COTTAGE POLLUTION SURVEY OF THREE MILE BAY AND PICKEREL (BENNETT) BAY ON WHITE LAKE RENFREW AND LANARK COUNTIES

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Ministry of the Environment
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Southeastern Region

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&

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BY

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MUNICIPAL & PRIVATE ABATEMENT SECTION

SOUTHEASTERN REGION

ONTARIO MINISTRY OF THE ENVIRONMENT

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Summary

This report is the result of a survey completed on that part of White Lake located in Lanark County. A questionnaire was completed at each cottage and commercial operation with the emphasis placed on sewage disposal systems and water supply. Bacteriological water samples had been taken by the White Lake Water Quality Committee and the results were referred to extensively in this report. Upon reviewing all the information, it was felt that very little pollution is being caused by the cottagers.

Introduction

To begin with, White Lake is a shallow lake with a mean depth of eleven (11) feet and a maximum depth of thirty (30) feet. It has a water volume of 60,953 acre-feet and an annual inflow of approximately 66,000 acre-feet, with a good percentage occurring during the spring melt - thus indicating a turnover period of approximately one year. The general consensus of the population is that White Lake is in the eutrophic state; that is, a nutrient enriched lake. However, a report published by this Ministry - "Enrichment Status of Fourteen Lakes in the Southeastern Region of Ontario" by G.W. Robinson - indicates that this lake is more or less situated on a tightrope between the eutrophic and mesotrophic state.

During a twenty-three (23) day period during the months of July and August 1975, a survey of all the cottages, residences and commercial operations was undertaken in Three Mile Bay and Pickerel Bay. This consisted of approximately two hundred and twenty-five (225) cottages and five (5) tent and trailer parks (with marinas). A questionnaire (see figure 9) was completed at each inspection and the information obtained was used for this report. If any illegal or improper systems were in use at the time of the inspection, the owner was informed of the necessary steps to take in order that the situation could be corrected.

It was found that the general population of the lake, including those that owned the commercial operations, were very conscientious about the lake water quality and were very co-operative in all respects. As a result of this concern, the "White Lake Water Quality Committee" was formed and has been in operation since 1973. Each year, with the help of the County Health Unit, both from Renfrew and Lanark Counties, the Committee has taken periodic bacteriological samples of pre-designated areas.

During the first year of operation, three hundred and seventy-four (374) samples were taken throughout the lake on three different dates (see Table I). Prior to the summer of 1974, the samples were tabulated and appraised with the result that those areas with the high bacteriological counts were again sampled. This time, five (5) samples were taken at each of 27 points on five (5) different dates (see Table II). In 1975, twenty pre-designated areas were sampled including an area near each of the commercial operations on White Lake (See Table III).

With such a sampling program now in existence, it was felt that any additional sampling done by this Ministry would be a duplication and a waste of time.

It should also be pointed out that a report on the "Enrichment Status of White Lake" by G.W. Robinson, as well as a subsequent report entitled "Enrichment Status of Fourteen

Lakes in the Southeastern Region of Ontario" by the same writer, have been completed and were reviewed by the writer. With this information, and the bacteriological results mentioned above, a concentrated effort was made on the private sewage and water supply systems.

Cottages and Residences

As mentioned previously in this report, there are approximately two hundred and twenty-five (225) residences and cottages and five (5) commercial enterprises in Lanark County bordering on White Lake. Of these, at least 75% are situated at Three Mile Bay, an inlet of shallow water protected from the elements on three sides.

Due to the limited flow of the water, and the protection from high winds, this bay is easily susceptible to pollution. The population on this bay is almost equal to that of the remaining part of the lake and it was due to this consideration that a concentrated effort was made on this area.

Private Sewage Systems

From the information received, one hundred and twenty-six (126) cottagers still retained the use of a pit privy. Of these, only one case did not meet the standards as set by this Ministry - an individual who had placed his pit privy 10 feet from a marshy area of the lake. The remaining one hundred and twenty-five (125) cottagers mentioned above had their outhouse placed a minimum of 50 feet from the lake and for the most part from 100 to 200 feet.

Septic tank systems are the next most popular method of sewage disposal. Most of these systems have been

constructed since 1968 and, except for two, all appeared to be working efficiently. To further expand on this subject, those systems which did not have ponding in the tile bed area and which were the required distance from the high water mark of the lake were considered to be "working efficiently." However, thirty-seven (37) of the systems are substandard when compared to the regulations now in effect and enforced by this Ministry and local Health Units. On closer inspection, it was also noted that these systems were only operating due to the low volume of waste directed to them by the individuals concerned; that is, most units are occupied only on the weekends and for a few weeks during the summer. In addition, many of the units are used on conjunction with a leaching pit, thereby reducing greatly the liquid volume entering the tank and tile bed.

Of the two systems found to be polluting, one was situated on a small island and the other along the shore, both of which are located in Pickerel Bay. In the first case, the land available for a private sewage system was minimal, and the owner, who had the system built, did so to the best of his ability; however, the tile bed, which consisted of approximately 30 feet of tile, was placed within 10 feet of the water. Water samples were then taken and the following results obtained:

Area	Total Coliform	Faecal Coliform	Faecal Streptococcus per 100 ml.
Docks	25	0	10
Near Tile Bed	7,700	450	200
Ministry of Environment Criteria for Recreational Waters are as follows:	1,000	100	20

When presented with the results of the samples taken and an explanation given with regard to these results, the owner was very co-operative in that he admitted that his system was inadequate and was willing to take corrective action. After some discussion, an electric toilet (Humus) was purchased and is to be placed on the Island when the cottage is opened in the spring.

In the second case, the system contained a large septic tank with an overflow pipe leading to the open ground, and, from there, the effluent travelled a short distance (10 to 15 feet) to the lake. The individual was contacted and the corrective procedure commenced.

The remaining major sewage disposal system consisted of Flush-o-matic Toilets. Of the eighteen (18) systems investigated, only two (2) systems met with the present criteria of a 500 gal. tank and 150 feet of tile - both figures representing minimums. The remaining systems consisted of small steel tanks varying in size from 45 gallon to 300 gallon and contained small tile beds averaging less than 100 feet. Needless to say, some of these systems are danger-

ously small; however, the owners realize the potential hazards of overflowing their tanks and have confined the use of small tanks for toilet wastes only. With the economical use of one quart of water for each flush, the systems have been operating for several years with no visible signs of failure.

The remaining systems inspected during the survey included an electric toilet, 2 holding tanks, 1 cesspool and 2 pit privies equipped with containers and emptied at the dump or buried as required.

In the majority of cases, the waste water used in the cottages (wash water; bath and shower water, laundry water, etc.) is emptied into a leaching pit (more commonly known as a dry well). Of the two hundred plus inspections, eighty-seven (87) were recorded as having this Class II system (leaching pit). Although this is not an exact figure, it is not far off. Add to this figure forty (40) or fifty (50) residences with septic tank systems capable of handling the waste water and this leaves approximately 30% without any means of disposal.

When this survey was under progress, one thing was considered above all others - was the water used carried by hand or was it pumped? Those carrying the water by hand use much less water per capita than those with running water (indoor plumbing). Also, the waste water, when emptied by hand, was thrown over a wider area and absorbed into the ground within seconds.

When water is pumped to the house, more water is used and this water is usually drained in one small area. This concentrated flow is treated as a public health nuisance, since organic deposits from the kitchen sink, phosphates from the soaps, and perhaps urine from bath water are collected on the ground near the drainage pipe. This deposit is a natural breeding ground for bacteria, thus creating a health hazard to individuals and contaminating storm water, which, in many cases, reaches the lake within minutes. Of the units inspected, only six individuals were requested to construct leaching pits and two have already complied. Those who did not have running water were not approached on this matter for reasons mentioned in the last paragraph; however, some owners volunteered the information that they would be upgrading their systems in the near future.

Water Supply

Although this lake is well populated, much of the shoreline has been unapproachable except by boat. The west side of Three Mile Bay, for example, has had a road constructed only this year, and, even then, a large number of persons remain unserviced due to a lack of funds to continue that construction. Add to this number, those cottages on islands and those along the north shore of White Lake, and it can be understood why the majority of the people (84%) are still importing water for drinking purposes. The remaining 14% included ten (10) drilled wells, eight (8) dug wells, twelve (12) filter systems (with a disinfectant) and three (3) chlorinators.

Of those using imported water for drinking purposes, 55% to 65% have water pumped from the lake for household purposes such as washing, cooking, laundry, etc. Some of these individuals obtain their drinking water from neighbors, but a majority go to one of the commercial establishments, notably Echo Bay Campsite and Holiday Ranch. Others coming to their cottages bring water from the city, but are confined to a small supply if they must travel to said cottage by boat. When this supply is finished, the cottagers must resort to other means, such as those mentioned earlier in this paragraph.

In all the places inspected, the individuals from only one cottage mentioned to the writer that they used untreated lake water for drinking purposes - obviously with no known harmful effects. These cottagers were immediately informed of the potential hazards involved with regard to pathogenic bacteria and special emphasis was placed on the susceptibility of young children.

Drilled wells appear to be adequate but are confined to those areas serviced by roads. Dug wells, on the other hand, are a potential problem. Most of these wells are dug within 10 feet of the lake to a depth of 8 to 12 feet. All this does is allow water from the lake to filter through the soil into the dug well. Those using such a well were advised to get the water tested for bacteria at regular intervals - previous results recorded by the owners have been good.

Commercial Establishments

There are five (5) commercial operations situated on White Lake in Lanark County. Although other enterprises existed on White Lake, these were not surveyed due to the fact that they are situated in Renfrew County and would require additional man-days not available for this project. Of the five (5) establishments, four (4) were located on Three Mile Bay and one on Pickerel (Bennett) Bay. Various methods of sewage disposal (pit privies, large septic tank systems and holding tanks) were employed and each met with, or surpassed, the standards set by this Ministry. In each case, a detailed plan was made (not to scale) and can be seen at the back of the report in Figures 3 to 8.

In the case of Millar's Cove and Three Mile Bay Campsite, pit privies are used and water is hauled by hand from the well outlet to the individual campsites. Millar's Cove is confined to a very small area (approximately 3 acres) and has four (4) cottages - one doubling as an office - and three (3) trailers. In this particular case, pails are used in the outhouses and emptied as required. The waste water is minimal since it is carried by hand, and does not appear to provide a threat to the environment in that it is readily absorbed into the soil.

In the case of Three Mile Bay Campsite, there is a combined residence/office, a cottage, and twenty (20) trailer sites. Services for this establishment include two (2) septic tank systems (one for the owner's residence, and one for the cottage) and five (5) pit privies. The entire operation is

serviced by one well (a drilled well) with hookups to the house, cottage and a central point in the camping area. Except for the cottage and residence, the waste water is thrown onto the ground.

Although the facilities are somewhat primitive, the pit privies used by the campers are established well back from the high water mark (100+ feet) and, along with the septic tank systems, more than meet our regulations with regard to distances from the well, lake, and buildings.

A third establishment is the Echo Bay Campsite (see figure 5) which was created two (2) years ago on Three Mile Bay with fourteen (14) campsites, three (3) cottages and a store. The owner is now in the process of upgrading the facilities and is applying for additional campsites.

Six of the fourteen (14) campsites are serviced with sewers and all fourteen (14) are serviced by water. The six (6) lots serviced for sewage have interconnectable lines leading to two 1,000 gallon holding tanks connected in series. The store and residence of the proprietor, as well as the comfort station now under construction, have a similar setup in that they are each serviced by two 1,000 gallon holding tanks connected in series. Until the comfort station is completed, four (4) pit privies are used by the campers.

The three cottages, on the other hand, are each serviced by an individual septic tank system with a 500 gallon tank and 200 feet of tile. The owner has not been required to

empty these tanks as of this date but does intend to set up his own pump-out system. He has approximately three hundred (300) acres near the campsite and has looked into the possibility (with the local Health Unit) of establishing an area away from the lake for the disposal of septic and holding tank contents.

As for the water system, all lots, cottages and store are serviced by one drilled well with a flow of six gallons per minute (6 gpm). Two other wells have also been drilled, giving flow rates of 6 gpm and 1 gpm, but these have not been incorporated into the present water system as they have not yet been required.

The owner, as previously mentioned, has already made an application to increase the number of lots at the campsite. With the installation of holding tanks, and the establishment of a disposal site in a remote area away from the lake, the owner has taken good steps in order to ensure that the environment is protected. Aside from the pollution caused by the swimming and boating activity, the site is well controlled and this was confirmed by the bacteriological samples taken at the site during the summer of 1975 (see Table III) by the White Lake Water Quality Committee.

The fourth and largest trailer site on Three Mile Bay is Holiday Ranch. This site consists of a large Marina, five (5) cottages, a combination store/residence/office, and sixty-five (65) trailer sites, of which thirty (30) are under construction (see figure 6).

Each of the cottages and the residence has an individual septic tank system and tile bed. Since the owner bought the place only two years ago, he was not able to give the details of these systems; however, it is known that the systems must be approximately ten (10) years old and, from experience on this lake, it is probable that each of these systems are substandard with regard to the regulations now in effect. However, problems with these systems are non-existent at the present time.

Thirty-five (35) of the campsites are serviced with a central comfort station consisting of approximately eight (8) toilets, wash basins and six (6) shower stalls divided into two sections. A coin wash (two washers and two dryers) is also serviced at this station and is connected, as are the other facilities, to a 5,000 gallon septic tank and 2,000-foot tile bed.

The remaining thirty (30) campsites are to be serviced via sewers to a similar setup (5,000 gallon tank and 2,000-foot tile bed). A central washroom will not be built since the sites will be used only by self-supporting trailers in that washrooms will exist in each of the trailers. All sewage and waste water are to be directed to the tank.

The area is to be serviced by two drilled wells with unknown flow rates. Each site has its own hookup and, except for the thirty-five (35) original campsites, the waste-water is directed to the septic tanks. Of the sites not connected, some individuals have the use of a leaching pit

but the majority use the holding tank built into the trailer. The owner of the trailer site then empties the tank, as required, by a portable system and directs the waste to the septic tank system supporting the new sites.

As is the case of the other four establishments mentioned, the systems in operation are more than the required distance from the high water mark and do not appear to be detrimental to the lake.

The last remaining commercial enterprise to be discussed is the Pickerel Bay Lodge (see figures 7 and 8). The operation consists of ten (10) cottages, thirty (30) campsites, a marina, coffee bar and a residence. The operation is serviced by various separate systems and two (2) wells.

The coffee bar is serviced by a septic tank system (750 gallons) installed in 1974, and a drilled well. The residence also has its own system but the size is unknown. To service the thirty (30) campsites, there is a central comfort station consisting of six (6) toilets, wash basins and two (2) showers serviced by a large conventional septic tank system, and a coin wash (one washer and one dryer) serviced by a separate and smaller septic tank system. Another comfort station, situated at the south end of the area, is connected to three (3) tanks of 800 gallons. These tanks are connected in a series and are used as holding tanks. A drilled well near the residence is used to serve the campsites and comfort stations.

Nine of the ten cottages, although connected to conventional septic tank systems, have shared tanks and/or tile beds. Rather than try to explain the set-up, it is felt that the diagram, as seen in figure 8, is self-explanatory. The tenth cottage, due to inadequate land area near the cottage, has two 850 gallon tanks connected in series to act as holding tanks. In each tank, the partition was destroyed in order to give the 2,000 gallon volume required by this Ministry. It should also be pointed out that two of the cottages are connected to individual 250 gallon steel tanks and correspondingly small tile beds. Each of these systems are ten plus (10+) years old and, according to the owner, are designated to be replaced this fall or spring (1976). The systems were not malfunctioning at the time of inspection so the owner is replacing them at his own recognizance.

The cottages have water pumped from the lake to meet their daily demands but obtain their drinking water from a drilled well situated across from cottage #3. This well is not hooked up to the cottages to prevent its use for other purposes and the arrangement has worked much to the satisfaction of the individuals and the owner.

Of the five establishments inspected during this survey, each of the owners was concerned with the water quality and pointed out that their business depended upon its condition. As a result, each was very co-operative in supplying the information required and each accompanied the writer on a tour

of his operation. As indicated many times before, the sewage disposal systems, although not always meeting present day standards, are situated a good distance from the lake and in no way appear to be polluting. Granted, the swimming and boating activity add some pollution, but it is these activities that attract the public to the lake.

The basic problem with the tent and trailer parks is the concentration of people in a small given area. Each campsite must have, according to the Ministry of Industry and Tourism, at least 1,600 sq. ft. per lot. Add together the number of lots at each campsite and it is believed that, at peak time, the population of the lake is expanded by 50% in the Three Mile Bay area alone. However, judging from the bacteriological results obtained over the last three years, and the secchi disc and chlorophyll a readings as interpreted in the Ministry report "Enrichment Status of Fourteen Lakes in the Southeastern Region of Ontario," the heavy concentration of individuals has not added to the pollution of this lake to any noticeable degree. Since a lake such as this, close to an urban area, has a high demand for recreational activity, it is felt that the commercial operations should be allowed to continue as long as the water quality is not adversely affected.

General Water Quality

As previously stated, the results of the bacteriological water samples are listed at the back of this report in Tables I, II and III. In each of the tables, the total and faecal coliform count/100 ml. are given as well as their locations (figures 1 and 2).

In 1973, there were three hundred and seventy-four (374) sample locations (see figure 1) throughout the lake with concentrated efforts on the more populous regions. Samples were taken on May 27, July 29 and September 16, and, in most cases, the coliform counts were either very low or non-existent. Upon reviewing the statistics, it was learned that only one sample had a total coliform count exceeding one thousand (1,000) and only nine (9) samples had a faecal coliform count exceeding one hundred (100). In each of these cases, the previous and the subsequent samples had values well within the criteria as set by this Ministry for recreational waters. It was also interesting to note that most of the higher figures were obtained on July 29, the peak time for cottagers and campers.

The Water Quality Committee, after reviewing the results, concentrated their 1974 sampling program on the twenty-seven (27) worst areas (see figure 2). Five samples were taken at each area, with one sample taken on each of the following dates - August 8, August 25, September 2, September 8 and September 15. Although the results (total and faecal coliform counts) are generally higher, they are, except for seven (7) individual cases, within the limits as set by this Ministry.

As in the previous year, those samples which exceeded the limits did so only once in any given area; in fact, the geometric mean of those areas mentioned above (those that exceeded the limit) gave good results.

Note: "Recreational waters can be considered impaired when the coliform, faecal coliform and/or enterococcus geometric mean density exceed 1,000, 100 and/or 20 per 100 ml. respectively; in a series of at least ten samples per month."

The 1975 sampling program (see Table III) commenced in May and ended in September. It consisted of twenty (20) samples taken on each of the following dates - May 19, July 1, August 1 and September 1 (see figure 1 for the designated areas). Included in this program are sampling points (sample 5 to 9) taken at each of the five (5) commercial establishments mentioned in this report.

The sampling points, as in the previous year, are believed to be the most "polluted" areas of the lake, but a review of the results indicate that only one sample (sample 3), taken on July 1, exceeded the limits. The remaining samples were well within the requirements, including those taken at sample point 3 on the three remaining dates.

Except for the odd sample, the results throughout the lake have been generally good. The geometric mean of each of the twenty sample points used in the 1975 survey was calculated to offset the odd bad result giving a truer picture of the situation. The results confirmed the previous statement in that each of the so-called "worst areas" had a very low coliform count. It would appear, from the results now listed (the

inconsistency), that the origin of the high counts could be organic material other than sewage and/or contamination due to animals.

The twenty-three (23) day period used for this survey was completed on August 17, 1975 and during this period, notably the week of August 3 to 9, temperatures exceeding 30^{o} C occurred. It was observed that the aquatic plant growth greatly increased to the extent that growths were visible near the water surface level, thereby reaching a length of five to seven feet. Previous to this, the plants had existed but had remained on a lower level. Many of the individuals on the lake commented on this fact and mentioned that this was the worst year since 1962, when plant growth hindered the use of motor boats to such an extent that individuals had to clear pathways to their cottages. By August 18, 1975, plant growth had been deteriorating for almost a week and had appeared to obtain their normal level.

To further expand on the subject, the water level, previous to 1970, had been more erratic than what is presently the case and the resulting lower water levels could account for additional problems encountered with aquatic plant growth. In 1970, the old dam at Waba Creek (built in 1845) was replaced by a new dam and the water was maintained at a more constant level. During the summer of 1975, however, rainfall was below average and as of August 16, 1975 the water level at the dam was 4.20 feet as compared to 4.54 feet in 1974 on the same date. With this lower depth, the penetration of the sun's rays were at a higher level and this factor as well as

that of the water level could have abetted the growth of the aquatic plants above all others.

It was also during this period that the writer was approached by a cottage owner with regard to an unusual situation encountered by a diver. It is understood that a diver, equipped with oxygen tanks, and a light, encountered a zone at a given depth whereby the light could not penetrate but his body could. A depth sample was taken at the area mentioned (north side of Hardwood Island) and the results appeared to be a fine organic material in suspension at the bottom of the lake, probably to a depth of two or three feet.

Further investigation revealed that a core sample had already been taken by this Ministry near Hardwood Island. This sample confirmed the above to some degree in that there was ten (10) feet of water, then ten (10) feet of suspended material followed by ten (10) feet of pure organic material.

Aside from these observations, and those concerning aquatic plant growth, no other tests were taken as this would duplicate efforts being completed by the Water Quality Committee of White Lake and another section of this Ministry.

However, information received from D.L. Galloway, Biology Officer, Ministry of the Environment, indicated that the "algal concentrations as reflected by chlorophyll a levels can be allowed to reach, but not exceed, a mean of five (5) micrograms per litre (ugm/l) over a season." When compared to the mean of approximately 3.0 micrograms per litre (ugm/l) for White Lake and using a margin of 70% against overdevelopment - giving a maximum predicted chlorophyll a reading of 4.4

micrograms per litre (ugm/l) - it is estimated that an additional loading of 623 kilograms per year (on top of the existing load) could be handled (according to Dillon (1975)). "With an estimated phosphorous supply of 462 kilograms from the existing shoreline establishments" as stated by Mr. Galloway, "it is apparent that there is considerable capacity for future development" in that the present artificial loading is only 43% of the allowable.

Conclusion

Fifteen years ago, according to some individuals, there was an outhouse located over the lake itself; now, with the educational program on pollution going full steam, cottagers, and the public in general, have become very conscientious about the water quality of their playground. This is carried to such an extent that, for the most part, sewage disposal systems are located two and three times the required distance from the lake. Those that are not, and do not meet the requirements, are asked to do so or are reported to the proper authorities.

However, many of the systems now used by the cottagers are substandard with regard to the regulations now in effect (other than setback distances from the lake). The owners using these systems realize their potential and have taken care not to overload them. To add to this, the systems are used, for the most part, on weekends, and for two or three weeks during the summer season. Now, with better roads, and the advent of snowmobiles, more and more cottagers are using the place throughout the year; in fact, many plan to use their cottage permanently upon retirement. This additional use of the cottage could lead to failures within these systems which would have to be rectified immediately. This problem is recognized but, since the units appear to be operating efficiently at the moment, the owners were not requested to upgrade their systems.

As the road is finished along the west side of Three Mile Bay, more wells will be drilled by individual owners;

however, most will continue to operate their water pumps, using lake water and importing their drinking water. Since much of this drinking water is obtained from the tent and trailer parks, which also have a large population to serve, it is felt that some control over the water quality of the wells should be maintained. Taking into consideration the number of trailer parks on White Lake, as well as those throughout the County, it is recommended that the onus be put on the individual owners to take at least one sample per week from each well, these to be analyzed and the results sent to the District Office, Ministry of the Environment.

With the information gathered for this report, it is believed that very little of the so-called pollution in this lake is caused by private sewage disposal systems, or, for that matter, those of the five (5) commercial establishments investigated. In essence, it is nature that has placed this lake in its present state. Combined with the information that was provided earlier, in that White Lake is on the borderline between the mesotrophic state and the eutrophic state, and additional information stating that the phosphorous supply to the lake was well under the allowable, it is felt that the lake is in a stable condition.

RWD/hf

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TABLE I

WHITE LAKE WATER (BACTERIOLOGICAL) SAMPLE RESULTS - 1973

Total/Faecal Coliform Organisms

Sample Point	Sample Location	May 27, 1973	July 29, 1973	September 16, 1973
1		2/0	10/2	20/0
2		6/6	0/0	40/2
3		0/0	35/2	10/8
4		10/0	25/6	100/0
5		6/0	30/2	15/2
6		4/4	15/2	0/0
7		2/2	10/4	60/22
8		2/2	10/0	15/0
9		40/40	25/14	10/2
10		14/10	2/2	10/4
11		40/40	125/34	5/4
12		76/72	85/6	80/8
13		2/2	10/0	30/10
14		24/18	10/2	
15		6/6	10/2	110/16
16		2/2	0/0	5/0
17)		16/12	5/0	5/0
18)	T. Bell	12/12	65/26	25/6
19)		4/2	45/20	20/6
20)		4/0	125/44	190/28
21		16/16	50/8	35/12
22		28/26	70/28	60/12
23		8/0	35/26	22/22
24		0/0	0/0	5/0
25		2/2	10/0	5/2
26		2/0	0/0	25/4
27		0/0	10/0	10/10
28		0/0	40/14	15/2
29		0/0	40/16	6/0
30		2/0	30/10	6/6
31		0/0	50/20	15/2
32		2/0	20/6	20/0
33		8/4	10/2	2/2
34		0/0	0/0	5/0
35		2/0	5/4	10/4
36		0/0	35/0	2/2
37		0/0	10/2	20/2
38		4/0	5/4	20/6
39		4/2	10/4	5/4
40		0/0	0/0	15/2
41		0/0	65/26	25/6
42		2/2	35/14	15/0
43		0/0	15/6	2/2
44		4/0	0/0	0/0
45		6/2	10/4	20/2
46		2/0	10/0	2/2
47		2/0	5/2	0/0
48		28/28	0/0	20/6
49		2/0	0/0	10/0
50		2/0	5/2	10/10

White Lake Water (Bacteriological) Sample Results - 1973

Sample Point	Sample Location	Total/Faecal Coliform Organisms May 27, 1973	July 29, 1973	September 16, 1973
51		2/0	15/4	100/2
52		2/0	60/8	35/4
53		6/0	10/2	15/0
54		6/0	25/0	70/6
55		2/2	10/8	45/2
56		0/0	15/4	95/0
57		4/4	10/10	20/10
58		4/0	8/8	30/6
59		2/0	10/4	40/8
60		4/0	15/12	35/20
61		4/0	20/2	30/12
62		0/0	25/8	75/6
63		6/6	55/6	80/2
64		0/0	20/4	55/4
65		2/0	50/2	110/16
66)		0/0	10/2	60/2
67)		2/2	40/2	85/22
68)		30/2	60/24	0/0
69)		12/6	10/4	0/0
70)	Bayview	4/2	75/6	30/0
71)	Lodge	2/2	15/2	25/0
72)		8/0	15/4	70/0
73)		2/0	10/8	10/2
74)		4/4	45/6	10/2
75)		2/2	65/4	No results returned
76)		14/4	120/30	60/0
77)		6/6	20/0	15/4
78		10/0	0/0	0/0
79		4/2	5/0	20/0
80		4/4	10/0	25/2
81		12/12	15/2	24/24
82		2/2	95/30	15/0
83		0/0	20/0	30/0
84		4/4	35/8	10/2
85		0/0	10/4	10/0
86		14/14	20/0	5/4
87		8/6	8/8	15/4
88		4/0	5/2	10/2
89		8/8	5/2	5/0
90		6/6	0/0	5/2
91		0/0	2/2	25/12
92		4/2	20/0	No results returned
93		12/10	10/6	10/2
94		10/0	10/0	20/20
95		0/0	34/14	25/2
96(a)		2/2	6/6	25/0
96(b)				45/34
97		0/0	5/2	40/6
98		4/0	15/0	5/4
99		0/0	0/0	20/4
100		2/2	0/0	0/0

White Lake Water (Bacteriological) Sample Results - 1973

Sample Point	Sample Location	Total/Faecal Coliform Organisms May 27, 1973	July 29, 1973	September 16, 1973
101		2/0	5/0	5/0
102		0/0	0/0	100/0
102(a)		0/0	30/4	2/2
103		4/4	15/10	5/0
104		0/0	5/2	0/0
105		0/0	5/0	20/0
106		2/0	5/0	10/0
107		0/0	25/0	5/0
108		8/0	0/0	5/0
109		80+/80+	10/0	0/0
110		10/0	10/2	10/2
111		2/0	10/0	5/2
112		0/0	350/0	0/0
113		0/0	2/2	10/0
114		6/0	15/0	5/0
115		2/0	5/2	2/2
116		0/0	0/0	0/0
117		2/0	15/4	0/0
118		8/0	0/0	4/4
119		0/0	0/0	0/0
120		0/0	5/2	4/2
121		2/2	2/2	5/2
122		0/0	5/0	0/0
123		0/0	25/6	5/0
124		0/0	0/0	5/0
125		12/4	15/8	0/0
126		2/2	30/0	2/2
127		4/4	0/0	0/0
128		0/0	5/0	4/4
129		0/0	5/0	10/0
130		0/0	5/0	10/8
131		2/0	10/4	5/2
132		2/2	No report-lab accident	5/0
133		0/0	5/2	2/2
134		0/0	5/0	0/0
135		0/0	0/0	5/0
136		12/2	5/0	5/0
137		2/0	10/0	0/0
138		6/4	45/4	0/0
139		6/6	5/0	0/0
140		8/0	4/4	4/4
141		0/0	25/2	5/4
142		0/0	20/2	5/2
143		0/0	4/4	0/0
144		0/0	15/0	5/2
145(a)		2/0	5/2	0/0
145(b)		2/0	5/0	0/0
146(a)		8/0	8/0	6/0
146(b)		8/0	8/8	5/0
147		0/0	10/0	2/2
148		2/0	10/0	0/0
149		4/0	5/2	0/0
150		10/0	0/0	5/0

White Lake Water (Bacteriological) Sample Results - 1973

Sample Point	Sample Location	Total/Faecal Coliform Organisms May 27, 1973	July 29, 1973	September 16, 1973
151		2/0	2/2	10/0
152		0/0	10/0	15/0
153		2/0	10/2	10/0
154		4/2	15/6	5/2
155		40/6	15/2	0/0
156)		24/16	5/2	5/2
157)		14/12	20/10	2/2
158)		0/0	25/6	5/0
159)		0/0	20/0	15/0
160)		6/0	30/6	10/4
161)	Pickerel Bay	8/8	5/2	0/0
162)	Lodge	0/0	15/0	15/0
163)		0/0	65/2	5/0
164)		0/0	50/1	5/0
165)		6/0	75/6	45/2
166)		2/0	25/4	40/2
167)		2/2	0/0	25/0
168		2/2	0/0	10/10
169		10/6	0/0	15/4
170		0/0	2/2	10/0
171		0/0	0/0	2/2
172		0/0	0/0	0/0
173		4/2	0/0	10/0
174		0/0	15/0	10/2
175		4/4	0/0	No result
177		2/0	0/0	0/0
178		26/0	0/0	0/0
179		6/0	0/0	0/0
180		2/0	0/0	25/0
181		8/0	4/4	0/0
182		2/0	0/0	5/0
183		8/2	15/0	5/0
184		4/2	0/0	0/0
185		0/0	10/0	5/2
186		0/0	10/6	5/0
187		2/0	5/2	10/0
188		2/0	0/0	2/2
189		4/0	2/2	10/4
190		0/0	0/0	2/2
191		4/0	0/0	4/4
192		2/2	0/0	0/0
193		4/0	0/0	5/4
194		0/0	2/2	0/0
195		4/0	0/0	5/0
196		4/0	0/0	20/0
197		0/0	0/0	5/0
198		2/0	0/0	15/0
199		0/0	5/0	6/2
200		0/0	100/86	5/4

White Lake Water (Bacteriological) Sample Results - 1973

Sample Point	Sample Location	Total/Faecal Coliform Organisms May 27, 1973	July 29, 1973	September 16, 1973
201		0/0	5/2	25/0
202		2/0	0/0	15/0
203		0/0	35/0	0/0
204		2/0	40/2	0/0
205		2/0	0/0	0/0
206		0/0	2/2	0/0
207		0/0	30/2	22/22
208		14/0	40/0	4/4
209		2/2	30/4	10/0
210		2/0	300/100	30/0
211		2/0	35/12	10/2
212		0/0	5/0	35/20
213		2/2	15/2	65/0
214		0/0	25/0	15/2
215		2/0	15/4	15/6
216		12/2	25/2	0/0
217		0/0	25/2	2/2
218		2/0	10/0	0/0
219		6/6	40/8	2/2
220		6/6	45/4	0/0
221		4/2	15/2	5/2
222		0/0	20/12	10/0
223		2/0	40/12	15/0
224		6/2	10/4	10/0
225		6/0	60/4	10/0
226		2/0	115/2	30/4
227		2/0	90/2	6/6
228)		2/2	20/8	10/0
229)	Millar's Cove	4/4	700/10	10/0
230)		22/22	1200/400	5/0
232		2/2	105/2	25/12
233		4/4	12/12	10/6
234		2/0	100/8	12/12
235		2/0	15/6	40/4
236		6/4	165/26	60/4
237		6/6	100/30	25/2
238		8/2	100/0	15/0
239		4/0	200/0	10/0
240)	Echo Bay	2/2	55/0	5/0
241)		0/0	50/0	35/0
242)		4/0	15/2	15/0
243)	Holiday	4/0	30/0	6/0
244)	Ranch	0/0	0/0	0/0
245)		4/2	200/2	100/10
246		8/8	20/4	10/2
247		16/0	100/4	0/0
248		14/4	5/4	5/0
249		12/10	0/0	5/2
250		4/2	30/0	2/2
251		8/2	15/2	15/4

White Lake Water (Bacteriological) Sample Results - 1973

Sample Point	Sample Location	Total/Faecal Coliform Organisms May 27, 1973	July 29, 1973	September 16, 1973
252)	Three Mile Bay	4/4	25/2	5/2
253)	Campsite	12/12	20/2	15/2
254		6/2	100/100	25/18
255		4/2	175/0	15/0
256		0/0	0/0	2/2
257		2/2	15/4	0/0
258		0/0	40/2	5/0
259		2/0	10/4	0/0
260		0/0	10/4	5/0
261		4/2	0/0	5/4
262		6/2	0/0	10/2
263		0/0	12/12	5/0
264		4/0	2/2	25/0
265		22/2	4/4	25/2
266		6/2	10/0	5/0
267		2/2	10/4	25/0
268		8/6	0/0	10/2
269		56/46	6/6	80/16
270		18/10	0/0	0/0
271		2/0	2/0	25/0
272		0/0	2/2	45/8
273		2/0	15/0	15/0
274		10/0	0/0	10/0
275		4/0	35/0	15/0
276		10/10	0/0	15/0
277		0/0	5/0	15/0
278		2/0	5/0	0/0
279		2/0	5/0	0/0
280		0/0	5/0	15/0
281		0/0	15/0	5/0
282		2/0	20/0	10/2
283		No result returned	100/16	285/100
284		0/0	60/8	15/2
285		4/4	5/2	5/0
286		2/2	100/0	10/0
287		0/0	5/0	15/0
288		2/0	80/4	20/2
289		6/4	15/2	5/2
290		4/0	10/4	15/0
291		0/0	2/2	10/4
292		0/0	0/0	15/4
293		0/0	5/2	5/0
294		12/0	40/6	0/0
295		0/0	0/0	5/0
296		4/0	10/4	10/2
297		2/2	5/0	5/2
298		16/0	10/4	4/0
299		2/2	40/0	0/0
300		10/0	25/4	5/2

White Lake Water (Bacteriological) Sample Results - 1973

Sample Point	Sample Location	Total/Faecal Coliform Organisms May 27, 1973	July 29, 1973	September 16, 1973
301		16/0	125/4	0/0
302		6/6	70/10	5/0
303		10/8	55/6	10/4
304		26/2	65/12	2/2
305		2/0	0/0	20/2
306		2/0	60/2	0/0
307		2/0	2/2	5/0
308		0/0	15/4	10/2
309		0/0	0/0	15/2
310		0/0	0/0	No result returned
311		2/2	15/8	5/4
312		2/0	5/2	2/2
313		4/2	10/0	10/6
314		6/4	5/0	20/20
315		6/6	0/0	No result returned
316		12/0	10/0	10/0
317		2/2	100/0	30/14
318		16/0	0/0	15/4
319		8/0	0/0	40/6
320		0/0	15/0	5/0
321		4/0	0/0	10/2
322		4/0	0/0	10/4
323		4/0	0/0	0/0
324		4/0	5/0	0/0
325		2/2	4/4	No result returned
326		12/2	10/2	10/0
327		4/0	6/6	5/0
328		4/0	10/2	No result returned
329		4/2	6/6	20/2
330		4/4	5/0	30/4
331		6/0	4/4	No result returned
332		0/0	15/0	15/0
333		0/0	2/2	20/2
334		0/0	2/2	100/100
335		4/4	0/0	12/12
336		2/0	10/0	10/6
337		0/0	70/2	5/2
338		2/0	10/4	8/8
339		0/0	4/4	5/4
340		0/0	0/0	100/100
341		4/0	60/0	20/2
342		0/0	12/12	30/0
343		20/0	10/2	20/2
344		22/0	10/0	0/0
345(a)		20/10	5/0	0/0
345(b)		2/0		
346		20/10	0/0	0/0
347		0/0	10/0	2/2
348		2/0	5/0	5/0
349		0/0	30/12	10/0
351		6/4	50/0	0/0

White Lake Water (Bacteriological) Sample Results - 1973

Sample Point	Sample Location	Total/Faecal Coliform Organisms		
		May 27, 1973	July 29, 1973	September 16, 1973
352		10/6	25/0	30/16
353		8/2	500/2	10/2
354		0/0	5/0	0/0
355		0/0	15/0	0/0
356		2/0	10/0	0/0
357		80/80	25/8	0/0
358		2/2	5/0	0/0
359		10/0	160/6	0/0
360		0/0	10/2	0/0
361		0/0	10/0	0/0
362		0/0	10/0	5/2
363		2/0	30/2	0/0
364		0/0	40/2	0/0
365		0/0	40/2	0/0
366		2/0	65/0	0/0
367		2/2	110/40	5/0
368		12/0	15/0	5/2
369		2/0	10/0	5/0
370		0/0	5/0	5/2
371		80+/80+	5/4	25/0
372		14/0	20/18	15/0
373		0/0	8/8	0/0
374		20/10	0/0	10/0

TABLE II

WHITE LAKE WATER (BACTERIOLOGICAL) SAMPLE RESULTS - 1974

Total/Faecal Coliform Organisms

Sample Point	Sample Location	Aug. 8	Aug. 25	Sept. 2	Sept. 8	Sept. 15
1	10	10/4	35/4	105/4	66/66	200/24
2	8	165/8	125/0	330/6	1000/74	220/74
3	T. Bell	36/36	15/0	45/6	160/32	1500/40
4	29	35/6	15/8	75/8	65/4	1800/22
5	31	65/4	60/0	55/6	200/84	3100/36
6	Bayview	65/0	95/2	190/18	165/8	235/46
7	Bayview (76)	35/4	60/2	185/2	30/4	2900/66
8	103		15/0	80/2	85/8	3800/200
9	118		10/0	50/2	15/0	100/10
10	127	25/2	25/4	75/2	35/4	85/28
11	154	50/2	30/2	50/0	40/36	100/10
12	Pickerel Bay Lodge	35/0	60/8	95/2	5/4	240/8
13	200	80/2	125/0	35/14	35/0	140/2
14	208	40/0	105/4	70/2	15/2	1800/12
15	220	8/8	75/16	140/2	125/2	110/46
16	226	0/0	45/0	110/2	185/0	85/12
17	Millar's Cove	0/0	235/4	90/16	17/5	100/8
18	Three Mile Bay Campsite	5/2	100/0	65/0	50/10	90/14
19	254	2/2	10/0	40/2	30/24	130/10
20	265	5/0	0/0	45/0	10/0	100/32
21	283	5/0	0/0	75/4	30/2	50/2
22	308	5/2	20/14	50/2	25/18	85/18
23	314	0/0	85/2	55/40	110/2	200/22
24	325	5/2	20/2	45/6	800/0	75/2
25	340	0/0	35/0	185/0	20/0	165/16
26)	259 to		0/0	5/2		
27)	261				120/10	60/18
27A)						125/44

TABLE III

WHITE LAKE WATER (BACTERIOLOGICAL) SAMPLE RESULTS - 1975

Total/Faecal Coliform Organisms

Sample Point	Sample Location	May 19	July 1	Aug. 6	Sept. 1
1	T. Bell	0/0	0/0	12/12	15/12
2	Bayview	0/0	20/2	20/2	60/6
3	Bennett's	0/0	315/152	20/0	15/8
4	W.L. Village Trailer Camp	0/0	115/0	15/0	195/20
5	Pickerel Bay Lodge	0/0	10/4	0/0	10/2
6	Echo Bay	8/8	0/0	15/4	25/8
7	Holiday Ranch	8/8	35/8	90/12	25/12
8	3 Mile Bay Campsite	0/0	0/0	5/2	45/2
9	Millers	8/8	5/4	60/24	60/18
10	210	2/2	0/0	0/0	70/4
11	230	50/8	45/22	20/10	6/6
12	269	5/2	0/0	0/0	5/0
13	31	10/10	0/0	5/2	5/4
14	368	20/2	5/2	6/6	5/0
15	325	0/0	5/0	0/0	5/2
16	340	0/0	5/0	0/0	5/0
17	200	5/2	20/8	5/0	10/2
18	283	15/14	95/4	20/2	155/22
19	112	0/0	0/0	0/0	5/0
20	359	0/0	10/10	25/0	10/0

TABLE IV

WHITE LAKE WATER (BACTERIOLOGICAL) SAMPLE RESULTS

Geometric Mean 1973 to 1975

Sample Point	Total Coliform	Faecal Coliform
Pickerel Bay Lodge	8.5	2.0
Bayview Lodge	19.2	3.1
T. Bell	20.3	6.8
Millar's Cove	20.8	4.9
Echo Bay	8.8	1.9
Holiday Ranch	10.8	2.3
3 Mile Bay Campsite	13.1	2.5
29	32.	5.2
31	23.2	5.0
103	38	5.4
200	20.1	3.0
208	45	2.3
210	8.2	2.6
230	32	13.8
254	21.6	6.6
269	8.5	2.8
283	34.	5.1
325	9.5	1.8
340	7.8	1.8

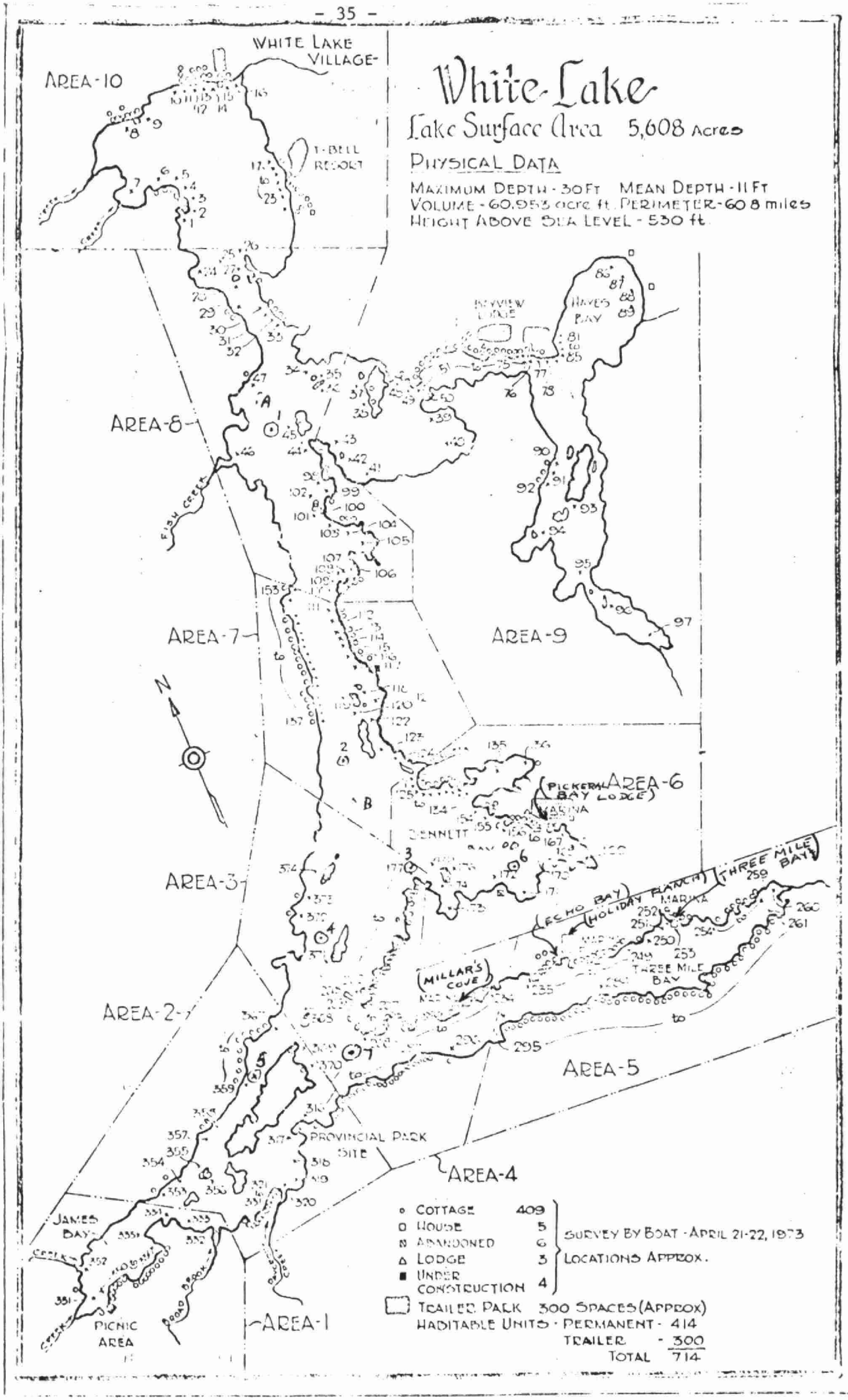
White Lake
Lake Surface Area 5,608 Acres
Physical Data
Maximum Depth - 30 Ft Mean Depth - 11 Ft
Volume - 60,953 acre ft. Perimeter - 60.8 miles
Height Above Sea Level - 530 ft
WHITE LAKE VILLAGE
AREA-10
T-BELL RESORT
BAYVIEW LODGE
HAYES BAY
AREA-8
FISH CREEK
AREA-7
AREA-9
N
PICKEREL BAY LODGE
AREA-6
MARINA
BENNETT BAY
AREA-3
ECHO BAY
(HOLIDAY RANCH)
MARINA
THREE MILE BAY
MILLAR'S COVE
AREA-2
AREA-5
PROVINCIAL PARK SITE
AREA-4
JAMES BAY
PICNIC AREA
AREA-1
Cottage 409
House 5
Abandoned 6
Lodge 3
Under Construction 4
Survey By Boat - April 21-22, 1973
Locations Approx.
Trailer Park 300 Spaces (Approx)
Habitable Units - Permanent - 414
Trailer - 300
Total 714

FIGURE 1

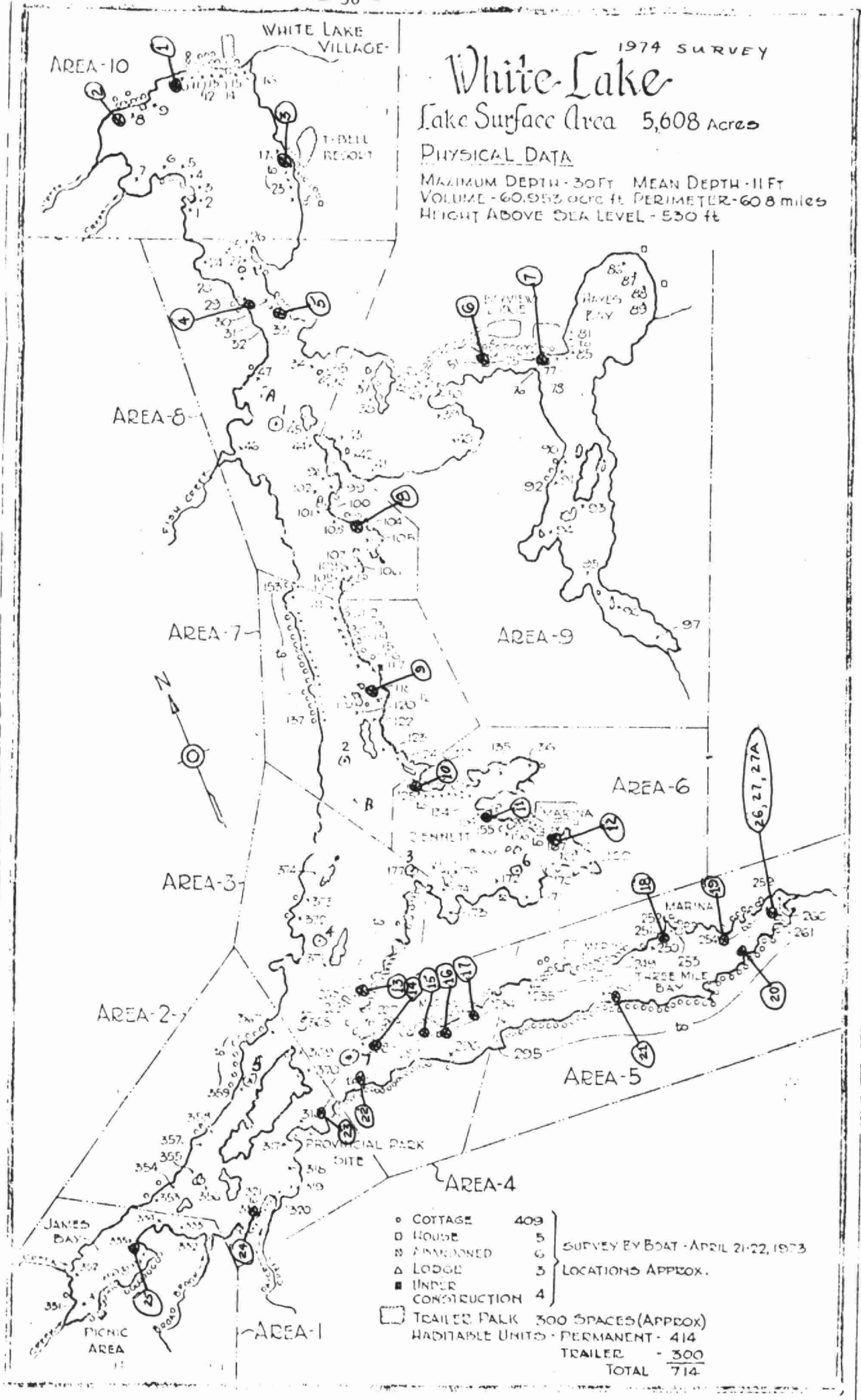
1974 SURVEY
White Lake
Lake Surface Area 5,608 Acres
PHYSICAL DATA
MAXIMUM DEPTH - 30 Ft MEAN DEPTH - 11 Ft
VOLUME - 60,953 acre ft PERIMETER - 60.8 miles
HEIGHT ABOVE SEA LEVEL - 550 ft
WHITE LAKE VILLAGE
AREA-10
T-BELL RESORT
AREA-8
AREA-7
AREA-9
AREA-6
AREA-3
AREA-2
AREA-5
AREA-4
AREA-1
MARINA
THREE MILE BAY
PROVINCIAL PARK SITE
JAMES BAY
PICNIC AREA
COTTAGE 409
HOUSE 5
ABANDONED 6
LODGE 3
UNDER CONSTRUCTION 4
SURVEY BY BOAT - APRIL 21-22, 1973
LOCATIONS APPROX.
TRAILER PARK 300 SPACES (APPROX)
HABITABLE UNITS - PERMANENT - 414
TRAILER - 300
TOTAL 714

FIGURE 2

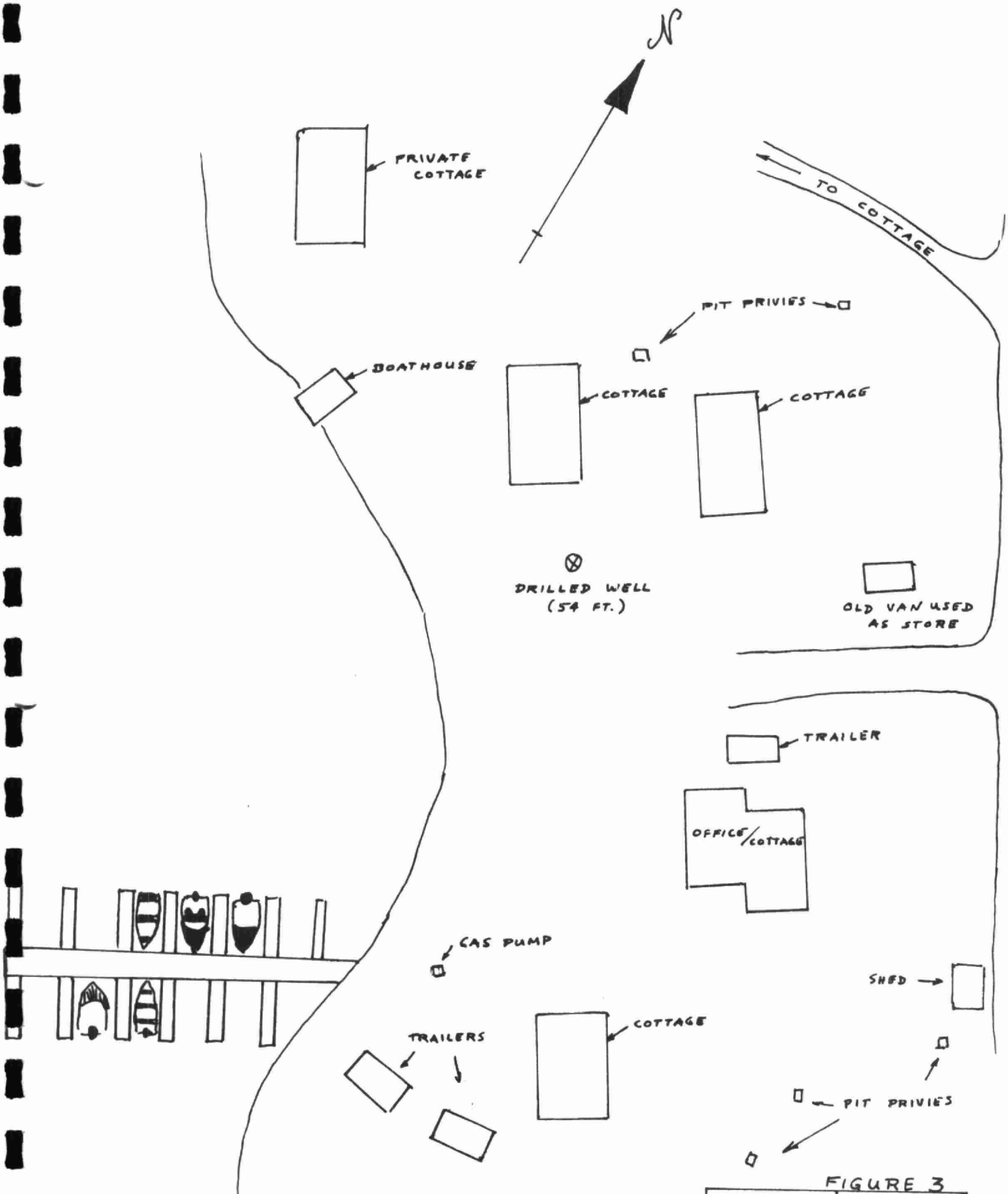

FIGURE 3

R. DOYLE	NOV 6, 1975
MILLAR'S COVE	
WHITE LAKE	LANARK CTY

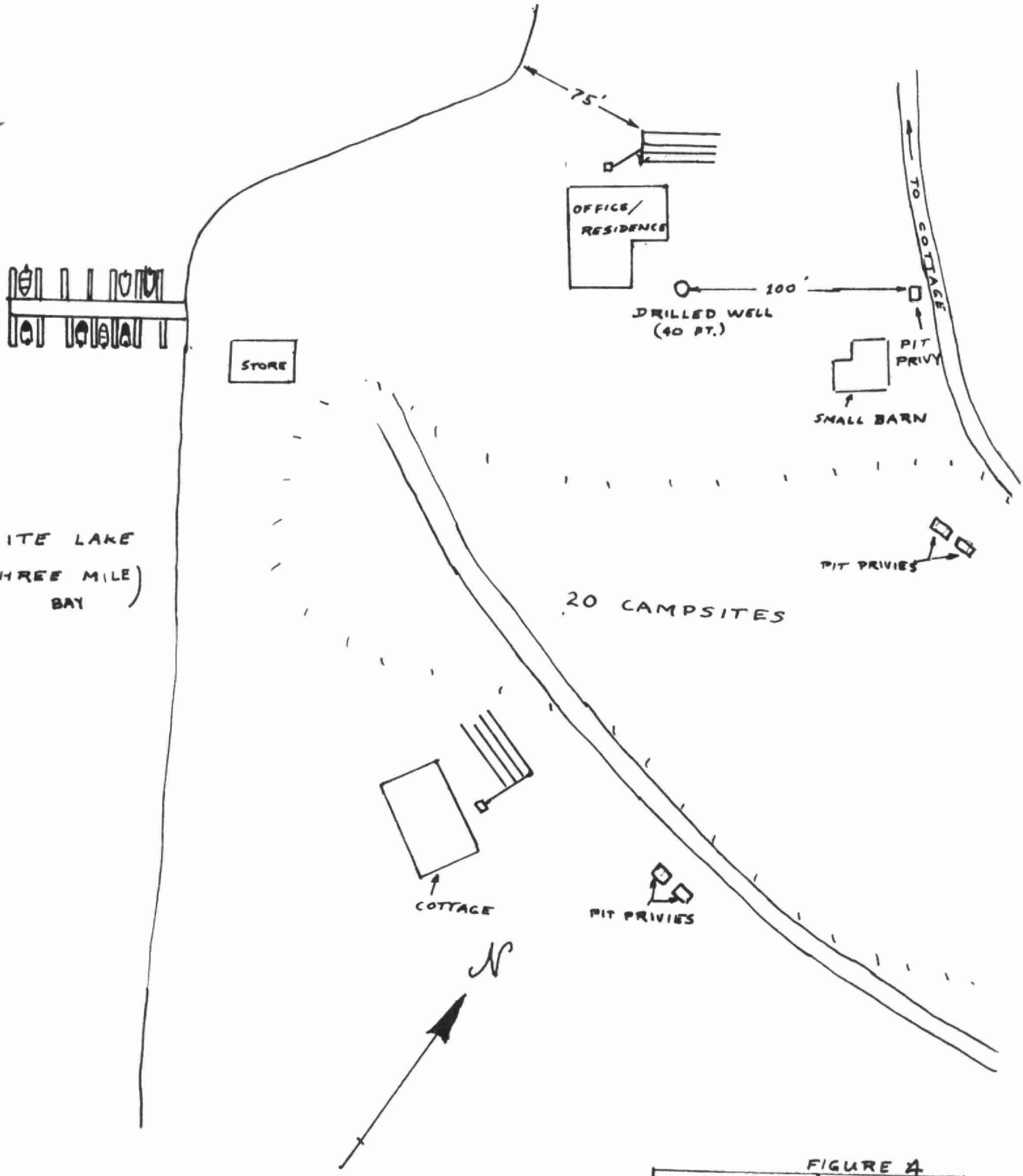

FIGURE 4

R. DOYLE	NOV 6, 1975
THREE MILE BAY CAMPSITE	
WHITE LAKE	LANARK CTY

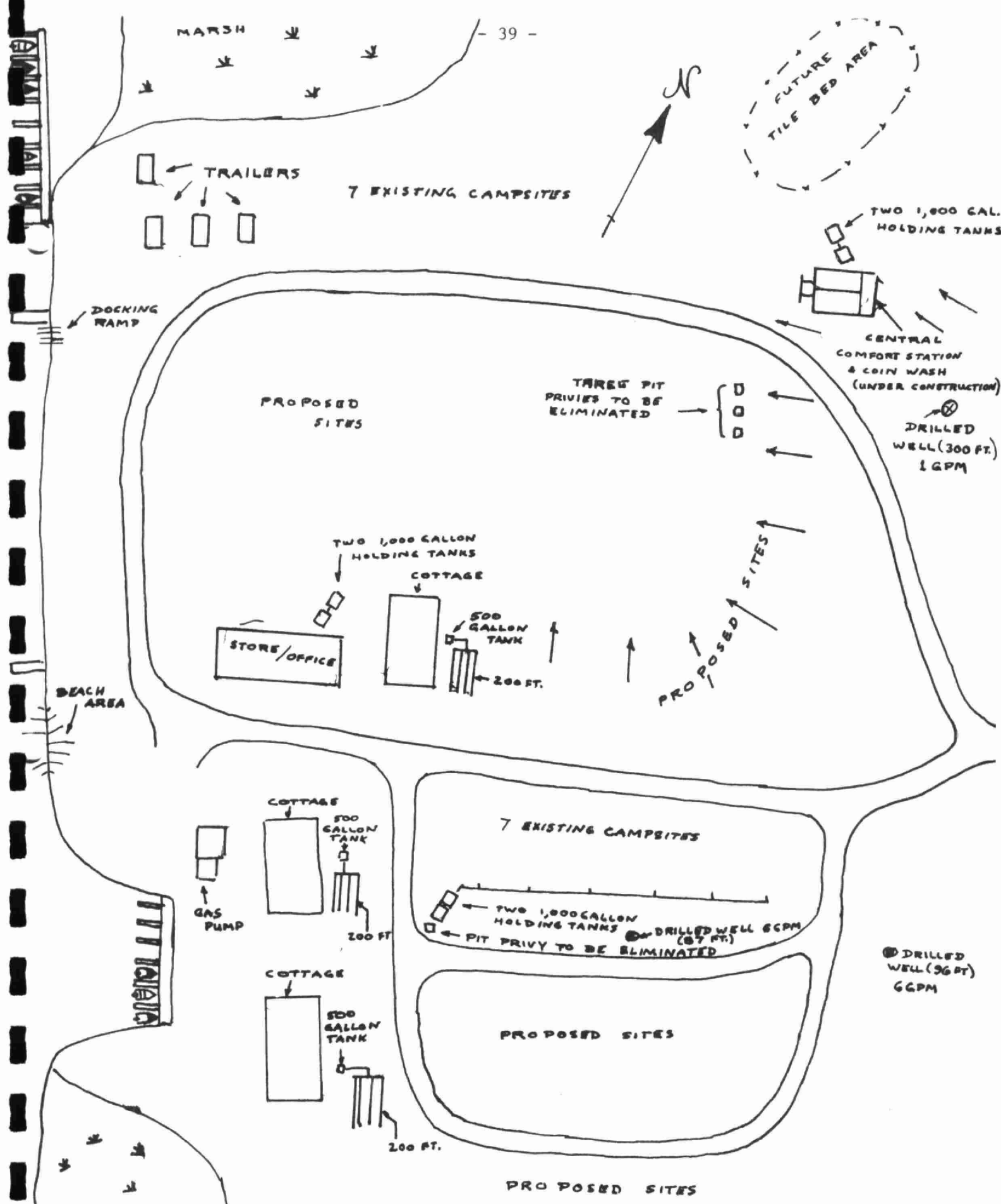

FIGURE 5

R. DOYLE	NOV 6, 1975
ECHO BAY CAMPSITE	
WHITE LAKE	LANARK CTY

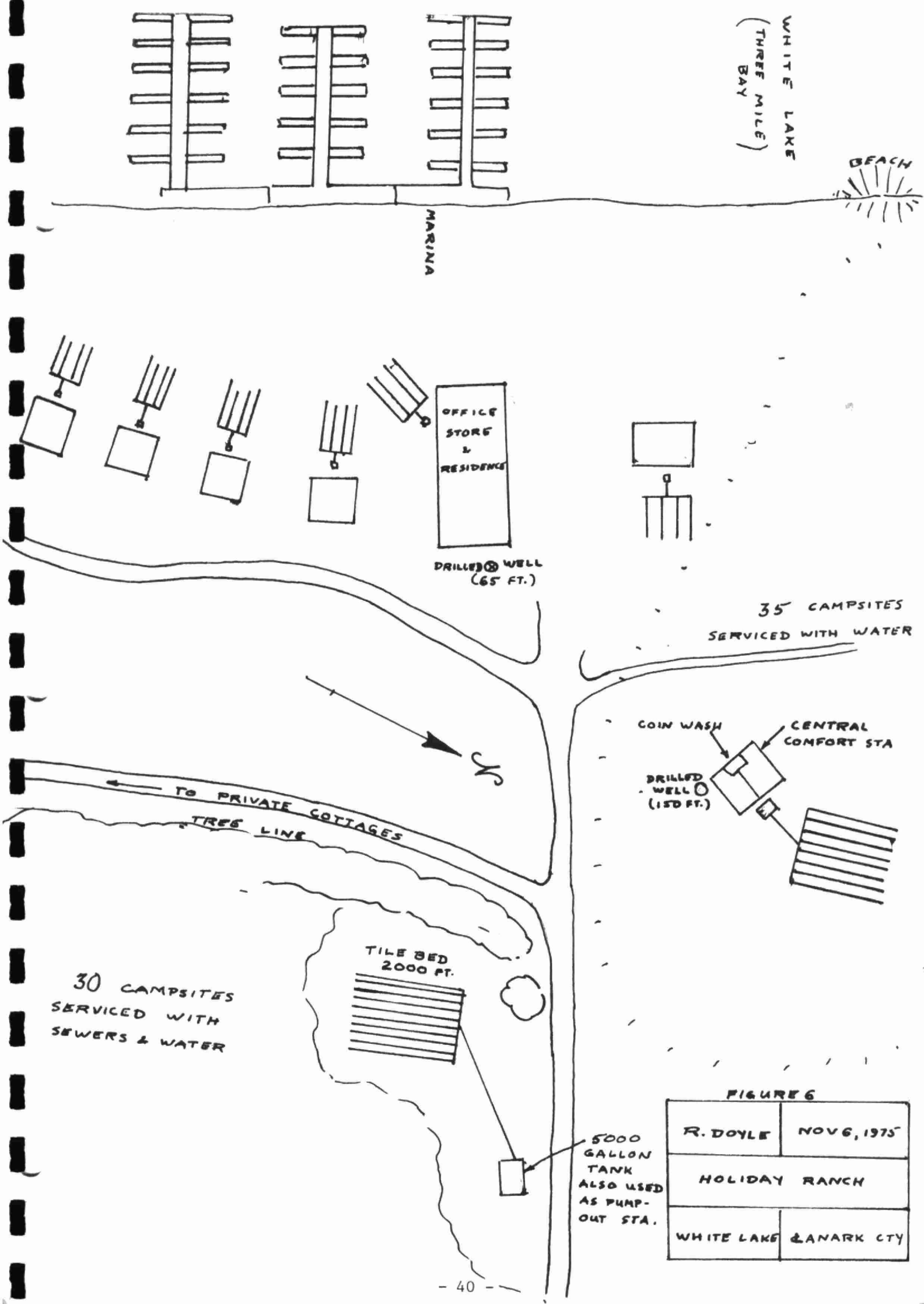

FIGURE 6

R. DOYLE	NOV 6, 1975
HOLIDAY RANCH	
WHITE LAKE	& ANARK CTY

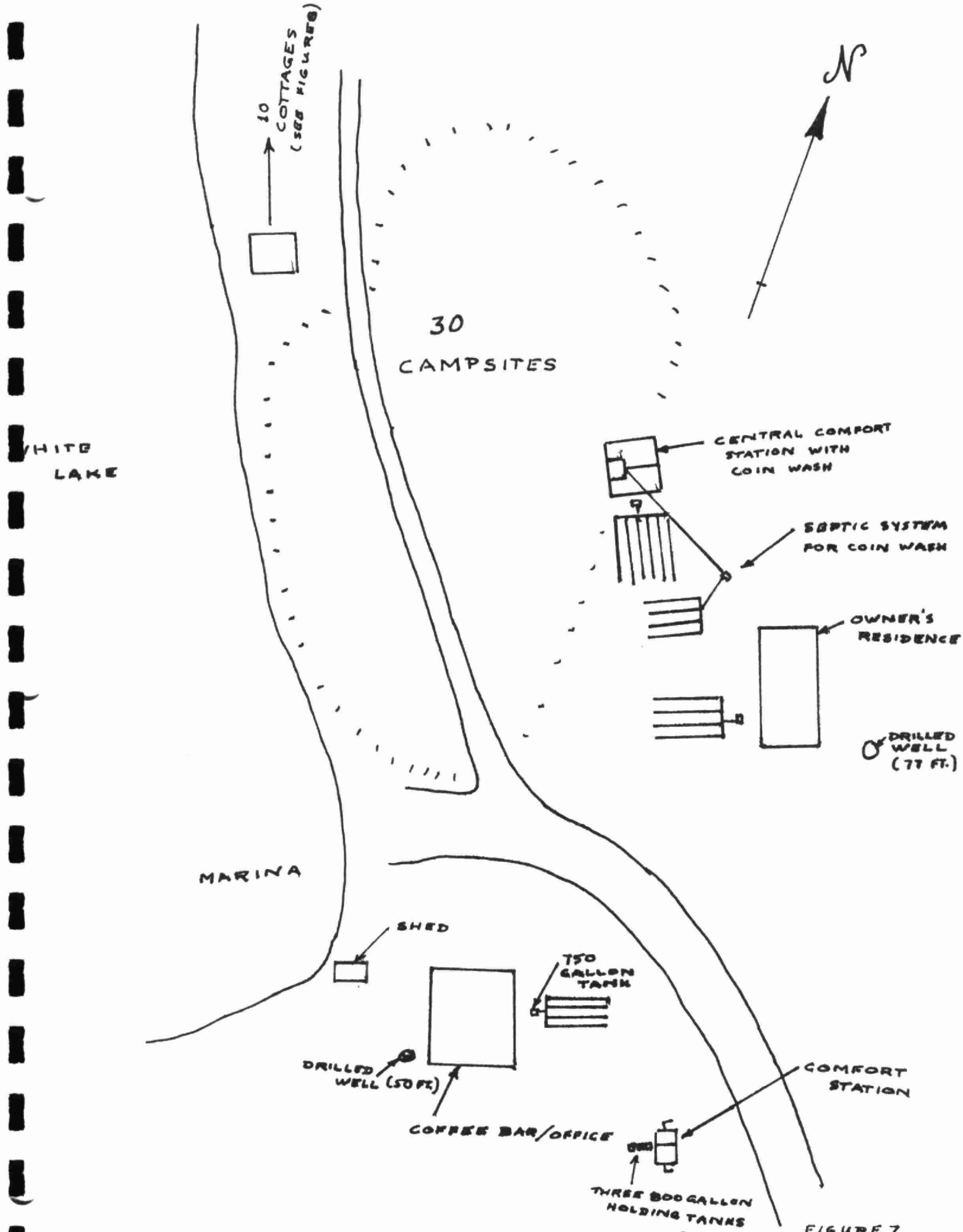

FIGURE 7

PICKERAL BAY LODGE	
WHITE LAKE	LANARK CTY

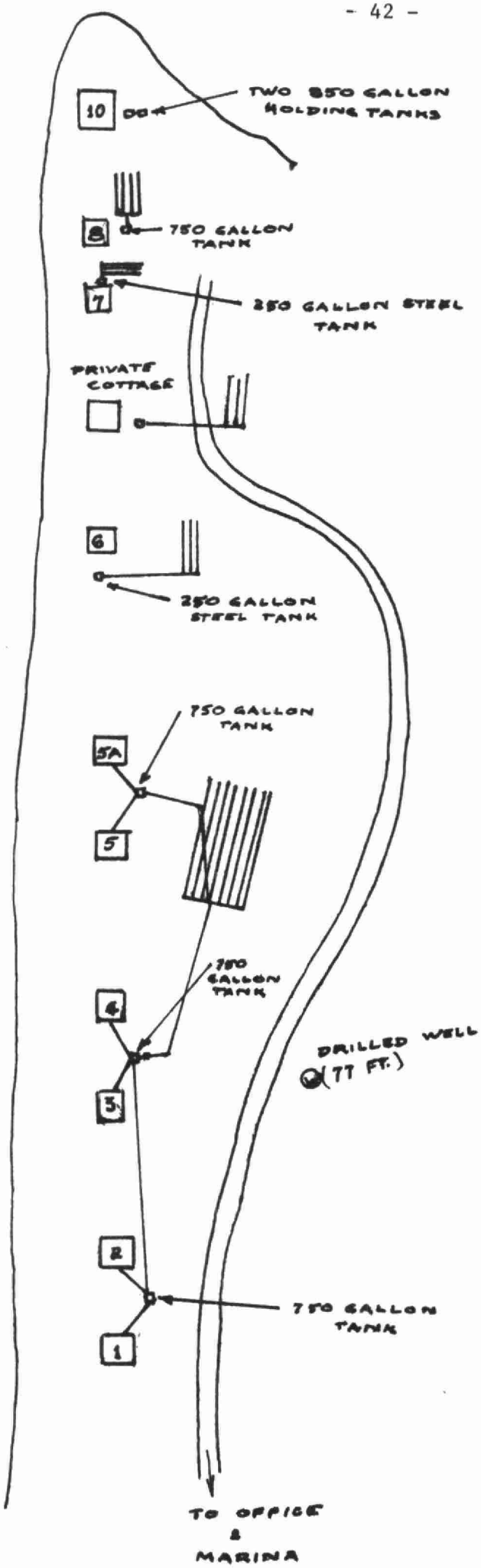

FIGURE B

R. DOYLE	NOV 5, 1975
PICKERAL BAY LODGE	
WHITE LAKE	LANARK CTY

Lake _____

Cottage Ref. No. _____

LAKE CAPACITY - FACILITY INVENTORY

I. Owner _____

Address _____ Tel. No. _____

II. Property Description:

Twp. _____

Lot _____ Conc. _____

Rock _____%

Swamp _____% Slope _____%

Is Lot subject to seasonal wetness _____

Cottage ☐
Perm. Res. ☐

Rented ☐
No. of Bedrooms ☐
No. of Persons ☐
No. of Bathrooms ☐

III. Services:

Type of Sewage Disposal:

Pit Privy ☐
Leaching Pit ☐
Cesspool ☐
Septic Tank ☐
Holding Tank ☐
Other ☐

Volume of Tank _____ Gal.
Length of Tile Bed _____ Ft.
Year Installed 19__
Type of Tank:
Steel ☐
Concrete ☐
Fiberglass ☐
Other ☐

Water Supply:

Drilled Well ☐
Dug Well ☐
Artesian Well ☐
Sand Pt. ☐
Other ☐

Depth of Well _____ Ft.

Comments:

IV. Sketch:

V. Comments:

FIGURE 9

Inspector _____