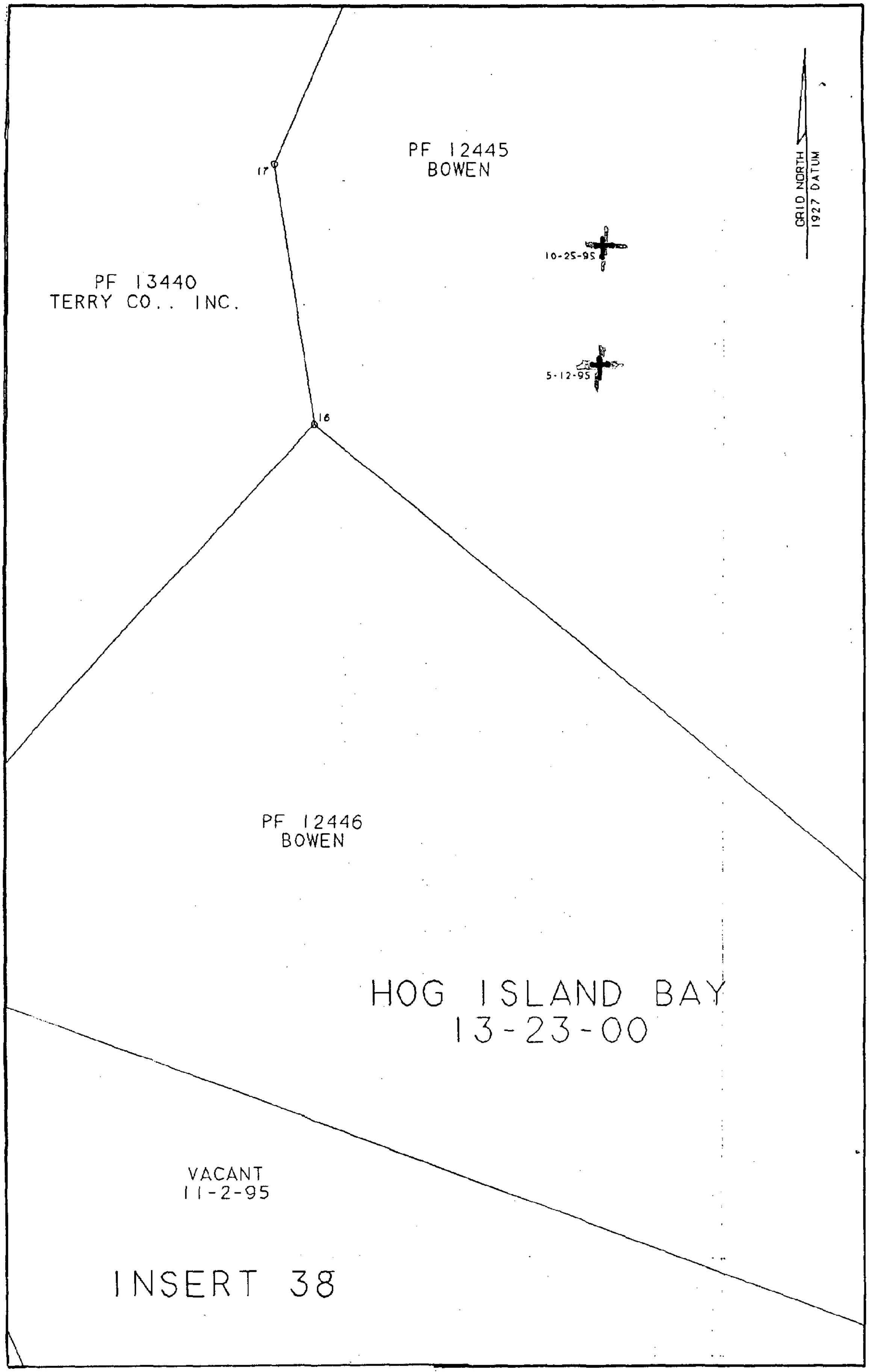

PF 13482
TERRY CO., INC.
PF 12172
HAMBLIN
PF 12170
BOWEN
GRID NORTH
1927 DATUM
15
HOG ISLAND BAY
13-23-00
8
PF 16038
HAMBLIN
GREAT
MACHIPONGO
CHANNEL
7
6
42-22-94
PF 13386
TERRY CO., INC.
INSERT 34
PF 10424
MORRIS/PARKS

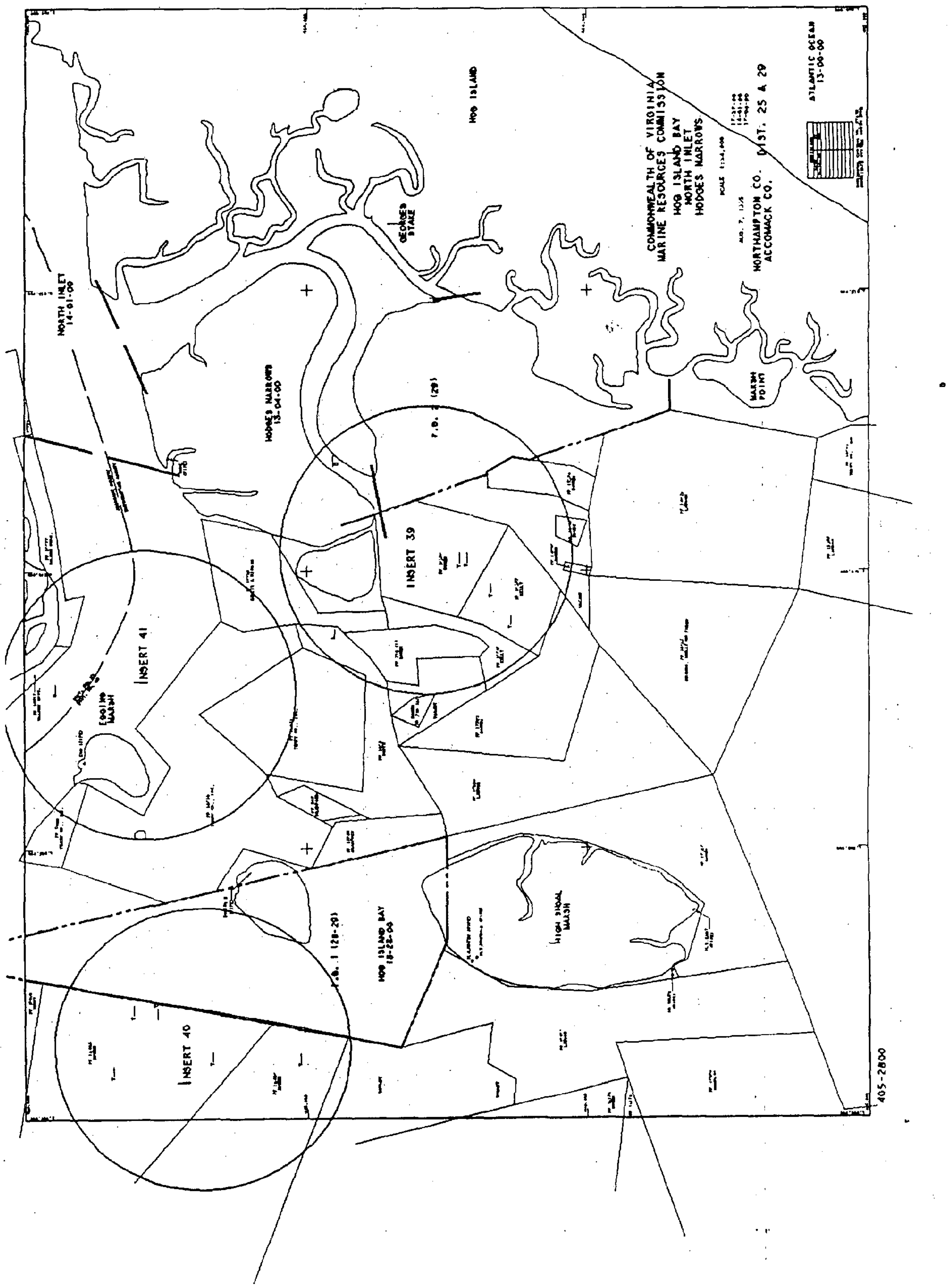

PF 13491
TERRY CO., INC.
GRID NORTH
1927 DATUM
12-22-94
2-22-94
12-22-94
12-22-94
2-22-94
12-22-94
12-16-94
GREAT
MACHIPONGO
CHANNEL
12-16-94
HOG ISLAND BAY
13-23-00
12-16-94
12-16-94
ROCKY
(PIPE IN OYSTER ROCK)
12-16-94
12-16-94
12-16-94
12-16-94
INSERT 35

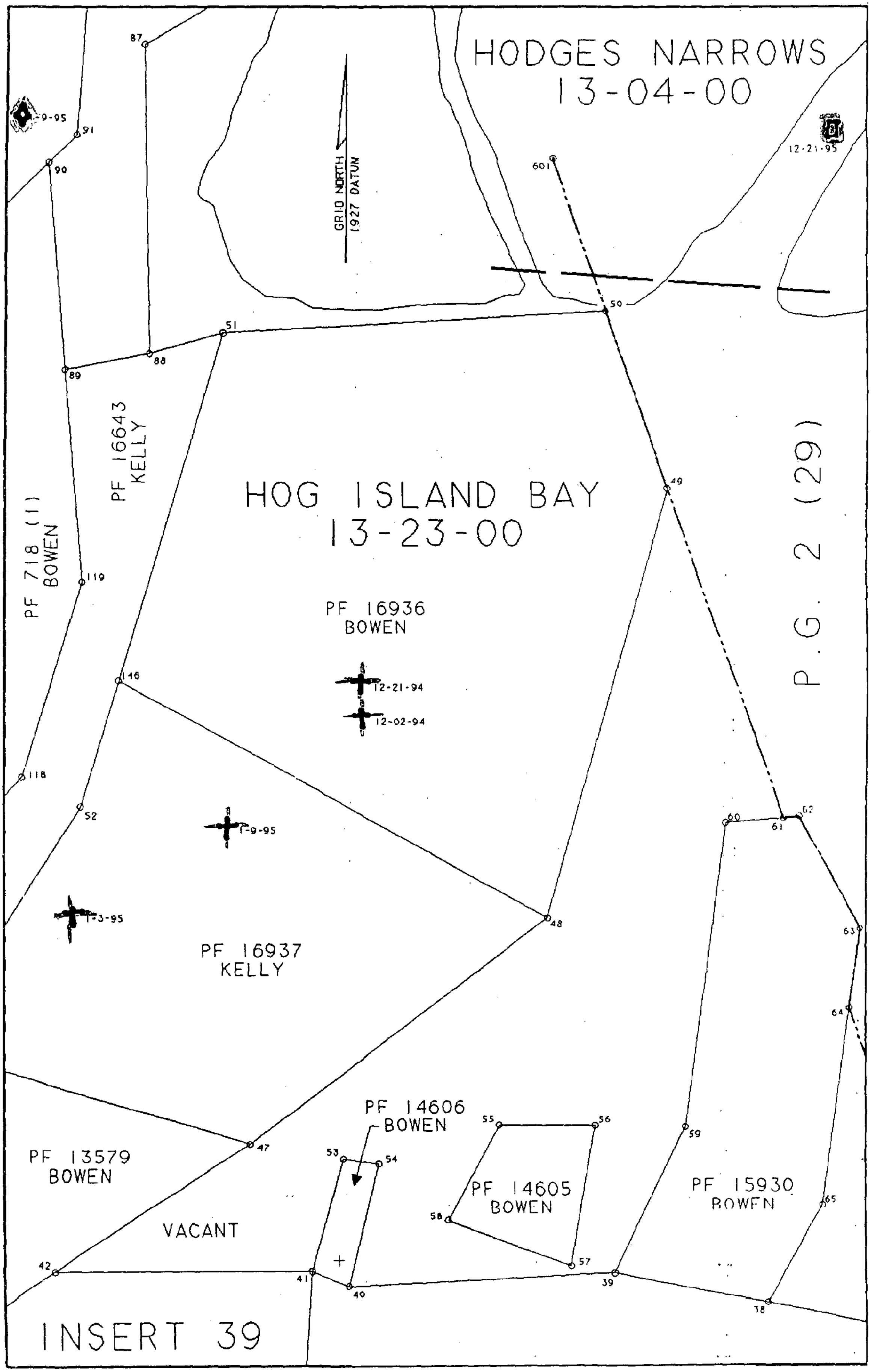

PF 13440
TERRY CO., INC.
GRID NORTH
1927 DATUM
PF 13491
TERRY CO., INC.
PF 12446
BOWEN
HOG ISLAND BAY
13-23-00
VACANT
11-2-95
5-23-95
PF 13482
TERRY CO., INC.
PF 12172
HAMBLIN
INSERT 36

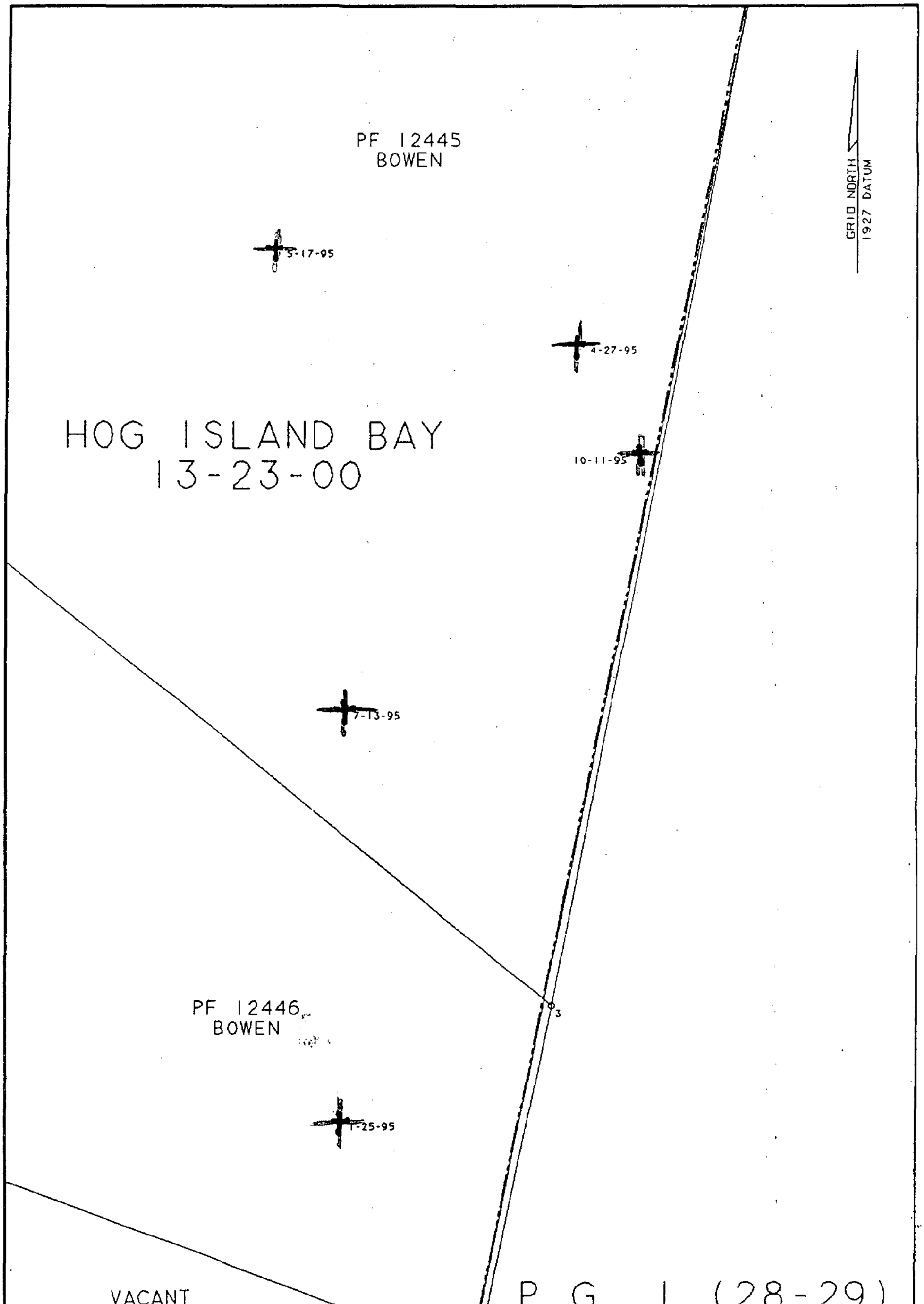


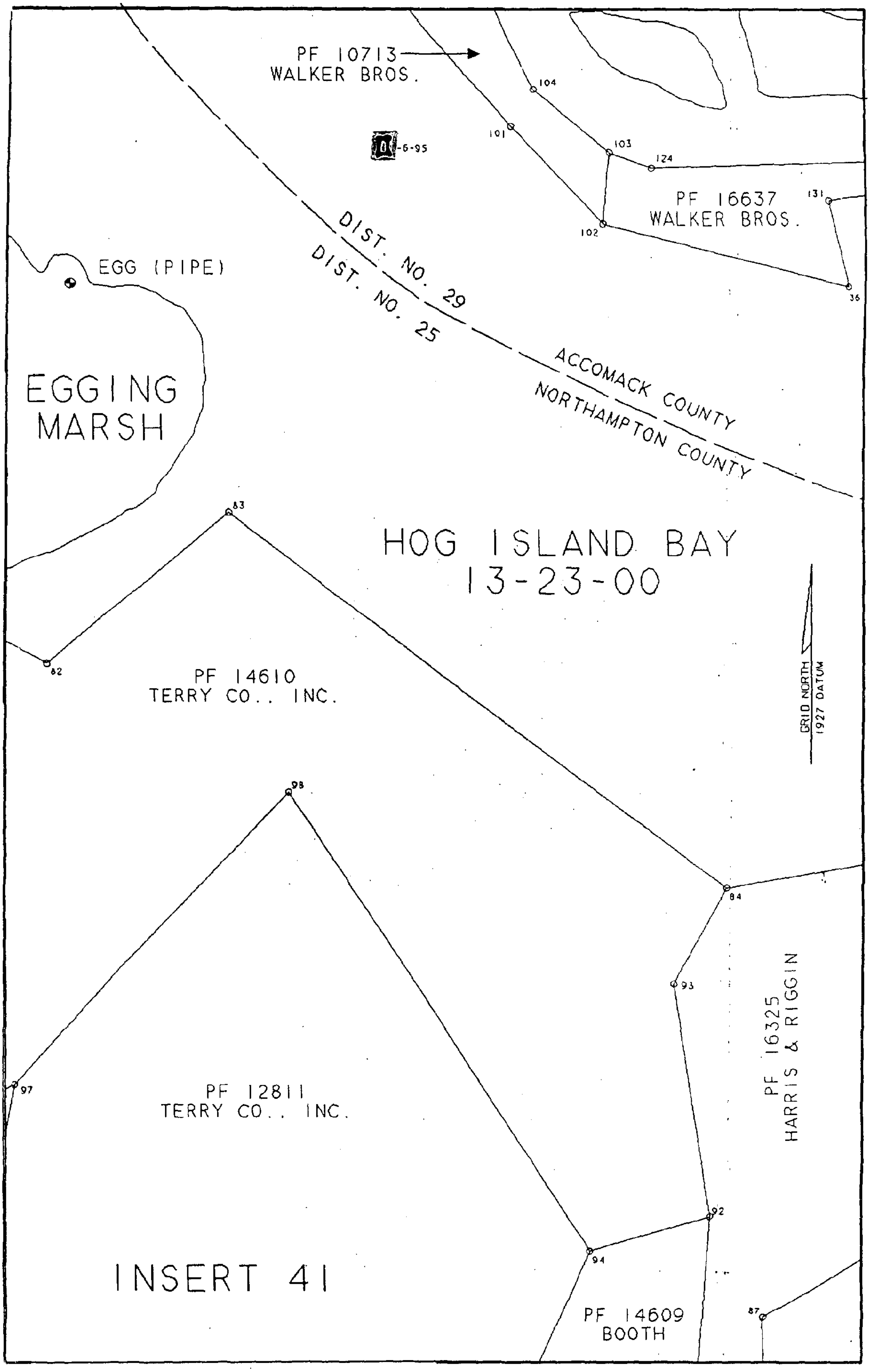
602
ACCOMACK CO.
NORTHAMPTON CO.
DIST. NO. 29
DIST. NO. 25
909
904
NORTH CHANNEL
1-9-95
804
805
807
806
S.T. 344
2.15 AC. 1990
GREAT
MACHIPONGO
CHANNEL
808
811
809
810
S.T. 234
.22 AC. 1987
815
812
814
813
S.P. 268
3.98 AC. 1988
GRID NORTH
1927 DATUM
HOG ISLAND BAY
13-23-00
INSERT 37

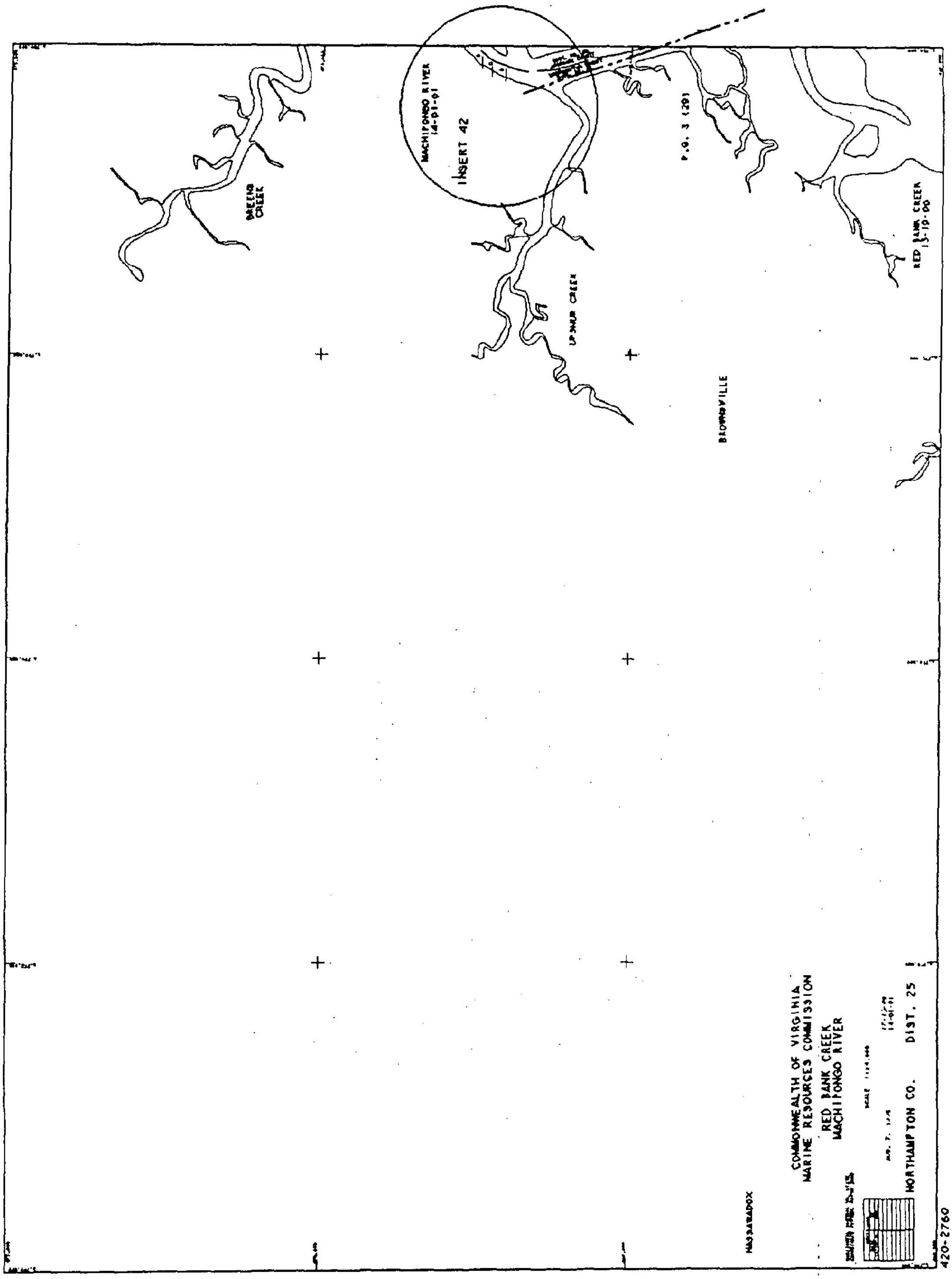

PF 12445
BOWEN
GRID NORTH
1927 DATUM
17
10-25-95
PF 13440
TERRY CO.. INC.
5-12-95
16
PF 12446
BOWEN
HOG ISLAND BAY
13-23-00
VACANT
11-2-95
INSERT 38

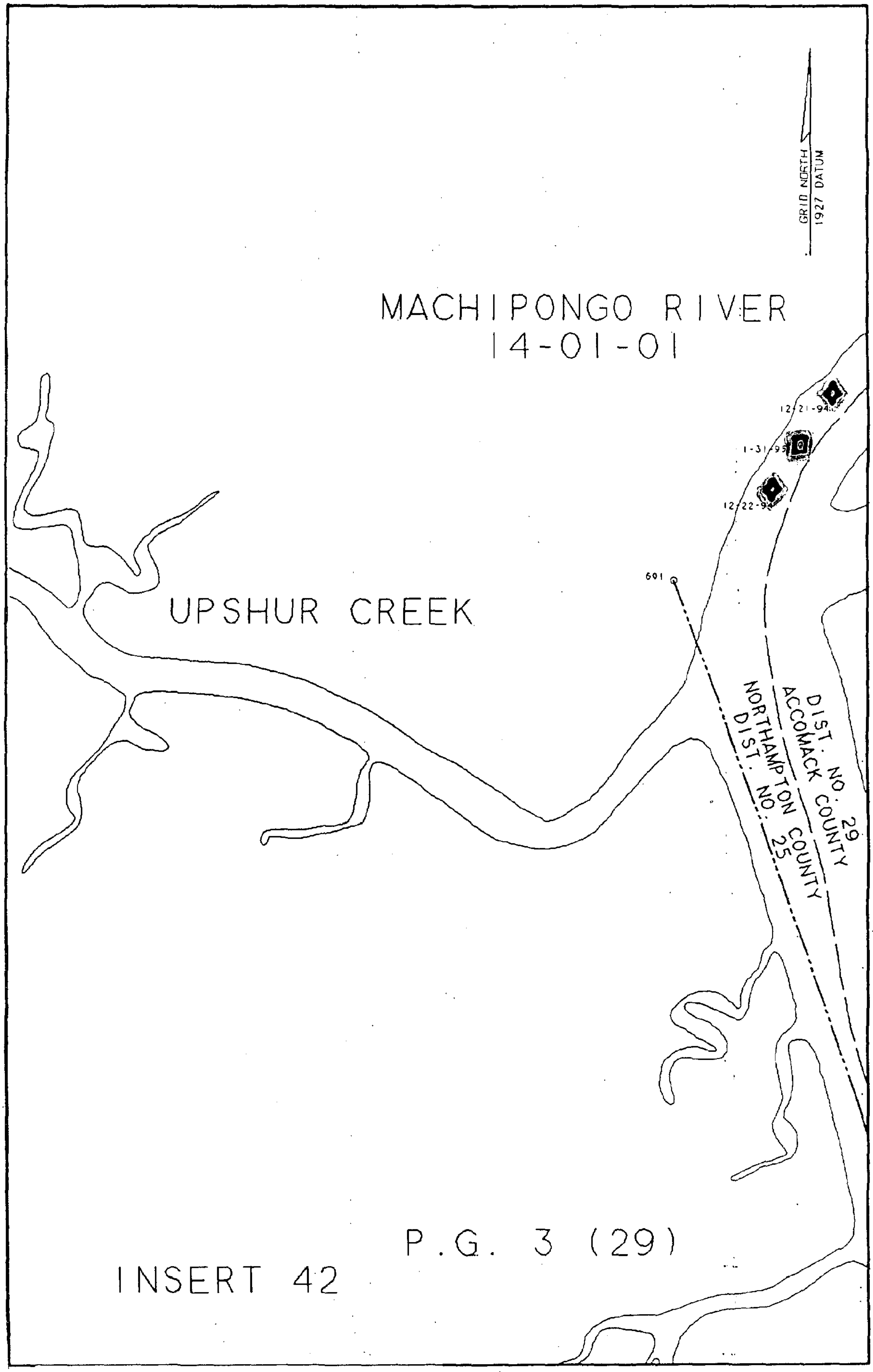

COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
HOG ISLAND BAY
NORTH INLET
HODGES NARROWS
NORTHAMPTON CO.
ACCOMACK CO.
DIST. 25 & 29
ATLANTIC OCEAN
13-00-00
HOG ISLAND
GEORGES STAKE
NORTH INLET
14-01-00
HODGES NARROWS
13-04-00
MARSH POINT
INSERT 39
INSERT 41
INSERT 40
HIGH SHOAL MARSH
HOG ISLAND BAY
18-28-00
405-2800

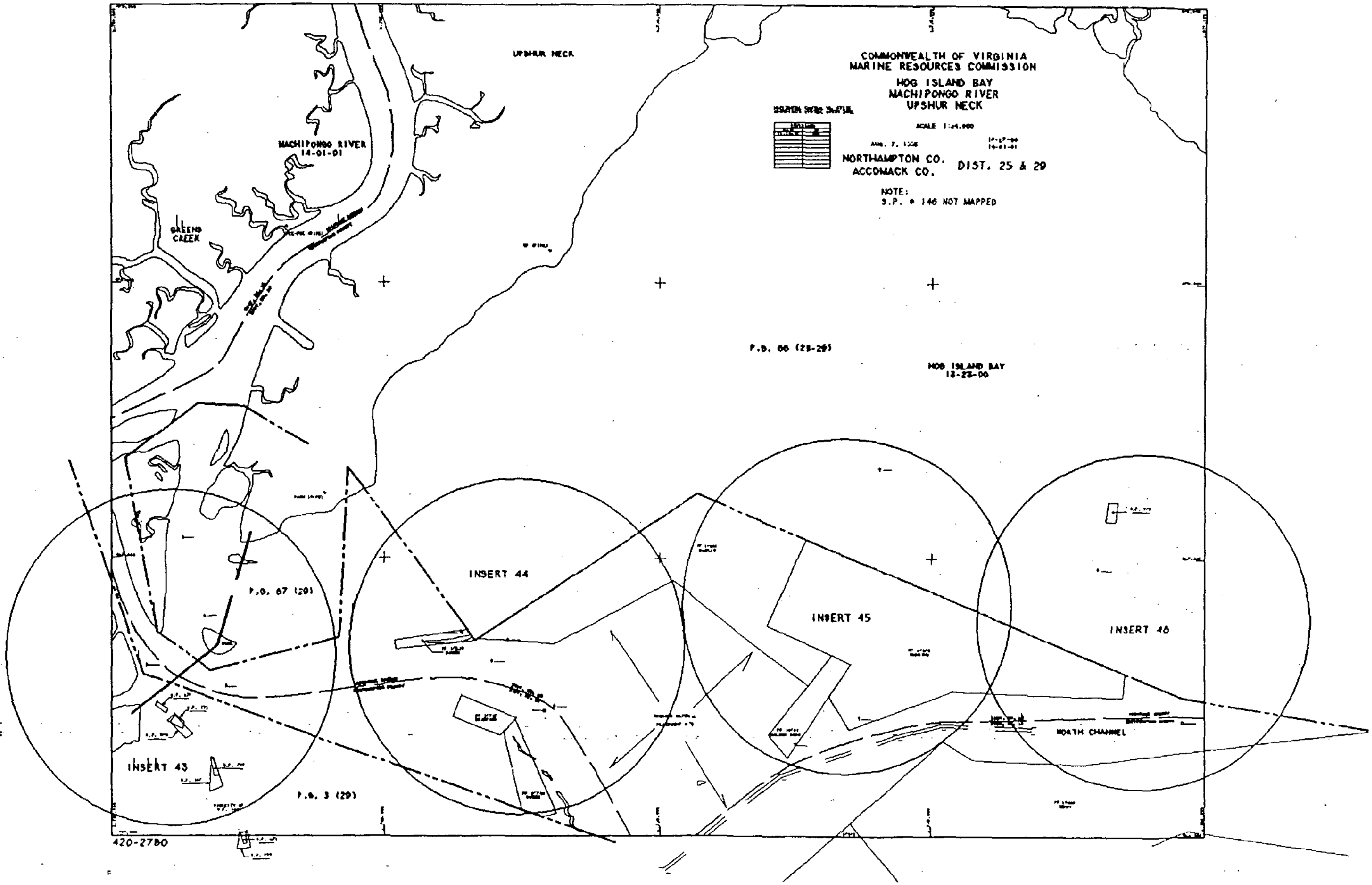

HODGES NARROWS
13-04-00
GRID NORTH
1927 DATUM
HOG ISLAND BAY
13-23-00
PF 16936
BOWEN
PF 16643
KELLY
PF 718 (1)
BOWEN
PF 16937
KELLY
PF 14606
BOWEN
PF 13579
BOWEN
VACANT
PF 14605
BOWEN
PF 15930
BOWEN
P.G. 2 (29)
INSERT 39
12-21-94
12-02-94
1-9-95
1-3-95
12-21-95

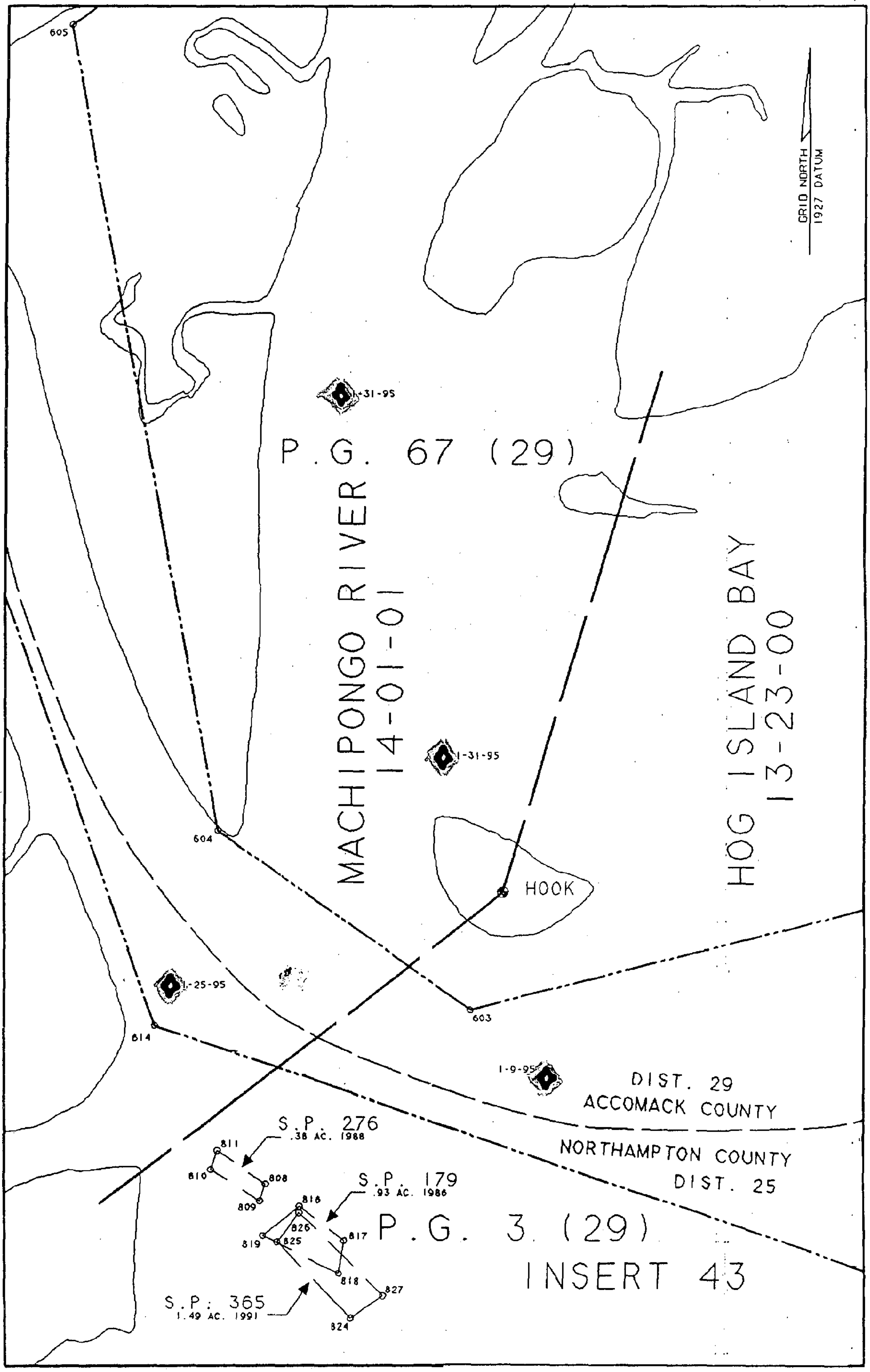

PF 12445
BOWEN
GRID NORTH
1927 DATUM
5-17-95
4-27-95
HOG ISLAND BAY
13-23-00
10-11-95
7-13-95
PF 12446
BOWEN
3
1-25-95
VACANT
INSERT 40
5
P.G. 1 (28-29)

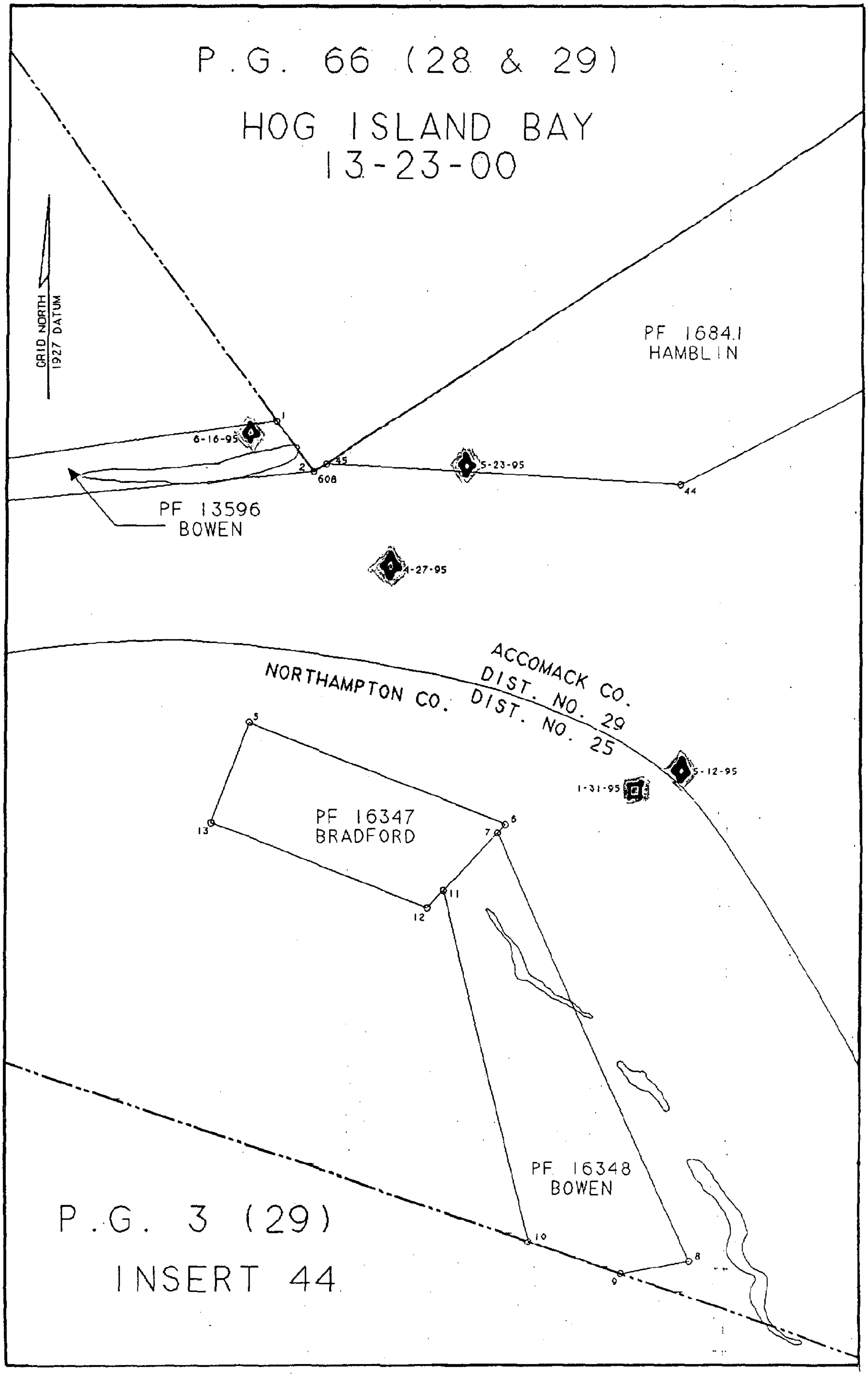

PF 10713
WALKER BROS.
104
101
103
124
PF 16637
WALKER BROS.
131
102
36
EGG (PIPE)
EGGING
MARSH
DIST. NO. 29
DIST. NO. 25
ACCOMACK COUNTY
NORTHAMPTON COUNTY
83
HOG ISLAND BAY
13-23-00
82
PF 14610
TERRY CO., INC.
GRID NORTH
1927 DATUM
98
84
93
PF 16325
HARRIS & RIGGIN
97
PF 12811
TERRY CO., INC.
92
94
INSERT 41
PF 14609
BOOTH
87

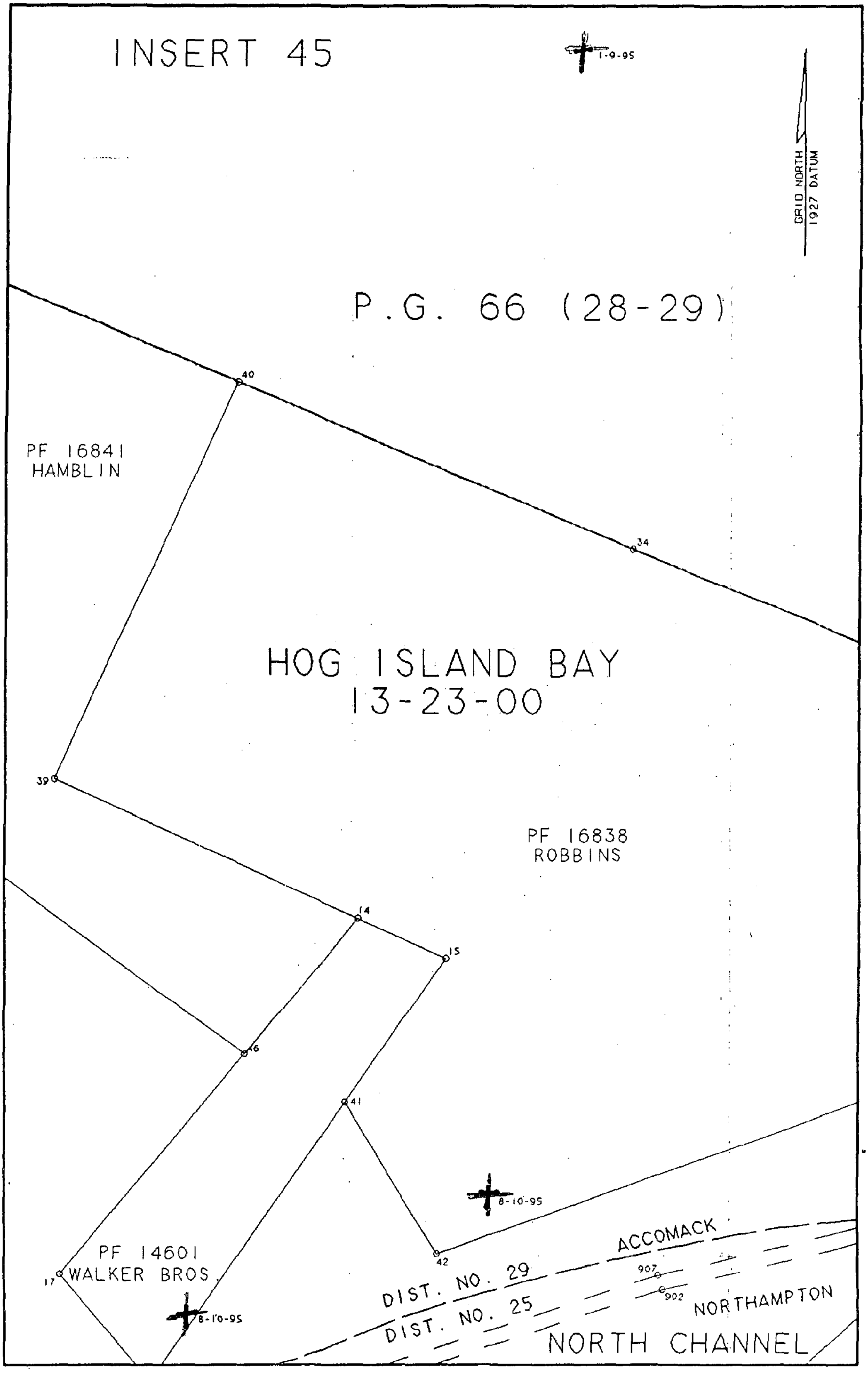

MACHIPONGO RIVER
14-01-01
INSERT 42
UPSHUR CREEK
BROWNSVILLE
RED BANK CREEK
13-19-00
NASSAWADOX
COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
RED BANK CREEK
MACHIPONGO RIVER
NORTHAMPTON CO.
DIST. 25
420-2760


GRID NORTH
1927 DATUM
MACHIPONGO RIVER
14-01-01
UPSHUR CREEK
601
DIST. NO. 29
ACCOMACK COUNTY
NORTHAMPTON COUNTY
DIST. NO. 25
P.G. 3 (29)
INSERT 42

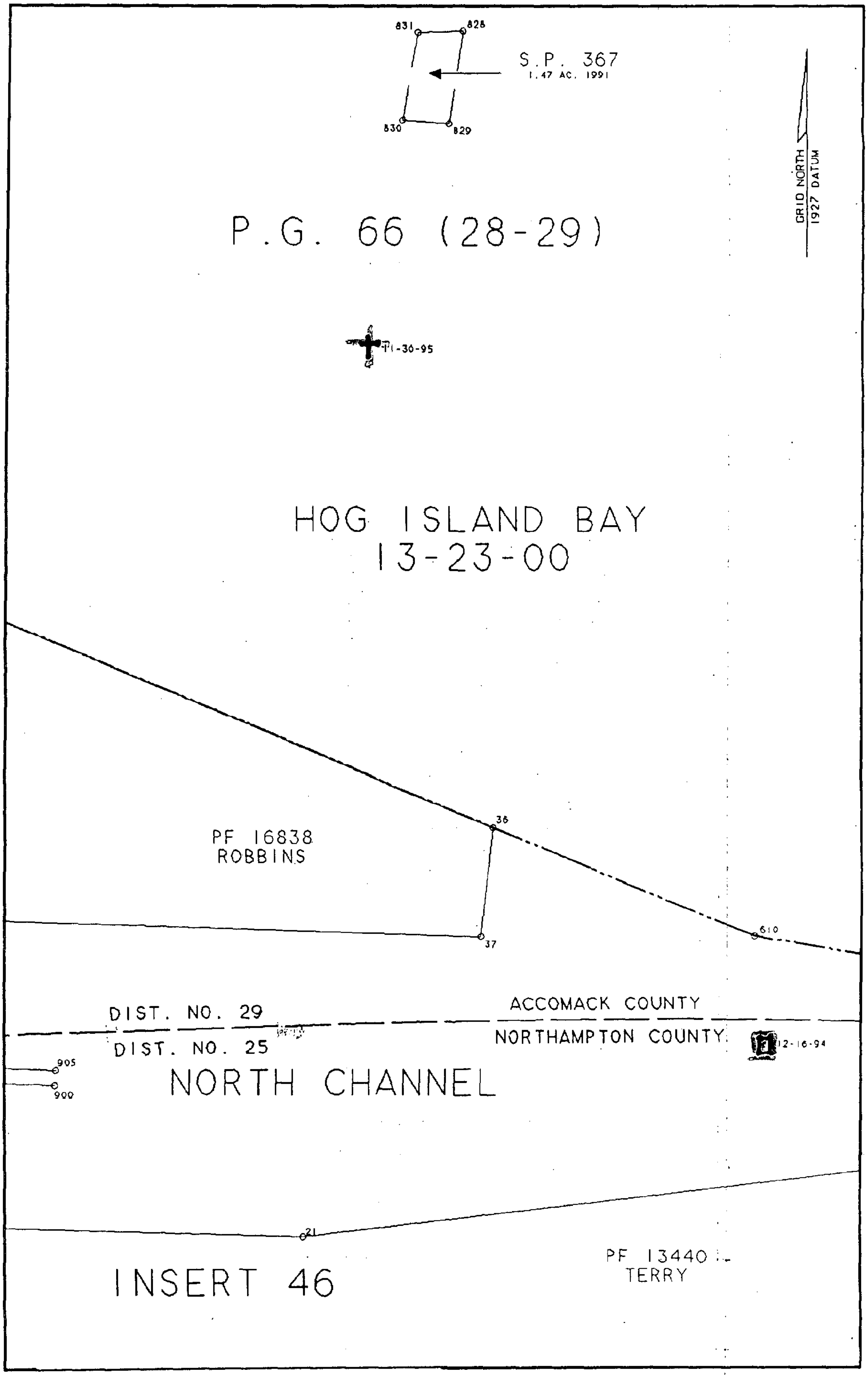

COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
HOG ISLAND BAY
MACHIPONGO RIVER
UPSHUR NECK
NORTHAMPTON CO.
ACCOMACK CO.
DIST. 25 & 29
NOTE:
S.P. # 146 NOT MAPPED
UPSHUR NECK
MACHIPONGO RIVER
14-01-01
GREENS CREEK
P.D. 66 (25-29)
HOG ISLAND BAY
13-25-00
INSERT 43
INSERT 44
INSERT 45
INSERT 46
P.D. 67 (29)
P.D. 3 (29)
NORTH CHANNEL
420-2780

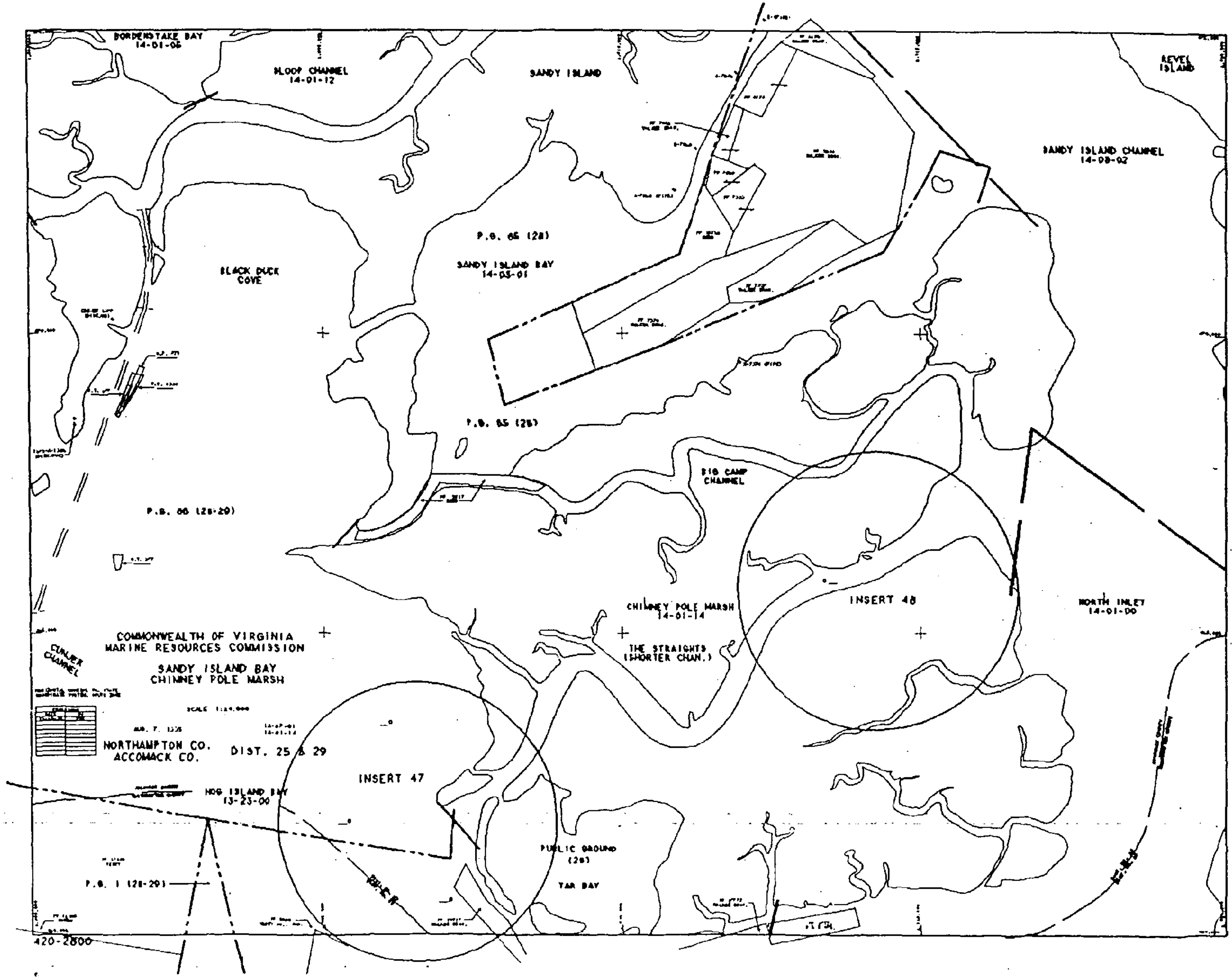

GRID NORTH
1927 DATUM
605
604
603
614
HOOK
P.G. 67 (29)
MACHIPONGO RIVER
14-01-01
HOG ISLAND BAY
13-23-00
1-31-95
1-25-95
1-9-95
DIST. 29
ACCOMACK COUNTY
NORTHAMPTON COUNTY
DIST. 25
S.P. 276
.38 AC. 1988
S.P. 179
.93 AC. 1986
S.P. 365
1.49 AC. 1991
811
810
808
809
816
826
825
819
817
818
827
824
P.G. 3 (29)
INSERT 43

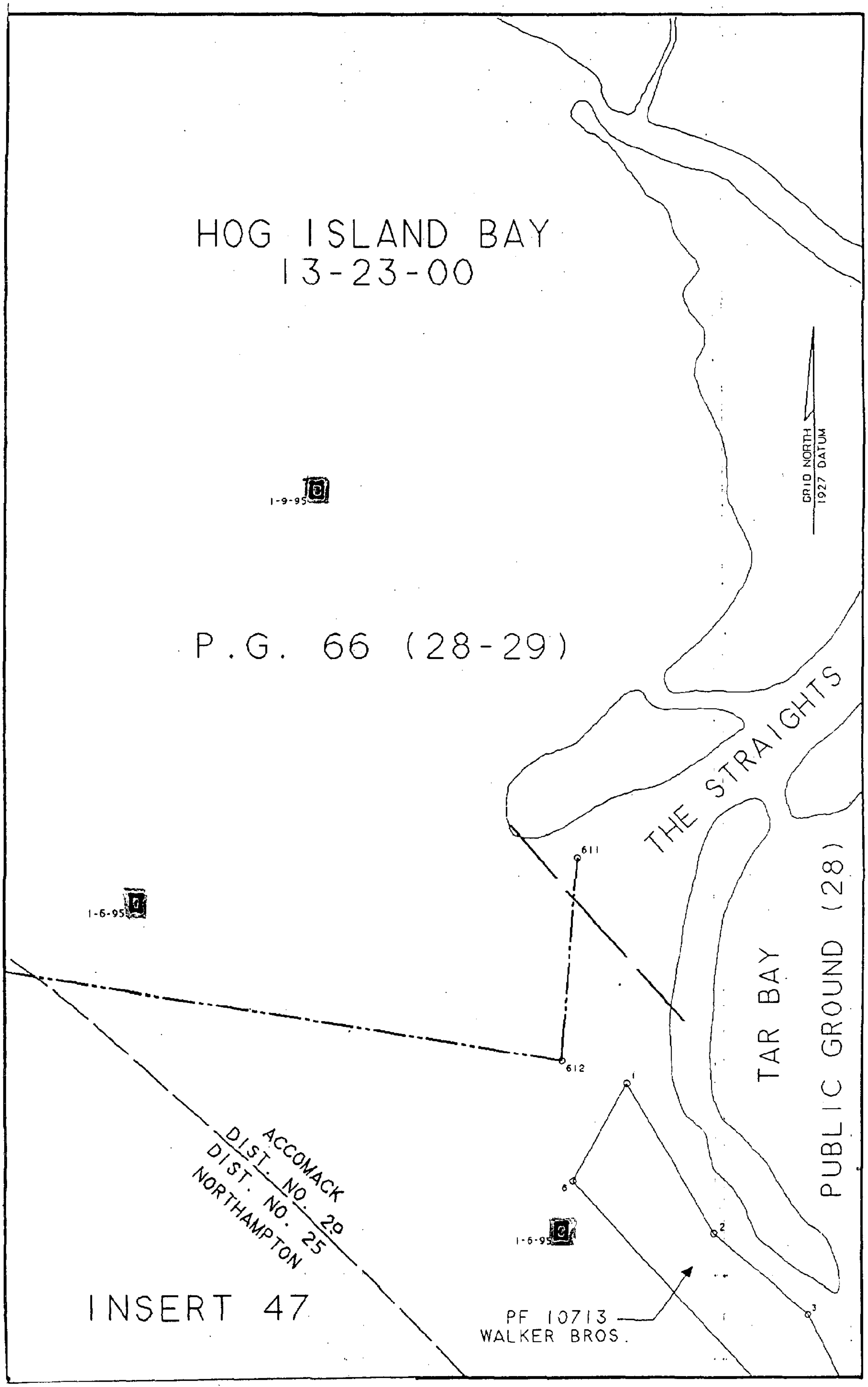

P.G. 66 (28 & 29)
HOG ISLAND BAY
13-23-00
GRID NORTH
1927 DATUM
PF 1684.1
HAMBLIN
6-16-95
5-23-95
PF 13596
BOWEN
4-27-95
ACCOMACK CO.
DIST. NO. 29
NORTHAMPTON CO.
DIST. NO. 25
5-12-95
1-31-95
PF 16347
BRADFORD
PF 16348
BOWEN
P.G. 3 (29)
INSERT 44

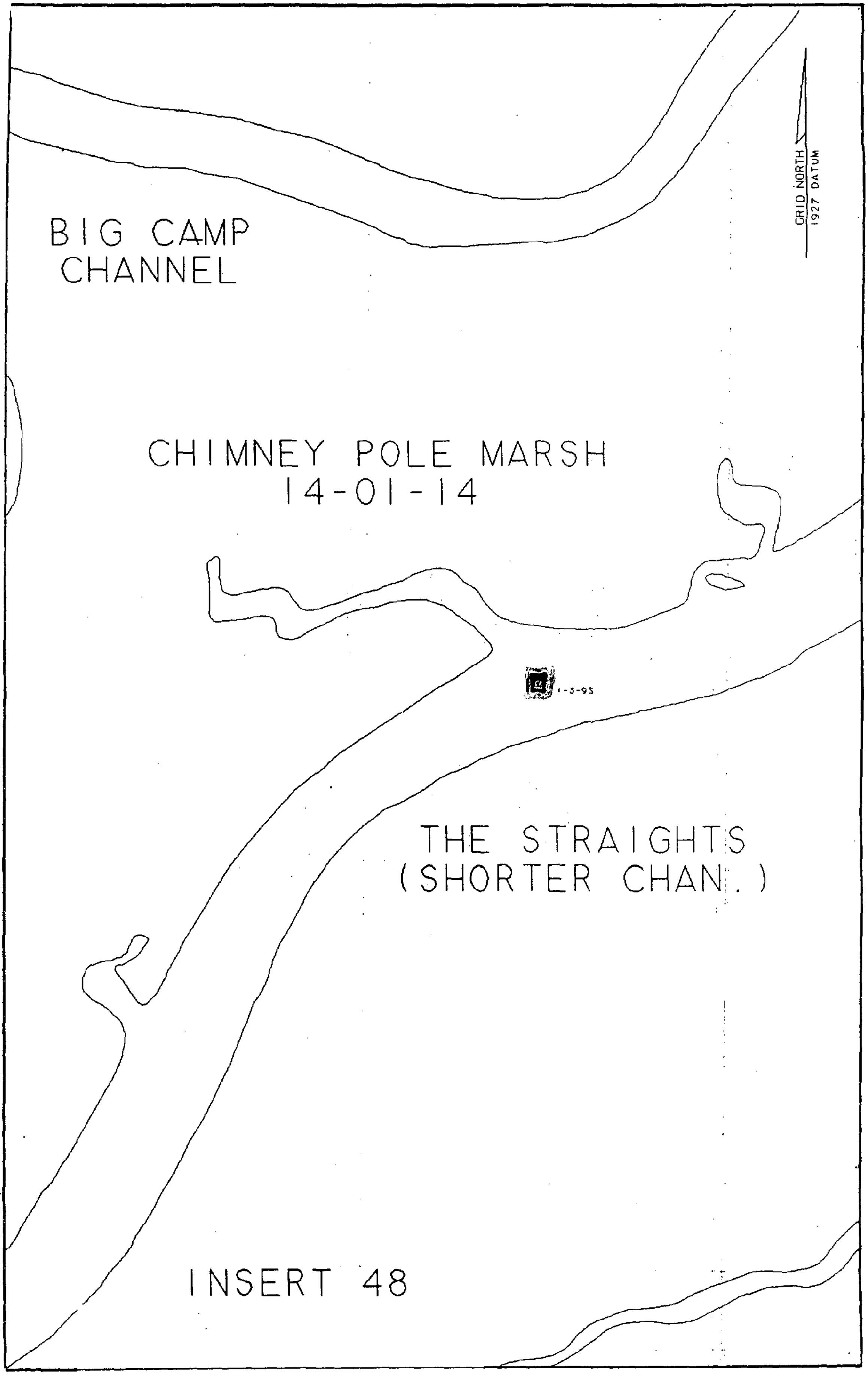


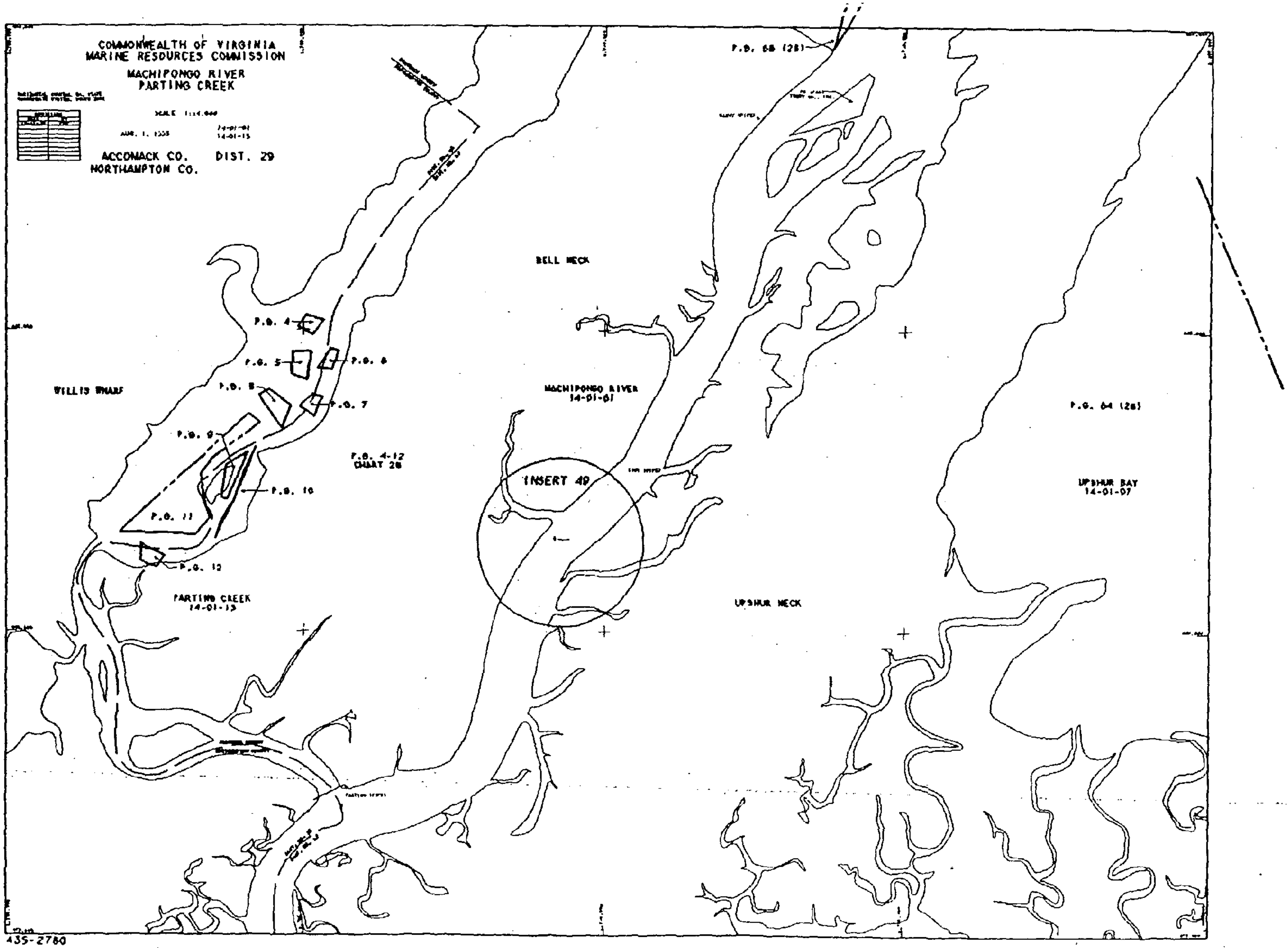
INSERT 45
1-9-95
GRID NORTH
1927 DATUM
P.G. 66 (28-29)
40
34
PF 16841
HAMBLIN
HOG ISLAND BAY
13-23-00
39
PF 16838
ROBBINS
14
15
16
41
8-10-95
42
ACCOMACK
DIST. NO. 29
DIST. NO. 25
907
902
NORTHAMPTON
NORTH CHANNEL
PF 14601
WALKER BROS
17
8-10-95

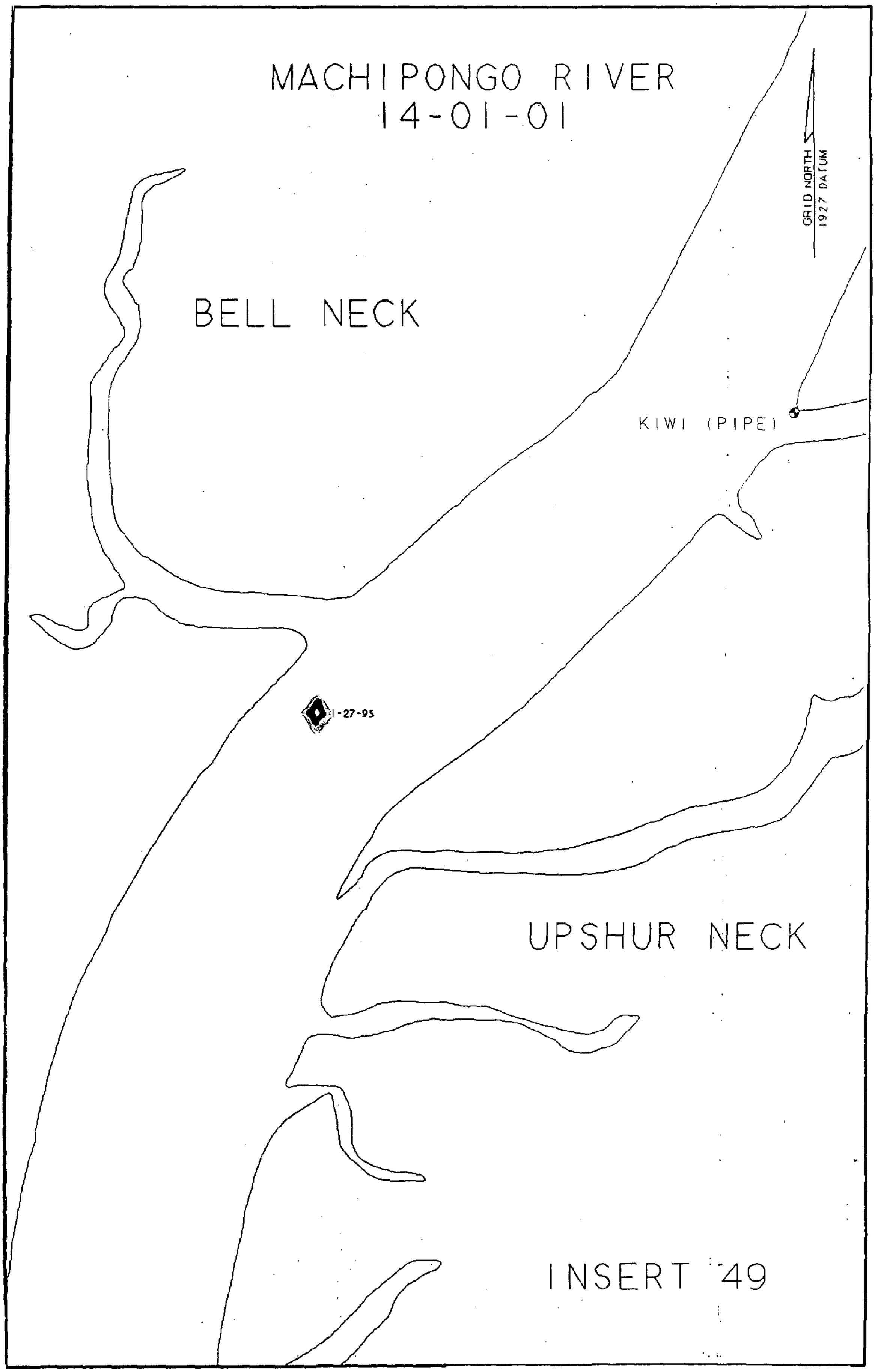

831
828
S.P. 367
1.47 AC. 1991
830
829
GRID NORTH
1927 DATUM
P.G. 66 (28-29)
11-30-95
HOG ISLAND BAY
13-23-00
36
PF 16838
ROBBINS
37
610
DIST. NO. 29
ACCOMACK COUNTY
DIST. NO. 25
NORTHAMPTON COUNTY
12-16-94
905
900
NORTH CHANNEL
21
PF 13440
TERRY
INSERT 46

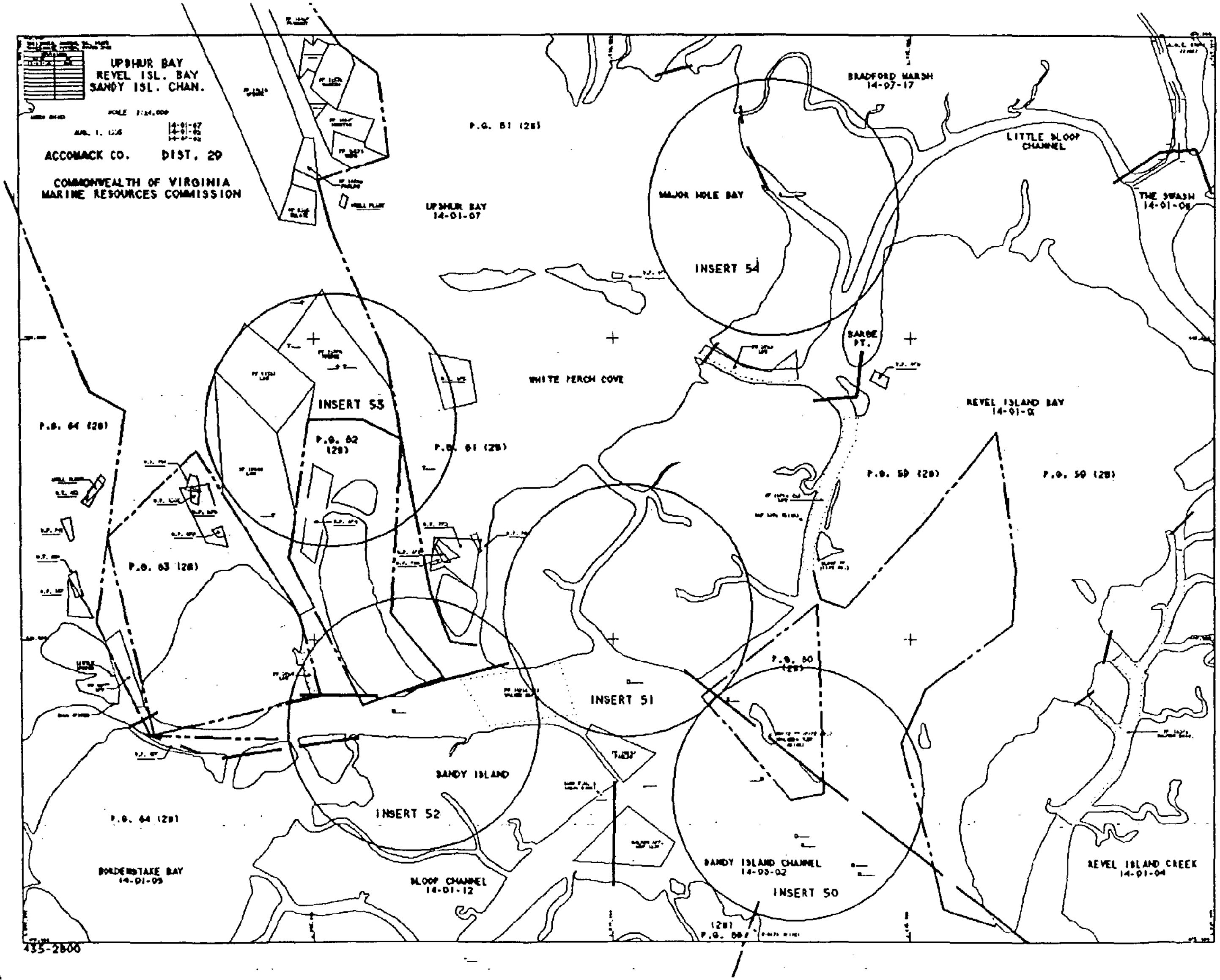

BORDENSTAKE BAY
14-01-06
SLOOP CHANNEL
14-01-12
SANDY ISLAND
REVEL ISLAND
SANDY ISLAND CHANNEL
14-08-02
P.G. 65 (28)
SANDY ISLAND BAY
14-03-01
BLACK DUCK COVE
P.G. 65 (25)
BIG CAMP CHANNEL
P.G. 66 (28-29)
CHIMNEY POLE MARSH
14-01-14
INSERT 48
NORTH INLET
14-01-00
THE STRAIGHTS
(SHORTER CHAN.)
COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
SANDY ISLAND BAY
CHIMNEY POLE MARSH
CUNJER CHANNEL
NORTHAMPTON CO.
ACCOMACK CO.
DIST. 25 & 29
INSERT 47
HOG ISLAND BAY
13-23-00
PUBLIC GROUND
(28)
TAR BAY
P.G. 1 (28-29)
420-2800

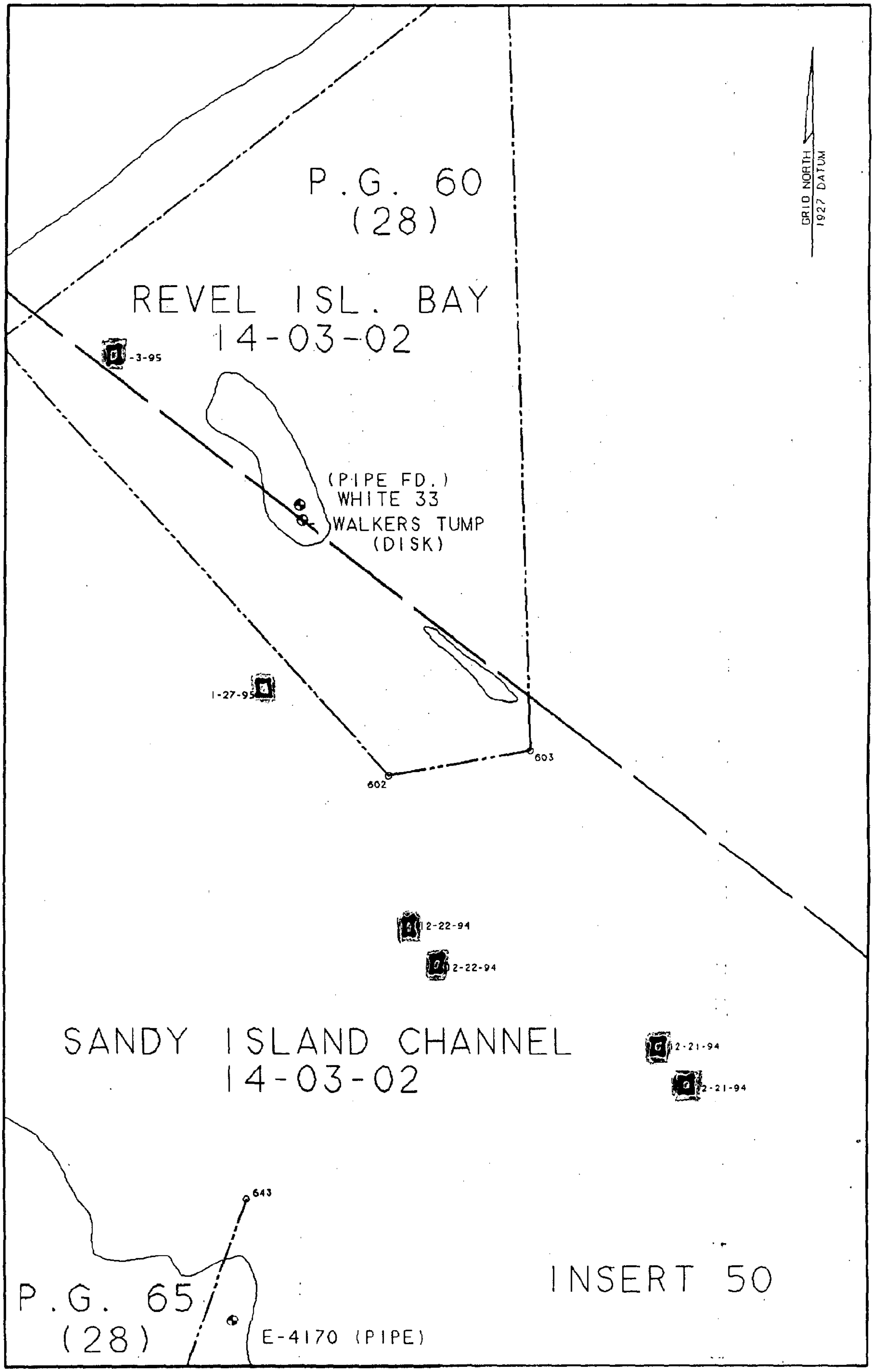

HOG ISLAND BAY
13-23-00
GRID NORTH
1927 DATUM
1-9-95
P.G. 66 (28-29)
THE STRAIGHTS
611
1-6-95
TAR BAY
PUBLIC GROUND (28)
612
1
6
ACCOMACK
DIST. NO. 20
DIST. NO. 25
NORTHAMPTON
1-6-95
2
3
INSERT 47
PF 10713
WALKER BROS.

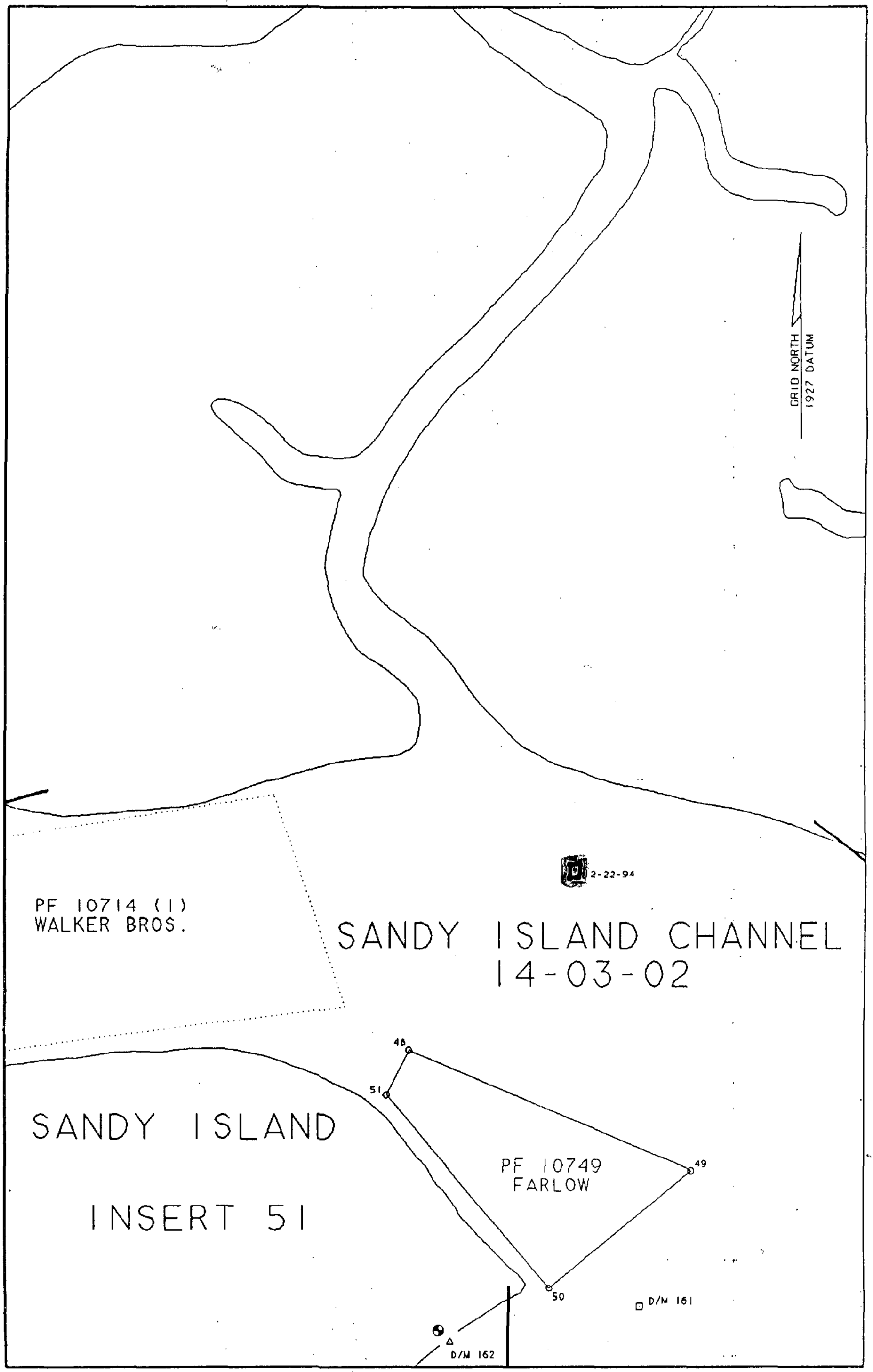

BIG CAMP
CHANNEL
GRID NORTH
1927 DATUM
CHIMNEY POLE MARSH
14-01-14
1-3-95
THE STRAIGHTS
(SHORTER CHAN.)
INSERT 48

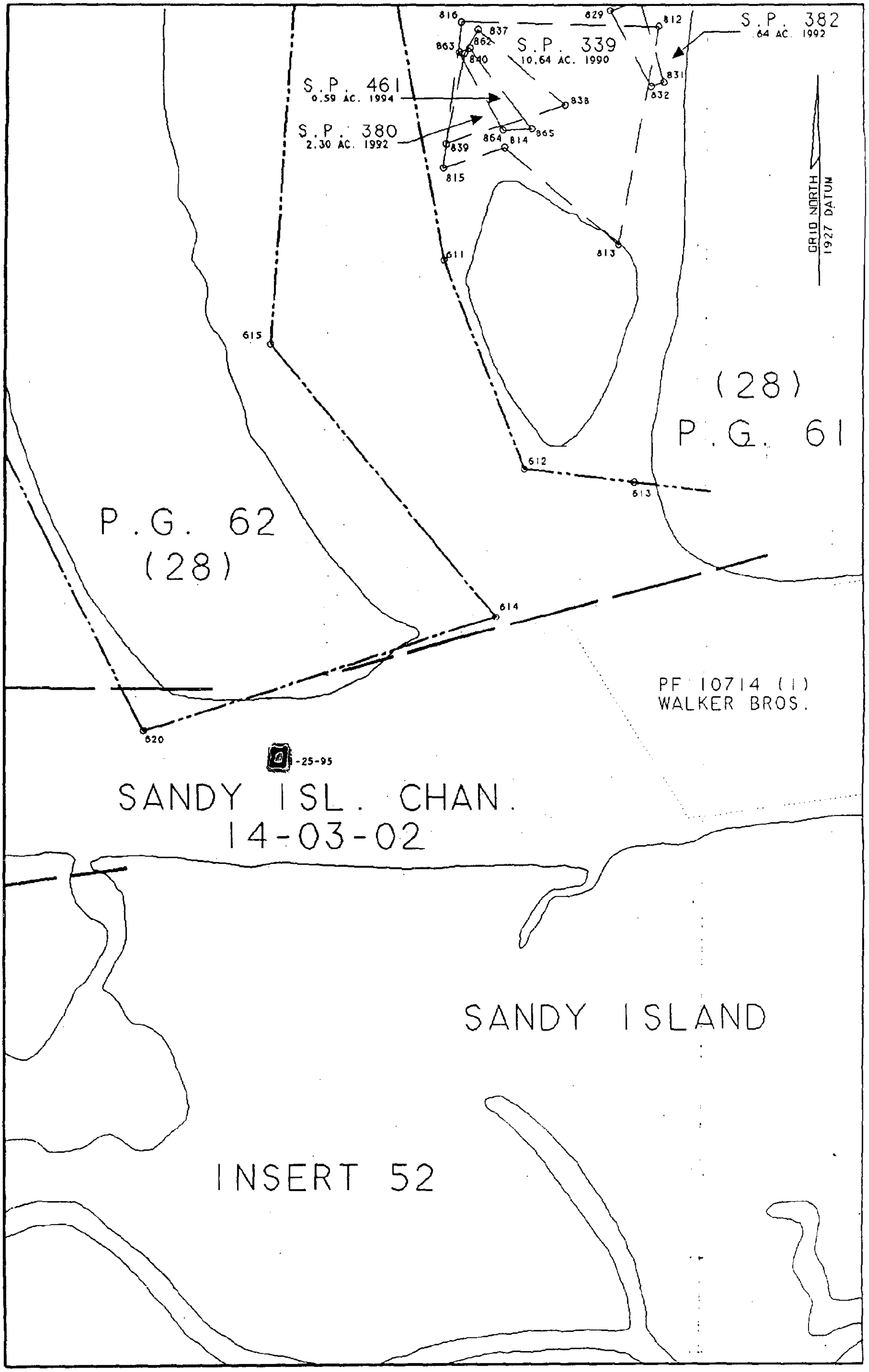

COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
MACHIPONGO RIVER
PARTING CREEK
ACCOMACK CO.
DIST. 29
NORTHAMPTON CO.
P.G. 68 (28)
BELL NECK
P.G. 4
P.G. 5
P.G. 6
P.G. 7
P.G. 8
P.G. 9
P.G. 10
P.G. 11
P.G. 12
WILLIS WHARF
MACHIPONGO RIVER
14-01-01
P.G. 4-12
CHART 28
INSERT 49
P.G. 64 (28)
UPSHUR BAY
14-01-07
PARTING CREEK
14-01-15
UPSHUR NECK
435-2780

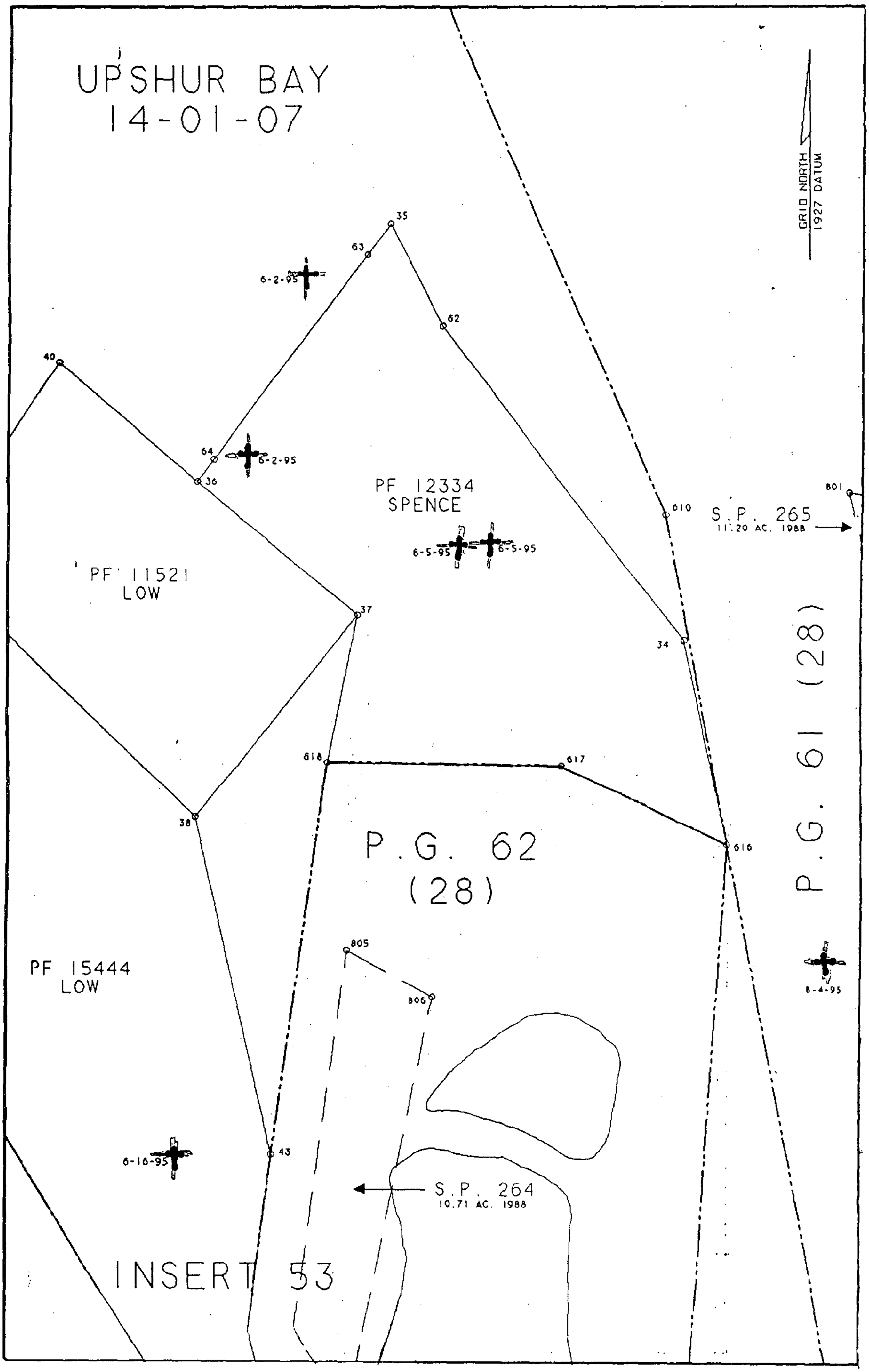

MACHIPONGO RIVER
14-01-01
GRID NORTH
1927 DATUM
BELL NECK
KIWI (PIPE)
1-27-95
UPSHUR NECK
INSERT 49

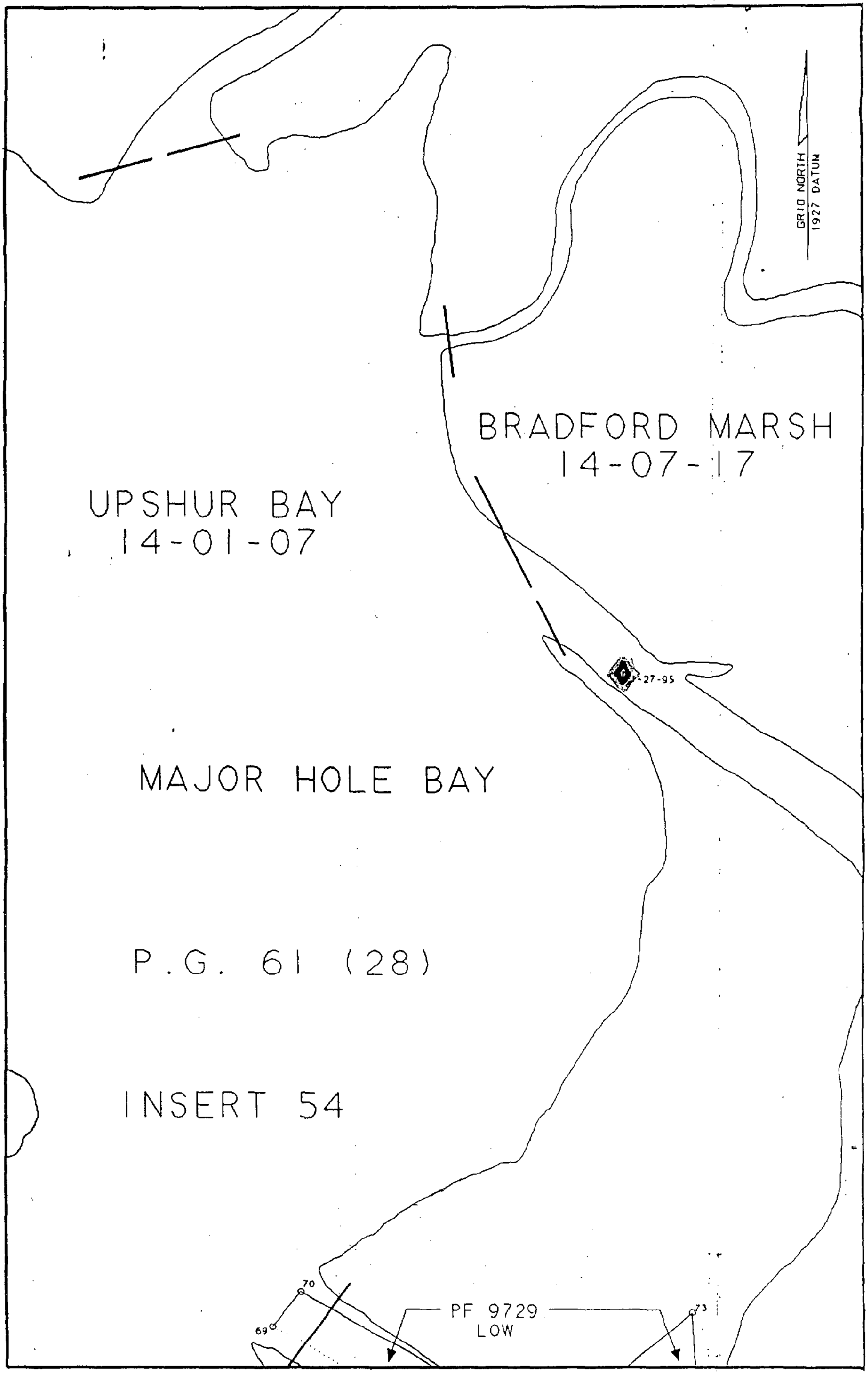

UPSHUR BAY
REVEL ISL. BAY
SANDY ISL. CHAN.
ACCOMACK CO. DIST. 29
COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
P.G. 61 (28)
UPSHUR BAY
14-01-07
BRADFORD MARSH
14-07-17
LITTLE SLOOP
CHANNEL
THE SWASH
14-01-06
MAJOR HOLE BAY
INSERT 54
BARBE
PT.
WHITE PERCH COVE
REVEL ISLAND BAY
14-01-10
INSERT 53
P.G. 62
(28)
P.G. 61 (28)
P.G. 64 (28)
P.G. 63 (28)
P.G. 59 (28)
P.G. 58 (28)
INSERT 51
P.G. 60
(28)
SANDY ISLAND
INSERT 52
P.G. 64 (28)
BORDENSTAKE BAY
14-01-09
SLOOP CHANNEL
14-01-12
SANDY ISLAND CHANNEL
14-03-02
INSERT 50
REVEL ISLAND CREEK
14-01-04
(28)
P.G. 60
435-2800

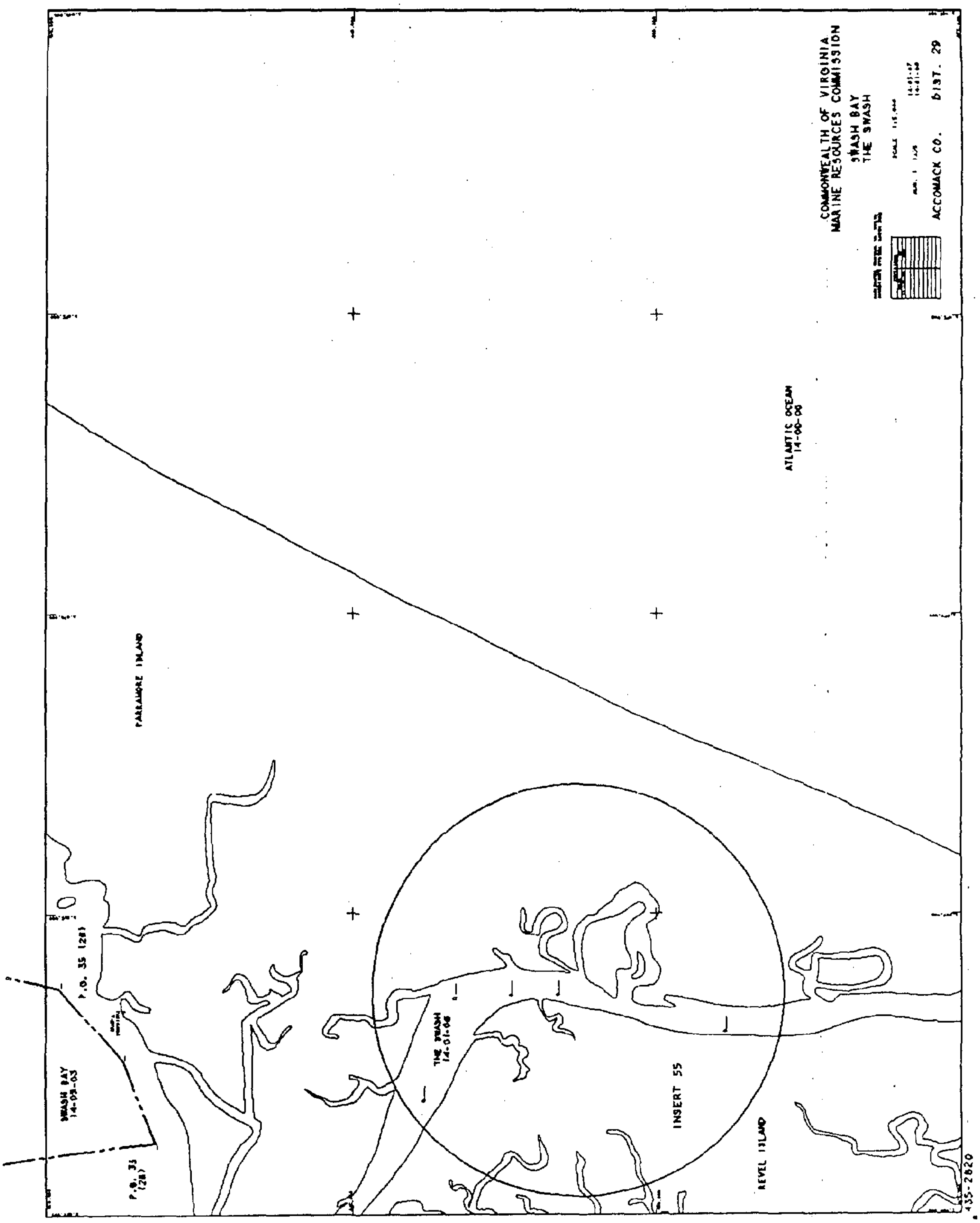

P.G. 60
(28)
REVEL ISL. BAY
14-03-02
GRID NORTH
1927 DATUM
-3-95
(PIPE FD.)
WHITE 33
WALKERS TUMP
(DISK)
1-27-95
603
602
2-22-94
2-22-94
SANDY ISLAND CHANNEL
14-03-02
2-21-94
2-21-94
643
INSERT 50
P.G. 65
(28)
E-4170 (PIPE)

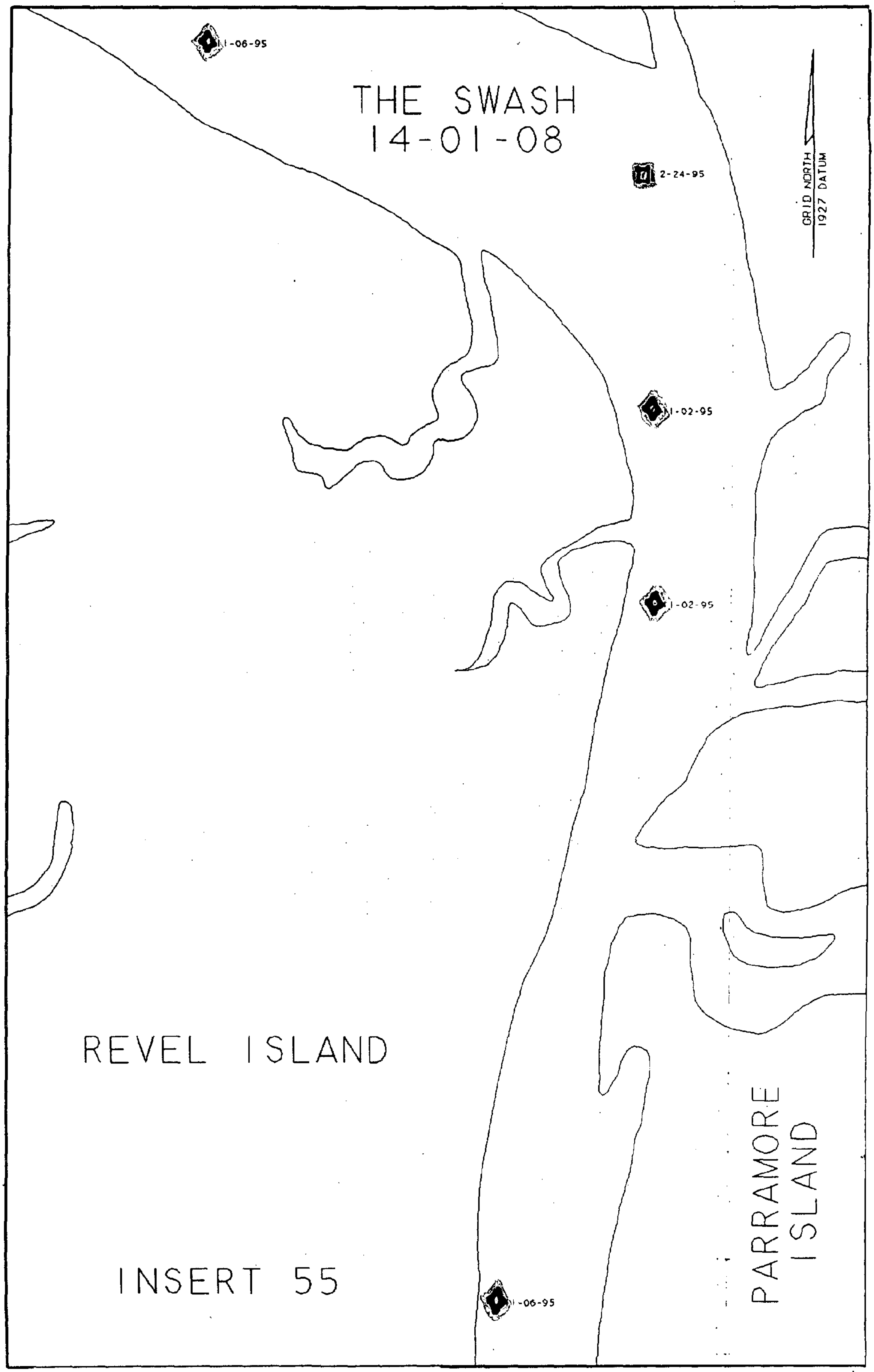

GRID NORTH
1927 DATUM
2-22-94
PF 10714 (1)
WALKER BROS.
SANDY ISLAND CHANNEL
14-03-02
48
51
49
50
PF 10749
FARLOW
SANDY ISLAND
INSERT 51
D/M 161
D/M 162


S.P. 382
.64 AC. 1992
S.P. 339
10.64 AC. 1990
S.P. 461
0.59 AC. 1994
S.P. 380
2.30 AC. 1992
GRID NORTH
1927 DATUM
(28)
P.G. 61
P.G. 62
(28)
PF 10714 (1)
WALKER BROS.
SANDY ISL. CHAN.
14-03-02
SANDY ISLAND
INSERT 52

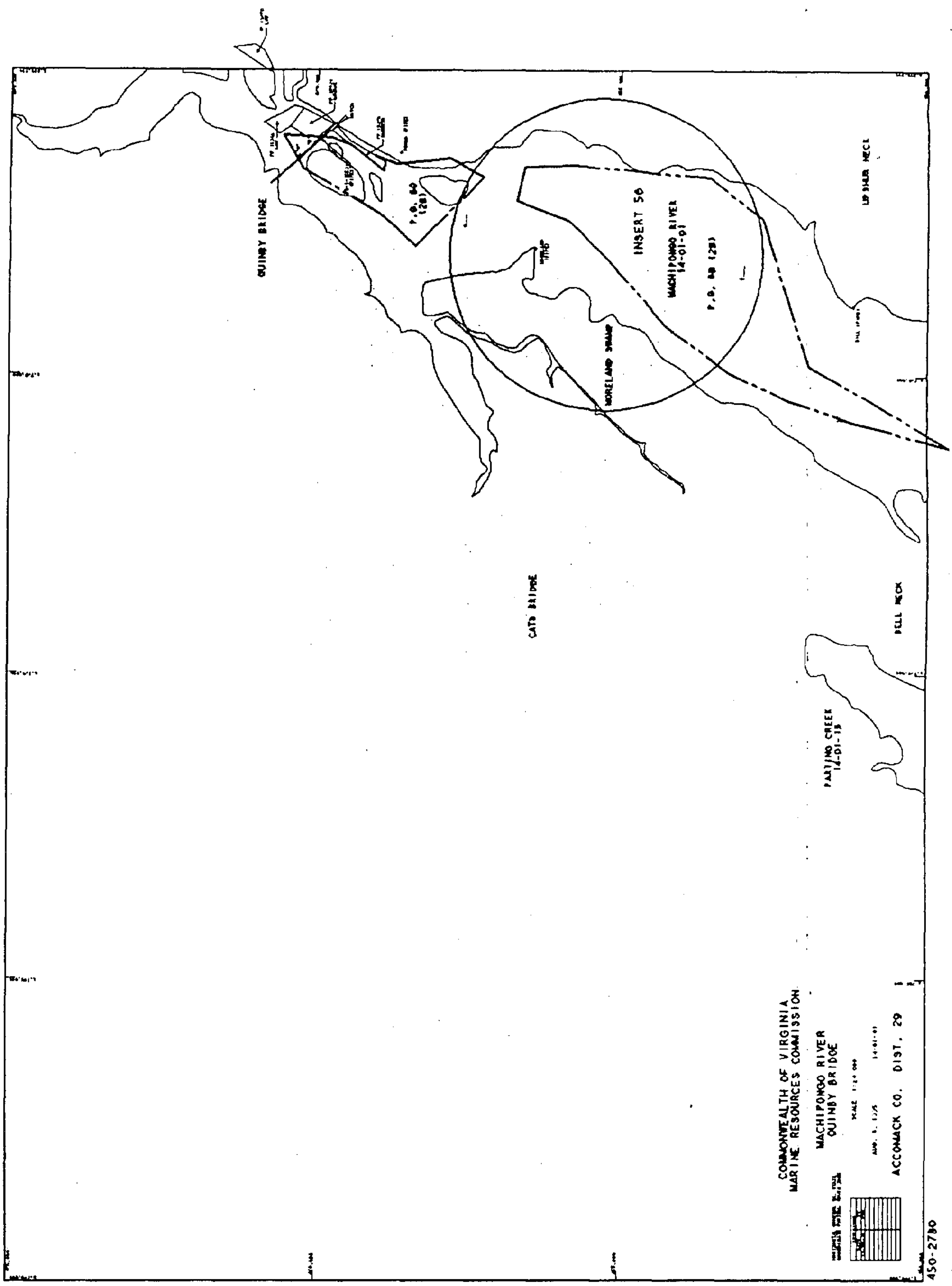

UPSHUR BAY
14-01-07
GRID NORTH
1927 DATUM
35
63
6-2-95
62
40
64
6-2-95
36
PF 12334
SPENCE
610
S.P. 265
11.20 AC. 1988
801
6-5-95
6-5-95
PF 11521
LOW
37
34
P.G. 61 (28)
618
617
38
616
P.G. 62
(28)
805
806
8-4-95
PF 15444
LOW
43
6-16-95
S.P. 264
10.71 AC. 1988
INSERT 53

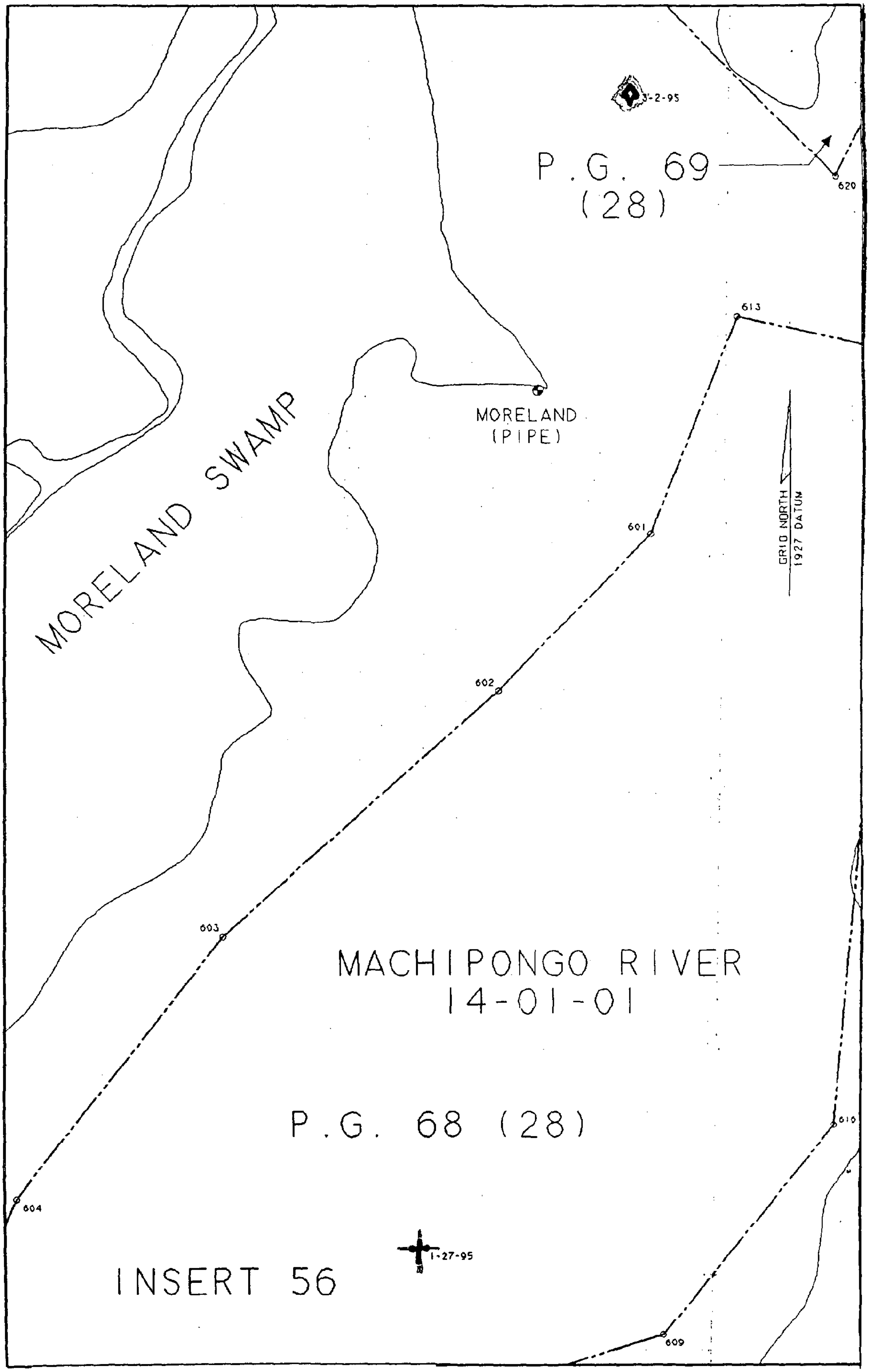

GRID NORTH
1927 DATUM
BRADFORD MARSH
14-07-17
UPSHUR BAY
14-01-07
27-95
MAJOR HOLE BAY
P.G. 61 (28)
INSERT 54
70
69
PF 9729
LOW
73

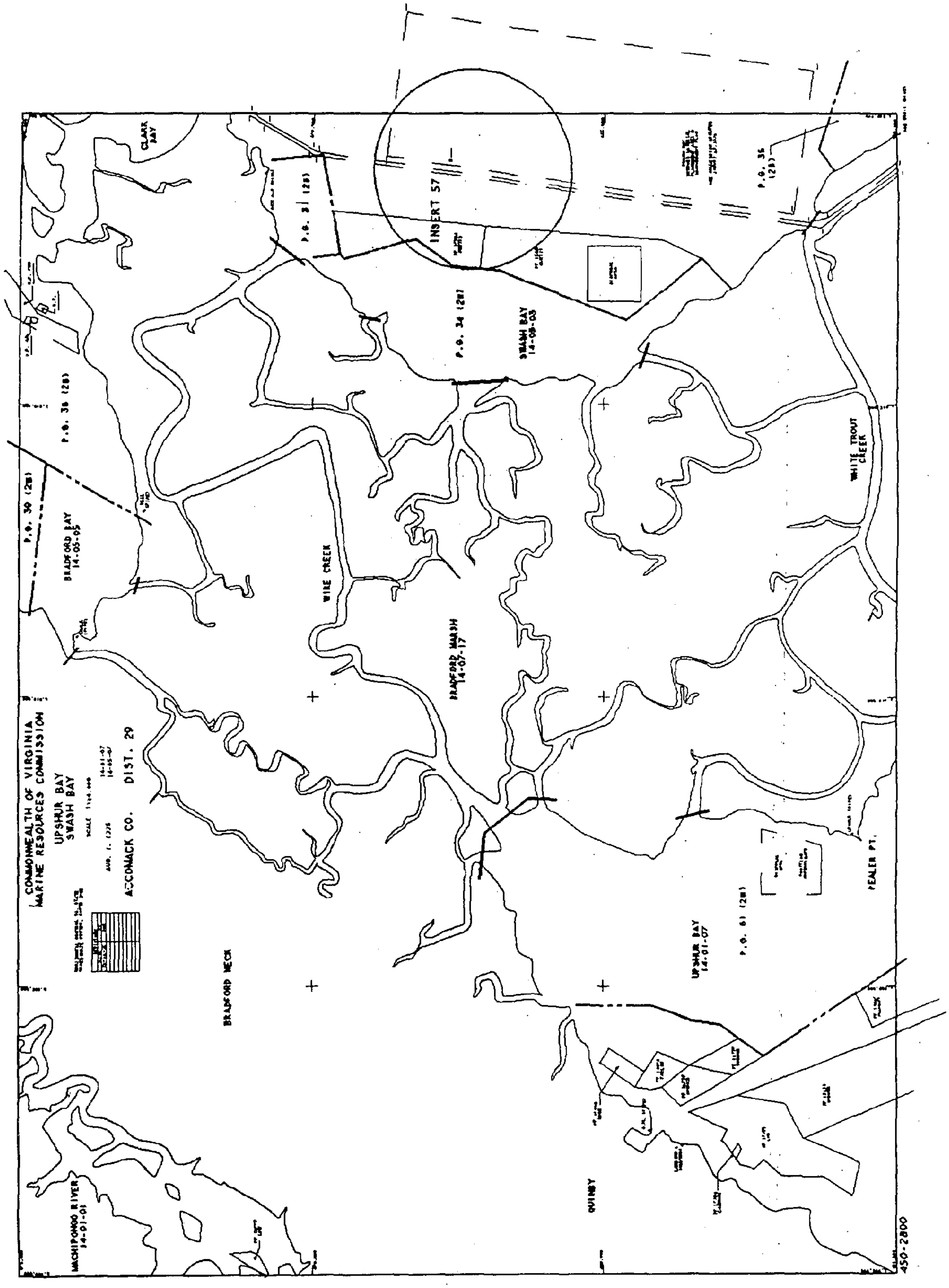

COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
SWASH BAY
THE SWASH
ACCOMACK CO.
DIST. 29
ATLANTIC OCEAN
14-00-00
PARRAMORE ISLAND
P.O. 35 (28)
SWASH BAY
14-09-03
P.O. 35
(28)
THE SWASH
14-01-06
INSERT 55
REVEL ISLAND
435-2820

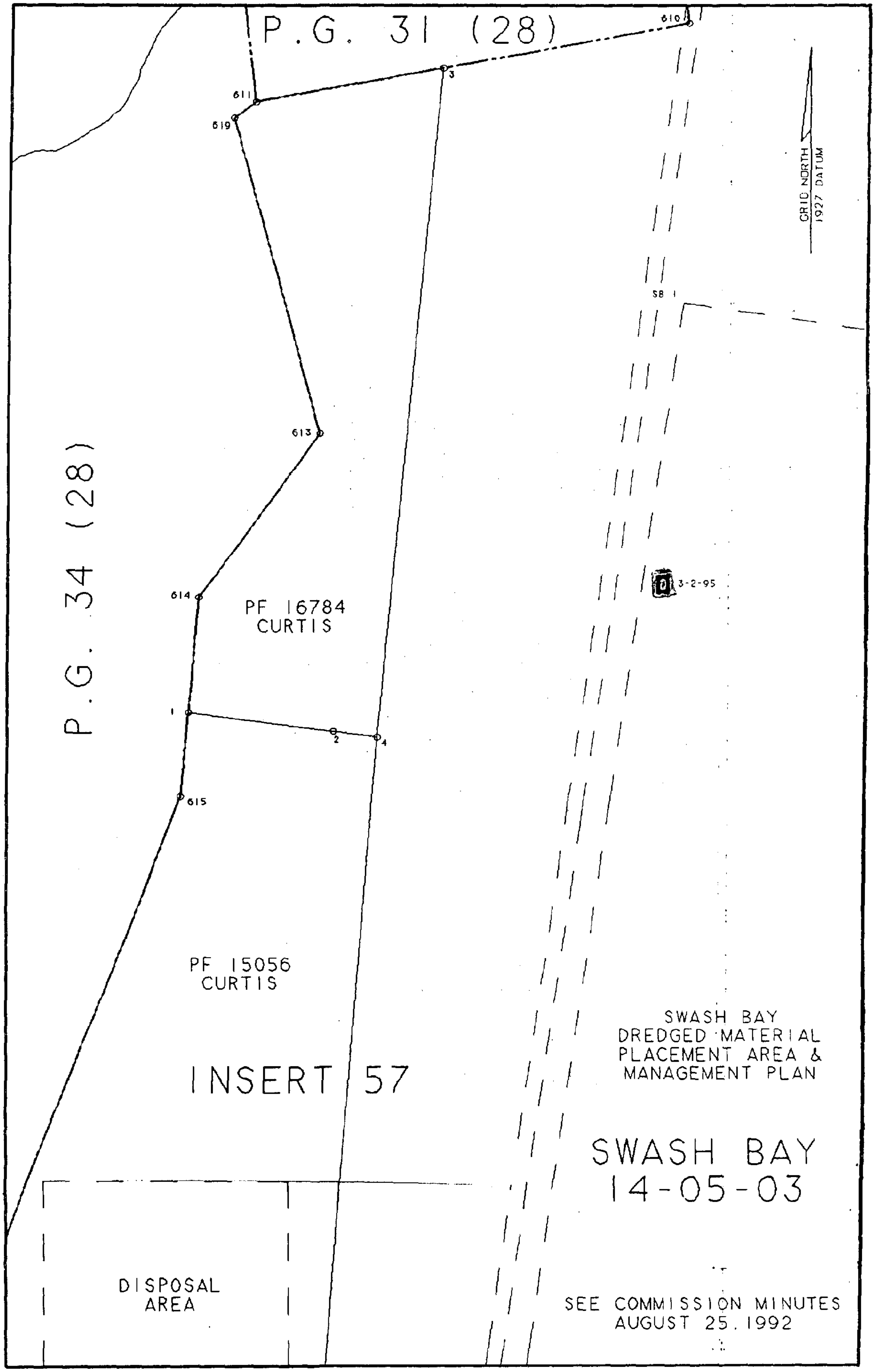


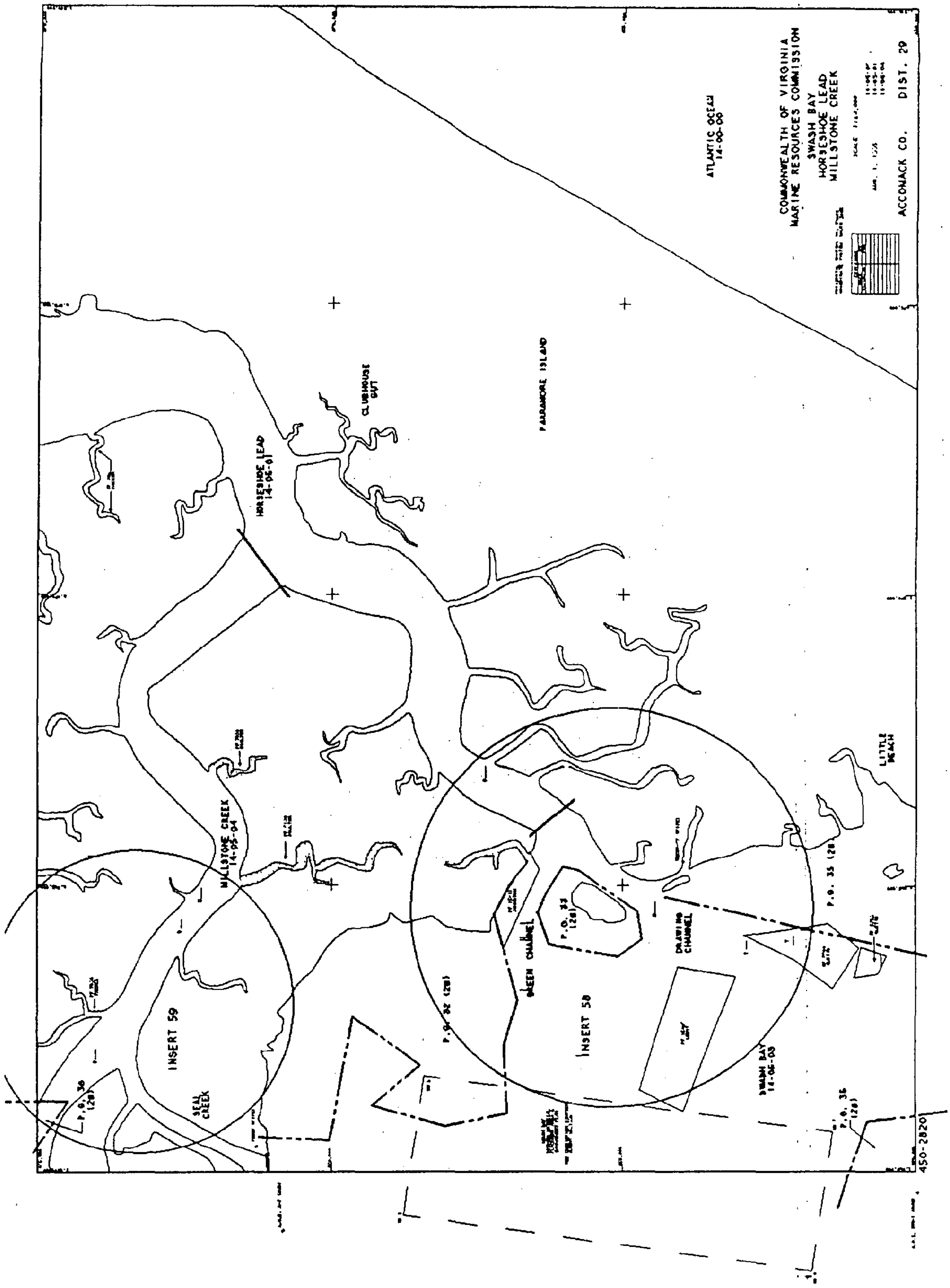
THE SWASH
14-01-08
GRID NORTH
1927 DATUM
1-06-95
2-24-95
1-02-95
1-02-95
REVEL ISLAND
PARRAMORE ISLAND
INSERT 55
1-06-95

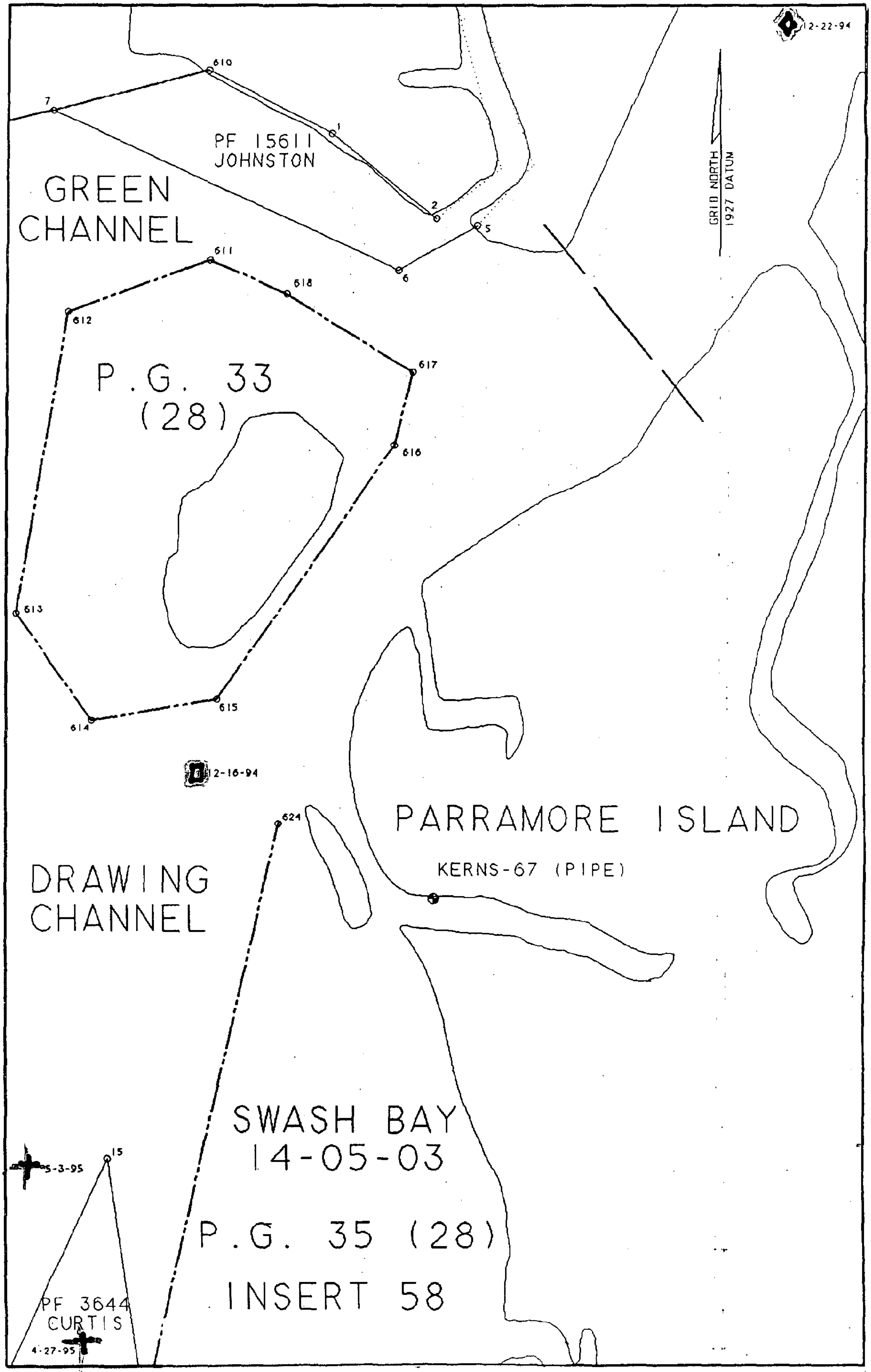

QUINBY BRIDGE
P.O. 80 (28)
INSERT 56
MACHIPONGO RIVER
14-01-01
P.O. 88 (28)
MORELAND SWAMP
CATS BRIDGE
BELL NECK
PARTING CREEK
14-01-13
COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
MACHIPONGO RIVER
QUINBY BRIDGE
ACCOMACK CO. DIST. 29
450-2780

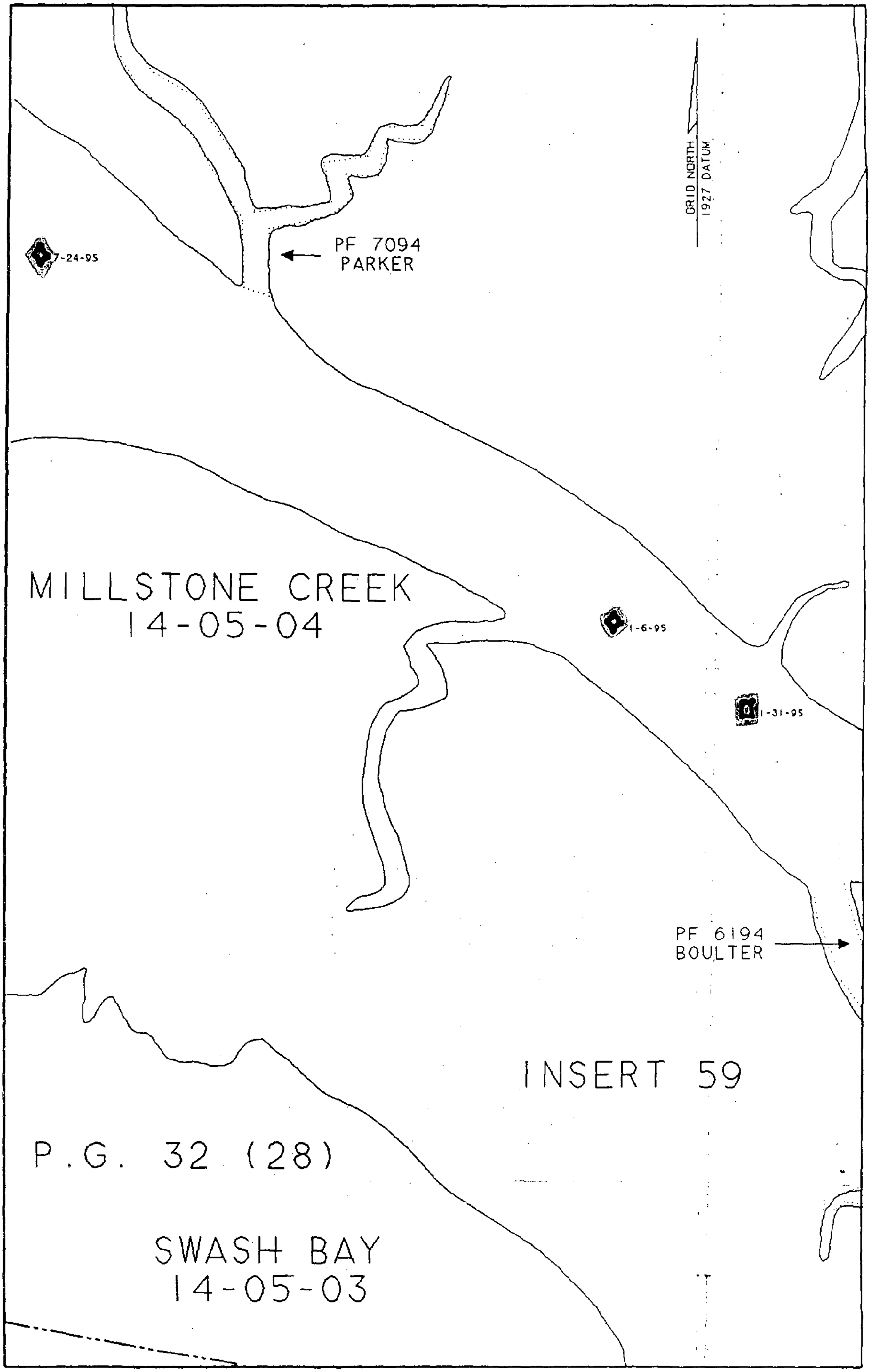

P.G. 69
(28)
3-2-95
620
613
MORELAND
(PIPE)
MORELAND SWAMP
GRID NORTH
1927 DATUM
601
602
603
MACHIPONGO RIVER
14-01-01
P.G. 68 (28)
610
604
1-27-95
INSERT 56
609

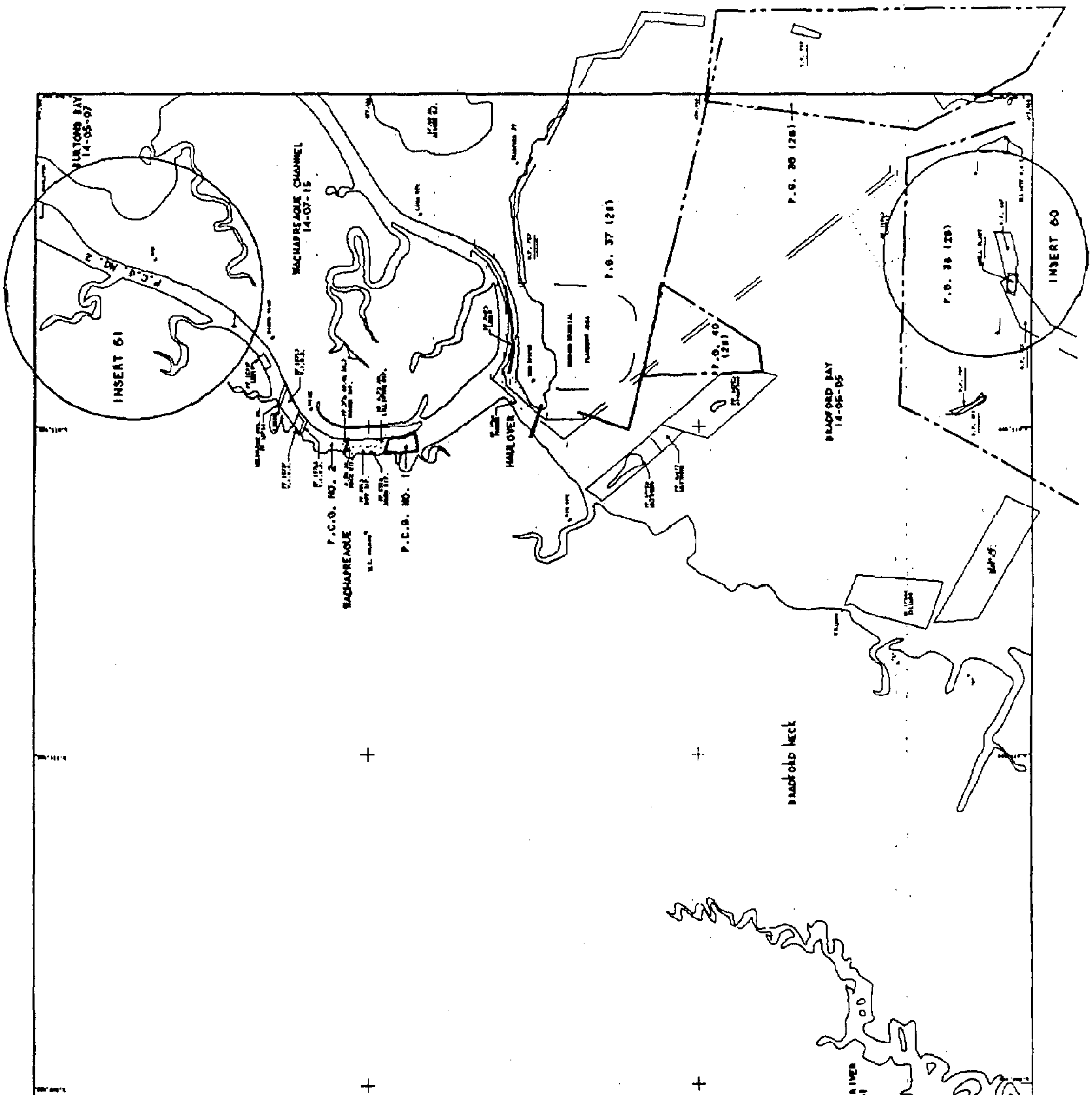

COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
UPSHUR BAY
SWASH BAY
ACCOMACK CO.
DIST. 29
BRADFORD NECK
MACHIPONGO RIVER
14-01-01
QUINBY
UPSHUR BAY
14-01-07
P.O. 61 (28)
PEALER PT.
WHITE TROUT CREEK
BRADFORD MARSH
14-07-17
WIRE CREEK
BRADFORD BAY
14-05-05
P.O. 30 (28)
P.O. 38 (28)
P.O. 34 (28)
SWASH BAY
14-08-03
INSERT 57
P.O. 31 (28)
P.O. 35 (28)
CLARK BAY
450-2800

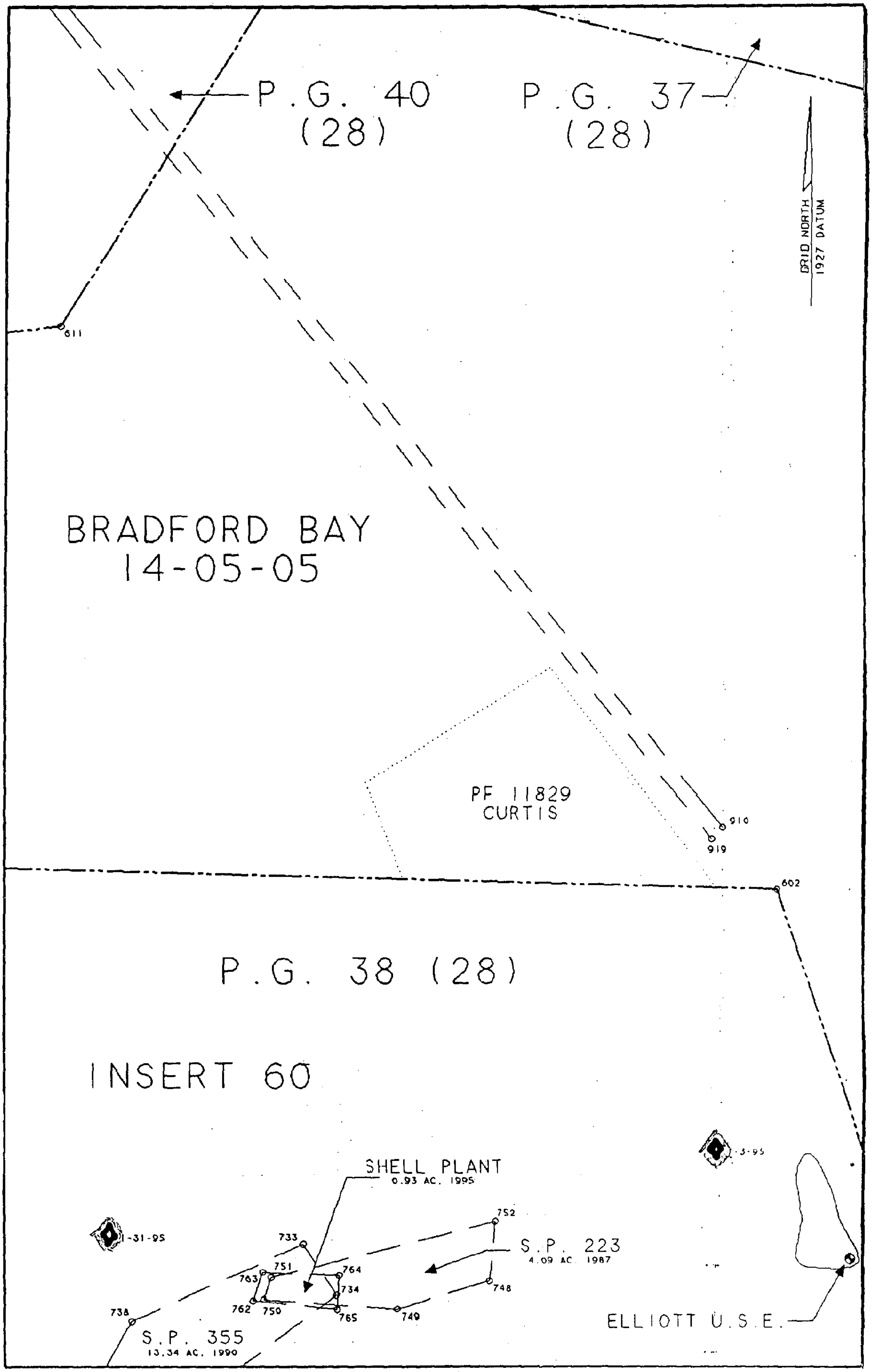

P.G. 31 (28)
610
3
611
619
GRID NORTH
1927 DATUM
SB 1
613
P.G. 34 (28)
3-2-95
614
PF 16784
CURTIS
1
2
4
615
PF 15056
CURTIS
SWASH BAY
DREDGED MATERIAL
PLACEMENT AREA &
MANAGEMENT PLAN
INSERT 57
SWASH BAY
14-05-03
DISPOSAL
AREA
SEE COMMISSION MINUTES
AUGUST 25, 1992

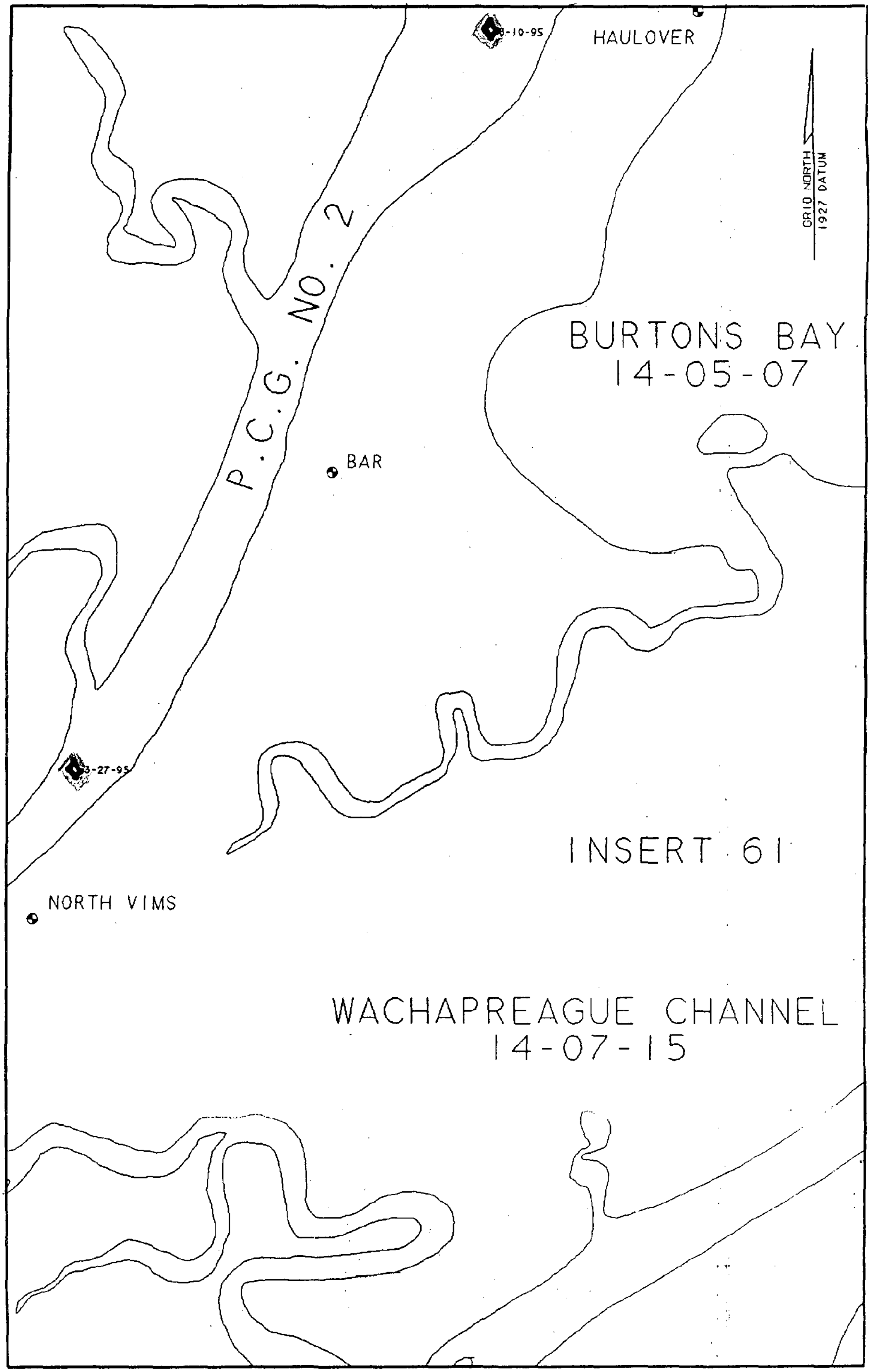

COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
SWASH BAY
HORSESHOE LEAD
MILLSTONE CREEK
ACCOMACK CO.
DIST. 29
ATLANTIC OCEAN
14-00-00
PARAMORE ISLAND
CLUBHOUSE GUT
HORSESHOE LEAD
14-06-01
MILLSTONE CREEK
14-05-04
GREEN CHANNEL
DRAWING CHANNEL
LITTLE BEACH
SWASH BAY
14-06-03
INSERT 58
INSERT 59
SEAL CREEK
P.O. 32 (28)
P.O. 33 (28)
P.O. 35 (28)
P.O. 36 (28)
450-2820

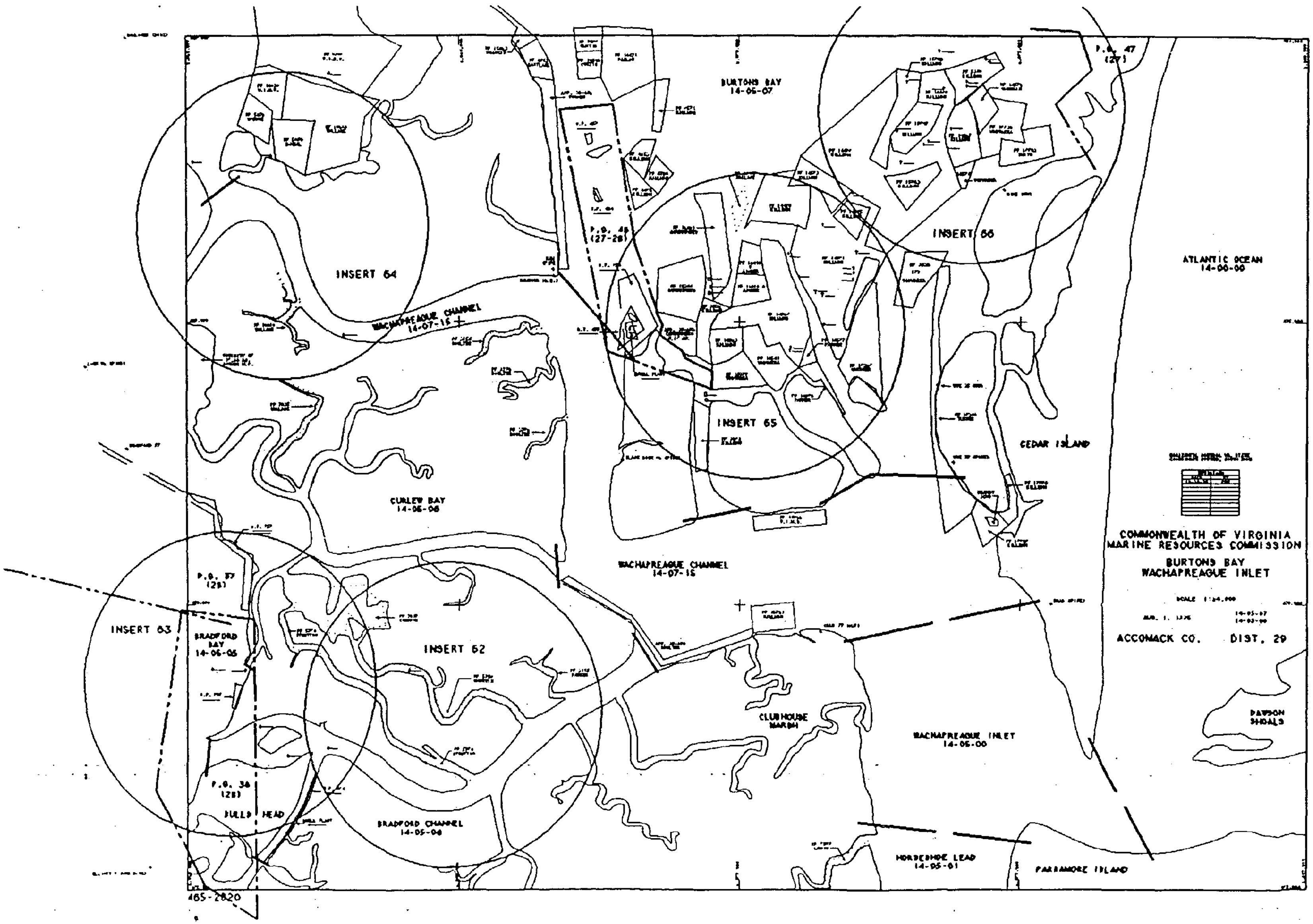

12-22-94
GRID NORTH
1927 DATUM
PF 15611
JOHNSTON
GREEN
CHANNEL
P.G. 33
(28)
12-16-94
PARRAMORE ISLAND
KERNS-67 (PIPE)
DRAWING
CHANNEL
SWASH BAY
14-05-03
5-3-95
P.G. 35 (28)
INSERT 58
PF 3644
CURTIS
4-27-95

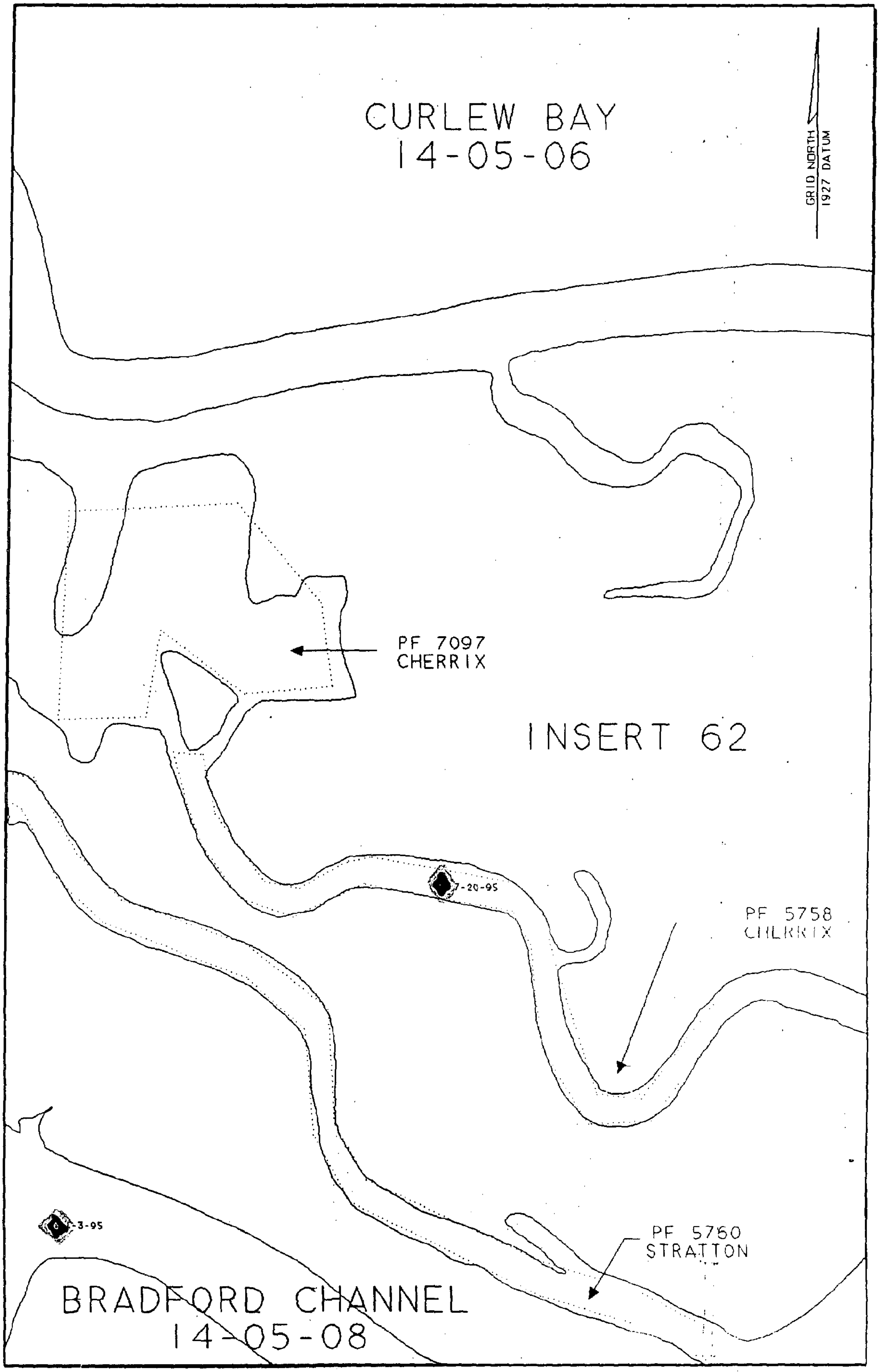

GRID NORTH
1927 DATUM
PF 7094
PARKER
7-24-95
MILLSTONE CREEK
14-05-04
1-6-95
1-31-95
PF 6194
BOULTER
INSERT 59
P.G. 32 (28)
SWASH BAY
14-05-03

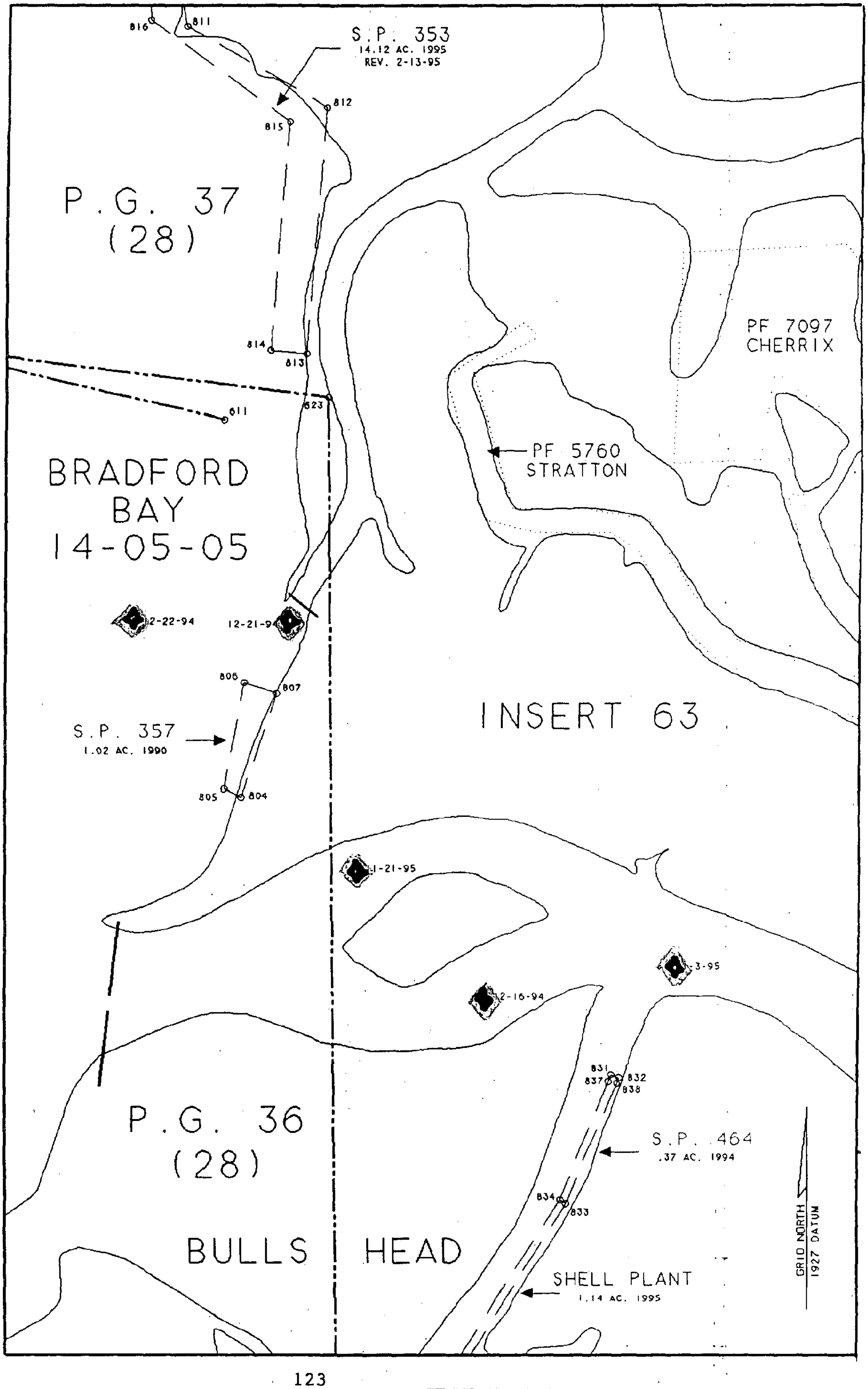

COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
BRADFORD BAY
WACHAPREAGUE
ACCOMACK CO. DIST. 29
BURTONS BAY
14-05-07
WACHAPREAGUE CHANNEL
14-07-15
INSERT 61
INSERT 60
P.C.G. NO. 2
P.C.G. NO. 1
WACHAPREAGUE
HAULOVER
P.G. 37 (28)
P.G. 38 (28)
P.G. 40 (28)
BRADFORD BAY
14-05-05
Bradford Neck
MACHIPONGO RIVER
14-01-01
465-2800

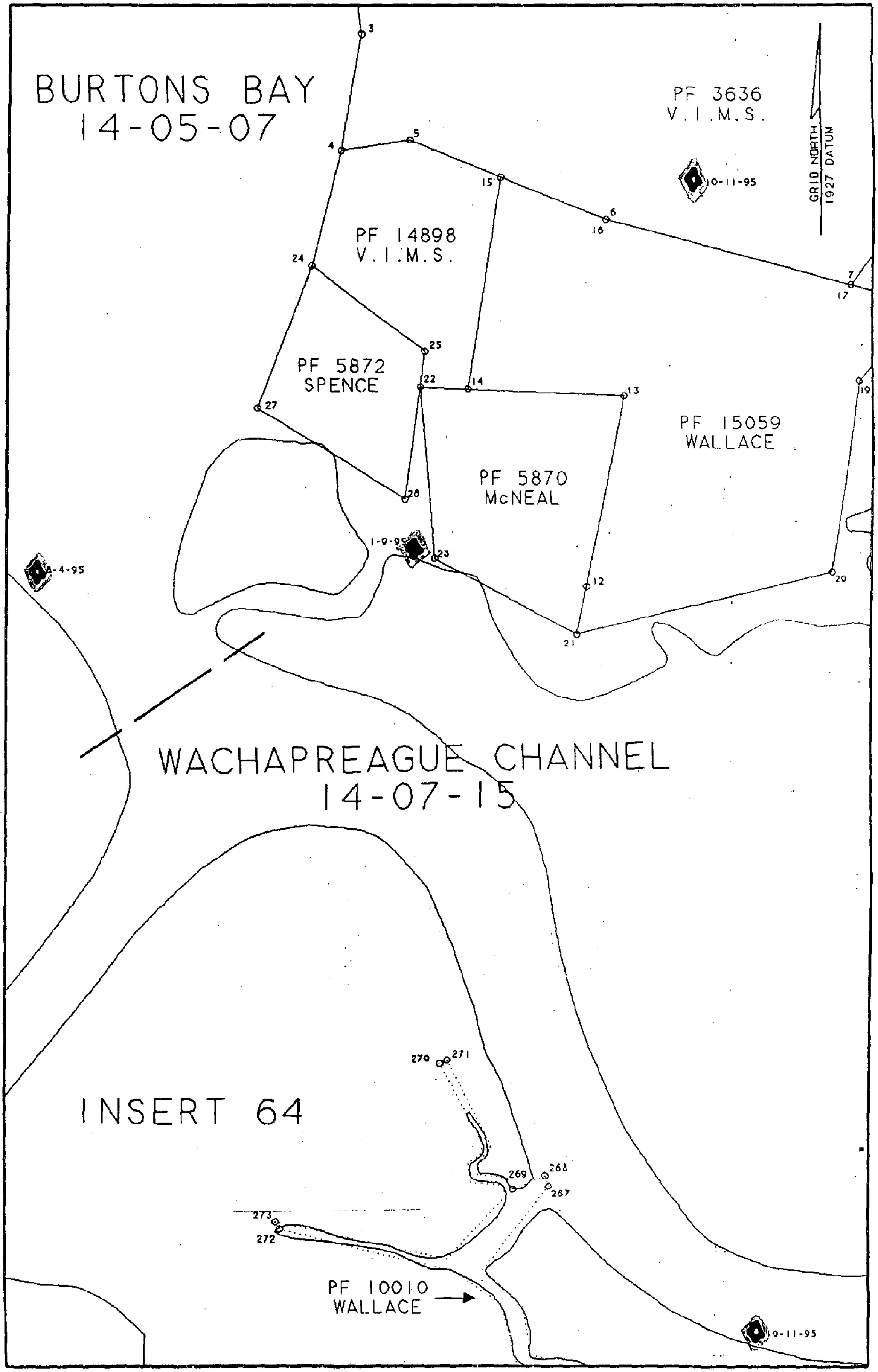

P.G. 40
(28)
P.G. 37
(28)
GRID NORTH
1927 DATUM
611
BRADFORD BAY
14-05-05
PF 11829
CURTIS
910
919
602
P.G. 38 (28)
INSERT 60
SHELL PLANT
0.93 AC. 1995
752
S.P. 223
4.09 AC. 1987
733
751
764
763
734
748
762
750
765
749
738
S.P. 355
13.34 AC. 1990
ELLIOTT U.S.E.

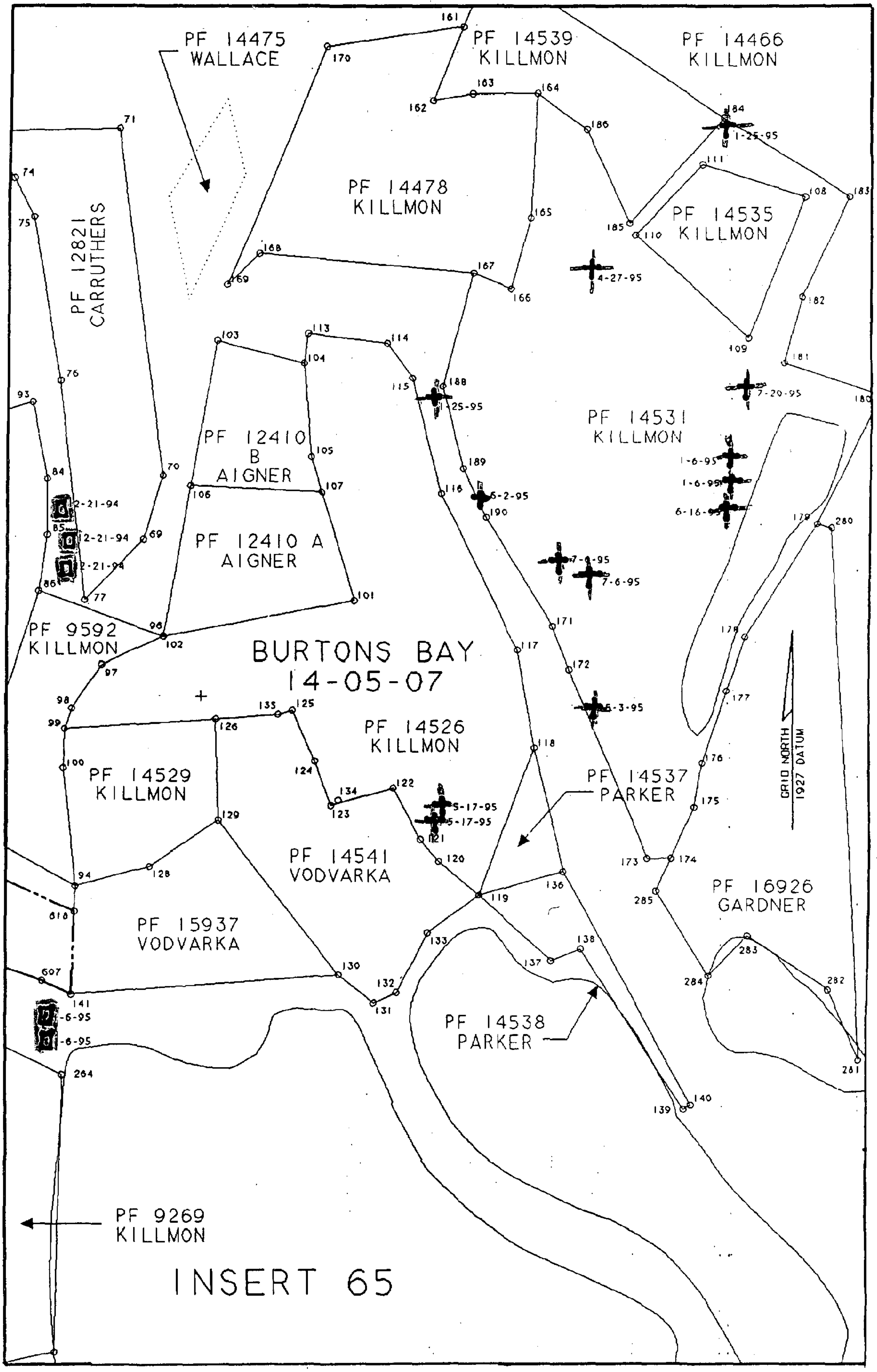

-10-95
HAULOVER
GRID NORTH
1927 DATUM
P.C.G. NO. 2
BURTONS BAY
14-05-07
BAR
3-27-95
INSERT 61
NORTH VIMS
WACHAPREAGUE CHANNEL
14-07-15

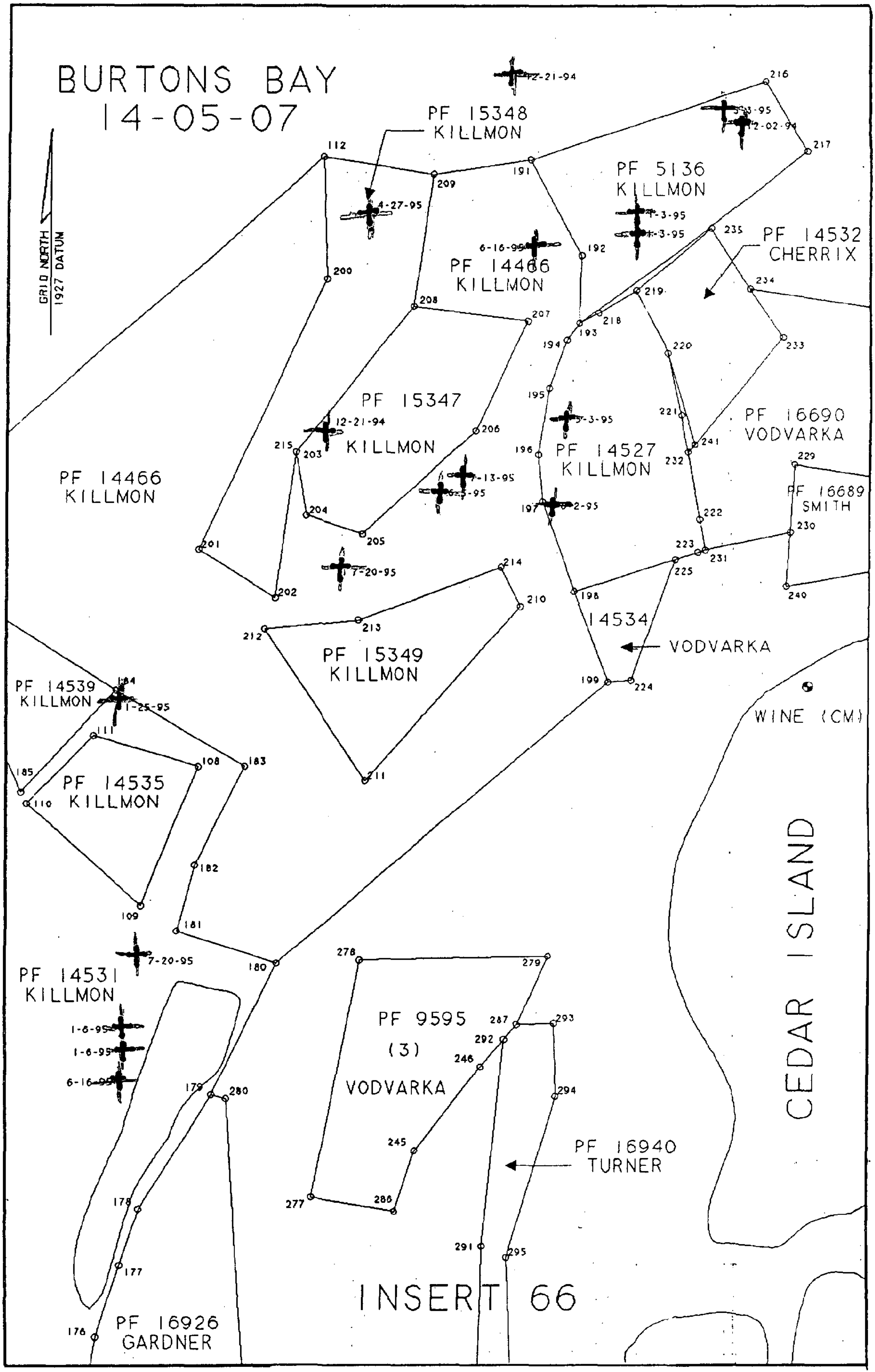

BURTONS BAY
14-05-07
P.G. 47
(27)
INSERT 64
INSERT 66
P.G. 48
(27-28)
WACHAPREAGUE CHANNEL
14-07-15
ATLANTIC OCEAN
14-00-00
INSERT 65
CEDAR ISLAND
CURLEW BAY
14-05-08
COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
BURTONS BAY
WACHAPREAGUE INLET
ACCOMACK CO. DIST. 29
WACHAPREAGUE CHANNEL
14-07-15
P.G. 37
(28)
INSERT 63
BRADFORD BAY
14-05-05
INSERT 62
CLUBHOUSE MARSH
WACHAPREAGUE INLET
14-05-00
DAWSON SHOALS
P.G. 36
(28)
BULLS HEAD
BRADFORD CHANNEL
14-05-08
HORSESHOE LEAD
14-05-01
PARRAMORE ISLAND
465-2820

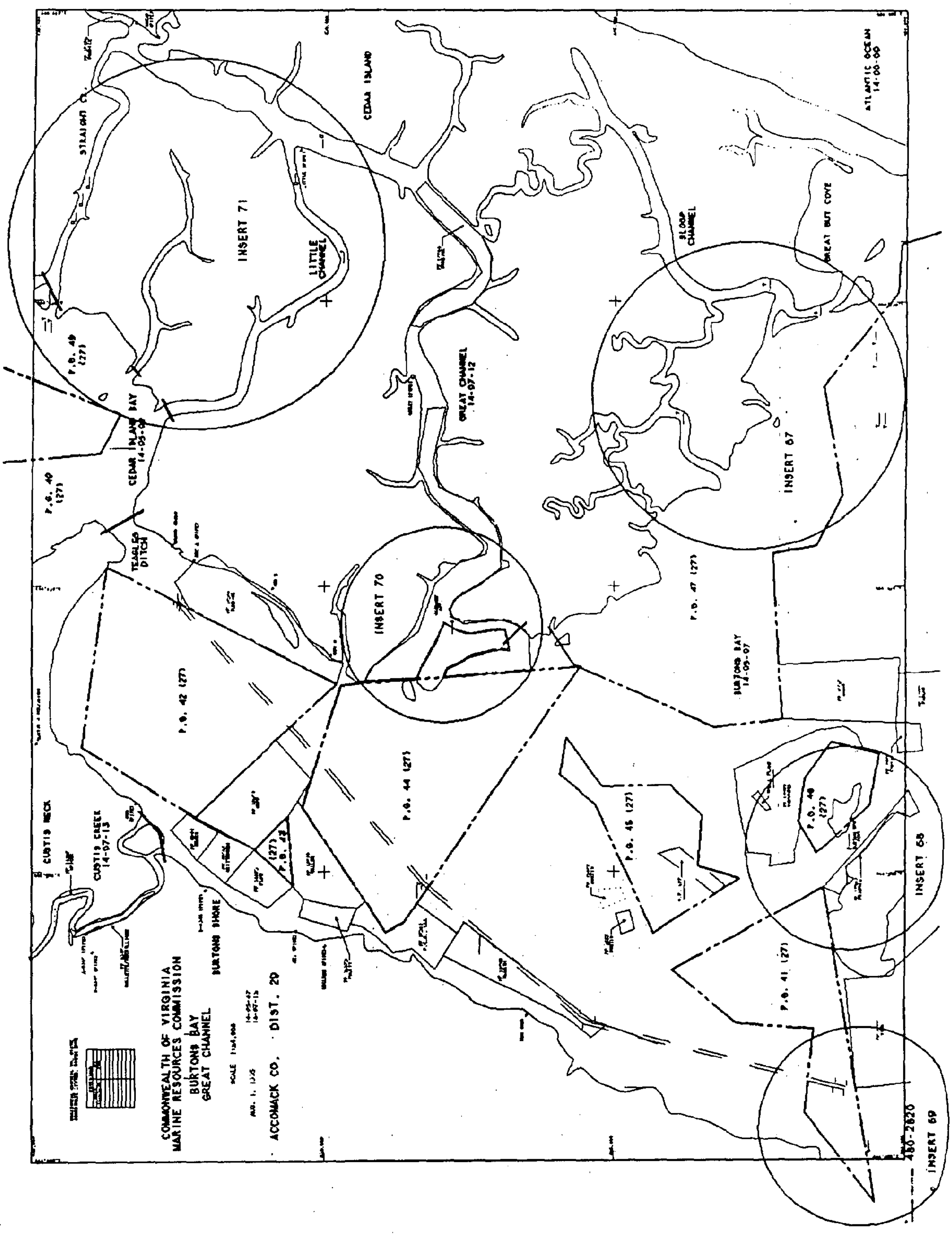

CURLEW BAY
14-05-06
GRID NORTH
1927 DATUM
PF 7097
CHERRIX
INSERT 62
7-20-95
PF 5758
PF 5760
STRATTON
3-95
BRADFORD CHANNEL
14-05-08


S.P. 353
14.12 AC. 1995
REV. 2-13-95
P.G. 37
(28)
BRADFORD
BAY
14-05-05
PF 7097
CHERRIX
PF 5760
STRATTON
INSERT 63
S.P. 357
1.02 AC. 1990
P.G. 36
(28)
BULLS HEAD
S.P. 464
.37 AC. 1994
SHELL PLANT
1.14 AC. 1995
GRID NORTH
1927 DATUM

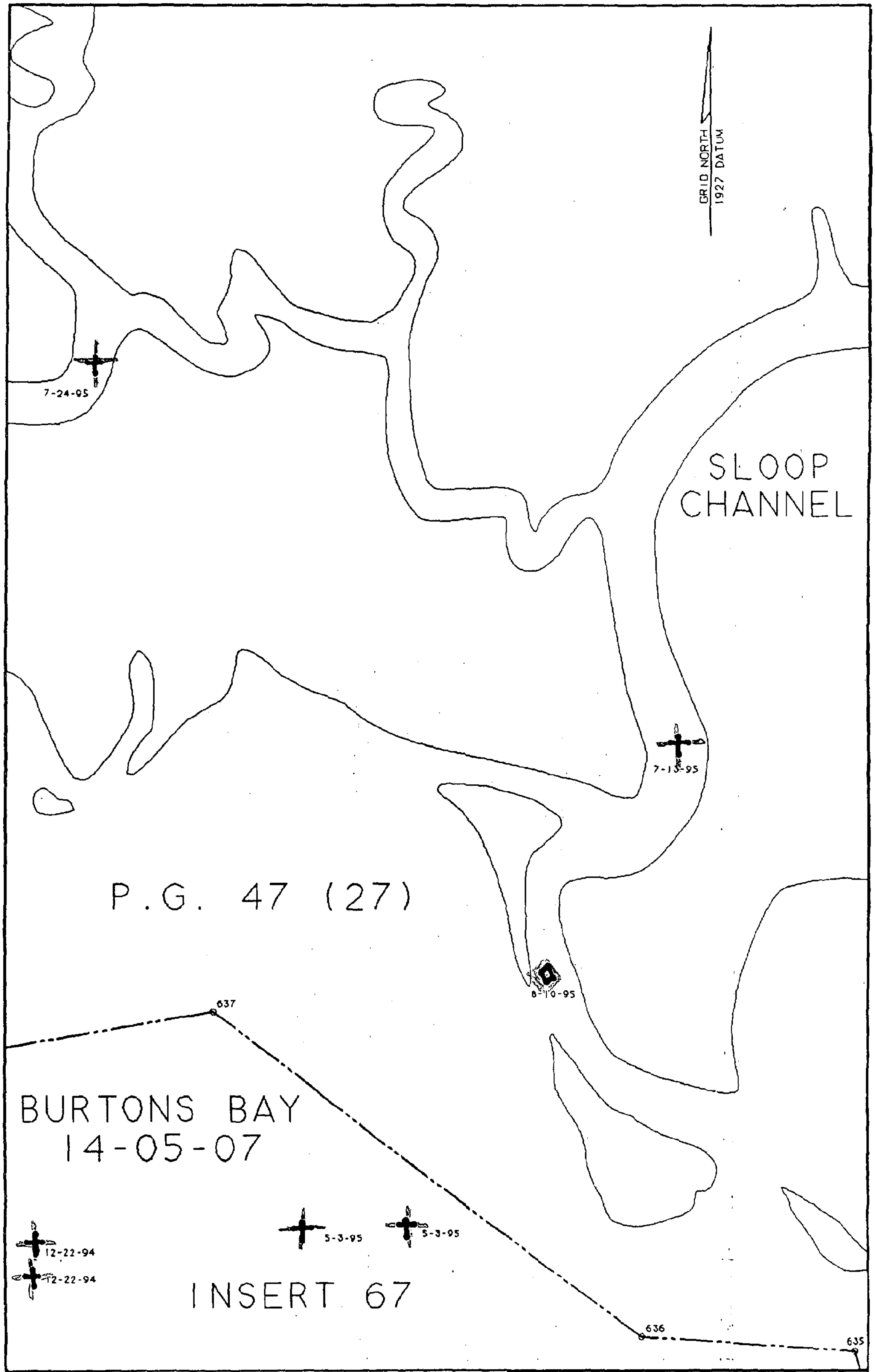

BURTONS BAY
14-05-07
PF 3636
V.I.M.S.
GRID NORTH
1927 DATUM
10-11-95
PF 14898
V.I.M.S.
PF 5872
SPENCE
PF 15059
WALLACE
PF 5870
McNEAL
1-9-95
8-4-95
WACHAPREAGUE CHANNEL
14-07-15
INSERT 64
PF 10010
WALLACE
10-11-95

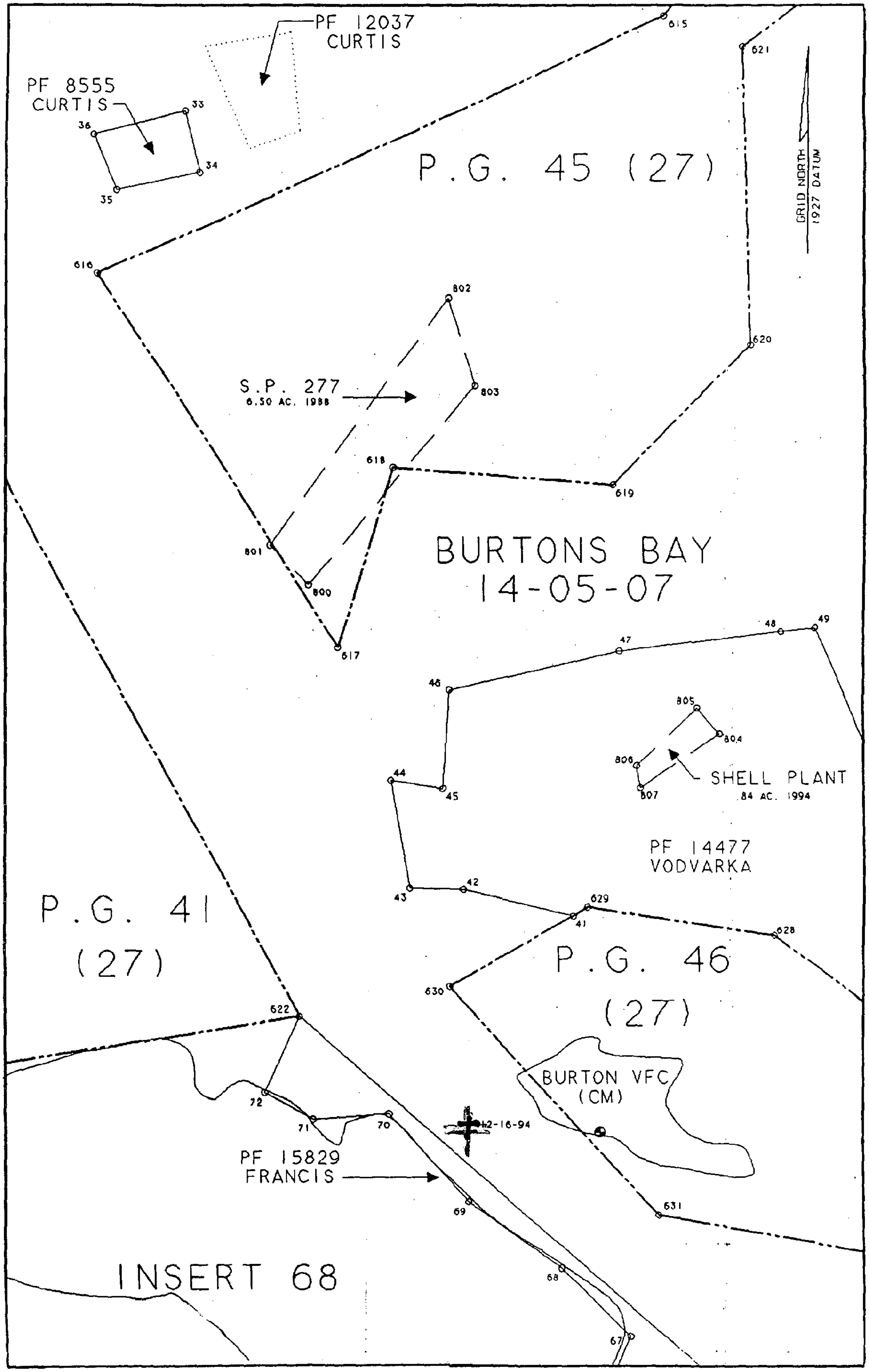

PF 14475
WALLACE
PF 14539
KILLMON
PF 14466
KILLMON
PF 12821
CARRUTHERS
PF 14478
KILLMON
PF 14535
KILLMON
PF 12410
B
AIGNER
PF 12410 A
AIGNER
PF 14531
KILLMON
PF 9592
KILLMON
BURTONS BAY
14-05-07
PF 14526
KILLMON
PF 14529
KILLMON
PF 14537
PARKER
GRID NORTH
1927 DATUM
PF 14541
VODVARKA
PF 15937
VODVARKA
PF 16926
GARDNER
PF 14538
PARKER
PF 9269
KILLMON
INSERT 65

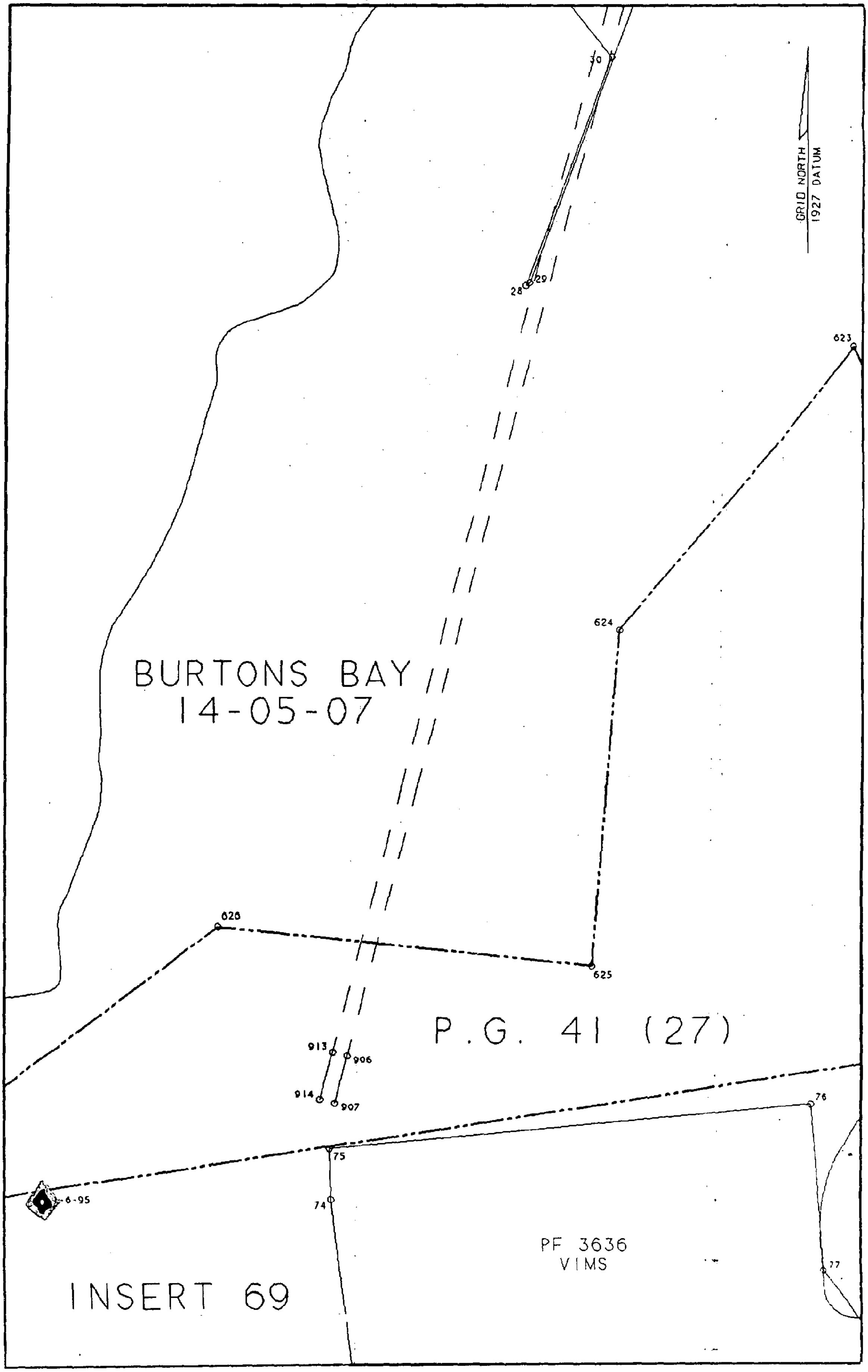

BURTONS BAY
14-05-07
GRID NORTH
1927 DATUM
PF 15348
KILLMON
PF 5136
KILLMON
PF 14532
CHERRIX
PF 14466
KILLMON
PF 15347
KILLMON
PF 14466
KILLMON
PF 14527
KILLMON
PF 16690
VODVARKA
PF 16689
SMITH
14534
VODVARKA
PF 15349
KILLMON
PF 14539
KILLMON
PF 14535
KILLMON
WINE (CM)
PF 14531
KILLMON
PF 9595
(3)
VODVARKA
PF 16940
TURNER
CEDAR ISLAND
INSERT 66
PF 16926
GARDNER

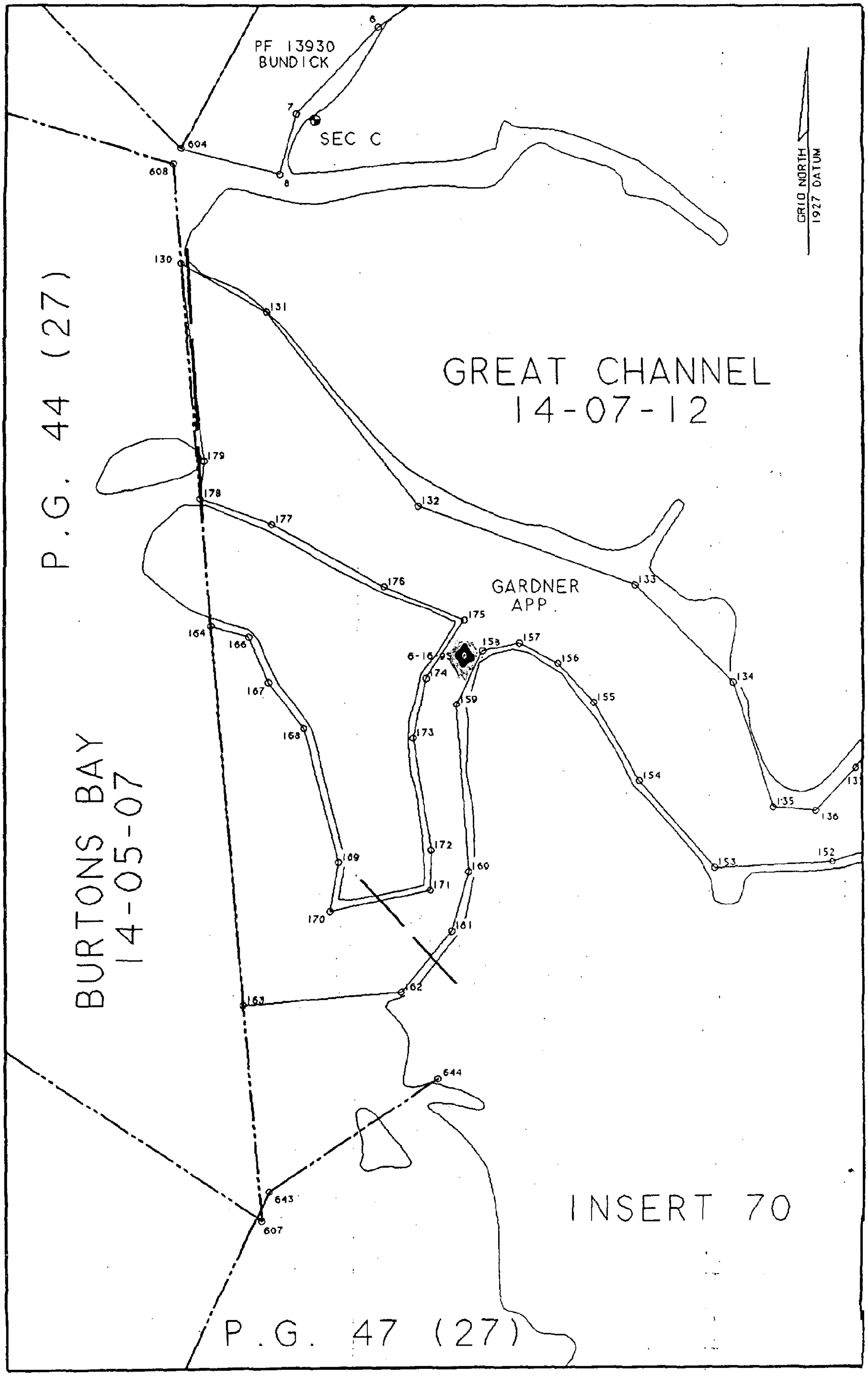


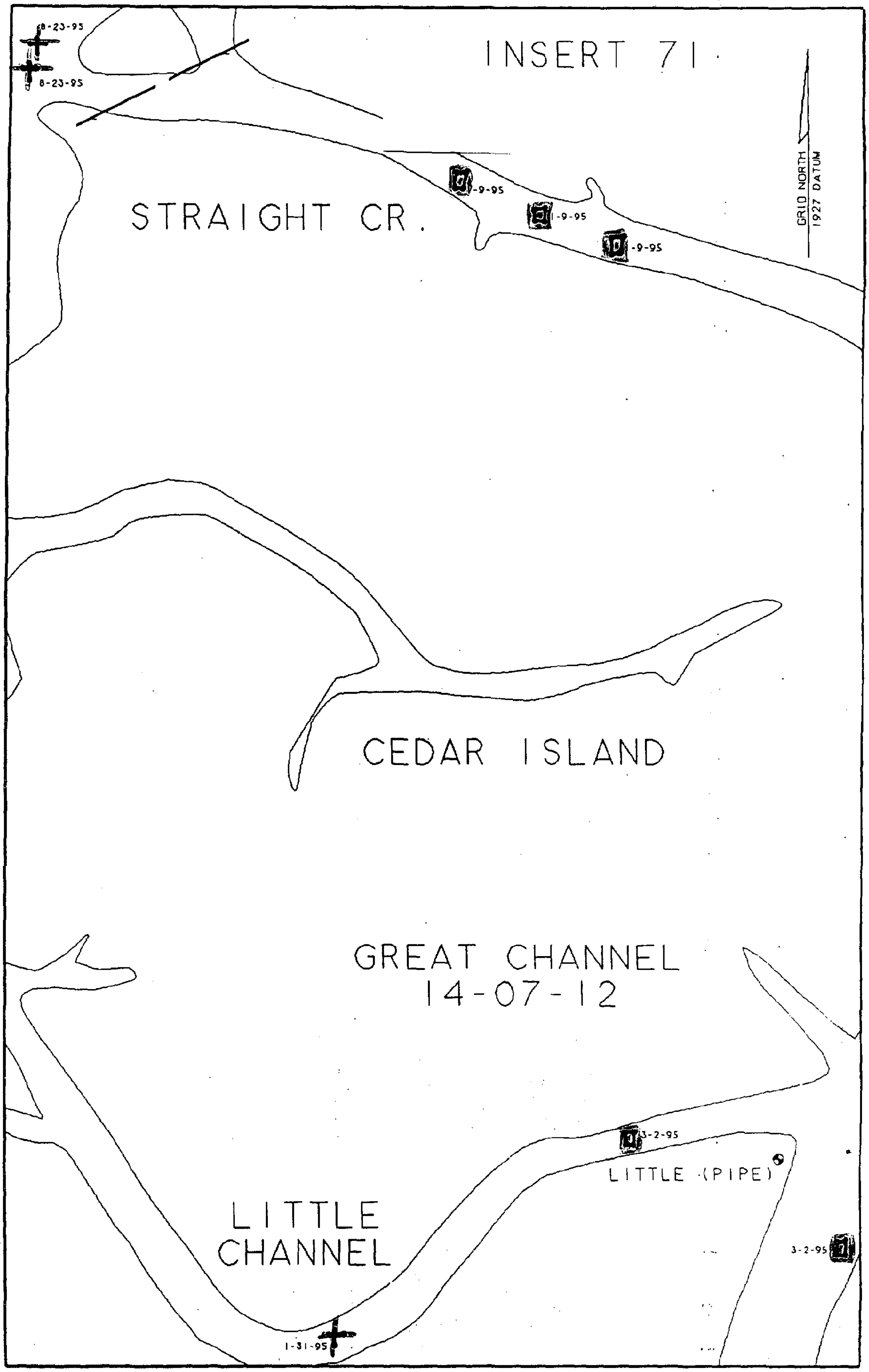
COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
BURTONS BAY
GREAT CHANNEL
ACCOMACK CO.
DIST. 20
CEDAR ISLAND
STRAIGHT CR.
INSERT 71
LITTLE CHANNEL
P.O. 49 (27)
CEDAR ISLAND BAY
P.O. 40 (27)
TEAGLES DITCH
GREAT CHANNEL 14-07-12
INSERT 70
SLOOP CHANNEL
GREAT BUT COVE
ATLANTIC OCEAN 14-00-00
INSERT 67
P.O. 47 (27)
BURTONS BAY 14-05-07
P.O. 42 (27)
P.O. 44 (27)
P.O. 45 (27)
P.O. 48 (27)
INSERT 68
P.O. 41 (27)
INSERT 69
480-2820
CURTIS NECK
CURTIS CREEK 14-07-13
BURTONS SHORE

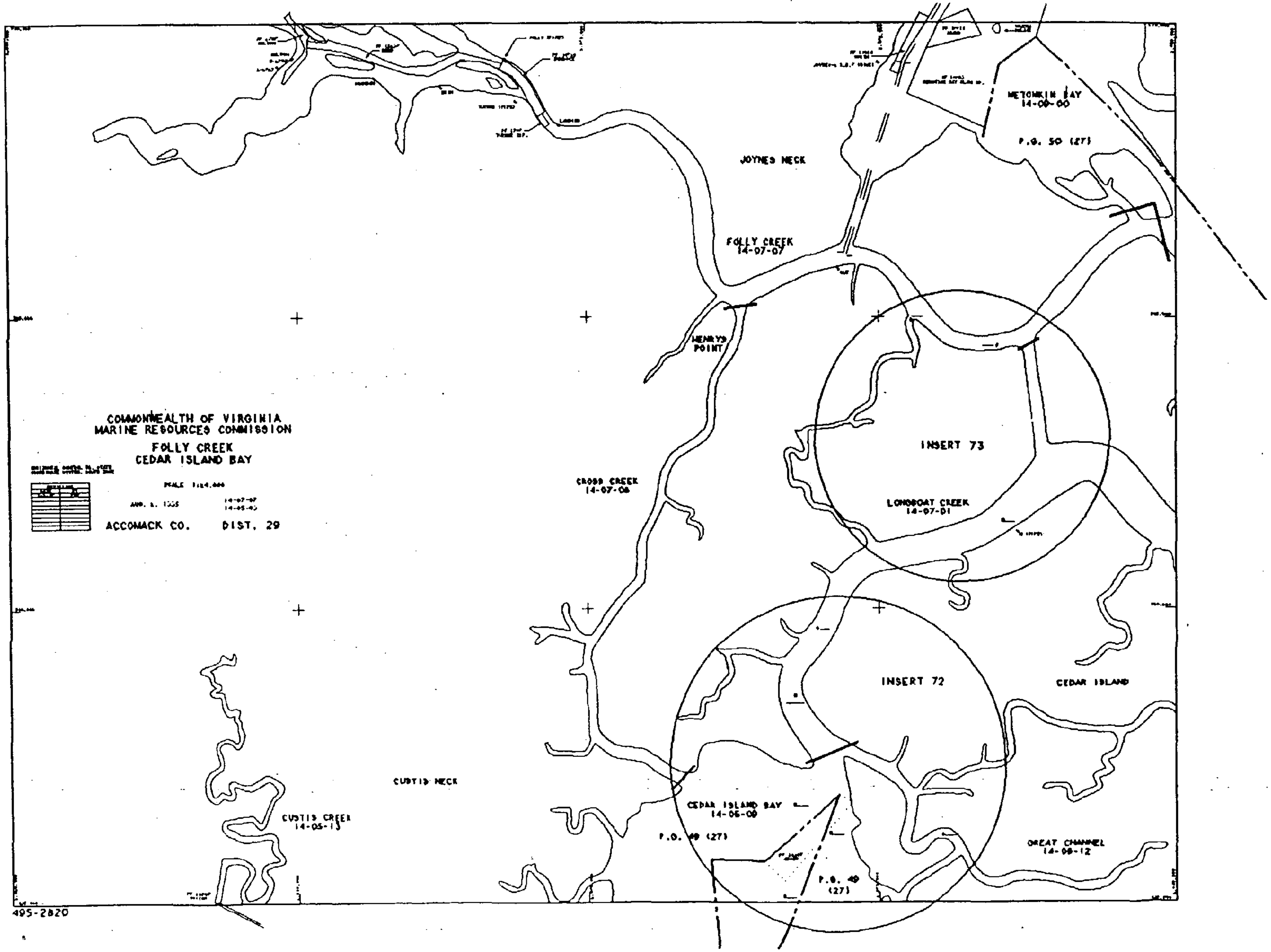

GRID NORTH
1927 DATUM
SLOOP
CHANNEL
7-24-95
7-13-95
P.G. 47 (27)
8-10-95
637
BURTONS BAY
14-05-07
12-22-94
12-22-94
5-3-95
5-3-95
INSERT 67
636
635


PF 12037
CURTIS
PF 8555
CURTIS
P.G. 45 (27)
GRID NORTH
1927 DATUM
S.P. 277
6.50 AC. 1988
BURTONS BAY
14-05-07
SHELL PLANT
.84 AC. 1994
PF 14477
VODVARKA
P.G. 41
(27)
P.G. 46
(27)
BURTON VFC
(CM)
12-16-94
PF 15829
FRANCIS
INSERT 68
615
621
616
802
803
620
618
619
801
800
617
47
48
49
46
805
804
806
807
44
45
42
43
629
41
628
630
622
72
71
70
69
631
68
67
33
34
35
36

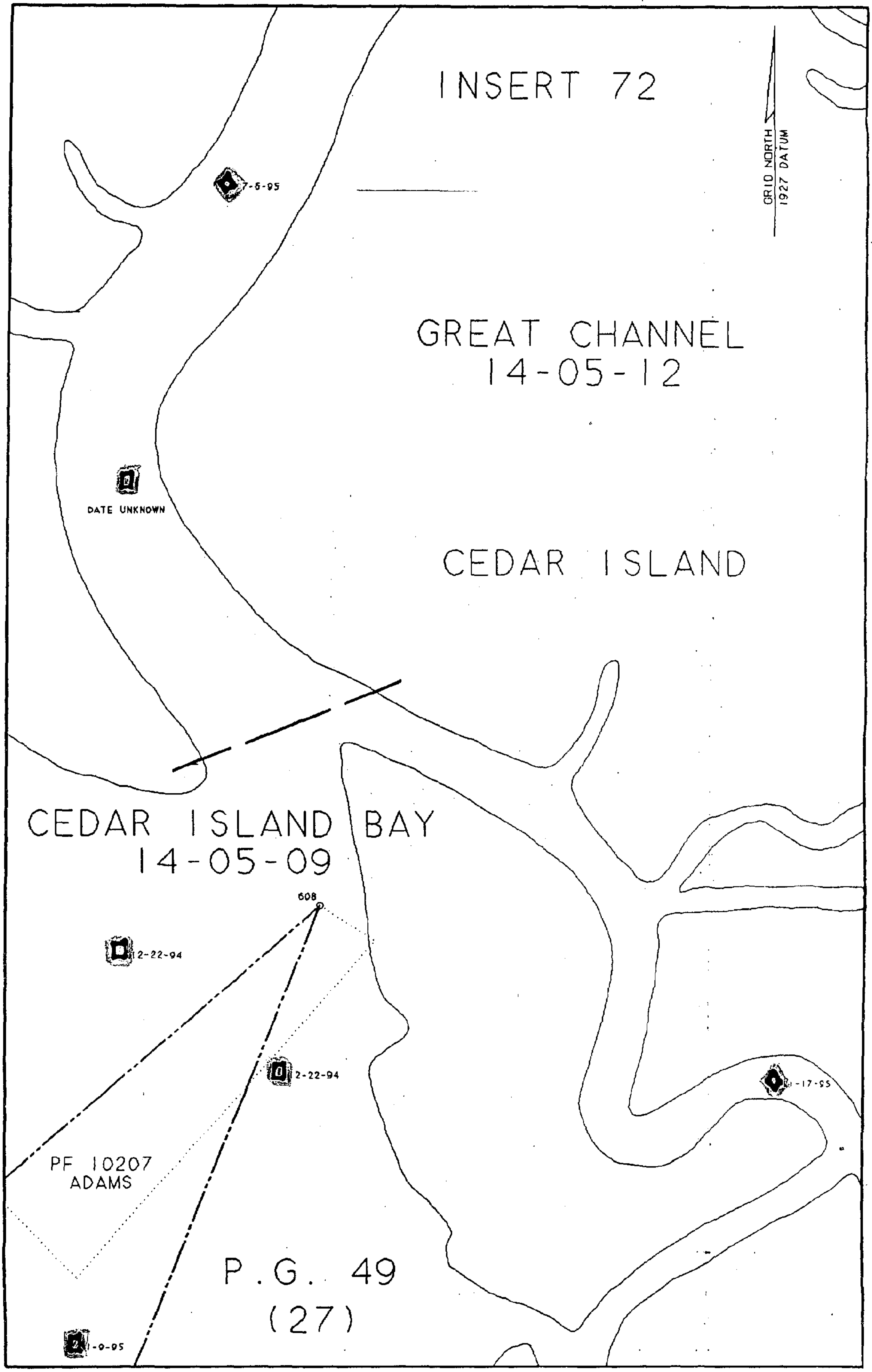

GRID NORTH
1927 DATUM
30
28
29
623
624
BURTONS BAY
14-05-07
626
625
P.G. 41 (27)
913
906
914
907
76
75
6-95
74
PF 3636
VIMS
77
INSERT 69

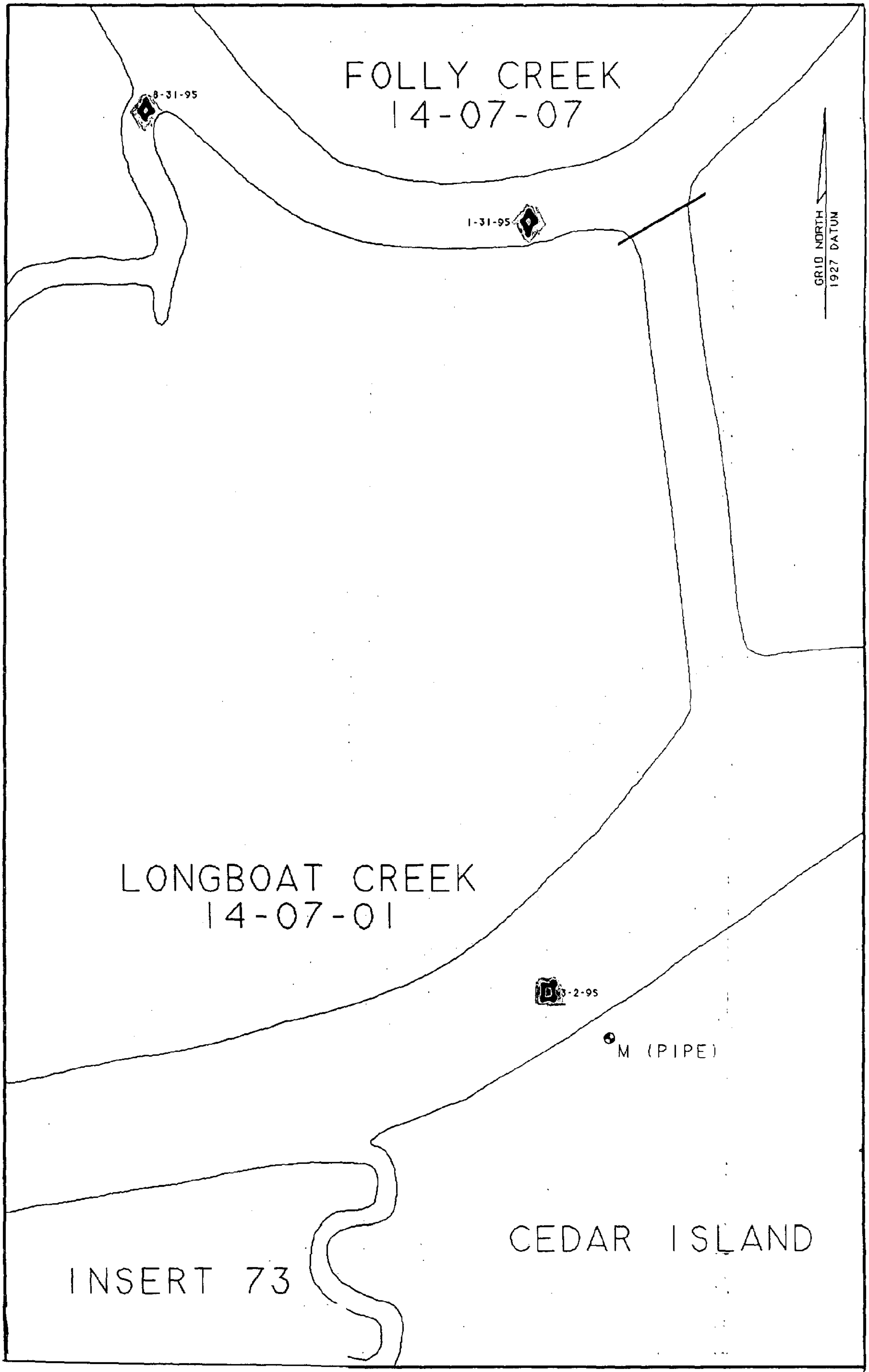

PF 13930
BUNDICK
SEC C
GREAT CHANNEL
14-07-12
P.G. 44 (27)
GRID NORTH
1927 DATUM
GARDNER
APP.
BURTONS BAY
14-05-07
INSERT 70
P.G. 47 (27)

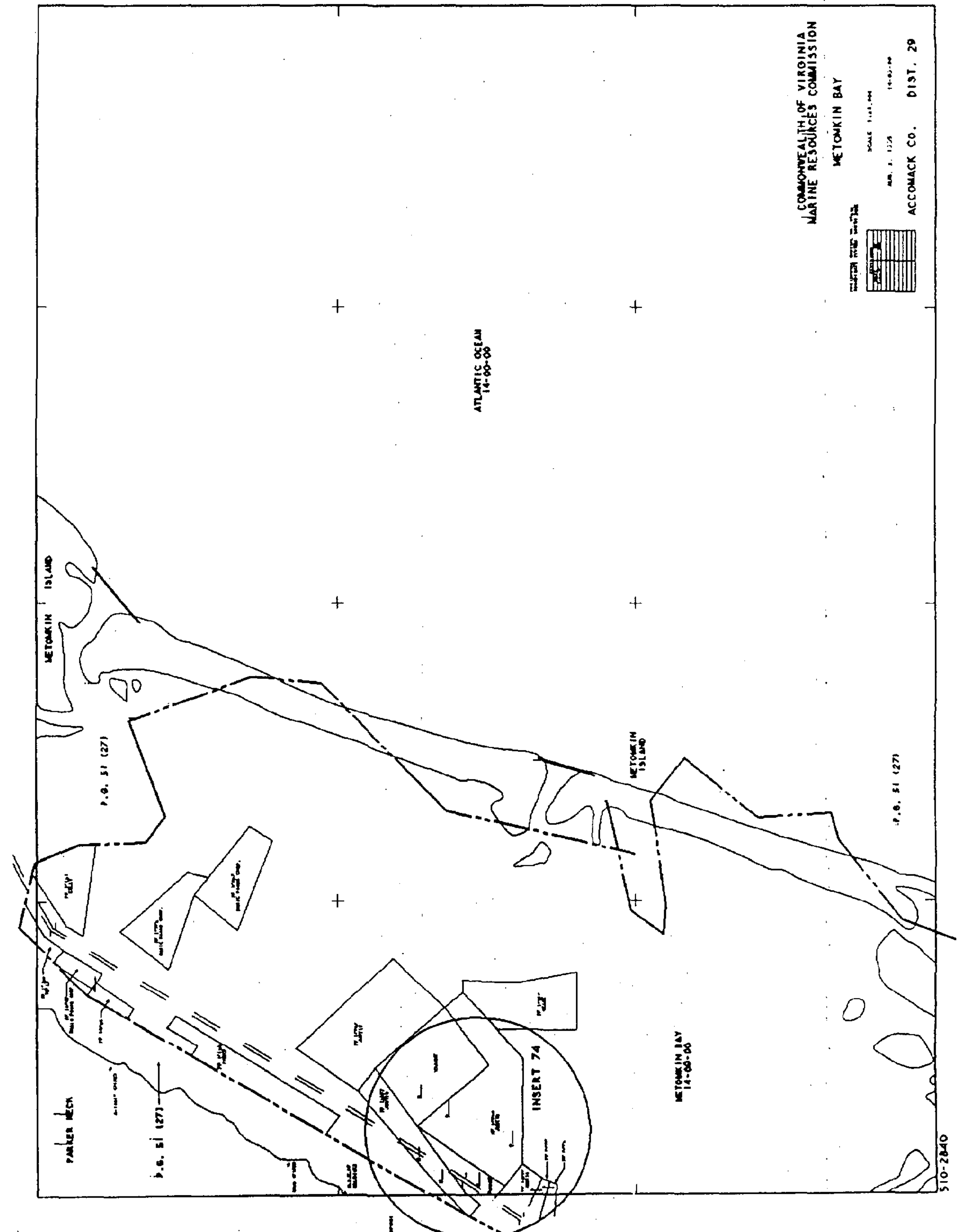

INSERT 71
GRID NORTH
1927 DATUM
8-23-95
8-23-95
STRAIGHT CR.
-9-95
1-9-95
-9-95
CEDAR ISLAND
GREAT CHANNEL
14-07-12
3-2-95
LITTLE (PIPE)
3-2-95
LITTLE
CHANNEL
1-31-95

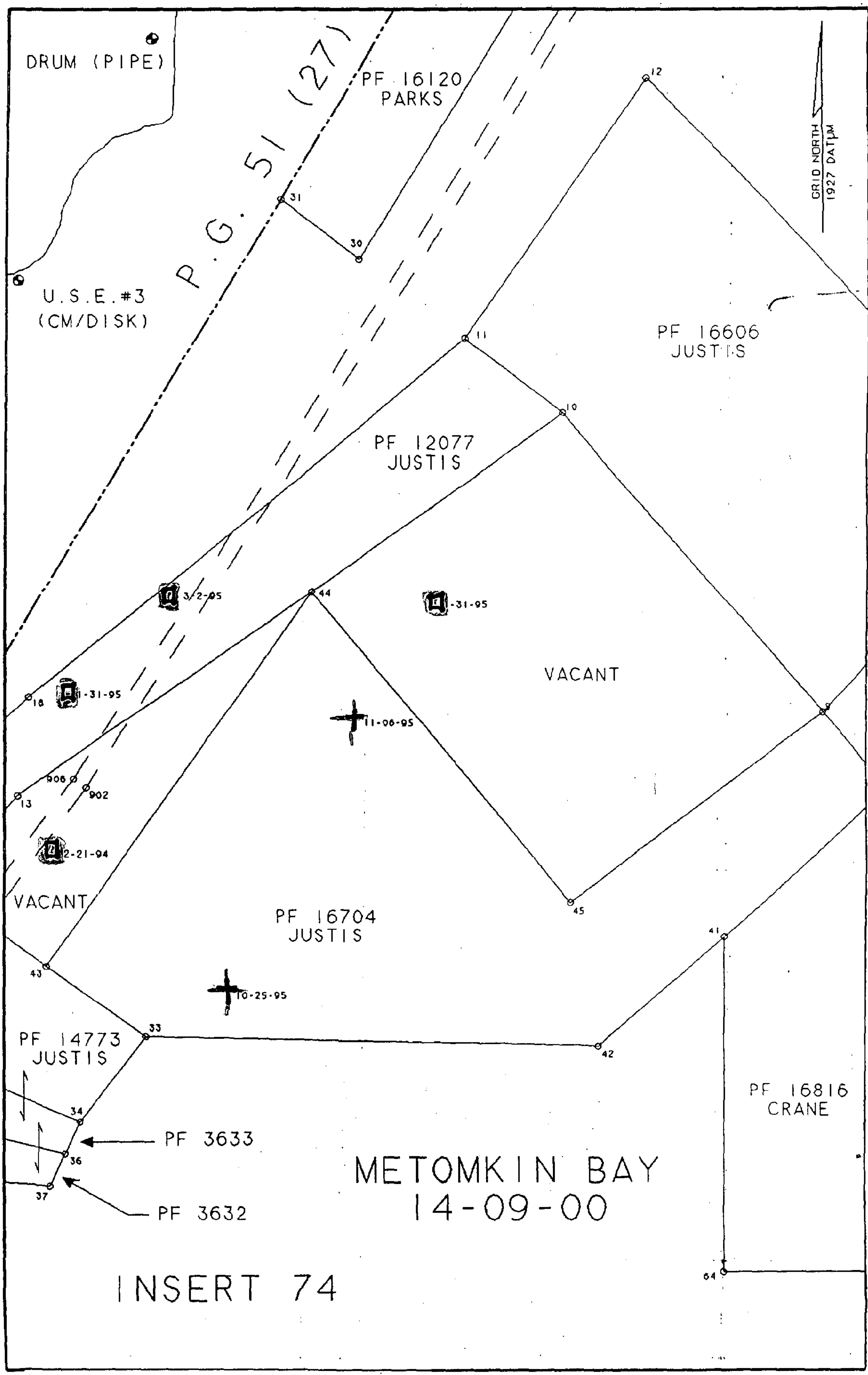

COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
FOLLY CREEK
CEDAR ISLAND BAY
ACCOMACK CO.
DIST. 29
JOYNES NECK
FOLLY CREEK
14-07-07
HENRYS POINT
CROSS CREEK
14-07-06
METOMKIN BAY
14-09-00
P.G. 50 (27)
INSERT 73
LONGBOAT CREEK
14-07-01
INSERT 72
CEDAR ISLAND
CURTIS NECK
CURTIS CREEK
14-05-13
CEDAR ISLAND BAY
14-06-00
P.G. 49 (27)
P.G. 49
(27)
GREAT CHANNEL
14-08-12

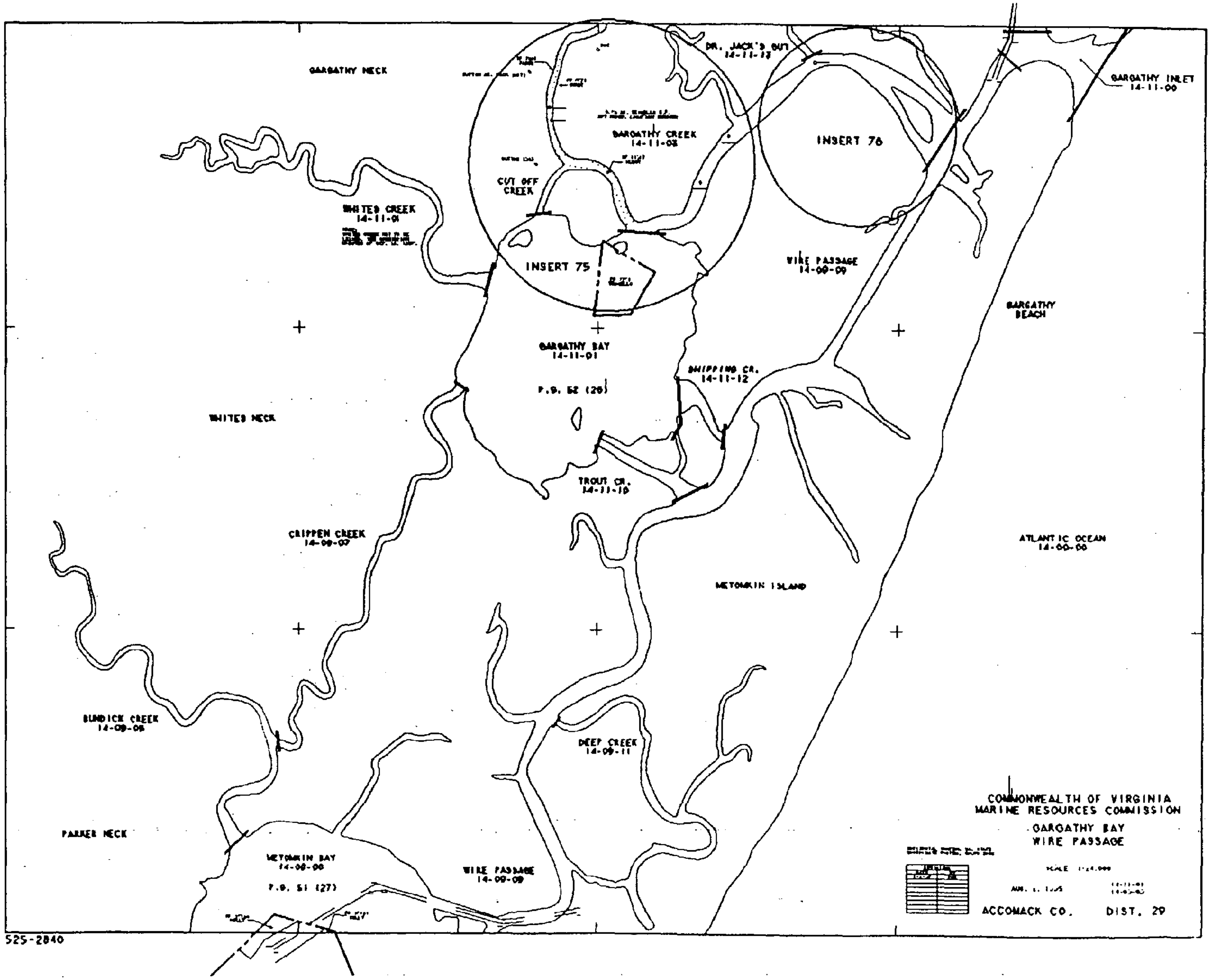
495-2820


INSERT 72
GRID NORTH
1927 DATUM
7-5-95
GREAT CHANNEL
14-05-12
DATE UNKNOWN
CEDAR ISLAND
CEDAR ISLAND BAY
14-05-09
608
2-22-94
2-22-94
1-17-95
PF 10207
ADAMS
P.G. 49
(27)
1-9-95

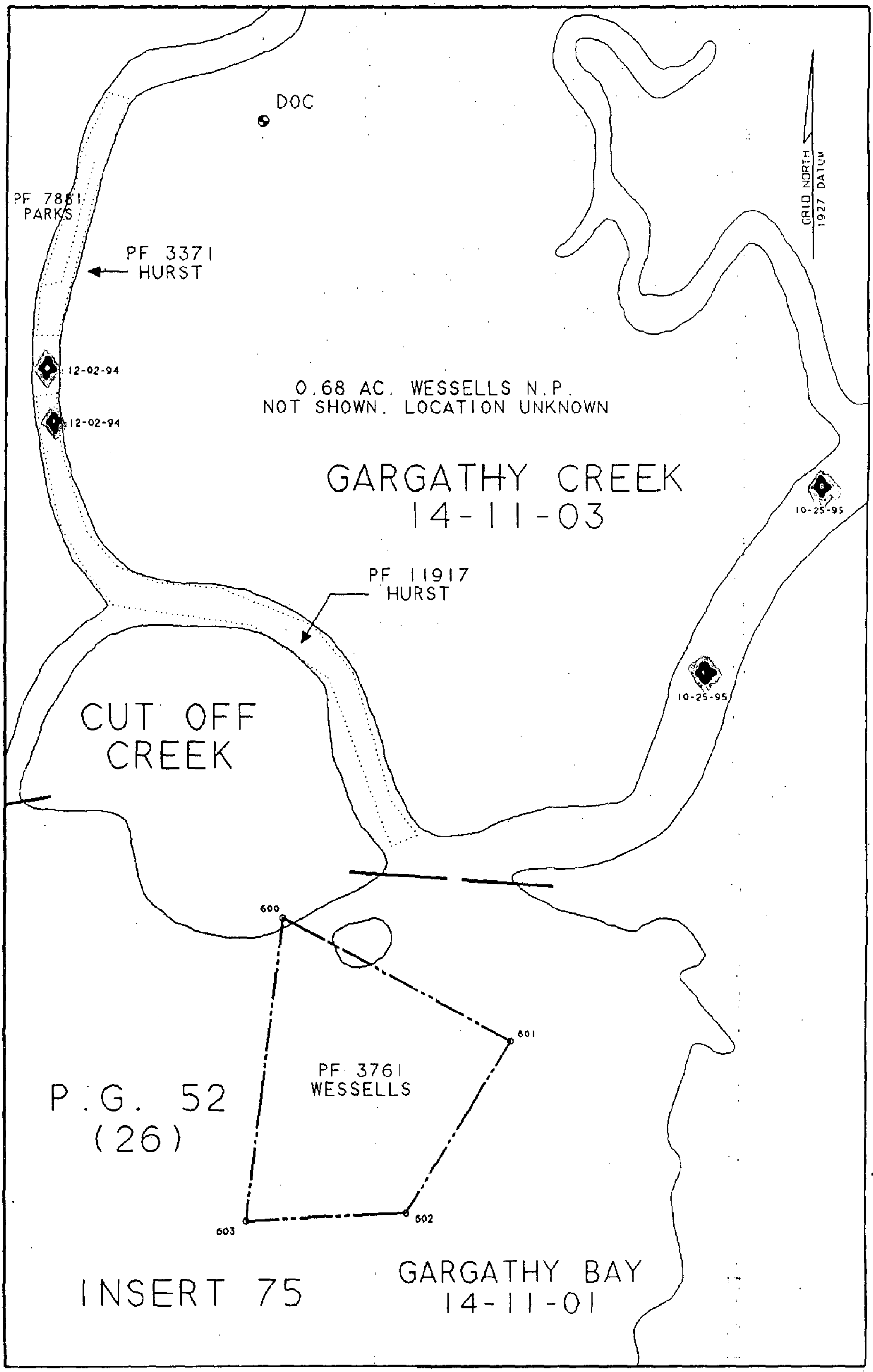

FOLLY CREEK
14-07-07
8-31-95
1-31-95
GRID NORTH
1927 DATUM
LONGBOAT CREEK
14-07-01
3-2-95
M (PIPE)
CEDAR ISLAND
INSERT 73


COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
METOMKIN BAY
ACCOMACK CO.
DIST. 29
ATLANTIC OCEAN
14-00-00
METOMKIN ISLAND
METOMKIN ISLAND
P.G. 51 (27)
P.G. 51 (27)
P.G. 51 (27)
METOMKIN BAY
14-00-00
INSERT 74
PARKER NECK
510-2840

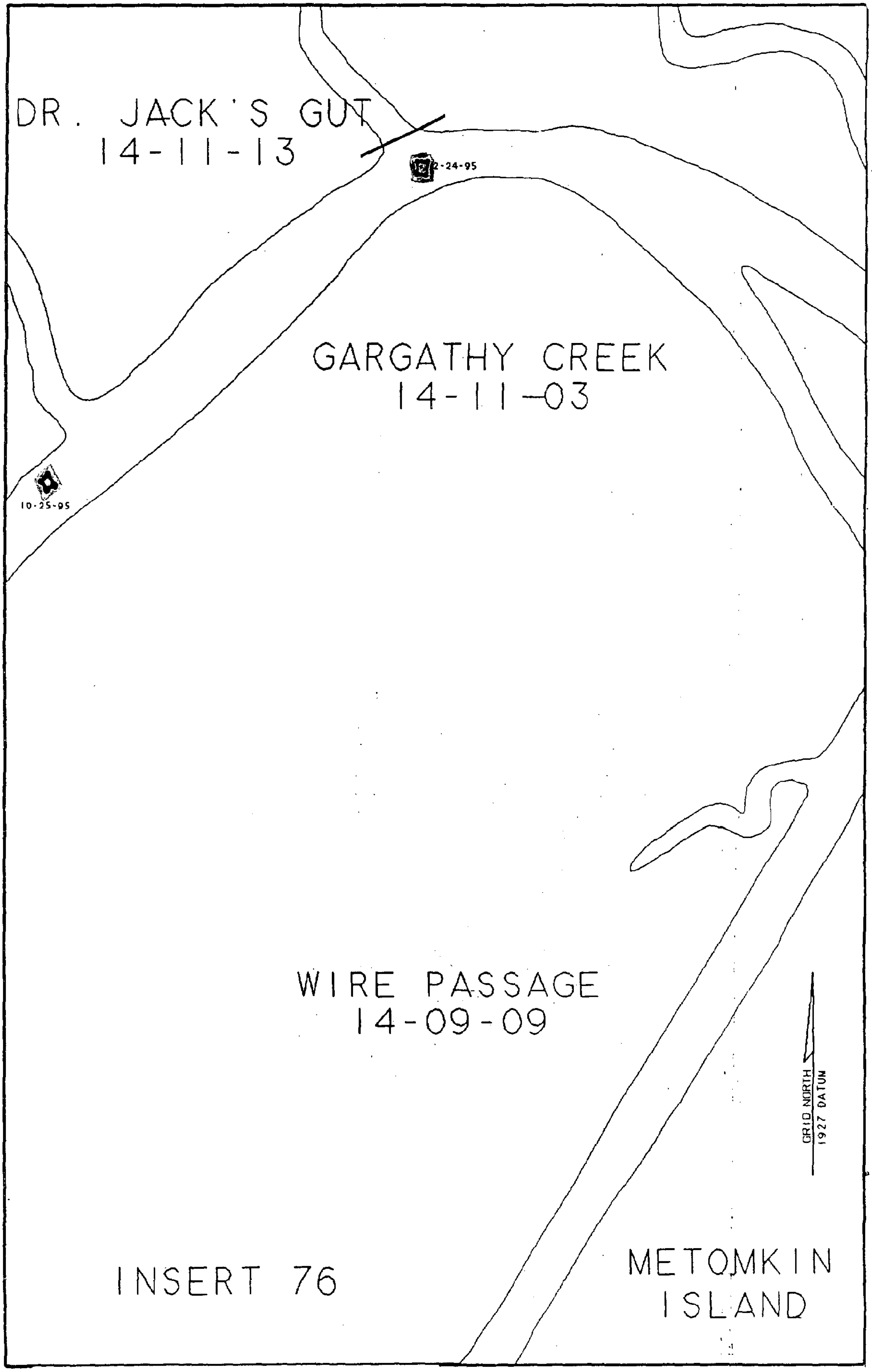

DRUM (PIPE)
P.G. 51 (27)
PF 16120
PARKS
31
30
12
GRID NORTH
1927 DATUM
U.S.E. #3
(CM/DISK)
11
PF 16606
JUSTIS
10
PF 12077
JUSTIS
3/2-95
44
1-31-95
VACANT
18
1-31-95
11-06-95
906
902
13
2-21-94
VACANT
45
PF 16704
JUSTIS
41
43
10-25-95
33
42
PF 14773
JUSTIS
PF 16816
CRANE
34
PF 3633
36
METOMKIN BAY
14-09-00
37
PF 3632
INSERT 74
64

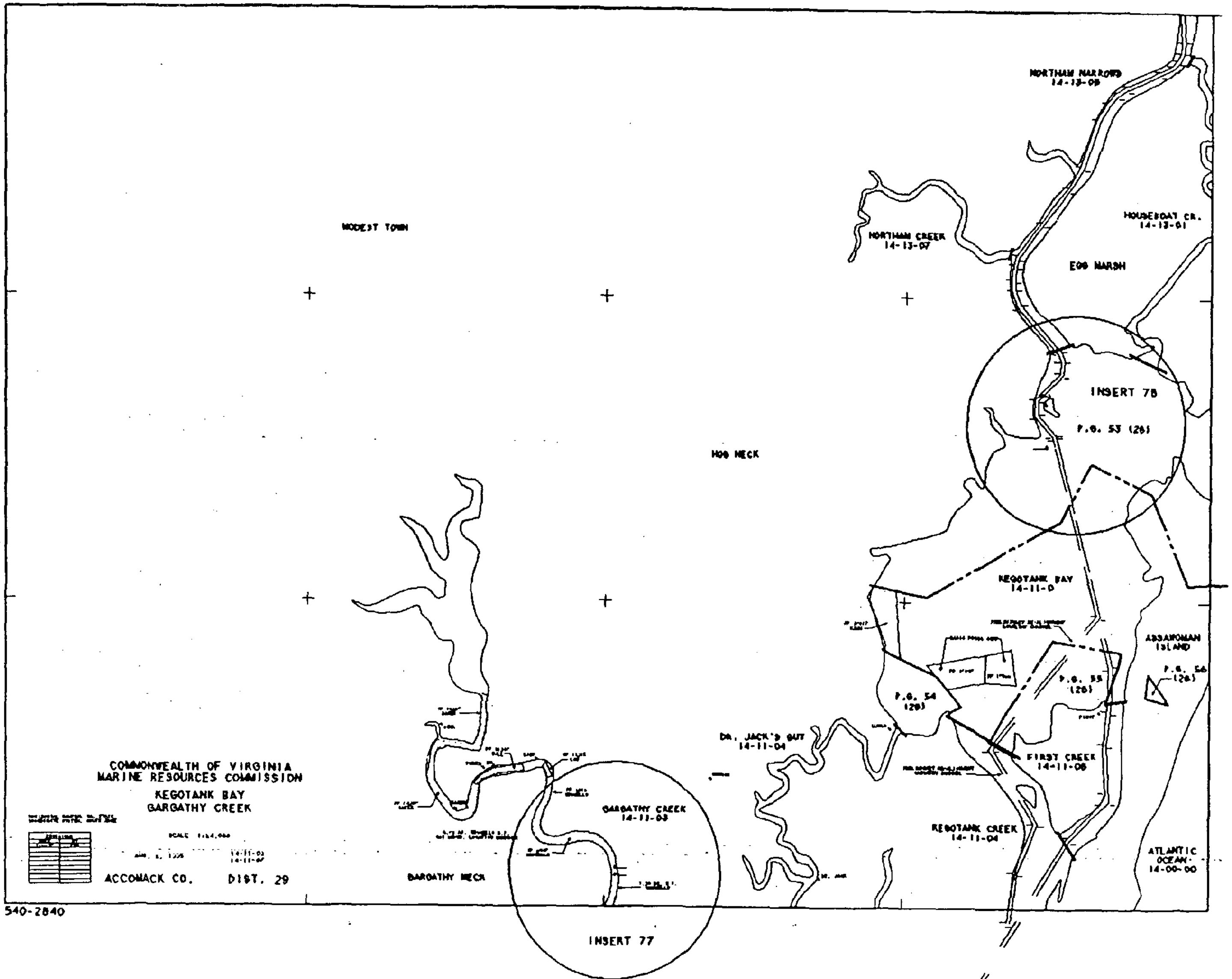


GARGATHY NECK
DR. JACK'S GUT
GARGATHY INLET
14-11-00
GARGATHY CREEK
14-11-03
INSERT 76
CUT OFF
CREEK
WHITES CREEK
14-11-01
INSERT 75
WIRE PASSAGE
14-09-09
GARGATHY
BEACH
GARGATHY BAY
14-11-01
P.G. 52 (28)
SHIPPING CR.
14-11-12
WHITES NECK
TROUT CR.
CRIPPEN CREEK
14-09-07
ATLANTIC OCEAN
14-00-00
METOMKIN ISLAND
BUNDICK CREEK
14-09-06
DEEP CREEK
14-09-11
PARKER NECK
METOMKIN BAY
14-08-00
P.G. 51 (27)
WIRE PASSAGE
14-09-09
COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
GARGATHY BAY
WIRE PASSAGE
ACCOMACK CO.
DIST. 29
525-2840

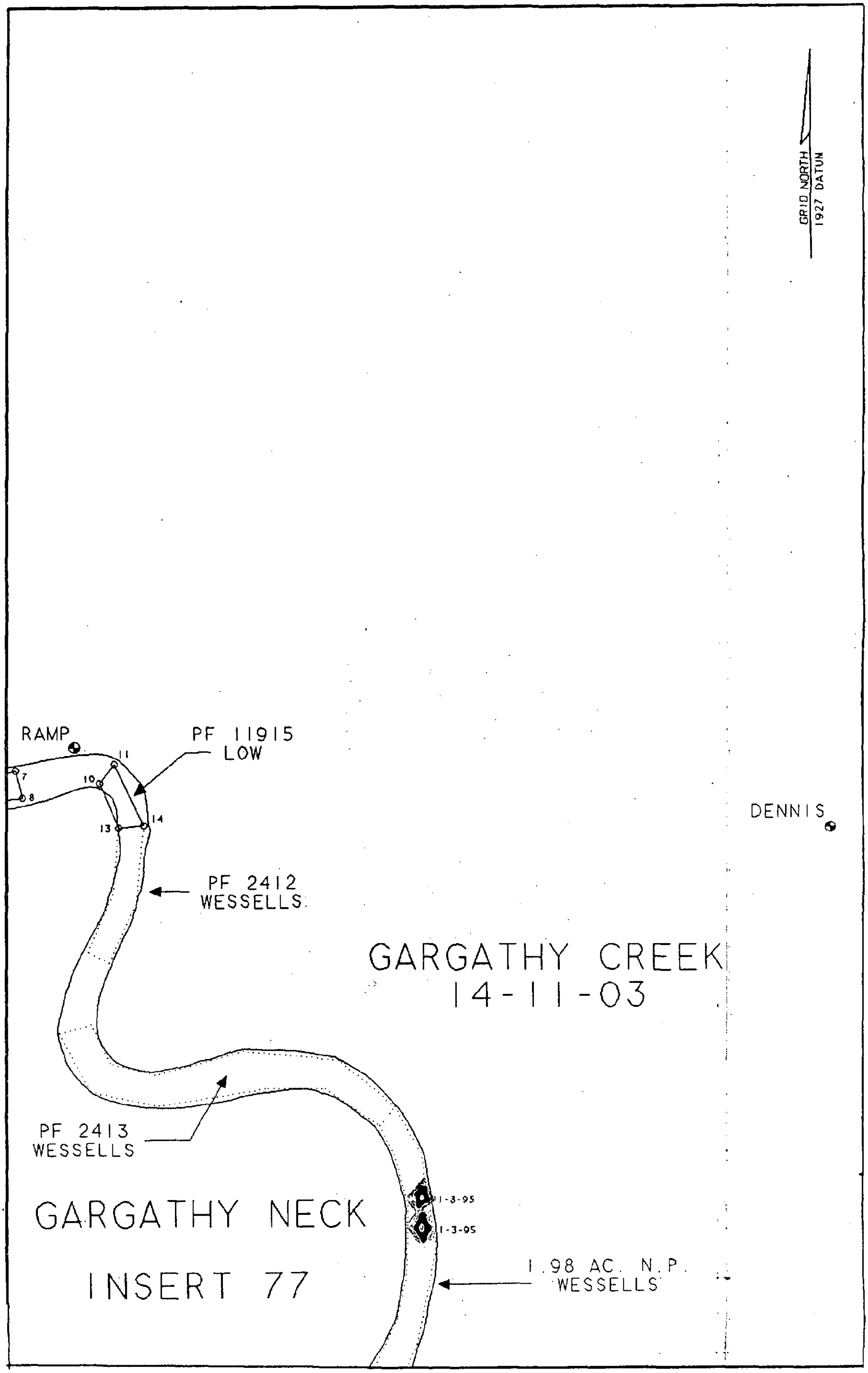


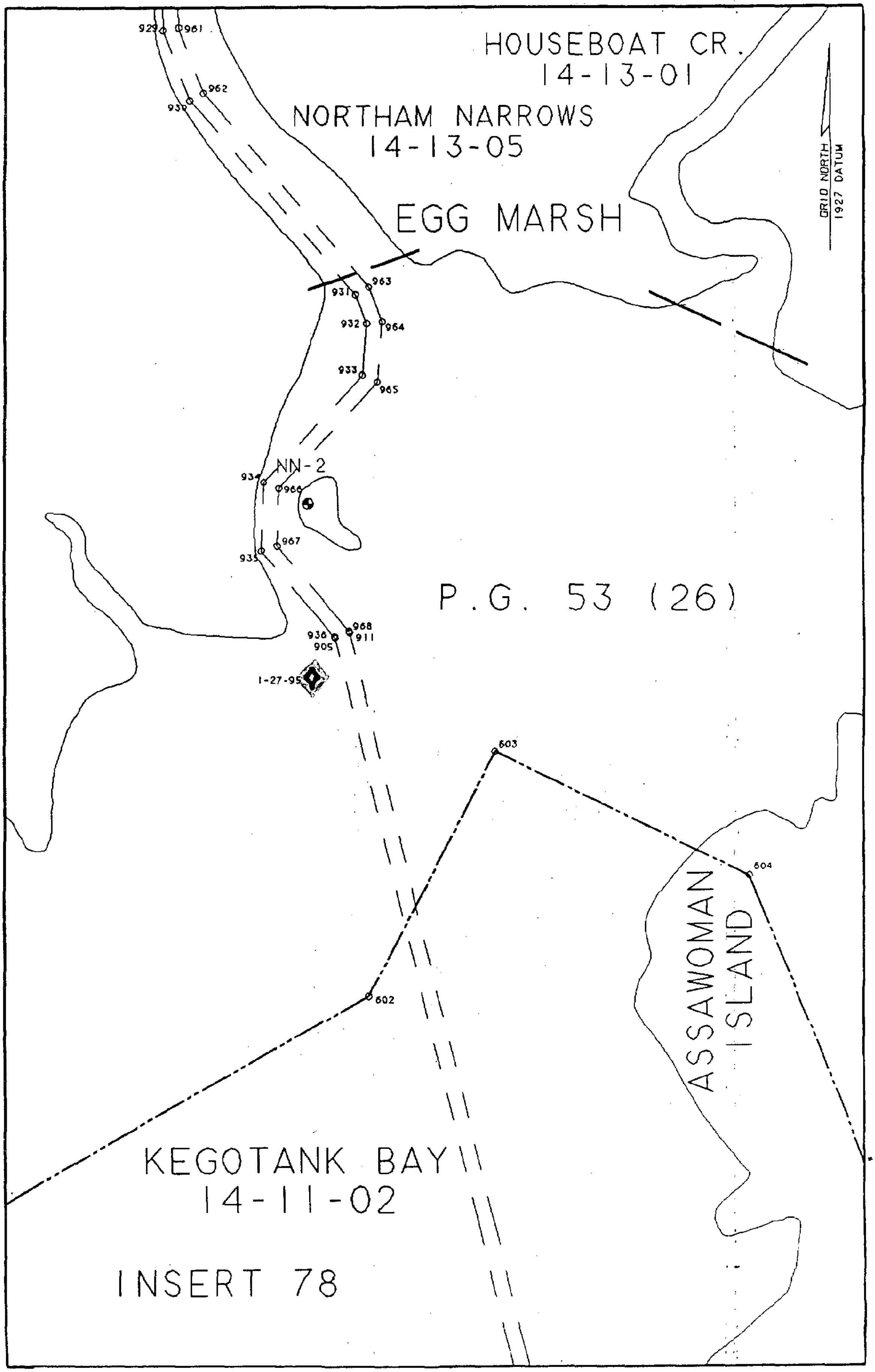
DOC
GRID NORTH
1927 DATUM
PF 7881
PARKS
PF 3371
HURST
12-02-94
12-02-94
0.68 AC. WESSELLS N.P.
NOT SHOWN. LOCATION UNKNOWN
GARGATHY CREEK
14-11-03
10-25-95
PF 11917
HURST
10-25-95
CUT OFF
CREEK
600
601
PF 3761
WESSELLS
P.G. 52
(26)
603
602
INSERT 75
GARGATHY BAY
14-11-01

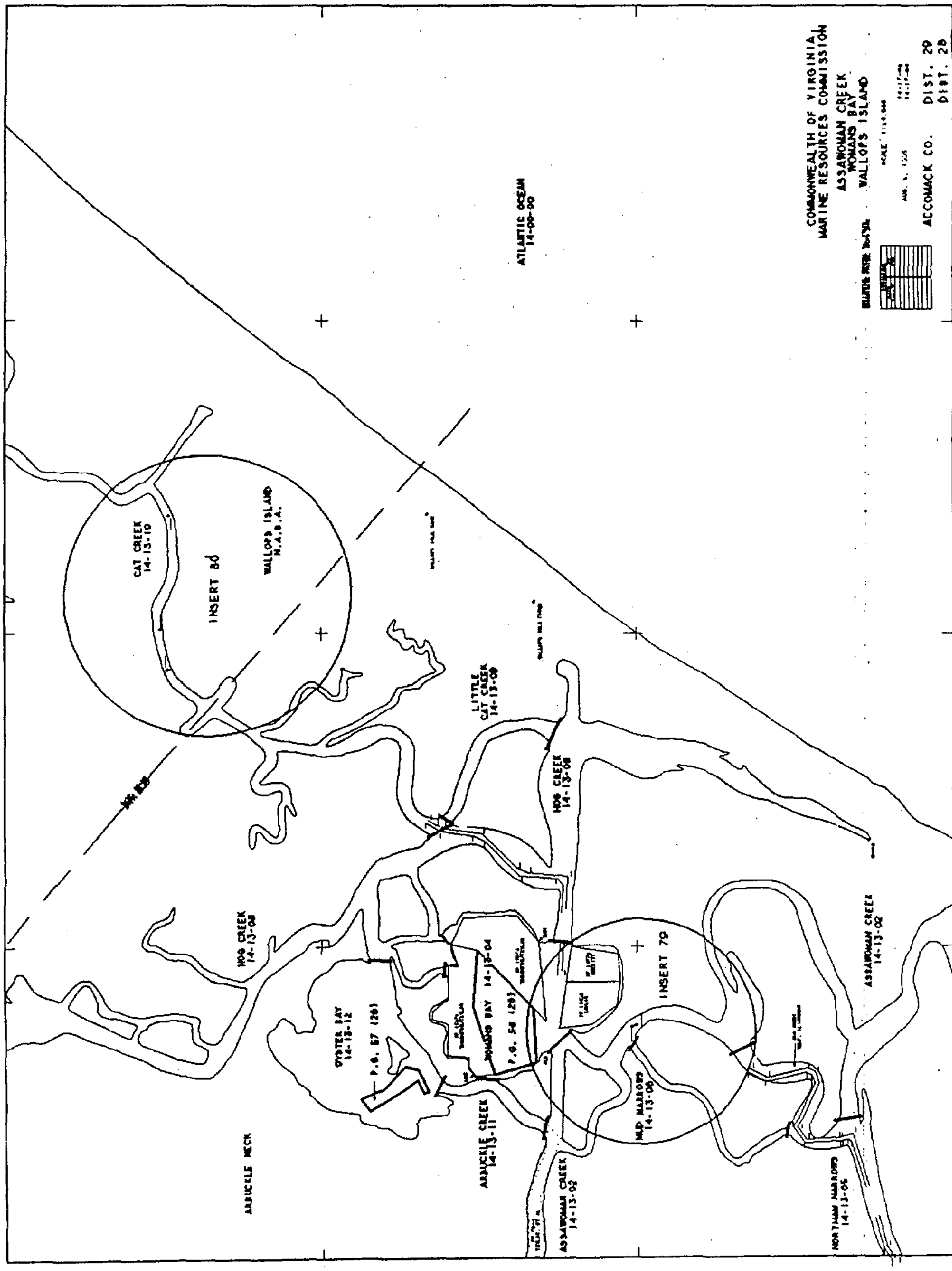

DR. JACK'S GUT
14-11-13
2-24-95
10-25-95
GARGATHY CREEK
14-11-03
WIRE PASSAGE
14-09-09
GRID NORTH
1927 DATUM
INSERT 76
METOMKIN
ISLAND

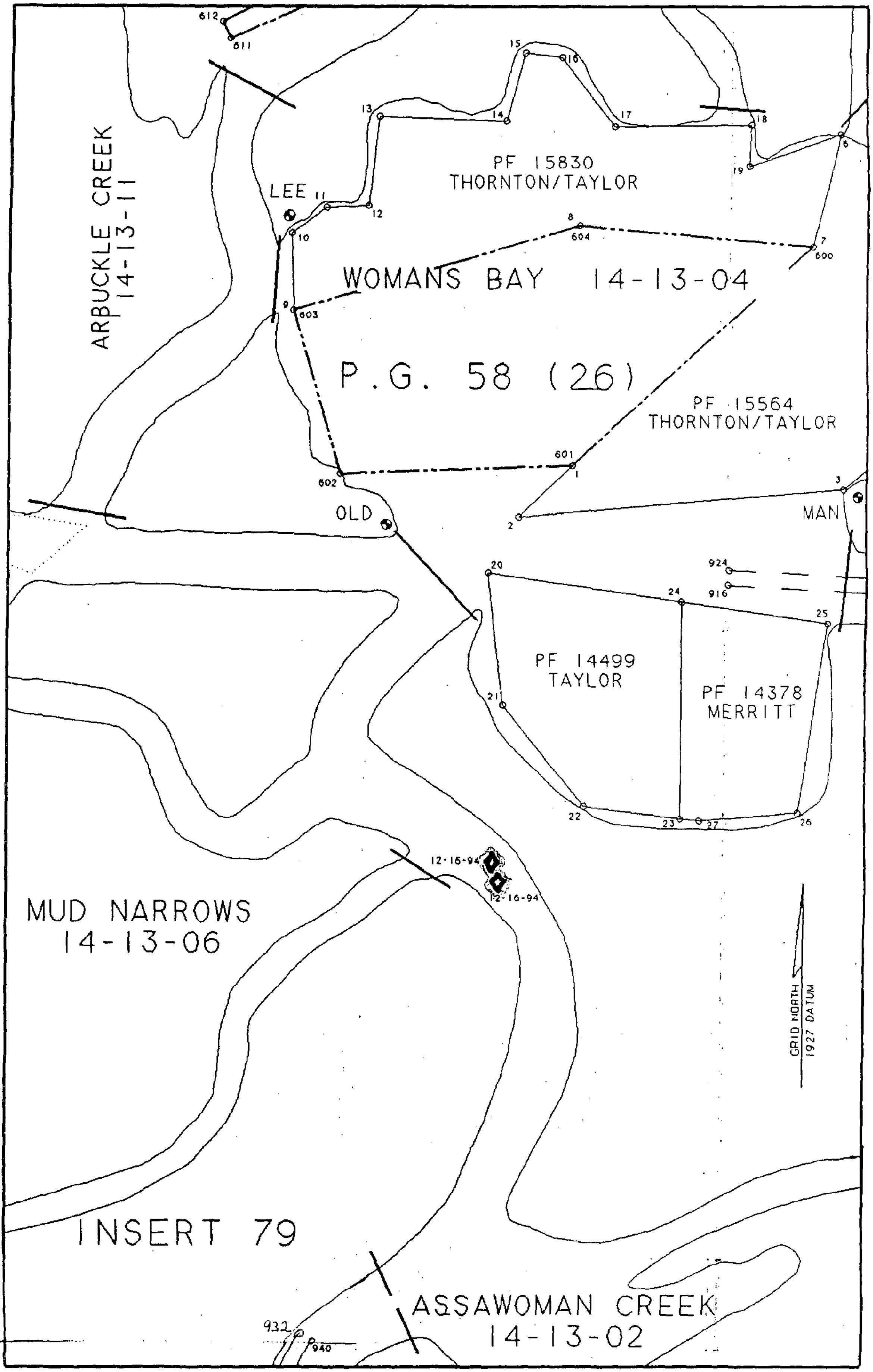

NORTHAM NARROWS
14-13-09
NORTHAM CREEK
14-13-07
HOUSEBOAT CR.
14-13-01
EGG MARSH
MODEST TOWN
INSERT 78
P.G. 53 (26)
HOG NECK
KEGOTANK BAY
ASSAWOMAN ISLAND
P.G. 56 (26)
P.G. 55 (26)
P.G. 54 (26)
DR. JACK'S GUT
14-11-04
FIRST CREEK
14-11-08
GARGATHY CREEK
14-11-03
KEGOTANK CREEK
14-11-04
ATLANTIC OCEAN
14-00-00
GARGATHY NECK
COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
KEGOTANK BAY
GARGATHY CREEK
ACCOMACK CO.
DIST. 29
INSERT 77

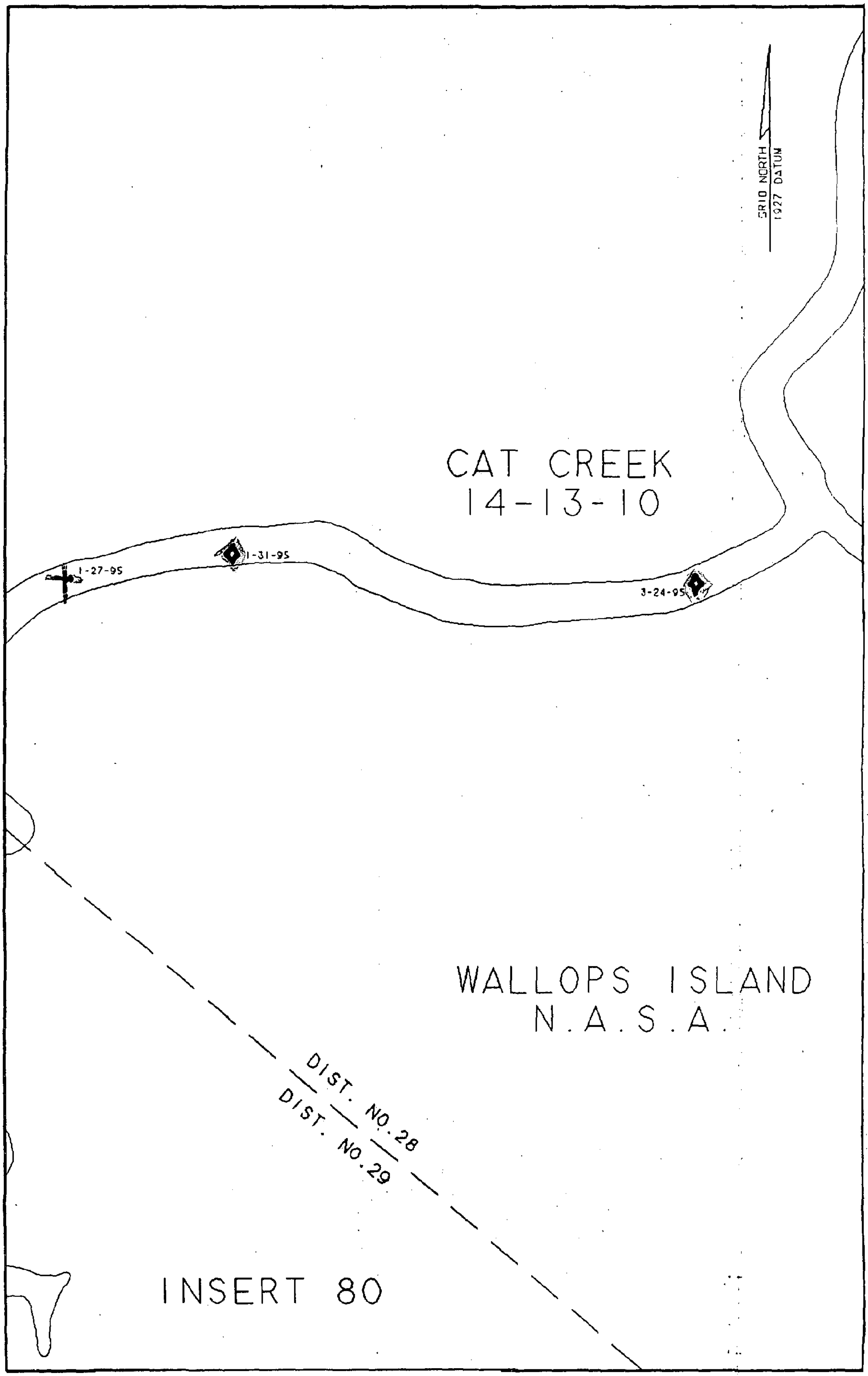
540-2840

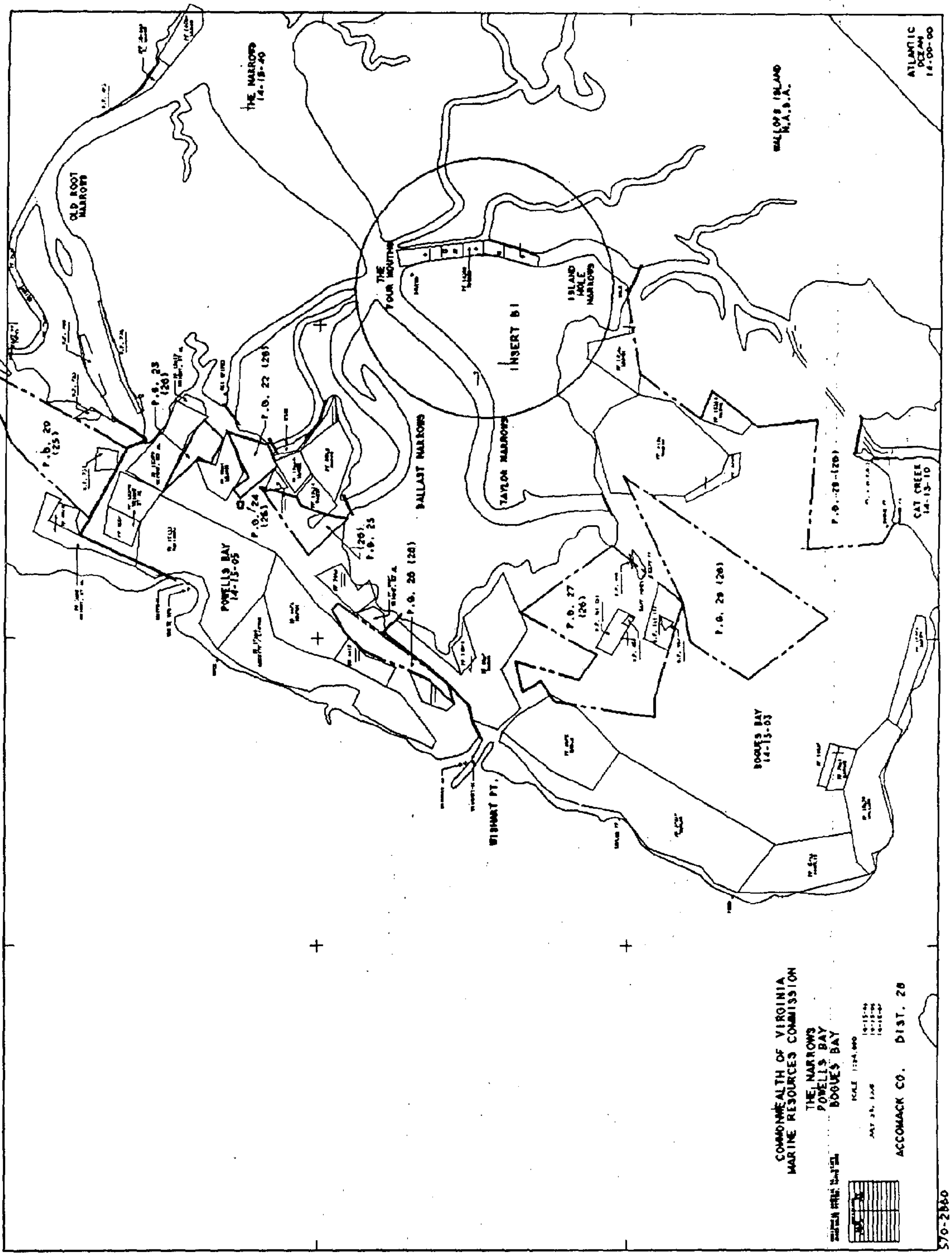

GRID NORTH
1927 DATUM
RAMP
PF 11915
LOW
11
7
10
8
13
14
DENNIS
PF 2412
WESSELLS
GARGATHY CREEK
14-11-03
PF 2413
WESSELLS
1-3-95
1-3-95
GARGATHY NECK
INSERT 77
1.98 AC. N.P.
WESSELLS

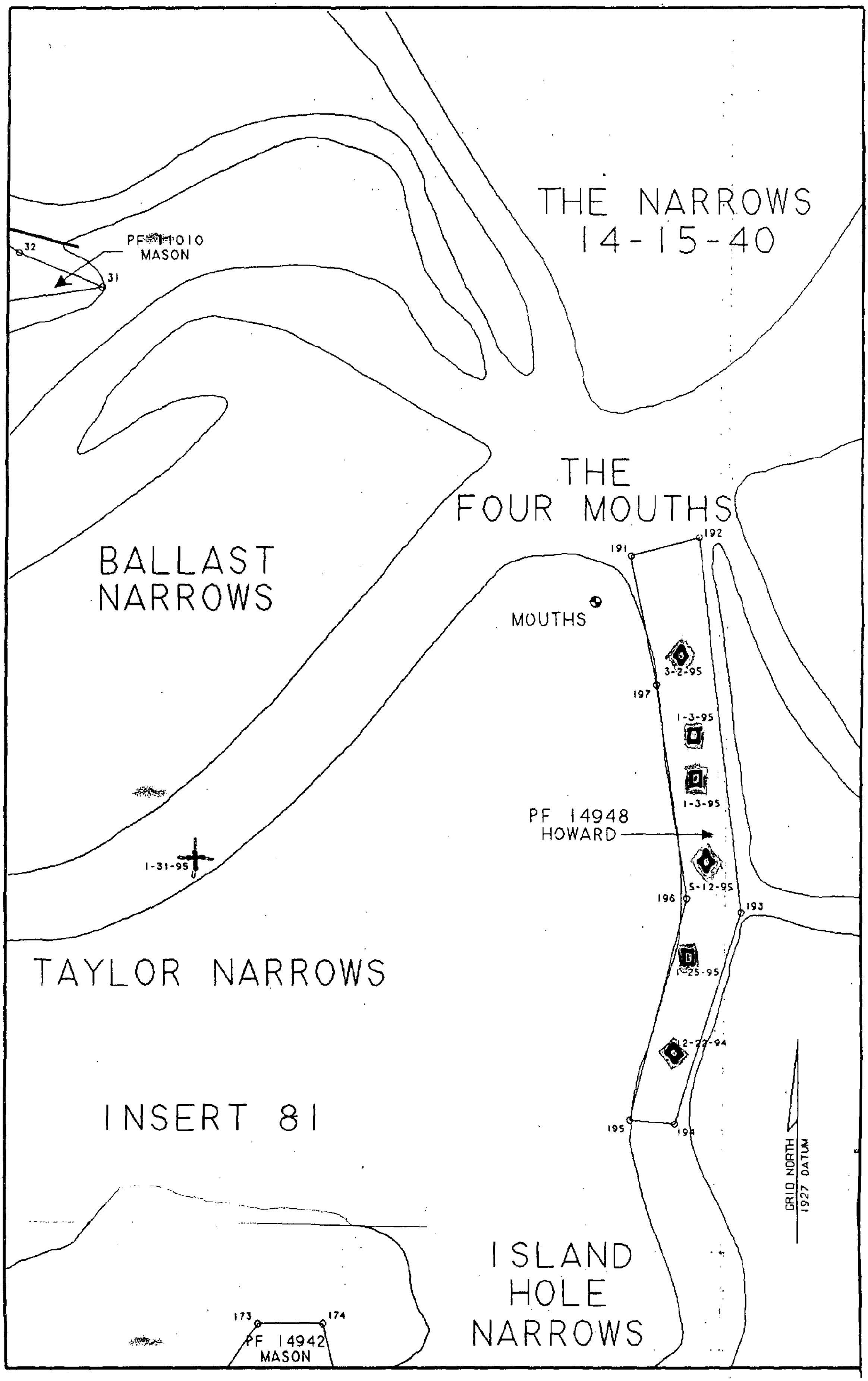

HOUSEBOAT CR.
14-13-01
NORTHAM NARROWS
14-13-05
EGG MARSH
GRID NORTH
1927 DATUM
NN-2
P.G. 53 (26)
1-27-95
ASSAWOMAN ISLAND
KEGOTANK BAY
14-11-02
INSERT 78

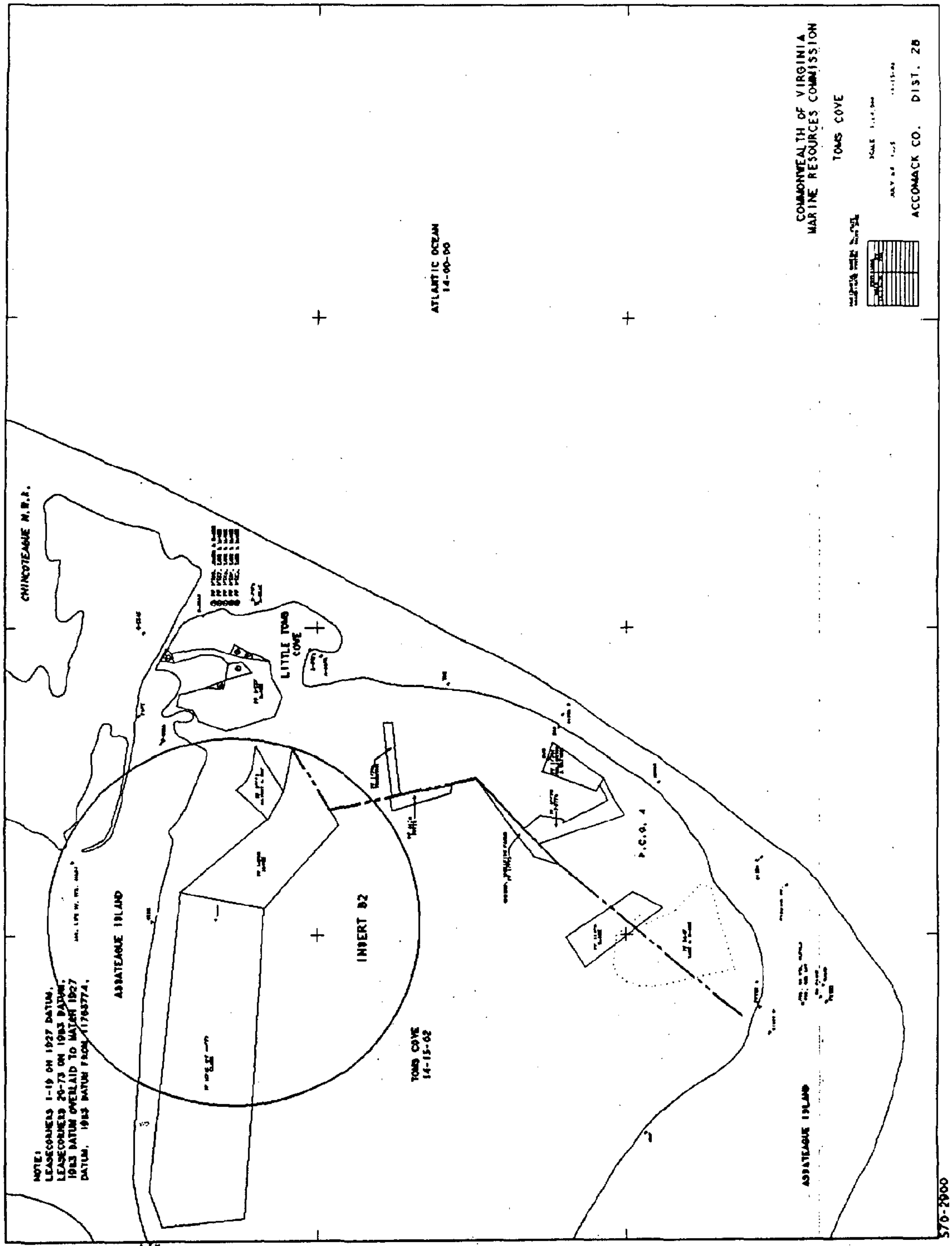

COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
ASSAWOMAN CREEK
WOMANS BAY
WALLOPS ISLAND
ACCOMACK CO.
DIST. 29
DIST. 28
ATLANTIC OCEAN
14-00-00
CAT CREEK
14-13-10
INSERT 80
WALLOPS ISLAND
N.A.S.A.
LITTLE
CAT CREEK
14-13-09
HOG CREEK
14-13-08
HOG CREEK
14-13-08
INSERT 79
ASSAWOMAN CREEK
14-13-02
OYSTER BAY
14-13-12
P.G. 57 (26)
WOMANS BAY
P.G. 58 (26)
ARBUCKLE CREEK
14-13-11
ARBUCKLE NECK
MUD NARROWS
14-13-06
ASSAWOMAN CREEK
14-13-02
NORTHAM NARROWS
14-13-05
555-2860

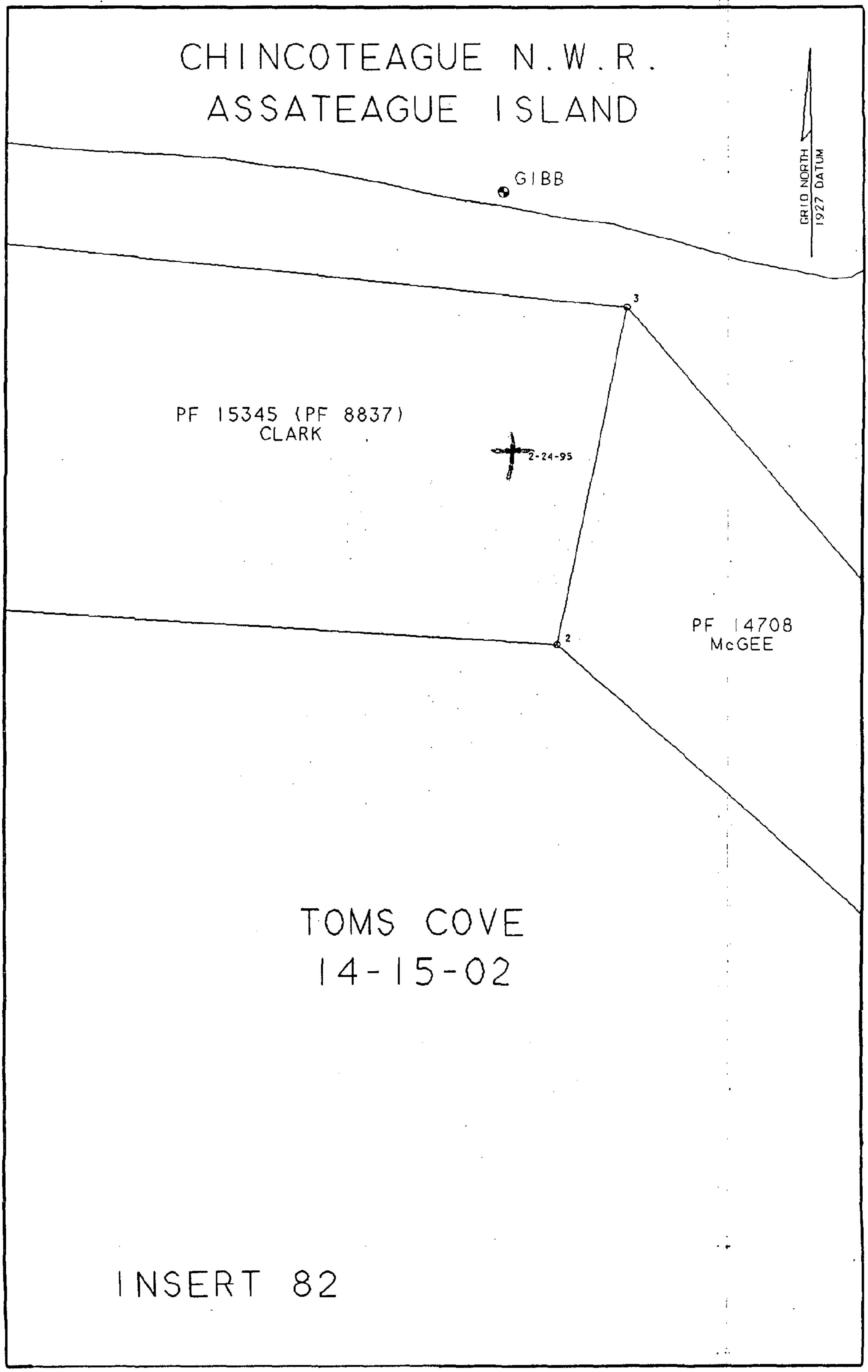

ARBUCKLE CREEK
14-13-11
LEE
OLD
MAN
PF 15830
THORNTON/TAYLOR
WOMANS BAY 14-13-04
P.G. 58 (26)
PF 15564
THORNTON/TAYLOR
PF 14499
TAYLOR
PF 14378
MERRITT
12-16-94
12-16-94
MUD NARROWS
14-13-06
GRID NORTH
1927 DATUM
INSERT 79
ASSAWOMAN CREEK
14-13-02

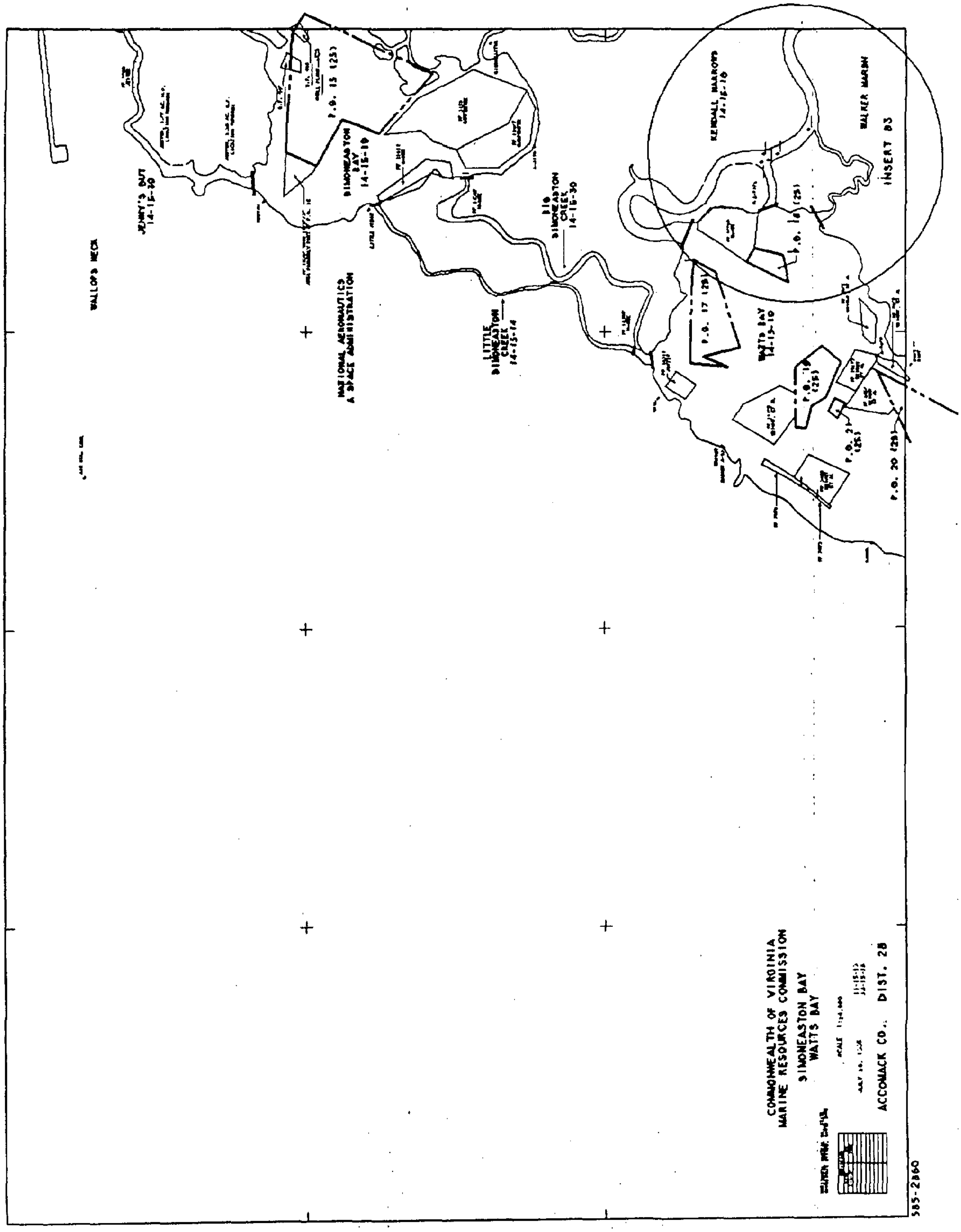

GRID NORTH
1927 DATUM
CAT CREEK
14-13-10
1-27-95
1-31-95
3-24-95
WALLOPS ISLAND
N.A.S.A.
DIST. NO. 28
DIST. NO. 29
INSERT 80

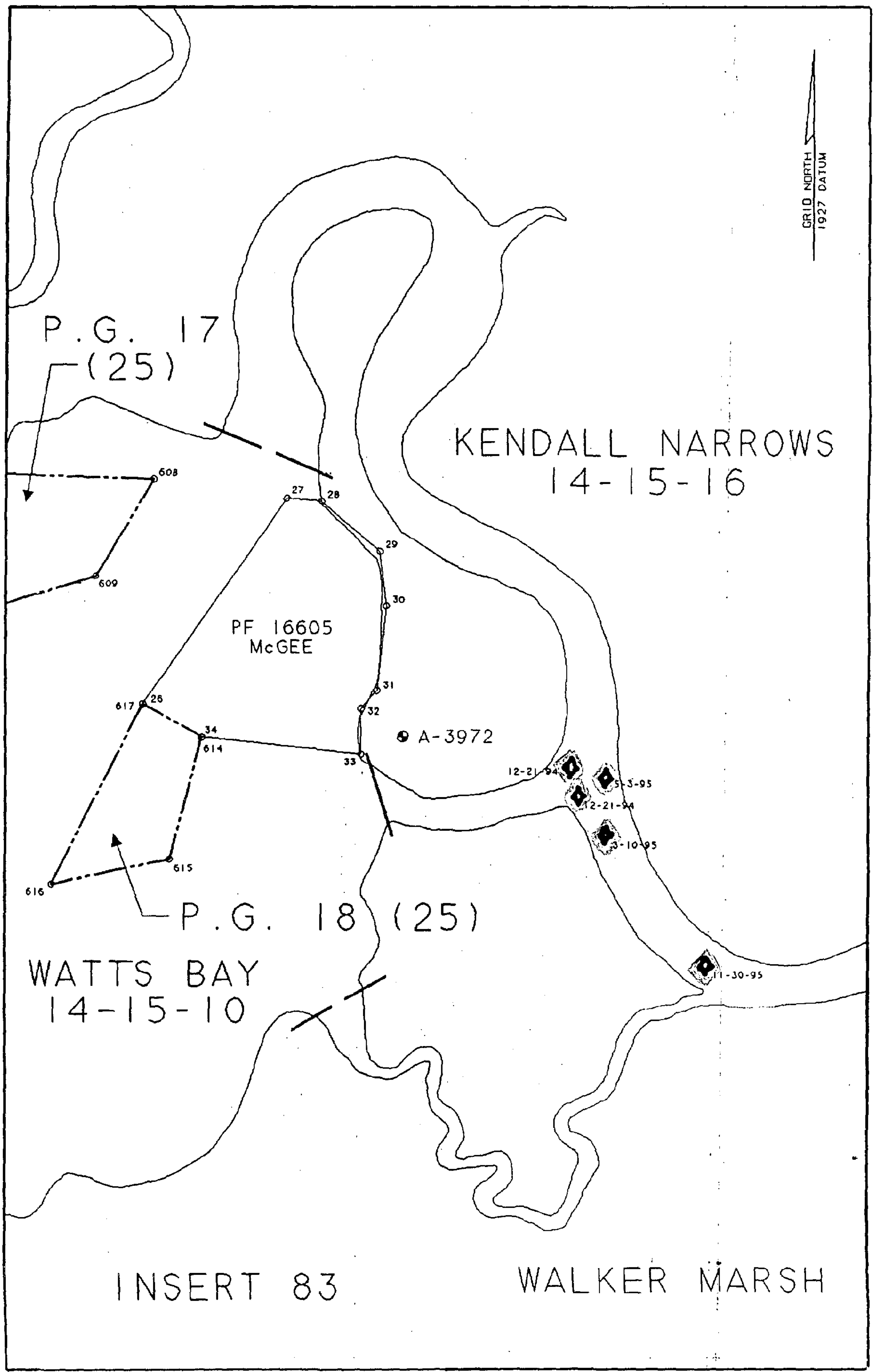

COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
THE NARROWS
POWELLS BAY
BOGUES BAY
ACCOMACK CO. DIST. 28
570-2860
OLD ROOT NARROWS
THE NARROWS 14-15-40
POWELLS BAY 14-15-05
BOGUES BAY 14-15-03
P.G. 20 (25)
P.G. 23 (26)
P.G. 22 (28)
P.G. 24 (26)
(26) P.G. 25
P.G. 26 (28)
P.G. 27 (26)
P.G. 29 (28)
BALLAST NARROWS
TAYLOR NARROWS
THE FOUR MOUTHS
INSERT B1
ISLAND HOLE NARROWS
WISHART PT.
WALLOPS ISLAND N.A.S.A.
CAT CREEK 14-15-10
ATLANTIC OCEAN 14-00-00

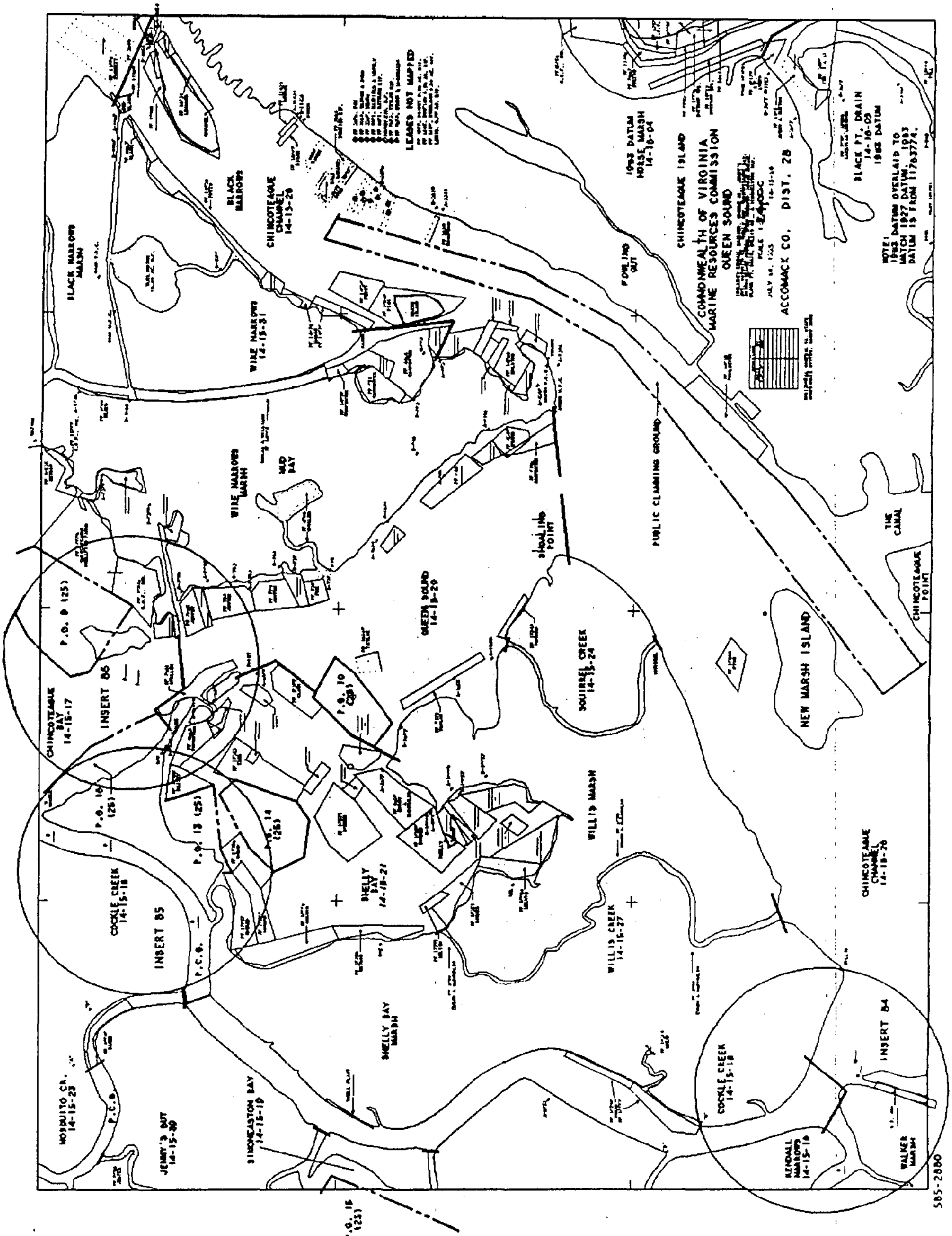

THE NARROWS
14-15-40
PF 11010
MASON
32
31
THE
FOUR MOUTHS
191
192
BALLAST
NARROWS
MOUTHS
3-2-95
197
1-3-95
1-3-95
PF 14948
HOWARD
5-12-95
196
193
1-31-95
TAYLOR NARROWS
1-25-95
2-22-94
INSERT 81
195
194
GRID NORTH
1927 DATUM
ISLAND
HOLE
NARROWS
173
174
PF 14942
MASON

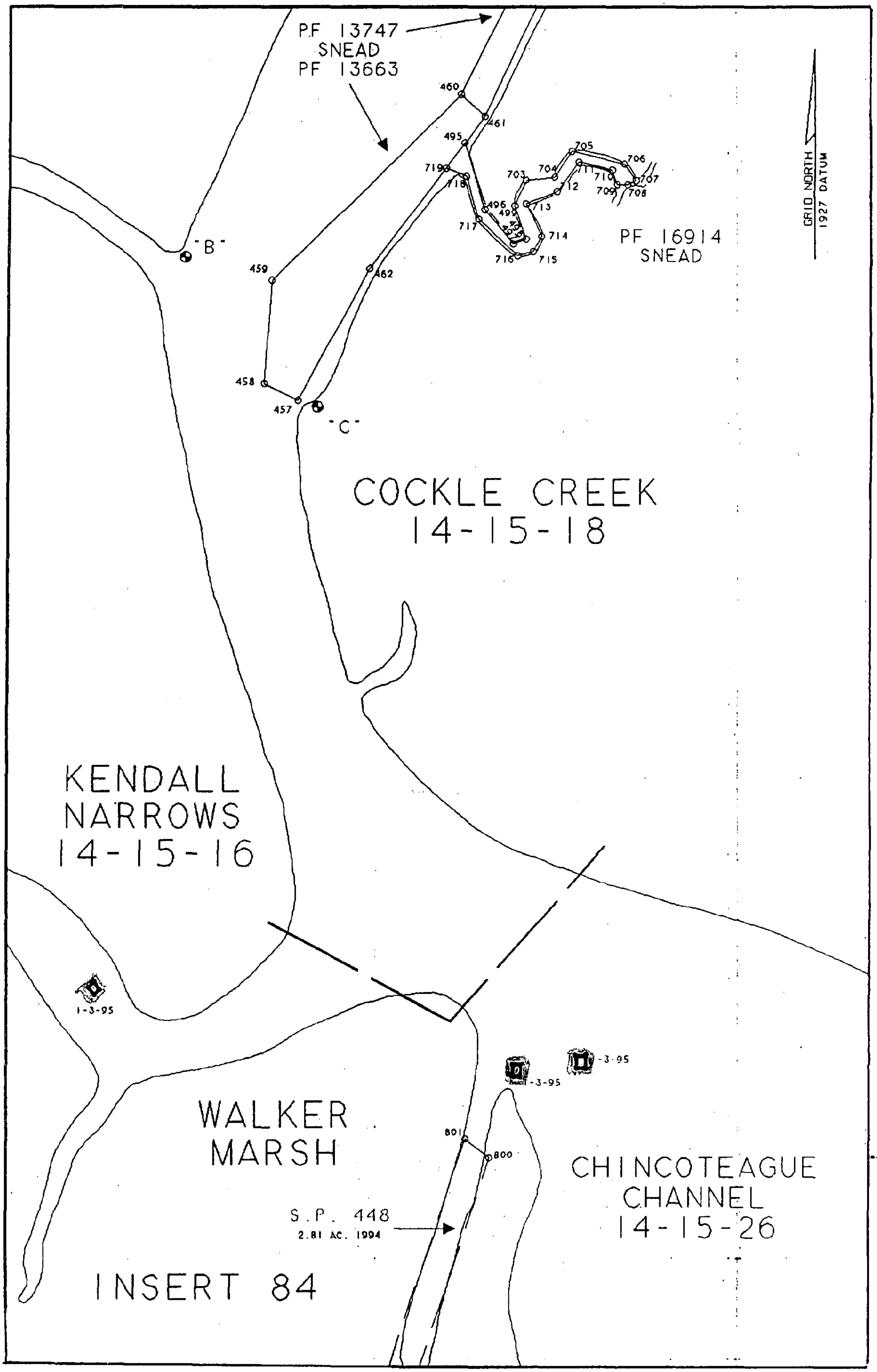

COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
TOMS COVE
ACCOMACK CO. DIST. 2B
ATLANTIC OCEAN
14-00-00
CHINCOTEAGUE N.W.R.
LITTLE TOMS COVE
ASSATEAGUE ISLAND
INSERT B2
TOMS COVE
14-15-02
P.C.O. 4
ASSATEAGUE ISLAND
NOTES:
LEASECORNERS 1-19 ON 1927 DATUM.
LEASECORNERS 20-73 ON 1983 DATUM.
1983 DATUM OVERLAID TO MATCH 1927
DATUM. 1983 DATUM FROM 1765774.
570-2000

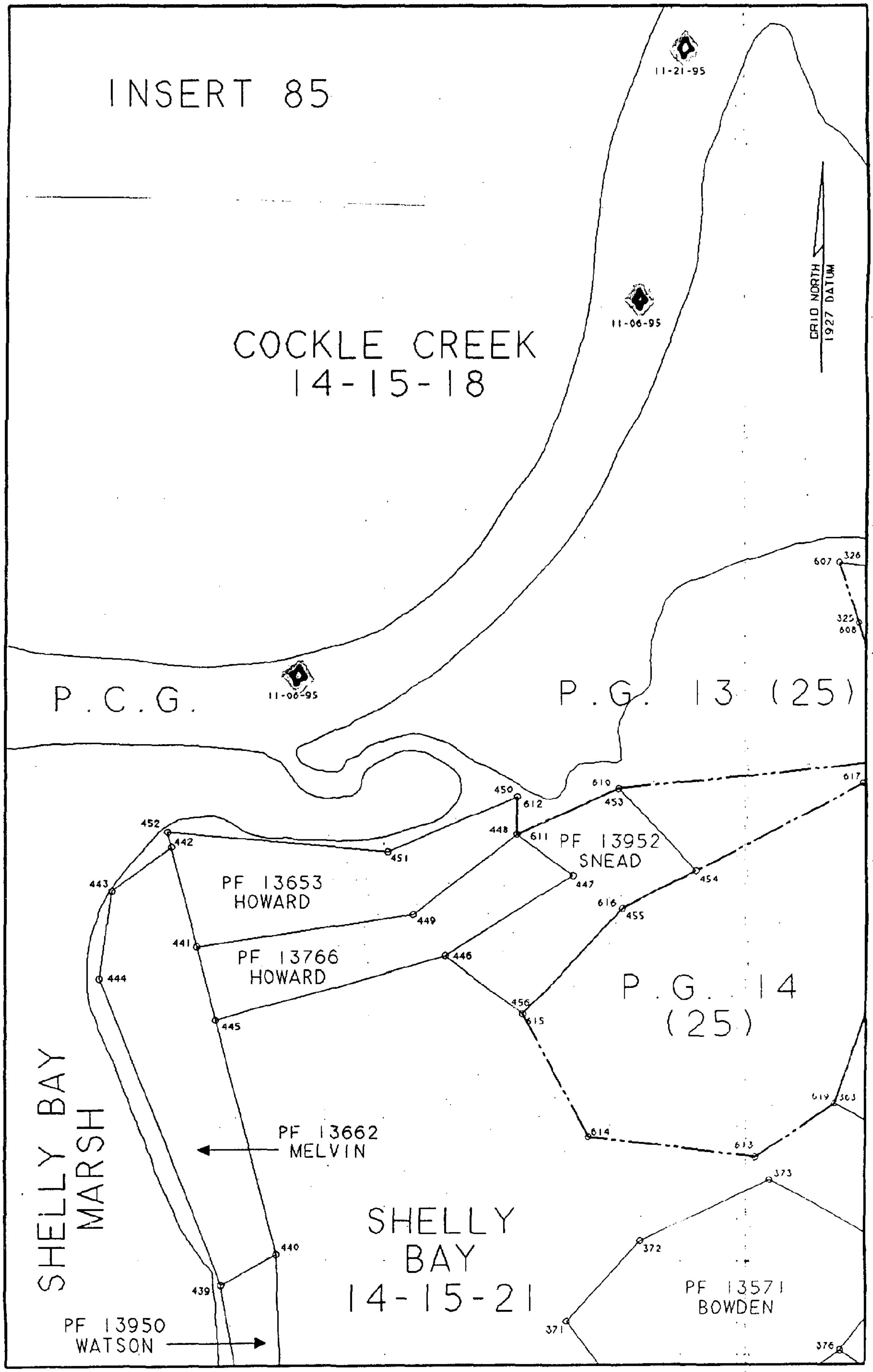

CHINCOTEAGUE N.W.R.
ASSATEAGUE ISLAND
GRID NORTH
1927 DATUM
GIBB
3
PF 15345 (PF 8837)
CLARK
2-24-95
2
PF 14708
McGEE
TOMS COVE
14-15-02
INSERT 82

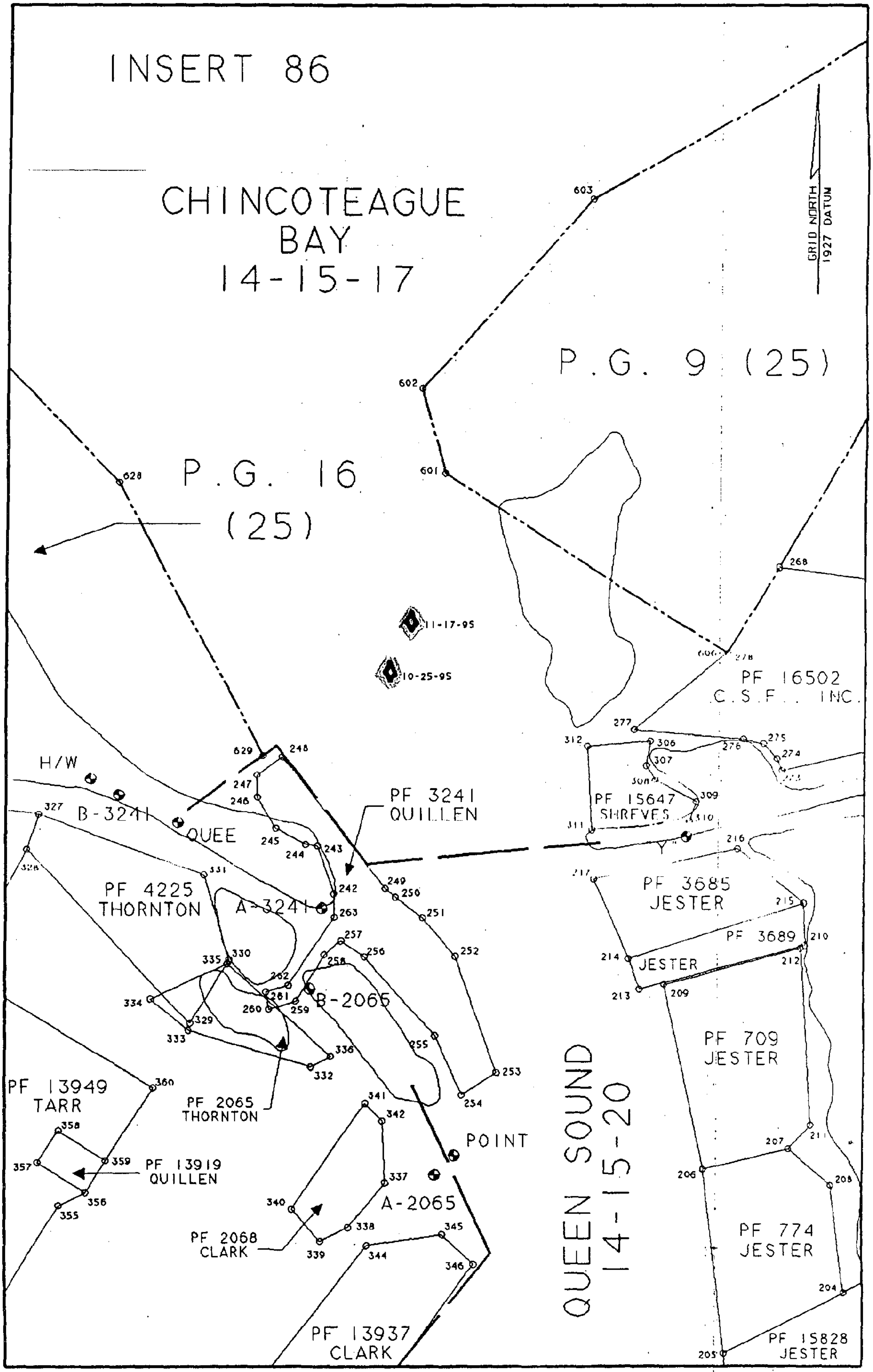

WALLOPS NECK
JENNY'S GUT 14-15-30
NATIONAL AERONAUTICS & SPACE ADMINISTRATION
SIMONEASTON BAY 14-15-10
P.O. 15 (25)
LITTLE SIMONEASTON CREEK 14-15-14
BIG SIMONEASTON CREEK 14-15-30
WATTS BAY 14-15-10
P.O. 17 (25)
P.O. 20 (25)
KENDALL NARROWS 14-15-16
WALKER MARSH
INSERT 83
COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
SIMONEASTON BAY
WATTS BAY
ACCOMACK CO. DIST. 28
585-2860

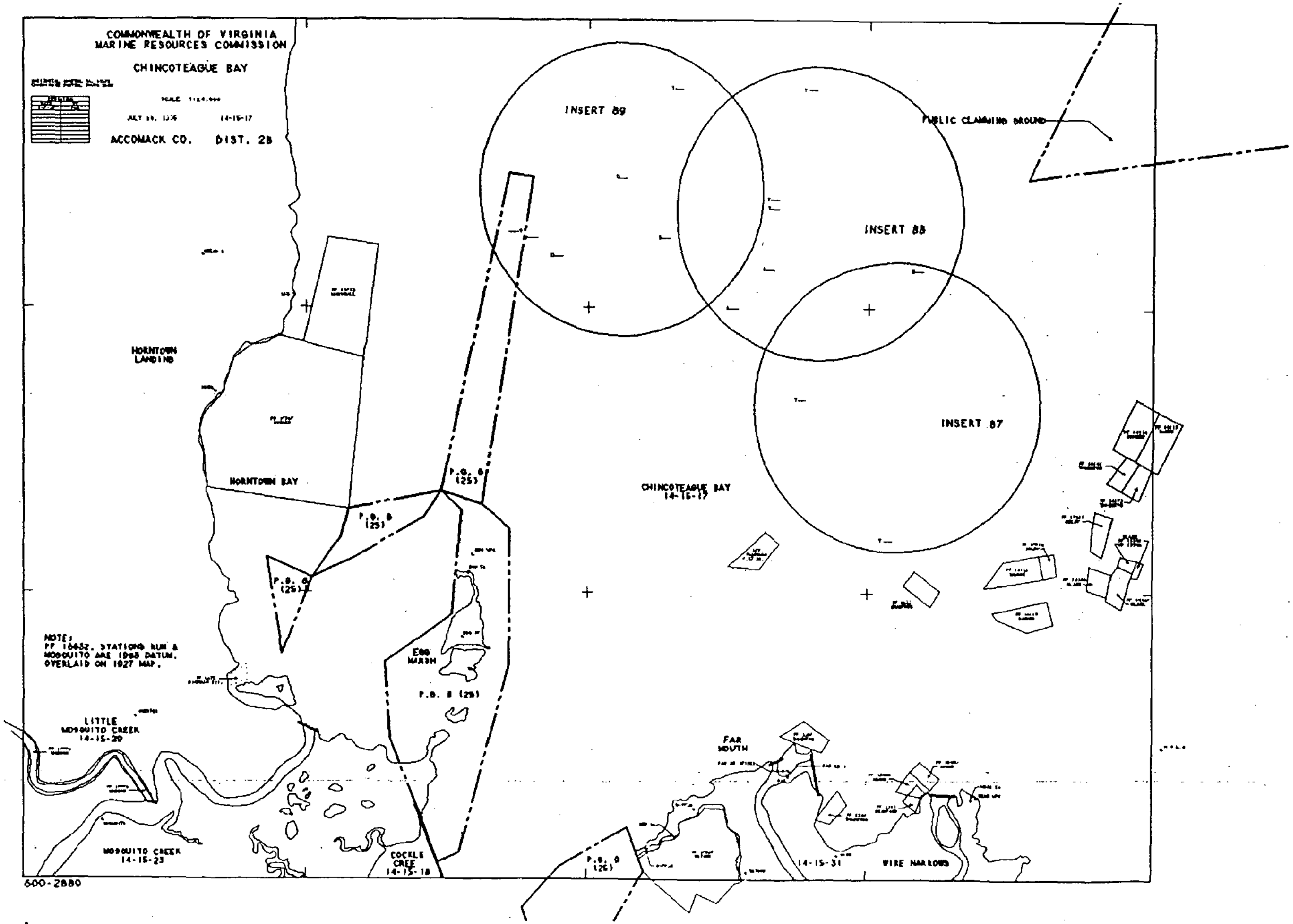

GRID NORTH
1927 DATUM
P.G. 17
(25)
KENDALL NARROWS
14-15-16
608
27
28
29
609
30
PF 16605
McGEE
31
617
26
32
A-3972
34
614
33
12-21-94
5-3-95
12-21-94
3-10-95
615
616
P.G. 18 (25)
11-30-95
WATTS BAY
14-15-10
INSERT 83
WALKER MARSH

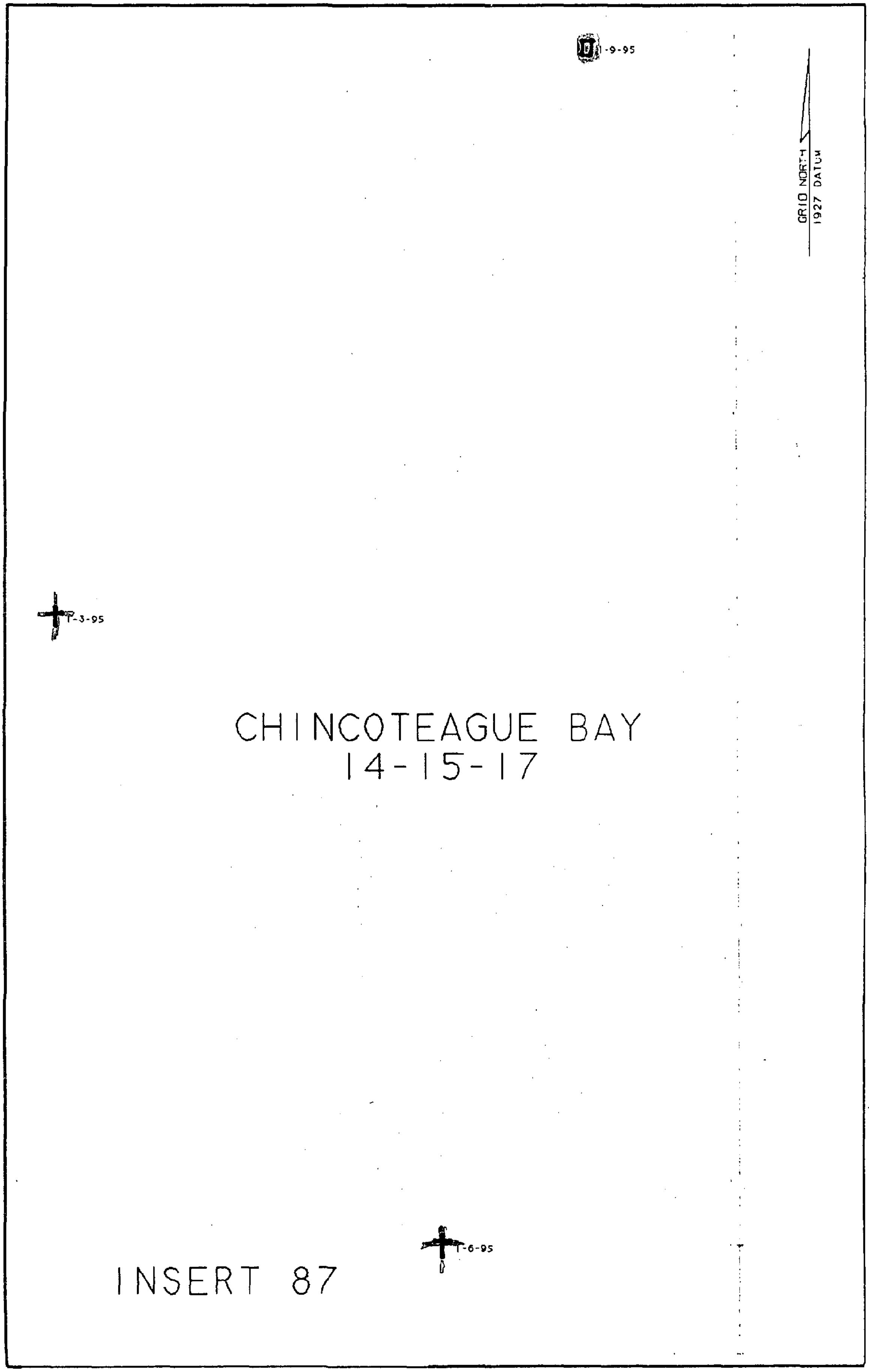

COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
QUEEN SOUND
ACCOMACK CO. DIST. 28
CHINCOTEAGUE ISLAND
NEW MARSH ISLAND
SQUIRREL CREEK 14-15-24
QUEEN SOUND
WILLIS MARSH
WILLIS CREEK 14-15-27
SHELLY BAY MARSH
COCKLE CREEK 14-15-18
INSERT 85
INSERT 84
WIRE NARROWS MARSH
MUD BAY
BLACK NARROWS
BLACK NARROWS MARSH
PUBLIC CLAMMING GROUND
SHOALING POINT
FOWLING GUT
THE CANAL
CHINCOTEAGUE POINT
JENNY'S GUT 14-15-20
WALKER MARSH
SBS-2880

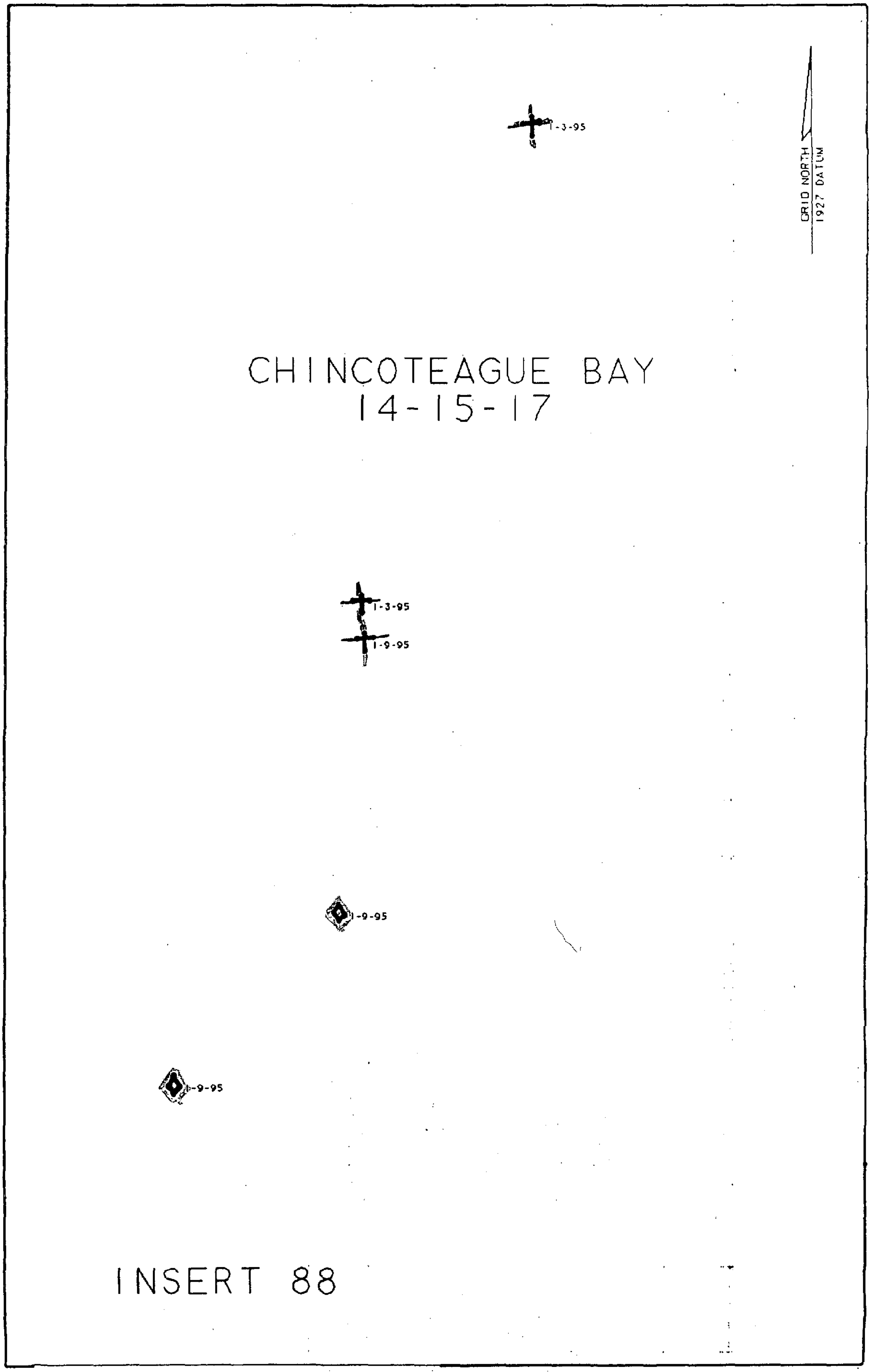

P.F 13747
SNEAD
PF 13663
PF 16914
SNEAD
GRID NORTH
1927 DATUM
"B"
"C"
COCKLE CREEK
14-15-18
KENDALL
NARROWS
14-15-16
WALKER
MARSH
CHINCOTEAGUE
CHANNEL
14-15-26
S.P. 448
2.81 AC. 1994
INSERT 84


INSERT 85
11-21-95
11-06-95
GRID NORTH
1927 DATUM
COCKLE CREEK
14-15-18
P.C.G.
11-06-95
P.G. 13 (25)
PF 13952
SNEAD
PF 13653
HOWARD
PF 13766
HOWARD
P.G. 14
(25)
PF 13662
MELVIN
SHELLY BAY
MARSH
SHELLY
BAY
14-15-21
PF 13571
BOWDEN
PF 13950
WATSON

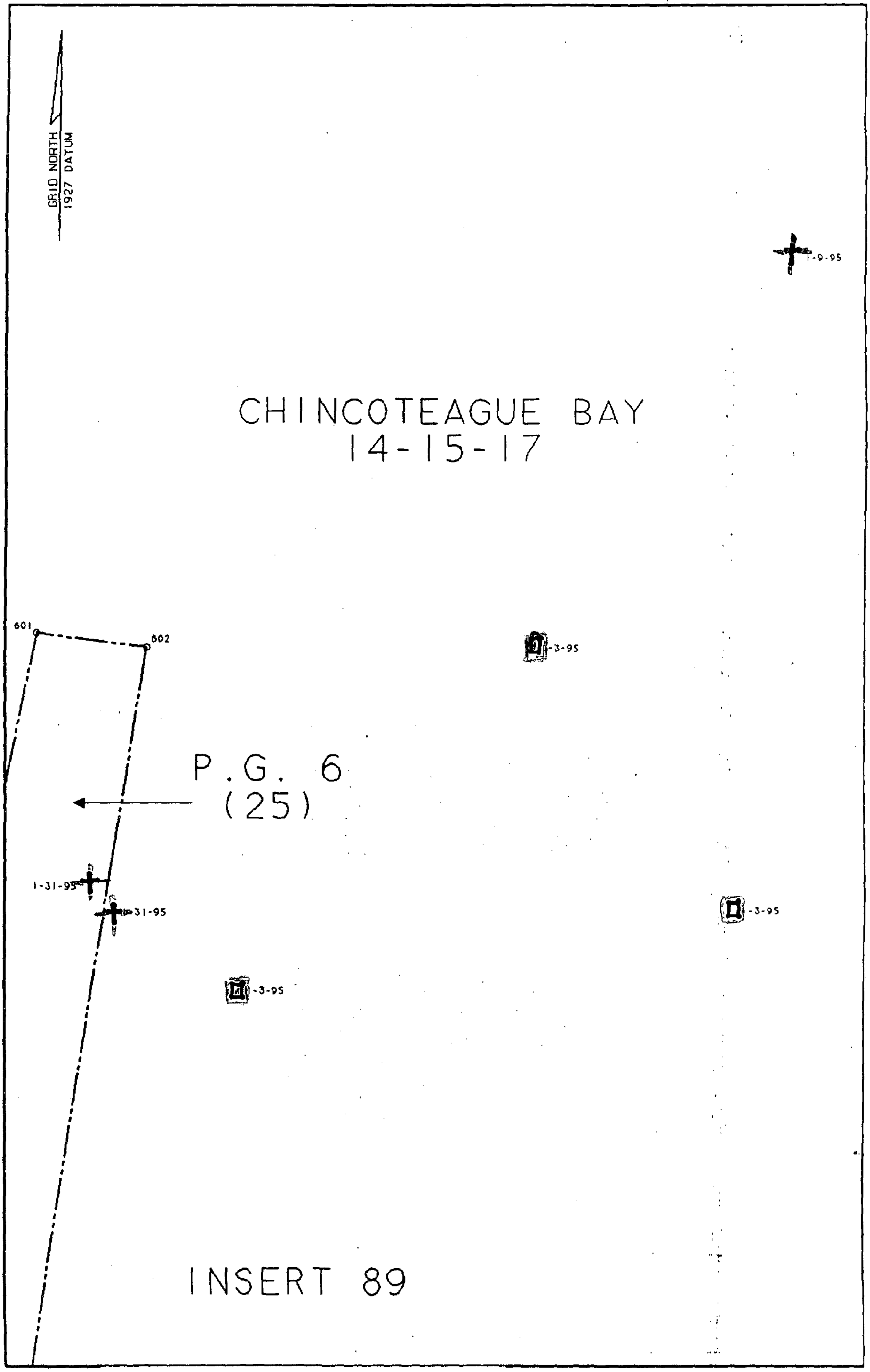

INSERT 86
CHINCOTEAGUE
BAY
14-15-17
GRID NORTH
1927 DATUM
P.G. 9 (25)
P.G. 16
(25)
11-17-95
10-25-95
PF 16502
C.S.F., INC.
H/W
B-3241
QUEE
PF 3241
QUILLEN
PF 15647
SHREVES
PF 4225
THORNTON
A-3241
PF 3685
JESTER
PF 3689
JESTER
B-2065
PF 709
JESTER
PF 13949
TARR
PF 2065
THORNTON
POINT
PF 13919
QUILLEN
A-2065
QUEEN SOUND
14-15-20
PF 2068
CLARK
PF 774
JESTER
PF 13937
CLARK
PF 15828
JESTER

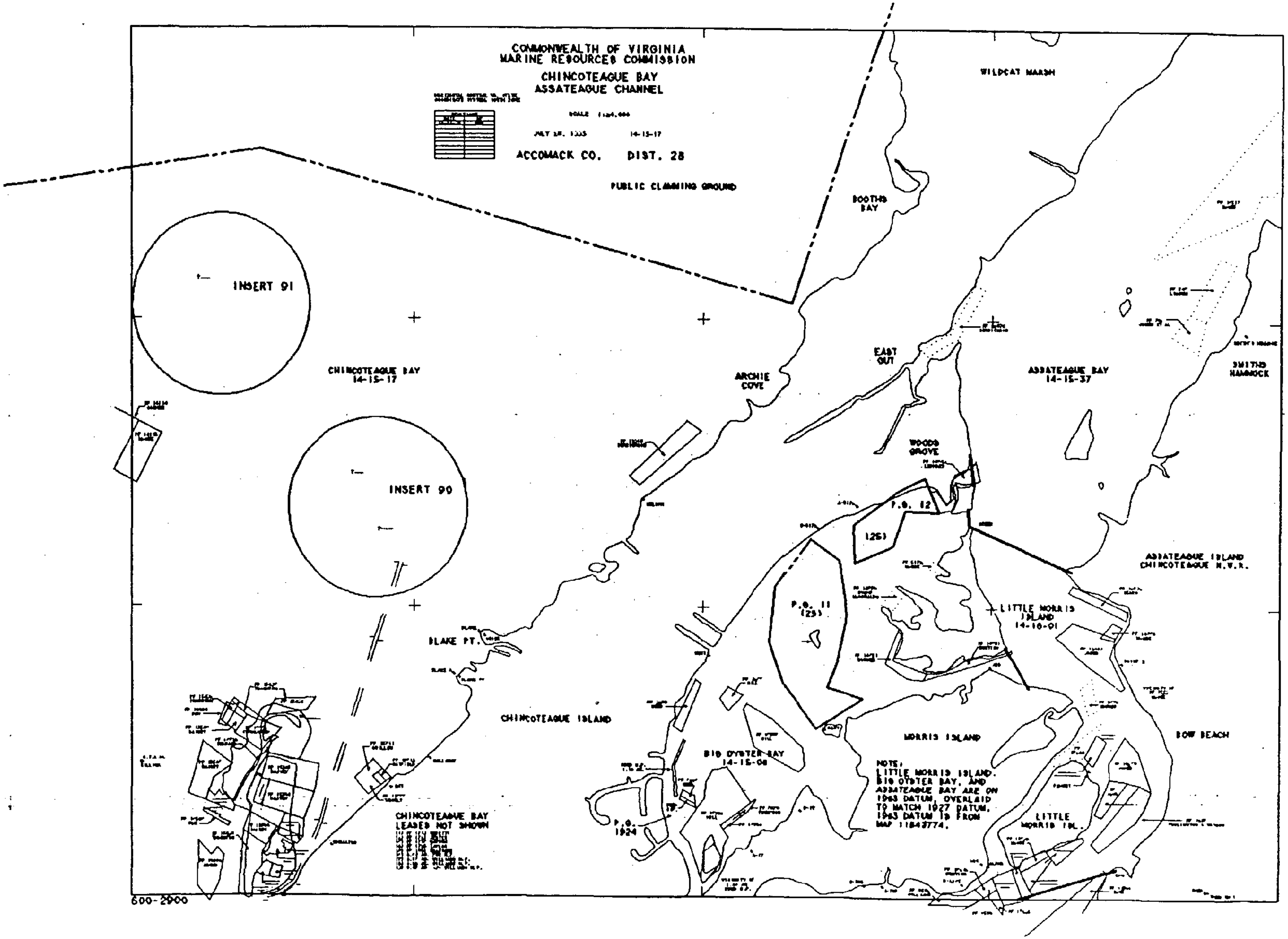

COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
CHINCOTEAGUE BAY
ACCOMACK CO. DIST. 2B
INSERT 89
INSERT 88
INSERT 87
PUBLIC CLAMMING GROUND
HORNTOWN LANDING
HORNTOWN BAY
P.G. 8 (25)
P.G. 8 (25)
P.G. 8 (25)
CHINCOTEAGUE BAY 14-15-17
NOTE: PF 10632, STATIONS RUM & MOSQUITO ARE 1968 DATUM, OVERLAID ON 1927 MAP.
EGG MARSH
P.G. 8 (25)
LITTLE MOSQUITO CREEK 14-15-20
MOSQUITO CREEK 14-15-23
COCKLE CREE 14-15-18
FAR MOUTH
P.G. 9 (26)
14-15-31
WIRE NARROWS
600-2880

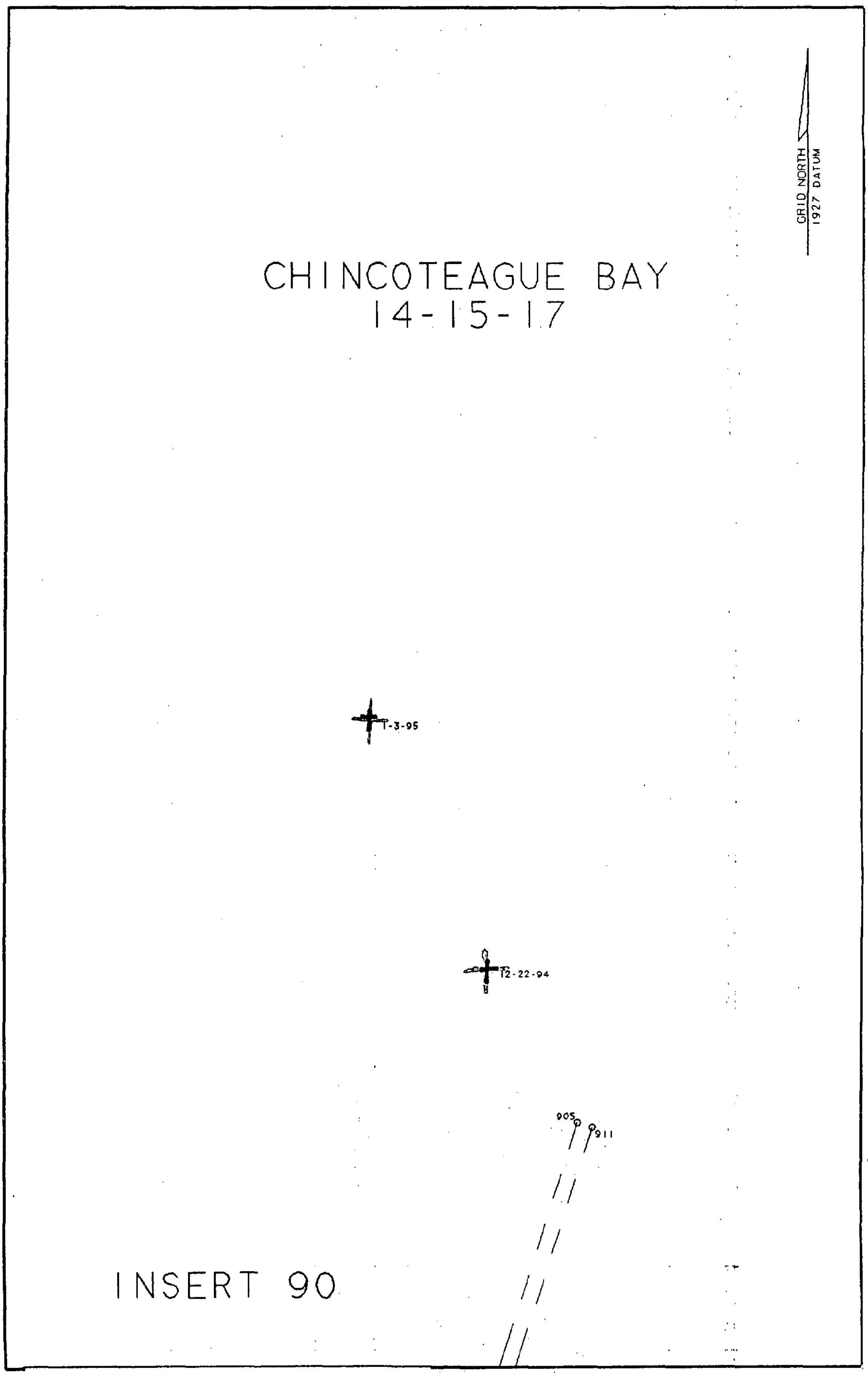

1-9-95
GRID NORTH
1927 DATUM
T-3-95
CHINCOTEAGUE BAY
14-15-17
T-6-95
INSERT 87

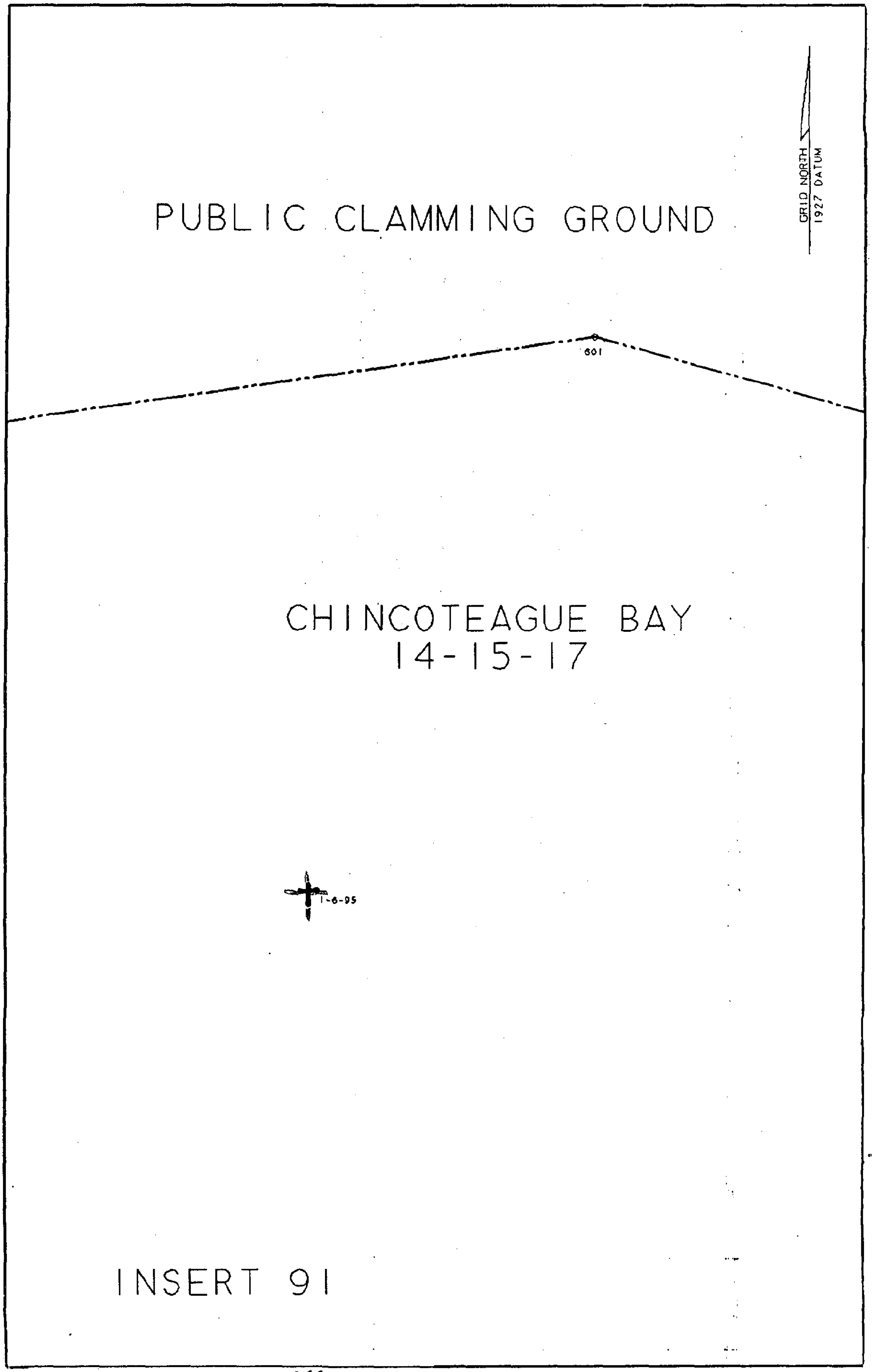


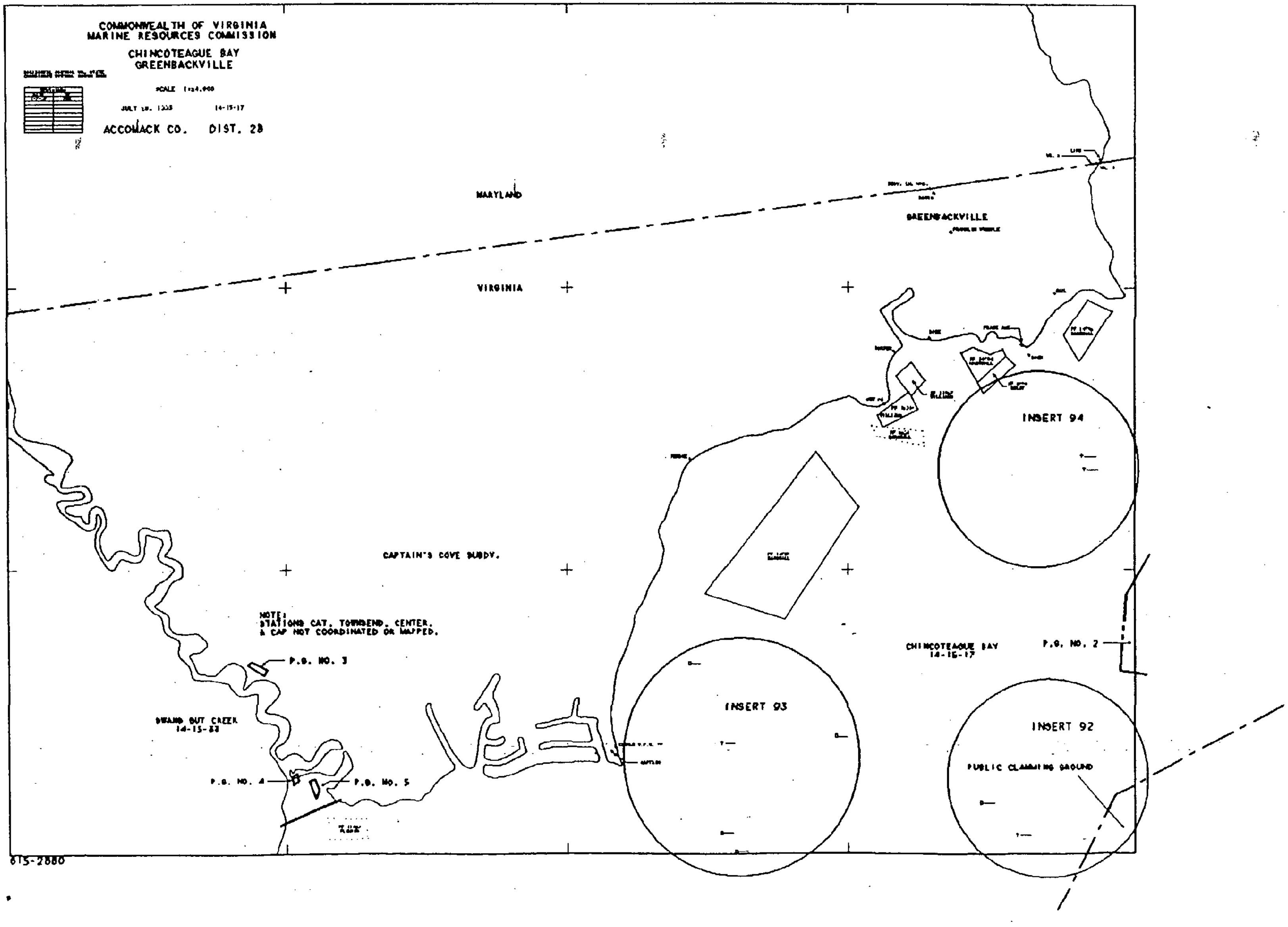
CHINCOTEAGUE BAY
14-15-17
GRID NORTH
1927 DATUM
1-3-95
1-3-95
1-9-95
1-9-95
1-9-95
INSERT 88

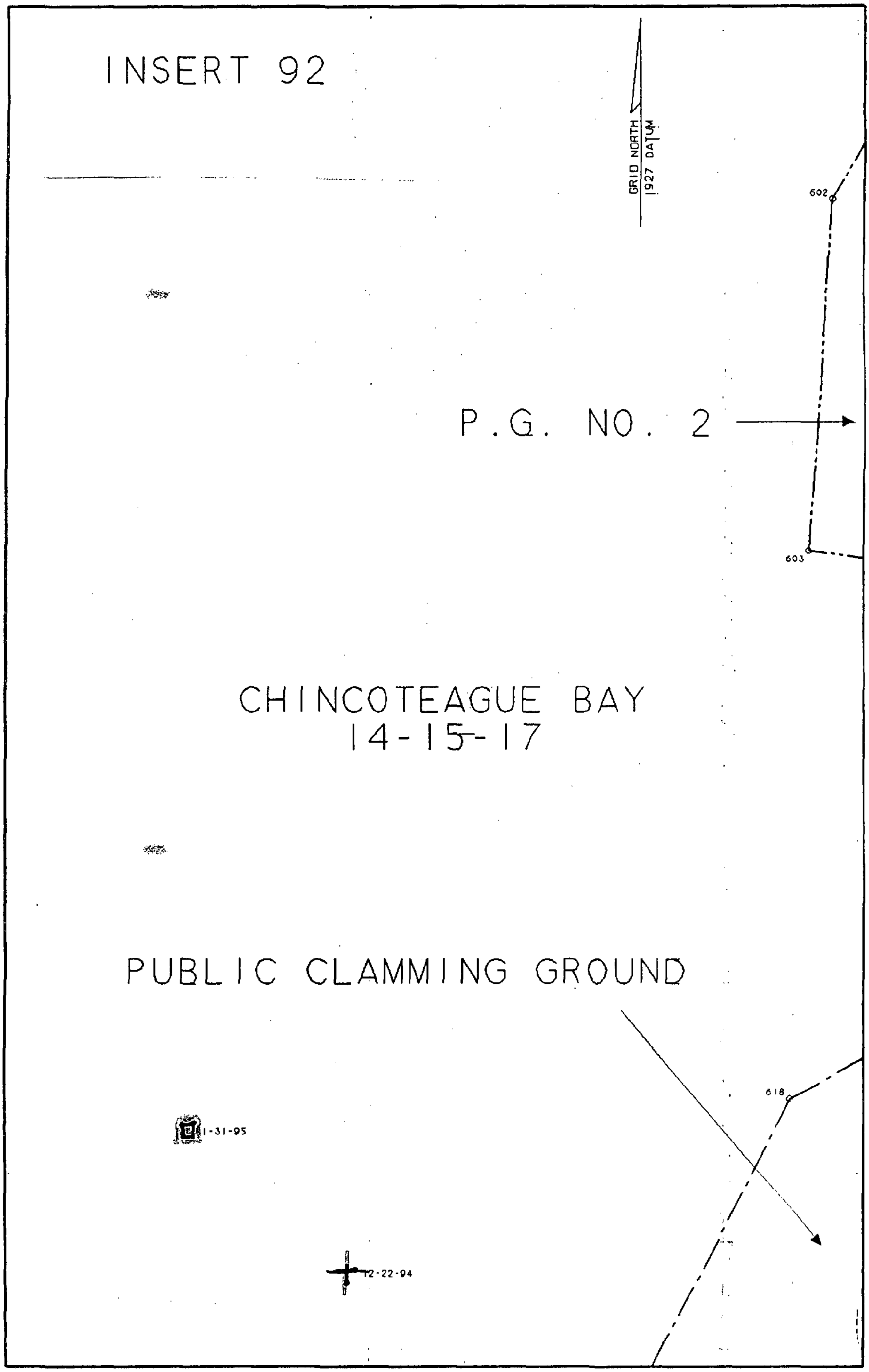

GRID NORTH
1927 DATUM
CHINCOTEAGUE BAY
14-15-17
601
602
P.G. 6
(25)
1-31-95
INSERT 89

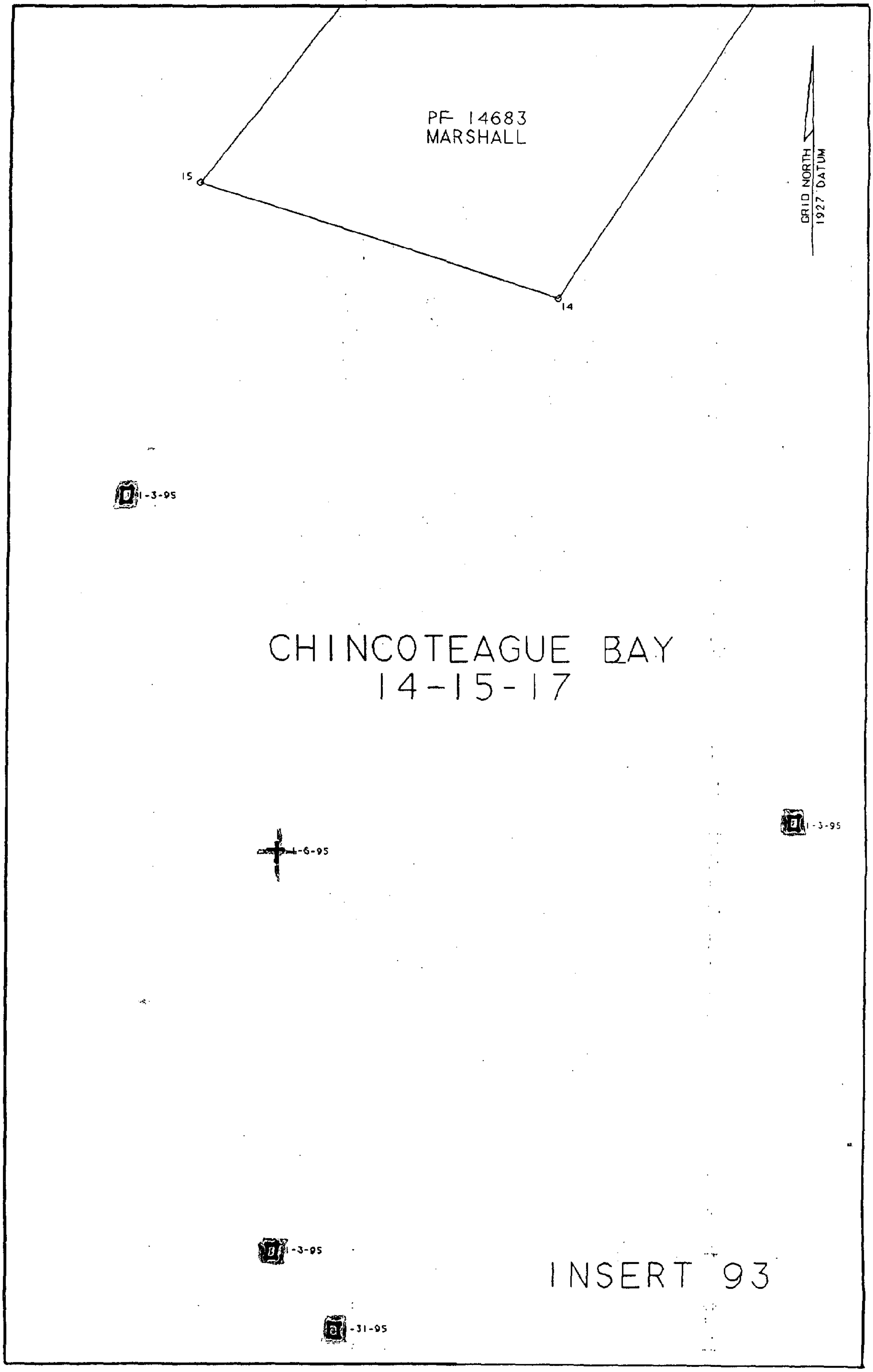

COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
CHINCOTEAGUE BAY
ASSATEAGUE CHANNEL
ACCOMACK CO. DIST. 28
PUBLIC CLAMMING GROUND
WILDCAT MARSH
BOOTHS BAY
INSERT 91
INSERT 90
CHINCOTEAGUE BAY
14-15-17
ARCHIE COVE
EAST GUT
ASSATEAGUE BAY
14-15-37
SMITHS HAMMOCK
WOODS GROVE
P.G. 12
(25)
P.G. 11
(25)
ASSATEAGUE ISLAND
CHINCOTEAGUE N.W.R.
LITTLE MORRIS ISLAND
14-16-01
BLAKE PT.
CHINCOTEAGUE ISLAND
MORRIS ISLAND
BOW BEACH
BIG OYSTER BAY
14-15-06
P.G.
1924
NOTE:
LITTLE MORRIS ISLAND,
BIG OYSTER BAY, AND
ASSATEAGUE BAY ARE ON
1983 DATUM, OVERLAID
TO MATCH 1927 DATUM.
1983 DATUM IS FROM
MAP 11843774.
LITTLE
MORRIS ISL.
CHINCOTEAGUE BAY
LEASES NOT SHOWN
600-2900

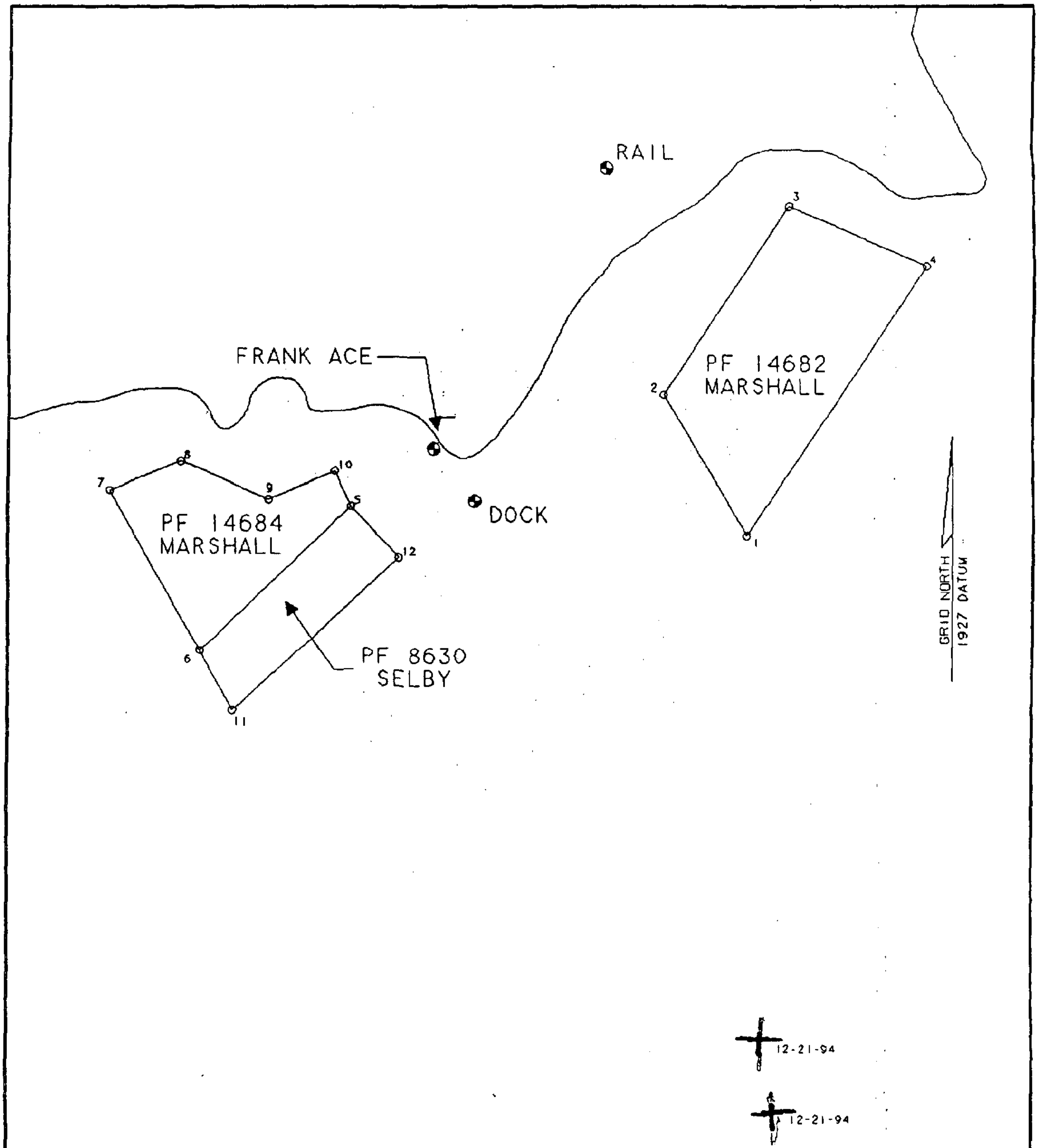

GRID NORTH
1927 DATUM
CHINCOTEAGUE BAY
14-15-17
1-3-95
12-22-94
905
911
INSERT 90


PUBLIC CLAMMING GROUND
GRID NORTH
1927 DATUM
601
CHINCOTEAGUE BAY
14-15-17
1-6-95
INSERT 91


COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
CHINCOTEAGUE BAY
GREENBACKVILLE
14-15-17
ACCOMACK CO. DIST. 28
MARYLAND
VIRGINIA
GREENBACKVILLE
INSERT 94
CAPTAIN'S COVE SUBDV.
NOTE:
STATIONS CAT, TOWNSEND, CENTER,
& CAP NOT COORDINATED OR MAPPED.
P.G. NO. 3
CHINCOTEAGUE BAY
14-15-17
P.G. NO. 2
SWANS GUT CREEK
14-15-33
INSERT 93
INSERT 92
PUBLIC CLAMMING GROUND
P.G. NO. 4
P.G. NO. 5
615-2880

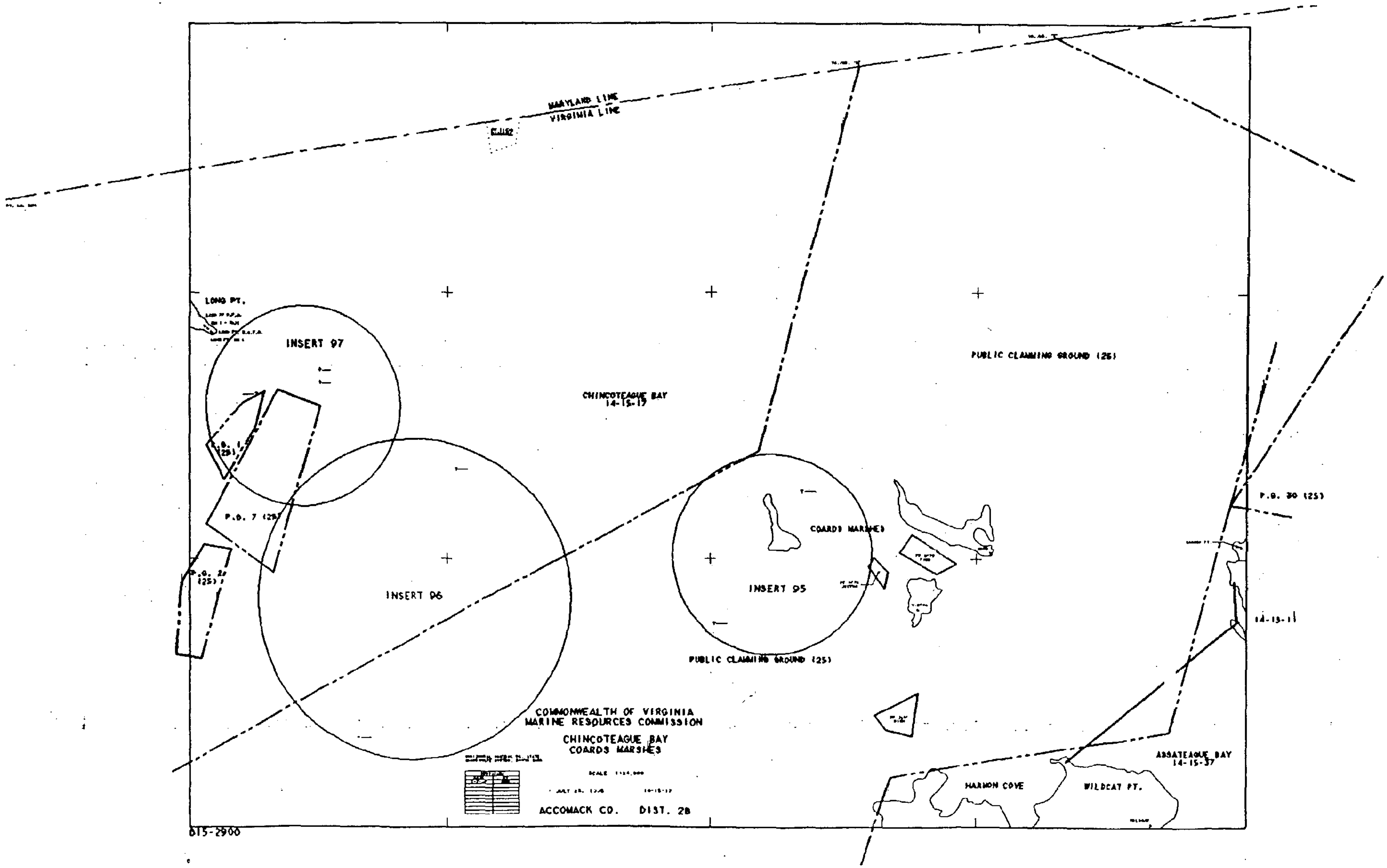

INSERT 92
GRID NORTH
1927 DATUM
602
P.G. NO. 2
603
CHINCOTEAGUE BAY
14-15-17
PUBLIC CLAMMING GROUND
618
1-31-95
12-22-94

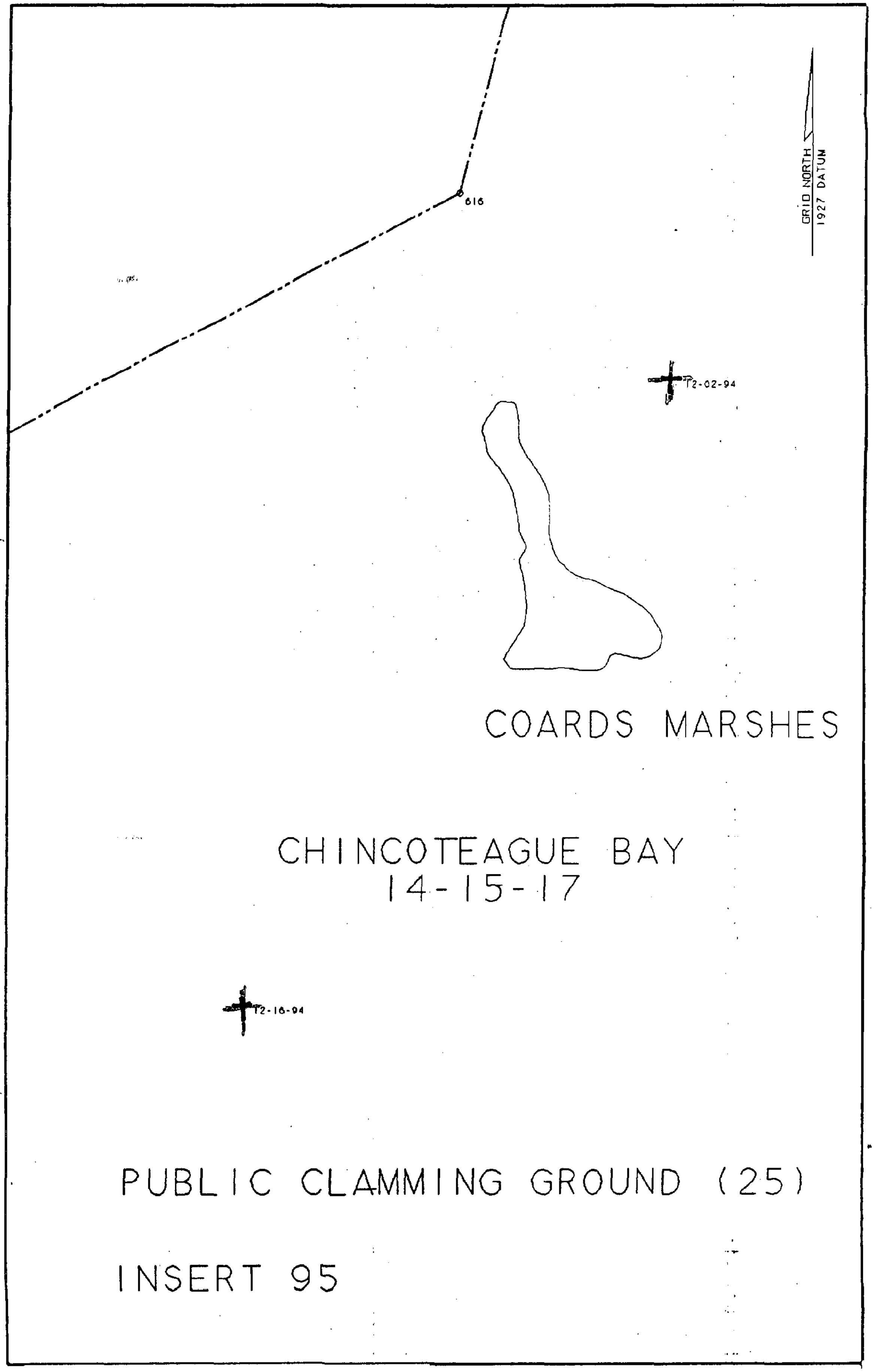

PF 14683
MARSHALL
15
14
GRID NORTH
1927 DATUM
1-3-95
CHINCOTEAGUE BAY
14-15-17
1-3-95
-6-95
1-3-95
-31-95
INSERT 93

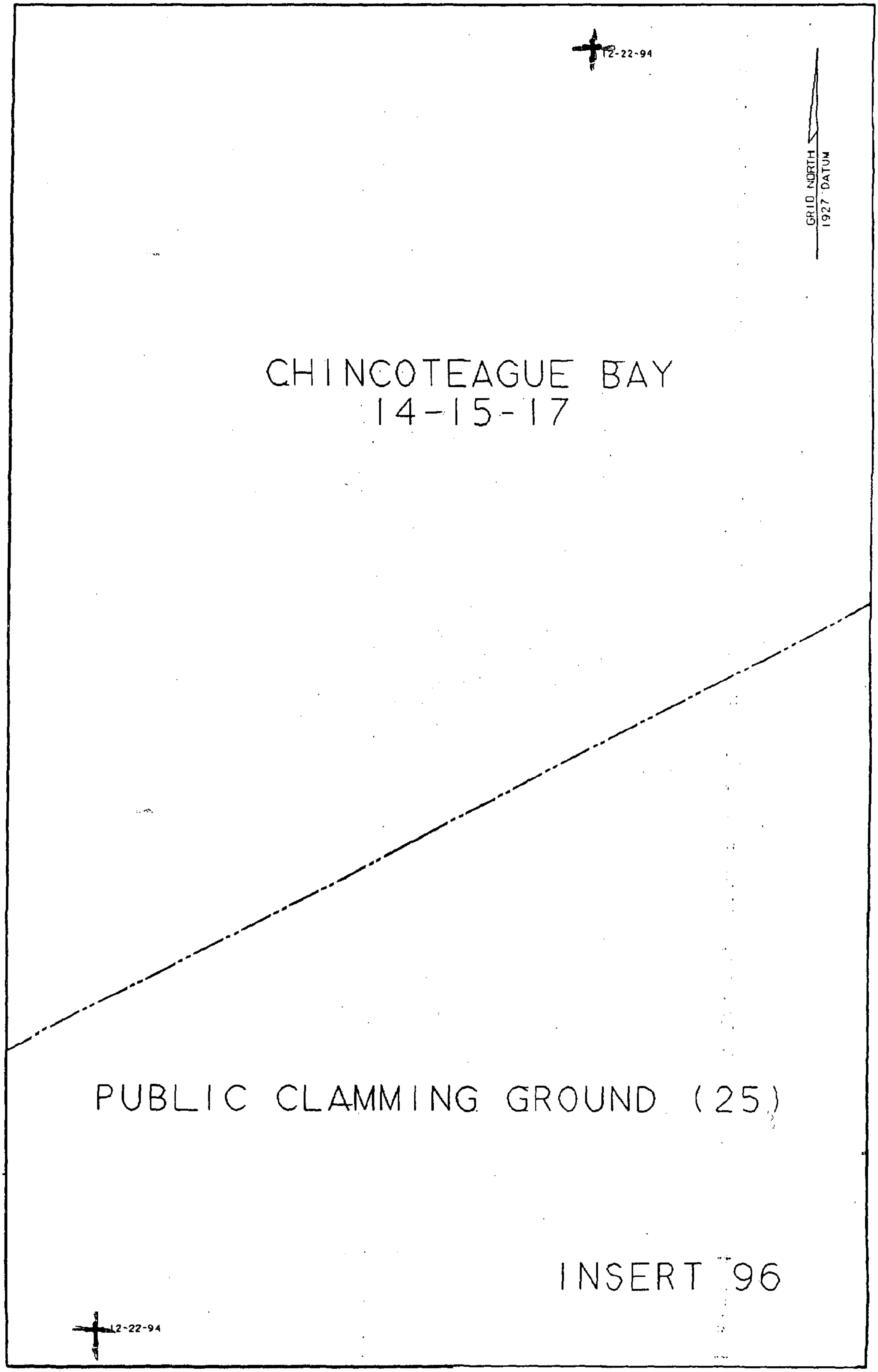


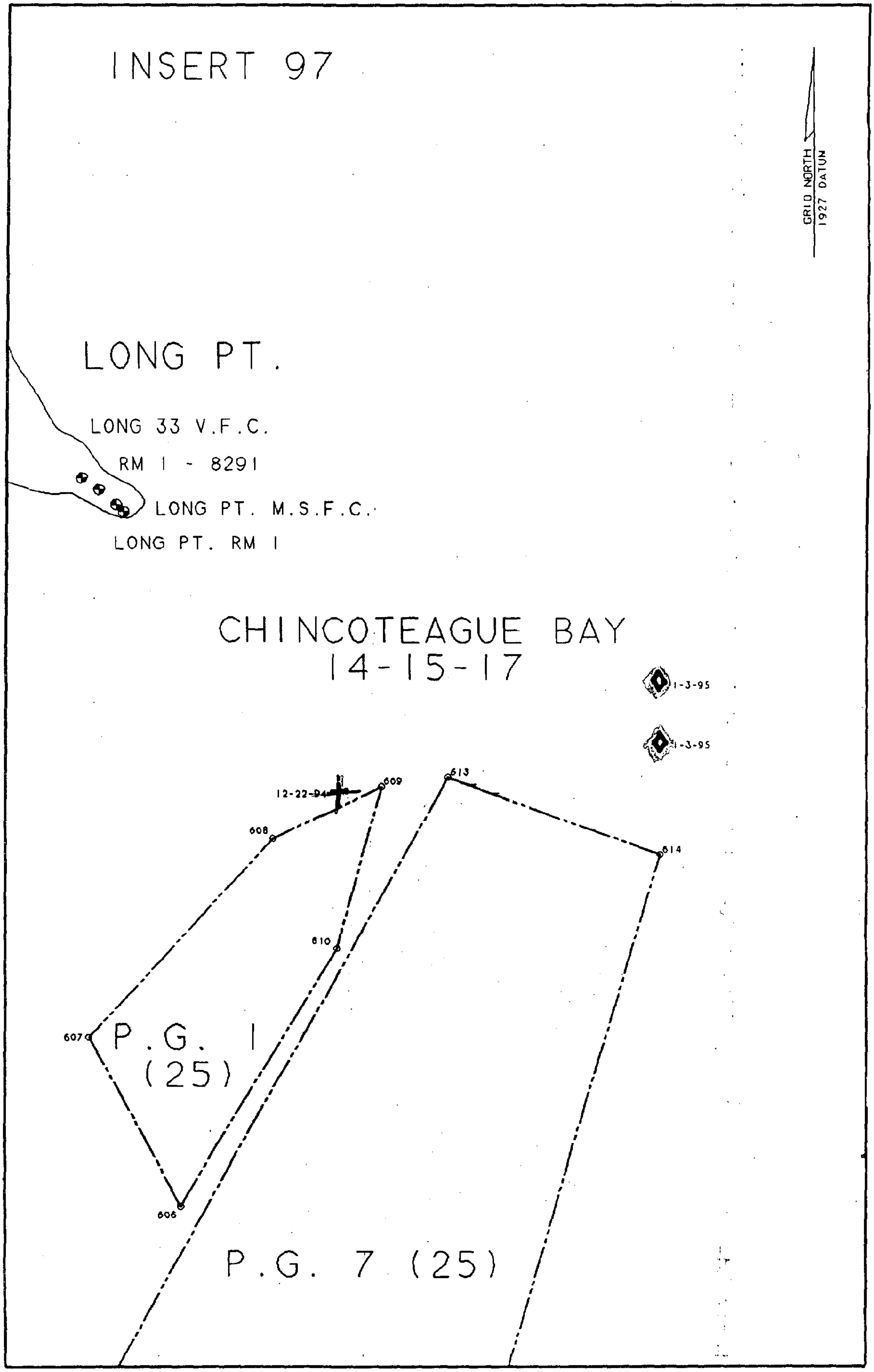
CHINCOTEAGUE BAY
14-15-17

INSERT 94


MARYLAND LINE
VIRGINIA LINE
PUBLIC CLAMMING GROUND (25)
CHINCOTEAGUE BAY
14-15-17
LONG PT.
INSERT 97
P.G. 1
(25)
P.G. 7 (25)
P.G. 2
(25)
INSERT 96
INSERT 95
COARDS MARSHES
PUBLIC CLAMMING GROUND (25)
P.G. 30 (25)
14-15-11
ASSATEAGUE BAY
14-15-37
MARMON COVE
WILDCAT PT.
COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
CHINCOTEAGUE BAY
COARDS MARSHES
ACCOMACK CO. DIST. 2B
615-2900


GRID NORTH
1927 DATUM
616
T2-02-94
COARDS MARSHES
CHINCOTEAGUE BAY
14-15-17
T2-16-94
PUBLIC CLAMMING GROUND (25)
INSERT 95


12-22-94
GRID NORTH
1927 DATUM
CHINCOTEAGUE BAY
14-15-17
PUBLIC CLAMMING GROUND (25)
INSERT 96
12-22-94


INSERT 97
GRID NORTH
1927 DATUM
LONG PT.
LONG 33 V.F.C.
RM 1 - 8291
LONG PT. M.S.F.C.
LONG PT. RM 1
CHINCOTEAGUE BAY
14-15-17
1-3-95
1-3-95
12-22-94
609
613
608
614
610
607
P.G. 1
(25)
606
P.G. 7 (25)

Appendix II. Benthic invertebrates (number of individuals and biomass) from Spider Crab Bay, (A) before and (B) after dredging. [Major taxa: A=amphipod, B=bivalve, D=decapod, G=gastropod, P=polychaete, O=other.]

(A)

Station	Major Taxa	Species	Number	Wet weight
Plot A, Rep 1	A	Corophium sp.	1	0.036
	A	Ampleisca sp.	10	0.3
	B	unidentified bivalve	1	--
	B	Tellina sp.	10	1.114
	B	Ensis directus or E. minor	189	12.374
	D	Pinnixa sp.	1	0.109
	D	Libinia spp.	2	2.213
	D	Xanthidae	3	2.282
	D	Alpheus heterochelis	9	4.332
	G	Anachis avara	1	0.365
	G	Nassarius vibex	3	3.367
	O	unidentified isopod	1	--
	O	Phoronis sp.	fragments	--
	P	Nereis spp.	fragments	--
	P	unidentified scale worm	fragments	--
	P	Maldanidae	fragments	--
	P	Diopatra cuprea	fragments	--
	P	Pectinaria gouldii	1	0.46
	P	Arabellidae	6	0.958
	P	Glycera sp.	4	1.096
	P	Hesionidae	1	--
Plot A, Rep 2	A	Ampleisca sp.	7	0.274
	A	Corophium sp	3	0.047

	B	Tellina sp.	7	0.55
	B	Ensis spp.	151	12.53
	D	Upogebia affinis	1	1.662
	D	Xanthidae	2	4.48
	D	Alpheus heterochelis	2	0.94
	G	Odostomia sp.	1	0.049
	G	Anachis avara	3	1.074
	G	Polinices duplicatus	1	0.365
	O	Thyone briareus	1	80.1
	O	Phoronis sp.	1	0.012
	O	Ceriantheopsis americanus	fragment	--
	P	Diopatra cuprea	fragment	--
	P	Nereis succinea	1	0.036
	P	Drillonereis sp.	1	0.111
	P	Glycera sp.	1	0.3
	P	Maldanidae	2	0.083
	P	Sabellaria sp.	1	0.104
Plot A, Rep 3	A	Corophium sp.	1	0.108
	A	Ampleisca sp.	10	0.373
	B	Noetia ponderosa	1	2.53
	B	Tellina sp.	1	0.045
	B	Ensis spp.	178	12.42
	B	Ensis spp.* (note large size)	1	8.344
	B	Tagelus spp.	1	0.07
	D	Xanthidae	2	0.787
	D	Palaemontes sp.	2	0.531
	D	Libinia emarginata	1	4.108
	D	Upogebia affinis	1	0.989
	D	Alpheus heterochelis	6	2.745
	D	Libinia dubia	1	0.845

	G	Anachis avara	2	0.569
	O	Thyone briareus	1	56.35
	O	Phoronis sp.	fragments	--
	P	Capitellidae	fragment	--
	P	unidentified scale worm	fragments	0.723
	P	Arabellidae	5	0.886
	P	Glycera sp.	3	0.109
Plot B, Rep 1	A	Corophium	2	0.065
	A	Ampelisca sp.	1	0.032
	B	Macoma phenax ?	1	0.614
	B	Macoma balthica ?	1	0.079
	B	Anadara ovalis	1	87.02
	B	Tellina sp.	28	2.557
	B	Tagelus spp.	5	3.35
	B	Ensis spp.	119	30.533
	D	Upogebia affinis	2	0.49
	D	Libinia dubia	1	0.257
	D	Alpheus heterochelis	3	0.757
	D	Callianassa atlantica	1	2.432
	D	Xanthidae	1	0.689
	G	Turbonilla interrupta	1	0.006
	G	Anachis avara	3	0.715
	G	Nassarius vibex	1	1.111
	P	Flabelligeridae	1	0.087
	P	Harmothoinae	1	0.345
	P	Arabellidae	5	1.504
	P	Neries succinea	1	0.117
	P	Terebellidae	1	0.108
	P	Maldanidae	3	0.108

Plot B, Rep 2	A	Ampleisca sp.	13	0.604
	A	Corophium sp.	4	0.123
	A	Caprellidae	2	0.019
	B	Ensis spp.	41	4.418
	B	Anadara ovalis	1	4.651
	B	Tellina sp.	26	2.47
	D	Alpheus heterochelis	1	0.208
	D	Libinia emarginata	1	9.561
	D	Pinnixia sp.	2	0.098
	D	Xanthidae	1	1.239
	D	Palaemonetes sp.	1	0.608
	G	Mitrella lunata	2	0.02
	G	Anachis avara	4	1.244
	G	Crepidula plana	1	1.141
	P	Nereis succinea	1	0.018
	P	Maldanidae	fragments	--
	P	Notomastus sp.	2	0.01
	P	Diopatra cuprea	fragment	2.4
	P	Glycera sp.	2	0.082
	P	Sabellidae	1	0.039
Plot B, Rep 3	B	Ensis spp.	18	5.077
	B	Tagelus spp.	1	2.434
	B	Tellina sp.	2	0.191
	B	Anadara ovalis	1	19.348
	D	Libinia sp.	1	0.189
	D	Cancer sp.	1	5.78
	O	Cerebratulus lacteus	fragments	8.03
	P	Maldanidae	fragment	--
	P	Nereis spp.	3	0.082
	P	Arabellidae	3	1.015

	P	Phylodocidae ? (no heads)	fragments	0.99
	P	Glycera sp.	2	0.358
Plot C, Rep 1	D	Alpheus heterochelis	2	0.451
	D	Palaemonetes sp.	1	0.106
	D	Xanthidae	2	1.256
	D	Cancer sp.	1	2.731
	O	Chaetopleura apiculata	1	0.138
	O	Arbacia punctulata	1	6.579
	P	unidentified scale worm	fragments	--
Plot C, Rep 2	A	Ampelisca sp.	4	0.034
	B	Anadara transversa	1	5.56
	B	Ensis spp.	1	0.037
	B	Anadara ovalis	2	43.175
	B	Noetia ponderosa	1	8.824
	D	Alpheus heterochelis	1	0.684
	D	Libinia spp.	1	3.005
	D	Xanthidae	4	1.859
	G	Eupleura caudata	1	0.104
	G	Odostomia impressa	1	0.016
	G	unidentified gastropod	1	--
	G	Anachis avara	3	0.24
	O	Chaetopleura apiculata	4	0.418
	O	Gobiidae	1	0.013
	O	unidentified tunicate	2	--
	P	Hesionidae	2	0.008
	P	Glycera sp.	2	0.146
	P	Nereis spp.	39	6.48
	P	Glycera sp.	1	0.039
	P	unidentified scale worm	fragments	0.428

	P	Arabellidae	fragments	0.137
Plot C, Rep 3	A	Ampelisca sp.	1	0.05
	A	Corophium sp.	1	--
	B	Noetia pondersosa	1	1.68
	B	Anadara ovalis	1	0.286
	D	Alpheus heterochelis	2	0.67
	D	Pagurus annulipes	1	0.323
	D	Cancer sp.	2	9.356
	D	Xanthidae	18	19.347
	D	Libinia emarginata	1	13.712
	D	Pagurus pollicaris	1	4.15
	O	Ectopleura caudata	1	shell only
	O	Chaetopleura apiculata	12	2.4
	O	Astrangia astreiformis ?	fragment	--
	P	Lumbrineridae	12 + frags	0.255
	P	Hesionidae	6	0.122
	P	Arabellidae	1	0.058
Plot D, Rep 2	A	Ampelisca sp.	3	0.034
	B	Mulinia lateralis	1	0.149
	B	Ensis spp.	9	0.54
	B	Tellina sp.	24	2.392
	D	Pinnixia sp.	2	0.058
	D	Cancer sp.	2	0.036
	D	tiny hermit crabs in shells	4	--
	D	Xanthidae	2	1.125
	D	Alpheus heterochelis	1	0.611
	G	Anachis avara	13	3.16
	G	Nassarius vibex	2	1.904
	O	Erichsonella sp.	2	0.077

	O	Phoronis sp.	2	0.023
	O	Nemertea	1	0.114
	O	Chaetopleura apiculata	1	0.538
	O	unidentified anemone	1	0.063
	P	Diopatra cuprea	fragment	--
	P	Glycera sp.	2	0.141
	P	Arabellidae	3	0.276
Plot D, Rep 3	A	Ampelisca sp.	6	0.012
	B	Tagelus spp.	1	0.035
	B	Anadara transversa	1	0.475
	B	Ensis spp.	2	0.159
	B	Mulinia lateralis	1	0.124
	B	unknown bivalve	2	--
	B	Tellina sp.	18	1.389
	B	Anadara ovalis	1	45.24
	B	Mercenaria mercenaria	2	1.218
	D	Xanthidae	2	0.497
	D	Pinnixia sp.	1	0.029
	G	Nassarius vibex	1	0.999
	G	Anachis avara	2	0.432
	G	Acteocina canaliculata	1	--
	O	Erichsonella attenuata	2	0.108
	O	Thyone briareus	1	22.12
	O	Phoronis sp.	fragments	0.049
	P	unidentified scale worm	fragments	--
	P	Nereis spp.	fragments	0.709
	P	Arabellidae	4	0.183

Appendix II. Benthic invertebrates (number of individuals and biomass) from Spider Crab Bay, (A) before and (B) after dredging. [Major taxa: A=amphipod, B=bivalve, D=decapod, G=gastropod, P=polychaete, O=other.]

(B)

Station	Major Taxa	Species	Number	Wet weight (g)
Plot A. Rep 1	B	Tagelus spp.	11	1.233
	B	Anomia simplex	5	4.628
	B	unidentified bivalve	2	--
	B	Ensis spp.	1	0.123
	D	Pagurus pollicaris	1	2.822
	D	Alpheus heterochelis	2	0.708
	D	Libinia spp.	2	24.304
	D	Xanthidae	11	3.177
	G	Anachis avara	2	0.446
	G	Credipula fornicata	9	4.174
	O	Arbacia punctulata	1	13.09
	P	Glycera sp.	1	0.085
	P	Arabellidae	fragments	--
	P	Hesionidae	15	0.539
	P	Nereis spp.	21	10.305
	P	Lumbrineridae	14	0.419
	P	unidentified scale worm	fragments	0.422
Plot A. Rep 2	A	Amphipoda	fragments	--
	B	Tagelus spp.	6	0.557
	B	Mulinia lateralis	1	0.073
	B	Anadara transversa	1	0.553
	B	unidentified bivalve	1	--
	B	Ensis spp.	2	2.16
	B	Mercenaria mercenaria	1	0.027

	D	Alpheus heterochelis	1	0.079
	D	Pinnixa sp.	1	0.039
	G	Crepidula fornicata	1	0.26
	G	Anachis avara	2	0.71
	O	unidentified anemone	1	--
	O	Chaetopleura apiculata	1	1.58
	O	Thyone briareus	2	97.55
	O	Phoronis sp.	frags in tubes	0.3
	O	Gobiidae	2	0.346
	P	unidentified scale worm	fragments	0.431
	P	Arabellidae	fragments	0.236
	P	Lumbrineridae	1	0.008
Plot A, Rep 3	A	Ampelisca sp.	1	0.005
	A	Caprellidae	1	--
	B	Tagelus spp.	4	0.267
	B	Anadara ovalis	1	3.81
	D	Xanthidae	3	0.222
	D	Alpheus heterochelis	2	1.041
	G	Crepidula convexa	1	0.18
	G	Anachis avara	6	1.727
	G	Nassarius vibex	1	1.278
	O	Gobiidae	2	0.131
	O	unidentifed anemone	1	--
	P	unidentified scale worm	fragments	0.059
	P	Hydroides hexagina	2	0.032
	P	Pectinaria sp.	fragment	--
	P	Arabellidae	fragments	0.685
	P	Nereis spp.	5	0.418
	P	Glycera sp.	2	0.232
	P	Lumbrineridae	fragments	0.089

	P	Cirratulidae	1	0.1
	P	Diopatra cuprea	1	0.16
Plot B, Rep 1	B	Macoma balthica	1	0.218
	B	Mulinia lateralis	1	0.075
	B	unidentified bivalve	1	--
	B	Ensis spp.	3	1.451
	D	Pagurus longicarpus	1	0.077
	D	Xanthidae	1	0.059
	G	Crepidula fornicata	1	0.752
	G	Crepidula convexa	1	0.244
	O	Phoronis sp.	frags in tubes	0.189
	O	Gobiidae	1	0.231
	P	Nereis succinea	3	0.531
	P	Maldanidae	2	0.143
	P	Glycera sp.	1	0.793
Plot B, Rep 2	D	unidentified hermit crab	1	0.035
	D	Upogebia affinis	1	0.106
	G	Crepidula convexa	1	0.094
	G	Nassarius vibex	1	0.996
	G	Anachis avara	1	0.335
	G	Polinices duplicatus	1	0.762
	O	Erichsonella sp.	1	0.033
	O	Phoronis sp.	frags in tubes	1.328
	O	Ceriantheopsis americanus	fragments	--
	O	Gobiidae	1	2.69
	P	Maldanidae	fragments	--
	P	Arabellidae	fragments	--
	P	Glycera sp.	1	0.063

Plot B, Rep 3	B	Ensis spp.	1	0.243
	B	Mercenaria mercenaria	1	275.5
	O	Phoronis sp.	1	0.005
	P	Arabellidae	1	0.081
Plot C, Rep 1	A	Corophium sp.	1	0.027
	B	Anomia simplex	2	12.633
	B	Xanthidae	5	2.726
	B	Macoma balthica	2	0.487
	B	Tagelus spp.	12	2.524
	B	unidentified bivalve	2	--
	B	Mercenaria mercenaria	4	700.28
	B	Noetia ponderosa	1	25.251
	B	Anadara ovalis	1	25.641
	D	Alpheus heterochelis	9	0.563
	D	Libinia emarginata	1	32.074
	D	Cancer spp.	1	2.172
	G	Crepidula fornicata	2	1.709
	G	Eupleura caudata	4	4.63
	O	Gobiidae	4	0.742
	O	Chaetopleura apiculata	1	0.229
	O	Thyone briareus	1	57.92
	P	Capitelidae	1	--
	P	Arabellidae	fragments	1.099
	P	Glycera sp.	fragments	0.148
	P	Nereis spp.	fragments	0.073
Plot C, Rep 2	B	Macoma balthica	7	4.409
	B	Anomia simplex	2	6.128
	B	Noetia ponderosa	2	23.793
	B	Tagelus spp	1	0.091

	D	Pagurus pollicaris	1	3.357
	D	Pinnixia sp.	1	0.007
	D	Libinia spp.	1	3.27
	D	Xanthidae	26	17.341
	D	Alpheus heterochelis	46	9.295
	D	Cancer irrorata	3	8.426
	G	Crepidula fornicata	1	0.796
	G	Crepidula plana	11	1.135
	G	Odostomia impressa	3	0.085
	G	Mitrella lunata	1	0.009
	O	Chaetopleura apiculata	2	0.306
	O	Arbacia punctulata	1	0.961
	O	Astrangia danae	1 colony	11
	O	Gobiidae	6	0.934
	P	Glycera sp.	1	0.039
	P	Arabellidae	fragments	2.588
	P	unidentified scale worm	fragments	1.431
	P	Lumbrineridae	7	0.111
Plot C, Rep 3	B	Macoma balthica	2	1.034
	B	Anomia simplex	1	17.978
	B	Mercenaria mercenaria	1	190.65
	B	Nucula proxima	2	0.18
	D	Alpheus heterochelis	57	7.33
	D	Heterocrypta granulata	1	0.09
	D	Pagurus longicarpus	1	1.275
	D	Xanthidae	20	15.41
	D	Cancer irroratus	8	28.221
	G	Crepidula fornicata	1	0.615
	G	Eupleura caudata	1	0.965
	G	Crepidula convexa	2	0.236

	G	Anachis avara	1	0.303
	G	Odostomia impressa	1	0.033
	G	Anachis transversa	1	8.846
	O	Thyone briareus	1	32.293
	O	Chaetopleura apiculata	1	0.179
	O	Gobiidae	2	0.412
	P	Lumbrineridae	2	0.04
	P	Hesionidae	4	2.08
	P	Nereis spp.	33	9.966
	P	unidentified scale worm	7	1.58
	P	Maldanidae	1	0.307
	P	Arabellidae	fragments	1.238
Plot C, Rep 4	B	Tagelus spp.	1	--
	B	unidentified bivalves	3	--
	B	Mercenaria mercenaria	1	108.67
	D	Heterocrypta granulata	1	0.139
	D	Cancer spp.	1	1.59
	D	Xanthidae	12	8.965
	D	Alpheus heterochelis	23	2.567
	D	Libinia spp.	1	2.382
	G	Crepidula convexa	1	0.14
	O	Gobiidae	3	0.35
	P	Nereis spp.	3	1.069
	P	Arabellidae	1	0.144
	P	unidentified scale worm	1	0.211
Plot D, Rep 1	B	Tagelus spp.	1	0.45
	B	Mercenaria mercenaria	2	0.119
	B	Ensis spp.	2	0.079
	B	Mercenaria mercenaria	1	27.602

	B	Tellina sp.	8	0.502
	D	unidentified mud shrimp	fragment	--
	D	Xanthidae	2	0.81
	O	unidentified anemone	1	0.313
Plot D, Rep 2	B	Tagelus spp.	4	0.402
	G	Crepidula convexa	1	0.158
	O	Phoronis sp.	4	--
	P	Nereis spp.	1	0.028
	P	Maldanidae	fragments	0.113
	P	Arabellidae	5	0.77
	P	Upogebia affinis	4	3.03
Plot D, Rep 3	B	Mulinia lateralis	1	0.144
	B	Tagelus spp.	11	2.278
	B	Mercenaria mercenaria	2	54.09
	B	Ensis spp.	3	3.35
	D	Xanthidae	3	0.667
	G	Crepidula fornicata	2	0.26
	G	Busycon canaliculatum	1	0.794
	O	Gobiidae	1	0.13
	P	Arabellidae	fragments	2.887
	P	Hesionidae	5	0.105
	P	Drillonereidae	fragments	--
	P	Maldanidae	2	0.034
	P	Glycera sp.	1	0.207
	P	Nereis spp.	3	1.589
	P	Upogebia affinis	2	0.708
	P	unidentified scale worm	fragments	0.665
	P	Diopatra cuprea	2	1.267
	P	Lumbrineridae	9	0.41

Appendix III - Clam dredge permits for the seaside of the Eastern Shore, September 1994- December 1995.

Dredger or Agent	Owner	Boat	Plat # (if available)
Fitchett, T.K.	Smith, David Ira	Vicky Lynn(8204L)	61.26
Lescallette, Ronnie	Farlow, Eddie	Vicky Lynn(8204L)	-
Fitchett, T.K.	Smith, David L.	Vicky Lynn	Burton's Bay
Fitchett, T.K.	Mears, Billy	Vicky Lynn	-
Fitchett, T.K.	Farlow, Eddie	Vicky Lynn	-
Fitchett, Thomas K.	Spence, George	Vicky Lynn	-
Fitchett, Thomas K.	Spence, George	Vicky Lynn	-
Smith, David	Farlow, Eddie	Vicky	Burton's Bay
Terry, H.M.	Terry, H.M.	Tug Hames	All Terry Ground
Terry, H.M.	Terry, H.M.	Tug Hames	-
Roberschet, David	Bell, B.L. & Sons	Three Brothers	-
Farlow, Eddie	Farlow, Eddie	Thelma	Burton's Bay
Farlow, John E.	Spence, G.O.	Thelma	-
Farlow, Eddie	Terry, H.M. Co.	Thelma	Paraby Ground
Farlow, Eddie	Spence, George	Thelma	-
Farlow, Eddie	Terry, K.	Thelma	-
Farlow, Eddie	Farlow, Eddie	Thelma	-
Farlow, Eddie	Farlow, Eddie	Thelma	Hog Island Bay
Farlow, Eddie	Robbins, Sam L.	Thelma	-
Farlow, Eddie	Robbins, Sammy	Thelma	-
Farlow, Eddie	Farlow, Eddie	Thelma	Burton's Bay
Farlow,Eddie	Farlow, Eddie	Thelma	69.7
Robins, Sammy	Parks, William T.	Sea Robbin	-
Robbins, Johnnie	Kilmon, Andy	Sea Robbin	-
Robbins, Sammy	Kilmon, Andy	Sea Robbin	-
Robbins, Johnnie	Parks, William T.	Sea Robbin	-
Robbins, Johnnie	Parks, Bill	Sea Robbin	John Mears Rock
Robbins, Johnnie	Curtis, Clifton	Sea Robbin	-
Robbins, Johnnie	Robbins, Johnnie	Sea Robbin	250
Robbins, John	Terry, H.M. Co.	Sea Robbin	-
Robbins, Johnnie	Robbins, Johnnie	Sea Robbin	-
Robbins, J.	Terry, K.	Sea Robbin	Humps Drain
Robbins, Johnnie	Robbins, Johnnie	Sea Robbin	-
Robbins, Johnnie	Robbins, Johnnie	Sea Robbin	-
Robbins, John L.	Robbins, John L.	Sea Robbin	250
Robbins, Johnny	Kilmon, Andy	Sea Robbin	-
Robbins, Johnnie	Robbins, Johnnie	Sea Robbin	77
Robbins, Johnnie	Robbins, Johnnie	Sea Robbin	-
Robbins, Johnnie	Robbins, Johnnie	Sea Robbin	250

Dredger or Agent	Owner	Boat	Plat # (if available)
Robbins, Johnnie	Robbins, Samuel	Sea Robbin	-
Brady, Walter Lee	Brady, Annie	Sea Gull	16432/149.76
Brady, Walter Lee	Brady, Walter Lee	Sea Gull	16338/16820
Brady, Walter	Brady, Walter	Sea Gull	South Bay
Brady, Walter	Brady, Walter	Sea Gull	100
Brady, Walter	Brady, Walter	Sea Gull	100
Brady, Walter	Brady, Walter	Sea Gull	149
Smith, David, Jr.	Terry & Co. (Pete)	Sabatage (3084AL)	-
Smith, David, Jr.	Spence, George	Sabatage (3084AL)	-
Smith, David, Jr.	Robbins, Sammy	Sabatage (3084AL	-
Smith, David Ira	Smith, David Ira	Sabatage (3084AL)	-
Smith, David, Jr.	Robbins, Sammy	Sabatage (3084AL)	-
Smith, David I., Jr.	Terry, H. M. Co.	Sabatage (3084AL)	-
Smith, David, Jr.	Spencer, George	Sabatage (3084AL)	-
Smith, David Ira, Jr.	Mears, Billy	Sabatage (3084AL)	-
Blanchard, Joseph	Parks, William T.	Phobe-Jo	-
Smith, David I., Sr.	Terry, H. M. Co.	Penny	Brant Hill
Smith, David I., Sr.	Smith, David I., Sr.	Penny	Burtons Bay
Smith, David	Lewis, Randy	Penny	-
Smith, David Ira, Sr.	Smith, David Ira, Sr.	Penny	207.38
Smith, David L., Jr.	Smith, David I., Sr.	Penny	-
Smith, David	Farlow, Eddie	Penny	-
Smith, David I., Sr.	Farlow, Eddie	Penny	-
Smith, David I.	Terry, K. S. Co.	Penny	-
Smith, David I., Sr.	Smith, David I., Sr.	Penny	Burtons Bay
Smith, David	Smith, David	Penny	10.33
Hamblin, John Larry	Hamblin, John Larry	Peggy Sue	-
Hamblin, Larry	Hamblin, Larry	Peggy Sue	Hog Island Bay
Hamblin, Larry	Hamblin, Larry	Peggy Sue	Hog Island Bay
Spady, Randy	McCready, Winfred	Miss Beth	10526 to 10530
Hancock, C. B.	Parks, William T.	Maria-Lynn	-
Parks, William T.	Parks, William T.	Lynn	74.2
Parks, Billy	Robbins, Johnnie	Lynn	-
Parks, William T.	Parks, William T.	Lynn	248.11
Park, William	Robbins, Samuel	Lynn	-
Parks, Billy	Robbins, Johnnie	Lynn	-
Parks, Bill	Terry, H. M. Co.	Lynn	North Ch/Brant Will
Parks, Bill	Curtis, Clifton Lynn	-	
Parks, William T.	Robbins, Sanuel	Lynn	-
Parks, William (Bill)	Parks, William (Bill)	Lynn	74.20
Parks, William T.	Parks, William T.	Lynn	248.11

Dredger or Agent	Owner	Boat	Plat # (if available)
Parks, William T.	Parks, William T.	Lynn	249.11
Parks, Billy	Kilmon, Andy	Lynn	-
Parks, Bill	Terry, H. M. Co.	Lynn	-
Parks, Billy	Kilmon, Andy	Lynn	-
Parks, B.	Terry, K.	Kathy	-
Curtis, James	Curtis, James	Joasha (1705)	45
Curtis, James	Curtis, James	Joasha (1705)	36/Seal Creek
Drewer, H. V. & Son	Drewer, H. V. & Son	Harvey Drewer	-
Curtis, James	Curtis, James	Francis (7914)	13841/35.21
Curtis, James	Curtis, James	Francis (7914)	7914/22.81
Curtis, James	Curtis, James	Frances	36
Curtis, James	Curtis, James	Frances	Swash Bay
Mears, Billy	Bell, B. L. & Sons	Denise	Gull Marsh/441.73
Mears, Billy	Bell, B. L. & Sons	Denise	Map 245-2760
Edwards, Douglas	Justis, Benny	Christina	-
Hamblin, Larry	Hamblin, Larry	Capt. Jim	Hog Island Bay
Hamblin, Larry	Hamblin, Larry	Capt. Jim	-
Hall, Billy	Hall, George E.	Billy Crystal	16624
Spady, Leonard R.	McCready, J. Steve	Betty	-
Spady, Leonard R.	Spady, Leonard R.	Betty	250
Spady, Leonard R.	Bell, B. L. & Sons	Betty	-
Parks, William T.	Robbins, John L.	Becky Lynn	-
Justis, Wayne C.	Justis, Wayne C.	Becky	60
Justis, Wayne	Justis, Wayne	Becky	60
Justis, Wayne C.	Justis, Wayne C.	Becky	65/Metompkin
Bowen, Robert L.	Bowen, Robert L.	Annie B. (9106)	All Bowen Ground
Parks, Bobbie L.	Justis, Clay	Ann	-
Schultz, David	Bell, B. L. & Sons	9470B	-
Bowen, Robert L.	Bowen, Robert L.	910L	-
Booker, Grayson	Scott, M. S., Jr.	8433P	-
Booker, Grayson	Parsons, George F.	8433P	-
Parks, John Dale	Justis, Benny	6320HH	-
Parks, John Dale	Parks, John Dale	6320HH	50/Metompkin
Bundick, Robert	Bundick, Robert	5745EE	3.51
Bundick, John	Bundick, John	5745EE	21.8
Pruitt, Morris	Pruitt, Morris	4352ZZ	-
Pruitt, Morris	Pruitt, Morris	4325ZZ	-
Curtis, Clifton	Curtis, Clifton	3153KK	-
Marshall, William	Marshall, William	3093R	-
Porter, Don	Drewer, H. V. & Son	1151TT	-
Bell, Tim	Bell, B. L. & Sons	4855	-

Dredger or Agent	Owner	Boat	Plat # (if available)
Roberschet, Dave	Bell, B. L.		Drum Hole
Reid, Jeffrey	Reid, Jeffrey		16804
William, Ray	Scott, M.		-
Dise, John	Parker, Alvin S., Sr.		-
Reid, Jeffrey	Reid, Jeffrey		15735