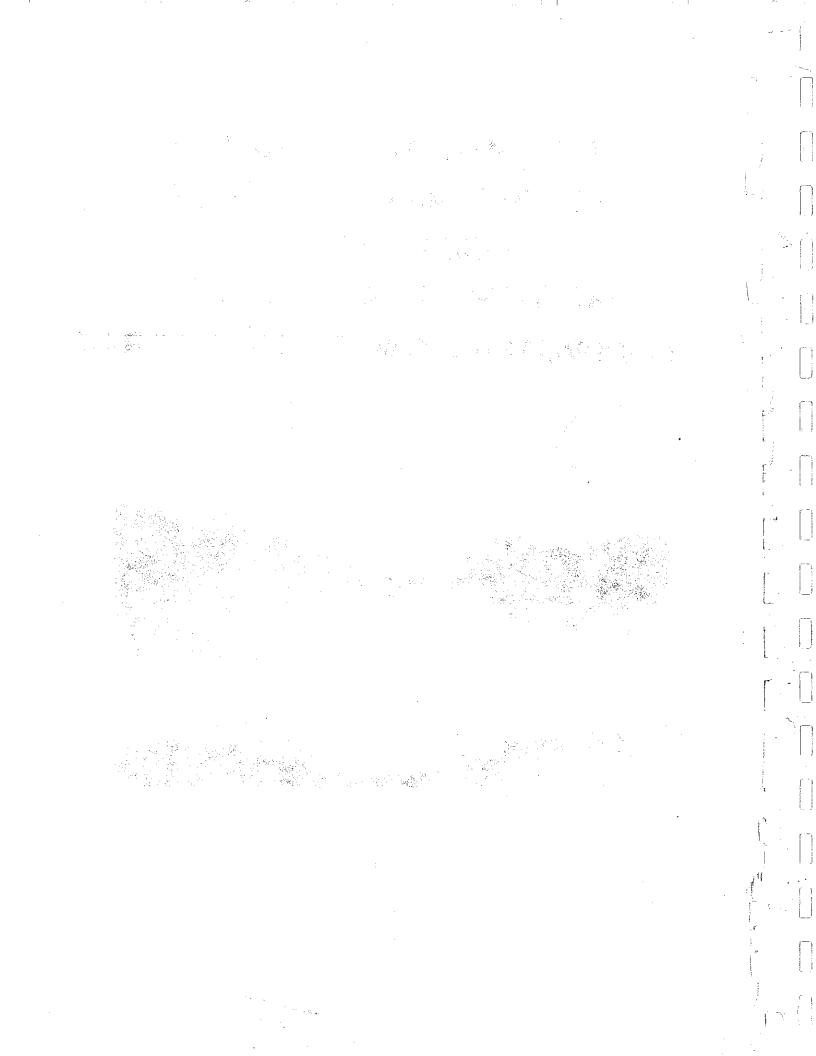
IMPLEMENTATION PROJECT FOR THE MANAGEMENT OF GREAT POND EASTHAM, MASSACHUSETTS: GROUNDWATER MONITORING PROGRAM





BAYSTATE ENVIRONMENTAL CONSULTANTS INC.



IMPLEMENTATION PROJECT

FOR THE MANAGEMENT OF GREAT POND,

EASTHAM, MASSACHUSETTS:

GROUNDWATER MONITORING PROGRAM

PREPARED FOR:

THE TOWN OF EASTHAM
TOWN HALL,
2500 STATE HIGHWAY,
EASTHAM, MASSACHUSETTS 01642

AND THE

DIVISION OF WATER POLLUTION CONTROL WESTVIEW BUILDING, LYMAN SCHOOL GROUNDS WESTBORO, MASSACHUSETTS 01581

PREPARED BY:

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JULY, 1991

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DISCLAIMER .

This report was funded under a cost sharing Substate Agreement between the Commonwealth of Massachusetts through its Division of Water Pollution Control (Division), Clean Lakes Program (Chapter 628, Acts of 1981) and the town of Eastham (Grantee). As stated in the Substate in the Substate Agreement (Paragraph A.3.11), the Grantee is required to submit a draft Final Report for the Division's review and comment. Subsequently, the Grantee must submit a Final Report that incorporates the Division's comments and corrections. Final payment of a 10% retainable would be released upon acceptance of the Final Report by the Division (Paragraph 1.7 of the Substate Agreement).

Prior to the completion of this Phase I project, most of the resources and staff of the Clean Lakes Program were reallocated by the Department of Environmental Protection. As one consequence of these actions a thorough and timely review of this report was not feasible. Since the Grantee and its subcontractor(s) should not be burdened unduly, the Division adopted an interim procedure of checking draft final reports solely to determine whether the Scope of Work (Appendix A of the Substate Agreement) had been met. This Draft Final Report has been checked by the Division, any discrepancies have been rectified by the Grantee or its subcontractor(s) and, at a minimum, it does fulfill all requirements specified in the Scope of Work. The Division has, therefore, accepted this report in accordance with Paragraphs 1.7 and A.3.11 of the Substate Agreement and released the 10% retainage to the Grantee and its subcontractor(s).

It should be emphasized, however, that this report has <u>not</u> been subjected to a full and thorough review by the Division as in the past and, therefore, the quality and completeness of this report, and the assessments and recommendations contained therein, represent primarily the work and judgments of the subcontractor.

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INTRODUCTION

Concern for groundwater quality has heightened in recent years with closings of public wells and increasing public awareness of the fragility of our groundwater resources. The relationship between activities on the land surface and the quality of the groundwater reserves below is being studied extensively, and regulations intended to protect groundwater are being formulated and implemented. Nowhere is the need for background data and protection programs more critical than on Cape Cod, where groundwater not only serves as a source of water for domestic purposes but also interacts freely with surface water resources of great value to each community. Concern in Eastham for groundwater resources and the condition of multiple ponds prompted a study of Great Pond under the Massachusetts Clean Lakes Program. The pond and related water resources in its watershed were the subject of an intensive study in 1985 and 1986. Baseline conditions were established and recommendations for future study and management were offered.

The Diagnostic/Feasibility Study report (BEC 1987) recommended that a grid of monitoring wells be established in the postulated groundwater drainage area of Great Pond. It was suggested that these wells be sampled seasonally for a year and less frequently thereafter. Some portion of the wells were to be clusters.of three at different depths to provide a vertical profile as well as horizontal profile of groundwater quality. Water table elevations determined from measurements in the wells were to be used to more accurately delineate the groundwater drainage basin of Great Pond. Water quality data were to be used to assess potential sources of contamination of the pond. The overall intent of the groundwater assessment program was to augment the existing groundwater data base and to facilitate evaluation of possible threats to pond condition via groundwater contamination.

METHODOLOGY

Groundwater Assessment Via Wells

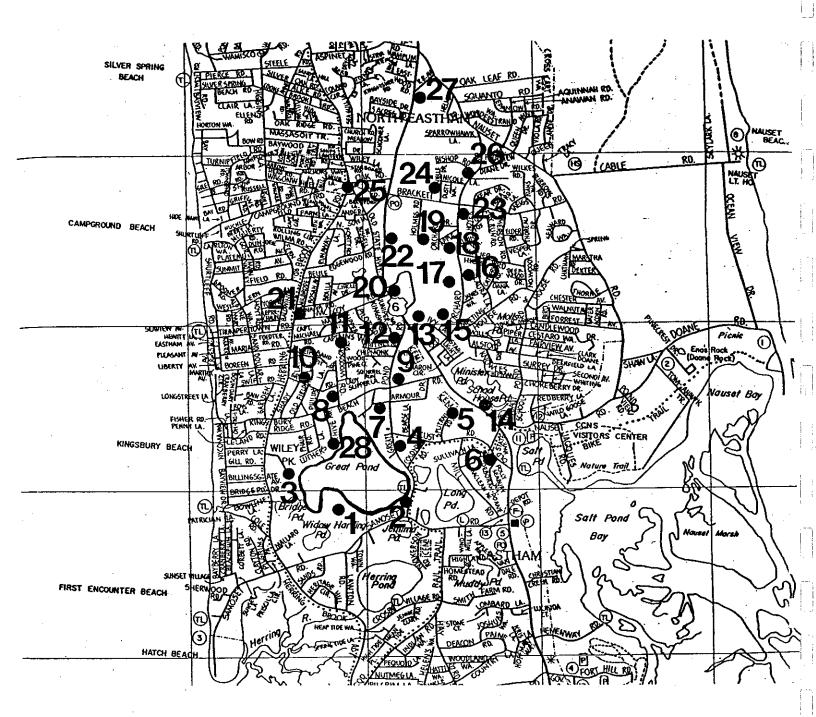
In Phase I of this project, BEC utilized the preliminary groundwater elevation map from the 1987 study report, which was based on a map prepared by the Cape Cod Planning and Economic Development Commission, to site possible well locations. In Phase II, we augmented this information with data for fourteen pond gauges collected by Town of Eastham personnel. Maps generated from data provided to BEC by Town of Eastham personnel are contained in Appendix A.

BEC also viewed the Eastham area groundwater contour map in preparation by Paul Barlow of the United States Geological Survey in Boston. While Mr. Barlow's map was not approved for public release at the time, he provided us with the data upon which his map was based. Additional water table elevation data was provided by Mr. Douglas Heath of the United States Environmental Protection Agency, Region I, in Boston, MA. The data provided by Messrs. Barlow and Heath contained very little information for the Great Pond drainage area, however, particularly at the scale necessary for this project. Typically, data for three or four wells within the study area were available. The data generally support the maps drawn from the Town of Eastham data.

BEC proposed general locations for new monitoring wells and the use of seven existing wells in an October 1988 quarterly report. The proposal was reviewed by the Department of Environmental Quality Engineering, Division of Water Pollution Control (DEQE, DWPC), the United States Geological Survey (USGS), and the United States Environmental Protection Agency (USEPA). Several sites were adjusted as a result of this review. Letters were then sent to five property owners in the vicinity of each general well location, requesting approval for installation of a well on the corresponding property (Appendix B). Letters were followed up by phone calls and visits, where appropriate. A list of consenting property owners was compiled and supplemented where necessary by door to door inquiries. Selected respondents were then notified and asked to sign a permission/release form (Appendix B).

Wells were installed between February 27 and March 15, 1989, by T.E. Desmond Well Drilling Company of Brewster, MA. Well installation was observed by BEC personnel. Resultant well locations are presented in Figure 1. More detailed information on well locations is contained in Appendix B. The elevation of the top of each well casing was surveyed by Schofield Brothers, Inc. of Orleans, MA, by mid-April, 1989. The elevation of the top of each well casing is given in Table 1, along with other general information about the wells.

FIGURE 1 WELL LOCATIONS FOR THE GREAT POND GROUNDWATER MONITORING PROGRAM



1 CM = 310 M

TABLE 1

LOCATIONS, ELEVATIONS AND DEPTHS OF INSTALLED WELLS

WELL #	LOCATION	TOC ELEV.	WELL DEPTH (ft.)
1 a -	30 Clark's Point Rd.	23.75	35
b			55
c ·		23.76	75 ,
2	305 Great Pond Rd.	13.13	15
3 (EGW-37)	Entrance to Wiley Park	26.86	20
4	360 Great Pond Rd.	34.45	40
5	35 Split Rail Rd.	21.63	2.5
6a	65 Deborah Doane Way	25.86	30
b	bebotan boane way	23.00	50
		•	70
C 7 -	25 Great Pond Place	23.86	. 25
7 a	2) Great roud rlace	23.00	- 45
ъ			
С	000 ** 1 01	00 70	63
8	320 Weir Rd.	28.78	30
9	347 Kingsbury Beach Rd.	44.53	43
1.0	55 Grove Rd.	35.59	37
11	55 Wood Song Drive	42.93	45
12a	Kingswood Rd.	45.18	45
Ь	•		65
c			8.5
13a	Atlantic Oaks Camp Ground	46.55	. 44
b	er en		62
С	Town Crier Motel	46.50	70
14a	R2-3280 Rt.6	44.12	45
b			6.5
c .			83
15 (HJ-2)	Town Landfill	16.75	. 12.30
16	320 Old Orchard Rd.	54.76	5.5
17 (HJ-1)	Town Landfill	19.38	7.90
18 (HJ-3)	Town Landfill	27.58	15
19 (16 5)	Eastham Ready Mix, Holmes Rd.		45
b	Eastham Ready MIX, normes Rd.	3.173	60
	•	•	80
с 20а	Eastham Common, Rt.6	37.83	25
	Eastham Common, Rt. O	37.03	55
b		9.	75
c		20 10	
21	Herring Brook & McKoy Rd.	38.10	40
22	Gift Land, Rt.6	42.32	40
23a	720 Old Orchard Rd.	54.01	50
Ъ			70
С			90
24a	25 Danielle Drive	47.17	50
· b			70
С			90
25	540 Massasoit Rd.	41.86	40
26	15 Bishop Rd.	47.00	4.5
27	Captains Quarter Motel, Rt.6	50.97	46
28	Wiley Park, Beehive Rd.	30.17	30

Wells designated with a, b or c are part of a cluster; the tops of all wells within a cluster are at the same elevation unless otherwise noted.

A single borehole was made with a hollow stem auger mounted on a drill rig at each selected well location. For all single monitoring wells, the hole was drilled to 10 ft below the contacted groundwater table at that specific location. For cluster wells, the hole was drilled to 50 ft below the contacted water table. Encountered soils included coarse and fine sands, brown clays and grey clays. Nearly all cluster well boreholes and many shallow single well boreholes penetrated clay layers. A few planned well screen depths had to be altered to avoid clay layers which would have greatly limited water entrance into the associated wells. Most cluster wells incorporated wells above and below the encountered clay layer. Additional information regarding associated soil features is contained in the boring logs in Appendix B.

Well casings were constructed from ten-foot sections of two-inch Sch40PVC flush threaded joint riser; no glues or other solvents were applied. The bottom 10 ft of each well casing was constructed from two-inch 0.010 slot screen. In the case of cluster wells, three casings were put in each borehole. The shortest casing extended to 10 ft below the contacted groundwater table, the intermediate casing terminated 25 ft below the water table, and the longest casing ended 50 ft below the water table (Figure 2). The natural annual fluctuation in the water table elevation is two to three feet in this area of Cape Cod (MDEQE 1980). Even if the water table was near its highest annual elevation at the time of well installation, none of the wells installed in this project should go dry at any time.

Ottawa sand was poured into each borehole to a depth of 10 ft, providing a porous medium through which groundwater could reach the well screen. Some collapsed natural formation is mingled with the sand in most wells. The sand addition was followed by an input of approximately five feet of bentonite clay seal to prevent vertical movement of water alongside the well casing. For single casing wells, the remainder of the borehole was filled with natural soils removed during drilling. For cluster wells, the sand additions were repeated for the intermediate and shallow casings, beginning at the bottom of each casing, but the bentonite seal was applied only above the shallowest casing (Figure 2).

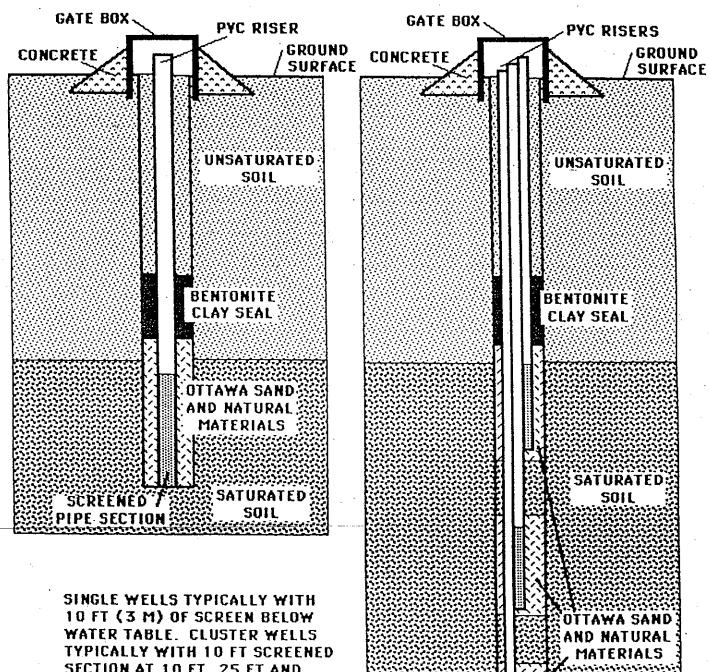
Each single well or cluster arrangement installed in this project was covered with an iron gate box set in concrete (Figure 2). The plate on the top of each gate box is secured with a bolt which can be removed by a pentagonal gate box wrench. Removal of the top plate allows access to the well casings for sampling. The seven pre-existing wells added to the well grid for this project have alternate cover arrangements; five are secured by padlocked pipe covers and two have screw top caps.

FIGURE 2

MONITORING WELL INSTALLATION ARRANGEMENTS

SINGLE WELL ARRANGEMENT

CLUSTER WELL ARRANGEMENT



SECTION AT 10 FT, 25 FT AND 50 FT BELOW WATER TABLE.

SCREENED PIPE SECTION?

In total, 23 boreholes were drilled, and 41 casings were installed. Nine three-well clusters and fourteen single wells were installed. The monitoring program takes advantage of an additional seven wells installed previously. Four of these preexisting wells are driven steel wellpoints, one at Wiley Park and three single wells in the landfill. The other three pre-existing wells were installed along the power line access road behind the Town Crier Motel and the Atlantic Oaks Campground, and functionally constitute another cluster arrangement (Table 1). Two casings are situated in one borehole and one single well is located several hundred feet away; the varied elevations of the well screens provide the vertical profile established in the BEC wells. This brings the total number of wells for sampling to 48, with 10 three-well clusters and 18 single wells (Figure 2, Table 1).

Each well was visited by BEC personnel on May 8-10, 1989, at which time the depth to water in each well was recorded and at least three times the standing volume of water in each well was pumped out. This verified that each well was established; water refilled the wells in all cases, although recovery rates varied substantially. In most cases it was not possible to detectably reduce the water level in the well with the foot-valve pump employed (pumping 0.5 to 1.5 gpm). The water in the wells became turbid after no more than one well volume was pumped out, and cleared again only after prolonged pumping in the most sandy locations.

Discontinuous use of wells on Cape Cod invariably leads to a return of turbidity (inflow of fine sediments) upon resumed pumping (Desmond 1989, Hanson 1989, Moran 1989). The presence of clays at most well sites also ensures that fine sediment will be available to enter wells upon purging. As fresh aquifer water does enter each well upon removal of more than one well volume of standing water, it was decided not to develop wells further, but to filter samples for nutrient analyses.

The existing grid of 48 wells was sampled in summer and fall of 1989 and spring of 1990. Well #18, a shallow pre-existing well in the landfill, was dry during the second and third samplings. Additionally, well #19, a cluster set, was damaged by heavy equipment after the first sampling; only the deepest of the three wells in this cluster (19c) could be sampled all three times; well #19a was sampled twice and well #19b only once. All other wells were sampled three times.

Depth to water in each well was measured prior to any pumping. Removal of well water was performed by manual operation of a one-inch outside diameter Delrin plastic foot-valve pump attached to an appropriate length of high density polyethelene tubing with an outside diameter of five eighths of an inch and an inside

diameter of one half inch (Figure 3, Rannie and Nadon, 1988). Wells were purged until stable conductivity was achieved or a minimum of three well volumes had been removed. Sampling took place immediately after purging, and all sampling was done in a consecutive four-day period. Decontamination between uses consisted of internal and external rinses with methanol followed by acidified distilled water. The purging process served as an additional decontamination process for the pump/sampling tube/receiving bucket.

Conductivity and pH were assessed by BEC on site on unfiltered samples. Samples were analyzed for total dissolved phosphorus, nitrate nitrogen, ammonium nitrogen and dissolved kjeldahl nitrogen (two dates only) by Berkshire Enviro-Labs; samples for these parameters were filtered on site through pre-washed 0.45 um membrane filters, placed in amber bottles, preserved with mercuric chloride, and kept on ice until delivered to the lab at the end of the sampling period. Samples were analyzed for sodium and VOC's by Dr. Joseph Moran's laboratory at Cape Cod Community College, although not all samples were analyzed on all dates. These samples were unfiltered, and the VOC samples were collected in septum vials. Samples were kept on ice and were delivered to Dr. Moran at the end of each sampling day.

BEC provided a distilled water blank and a triplicate sampling of one well for each of the three sampling runs. The resulting quality control data facilitates an assessment of precision and accuracy.

Data collected through the examination of well water is used to map the elevation of the water table throughout the area covered, facilitating more accurate determination of the groundwater drainage basin serving Great Pond. Flow net analysis is used to evaluate the likelihood of potential pollution sources impacting the pond. Well water quality data provides a data base for groundwater quality which greatly supplements previous information collected by DEQE, USGS, USEPA, BEC and Dr. Moran for the study area. Separation of vertical and horizontal trends is facilitated, allowing testing of hypotheses relating to postulated plumes from specific sources of groundwater contamination.

Groundwater Assessment Via Seepage Meters and LIP Samplers
The Phase I study report recommended additional assessment of
groundwater at its points of entry to Great Pond. BEC employed
the seepage evaluation approved by the DWPC for recent Phase I
studies, as detailed in Mitchell et al. (1988, 1989). Briefly,
this procedure involves the temporary installation of modified
end sections of 55-gallon drums (Figure 4), through which
groundwater seeping into or out of the pond must pass. An
attached bag containing a premeasured quantity of water allows

FIGURE 3

SCHEMATIC OF A FOOT VALVE PUMP FOR REMOVING WATER FROM MONITORING WELLS

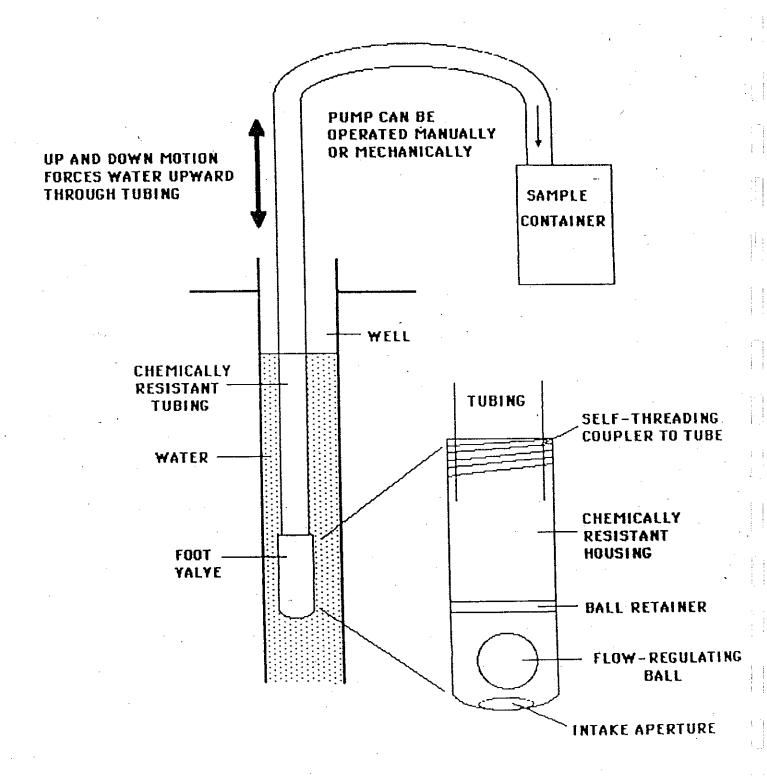
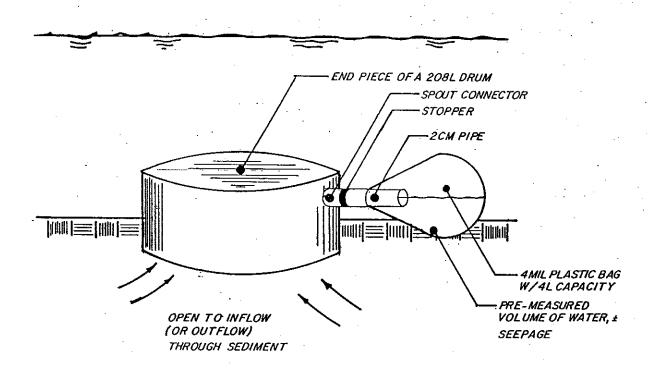


FIGURE 4

Seepage Meter Apparatus for Quantifying Ground Water Flow.



quantitative determination of seepage over time for the area covered. Six transects of four seepage meters each were set up around the pond (Figure 5).

Quality of seepage water was assessed through samples collected with the Littoral Interstitial Porewater (LIP) sampler (Figure 6). One composite sample was collected for each seepage transect and analyzed for the same parameters as assessed for well water samples. Seepage assessment was performed twice, once in each of June and September, 1989.

The quantitative and qualitative evaluation of seepage is used in conjunction with well data to evaluate impacts of groundwater on the pond. Corroboration of measured seepage rates with the Phase I hydrologic budget is desired, with a breakdown of net groundwater income into total income and outflow. Potentially critical factors which may modify certain aspects of incoming groundwater quality include biological and chemical interactions at the sediment water interface and at the thermocline during summer stratification. Groundwater quality assessments were therefore supplemented with additional surface water investigation.

Surface Water Assessment

The water in Great Pond was sampled in June and September, 1989, in conjunction with the seepage measurements. Near surface and near bottom samples were collected on each of the two dates at a location near Station GP-3 of the Phase I study. This is the deepest part of the pond (11 m or 36 ft). Assessed parameters include total phosphorus, total filterable phosphorus, ammonium nitrogen, nitrate nitrogen, total kjeldahl nitrogen, sodium, pH, conductivity, chlorophyll and secchi disk transparency. Additionally, temperature and dissolved oxygen profiles were determined at this site.

FIGURE 5
TRANSECT LOCATIONS FOR GREAT POND SEEPAGE ASSESSMENT

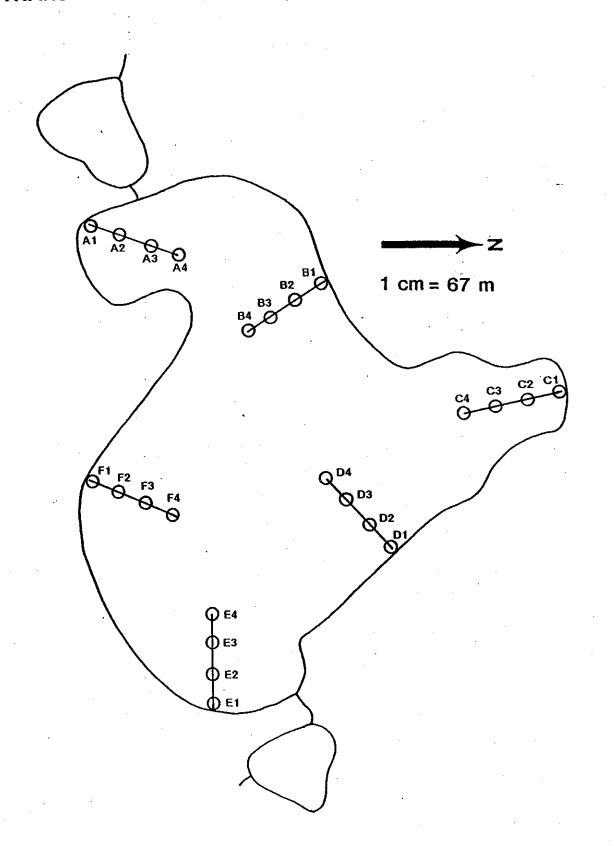
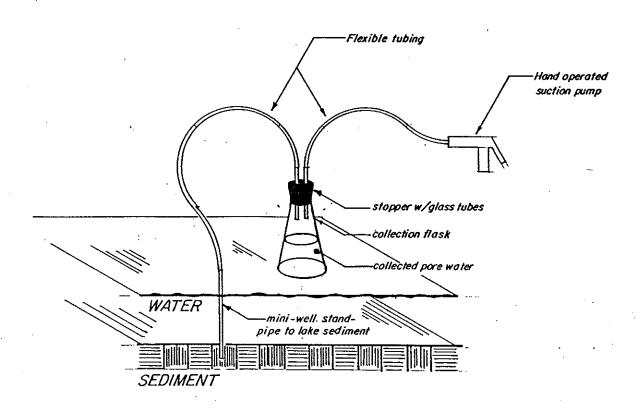
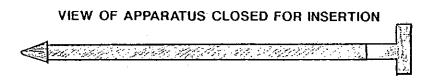
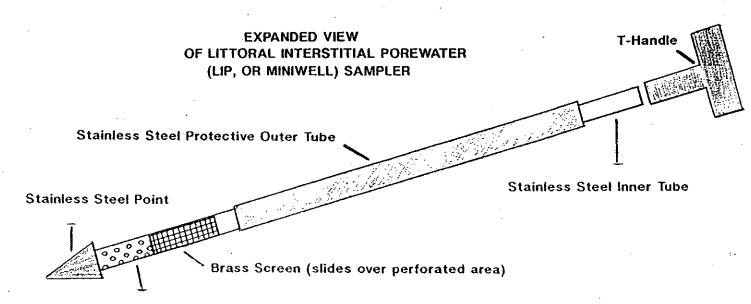


FIGURE 6

Mini - Well Device for Obtaining Pore Water from Lake Sediments







RESULTS

Groundwater Mapping

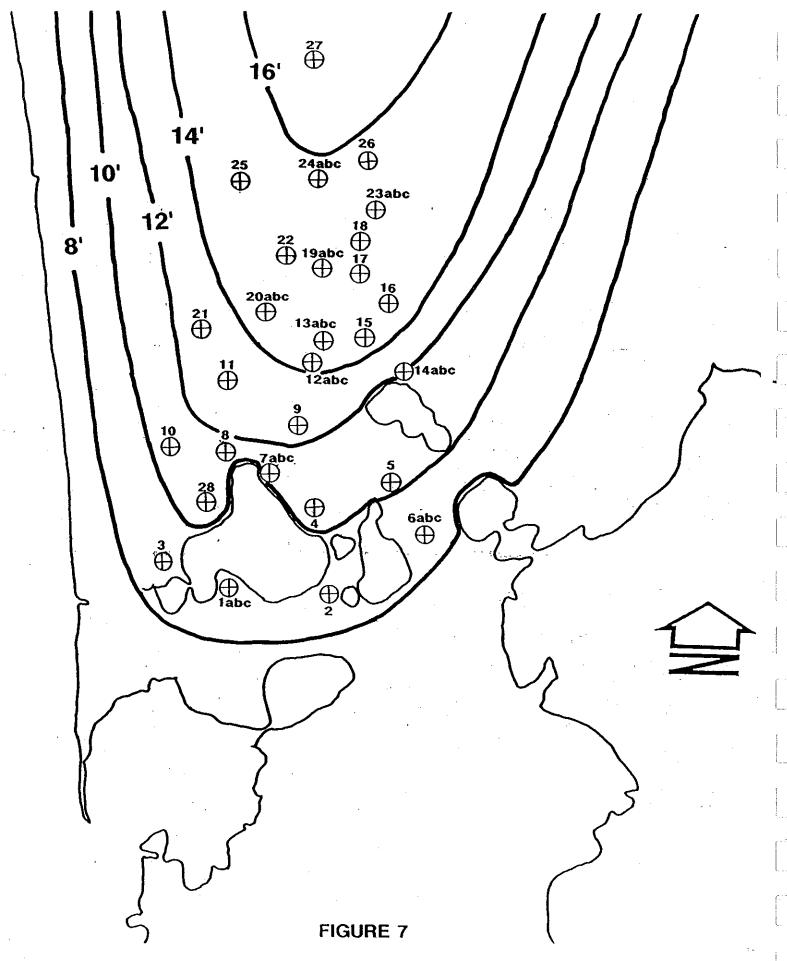
The groundwater elevation readings obtained from the wells (Appendix C) allowed construction of contour maps for each of three dates (Figures 7-9). These maps agree well with those constructed from data provided by other studies (Appendix A); the position of contours varies seasonally, but a clear pattern is evident. In general, there is a groundwater divide which runs from a point north of Brackett Road along Route 6 to Herring River Marsh, passing through Great Pond and sloping southward as it progresses. As a result, groundwater flows southeast or southwest from the divide, or almost due south along it. Localized groundwater flow patterns may vary considerably, however, as a function of clay lenses and surface water interception of groundwater.

At the northern end of the study area the groundwater attained an elevation of approximately 16 feet above sea level (ft MSL), while at the southern end the groundwater level was less than 8 ft MSL. The distance between these points is about 3.3 km (10,700 ft or about two miles), resulting in a groundwater table slope of 0.00075 in the north-south direction. Water table slopes are steeper along the east-west axis at up to 0.003.

Groundwater Drainage Area to Great Pond

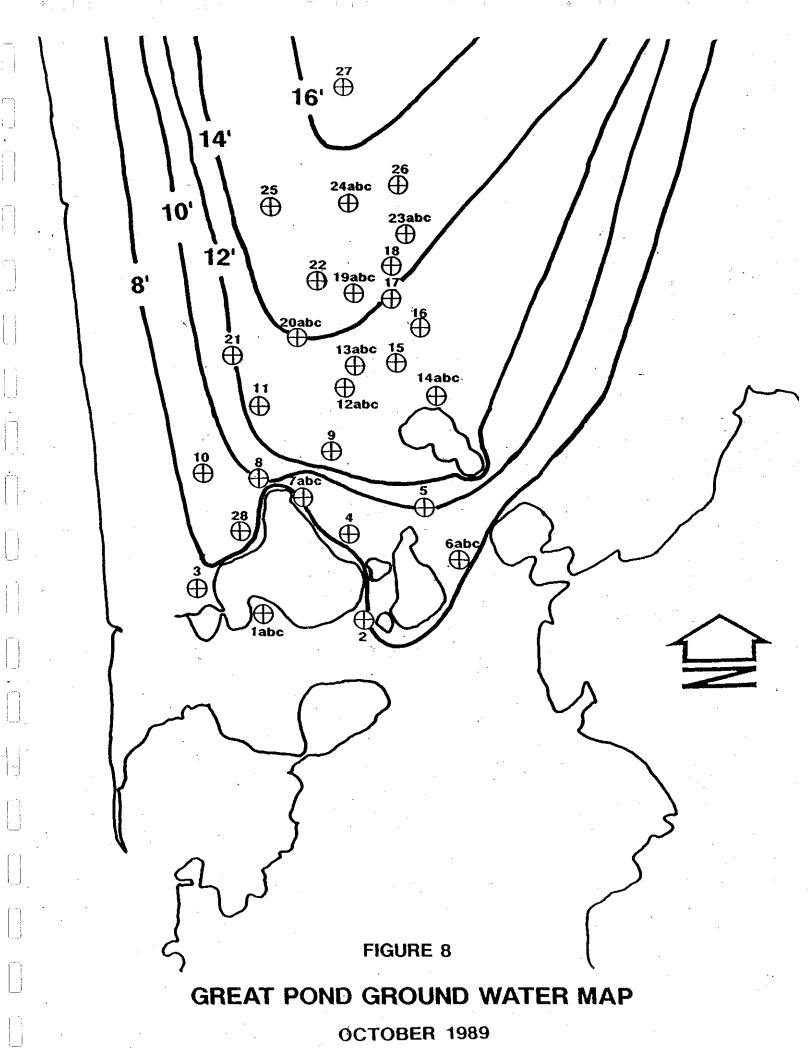
The groundwater drainage area contributing to Great Pond is basically a tear-drop shaped piece of land aligned in a north-south direction (Figures 10 and 11). This area begins slightly north of Brackett Road just east of Route 6 and extends southward to Great Pond with an eastern boundary roughly coincident with the old railroad bed. The western boundary cuts across Route 6 and passes through largely residential area, enclosing a drainage area which includes several of the major hotels along Route 6.

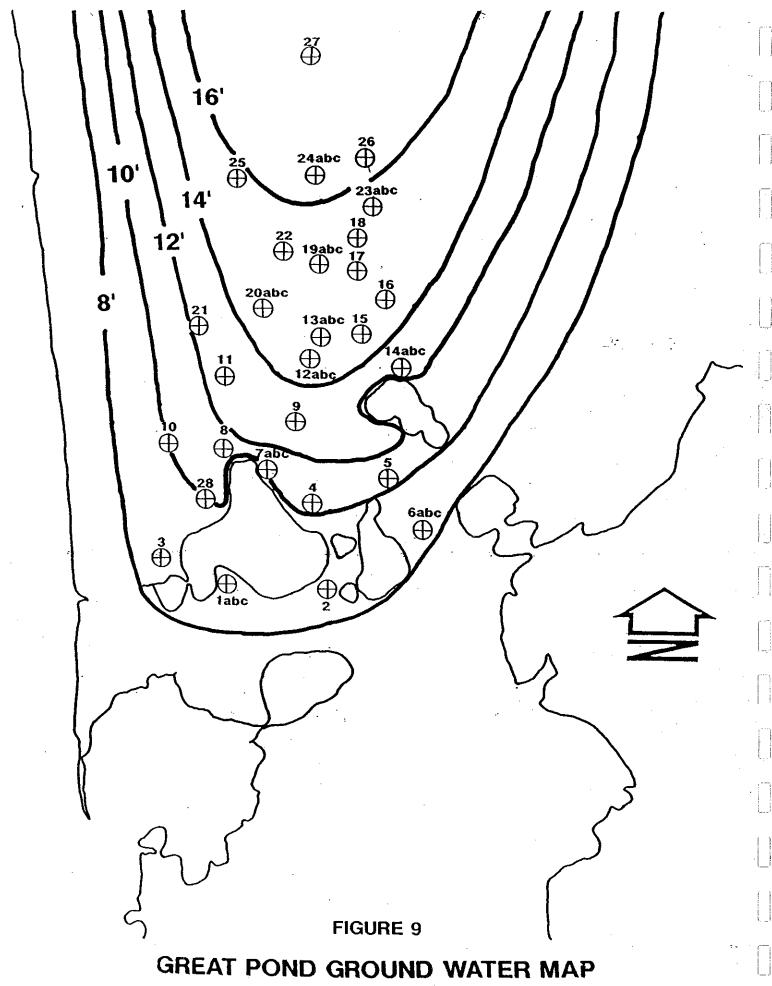
The solid boundary line drawn in Figures 10 and 11 encloses the area which apparently contributes groundwater to Great Pond on a regular basis. The dashed line in these figures encloses additional area which may contribute groundwater to the pond on a seasonal or intermittent basis. The existence of clay lenses and other non-conformities in the generally sandy soils of the area can cause substantial localized alteration of the overall groundwater flow pattern. Great Pond appears to intercept groundwater from its entire perimeter, passing the excess of inflow over evaporation and intermittent outseepage as surface outflow into Bridge Pond. Groundwater mounding as a consequence of elevated inputs (e.g., at the Sheraton Hotel on Route 6) is also known to alter localized groundwater flow patterns.



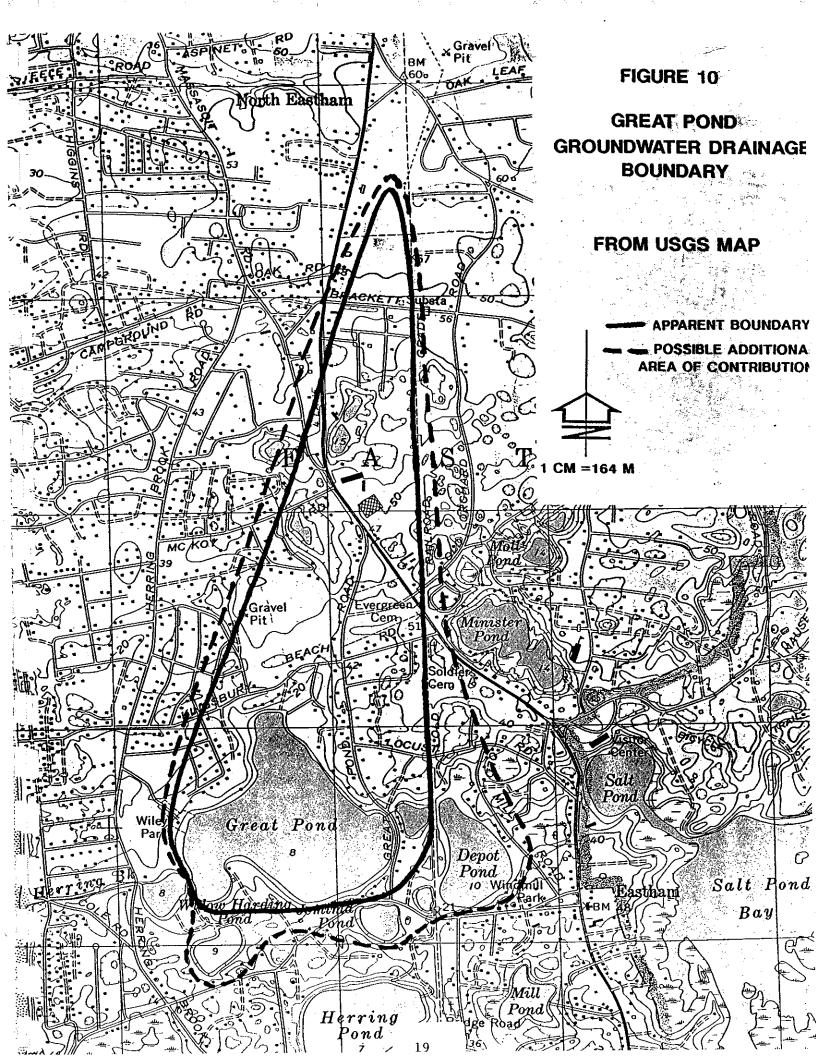
GREAT POND GROUND WATER MAP

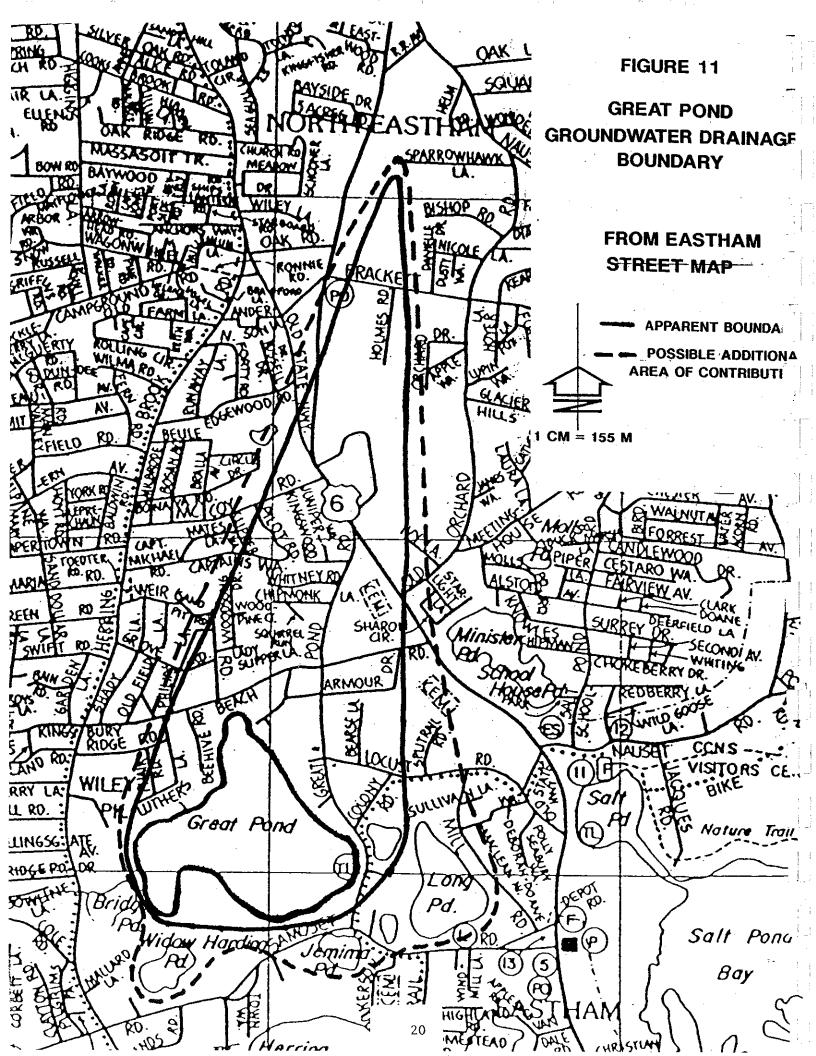
AUGUST 1989





MAY 1990





A wide range of land uses is encompassed by the approximately 500 acre (solid line) to 720 acre (dashed line) groundwater drainage basin boundary. The area nearest Great Pond, to the southwest of Route 6, is primarily residential. Lot sizes are highly variable, with substantial quantities of undeveloped land in this area. Average house density is on the order of one per two acres of land excluding the pond area from the calculation, but including wetlands, cemeteries and other landforms.

The Route 6 corridor is generally commercial, with several large hotel complexes, multiple restaurants and numerous shops. The area northwest of Route 6 includes some residential land, a small industrial park (including a concrete operation and several building trade shops), and possibly the western edge of the Eastham Town Landfill, which is within the dashed but not the solid boundary line. The Route 6 corridor and the landfill have been the subject of considerable discussion and allegation in Eastham with respect to impacts on groundwater quality.

Well Water Quality

Average water elevation and values for selected water quality parameters are presented in Table 2. Soluble inorganic nitrogen in Table 2 is the sum of nitrate and ammonium nitrogen from Appendix C. As ammonium nitrogen is converted to nitrate nitrogen in the presence of oxygen and certain common bacteria, it is assumed that the measured ammonium will become nitrate at some distance from the source. Application of nitrate concentration standards to the soluble inorganic nitrogen level is therefore considered appropriate.

Average soluble inorganic nitrogen concentrations ranged from less than 0.1 mg/l to just under 5 mg/l. As no mean value (and in fact no individual value) exceeded the health standard of 10 mg/l, no imminent health risk is implied. However, many communities on Cape Cod employ a warning limit of either 2 or 5 mg/l; no average values exceeded 5 mg/l, but 8 of the means exceeded 2 mg/l. Concentrations above 1 mg/l are uncommon under natural circumstances, and 17 out of 48 means (over a third) exceeded 1 mg/l.

Total Kjeldahl Nitrogen (TKN) is a measure of the ammonium nitrogen plus all organically bound forms of nitrogen. As the samples from this project were filtered prior to testing, only dissolved nitrogen forms are represented by the TKN values. TKN values are generally low in the collected samples, with 21 out of 48 mean values less than 0.1 mg/l and only two means greater than 1 mg/l. Ammonium nitrogen typically accounts for the great majority of the measured TKN (Appendix C), with urea and amino acids suggested as the most likely additional components.

TABLE 2

MEAN VALUES FOR SELECTED WATER QUALITY PARAMETERS

WELL #	WATER ELEVATION (feet)	SOLUBLE INORGANIC-N K (mg/l)	TOTAL (JELDAHL-N * (mg/l)	TOTAL FILTERABLE-P (mg/1)	pH CONI	OUCTIVITY unhos/cm)	SODIUM ** (mg/1)
1abc 23456abc 7bc 8910112 bcabc 1567 89 bcabc 223 abcabc 25678	8.48 8.24 8.33 8.90 8.49 12.23 9.11.23 9.36 10.96 11.58 11.59 13.41.33 14.33 14.35 14.35 14.38 16.38 16.38 16.38 16.38 16.38 16.38 16.38 16.38 16.38 1	.21 .36 .39 1.14 2.39 2.725 .63 .427 2.35 .63 .427 2.35 .63 .427 2.35 .63 .421 1.613 .421 1.818 .610 .28 .426 .427 .435 .421 1.818 1.818 .421 1.818 .421 1.818 .421 1.818 .421 1.818 .421 1.818 .421	.14 .47 .47 .46 .10 .10 .10 .10 .10 .10 .10 .10 .10 .10	.11 .13 .13 .13 .13 .13 .13 .13 .13 .13	901223213435813100001141136827043099129211211393	90 107 102 127 153 194 155 176 1155 1165 1165 1165 1165 1165 1	4.0 5.0 13.0 10

^{*-} sampled only in August & October of 1989. **- sampled only in May of 1990.

Total filterable phosphorus values were low relative to concentrations typically associated with sewage or industrial discharges, but were moderate to high relative to desired levels in surface water for the control of eutrophication. Means ranged from 0.04 to 0.58 mg/l, while values greater than 0.05 mg/l are considered excessive in lakes and values over 0.1 mg/l are considered high in streams or rivers.

Phosphorus is readily adsorbed onto positively charged soil particles; sandy soils typically hold about 100 ug P per gram of soil, which equates to over 2000 mg P per liter of soil. Relative to these levels, the observed filterable phosphorus concentrations are not especially high. They may be an artifact of the sampling and filtration process (some dissociation may have occurred), or may indeed suggest that the soils in some areas are becoming saturated with phosphorus.

Log mean pH values ranged from 5.8 to 7.4, a fairly wide range considering that each pH unit represents a ten-fold change in the hydrogen ion concentration. Most values were between 6.0 and 6.5, however, a range commonly associated with natural groundwater pH on Cape Cod.

Conductivity means ranged from 63 to 361 umhos/cm, indicating a fairly wide range of dissolved solids levels. Most values were between 100 and 200 umhos/cm. Values lower than 100 umhos/cm are generally assumed to represent waters of low ion concentration, while values much above 200 umhos/cm suggest substantial concentrations of nutrients, chloride, or other contaminants. Values on Cape Cod can vary tremendously as a consequence of natural factors, primarily the influences of saltwater and acidity. The conductivity-raising influence of urbanization may therefore be obscured.

Sodium levels, measured only for the last set of samples, ranged from 4 to 50 mg/l. The health criterion for consumptive purposes is 20 mg/l, above which there is a danger of elevated blood pressure in a significant portion of the population. Ten of the observed values were in excess of 20 mg/l, and six more values fell between 15 and 20 mg/l. While human activities are known to raise the sodium level (e.g., road salting and septic system discharges), the natural influence of salt spray from the nearby ocean and bay may be more influential.

The results of the VOC analyses provided by Dr. Joseph Moran are most encouraging from a health perspective, as few compounds were detected (Appendix C). Of the 50 compounds detectable with EPA Method 502.1, only chloroform was detected with any regularity,

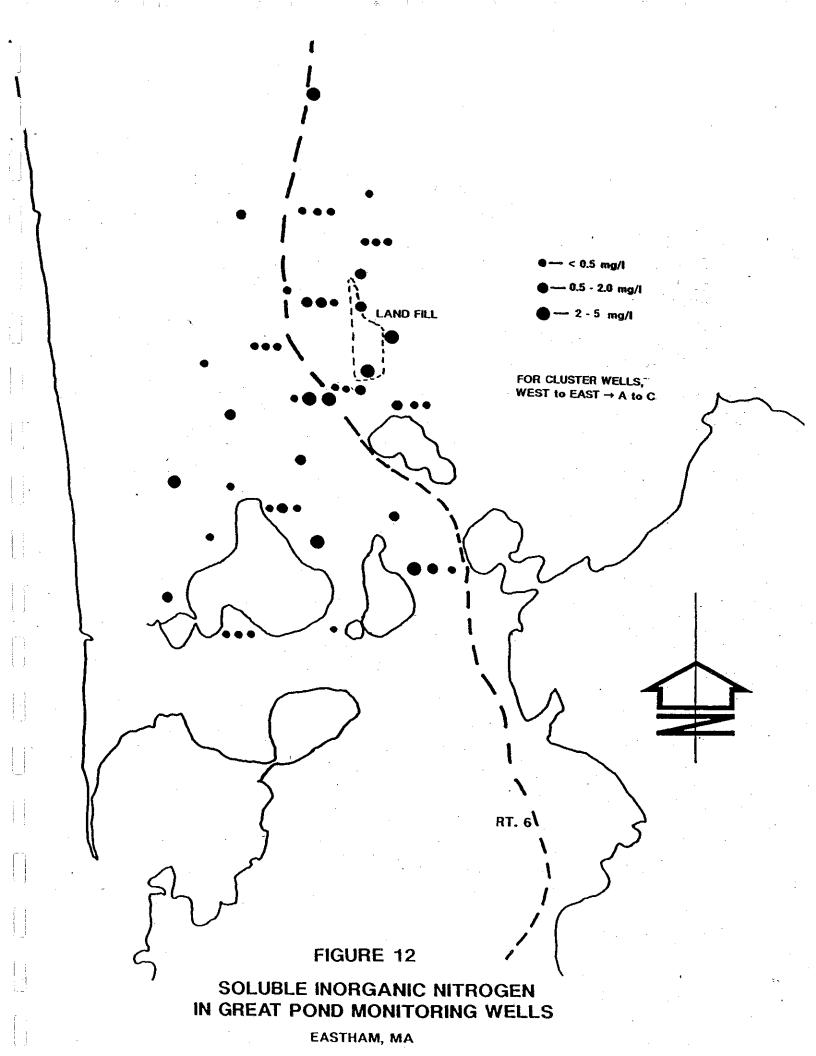
appearing in 31 out of 55 samples at concentrations up to 6 ppb (ug/l). As the Massachusetts Office of Research and Standards recommends a maximum value of 5 ppb in drinking water, one well (#23a) exceeds this allowable limit for potable water. A recommended but unofficial federal criterion for chloroform is 1.9 ppb, a level exceeded by four additional wells (#8, 13b, 16 and 28).

Chloroform is one of four commonly assessed trihalomethanes, the USEPA drinking water standard for which 100 ppb (all trihalomethanes combined). The observed levels of all trihalomethanes do not even approach 100 ppb, suggesting no overall health hazard. According to the Barnstable County Laboratory, chloroform is commonly found in Cape Cod groundwater at 0.2 to 5 ppb. Chloroform is a solvent and cleansing agent as well as an anasthetic. The most probable route to groundwater is via septic systems, as solutions containing chloroform are dumped down drains by homeowners or business operators.

Five other compounds were detected in up to three samples each, with little overlap in occurrence and no concentrations of health concern. Although there is a threat of significant groundwater pollution from the landfill and Route 6 businesses, the pattern (or lack thereof) of VOC values indicates that contamination from individual residence septic systems is just as likely, but that overall there is only a nominal health threat based on the data collected during this study.

Examination of the vertical distribution of contaminants within cluster well sets revealed no consistent pattern. Contaminant levels exhibited no discernible pattern among the three vertical levels sampled (0-10 ft, 15-25 ft, and 40-50 ft into the groundwater). The depth-concentration relationship for soluble inorganic nitrogen is illustrated in Figure 12, along with the spatial distribution of mean values over the area sampled.

Examination of the temporal distribution of contaminant levels suggests that contaminant levels do appear to increase markedly over the summer and decline over the winter. For example, the highest soluble inorganic nitrogen value (ammonium plus nitrate nitrogen) for each well sampled three times occurred in August 24 times, in October 18 times, and in May 3 times. Variability among dates was substantial (Appendix C), with changes of more than 1 mg/l occurring in the August-October period at 14 wells and in the October-May period at 13 wells.



Quantity and Quality of Seepage into Great Pond
Seepage measurements at 24 points (Figure 5) around Great Pond
indicated groundwater inflows of 2.3 (Table 3) and 1.0 (Table 4)
cubic meters per minute, or 1.4 and 0.6 cfs, respectively.
Outflow via groundwater was minimal on both dates. Inseepage was
highest along the northeastern segment of the pond, between
transects C and E (Figure 5), but inseepage was detected all
around the pond.

The groundwater inflow estimates obtained in this study are about equal to the net groundwater inflow assumed in the Diagnostic/Feasibility study (BEC 1987). The 1987 study, however, assumed a larger absolute inflow and some outflow via groundwater, based on calculations using Darcy's equation. Actual measurements, however limited, appear to controvert any assumption of substantial groundwater outflow and suggest a smaller actual inflow of groundwater to Great Pond.

The zones of greatest contribution are generally consistent with the apparent path of groundwater flow in the drainage area, although greater inflow from the north into the vicinity of transect C might be expected. This inflow is seemingly reduced by a thick layer of organic material in the northern cove; similar deposits are encountered in the southwestern cove, but the rest of the nearshore area of the pond is relatively sandy.

During most of the year the water level in Great Pond is apparently slightly lower than that of the surrounding groundwater table, resulting in groundwater inflow from all around the pond. This is a consequence of observed rapid percolation of rainfall into the soil (Great Pond receives very little surface flow, even during storms) and much greater evaporative influence on the pond than the groundwater.

Captured groundwater is passed as surface flow through an unregulated channel into Bridge Pond, which overflows through a weir into a small tidal creek. The only time that groundwater outflow is expected to be significant is during times of high water level and substantial precipitation (typically early spring). During such times the surface water level in Great Pond is higher than the groundwater table and the porous sandy soils around the pond facilitate water level equilibration.

The quality of the groundwater entering Great Pond is somewhat variable (Table 5). Total filterable phosphorus concentrations range from the lower detection limit of 0.01 mg/l to 0.18 mg/l, with a marked difference between June and September samples. The average phosphorus level in June was an acceptable 0.025 mg/l, while that for September was a fairly high 0.072 mg/l, almost a threefold increase.

TABLE 3
GREAT POND SEEPAGE, JUNE 1989

GREAT PO	ND SEEPAGE				rr \	
Date	Meter #	Dist. shore	from (M)	Seepage time (HR)	Volume change : (L) (Seepage L/SQ.M/D)
06/13/89	A1234123412341234123412341234123412341234		1.50 19.00 13.00 13.00 12.00 12.00 12.00 12.00 12.00 13.00 10.00 1	4.60 4.660 4.665 4.665 4.665 4.665 77777 777 888 884 44.42 44.00 90 90 90 90 90 90 90 90 90 90 90 90 9	1.16 1.16 1.40 1.45 1.42 1.22 1.22 1.85 1.85 1.85 1.85 1.85 1.85 1.85 1.85	11.48 31.30 15.86 24.21 8.26 10.94 13.01 13.42 28.55 59.17 -1.32 30.79 121.66 14.12 6.73 11.52 4.56 12.96 74.40

GREAT POI	SEEPAGE LENC	CULATIONS TH ALONG RELINE (M)	DISTANCE FROM SHORE (M)	AREAL SEEPAGE (L/D)		
A B C D E F	20.7 11.4 30.3 38.8 12.3 25.9	500 500 500 500 500 500 500	25 45 30 85 35 40	258913 256645 455094 1647828 214751 517200	·	
•		•	INFLOW OUTFLOW	3350431 0	. =	2.327 CU.M/MIN 0.000 CU.M/MIN

TABLE 4
GREAT POND SEEPAGE, SEPTEMBER 1989

GREAT PO	ND SEEPAGE				
Date	Meter #	Dist. from shore (M)	Seepage time (HR)	Volume change (L) (Seepage L/SQ.M/D)
09/12/89	A1 A2 A4 B1 B2 B3 C1 CC3 CC4 DD2 D4 E1 E23 F4 F7 F7 F7	1.5 8.0 15.0 19.0 13.0 13.0 40.5 12.0 12.0 12.0 33.0 66.0 76.0 18.0 18.0 25.0 18.0 23.0	3.17 3.15 3.20	.21 .23 .01 03 .46 .50 .125 10 .04 .44 .23 .74 .18 .02 .78 .30 1.61 1.00 .01 .21 .67	6.88 7.834 -1.04 15.49 17.02 4.11 8.73 -3.49 15.82 82.34 24.00 82.20 18.34 29.334 29.334 29.334 19.98

GREAT POI	SEEPAGE LENG	CULATIONS TH ALONG RELINE (M)	DISTANCE FROM SHORE (M)	AREAL SEEPAGE (L/D)		
A B C D E F	3.5 11.3 5.5 13.1 22.2 7.7	500 500 500 500 500 500	25 45 30 85 35 40	43792 255136 82176 556753 389311 154390		
e e			INFLOW OUTFLOW	1481559 0	=	1.029 CU.M/MIN 0.000 CU.M/MIN

TABLE 5

GREAT POND SEEPAGE AND IN-LAKE WATER QUALITY

GREAT POND POREWATER AND SURFACE WATER SAMPLE ANALYSIS RESULTS: JUNE 15, 1989

e e e e e e e e e e e e e e e e e e e	+ £	സരം	رد در م	LI	P SAMPLE	LOCATIONS (BY TRANSECT)	
PARAMETER	UNITS	GP-3S (SURFACE)	GP-3B- (BOTTOM)	A	В	Carral Data / Eng.	F
Tot. Phosphorus Tot. Filt. Phosphorus Ammonium nitrogen Nitrate nitrogen Total Kjeldahl Nitrogen Total Alkalinity Sodium pH Conductivity Fecal Coliform	mg/! mg/! mg/! mg/! mg/! mg/! mg/! s0 umhos/cm #/100 mi	.02 .01 .02 .06 .70 6.6 6.9 131 2	.01 .01 .22 .01 1.00 6.4 6.9	.01 .06 .07 12 4.4 6.8 89 <10	.01 .30 .08 23 9.4 6.5 151 <10	.01 .09 .01 .01 .01 .09 .01 .09 .00 .02 .24 .09 .00 .02 .24 .00 .00 .00 .00 .00 .00 .00 .00 .00 .0	.02 .02 .09 22 6.7 6.6 135 < 10

GREAT POND POREWATER AND SURFACE WATER SAMPLE ANALYSIS RESULTS: SEPTEMBER 15, 1989

		ന മെ	en en	LII	P SAMPLE	LOCATIONS	(BY TRANS	ECT)	•
PARAMETER	UNITS	GP-3S (SURFACE)	GP-3B (BOTTOM)	Ā	В	C	D	E	F
Tot. Phosphorus Tot. Filt. Phosphorus Ammonium nitrogen Nitrate nitrogen Total Kjeldahi Nitrogen	mg/l mg/l mg/l mg/l	.02 .02 .01 .01	.02 .02 .28 .01 .89	.04 .07 3.80	.08 .05 1.10	.04 .05 4.00	.04 .42 .06	.05 .58 .01	.18 .73 .01
Total Alkalinity Sodium pH Conductivity Fecal Coliform	mg/l mg/l mg/l SU umhos/cm #/100 ml	6.0	5.9 141	14 16.4 5.7 210 <10	10 11.0 5.9 145 <10	7.5 7.8 5.8 135 <10	23 15.5 5.8 162 <10	21 12.0 5.9 146 20	36 15.0 5.8 172 < 10

JUNE 15, 1989				SEPTEMBER	SEPTEMBER 15, 1989		
DEPTH (M) TEMP	(C) DO	(MG/L)	TEMP (C)	DO (MG/L)		
	0 123456789	19.0 19.1 19.1 19.1 19.1 19.1 18.6 17.9 14.7 13.1 13.0	8.3 8.39 7.9 8.3 7.9 8.3 7.1 4.9 7.5	23.1 23.1 23.1 22.0 21.5 21.2 19.8 15.8	9.0 8.9 8.0 8.0		
SECCHI	READING		3.9 1.3		3.2		

A similar pattern was observed for soluble inorganic nitrogen (SIN), the sum of ammonium and nitrate nitrogen values. The average June SIN concentration was a relatively low 0.33 mg/l, while the September values averaged 1.81 mg/l. High values for nitrate nitrogen in three of the September samples were responsible for this change.

Alkalinity levels ranged from 5 to 36 mg/l, and decreased slightly on average between June and September; obvious decreases in the areas associated with transects B and C were responsible. Sodium concentrations ranged from 4.4 to 16.4 mg/l, and increased almost twofold from an average of 6.8 mg/l in June to 12.9 mg/l in September. The pH declined markedly between sampling dates at all stations, averaging 6.6 SU in June and 5.8 SU in September. Conductivity increased somewhat between samplings, averaging 133 umhos/cm in June and 162 umhos/cm in September, but there were substantial changes at only two stations (A and F). Fecal coliform levels were consistently low, with all but one sample (E in September) exhibiting values below the 10 FC/100 ml detection limit.

Surface Water Quality

Although there is a substantial data base for this aspect of the Great Pond system (BEC 1987), continued monitoring is useful in the detection of trends and in assessing management progress. As this process has just begun, there are few valid comparisons which can be made. The results of the limited testing (Table 5) suggest no obvious change in water quality since the 1985-86 sampling program, and no such change would be expected.

Nutrient levels are low to moderate, pH and conductivity values are moderate, and sodium and fecal coliform concentrations are low. Hypolimnetic oxygen depletion continues to occur, although not at exceptionally severe rates. Oxygen deficiency in the hypolimnion results in a slight build-up of ammonium and TKN near the bottom of the pond, but phosphorus levels at the surface and bottom of Great Pond are not discernibly different. Water clarity and chlorophyll levels (generally inversely proportional to each other) are moderate and quite acceptable for the desired uses of Great Pond.

Quality Control Assessment

The quality control sample results (Appendix C) are not encouraging from a research perspective, but suggest ample accuracy and precision for detection of major differences in contaminant levels. The least impressive results were for nitrate nitrogen, where an apparently blown lab test in the May 1990 batch of QC samples resulted in a standard deviation of over 1 mg/l. Standard deviations for nitrate nitrogen from the August 1989 and October 1989 sample batches were 0.53 and 0.35 mg/l, respectively. This suggests that compared values must exhibit

more than a 0.7 mg/l difference (and as much as a 2 mg/l difference) to be 95% sure that the difference is not a function of laboratory error.

Values for the distilled water blank were not always indicative of distilled water, but only the distilled water used in the first round was fresh; results from the first batch of QC samples were the best in this regard. Again, it appears that order of magnitude differences are readily detectable, but more subtle variations in water quality cannot be separated from potential lab error.

DISCUSSION

Sources of Contamination

There are basically two modes of groundwater contamination within the study area: contaminants are carried by precipitation from the air or land surface into the ground or discharged to the ground through waste disposal systems (solid or liquid). Where solid waste is involved, the percolating rainwater will aid leaching, thereby linking the two mechanisms.

Within the study area, fertilizer, accumulated road pollutants (metals and hydrocarbons) and deicing compounds (mainly salt) are the primary man-made pollutants washed from the land surface by precipitation. Wastewater from private residences, hotels, and restaurants comprise the great majority of liquid discharges to the ground. The Eastham landfill represents a more complicated situation, being a repository for a wide variety of largely solid wastes along with septage pumped from area septic tanks.

All of the above sources have the potential to affect Great Pond via the groundwater, but to varying degrees, based on the results of the monitoring program. Key factors include the direction of groundwater flow, the depth to groundwater under the pollutant source, the magnitude of inputs, the frequency of inputs and the distance from the source to the pond.

Most of the landfill appears to be outside the groundwater drainage area for the pond (Figures 11 and 12), but there is some potential for groundwater mounding associated with the septage disposal area to cause contaminated water to flow into the drainage area for Great Pond. It is also possible that clay lenses, frequent in Eastham, could alter local flow patterns enough to divert some of the landfill-influenced groundwater into the Great Pond drainage area. Further study would be necessary to verify these possibilities. Large, regular flows are unlikely, however, as the direction of flow for groundwater leaving the landfill is generally to the east. If southerly flow did occur, the contaminated water would have to travel over 4500 ft through purifying sands, mixing with groundwater to a high dilution factor, prior to entering Great Pond. Although nitrates and certain other less reactive compounds might form a substantial plume, a sustained, detectable impact on Great Pond is unlikely.

The vertical distance to groundwater is over 10 ft in all but three wells (one adjacent to Great Pond and two in the landfill), and averages close to 25 ft for all wells. This distance is sufficient to remove large quantities of pollutants by biological uptake, filtration and adsorption processes, although nitrates are only minimally affected once they move below the root zone of the vegetative cover. It is possible to exhaust the pollution

removal capacity of the soil, but breaks provided by seasonal variations in pollutant loading allow soil rejuvenation. For this reason, only fertilizer or road runoff originating very near the pond has any appreciable opportunity to affect the pond.

On-site wastewater disposal facilities, or septic systems, are subject to the same soil transport and removal processes as the surface contaminants, with somewhat less opportunity for biological uptake. These systems are quite pervasive throughout the study area, however, and provide a seasonally intense source of nutrients and other contaminants. Type of system, the number of people using it, and the seasonal pattern of use are added variables which determine the impact of septic system effluents on the groundwater and Great Pond.

The larger septic systems associated with hotels, restaurants and other businesses along the Route 6 corridor within the Great Pond groundwater drainage area have received considerable scrutiny in recent years. While these systems are fairly high above the groundwater table, lay over 3000 ft from Great Pond, and may not be continuous high level contributors, they are highly visible summer sources of contaminants and contribute at lower levels during the remainder of the year.

Of particular concern are the inputs associated with the Sheraton Hotel; the water inputs alone cause detectable mounding and temperature changes in the groundwater (Moran 1989), and the results for Well #12 in this study suggest that impacts extend beyond the property boundary in the direction of Great Pond. High nitrate values for other wells in the area suggest problems from other establishments as well, but the extent of impact beyond their respective boundaries is uncertain.

The many smaller septic systems associated with individual private residences are of definite concern as well, although no one system is an overwhelming threat. The conversion of seasonal homes to year round dwellings and the great expansion of many residences in the 1970's and 1980's increased the loading potential without a commensurate increase in treatment or dilution potential. Systems closer to the pond are more likely to impact the pond than those systems further away, but in terms of public health these systems should all be considered threats. Most high nitrate levels in sampled wells appear related to contamination by nearby septic systems; in some cases the septic system on the same property as the well may very well be responsible for the observed contamination.

The seasonal use of septic systems is reflected in the pattern of values for many contaminants between spring, summer and autumn samples (Appendix C). Although inputs from nearly all described pollution sources increase during summer, the increase in septic

system use is most obvious, as the population swells by an order of magnitude. The spatial pattern of contaminant concentrations (Table 2, Figure 12, Appendix C) is consistent with widespread pollution from smaller sources, although the impacts from the single larger sources noted above cannot be ignored.

Plume Formation

There is no detectable plume extending from any discernible source all the way to Great Pond. Any contamination from the landfill is not differentiable as such even in the Route 6 corridor within the Great Pond drainage area (Figure 12, Appendix C). Although the businesses in the Route 6 corridor appear to provide inputs which should be detectable across Route 6 to the south, even the apparent plume from the Sheraton dissipates halfway to the pond, or at least its differentiation is confounded by likely inputs from smaller septic systems. A considerably greater number of wells would be necessary in the predicted path of the Sheraton plume to trace it and conclusively demonstrate its existence as a threat to Great Pond.

There is no distinct plume from the landfill within the study area, and the pattern of contaminant values does not suggest any single source to be an overriding influence within this system. The high average nitrate value for Well #4 and the intermediate value for Well #7b could be a consequence of a plume from the Route 6 corridor or more local septic system influences. After all the effort expended, it is somewhat disappointing to get less than conclusive results, but the complexity of the system and the lack of a single, overwhelming pollutant source are underscored.

Groundwater Impact on Great Pond

Given the observed water quality in the monitored wells and in Great Pond, it is apparent that although much of the pond water (about half) is derived from groundwater, its quality is more affected by in-lake processes than the quality of seepage. An increase in nitrogen loading over the course of the summer from groundwater appears evident (Table 5), but the in-lake and porewater levels of various forms of nitrogen suggest substantial modification from the primarily nitrate-dominated groundwater nitrogen load.

Phosphorus concentrations appear to be determined largely by sediment-water interactions and biological uptake. The slight increase in average dissolved phosphorus concentration between June and September is not statistically significant. There is a substantial reserve of phosphorus in the sediments, based on the 1987 BEC study, but little of this reserve seems to reach the water column. As primary productivity in Great Pond is believed

to be largely dependent on phosphorus dynamics, groundwater inputs are not as influential as might be expected, given the importance of groundwater in the hydrologic budget.

In general, the quality of water in Great Pond is entirely appropriate to its varied uses; alteration through management appears unnecessary at this time. Preservation does not equate to lack of management, however. If impacts on groundwater increase, impacts on the pond can be expected to increase as well. Great Pond seems to have a fairly strong biological buffering system comprised of an active microbial community in the sediment and a healthy rooted plant assemblage (BEC 1987). This system should be protected. As groundwater contamination is typically a long-term process with long-term consequences, prevention of such contamination is in the best interest of the pond as well as the health of the Eastham community.

RECOMMENDATIONS

Based on the results and discussion above, very little in-lake management appears necessary. Control of nuisance growths of rooted aquatic plants in swimming areas does not represent a serious threat to the biological system, but widespread reduction in plant densities is not advisable. Within the watershed, efforts to isolate sources of groundwater contamination are warranted, but could be expensive. Reduction of such contamination would be even more expensive, although the resulting health and ecological benefits may make such expenditures worthwhile.

If the Town of Eastham is serious about tracking plumes from major contaminant sources, it will be necessary to install additional wells along the flow lines predictable from this study. Consideration should first be given to the likely remedial action when the source has been quanitifed and thoroughly evaluated, and how such action will affect the community socially, economically and politically. It may not be worthwhile to pinpoint a source and its impacts if the Town is not prepared to force or take the necessary remedial action. Groundwater contamination is a community level problem which warrants community level participation in its prevention and/or solution.

Although groundwater problems are evident in the study area, there is no marked threat to Great Pond at this time. The threat to potable water supplies is more pervasive, although it is no more severe than in many other Cape Cod communities. If groundwater resources can be protected as potable water supplies, Great Pond should be in no danger. Continued monitoring of the established well grid is recommended on an annual basis, with soluble inorganic nitrogen (nitrate plus ammonium) as the primary indicator parameter. Sampling in late summer would reveal the worst possible conditions in most wells. Additional sampling should be considered for chronically contaminated wells (SIN >2 mg/l), with remedial action recommended on a case by case basis.

ADDENDUM

Although the original contract for this project called for four samplings of the wells in a one-year period, non-payment by the Commonwealth of Massachusetts resulted in cancellation of the winter 1989-90 sampling. To meet contract requirements and provide additional information to the Town of Eastham, a fourth round of well sampling was conducted in late June of 1991. the results are contained in Appendix D.

In general, the results were similar to those obtained in the other samplings. Water levels in the wells were slightly lower, a consequence of a very dry June. No nitrate levels in excess of the 10 mg/l health standard were detected, but 15 values over 1 mg/l were obtained, suggesting human influence on water quality in the associated wells. Potential problem wells were almost all the same as in previous samplings. This suggests a relatively constant source of contamination, and not the passage of a slug from some past accident or environmental abuse. Variability in the data set indicates substantial fluctuations in nitrate (and other parameter) values even at problem wells, however, with some indication of a seasonal pattern. As suggested previously, onsite wastewater disposal systems are the most likely route for groundwater pollution in the Great Pond watershed.

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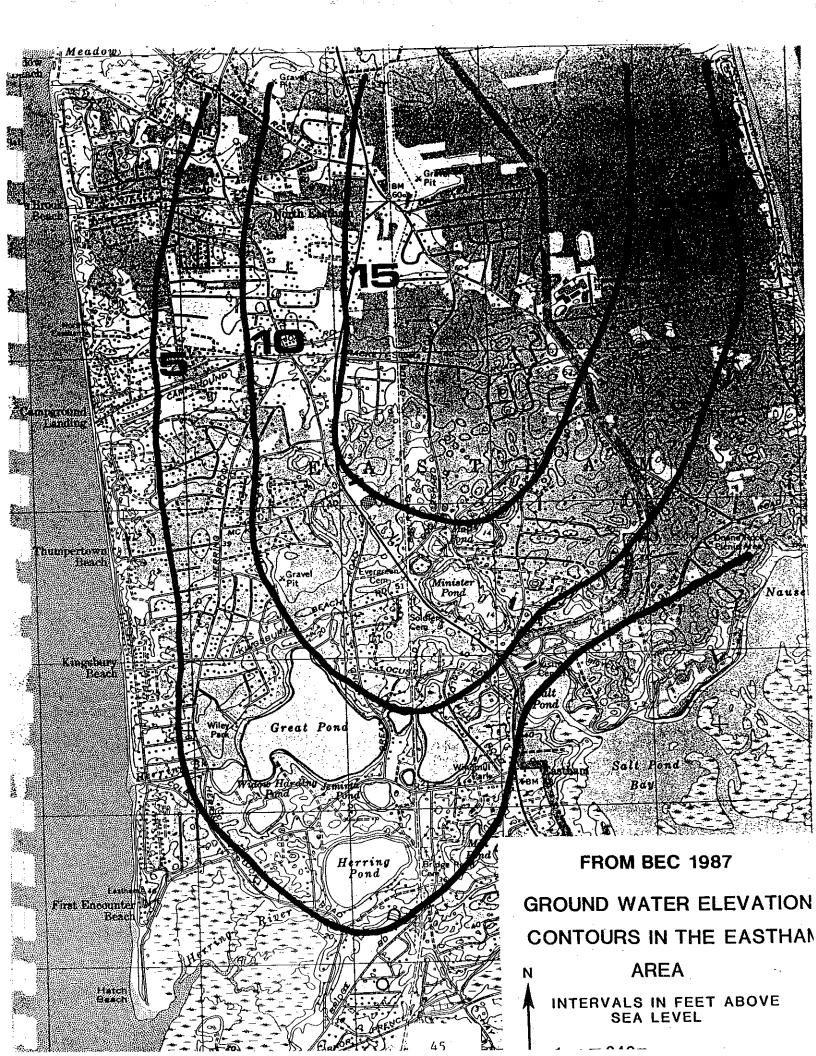
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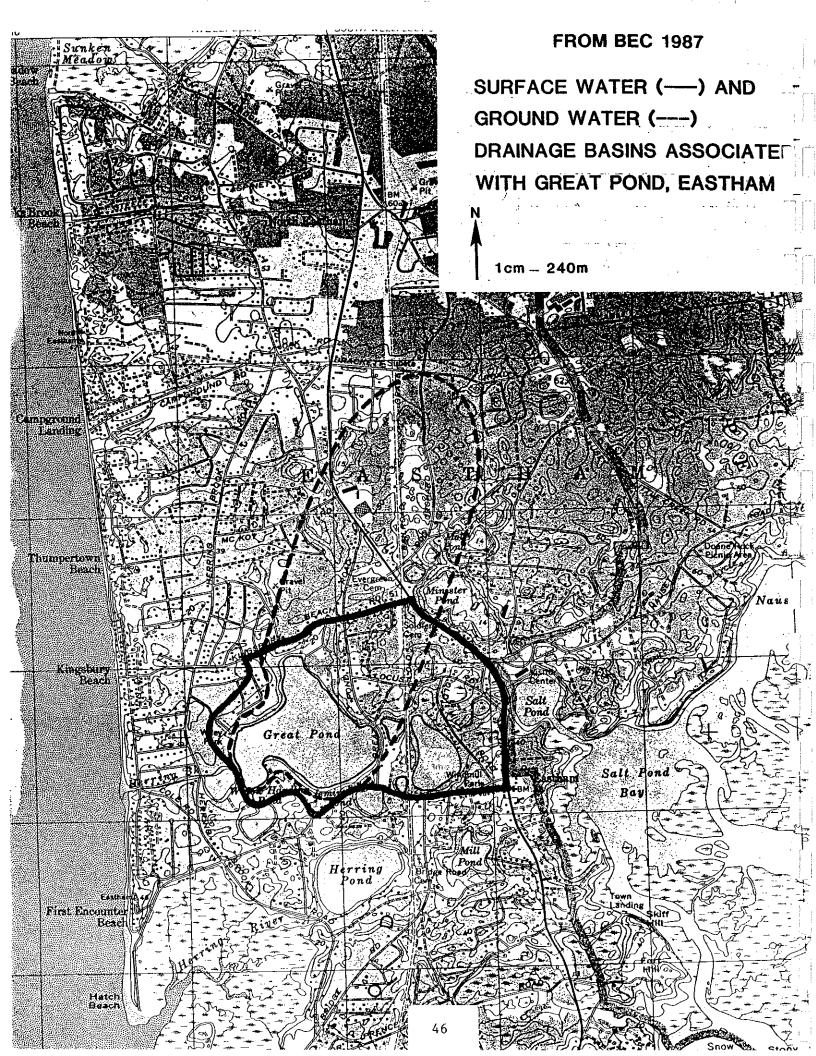
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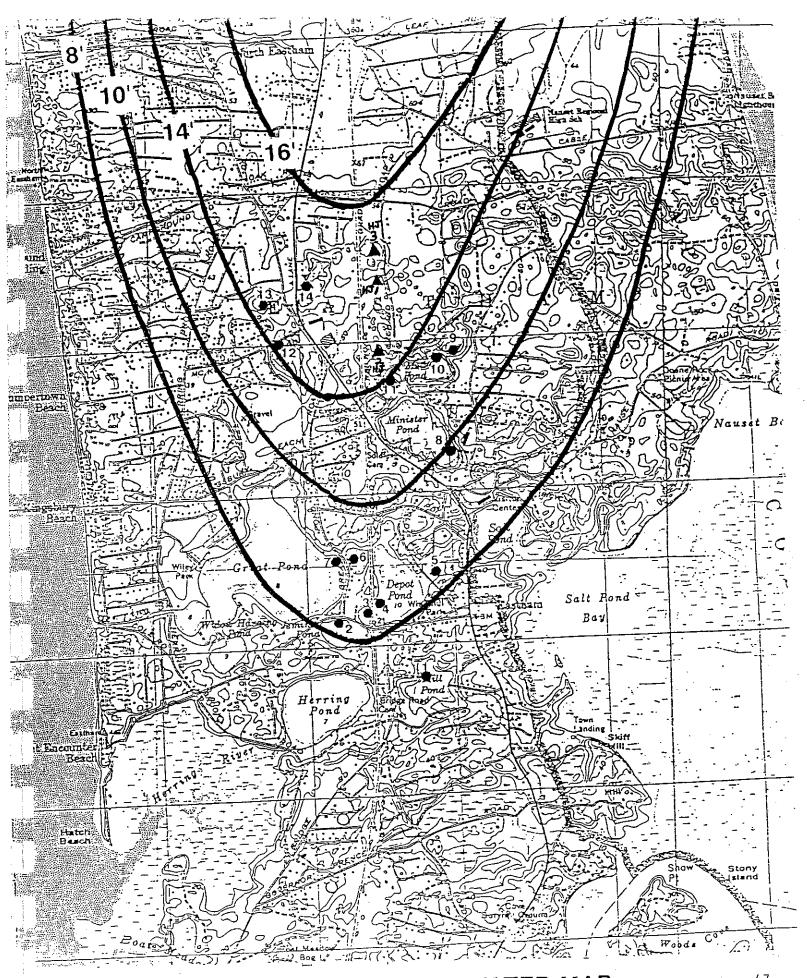
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APPENDIX A

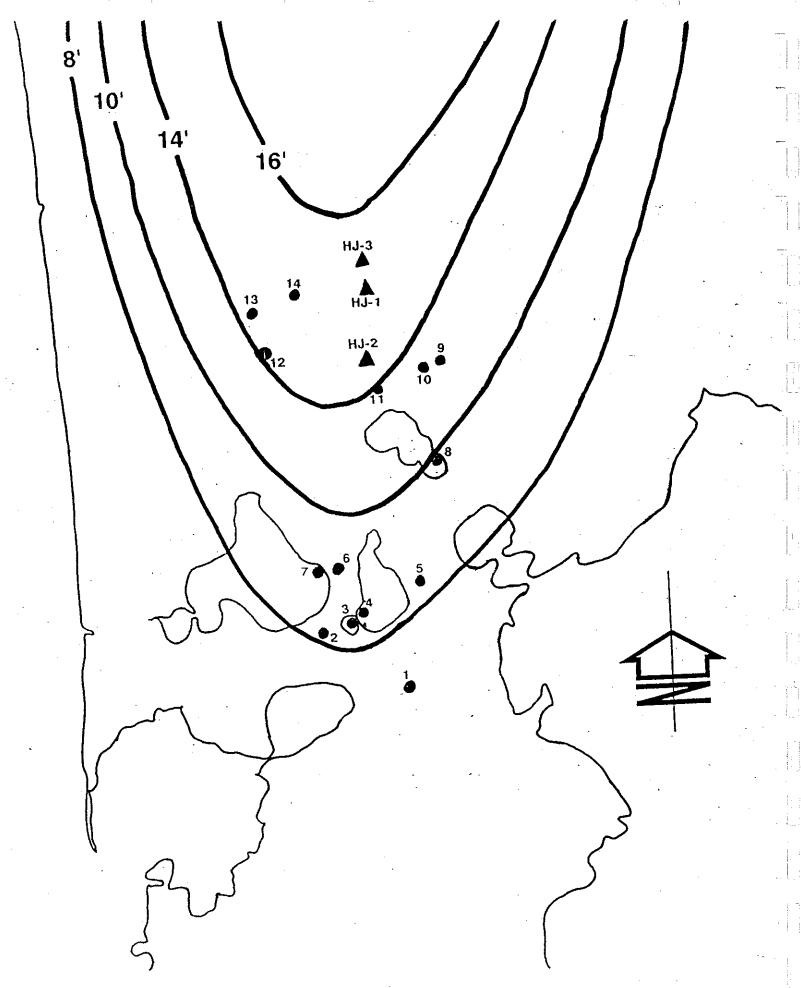
GROUNDWATER INFORMATION FROM PREVIOUS STUDIES





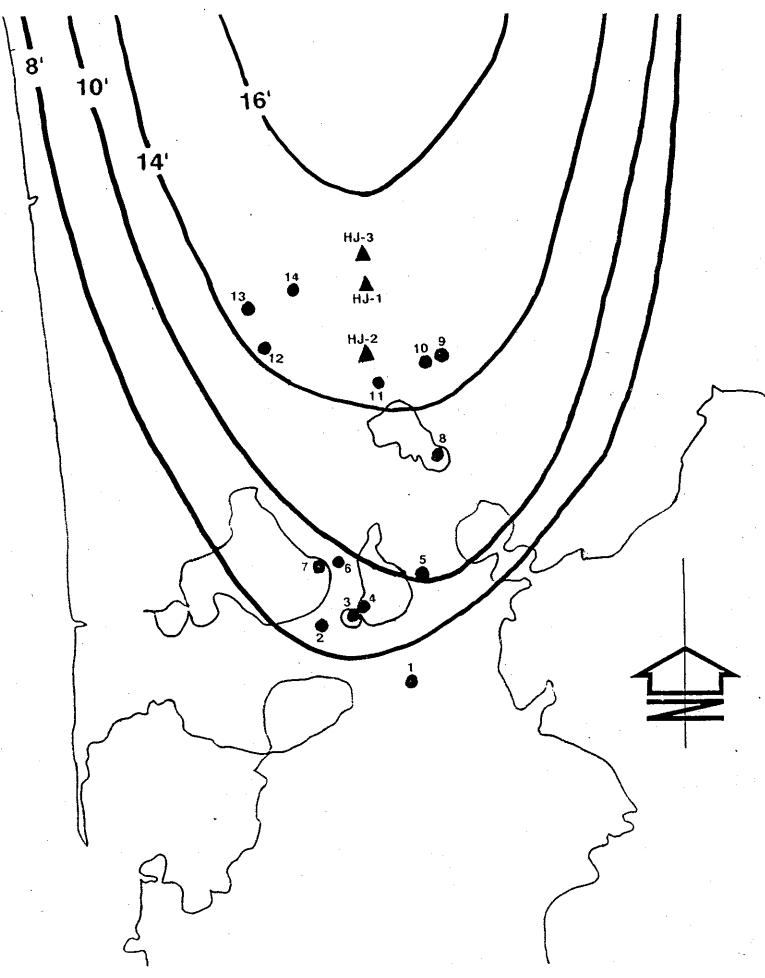


GREAT POND GROUND WATER MAP
COMPOSITE ON USGS TOPOGRAPHIC MAP
BASED ON DATA FOR EASTHAM POND GAUGES AND THREE WELLS



GREAT POND GROUND WATER MAP

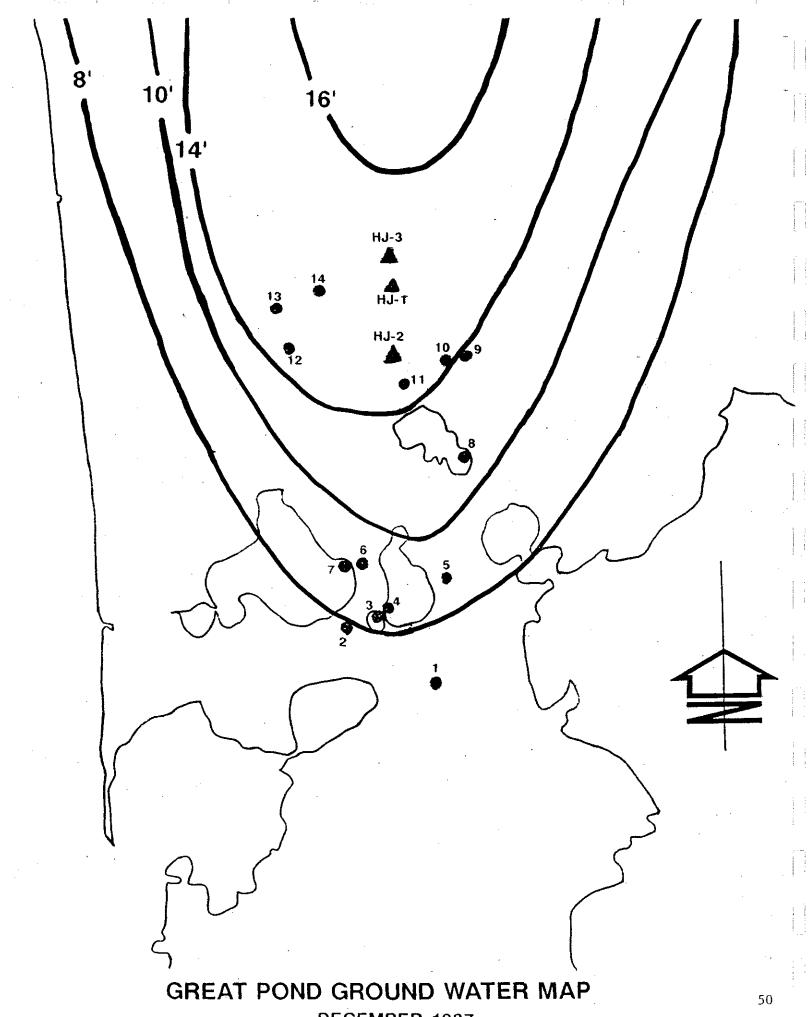
COMPOSITE
BASED ON DATA FOR EASTHAM POND GAUGES AND THREE WELLS



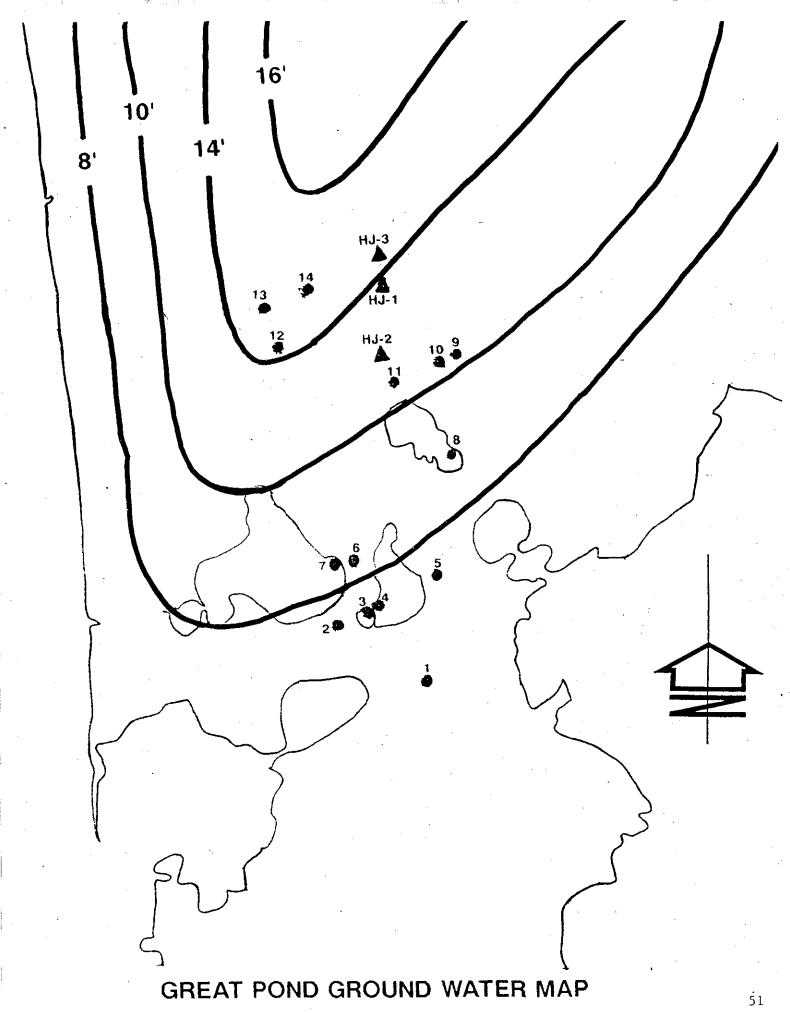
GREAT POND GROUND WATER MAP

49

NOVEMBER 1987

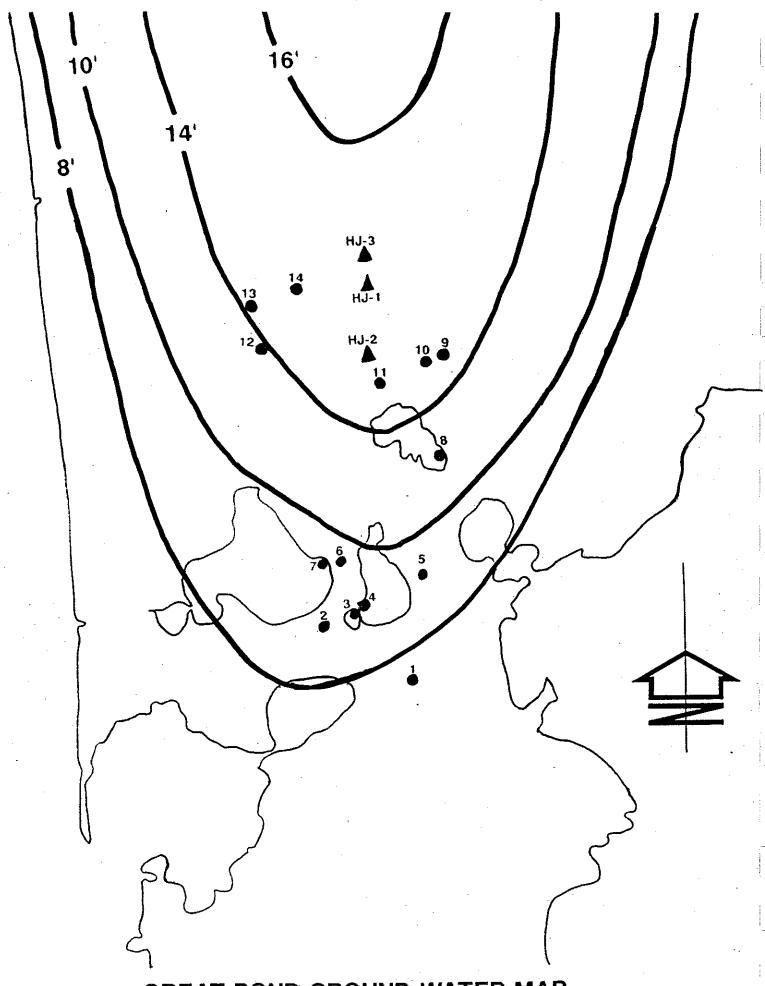


DECEMBER 1987
BASED ON DATA FOR EASTHAM POND GAUGES AND THREE WELLS



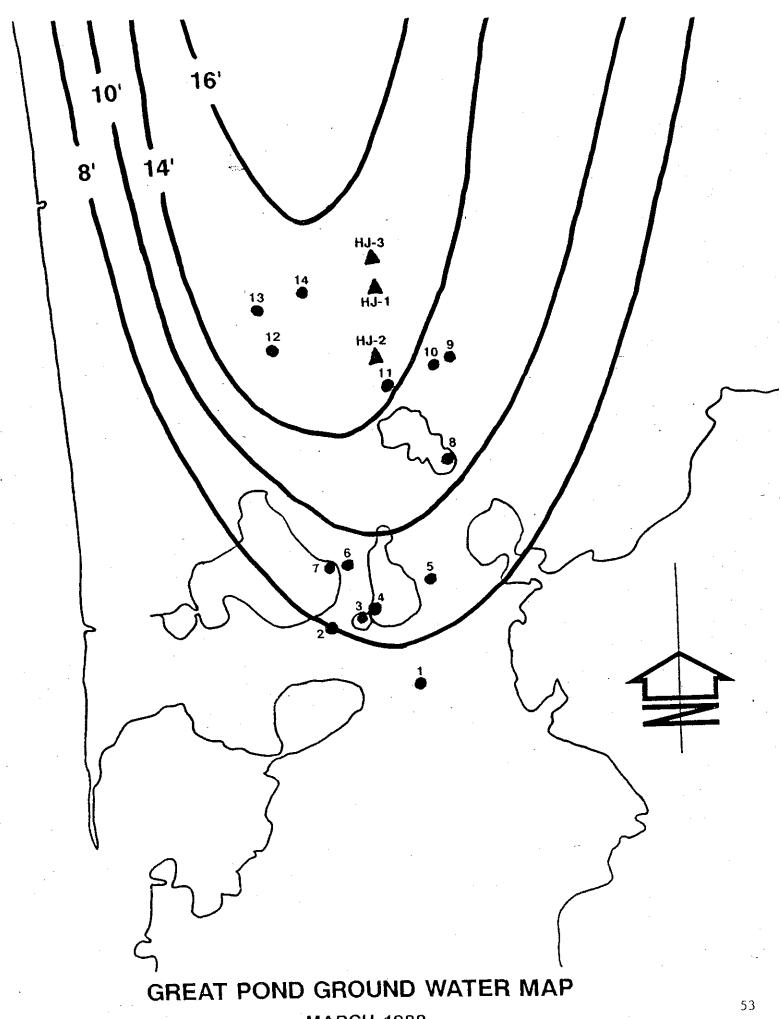
JANUARY 1988

RASED ON DATA FOR FASTHAM POND GALIGES AND THREE WELLS

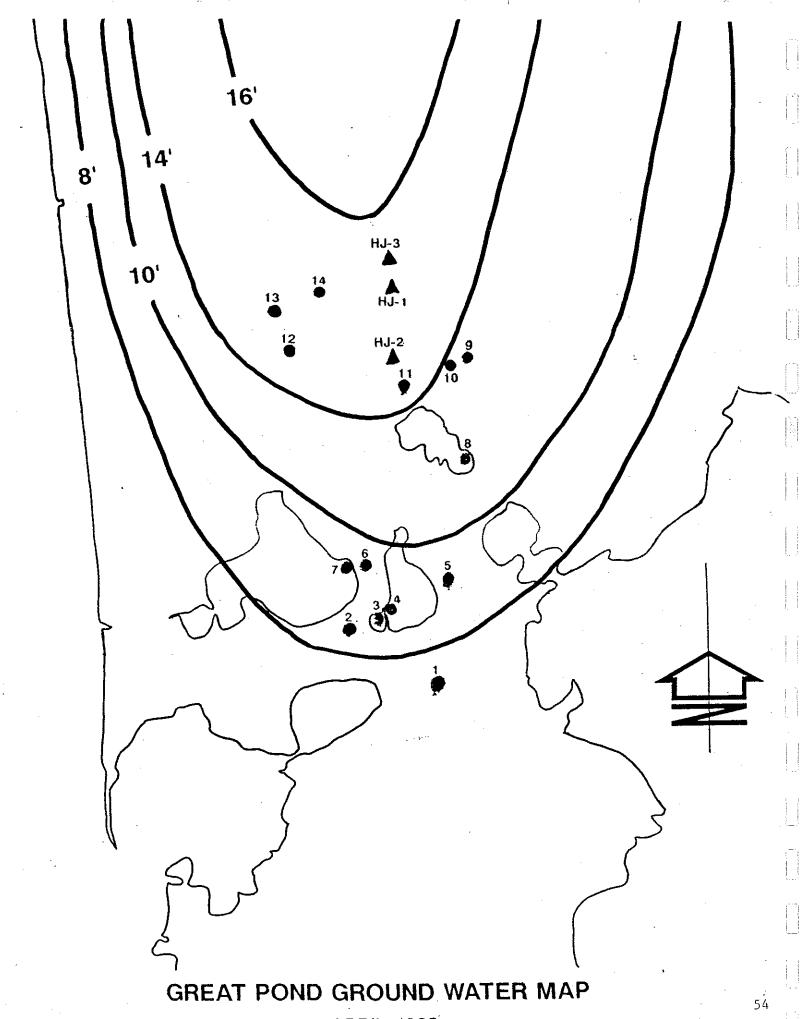


GREAT POND GROUND WATER MAP

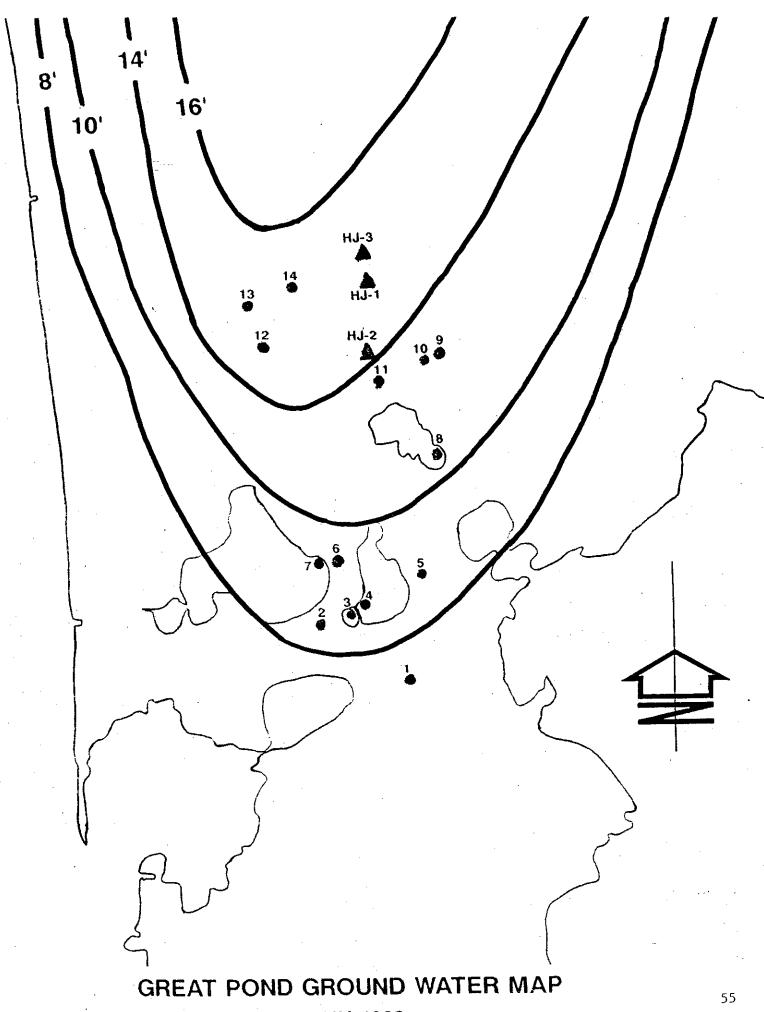
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MARCH 1988

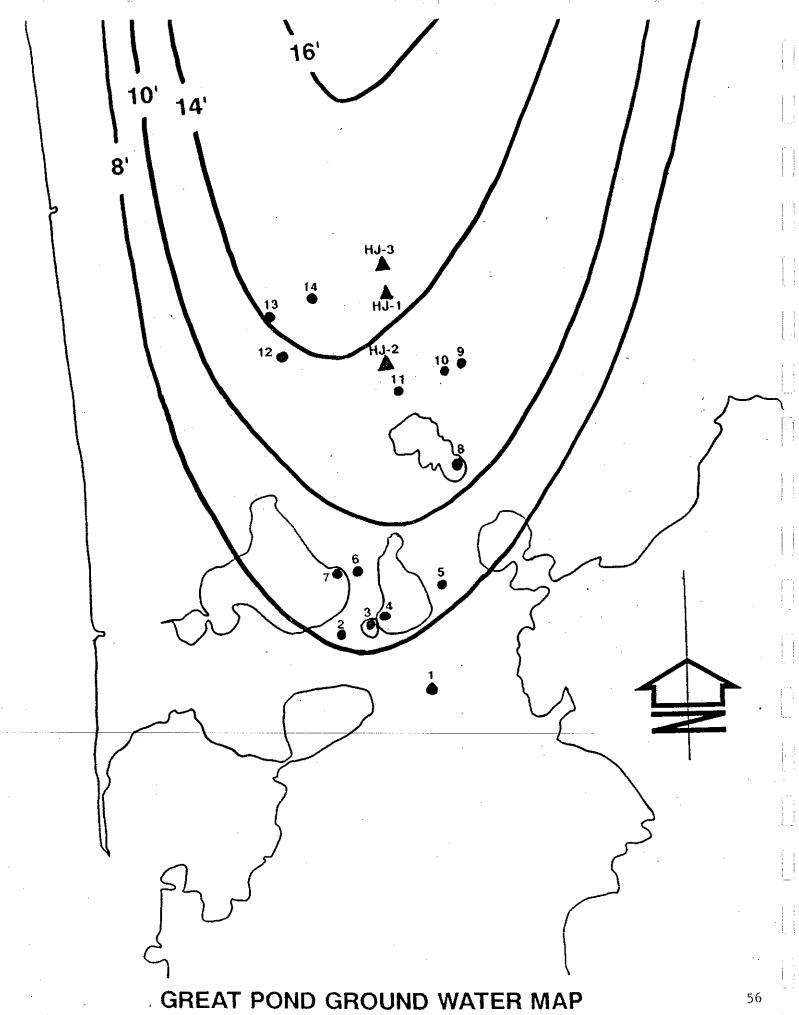


APRIL 1988
BASED ON DATA FOR EASTHAM POND GAUGES AND THREE WELLS



MAY 1988

ATA COD CACTUARS DONO CALICEC AND TUDEE WELLS



APPENDIX B LOCATIONS AND BORING LOGS FOR INSTALLED OR MONITORED WELLS



BAYSTATE VVIRONMENTAL CONSULTANTS

Scientists Engineers Planners Dear Resident:

Baystate Environmental Consultants, Inc (BEC) of East Longmeadow, MA are currently working for the Town of Eastham to perform a Phase II study of Great Pond. As part of the study we are attempting to assess the ground water elevation, movement, and water quality. This information will be used to help assess the ground water In order to do this 40 influence to Great Pond. wells must be installed. There will be 13 single wells and 9 Piezometer "Cluster" wells. A monitoring program will be conducted and each well will be sampled 4 times, once each season. The results of water quality will be available for each resident with a well on his/her property.

The property referenced below is one of several locations that has been chosen as a possible site to have a well installed. We would like to install this well in an unobtrusive area of your choice (along the roadway or the corner of your property). If your are at all interested in participating in this project and you are willing to have a well installed on your property we would appreciate you contacting our office at (413) 525-3822.

The goal of the entire study is to make Great Pond a better facility for you. We can do little without your cooperation and assistance. We look forward to working with you.

Very truly yours,

BEC, INC.

Kenneth J. Wagner, Ph.D.

Vennett J Wagner

Associate

KJW/ble

296 North Main Street East Longmeadow, MA 01028 (413) 525-3822



BAYSTATE ENVIRONMENTAL CONSULTANTS

Scientists Engineers Planners January, 1989

Mr. Resident Address Town, Mass. Zip Code

Dear Mr. Resident,

Enclosed you will find a map of your property along with a permission letter. We, Baystate Environmental Consultants, Inc., (BEC) have chosen a location on your property to have the monitoring well installed, with your approval. At this time you may choose to move the well and mark the new location on the map, or approve the location given. Bear in mind that a drill rig must access the well site. Return the map with the signed permission letter to our office at your earliest convenience.

All of the locations selected to have a monitoring well installed are within the ground water drainage basin of Great Pond and were chosen after BEC, Inc. reviewed the ground water data collected over the past year. The ground water appears to be flowing in a south-westerly direction, leading to the orientation of the sampling (well location) grid set up by BEC, Inc.

The monitoring wells will be sampled once each season, a total of four times a year. The parameters to be assessed include the following: phosphorus, nitrogen series, pH, conductivity, alkalinity, sodium, fecal coliform and fecal streptococci. The chemical data will be made available to each property owner. The results will help the Town of Eastham protect Great Pond and improve ground water quality in Eastham.

The duration of the study is 2 years, which means BEC, Inc. personal will examine and sample each well 8 times, requiring access onto your property each time the well is to be sampled. Our presence will be unobtrusive, and no damage will be done to the property.

If you have any questions regarding this letter please contact our office at (413) 525-3822.

Very truly yours,

BEC, INC.

Todd L. Bachand

296 North Main Street East Longmeadow, MA 01028 (413) 525-3822



BAYSTATE ENVIRONMENTAL CONSULTANTS

I hereby give Baystate Environmental Consultants, Inc. of East Longmeadow, MA. permission to access my property and to install a monitoring well within the boundaries of my property. I understand that BEC, Inc. will need access to my property for the next two years in order to sample the monitoring well on a quarterly basis.

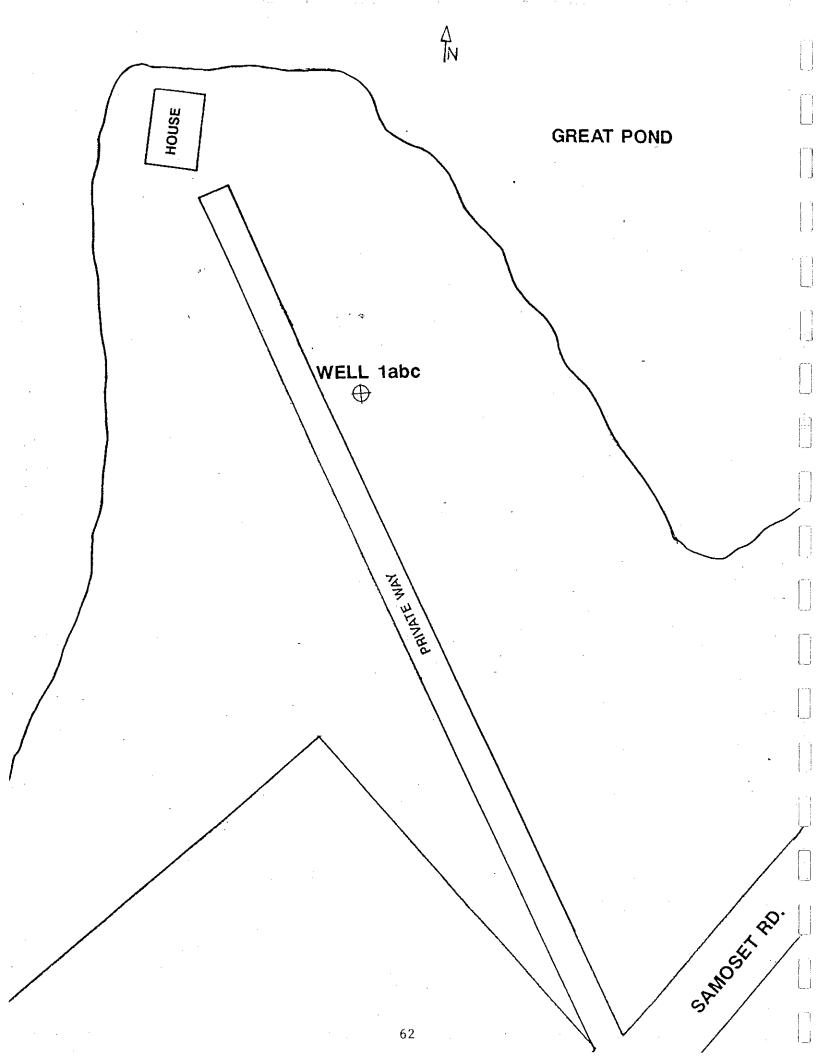
NAME:

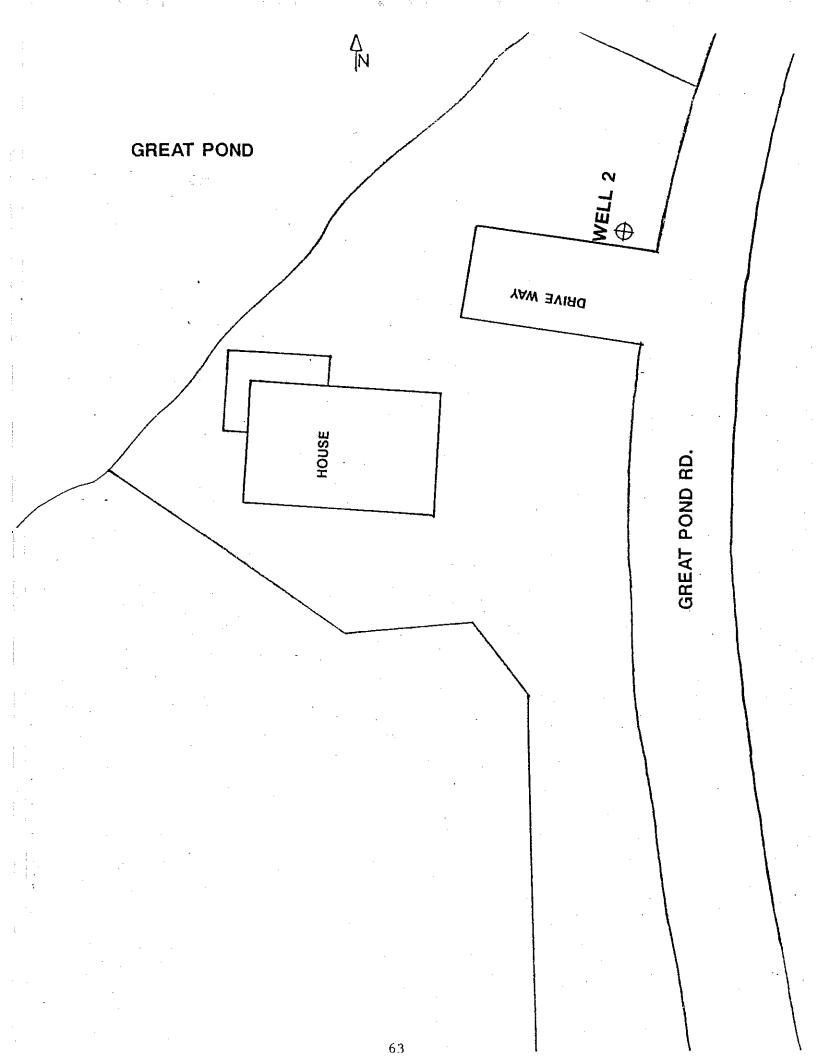
PROPERTY LOCATION:

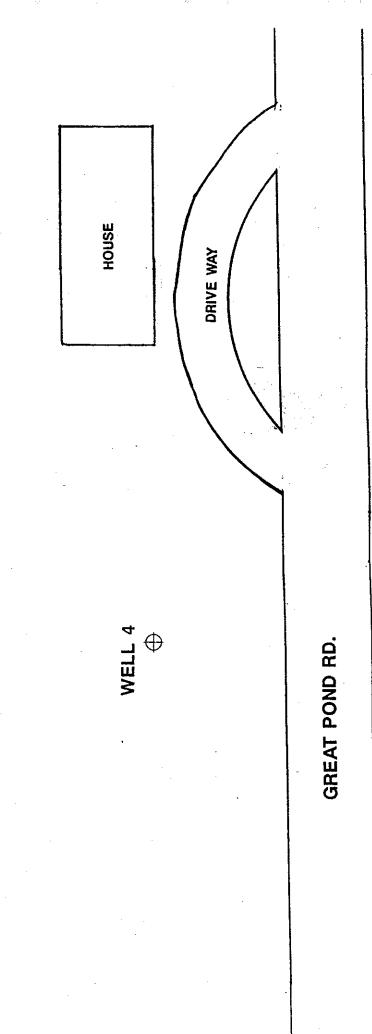
SIGNATURE:

DATE:

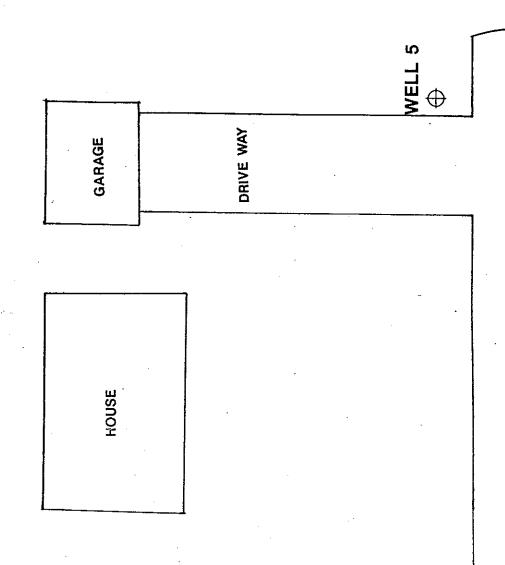
Copies of signed slips are on file with the Eastham Board of Selectmen



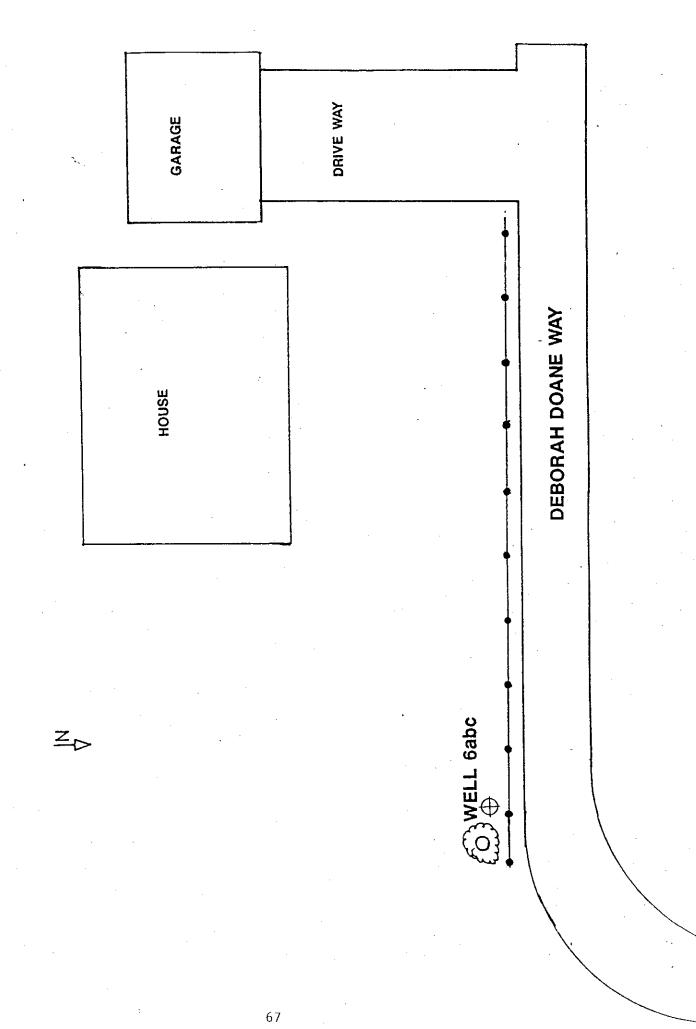


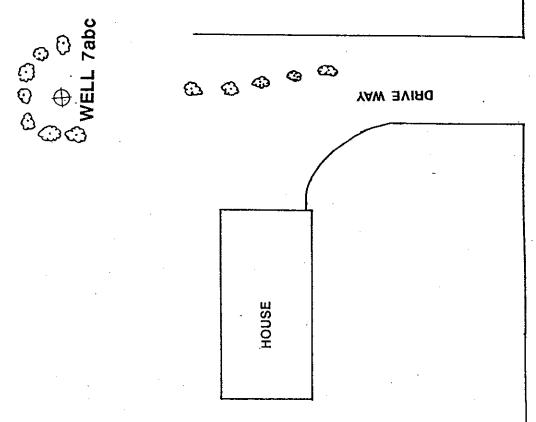


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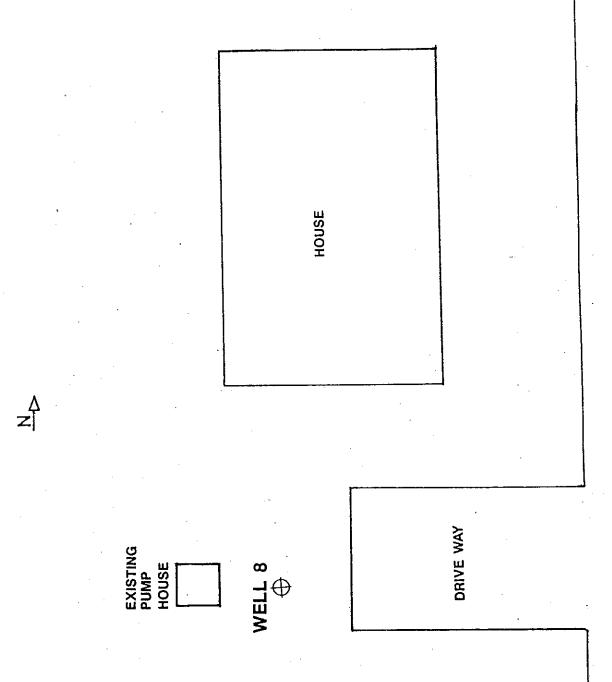


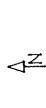
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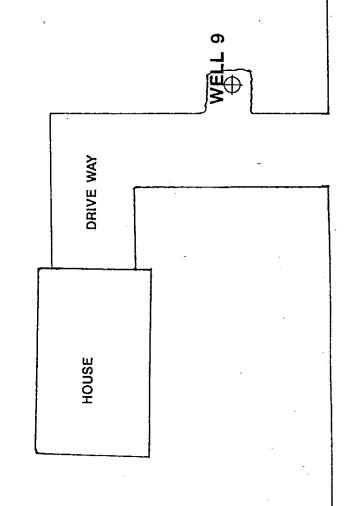




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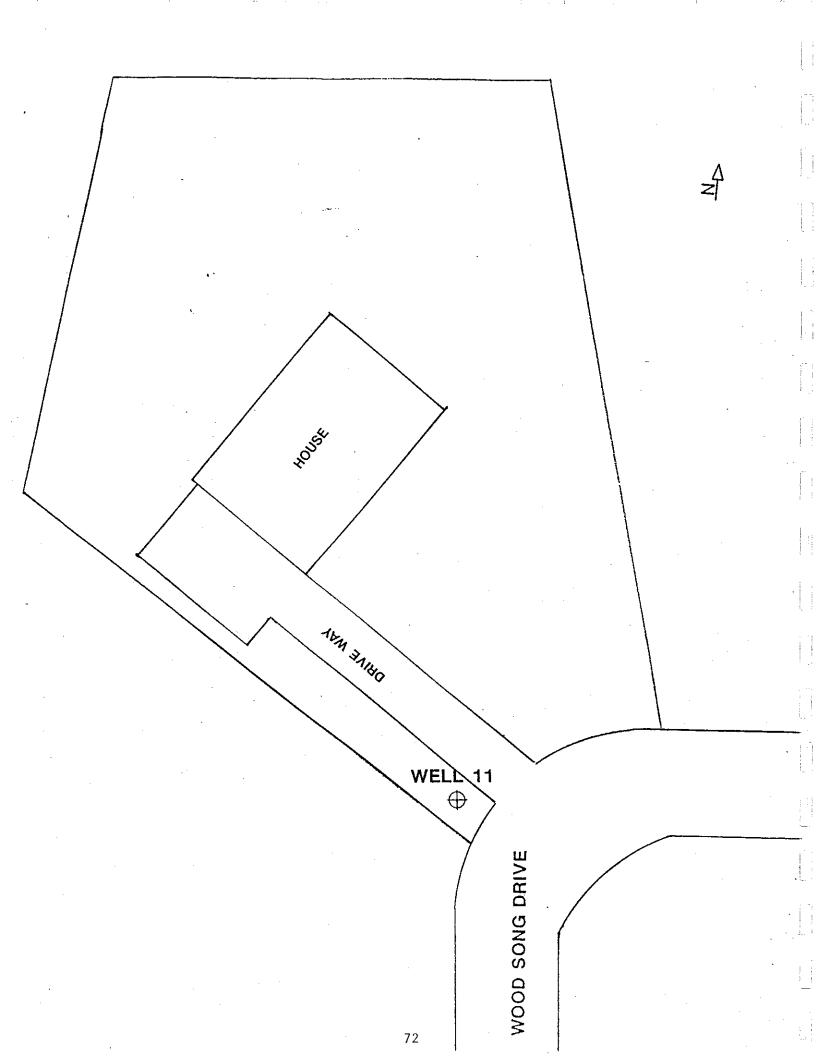


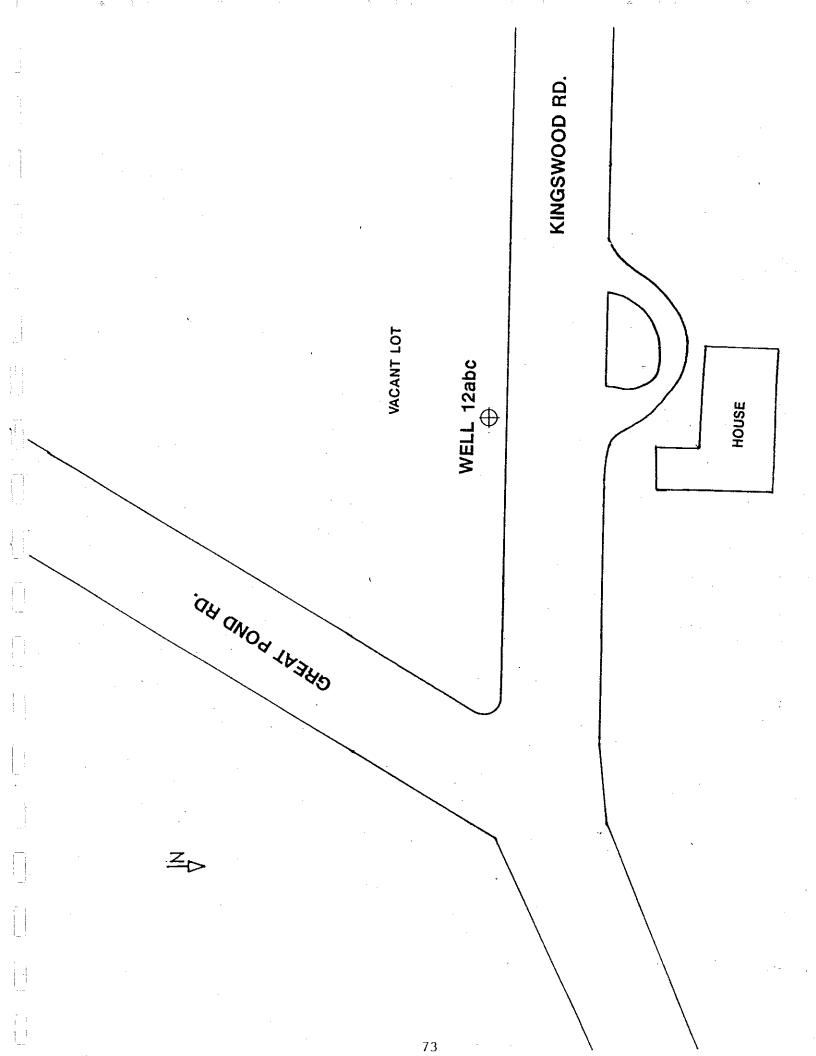




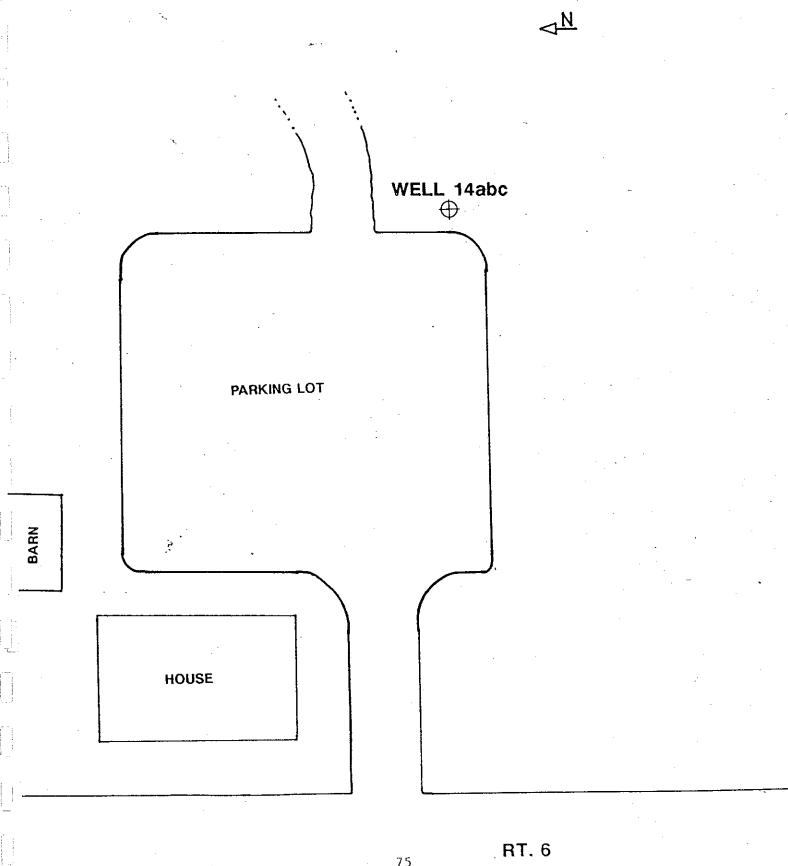
СВЕАТ РОИВ ВВ.

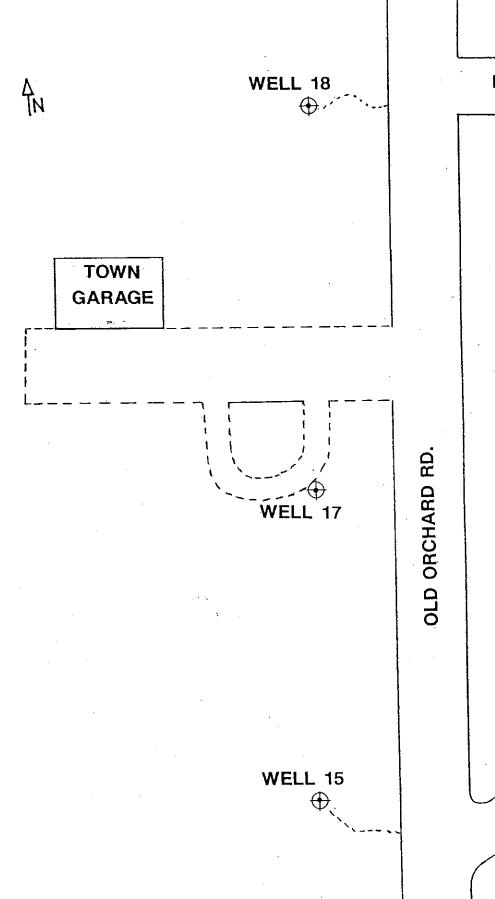
HOUSE SHADY LANE WELL 10 GROVE RD.





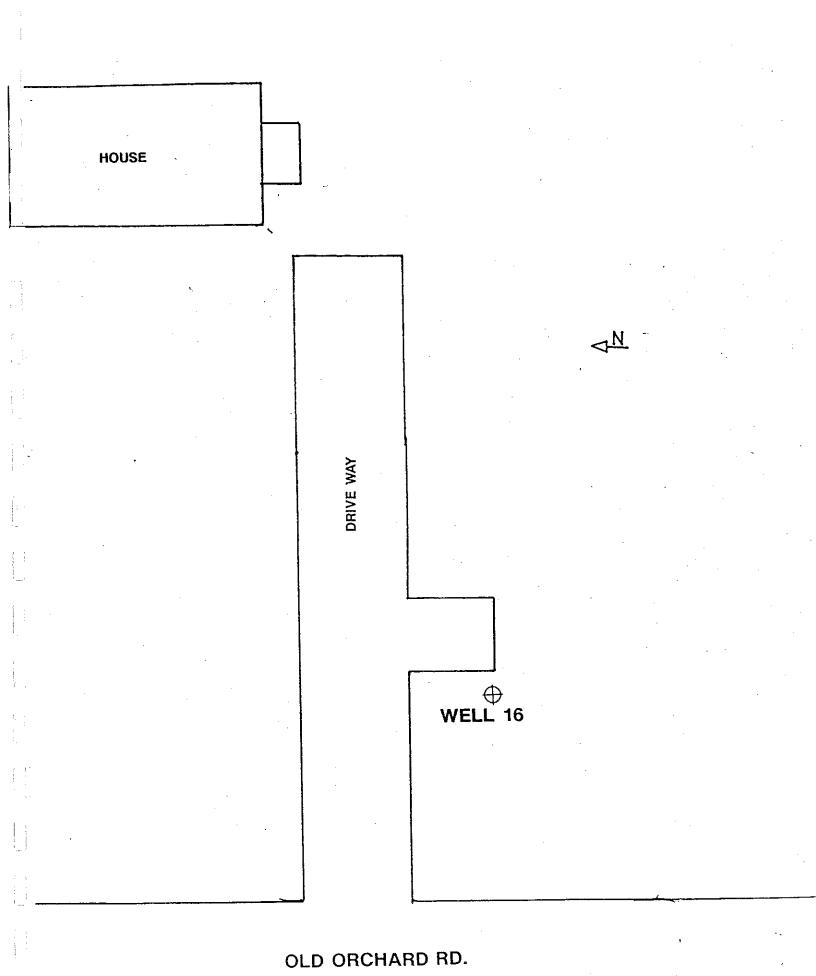
P0117F 6

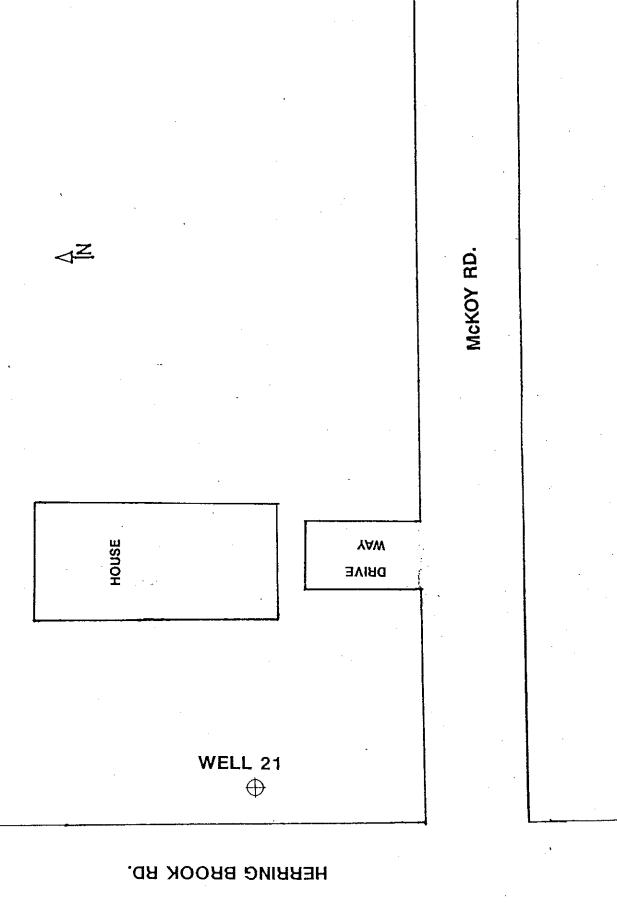


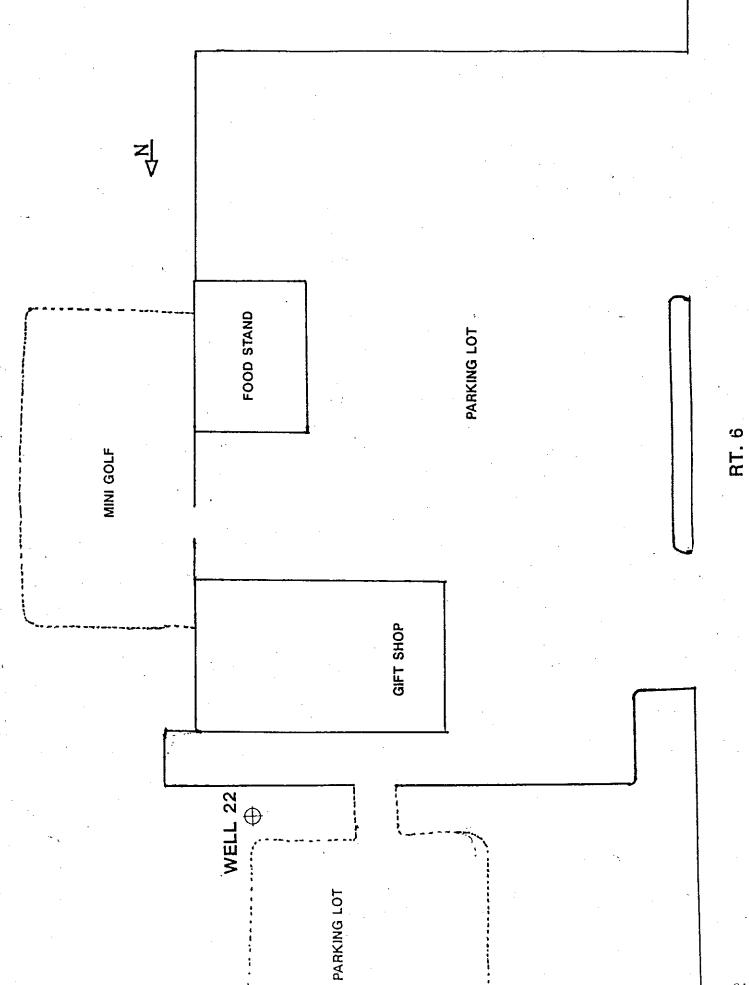


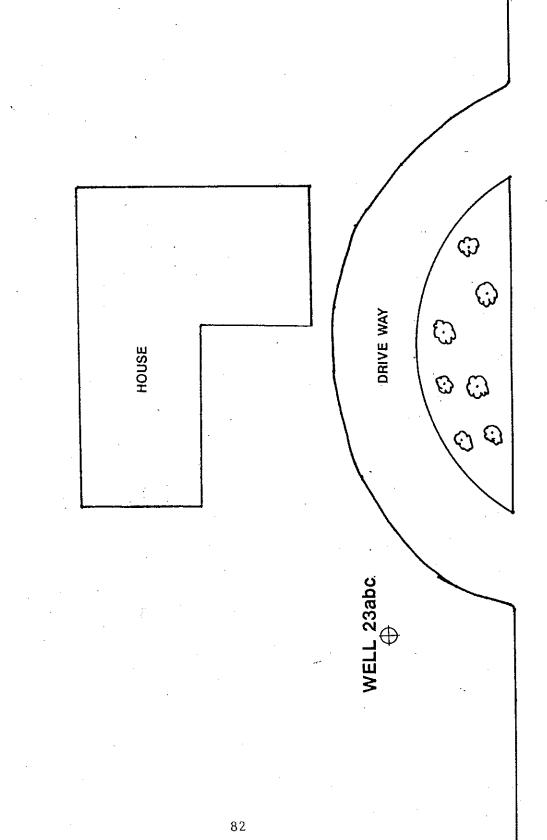
LUPIN WAY

MEETING HOUSE R.



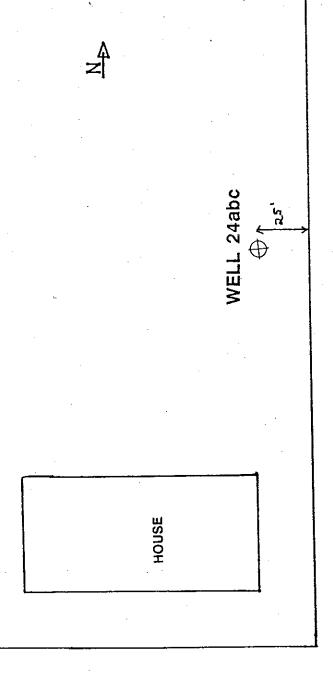




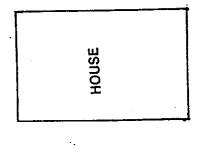


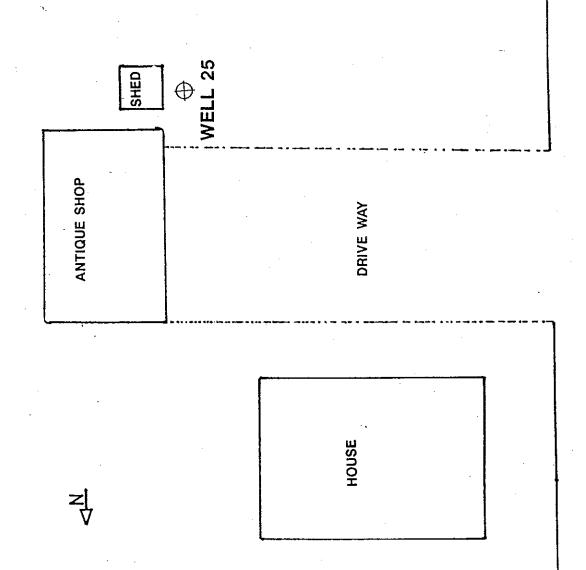
OLD ORCHARD RD.

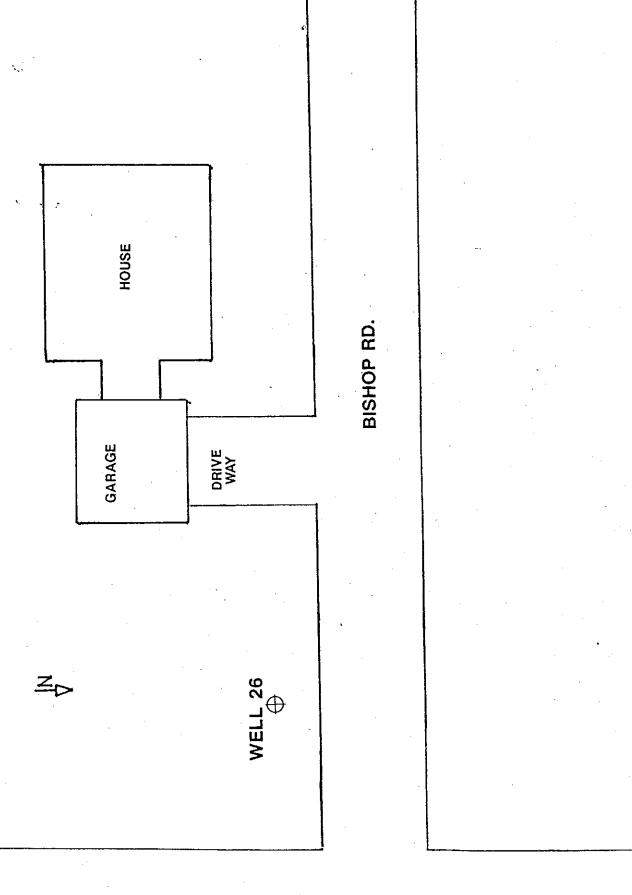
BRACKETT RD.



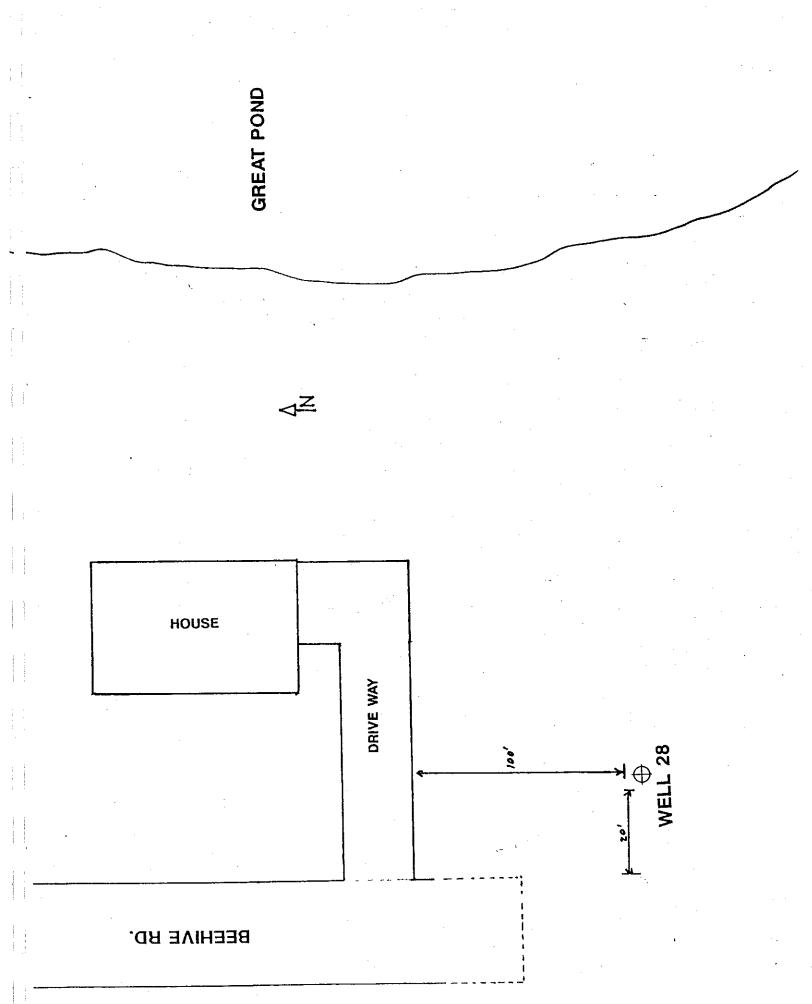
DANIELLE DRIVE







RT. 6



	MOJECT GIN	eat Pond	0	
		ladris foint	Phase II Rd. Eathann:	WELL NO A
	COORDINATES	NIA	- Rd, Eastham.	
	DATE COMPLETE		१९	AQUIFICA -
	SUPERVISED BY			
-		_ 		
	3 .		Elevation of reference point	23.75
	GROUND ELEVATION		Height of reference point above ground surface	Flush
	SUBJECT OF		Death of surface seal	1.5-2.01
			Type of surface seal: Concre	
			1.0. of surface casing	8"
			type of surface casing:	
			•	18"
	Ì		Death of surface casing .	10
			Type of riser pipe:	2"
AH			Threaded PYC	
AATICRAPHY	中共		Diameter of borehole	8"
TAAT	Sond Sitt		-Type of filler: Sand	
~	1 2 2		Elevetion / death of too of seel	7.75
CENTRALIZED			Tym of mal: Benjanite	
346	clays affarent		Type of gravel pack Sand	- NIA
. J	10 d t		Elev./depth of top of gravel pack	
3	¥ 2		Description of screen	
	30		Sch. 40 PVC with 101 of	
-	27 7 15		1.D. of screen section	2"
			Elevetion / death of bottom of sci	-6,25
	0-601 55-65 5-75'			
	5. 5		Elev./depth of bottom of gravel pa	NA
	79		Flank Section	/*//
	`		Type of filler below plugged NIA	
			Elevation of bottom of boremole	51.25

Well Constitution Summary

	6.00	at Pond Pho		•
-	ا الم		Se II	WELL NO 16
			· montess,	1
	COORDINATES	3/189		AQUIFIER -
	SUPERVISED BY			
		DOC		
			1.5	73.36
İ	١,		Elevation of reference paint	23.75
	G#OUND		Height of reference point above	
	ELEVATION		ground surface	Aush
	dustance.	P(3 (<u>6</u>)2	Desch of surface seal	15-201
	·			
			Type of surface seal: BONCIET	<u>~</u>
			1.0. of surface casing	
			Cast gate box	
			Sust gare box	-
		4	Death of surface casing	_18"
-	İ		•	2"
			Type of riser pipe:	
1			threaded PVC	
A A			Diameter of borehole	
5			Jon of the Sand	
STAATICAAPILY			1774 or filler:	77-
1			Type of seal: Bentonite	7.75
CI NE BAL 1710	à		TOOLINATE O	
1	10	in the second	Type of gravel pack _Sand	
, Ş			Elev./desch of top of gravel pack	- <u>NA</u>
3	20		Elevation / death of too of scree	<u>-21.25</u>
1			Schito PVC with 10' o	[- · ·
	Ž		0.010 Slot Screen	•••
	Same		1.0. of screen section	2"
	_	73	Elevation / depth of bottom of sci	-31.25
			Elev./death of battom of gravel public lev./death of battom of plugged	ex
			Blank Section	NA
			Type of filler below plugged NA	
			-flevetion of battom of baremole	-51.25

Well Construction Surmary.

	MOJECT Growt P	and Place	0 1	
	SITE Clarks	A	casthom .	WELL NO 10
	COORDINATES _ W/A	!	- Cust nom .	
- 1	DATE COMPLETED	3/189		AQUINER -
	SUPERVISED BY	3EC		
	,		Elevation of reference point	23.76
	GROUND ELEVATION	1 8	Height of reference point above ground surface	Flush
	William Cont.		Death of surface seal	1.5-2.01
			Type of surface seal: (D)NCTE	
			1.0. of surface casing	8"
	<u>}</u>		Type of surface casing:	
-	}		_ rast gate box	
		} -	Depth of surface casing	1811
			1.0. of riser pipe	2"
=			threaded DVC	
AATIGRAPHY				8"
15			Diameter of borenois	· · · · ·
17.		·	Type of filler: Sand	
ST			Elevation / depth of top of seal Type of seal: Bentonite	7.75
CI NÉ RAL 17ED	•		Type of wal: Bentonite	
1 7	a	2000	Type of gravel pack _Sand	
. 5			Elev./depth of too of gravel pace	
3	3		Elevetion / depth of top of scree	-41.25
	'		Sch. 40 PYC with 10'	<u>√</u>
	3 1		0.010 Slot screen	<u> </u>
,	Same		1.0. of screen section	d =
	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	11	Elevation / depth of battom of sc	<u>~5/.25</u>
	1	J.,	Elev./death of bottom of gravel p	NIA
		-	flev./septh of battom of plugged blank section	NIA
	1		•	
	1		Type of filler below plugged N/	4
			Clevetion of batton of barenals	-51.25

Well Construction Summary.

	PHOJECT Great	t And Pr	haca II	·
	SITE Gree	at Pond K	Id., Eastham .	WELL MA - 2
	OGREHNATES	0 2 28 80		AQUINES
ļ	SUPERVISED BY	BEC		
	ν,		Elevation of reference point	13./3
	GROUND ELEVATION		Height of reference point above	Flush
			Death of surface seal	15-2.51.
	-		Type of surface seal: Concret	<u>e</u>
			Type of surface casing: Cost gate Nox	3"
			Death of surface casing	201
-			Type of riser pipe: Threaded PVC	<u> 2"</u>
AATIGRAPIIY	ands		Dismeter of barehole	4"
STAL	\$		Type of filler: Sand	
977	3		Type of seal: Bentonite	
MERALIZE	200		Type of gravel pack Sauch Elev./depth of too of gravel pack	· NA
3	9		Description of screen Sch. 40 PVC with 10' of	8,13
:	1/4		biolo slot screen	···
	ā		I.D. of screen section Elevation / depth of battom of scre	
ļ	0.2		Elev./death of bottom of gravel pac	· NIA
			Type of filler below plugged N/A	NA
			Elevation of bottom of borgmaly	8.87

Well Construction Surmary.

Γ	PROJECT Great	Pond Pho	ce TI	<u> </u>
	SITE Wiley A	ast Ea	Sthom	WELL MA 3
	COORDINATES LA	t. 41-49-5	9 Long. 69-59-50	(existing)
	DATE COMPLETED _	6/18/75		AQUIFICE -
	SUPERVISED BY			
}_				
	•		Elevation of reference point	26,86
	GROUNG ELEVATION		Height of reference point shows	Flush
	Sugar Com		Death of surface seal	N/A
			Type of surface seal: NA	
			1.0. of surface casing Steel	
<u> </u> 			Depth of surface casing	_N/A
			1.D. of riser pipe	1.25"
A. 74.	1110		hlack PVC	
STAATIGRAPHY	N/H		Diameter of borenole	NA.
TAAT		-	Type of filler: N/4	 ~ .
	. 		Elevation / depth of top of seal Type of seal:	<u>~~ A</u>
CENTRALIZED			Type of gravel pack NIN- Elev./depth of top of gravel pack	- NIA
3			Elevation / death of too of scree	• • •
	[]		Descripcion of screen	
			1.0. of screen section	1.25"
			Elevation / depth of bottom of sc.	-0.34
			Elev./death of batton of gravel p	NA NA
			Elevi/depth of Sottom of plugged blank section	_N/A_
			Type of filler below plugged N	
-			Elevation of pottom of poremole	_NA

Well Construction Summary.

			· · · · · · · · · · · · · · · · · · ·	•
- 1	PROJECT _GN	eat Pond F	Phase II	11
j	SITE Great		Eastham .	MELL NO -4
	COORDINATES	NA		
	DATE COMPLETE	3/8/89		AQUINER
	SUPERVISED BY	BEC		
- }-				65
				21/115
	· ·		Elevation of reference point	34,45
-	GROUND			
-	ELEVATION		Height of reference point above ground surface	Flush
	SULLI CALCULA		Design of surface seal	15-251
.		国		12.40
	ľ		Type of surface seal: CONCRET	e
.				3"
			Type of surface casing:	
	1.		cost gate box	
-		11 17	0	
	1	Y	Death of surface casing	2.0'
			1.D. of riser pipe	· 2"
-			Type of riser pipe:	
Ē		11 11	Inreaded PVC	
4			Diameter of borenois	_4"
AATIGRAPHY	1 2 %	11 11	- C - A	•
STA	San		Type of filler: Sund	
1	1 2 × 1		Type of seal: Bentonife	18.45
2	12 321		Tym of wal: Bentonite	
CLME RALIZE	1 3 3 8		Type of grand pack Sand	
3	2		Elev./desth of toe of gravel pack	- NA
X	3 20 2			· · · · · · · · · · · · · · · · · · ·
٦	12.83		Description of screen	4.45
	1		3ch.40 pyc with loi of	
].	- · ·		10:010 slot screen	
}	37		1.0. of screen section	2"
i	2 × × × × × × × × × × × × × × × × × × ×	13.65	Elevation / death of battom of sci	-5,55
l	3 2 2			i i
}			Elev./death of bottom of gravel put Elev./death of bottom of plugged	ex <u>N/A</u>
			blank section	NA
			Type of filler below plugged	· I
			sectionN	4
			illevation of pattor of parenals	-15,55

Well Construction Surmary.

	POJECT Great	Qual Oli	-7	
1				WELL NO 5
1	sire Split Rail Rd., Eastham .			
	ORDINATES			AQUIFIER —
	TE COMPLETED.			
St	IPERVISED BY	136C		
}				-
	ν,		Elevetion of reference point	21.63
	POUND LEVATION		Height of reference point above ground surface	Plush
	1111/12/2017 - 1		Depth of surface seal	1.5-2.5
			Type of surface seal: concrete	
			Type of surface casing:	3"
			rast gate box	
			Death of surface casing	201
,			Type of fiser pipe:	<u></u>
STAATICAAPHY	21		Threaded PVC	<u> </u>
34716	gar		Type of filler: Sand	-
- I			Elevation / depth of top of seal Type of seal: Deuton te	11.63
CINTRALIZED	GED-/SE		1	
K B A	0		Type of gravel pack	A .
3	Mos		Description of screen	6.63
'i !	Se		schillo PVC with 10' of	11
	ò		1.B. of screen section	-3,37
			Elevation / depth of battom of scr Elev./depth of battom of gravel pa	
			Elev./depth of bottom of plugged blank section	<u> </u>
		; -	Type at filler below plugged N/4	
:			Elevation of pottor of parenals	-3.37

Well Construction Summary.

STATE CHARGE PARCE PARCE IT STATE LORGINATES MICH ACCUMULATED SUPERVISED BY AGE Clavation of reference point above Flock SUPERVISED BY AGE Clavation of surface seals ACCUMULATED Type of surface seals ACCUMULATED L.S. at river seals ACCUMULATED L.S. of river size casing ACCUMULATED Type of surface casing: (ACCUMULATED ACCUMULATED AC	Carl O	
SUPERVISED BY AGE Elevation of reference point SUPERVISED BY AGE Elevation of reference point Supervised By Age Insurance Surface seals Type of surface casing Insurance Surface Casing Insurance Surface Casing Insurance Surface Casing Insurance Surface Casing Insurance Surface Casing Insurance Surface Casing Insurance Surface Casing Insurance Surface Casing Insurance Surface Casing Insurance Surface Casing Insurance Surface Casing Insurance Surface Casing Insurance Surface Casing Insurance Surface Casing Insurance Casing Insurance Surface Casing Insurance Surface Casing Insurance Surface Casing Insurance Surface Casing Insurance Casing In	SITE Deberah Aran Ahase II	
SUPERVISED BY AGE Clauseion of reference point Clauseion of reference point Clauseion of reference point Clauseion of reference point Comparison	WUNDHATES AIA	WELL MA 69
Elevation of reference point SECURIOR CLEVATION Proper of surface seal Lips of surface casing Lips of surface casing Lips of surface casing Lips of surface casing Lips of surface casing Lips of surface casing Lips of surface casing Lips of surface casing Lips of surface casing Lips of surface casing Lips of surface casing Lips of surface casing Lips of surface casing Lips of surface casing Lips of surface casing Record to surface casing Record to surface casing Lips of surface casing Record to surface casing R	DATE COMPLETED 3/1/89	AQUIDES
RELEVATION RELEVATION RELEVATION RELEVATION RELEVATION RELEVATION RELEVATION Region of reference point above Region of surface seal RECOMP Type of surface casing Region of surface casing Region of surface casing Region of region Region of surface casing Region of surface casing Region of surface casing Region of region Region of region Region of region Region Region of region Regio	SUPERVISED BY BEC	
RELEVATION RELEVATION RELEVATION RELEVATION RELEVATION RELEVATION RELEVATION Region of reference point above Region of surface seal RECOMP Type of surface casing Region of surface casing Region of surface casing Region of region Region of surface casing Region of surface casing Region of surface casing Region of region Region of region Region of region Region Region of region Regio		
Selevation of part of serven Selevation of surface seed: Served surface casing: Super of super of super of super of super of super of super of su	Elevation of reference po	inc 25.86
Depth of surface seal Type of surface casing 1.0. of surface casing Type of filter: SQNA Type of filter: SQNA Type of filter: SQNA Type of surface casing Type of su	EL FVATION MISTON	
Type of surface casing 1.0. of surface casing Type of surface casing (Ast gate box Depth of surface casing (Ast gate box Input of filer pipe: Threaded PYC Dimeter of borerole Type of filer: Sand Type of surface casing (Ast gate box Input of surface casing (Ast gate box Input of surface casing (Ast gate box Input of surface casing (Ast gate box Input of surface casing Input		Eluch
1.0. of surface casing Type of surface casing (USE 9916 DOX Depth of surface casing [1.0. of riser pipe Type of riser pipe: Threaded PRC Dismeter of borehole [1.0. of riser pipe: Threaded PRC [1.0. of riser pipe: Threaded PRC [1.0. of riser pipe: Threaded PRC [1.0. of riser pipe: Threaded PRC [1.0. of riser pipe: Threaded PRC [1.0. of riser pipe: Threaded PRC [1.0. of riser pipe: Threaded PRC [1.0. of riser pipe: Threaded PRC [1.0. of riser pipe: Threaded PRC [1.0. of riser pipe: Threaded PRC [1.0. of riser pipe: Threaded PRC [1.0. of riser pipe: Type of filler: SQUA [1.0. of serven pack [1.0. of serven Type of filler pack Type of serven Type of filler pack Typ		15-20'
Deeth of surface casing Deeth of surface casing I.D. of riser pipe Type of riser pipe: Threaded PVC Oismater of barengle Sand Type of filler: Sand Type of surface pipe: Type of surface pipe: Type of surface pipe: Type of surface pipe: Sand Type of surface pipe: Sand Type of surface pipe: Sand Type of surface pipe: Sand Type of surface pipe: Sand Type of surface pipe: Sand Description of surface pipe: Sand Description of surface pipe: Sand Description of surface pipe: Sand Description of surface pipe: Sand Description of surface pipe: Sand Type of surface pipe: Sand Type of surface pipe: Sand Type of surface pipe: Sand Type of surface pipe: Sand Type of surface pipe: Sand Type of surface pipe: Sand Type of filler below plugged Saction Type of filler below plugged Saction of barrangle UH1/14	Type of surface seal: Cor	ncrete
Deeth of surface casing Deeth of surface casing I.D. of riser pipe Type of riser pipe: Threaded PVC Oismater of barengle Sand Type of filler: Sand Type of surface pipe: Type of surface pipe: Type of surface pipe: Type of surface pipe: Sand Type of surface pipe: Sand Type of surface pipe: Sand Type of surface pipe: Sand Type of surface pipe: Sand Type of surface pipe: Sand Description of surface pipe: Sand Description of surface pipe: Sand Description of surface pipe: Sand Description of surface pipe: Sand Description of surface pipe: Sand Type of surface pipe: Sand Type of surface pipe: Sand Type of surface pipe: Sand Type of surface pipe: Sand Type of surface pipe: Sand Type of surface pipe: Sand Type of filler below plugged Saction Type of filler below plugged Saction of barrangle UH1/14	1.0. of surface casing	3"
Death of surface casing 1.0. of riser pipe Type of riser pipe Threaded PNC Dismeter of borerole SUN Type of filter: Sand Type of filter: Sand Type of seal: Newtonite seal Type of seal: Newtonite Simple Type of seal: Newtonite Type of seal: Newtoni	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
Type of filter: Sand Similar pipe: Thitaded PVC Similar of borenole Similar pipe: Thitaded PVC Similar of borenole Similar section Similar se	(1) (4)	0"
The description of screen Screen Sand State Sand	I.D. of all	· ———
Type of filler: Sand The state of the s		
Type of filler: Sand Clevetion / depth of top of seel Type of seel: Sand Type of seel: Sand Type of gravel pack Sand Elevation of top of gravel pack Description of screen Schill Pyc With Wo of O.O.O. Slot Screen Clevetion / depth of bottom of screen The section Clevetion / depth of bottom of screen The section Clevetion / depth of bottom of screen The section Type of filler below plugged Alife Llevation of bottom of porerols Clevation of bottom of borrends	Threaded PVC	0//
Type of seal: Devitority seal Type of seal: Devitority seal Type of seal: Devitority seal Type of seal: Devitority seal Type of seal: Devitority seal Type of seal: Devitority seal Elev./depth of too of screen S.86 Description of screen Shull Deve with we of Outlo slot screen L.B. of screen section Elev./depth of bottom of screen Liev./depth of bottom of screen Plant section Type of filler below plugged Section of bottom of borganity Clevation of bottom of borganity Lievation of bottom of borganity Clevation of bottom of borganity	The Boremole	
Type of gravel pack Sand Elevation / depth of too of screen Shill Pyc With Wo of Coolo slot screen Levation / depth of bottom of screen Chill Slot screen Elevation / depth of bottom of screen Li.D. of screen section Elevation / depth of bottom of screen Li.D. of screen section Elevation / depth of bottom of gravel pack Elevation of bottom of plugged Alfa Type of filler below plugged Section Lievation of bottom of boreaning Clevation of bottom of boreaning	To de de liner:	
Type of gravel pack Sand Elevation / depth of too of screen 5.86 Description of screen Schill by of Of Oriolo Slot Screen Schill by of Oriolo Slot Screen Screen Share Schill by of Oriolo Slot Screen Section Sleveling of screen Scre	Type of seal: Bentonite!	N/A
Elevation / depth of top of screen Shell PYC With W of Onlo Slot Screen Levation / depth of bottom of screen Elevation / depth of bottom of screen Elevation / depth of bottom of gravel pack Elevation of bottom of plugged blank section Type of filler below plugged section Levation of bottom of boreroly Levation of bottom of boreroly Levation of bottom of boreroly Levation of bottom of boreroly Levation of bottom of boreroly	1 2 3 3 3 5 5 Type of eram	,
Elevation / depth of top of screen Shell PYC With W of Onlo Slot Screen Levation / depth of bottom of screen Elevation / depth of bottom of screen Elevation / depth of bottom of gravel pack Elevation of bottom of plugged blank section Type of filler below plugged section Levation of bottom of boreroly Levation of bottom of boreroly Levation of bottom of boreroly Levation of bottom of boreroly Levation of bottom of boreroly	Elev./depth of too of gravel	MIA . NIA
1.B. of screen section Elevation / death of bottom of screen Clav./death of bottom of gravel pack Elev./death of bottom of plugged Alfa Type of filler below plugged Section Levation of bottom of borerols Clavation of bottom of borerols Levation of bottom of borerols		5.86
Elevation / death of bottom of screen — 4.14 1.0. of screen section 20 Elevation / death of bottom of screen — 4.14 1.0. of screen section 20 Elevation / death of bottom of gravel pack NIA Elevation Section NIA It poe of filler below plugged NIA It poe of poeton of poe	8 88 Schill ple with w	of.
Flev./depth of bottom of gravel pack Partial Property of Section of Blugged ANA	. S 3 8	211
S S R Elev./depth of bottom of gravel pack Flev./depth of bottom of plugged AIA Type of filler below plugged Section Lievation of bottom of borerols -44,14	Elevation / death of home	<u>-4</u>
Type of filler below plugged section NIA Elevation of pottor of parenals —44,14	1 9 9 3 Elev./4eptn of	!
Type of filler below plugged section NIA Elevation of pottor of parenals —44,14	Elev./depth of bottom of plugge	∢ 1
Elevation of pattor of parton, -44,14	Type of filler hale	_NIA
Well Common barrook -44,14	1 (
	Unit C	<u>-44,14</u>

	source Great	Pand Phase	0 71	weii n 6b
1		Doane War		WELL NO 60
ľ	CORDINATES NA	77		•
0	ATE COMPLETED	3/1/89		TOTILES —
5	UPERVISED BY _	BBC	-	
			Elevation of reference point	25.86
,	ACUNG LEVATION		Height of reference point above ground surface	Flush
	SULDINATE AS		Death of surface seal	1.5-20'
			Type of surface seal: concrete	
			1.0. of surface casing Type of surface casing:	8
			cost gate box	· · · · · · · · · · · · · · · · · · ·
		V V	Death of surface casing	18:"
ļ			1.0. of riser pipe	2"
*			Threaded PVC	
RAP			Diameter of borehole	811
AATIGRAPHY			Type of filler: sand	
12	~ س		Elevation / depth of too of seal Type of seal: Sentonice	_ <i>NI</i>
CLNE AAL 1260	8		Type of gravel pack	
CAAL	- v		Elev./depth of top of gravel pac	· <u>N/A</u>
3	a		Elevation / depth of top of screen	<u>-14.14</u>
	Same		sch. 40 PVC with 10' o	
	Ŋ		1.0. of screen section	<u>a''</u>
}			Elevetion / depth of battom of s	-24.14
				PACK NIA
			Elev./depth of battom of plugged blank section	_ N/A
		-	Type of filler below plugged section	N/A_
			Illeration of pottom of boremale	-44.14

Well Construction Summary

Γ	MOJECT Great F	and Phase	I	
	SITE Beborah	Done Way	castham .	WELL MA 60
	COORDINATES NA	T to at		
	DATE COMPLETED			AQUIFIER —
-	SUPERVISED BY	<u> </u>		
			Elevation of reference point	2586
L	GROUND ELEVATION		Height of reference point above ground surface	Flush
	SUSTINITION OF	22	Death of surface seal	1.5-2.01
			Type of surface seal: CONCRET	e
			1.0. of surface casing	<u> 8' </u>
			Type of surface casing:	
			Death of surface casing	18"
			Type of riser pipe:	<u> </u>
PHY	!	1 1	threaded pvc	
STAATICHAPHY			Dimeter of borenois. Type of filler:	811
SIA	_~		-	- 10
9			Elevation / depth of toe of seal Type of seal: Boutonite	NA_
MERAL 1260	20		Type of gravel pack <u>SAMD</u> Elev./desch of top of gravel pack	·_NA
3	5		Elevation / depth of top of scree	-34.14
			Sch. 40 PYC, with 10	o f
7	1 3%		0.010 slot screen	_a''
	So.	200	1.0. of screen section	~
			Elevation / death of bottom of sc.	
	e		llev./death of bottom of gravel pullev./death of bottom of plugged	
			lank section	NA
			ype of filler below slugged N/A	2
			levation of pottom of paremaly	-44.14

Well Construction Summary.

٠,	MOJECT Great Fond	Phase II	
- 1	HTE Great Rond P.		WELL MA 79
	CORDINATES NIA		
	DATE COMPLETED 3/14/8	AQUIFIER -	
	SUPERVISED BY BEC		
			23,86
		Elevation of reference point	
		Height of reference point above	
	ROUND LEVATION	Browne surface bathe show	<u>Flush</u>
	William Control	Depth of surface seal	15-20
İ			/
1		Type of surface seal: CONCRET	<u>e</u>
		1.0. of surface casing	
	\.\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	Type of surface casing:	
		cost gate box	
			1811
Ĭ		Depth of surface casing	
		1.0. of clear pipe	<u>a"</u>
<u> -</u>		Threaded PVC	
A P.			8"
H G	. []	Olameter of borenole	
AATIGRAPILY		Type of filler: Soud	-
1.5			13.86
٥		Elevation / depth of toe of seel Type of seel; Dentonife	
			$\overline{\rho}$
1	***	Type of gravel pack Sanc	· N/A
SENÉRAL 176		Elev./depth of top of gravel pac	
3	8 23	Clevetian / depth of top of screen	·n <u>8.86</u>
	Skap	sch. 40 PVC with 10'	of .
	N Z N	0.010 slot screen	
;		1.D. of screen section	2"
1	15 F W	Elevation / desth of battom of s	-1.14
	136	l' !	NA NA
	10 % S 12	Elev./desth of bottom of gravel	SACE -
		Elev./depth of bottom of plugged blank section	NIA
	'	Type of filler below plugged	
-		section N	
		- Elevation of potton of parenole	-39.14

Well Construction Summary,

PROJECT Great Pand Phase II. SITE Great Pend Place, Eastham COGROMATES NIA DATE COMPLETED 3/14/89 SUPERVISED BY BEC	WELL NO 76
GROUND ELEVATION Paignt of reference point above ground surface Original Surface seal	23.86 Flush 1.5-2.01
Type of surface seal: Concrete 1.D. of surface casing Type of surface casing: Cost gate box Depth of surface casing 1.D. of riser pipe Type of surface casing	
Threaded PYC Dimeter of borerole Type of filler: Sand	13.8%
Type of gravel pack Saud Elev./depth of top of gravel pack Clevetion / depth of top of screen Sch. 40 pyc with 10' of D.010 Slot screen	- NIA -11.14
Elevation / death of bottom of screen Elev./death of bottom of gravel pack Elev./depth of bottom of plugged blank section Type of filler below plugged section	~2" -21.14 NIA N/A
Elevation of pottor of porerols Well Construction Firm	-39,14

Well Construction Summary.

SITE Great Pond Phase SITE Great Pond Place, S. COORDINATES NA		WELL NO FC
DATE COMPLETED 3/14/69		TONINES -
SUPERVISED BY BEC		
	Elevation of reference paint	23.86
GROUND ELEVATION	Height of reference point above ground surface	FILEST
THE THE PARTY OF T	Depth of surface seal	1.5-20
	Type of surface sees: Concret	<u> </u>
	Type of surface casing: Cast gate Rox	
	Depth of surface casing	2"
 	Type of riser pipe: Threaded PSC	~ ~ ~ ~
AATIGRAPH	Dismeter of borehole Sand	<u> </u>
5 +	Type of filler: Elevation / depth of toe/of sea Type of seal: Rendonital	13.86
90	Type of gravel pack	
CLINT MALLIZE	Elevation / depth of top of scr Description of screen	- 79 IU
	O. dio stat screen	
. a	I.D. of screen section	-39.14 -39.14
Sa	Elevation / depth of battom of	NIA
	Clay, depth of bottom of gravel Elev. depth of bottom of plugge blank section	
	Type of filler below plugged Naction	-39.14

Well Construction Summary.

PAQUECT Great Pond Phose II	•
sire Neir Ed., Eastham	WELL MA 8
COORDINATES N/A DATE COMPLETED 3/7/49 SUPERVISED BY BEC	LOUIFIER
Elevation of reference pain	28078
GROUND ELEVATION Height of reference point a ground surface soal	Flush
Type of surface seal: Conc	
Type of surface casing: COST Gate box	_3"
Death of surface casing 1.D. of riser pipe Type of riser pipe:	<u>2'</u> a"
Dimeter of borenois	4"
Eleverian / death of the eff	-
Type of gravel pack Sounds	NA NA
p g Generalisation of the af see Sch. 40 pvc with 10' 0.010 slot screen 1.0. of screen	
1.0. of screen section	<u>a"</u>
Elevation / death of bottom of Elev./death of bottom of gravel Elev./death of bottom of gravel Elev./death of bottom of plugge	BACK NA
Type of filler below plugged	<u>~//4</u>
Elevation of bottom of boremaly	

Wall Construction Summary

PROJECT Great Po		WELL MA 9
	& Beach Rd., Eastham	
000 ROTHER 2 140	12889	ACUIFIER -
SUPERVISED BY B	E.C.	
SOFERITIES BY		
	Elevecian of reference paint	44.53
GROUND ELEVATION	height of reference point above	FIRSH
MANAGE AS AS	Depth of surface seal	1.5-2.51
	Type of surface seal: Concret	<u>le</u>
	1.0. of surface casing	3"
}	Cast gata Box	
	Death of surface casing	2.0
las las	1.0. of riser pipe	24
рич Віале	Threaded PVC	
e of gr	0 ismeter of borehole	 ·
36	Type of filler: Sand	36.53
Jace Jace	Type of seal: <u>Newtonite</u>	
	Type of gravel pack sand	
CINEAL S. H S. H	Elev./desch of top of gravel pa	
	Elevation / depth of top of scr Description of screen	
sanol mediantes	Sch. Wo PVC with nor of	
1. 1	1.0. of screen section	2"
med.	Elevation / death of battom of	- (-53
1 5 5 m	Elev./depth of battom of gravel flev./depth of battom of plugge	pack N/A
18-12'	blank section	
3 2 20	Type of filler below plugged N	14
	Elevation of pottor of parenals	1053

Well Construction Summary

COCRONATES	NIO :	WELL NO 10
SUPERVISED	17 SEC 128/89	AQUIRER
GROUND	Elevation of reference point	35.59
ELEVATION	Prouve surface soil Type of surface seal: Concrete	Elush 1.5-2.51
	Type of surface casing Type of surface casing: Cost gale box	3"
S APHY	Depth of surface casing 1.D. of riser pipe Type of riser pipe: Threaded PVC	20° 2°
347168	Oisseter of borenoise Type of filler: Sand	- ' ''
de sand	Type of seal: Bluttonite	12.59
to me	Elev-/depth of top of gravel pack Elev-/depth of top of gravel pack Elevation / depth of top of screen Sch. 40 PVC With 101 of O:010 SIGH Screen	·_N 4 8.59
E/0	1.0. of screen section Eleverian / death of bactom of screen	<u>-1.41</u>
45-0	Elev./depth of bottom of gravel pack Elev./depth of bottom of plugged Blank section	NIA
	Type of filler below plugged NA Elevetion of potton of porenole	1,41

SITE Woodsage Price Cost ham COMPLETED March 2, 1989 SUPERVISED BY BEC Claration of reference point Height of reference point above Flush From the surface seal: Cost gate Dox Type of surface casing Type of surface casing Type of reference Type of reference Cost gate Dox Destrict of wrface casing Type of reference point above Flush Cost gate Dox Destrict of surface casing Type of surface casing Type of reference Type of reference point above Flush Cost gate Dox Destrict of surface casing Type of reference point above Flush Cost gate Dox Destrict of surface casing Type of reference point above Flush Cost gate Dox Type of surface casing Type of reference point above Flush Cost gate Dox Type of surface casing Type of reference point above Type of surface casing Type of reference point above Type of surface casing Type of reference point above Type of surface casing Type of reference point above Type of surface casing Type of filter: Cost gate Dox Type of filter: Cost gate Dox Type of filter: Cost gate Dox Type of filter: Cost gate Dox Type of filter: Cost gate Dox Type of filter: Cost gate Dox Type of filter: Cost gate Dox Type of filter below plugged NIA Type of filter below plugged NIA	34	OURCE Great	t fond Phas	e #	WELL NO -
DATE COMPLETED March 2, 1989 SUPERVISED BY BEC Flavation of reference point Flush	•	12	ong Drive,	East ham .	
GROUND GROUND GLEVATION Type of surface sail: Ground surface sail: Type of surface casing: Type of filler: Ground surface casing: Type of filler: Ground surface casing: Type of filler: Ground surface casing: Type of filler: Ground surface casing: Type of filler: Ground surface casing: Type of filler: Ground surface casing: Type of filler: Ground surface casing: Type of filler: Ground surface casing: Type of filler: Ground surface casing: Type of filler: Ground surface casing: Type of filler: Ground surface casing: Type of filler: Ground surface casing: Type of filler: Ground surface casing: Type of filler: Ground surface casing: Type of filler: Ground surface casing: Type of filler: Ground surface casing: Type of filler: Ground surface casing: Type of filler: Ground surface casing: Type of filler surface casing: Type of filler surface casing: Type of filler surface casing: Type of filler surface casing: Type of filler below surface: Type of filler below surgard NA Type of filler below surgard NA Type of filler below surgard NA Type of filler below surgard NA Type of filler below surgard	α	ESTANIBROS			AQUIFIER
CROUND CLEVATION Type of surface sains Type of filler: Clevation of depth of top of spail Type of surface for surface casing Type of filler: Clevation of surface casing Type of filler: Clevation of depth of top of spail Type of surface sain of surface sain Type of surface casing Clevation of depth of top of spail Type of surface sain Type of surface sain Type of surface sain Type of surface sain Type of filler: Clevation of depth of top of spail Type of surface sain Type of surface	0.4	TE COMPLETED	March 2,	1989	
GROUND ELEVATION Nell ght of reference point above growed surface seal 1.5-2.5' Type of surface seal 1.5-2.5' Type of surface casing 3 1.0. of surface casing 2.0' Type of surface casing 2.0' Death of surface casing 2.1 Type of riser pipe 70 points	St	JPERVISED BY	BEC	<u> </u>	
Section of reference point above Slush Section S	-				41.93
GROUND ELEVATION Type of surface seal: Type of surface casing Type of surface casing Type of surface casing Type of surface casing Type of surface casing Type of surface casing QST QAR DOX Depth of surface casing Type of riser pipe Type of riser pipe: Type of filler: Sand Type of filler: Sand Type of seal: Type of seal: Type of gravel pack Elevation / depth of top of yeal Type of seal: Sond Elevation of seal: Type				Elevation of reference point	10001.2
Depth of surface small: Concrete Type of surface casing Type of surface casing: CQST PARE DOX Depth of surface casing: CQST PARE DOX Depth of surface casing: CQST PARE DOX Depth of surface casing: CQST PARE DOX Depth of surface casing: CQST PARE DOX Depth of surface casing: CQST PARE DOX Depth of surface casing: CQST PARE DOX Depth of surface casing: CQST PARE DOX Depth of surface casing: CQST PARE DOX Depth of surface casing: CQST PARE DOX Depth of surface casing: CQST PARE DOX Depth of surface casing: CQST PARE DOX Depth of surface casing: CQST PARE DOX Depth of surface casing: CQST PARE DOX Dox PARE DOX Dismatar of borenoise CQST PARE DOX Dismatar of borenoise CQST PARE DOX Dismatar of borenoise CQST PARE DOX Dismatar of borenoise CQST PARE DOX DISMATCH DOX DIS					Flush
Type of surface small: Concrete 1.9. of surface casing Type of surface casing Type of surface casing 2.0 Depth of surface casing Type of filer pipe Type of filer: Cast gate box Depth of surface casing 1.0. of riser pipe Type of filer: Cast gate box Depth of surface casing 2.1 Depth of surface casing 2.1 Type of riser pipe Type of filer: Cand Type of filer: Cand Type of filer: Cand Type of small: Cand Type of small: Cand Type of small: Cand Type of small: Cand Type of small: Cand Type of small: Cand Type of small: Cand Type of small: Cand Type of small: Cand Type of small: Cand Type of small: Cand Type of small: Cand Type of small: Cand Type of small Type of small: Cand Type of small: Cand Type of small: Cand Type of small pack Cand Type of small pack Cand Type of small pack Cand Type of small pack Cand Type of small pack Cand Type of small pack Cand Type of small pack Cand Type of small pack Cand Type of small pack Cand Type of small pack Typ				ground surface	
1.9. of surface casing Type of surface casing Cast gate box Depth of surface casing 1.9. of riser pipe Type of riser pipe Type of riser pipe: The Reduct PVC Diameter of barehole Type of filler: Cand Type of filler: Sand Type of seal: Clevation / depth of toe of years Type of gravel pack Sond Clevation / depth of toe of screen Description of top of gravel pack Chul PVC Lievation / depth of toe of screen Schulo PVC Lievation / depth of toe of screen Chul PVC Lievation / depth of toe of screen Chul PVC Lievation / depth of toe of screen Chul PVC Lievation / depth of toe of screen Chul PVC Lievation / depth of toe of screen Plant Schulo PVC Lievation / depth of bottom of screen Plant Schulo PVC Lievation / depth of bottom of gravel pack Elevation / depth of bottom of gravel pack Elevation / depth of bottom of gravel pack Elevation / depth of bottom of plugged NIA Type of filler below plugged NIA				Depth of surface seal	165-205
Type of filter: Samd				Type of surface smal: concret	
Type of filter: Samd		X		1.8. of surface casing	311
Type of filter: Samd	ĺ	Ž.		Type of surface casing:	
Type of filter: Samd		è		Cust gate box	
Type of filter: Samd		2	4 7	- Centh of suctace casing	Z.D
Type of filter: Samd	1	8			2"
Type of filter: Sand				Type of risernaige:	
Type of seal: ISEN-TONIC Type of gravel pack Sond Elev./depth of top of gravel pack Type of gravel pack Sond Elev./depth of top of gravel pack Type of seal: ISEN-TONIC Type of gravel pack Sond Elev./depth of top of screen Type of seal: ISEN-TONIC Type of gravel pack Sond Type of gravel pack Type of seal: ISEN-TONIC Sond Type of gravel pack Sond Type of filler below plugged NA Type of filler below plugged NA Type of filler below plugged NA	<u> </u>	3		Threaded PVC	- till
Type of seal: ISEN-TONIC Type of gravel pack Sond Elev./depth of top of gravel pack Type of gravel pack Sond Elev./depth of top of gravel pack Type of seal: ISEN-TONIC Type of gravel pack Sond Elev./depth of top of screen Type of seal: ISEN-TONIC Type of gravel pack Sond Type of gravel pack Type of seal: ISEN-TONIC Sond Type of gravel pack Sond Type of filler below plugged NA Type of filler below plugged NA Type of filler below plugged NA	1 A P	80,	1	Olemeter of borehole	
Type of seal: ISEN-TONIC Type of gravel pack Sond Elev./depth of top of gravel pack Type of gravel pack Sond Elev./depth of top of gravel pack Type of seal: ISEN-TONIC Type of gravel pack Sond Elev./depth of top of screen Type of seal: ISEN-TONIC Type of gravel pack Sond Type of gravel pack Type of seal: ISEN-TONIC Sond Type of gravel pack Sond Type of filler below plugged NA Type of filler below plugged NA Type of filler below plugged NA	15.	2 2		sand	<u> </u>
Type of seal: ISEN-TONIC Type of gravel pack Sond Elev./depth of top of gravel pack Type of gravel pack Sond Elev./depth of top of gravel pack Type of seal: ISEN-TONIC Type of gravel pack Sond Elev./depth of top of screen Type of seal: ISEN-TONIC Type of gravel pack Sond Type of gravel pack Type of seal: ISEN-TONIC Sond Type of gravel pack Sond Type of filler below plugged NA Type of filler below plugged NA Type of filler below plugged NA	1 2	1 %		•	15.93
Type of gravel pack Sond Elev./depth of top of gravel pack Top of gravel pack Top of gravel pack Top of gravel pack Top of gravel pack Top of screen Ch. 40 PVC With 101 of O1010 Slot screen Top of screen section Top of screen section Flevation / depth of bottom of screen NIA Type of filler below plugged NIA Type of filler below plugged NIA	1	6		Elevation / depth of top of seal	
Type of gravel pack	0	I Po			
Sch. 40 PVC with 101 of 0.010 Slot screen 1.D. of screen section Elevation / depth of bottom of screen VIII VIII Type of filter below plugged NA	13	1 -	722		. N/A
Sch. 40 PVC with 101 of 0.010 Slot screen 1.D. of screen section Elevation / depth of bottom of gravel pack Elev./depth of bottom of gravel pack Signal section Type of filter below plugged NA	1. 3				707
Sch. 40 PVC with 101 of 0.010 Slot screen 1.D. of screen section Elevation / depth of bottom of gravel pack Elev./depth of bottom of gravel pack Signal section Type of filter below plugged NA	1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	2 9			
1.D. of screen section 1.D. of screen section -2.07		175		Sch. 40 PVC with 101	<u>of</u>
Elev./death of bottom of gravel pack [lev./death of bottom of gravel pack [lev./death of bottom of plugged NA Type of filler below plugged NA		1 5 _	1	0.010 516+ screen	711
Elev./death of bottom of gravel pack [lev./death of bottom of gravel pack [lev./death of bottom of plugged NA Type of filler below plugged NA	7	2 30		1.D. of screen section	-2.07
Elev./death of bactom of gravel pack Elev./death of bactom of glugged NA Type of filler below slugged NA	-	600		Elevation / death of bottom of	screen
Signal section Type of filler below plugged NA		1 7		lev./death of batton of aravel	NA NA
Type of filler below stugged NA		25		Elev./septh of bottom of plugge	
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		1 7 %		1	
1 100.141		102	1 -1		NA
Clevetian of patter of parenals					-10.07

Wall Construction Summer

				<u>.</u> •
	MOJECT Great	-Pond Phe	258 II	
	SITE KLASSI	some Of	Easthan	WELL MA 12a
	CORDINATES	U/o	EUSTNOW	
	DATE COMPLETED			AQUIFIER -
		, , , , , , , , , , , , , , , , , , , ,		- Admit A
1	SUPERVISED BY _	BEC		
<u>}</u>		·		
	•		Elevation of reference point	45.18
	V .		Dint.	
1	GROUND		Height of reference point show	
	ELEVATION		ground surface	Flush
	Millioner of		Death of surface small	
1			PAREN OF SUPPRICE SOA!	1.5-2.01
	,		Type of surface seal: CONCre	te
				 8"
1			1.0. of surface casing	_ 😽
-			Type of surface casing:	
1		41 18	cast gate Box	
		0 7		1411
			Death of surface casing .	- / 0
1			1.0. of riser pipe	<u> </u>
1 :			Type of riser pipe:	
TAATIGRAPHY			Threeded PVC	
R G		·	Diameter of borehole	-8"
=			Jim was sand	-
1 3]		Type of filler: Samoc	-
v	٠"		Elevation / death of top of anil	23.18
9	}	. [] . []	Type of seal: Bentonie	
HERALIZE				
A A	·	我等	Type of gravel pack Sound	— alia
. <u>Ş</u>	- 36		Elev./desch of top of gravel pack	- NA
3	1 7		Elevation / depth of top of screen	10.18
[schill fuc with 100 of	
[1 1		0.010 Slot screen	
:	6			<u> </u>
	12		1.D. of screen section	
	ţ	Part of the last o	Elevation / death of battom of scr	0018
			•	s 16 s 1
l .	}		Elev./death of bottom of gravel pa Elev./death of bottom of plugged	ck IVIII
		1 .	blank section	NIA
			17000 06 6111	- F
			Type of filler below plugged NA	
				-39.82
			-Elevation of pottor of barrools	

Well Construction Summary.

	MOJECT Great A	and Place IT	•
	sire Kingswood	WELL MA 126	
	M ESTANISHOOD	3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
	DATE COMPLETED	AQUIFICA	
		EC	
- 1			
		Elevation of reference point	45.18
	*		
	GROUND ELEVATION	Height of reference point above	Flush
	WILLIAM CONTRACT	1 1 5.3	
		Death of surface seal	1.5-2.01
		Type of surface seal: Concret	e
1			
	\ \ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	1.0. of surface casing Type of surface casing:	_8
		cost gate Rox	
	1	Death of surface casing .	18"
		1.D. of elser pipe	2"
· _		1794 of riser gioes	
Ĭ		Threaded PVC	
45		Dismeter of borehole	8"
TAATIGRAPHY		Sand	·
S F.		1 11100 01 111107:	
٥		Type of seal: Revionite	23.14
		THE OF MAIL: I SECTIONAL	
SENCAAL 120		Type of gravel pack SONOL	
٤	0	Cley./desch of top of gravel pack	- N/A
3	3	Elevation / depth of top of screen	-9.82
		Description of screen	- 18 05
1	See	Ocolo Stot sceen	24-
;	N	1.D. of screen section	 0"
}			- (0 (4)
		Elevation / death of battom of ser	-19.82
	ار ا	Elev./death of bottom of gravel pa	W/A
[i		Elev./septh of bottom of plugged blank section	NA
		l ,	10/07
	f	Type of filler below stugged N	1A
			39.82
		Elevation of pottor of parenals	

Well Construction Summary.

MOJECT Great fond Phase IT	
SITE KINGSWOOD Pd., FOS	than well no 12c
SUPERVISED BY BEC	AOUIFIER
GROUND ELEVATION Typ Dept	evacion of reference point Igns of reference point above pund surface isth of surface seal: of surface casing of surface casing: Cost gate box in of surface casing of riser pipe of riser pipe: Threaded PYC star of borenole USIVE Flush Flush 5-2.0' 6' 6' 7-2.0' 6' 7-2.0' 6' 7-2.0' 6' 7-2.0' 7-2.0' 7-2.0' 8' 7-2.0' 8' 8' 9' 9' 9' 9' 9' 9' 9' 9
Type	tion / depth of 100 of soil of seal: Bentoniated
S C Elava	of gravel pack Sand Idepth of top of gravel pack Sion I depth of top of screen —29.82 Ho PVC with Incot D Slot screen
1.0. 0	ion / depth of battom of screen -39.82
Elev./s	depth of bottom of gravel pack depth of bottom of plugged NA NA
1441.00	on of battor of barerols 39.82

Well Construction Summary.

MOJECT Goeat Pond Phase II	
SITE Atlantic Ooks Comp Ground, Easthon WEL	1 m /3a
COORDINATES NIA	(existing)
DATE COMPLETED NIA	IFIER ———
SUPERVISED BY EPA	
Elevation of reference point	460.5
GROUND ELEVATION Height of reference point above ground surface	2.47
Death of surface seal	NA
Type of surface seal: N/A	<u> </u>
1.B. of surface casing Type of surface casing:	
steel well cover	-
DestR of surface casing	NA
Type of riser pipe: PVC	105"
The street plant is a street plant in the street plant is a street plant in the street plant in the street plant in the street plant in the street plant is a street plant in the street p	-
NA Disector of boronole	$-\omega / h$.
Type of filler: NA	
Type of seal: With	NIA
Type of gravel pack	
Elev./depth of top of gravel pack	- • <u>N/A</u>
Elevation / depth of top of screen Description of screen	<i>\omega \theta \delta \theta \delta </i>
	<u> </u>
1.0. of screen section	1.5"
Elevation / depth of bactom of screen	2.55
Elev./depth of bottom of gravel pack Elev./depth of bottom of plugged	<u>~//}</u>
blank section	_ N/A
Type of filler below plugged with	<u>4</u>
Elevation of bottom of barrandle	NA

Well Construction Summary.

PROJECT Great SITE Atlantic COORDINATES NO DATE COMPLETED SUPERVISED BY	NIA	WELL MO 136 (Oxisting)
GROUND ELEVATION	Elevation of reference point Helgnt of reference point above ground surface Death of surface seal Type of surface seal: NA	2.47 NA
Chapur V	Type of surface casing: NA NA	
CINERALITED STRATIGA	Type of filler: Elevation / depth of top of seal Type of seal: N/A Elevation / depth of top of seal Elev./depth of top of gravel pack Elevation / depth of top of screen Description of screen	_N/A
	Description of screen I.D. of screen section Elevation / depth of bottom of screen Elev./depth of bottom of gravel pack blank section	1.5" -15.45 -NA
	Type of filler below slugged NA Elevation of battor of barenale Well Conscruction Suppose	MA

MOJECT Great Pond Phase II	12
SITE TOWN Crier Motel, Eastham	WELL NO 13c (existing)
NIA NIA	' '/
DATE COMPLETED NA	AQUINER
SUPERVISED BY EPA	· · · · · · · · · · · · · · · · · · ·
Elevation of reference point	<u>46.50</u>
GROUND ELEVATION Height of reference point above ground surface	1021
Province Seal Death of surface seal	NA
Type of surface seal: NA	
1.0. of surface casing	_N/A
Type of surface casing: NA	
Depth of surface casing	<u> </u>
1.D. of riser pipe	2"
Type of riser size:	
NA Oissetter of borenole	NA.
عادم .	
Type of filler:	, Jn
7	NA
191	
Type of gravel pack NA Elev./depth of top of gravel pac Elevation / depth of top of scre	41/1
City./septin or top or graver pac	1/10
Elevation / depth of top of screen Description of screen	*n 10 R
	
	2"
1.D. of screen section	-23.50
Elevation / death of bottom of s	creen
Elev./desth of bottom of gravel	•
Elev./depth of battom of plugged blank section	<u> </u>
Type of filler below stugged	NA
Section	

Well Construction Summary

	PROJECT GA	cat Pond	Phase II	WELL NO 14a
į	COORDINATES	NIA 3/13/89		AQUINER
CENTRALIZED STAATICRAPHY	GROUND ELEVATION ZAYZAVARAZO		Elevation / depth of bottom of screen Elevation / depth of bottom of gravel pack Elev./depth of bottom of plugged blank section Type of filler below plugged N/A section	18" 2" 2" 24.12 MA 9.12 2" -0.88 N/A
	· · · · · · · · · · · · · · · · · · ·		Elevation of pottom of paremole	-40.88

Well Construction Summer

MOJECT Great Poncy Phase	TT WELL MO 146	
size Rt. 6 Gastham		İ
COORDINATES N/4	AQUIFIER	.
DATE COMPLETED 3/3/89		
SUPERVISED BY BEC		
	(/// /2	
ξ1•	vetion of reference point 44./2	•
	ght of reference point above Flush und surface	•
TATION CANCEL COMMENT	th of surface seal (a)5-200	(.
	e of surface seal: concrete	
	and surface casing and surface casing: Cast gate	•
	th of surface casing	•
מינדי ידור	of riser size: of riser size: Threaded PVC	- !
1	mater of borehole	• •,
[5]	of filler: sand	
	e of seal: Bentonite	
1 E1.	r./depth of top of gravel pack . NH	•
[retion / depth of top of screen	-
	010 slot screen	
	of screen section 20.88	-
1 7 7 7 1 1 1	vection / depth or battom of screen A)//A	
[r./depth of bottom of gravel pack r./septh of bottom of plugged NK section	-
1346	ion	-
	ration of bottom of boremals	

Well Construction Summary

	MOJECT Gree	+ fond Phase II	
	SITE Pt.6	+ Eastham	WELL MA 14c
}	COORDINATES	•	
	DATE COMPLETED	3/13/89	AQUIFIER -
	SUPERVISED BY	BEC.	
<u> </u>			·
	`	Elevation of reference point	44.12
	GROUND ELEVATION	Height of reference point above	Flush
	Sussemile	Death of surface seal	105-2001
		Type of surface seal: CONCIN	ete_
		Type of surface casing:	8"
		Cost gate box	
		Depth of surface casing	18"
.	110	Type of riser pipe	2"
ATIGRAPHY	N/A	threaded PVC	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
AAT16		Type of filler: Sand	
2		Elevetion / depth pl top of seel Type of seal: Seviton/He	24.12
9321			
HERALIZE		Type of gravel pack Saud Elev./deptn of top of gravel pack	•
3		Elevation / depth of top of screen Description of screen	
		Sch. 40 PYC with 10 0.010 slot screen.	10f
:		1.0. of screen section	<u> </u>
		Elevation / death of battom of scr	<u>-38.88</u>
 - -		Elev./desch of bactom of gravel pa	a w/A
		at with Hection	wa
		Type of filler below plugged N	A 110 CE
	<u> </u>	Elevation of bottom of borenote	-40.88

Well Construction Summary.

	PROJECT Great	Pord Phase IL	
	SITE Town land	fill, Easthan	WELL MA 15
	CORDINATES _A)/A	043/104/	(existing)
	DATE COMPLETED	IA	REGILION
	SUPERVISED BY EPP	j	
<u> </u>			
-	N.	Elevation of reference	point 16.75
	GROUND ELEVATION	Height of reference po	Int above
	411311000 AS - C C.	Death of surface seal	NA
		Type of surface seal:	coverete
		1.D. of surface casing Type of surface casing	Nowe
		Depth of surface casing	
_	NA	I.D. of riser pine Type of riser pine:	11/4"
ATICRAPHY		Steel	NIA
STAATI		Type of filler:	NA
1760 \$	"	Elevation / depth of too Type of seal:	or seeluly N/A
HE RAL I	1	Type of gravel pack [lev./deptn of Top of gr	avel pack - N/A
3	100 miles	Elevation / depth of too	of screen NIA
.		1.D. of screen section	wip wip
.		Elevation / depth of bat	-1.11
		Elev./death of bottom of Elev./death of bottom of blank section	gravel pack plugged W/A
		Type of filler below plus section	N//
	<u>'</u>	Elevation of pottor of pe	N/A

Well Construction Summary

Γ	MOJECT Great Pond Phase II	
	SITE Old Orchard Rd., Easthon	WELL HO 16
	COORDINATES NIA	
	SUPERVISED BY REC	AQUIFIER -
	The Lates of the L	
	Elevation of reference point	54.76
	GROUND ELEVATION Height of reference point about surface	Flosh
	Death of surface seal	1.5-2.5'
	Type of surface seal: Concre	<u>4e</u>
	1.0. of surface casing	
	Type of surface casing: - cast gate box	
	Death of surface casing	2.01
	1.D. of class aim	2"
=	Threaded PVC	
ATICRAPHY	Diameter of borenois	
TAKE	Type of filler: Sand	<u> </u>
0 0	Elevation / depth of top of small Type of small Dentonite	26.76
HERAL 17	Type of gravel pack Sont Elev./depth of top of gravel pac	e. NA
CI N	Elevation / depth of top of scre	
	V V Sch Up DV	10 of -
,		
		_2"
	Elevation / death of battom of so	
	Elev./death of bottom of gravel p Elev./death of bottom of gravel p Elev./death of bottom of gravel p Elev./death of bottom of gravel p Elev./death of bottom of gravel p Elev./death of bottom of gravel p Elev./death of bottom of gravel p Elev./death of bottom of gravel p Elev./death of bottom of gravel p Elev./death of bottom of gravel p Elev./death of bottom of gravel p Elev./death of bottom of gravel p Elev./death of bottom of gravel p	N/A
	O 9 5 Type of filler below plugged N	14
	Elevation of bottom of poremoly	-0.24

Well Construction Summary.

	Carpet 1	and Phase II	
		FILL , Easthan WEL	L Ma 17
	DORDINATES N	(existing)	
	DATE COMPLETED		IFIER
4	SUPERVISED BY		
	¥.	Elevation of reference point	19.38
	ROUNG LEVATION	height of reference point above	-
	MAN CONTRACTOR	Death of surface seal	NIA
		Type of surface seal: Moncrete	<u>.</u>
	<u> </u>	Type of surface casing:	NA_
		Death of surface casing	NA
ATIGRAPHY	10	Type of riser pipe: Steel	
STAATICA	NH	Type of filler: NA	_
CINTRALIZED		Type of seal: Type of seal: Type of gravel pack NA	NA
H(RA		Elev./depth of top of gravel pack	- NA
3	i İ	Clevetian / depth of top of screen Description of screen NA	- NA
:		1.D. of screen section	
}		Elevation / death of battom of screen	11.48
		Elev./death of battom of gravel pack Elev./depth of battom of plugged blank section	_ <i>NA</i>
	Ţ	Type of filler below plugged NA	N/A

Well Construction Summary.

Г			•.
	MOJECT CO-read-	and Phase II	1
	SITE North	WELL NO 1/8	
- }	CONSINATES	NA	(existing)
	DATE COMPLETED		AQUIFIER -
	SUPERVISED BY	<i>.</i> PA	
-			
		Elevation of reference point	27.58
	GROUND ELEVATION	Height of reference point above	<u> N/4</u>
	Sussian	Death of surface seal	NA.
		Type of surface seal: Concre	te
		Type of surface casing:	- W/A
	•		
		Depth of surface casing	-MA
· =		Type of riser pipe: Stee	-NA
TAATIGRAPHY		Diemeter of barehole	
STAA		Type of filler:	
0 3 2 1		Elevation / depth of top of seal Type of seal:	NA
GENÉBAL	and the same of th	Type of gravel pack Elev./depth of top of gravel pack	- NA
3	· . · · · · · · · · · · · · · · · · · ·	Elevation / depth of top of scree	
.			
		1.0. of screen section	12.58
		Elevation / depth of bottom of sci	
		Elev./death of bottom of gravel pu Elev./death of bottom of plugged blank section	14/10
		Type of filler below slugged p	102
		Elevation of bottom of borenote	NA

Well Construction Surmary.

	PROJECT 6 SITE Hole COORDINATES DATE COMPLE SUPERVISED E	WELL NO. 1901	
CENTRALIZED STRATIGRAPHY	50-30' coarse sand somerial to mixed some sold sold sold sold sold sold sold sold	Elevation of reference point Height of reference point above ground surface Depth of surface seal Concret	3"
		 Elevation of bottom of boremale	-57.05

Well Construction Summary.

	MOUTET Great	t Pond Pho	·	<u> </u>
İ	SITE Holow	s ld. Host	than	WELL MA 196
	DATE COMPLETED	2/12		. ACUITAN
	SUPERVISED BY			AOUFFER
 				
	" .		Elevation of reference point	37.95
	GROUND ELEVATION	A	Height of reference point above ground surface	Flush
	SUBJUSTICAL STATES		Death of surface seal	15-2.01
			Type of surface seal: CONCRET	le
			1.D. of surface casing Type of surface casing;	9"
			cost go te box	
			Depth of surface casing	18"
<u></u>			I.D. of riser gipe Type of riser gipe:	2"
ATIGRAPHY		ul li .	Threaded PVC	
3416			Diameter of borenois	<u> </u>
\$12			Type of filler: sand	- 1000
1710			The of seal: Bentonie	_15.95
HE RALIZE		The state of the s	ype of gravel pack Bomd	
3	0	1 4004031 1	lev./depth of top of gravel pack	·_NA
	-	1 48000011 1 1 1	levetion / death of top of screen scription of screen Sch. 40 PVC With 10' 0:	
:	1 3		DOID Slot Screen	
		20059	D. of screen section	<u>a</u>
			evetion / death of battom of scre	· · · · · · · · · · · · · · · · · · ·
			ev./depth of battom of gravel pec ev./depth of battom of plugged ank section	
		775	e of filler below alumned	N/A
	_	"	~/A	
			vation of potton of parenale	-57.05

Well Construction Surmary.

	market (eat fond Phase		•
-	SITE Hol			WELL NO 19e
	CORMINATES _			
	DATE COMPLET		AQUIFIER -	
	SUPERVISED B			
	-	1 1		22.07
	٠.		evection of reference point	37.95
1.	GROUND		lant of outside	
	ELEVATION	A 190	ight of reference point above	Flosh.
	MANAGAN		ith of surface seal	105-20'
1			•	
			m of surface multi concrete	<u>L</u>
	}		. of surface casing	8"
	j ·	1 170	e of surface casing:	 -
			Cast gate Box	
		U I		<u></u>
	·		th of surface casing	2"
		1.0	of riser pipe	<u>d</u>
=			Threaded PVC	
AATIGRAPHY		0:4	meter of borenois	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
2.0				*
2		Тур	of filler:	
12	,~		ection / depth of itom of and	15.95
9		Тура	estion / depth of som of small of small: Bentonite	
HERALIZE	a .	1 700	of gravel pack	
RA	_ &	El ev	./desth of top of gravel pac	· NA
3	-1	· [2999	etion / death of top of scree	_ ` _ I
	See	120015 194 SC	ription of screen	
j	N		40 PVC with 10' of	
		1 (20)		<u>~~</u> ∂" ~~ ¦
		2 78%-2 3	of screen section	112
		Elev.	etion / depth of battom of sc	<u>-42.05</u>
		[] [] [] []	./death of bottom of gravel p	win_
ĺ		[[] [] [] []	/MOCH of bactom of alument	w/A
ĺ			k section	W O1
	•	Type	of filler below plugged	VA
		1 1		-57.05
		Eleva	tion of batton of barrhale	

Well Construction Summary.

PROJECT	Great Pend Phase II	
CORDINATE	b testham	WELL ME 20 a
DATE COMP	ETED 3/3/79 BY BEC	LOUIRER
	Elevation of reference point	37.83
GROUND ELEVATION	Height of reference point above ground surface seal	Flush-
	Type of surface seal: CONCrete 1.0. of surface casing Type of surface casing: COAL gate Dox	
ATIGRAPHY	Depth of surface casing 1.D. of riser pipe Type of riser pipe: Threader PYC	<u>-18"</u> _2"
R S G	Type of tiller: SOMO Elevation / depth of too of seal Type of seal: Depth of the seal	25.83
CENCRALIZE	Elevation / depth of top of screen Sch. UP PW. Williams	- NA 22.83
	1.0. of screen section Elevation / depth of bottom of screen	12.83 NA
	Elevation of bottom of gravel pack blank section Type of filler below plugged section Elevation of bottom of borenole	-42.17

PA	OJECT Great P	nd Phase IF		WELL NO 206
317	· /	Eastham		
3		A	· · · · · · · · · · · · · · · · · · ·	ACUIFIER
	TE COMPLETED	3/13/89		
Su	PERVISED BY	<u> </u>		
		Elevation	of reference point	37,83
	IOUNO EVATION	helghe of ground su	reference point above	Flush
	MANAGE AND AND AND AND AND AND AND AND AND AND	Desch of	surface seel	1.5-2.0'
) } ;	Type of a	erisce seel: concret	<u>s</u> &'
	{		urface casing	
•	, 1	Cas	Lyate box	
	·	James of	surface casing	18"
	NA	I.D. of r Type of r		&
¥11.	10/14	Tho	eaded fix	8"
STAATIGRAPHY			of borenole sand	·
1441	,	Type of f	iller:	25,83
۵	-20	Type of s	depth of two of seal	
CE NE MAL 126		Type of g	ravel pack <u>Sand</u> th of too of gravel page	. NA
A B				-7/7
± 5		Descripti	/ death of top of scri	
	<u>}</u>	Sch. 40		<u>ot</u>
ļ	 	200	slot screen.	
1			creen section	-17,17
` { 		Elevation	/ desch of baccom of	NIA_
			ith of bottom of gravel	pack
		Elev./deg bians ser	ith of battom of plugge ition	_ n/n
			liller below plugged	MA
		section _		92.1 <i>†</i>
l	1	Elevation	of bottom of baremale	

Uall Constitution Summary

	maries Great	Pand Phase I		•
		WELL MO	20c	
1.		Eastham		
j	COORDINATES	NIT	- AQUIFIER	
1	DATE COMPLETED			
- [SUPERVISED BY	BEC		
				·
	X	Elevation of re	ference paint -	37.83
	GROUND ELEVATION	Height of refer	ence point above	Flush
	Sugar	Desich of surface	e seal	1.5-2.01
		Type of surface	mal: concrete	
		1.0. of surface Type of surface	Casing	g"
		cast ga	uto pox	
		Depth of surface	•	2"
		The eader	P# :	a
RAPHY	NA	Oisseter of bores		8"
AATICA		Type of filler:	sand	
15 01	- 12m*	Elevation / depth Type of seal:		25.83
BALIZ		Type of gravel pa	es sand	w.Vn
HERAI	-2	Elev./desth of To		10/10
3		Second	of too of screen	2717
	1	SCh.40 PYC 0,010 S/6+	screen	
•		1.0. of screen se		2"
				37.17
		Elev./death of bot	tton of gravel pack —	N/A
		Plank section		N/A
		Type of filler bei	N/A	
		Elevation of patto	r of barrole -	42.17

Well Constituers an Succession

		(01		
	PROJECT Great P	WELL MA 21		
	SITE Mckoy Rd			
1	COMPLETED	216-189		ACUIFICA -
	SUPERVISED BY	BEC		
	ι,		Elevation of reference point	38.10
	FROUND ELEVATION		Height of reference point above ground surface	Flush
	Subjected to a	22	Death of surface seal	1.5-2.51
			Type of surface seal: Concret	
			1.D. of surface casing Type of surface casing:	
			<u>rest gate box</u>	
	Sanos		Death of surface casing	<u> 2°01</u>
	g		I.D. of clear gipe	
PHY			Threaded PVC	—— Un
AATIGRAPHY	5		Diameter of barenale	-4.
STAL			Type of filler: Sand	18.10
۵	6		Elevation / depth of toe of small Type of small <u>Sentente</u>	
מ אנ שארוזנ	ned		Type of gravel pack <u>Kand</u> Elev./depth of top of gravel pack	- NIA
. <u>Ç</u>				
3	المراح ا		Elevation / death of top of screen	
	i		schillo PVC viffy lor 0.010 slot screen	<u>ot</u>
			1.D. of screen section	_2''
-	}		Elevation / death of battom of so	-1.90
	1	1 1 !	Elev./depth of battom of gravel p	<u>alu</u>
			Elevidenth of bottom of plugged blank section	NIA
			Type of filler below plugged	, iva
	-		section	-6.90

Well Construction Summary

	SITE Pt. 6, Eacthan	WELL NO 22
	SUPERVISED BY BEC	AQUINEX
	Elevation of reference poi	ns <u>42.32</u>
0 STAATICAAPHY	Elevesion / death of season	20' 20' 20' 20' 20' 20' 20' 20' 20' 20'
CINEBALIZED	Type of gravel pack	of screen wipe

Vell Construction Summary

C = 40 / 01 TT	
MOJECT Great Pond Phose II	well to 23a
SITE Old Orchard Rd., Easthe	<u> </u>
COORDINATES NA	AQUINER
DATE COMPLETED 3/7/89	
SUPERVISED BY BEC	
Claves	ion of reference point 54.01
GROUND A STORM	at reference point above Flush
	of surface seal 65-2.01
	,
Type of	surface seal: <u>concrete</u>
	surface casing
	surface gating:
<u> ca</u>	St gate Box
	1 welves earlies 18"
Desth a	f surface casing
1.0. 01	riser nipe
There	aded PVC
1 1 1 1 1 1 1 1 1 1	
12 0 3 11 11 .	r of borehole,
Som Signal	tiller: Sand
To Sometic	19.01
a a g	seal: Centonite
Type of Elev./4	5 0
Tiev./a	gravel pack Some . N/A
Oescript	in I depth of top of screen 14.01
	o PVC with 10' of
1 5 36 1 0.010	21/
Blawn is	serten section
Elevetio	m / depth of battom of screen 4,0/
	ath of bottom of gravel pack N/A
[1e4./ee	pth of bottom of plugged
O So	ction
1404 01	filler below plugged NIA
section	-2£ 4Q
	n of pattor of parenals

Well Construction Summary.

. [6-	eat Pand Phase I	•
- }	MOJECT US-/C	WELL MA 236	
		schard ed., Easthom .	
	COTANIDADO	21-1-0	AQUIFIER -
- 1	DATE COMPLET		
ł	SUPERVISED 8	BEC	
	•	Elevation of reference point	54.01
	GROUND . ELEVATION	Height of reference point abo	Flush
	Sylvensing	Dagen of surface seal	1.5-2.01
		Type of surface seal: CONC.	ete_
		1.0. of surface casing Type of surface, casing:	₹"
		cast gate Box	
		Depth of surface casing	
		Type of clier pipe	۵"
APIEY		Threaded PVC	8".
AFIGR		Type of tiller: Sand	
STA		Elevation / depth of top of sa Type of seal: Bentonite	19.01
17.0			0
CINCALIZ	- M	Type of gravel pack Color Clev./depth of top of gravel p	- NA
3	1 (%	Elevation / death of too of sc.	<u>-5.99</u>
	Sec	Sch.40 PVC With 10' 0.010 slot screen	oF.
;	VI	1.0. of screen section	-15.99
		Elevation / death of bottom of	screen
		Elev./death of bottom of gravel	
		Biank section	<u> </u>
		Type of filler below plugged	NA DE 90
	<u> </u>	Elevation of sattor of sarerole	-35.99

Wall Construction Summary

_	<i>a</i>		-	•
		at fond Pho		WELL MA 23:6
-	SITE Old	Occhard Rd.	, Gastlam .	MELL NO TOTAL
	COTAMIDE	U/A		
	DATE COMPLETE	~ ' '		AQUIFIER
- İ	SUPERVISED BY	BEC		
<u> </u>				
	•,		Elevation of reference point	54.01
		1 1		
•	GROUNG ELEVATION		Height of reference point above ground surface	_Flush_
-	MANAGE AND AND AND AND AND AND AND AND AND AND	**		
	`		Depth of surface seel	1.5-2.01
			Type of surface seal: CONCret	<u>6</u>
			1	8"
			Type of surface casing:	
			cast gate box	
				18"
			Death of surface casing .	
1			1.0. of riser pipe	2"
<u></u>		11 -}-	Threaded PVC	···
A A	ļ		1	24
AATIGRAPHY			Olemater of borenote	
77		1 +	Type of filler: Sand	
5.			Elevation / depth of too of seal	19.0(
٥			Type of seal: Bentonite	
CENÉRALIZE			1-0	
A A	- d		Type of gravel pack <u>CONOL</u> Elev./depth of top of gravel pack	· NIA
Ē	M		1	
3	1 68		Elevation / depth of too of screen	<u>-25.99</u>
	: 8		sch. 40 PYC with 10	of
	Ŋ		0.010 Slot screen.	<u> </u>
			1.0. of screen section	<u>a</u>
			Elevation / death of battom of sc	-35.99
			Elev./death of bottom of gravel p	NIA
			icley. / septh of battom of plugged	4cx
			Plank section	NIA
			Type of filler below plugged	<u>la </u>
,			•	-35.99
!			Elevation of pottom of paremale	

Well Construction Summary.

Γ	MOJECT Great Pond	D Dla T	
	7 4 1 7 7		WELL NO 249
	site Danielle Ortve, Eastham .		
j	COORDINATES NA	120	ACUIFIER -
	DATE COMPLETED 3	5 8 7	
	SUPERVISED BY BEC		
<u> </u>			
	` `	Elevation of reference point	47.17
1	4.00		
	GROUND ELEVATION	Height of reference point above	Flush
	MILLIAN CONT.	Desich of surface seal	15-2.01
			125-20
		Type of surface seal: Concre	<u>k_</u>
			 8"
	()	Type of surface casing:	
ł		Costyate Box	
1			- "
		Death of surface casing	_18"
		i.D. of elser pipe	2"
_		Type of clear aims	
Ę	NA	Threeded PVC	8"
C.B.	'"	Disector of barehale	8
AATIGRAPHY		Type of filler: Sand	
S I A			117
٥		Type of seal: Forton	1/2 17.17
		THE OF SEATS AND ALL	<u> </u>
SCHÉRAL 126		Type of gravel pack _South	,
. E		Elev./depth of top of gravel pack	· W/A
3	33	Elevation / depth of too of scree	4.17
		図 「Vescription of Lereen	 '
		Schi40 APC with 10'	ot
;		1.D. of screen section	2"
		3	-2.83
	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Elevation / depth of battom of sc	reen -Arus
	1,	Clay./depth of batton of gravel p.	NA
		Elev./septh of battom of plugged	
			\ A
	-	Type of filler below plugged	u'a l
ĺ			4a42.83
		Elevation of pottor of pareraly	10/4

Well Constitution Summer

	PROJECT Great Par	of Ohmo T	
1		Drive, Bostham	WELL NO 246
	41/4	pire, Businam	
-	COORDINATES NA 3/3	149	AQUIFIER
	SUSTEMBLETES		
1	SUPERVISED BY BEC		•
		1.00	47.17
	` [Elevation of reference point	17-17
	GROUND A	height of reference point above	Flush
	MANAGERICA	Death of surface seal	1.5-2.01
		Type of surface saal: Concrete	-
		1.0. of surface casing	 9"
}		Type of surface casing:	<u></u>
		cost gate Box	· ·
	l U		
		Depth of surface casing	2"
		1.D. of riser pipe Type of riger pipe:	<u> </u>
≥		Threaded PVC	
ATIGRAPHY	NA	Dismeter of borenole	 8"
1 5		1)	
- ۲۰		Type of filler: Sound	
2	~ `	Elevation / death of itom of seal	17.17
2		Type of seal: Bendonite	
CENCRAL 121		Type of gravel pack	
RA		Elev./desth of top of gravel pack	- NIA
3		Elevation / death of top of screen	-12.83
د ا		Description of screen	
			£
		0.010 slot surcen.	
	38	I.D. of screen section	-22.83
		Elevation / depth of battom of scr	-Ad. 0.3
	1	Elay./death of bottom of gravel par	NIA_
	<u> </u>	Elevidenth of bottom of plugged	NIA
		blank section	
	. (Type of filler below plugged NI	<i>t</i>
		1 . ·	- - ન્યુ _ર , ૪૩
!	···········	Elevation of pattor of parenale	

Well Construction Summary.

	6 - 1	0 / 0/ ==	
- 1	PROJECT Great		WELL NO 240
		Drive, Eastham .	
	CODRINATES		AQUIFIER -
	DATE COMPLETED	_ / !	
	SUPERVISED BY	90	
	N _C	Elevation of reference point	<u> 47.17</u>
	GROUND ELEVATION	Height of reference point ab	-Flush
	MINNER WASH	Depth of surface seal	15-201
		Type of surface seal: CONC	rete
			 8"
ļ	(:	Type of surface casing:	8
		Cost gote Box	
		Depth of surface casing	78
		1.D. of riser pipe	_2"
 		Type of riser pipe:	· · · · · · · · · · · · · · · · · · ·
ج	1 4/G	Threaded PVC	Q"
16.R	1 10 (4)	Dissector of borenote	
TAATIGRAPHY		Type of filler: sand	<u>/ </u>
S		Elevetion / death of toe of s	17.17
710	·	Type of wal: Beatonite	
SCHERALI	ļ	Type of gravel pack	<u>Q</u>
<u>وَ</u>		Elev./depth of too of gravel	N/A
3		Elevation / death of top of sa	-32.83
		Description of screen	of
!	1	G.OLO Slot screen	- 90
:		I.D. of screen section	2"
		Elevation / depth of battom of	-42.83
	1.	Elev./death of bottom of grave	NIA_
		tier./+epth of bacton of plugo	pack
		blank section	N/A
	1	Type of filler below plugged	NA
·		section	_//> \(\lambda \)
!	<u> </u>	Elevation of pottom of borgmal	100

Wall Constituted on Succession

marcer Great Pas	d Oboca T	25	
	MOJECT Great Pond Phase II		
COORDINATES N/A			
DATE COMPLETED 2/2	8/89	AQUINER	
SUPERVISED BY BEC			
, ,	Elevation of reference paint	41.86	
	Height of reference point above		
GROUND ELEVATION	ground surface point about	Flush	
SULVE CONTRACTOR	Design of surface seal	15-2.01	
	Type of surface seal: CONCIN	<u>ete</u>	
	1.0. of surface casing	3"	
	Type of surface casing:		
	cast gate Box		
4	Depth of surface casing	2,0'	
1	1.0. of riser pipe	- 511	
= 3 3	Threaded PVC		
Sace	Dismeter of borenois	Y"	
STANTICHAPILY BOAN SOL	1 conf		
131		ich	
9 7 89	Type of seal: Blutonite	15.86	
Z / Z		0	
Med	Type of gravel pack	· WIA	
三 73	Elevation / depth of top of wee	' /	
2 6 3	Schillo Ruc with 10'0	_ • •	
	DIOIO Stat Screen		
. 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2	1.9. of screen section	<u>""</u>	
	Elevation / depth of battom of s	ersen <u>1.86</u>	
-30,	Elev./desch of bacton of gravel	W/4	
880	Elev./depth of bottom of plugged blank section	NIA	
-	Type of filler below plugged	U/A_	
	saction	1.86	

Well Construction Surmary.

F	MOJECT GAR	eat Parl Phase IL	•
- 1		WELL NO 26	
	SITE RISH		
	COTANGROOM		AQUIFIER
ı		720 3/8/89	
	SUPERVISED (T ISEC	
<u> </u>			
	X	Elevation of refere	100 <u>47.00</u>
	GROUND	Height of reference	point shows
<u> </u>	ELEVATION	1 ground surface	Flosin
	SUSSIEN	Comment of surface se	al 1.5-2.0'
1.		Type of surface sea	porreto
-		C surface sea	: Carica oce
-	1	1.0. of surface cas	3"
1		Type of surface cas	ing:
1		Cast gate	1200
		Depth of surface ca	2.0'
	5 0	{	2"
	1 3	I.D. of riser sine Type of riser Sipe:	
=	3.3	Threaded P	1)(-
1 4	42	Oisseter of barenois	4"
1 5	106	The section of porthole	- 1
TAATICRAPHY	6 3	Type of filler: -	sand
5	var 150	Elevation / seath of	24,00
9	å [Elevation / death of Type of seal: Likih	TOMILO
CENERALIZE	29		sound
A A	-6. 3	Type of gravel pack Elev./deptn of top o	I gravel such . N/A
3	33		
J	1 3	Elevation / depth of Description of screen	top of serven 12.00
1	3	Schill PVC. 4	11th 10'0F
	ا إ	0,010 5/0+ 3	
,	λ,	1.0. of screen section	
	0	Elevation / depth of	battom of screen 2.00
		1 1 !	
		Elev./depth of bottom	of nivered
		blank section	_NIA_
		Type of filler below	plugged Lin
		section	NIH - COO
		Elevation of sottom o	1 barroly

Well Construction Summary.

SITE Lt. 6, Gast ham COORDINATES NA DATE COMPLETED 3/8/89 SUPERVISED BY BEC Clevation of reference point Insight of reference point above FLEVATION Type of surface seal L.D. of surface casing Type of surface casing Type of surface casing Type of riser pipe Type of riser pipe: Threaded PUC Oissector of boreroit Type of filler: Gaud Type of gravel pack Clavation / depth of top of screen Clavation of depth of top of screen Clavation of depth of top of screen Clavation of depth of top of screen Clavation of depth of top of screen Clavation of depth of top of screen Clavation of depth of top of screen Chi UN PUC With 100 of Depth of screen section Clavation / depth of bottom of screen Clavation / depth of bottom of screen Clavation / depth of bottom of screen Clavation / depth of bottom of screen Clavation / depth of bottom of screen Clavation / depth of bottom of screen Clavation / depth of bottom of screen Clavation / depth of bottom of screen Clavation / depth of bottom of screen Clavation / depth of bottom of screen Clavation / depth of bottom of screen Clavation / depth of bottom of screen Clavation / depth of bottom of screen		100	t. 0.1 0/		•
CROUND ELEVATION CROUND ELEVATION CROUND ELEVATION CROUND ELEVATION CROUND		PROJECT Great Pond Phose IL			WELL NO 27
DATE COMPLETED 3/8/9 SUPERVISED BY BBC Elevation of reference point SO.97 Elevation of reference point SO.97 Elevation of reference point above Flush From surface seal: Concrete 1.D. of surface casing Type of surface casing L.D. of river pipe: Throad PUC Oismeter of borehole Type of filler: Clevation / depth of too of seal Type of gravel pack Elevation / depth of too of seal Type of gravel pack Elevation of too of gravel pack Chell Of NC With 10' of O.010 Stoft Screen 2/97 Elevation / depth of bottom of screen Schul ONC With 10' of O.010 Stoft Screen 2/97					
SUPERVISED BY BEC Clevation of reference point Incignt of reference point above FLEVATION Desirn of surface seal I.D. of surface casing Type of surface casing Type of surface casing I.D. of riser pipe Type of riser pipe Type of riser pipe: Threaded PUC Oisentar of boreardie I type of filler: Clevation / depth of too of seal Type of gravel pack Clevation / depth of too of seal Type of gravel pack Clevation of too of gravel pack Clevation of too of gravel pack Clevation of too of gravel pack Clevation of too of serven Schull PUC With 10' of D.D. of screen section 1.0. of screen section Clevation / depth of bottom of screen Child Soft Screen 1.0. of screen section Clevation / depth of bottom of screen Child Soft Screen Clevation / depth of bottom of screen		ESTANIORODO	3/4/40		AQUIFIER
ELEVATION ELEVATION Type of surface seal: Concrete 1.D. of surface seal: Concrete 1.D. of surface casing Type of surface seal: Concrete 1.D. of riser give Type of riser give Type of riser give Type of riser give Type of surface casing 1.D. of of surface casing 1.D. of of surface casing 1.D. of fiser give Type of surface seal: Concrete 1.D.					
SACUND ELEVATION Type of surface seal LO. of surface casing Type of surface casing LO. of surface casing Type of surface casing LO. of riser size Type of riser size Type of riser pipe: Threadd PUC Dismeter of borenois Type of filler: Gand Type of filler: Gand Type of gravel pack Elevation / depth of top of screen Clevation of depth of top of screen Schulp PUC wiff 100 of Description of top of screen LO. of screen section Clevation / depth of bottom of screen Description of top of screen Challo Slot Screen LO. of screen section	_	ZONEXAIZED BA -	<u> </u>	_	
Depth of surface seal: Concrete Type of surface casing Type of surface casing 1.D. of surface casing Type of surface casing 1.D. of surface casing Type of riser gipe Type of riser, pipe: Threadd puc Oiseaster of borerole Type of filler: Clevation / depth of top of seel Type of gravel pack Clevation / depth of top of screen Sch. 40 fuc with 10 of Oolo Soft Screen 1.D. of screen section Clevation / depth of bottom of screen Colo Soft Screen Clevation / depth of bottom of screen Colo Soft Screen Clevation / depth of bottom of screen Clevation / depth of bottom of screen Colo Soft Screen Clevation / depth of bottom of screen Clevation / depth of bottom of screen Clevation / depth of bottom of screen		N _e		Elevation of reference point	50.97
Type of surface seal: Concrete 1.D. of surface casing Type of surface casing 1.D. of riser gipe Type of riser pipe: Threaded PUC 0 inneter of borenois 1 type of filler: Sand 1 type of seal: Senton Seal 1 type of gravel pack Sand 1 type of gravel pack sand 1 type of gravel p		ELEVATION		telight of reference point above pround surface	Flush
1.D. of surface casing Type of surface casing Open of		SUSTEMBLE SE	1	with of surface saal	1.5-2.01
Type of surface casing. Depth of surface casing Depth of surface casing Depth of surface casing Depth of surface casing Depth of surface Depth of surfac				you at surface seal: Concre	te
Depth of surface casing Openth of surface casing Depth of surface casing 1.D. of place pipe Type of river pipe: Threaded PVC Oisemeter of borerole United process of seel of the pipe of the pipe of seel of the pipe of th		ļ		.D. of surface casing	3"
Depth of surface casing 1.0. of riser gipe Type of riser pipe: Threaded PUC- Oisertar of borerola Type of filler: Gand Type of filler: Gand Type of seal: Spiritory of seal Type of gravel pack Sand Elevation / depth of top of screen 14.97 Description of screen Schull PUC Wiff 10' of Deold Slot Screen 1.0. of screen Clevation / depth of bottom of scre				ype of surface casing,	
Type of filter: Clevetion / depth of top of screen Clevetion / depth of top of screen Type of gravel pack Sand Clevetion / depth of top of screen Type of gravel pack Sand Clevetion / depth of top of screen Liev./depth of top of screen Schulp PVC wiff 10' of Ociolo Slot Screen. Clevetion / depth of bottom of screen Liev. Soft Screen. Clevetion / depth of bottom of screen Liev. Screen. Clevetion / depth of bottom of screen Liev. Screen. Clevetion / depth of bottom of screen Liev. Screen. Clevetion / depth of bottom of screen				Tuzi gua pox	
Type of riser size: Threaded PUC Oismeter of borenoise Type of filter: Clewition / depth of top of seed Type of gravel pack Sand Elevation / depth of top of screen Itelevation / depth of top of screen Schill PUC With 10' of Diolo Slot Screen 1.0. of screen section Clevation / depth of bottom of screen I.0. of screen section Clevation / depth of bottom of screen Chill PUC With 10' of Diolo Slot Screen Clevation / depth of bottom of screen Chill Public With 10' of Diolo Slot Screen Clevation / depth of bottom of screen			م ا	eath of surface casing	
Type of riser pipe: Threaded PUC Dismeter of barenole U'' Type of filler: Gand Type of filler: Gand Type of seal: Dentarate Type of seal: Dentarate Type of gravel pack Sand Elevation of gravel pack W/A Elevation of depth of top of screen 14.97 Description of screen Sche Up PUC W/A 10' of Deal Slot Screen 2' Threaded PUC Uppe of filler: Gand Type of filler: Sand Elevation of depth of top of screen Sche Up PUC W/A 10' of Deal Slot Screen 2' Threaded PUC Type of filler: Gand Type of filler:				Diaf riser gipe	<u> 2" </u>
Type of gravel pack Sand [levelion / depth of top of seal Type of gravel pack Sand [levelion of gravel pack sand [leveli	<u> </u>		' ^T 1	rpe of riser pipe:	·
Type of gravel pack Sand [levelion / depth of top of seal Type of gravel pack Sand [levelion of gravel pack sand [leveli	A P	18			 4"
Type of gravel pack Sand [levelion / depth of top of seal Type of gravel pack Sand [levelion of gravel pack sand [leveli	TIGA	\$			
Type of seal: Bentombe seal Type of seal: Bentombe Type of gravel pack Sand Elevation of top of gravel pack Elevation of top of screen Schull full full of top of Ociolo Slot Screen 1.0. of screen section Elevation / depth of bottom of screen Ungariation of screen Schull full full of Elevation / depth of bottom of screen	17.1	अ	1 1 1	pe of filler: Sand	
Type of gravel pack Sand Elevation / depth of top of screen Che 40 PVC With 10' of Deal Slot Screen 1.0. of screen section Clevation / depth of battom of screen Che 40 PVC With 10' of Deal Slot Screen Clevation / depth of battom of screen	0	8	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	emetion / death of too of seal med seal	<u> 2do 9 F</u>
Description of screen Sch. 40 PVC Wiff 10' of O.010 Slot Screen. 1.0. of screen section Clevation / depth of bottom of screen	77	g		0	-
Description of screen Schu 40 PVC Wiff 10' of Ocolo Slot Screen 1.0. of screen section Clevation / depth of bottom of screen	RAL	9	17	ev./449th of top of gravel nuc	· WIA
Description of screen Sch. 40 PVC Wiff 10' of O.010 Slot Screen. 1.0. of screen section Clevation / depth of bottom of screen	3	3			
1.D. of screen section [Insulation / depth of bottom of screen 4.97]	٦	1 3	B	scription of screen	^
1.0. of screen section 2 4.97 Elevation / depth of battom of screen		İ		3.010 Slot screen.	<u> </u>
Elevation / death of bottom of screen 4097	:	$ \dot{o} $		· · · · · · · · · · · · · · · · · · ·	<u> 2' </u>
			[]		4.97
		0			
Elev./septh of battom of places		٠.		iv./mpth of battom of plugged	HCL
Mank section	I		1 1	MIN SACTION	
Type of filler below slugged NA			1775	e of filler below plugged	NA
Elevation of pottor of porerols —9.03			1 1		-9.03

V411 Construction Summary.

and the first	1 0 1 0/2		
MOJECT Great		WELL MA 28	
	SITE Seehive Rd., Eastham.		
DATE COMPLETED		- AQUIFIER -	
SUPERVISED BY			
	Elevation of reference p	30./7	
GROUND	Helght of reference poin	t stone	
ELEVATION	ground surface		
	Depth of surface seal	115-2.01	
	Type of surface seal: @	<u>oucrete</u>	
	1.0. of surface casing	· y	
	-		
	cast gate Bo)×	
	Death of surface casing	2.0'	
40	11 11 .	2"	
sond sand	Threaded POC		
San San area.	3 1 1 1 1	· ull	
5 0	Dissector of barenale		
Med. Sapel. Sangel. Sange.	Type of filler: SC	and_	
3	Elevation / death of too ? Type of seal: BENTOKE	all 2001 13017	
THE TO TO TO TO TO TO TO TO TO TO TO TO TO	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	^	
2 8 (3)	Type of gravel pack	and wife	
4 17 3	5999		
五年 五	Clevation / depth of top of Description of screen	· · · · · · ·	
र्र उ	Schillo PYC with 10	o' of	
Bown Unite	1.0. of screen section	۵′ -	
		0.17	
	Elevation / depth of batto	= of screen	
3 % &	Elev./desth of bottom of g	ravel pack WA	
25-00 25-40	blank section	N/A	
0 %	Type of filler below plugg	#d	
* *	saction	-7,83	
	Elevation of pottor of par	e-ale	

Well Construction Summary.

APPENDIX C

GROUNDWATER QUALITY DATA AND WATER LEVELS





Scientists Engineers ` Planners TO: All owners of well sites for the Great Pond Groundwater Study

FROM: BEC, Inc.

REGARDING: Well test results

September 27, 1990

Dear Sirs and Madams:

We at BEC would like to take this opportunity to thank you for your participation in the Great Pond groundwater study, and to apologize for the lengthy delay in supplying you with results. As you are probably well aware, the fiscal crisis in Massachusetts has slowed or eliminated many projects, and the Eastham Clean Lakes Project was subject to substantial payment delays. While we did accomplish three rounds of well sampling, we were unable to pay the laboratory invoices for analysis. The results were therefore not released by the laboratory until recently.

All that aside, enclosed please find the results of three samplings of the well on your property. If your property contains a cluster well (a set of three wells of varying depths), you have three sets of three samplings to review. In each sampling, the depth to water from the top of the well was measured and the elevation of the groundwater level was calculated relative to sea level. Water quality parameters which were assessed all three times included pH, conductivity, phosphorus, nitrate and ammonia. Total kjeldahl nitrogen measurements were made twice, and sodium was measured once.

Maximum, minimum and average values are given on the enclosed data sheet(s). For the water level information, these are based on data for only the well listed at the top of the data sheet. For the water quality parameters, the maximum, minimum, and average are based on all data collected throughout the three samplings. This will enable you to compare your well to others in the study in a general way.

There is a health standard of 10 mg/l for nitrate nitrogen; no values in this study exceeded it, but values over 2 mg/l are cause for additional monitoring in the future, as such values are unnaturally high. There is also a recommended health limit for sodium of 20 mg/l. Values higher than this may be natural in a coastal setting such as Eastham, but people with high blood pressure should not drink this water regularly.



While there are no health standards for the other parameters, we would like to offer a few notes on what various values suggest. Ammonia nitrogen is usually converted to nitrate nitrogen, so the ammonia nitrogen values should be treated like the nitrate nitrogen values for health purposes; the sum of the ammonia and nitrate values is of concern if it is greater than 10 mg/l, and further investigation is warranted if the sum is greater than 2 mg/l. Conductivity is a measure of the quantity of substances dissolved in water; values over about 200 umhos/cm suggest elevated dissolved substance levels and warrant some investigation of the nature of those substances. pH is a measure of the acid content of the water, with lower values indicating greater acidity. Values lower than 6 SU may cause pipe corrosion and leaching of undesirable materials (like metals) into the water. Further testing for metals such as copper or lead would be advisable where the pH is low, and a water softener may be useful.

While results of testing for organic chemical contamination are not reported on the enclosed summary sheet(s), we did test for a variety of such pollutants on one date, with follow-up checks at selected high-risk sites. No contamination beyond expected background levels was detected in any well.

BEC will now be evaluating the overall pattern of the well data to determine which management methods would best protect the groundwater supply in Eastham. The data collected from the well on your property is extremely valuable in this regard, even if the results show no signs of contamination. Your participation has made this study possible. Copies of the final report should be on file with the Board of Selectmen by the end of 1990, should you wish to examine one.

A business card is enclosed should you have any questions or wish to discuss follow up investigations. Thank you again for your cooperation in this study.

Very truly yours,

Len Wagner

BEC, Inc.

Kenneth J. Wagner, Ph.D

Associate

VELL #1a DEPTH (FT) 35

DATE	DEPTH TO WATER	WATER ELEVATION	рН	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL Kjeldahl	SODIUN
UNITS	(FT)	(FT)	SU	uNHOS	MG/L	MG/L	MG/L	MG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	15.4 15.8 15.0	8.36 7.96 8.76	6.7 6.5 7.5	70 130 71	.04 .14 .16	.03 .08 <.01	<.01 .12	.13 .15	4.0
MINIMUM FOR ALL DATA	15.0	7.96	5.3	51	<.01	<.01	<,01	<.10	.1
AVERAGE FOR ALL DATA	15.4	8.36	6.2	165	.01	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	15.8	8.76	9.3	435	.82	1.90	5.30	5.60	40.0

RECORD OF WATER QUALITY DATA

WELL #15 DEPTH (FT) 55

DATE	DEPTH TO WATER	WATER ELEVATION	pH	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
UNITS	(FT)	(FT)	SU	uMHOS	MG/L	MG/L	MG/L	MG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	15.7 16.1 15.2	8.06 7.66 8.56	6.9 6.4 7.7	120 132 70	.06 .26 .07	.35 .53 <.01	.02 <.01 .16	.75 .82	5.0
MINIMUM FOR ALL DATA	15.2	7.66	5.3	51	<.01	<.01	<.01	<.10	.1
AVERAGE FOR ALL DATA	15.6	8.09	6.2	165	.01	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	16.1	8.56	9.3	435	.82	1.90	5.30	5.60	40.0

RECORD OF WATER QUALITY DATA

WELL #1c DEPTH (FT) 75

DATE	DEPTH TO WATER	WATER ELEVATION	рH	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
UNITS	(PT)	(FT)	SU	uMHOS	MG/L	MG/L	MG/L	MG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	15.7 15.8 15.1	8.05 7.95 8.65	7.2 7.0 7.3	125 122 59	.02 .23 .07	.19 .24 <.01	<.01 <.01 .13	.36 .58	5.0
MINIMUM FOR ALL DATA	15.1	7.95	5.3	51	<.01	<.01	<.01	<.10	.1
AVERAGE FOR ALL DATA	15.5	8.22	6.2	165	.01	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	15.8	8.65	9.3	435	.82	1.90	5.30	5.60	40.0

WELL #2 DEPTH (FT) 15

DATE	DEPTH TO WATER	WATER ELEVATION	Hq	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
UNITS	(FT)	(FT)	SU	uMHOS	MG/L	MG/L	MG/L	HG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	4.6 4.8 3.6	8.53 8.33 9.53	7.1 5.8 5.8	105 155 121	.03 .30 .11	.15 .15 .43	.01 .48 .05	.44 .48	12.0
MINIMUM FOR ALL DATA	3.6	8.33	5.3	51	<.01	<.01	<.01	<.10	.1
AVERAGE FOR ALL DATA	4.3	8.80	6.2	165	.01	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	4.8	9.53	9.3	435	.82	1.90	5.30	5.60	40.0

RECORD OF WATER QUALITY DATA

WELL #3 DEPTH (FT) 20

DATE	DEPTH TO WATER	WATER ELEVATION	pН	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
UNITS	(FT)	(FT)	SU	uNHOS	MG/L	MG/L	MG/L	MG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	18.5 19.1 18.1	8.36 7.76 8.76	6.7 6.0 5.9	159 149 152	.03 .34 .03	.47 .24 .40	1.80 1.31	.80 .39	13.0
MINIMUM FOR ALL DATA	18.1	7.76	5.3	51	<.01	<.01	<.01	C.10	.1
AVERAGE FOR ALL DATA	18.57	8.29	6.2	165	.01	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	19.1	8.76	9.3	435	.82	1.90	5.30	5.60	40.0

RECORD OF WATER QUALITY DATA

WELL #4 DEPTH (FT) 40

DATE	DEPTH TO WATER	WATER ELEVATION	рH	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
UNITS	(FT)	(FT)	SU	uMHOS	MG/L	MG/L	HG/L	MG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	24.9 25.3 24.3	9.55 9.15 10.15	6.9 6.1 5.9	190 162 229	.06 .29 .05	.13 .06 .08	3.40 .12 3.20	<.10 <.10	19.0
MINIMUM FOR ALL DATA	24.3	9.15	5.3	51	<.01	<.01	<.01	<.10	.1
AVERAGE FOR ALL DATA	24.83	9.62	6.2	165	.01	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	25.3	10.15	9.3	435	.82	1.90	5.30	5.60	40.0

WELL #5 DEPTH (FT) 25

DATE	DEPTH TO WATER	WATER ELEVATION	pH	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
UNITS	(FT)	(FT)	SU	uMHOS	MG/L	MG/L	MG/L	MG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	10.50 11.60 9.80	11.13 10.03 11.83	6.9 5.7 5.9	140 205 122	.03 .07 .13	.05 <.01 <.01	2.10 2.48	<.10 <.10	12.0
MINIMUM FOR ALL DATA	9.80	10.03	5.3	51	<.01	<.01	<.01	<.10	.1
AVERAGE FOR ALL DATA	10.63	10.99	6.2	165	.0i	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	11.60	11.83	9.3	435	.82	1.90	5.30	5.60	40.0

WELL #6a DEPTH (FT) 30

DATE	DEPTH TO WATER	WATER ELEVATION	pH	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL Kjeldahl	SODIUM
UNITS	(PT)	(PT)	SU	uMHOS	HG/L	MG/L	MG/L	MG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	17.00 18.00 16.00	8.86 7.86 9.86	6.7 5.6 6.1	160 162 113	.01 .12 .05	3.10 .10 .02	2.60 .29 2.10	5.60 <.10	10.0
MINIMUM FOR ALL DATA	16.00	7.86	5.3	51	<.01	<.01	<.01	<.10	.1
AVERAGE FOR ALL DATA	17.00	8.86	6.2	165	.01	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	18.00	9.86	9.3	435	.82	1.90	5.30	5.60	40.0

RECORD OF WATER QUALITY DATA

WELL #6b DEPTH (PT) 50

DATE	DEPTH TO WATER	WATER ELEVATION	рΗ	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
UNITS	(FT)	(FT)	SU	uMHOS	MG/L	MG/L	MG/L	MG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	17.00 17.50 16.60	8.86 8.36 9.26	6.9 5.9 6.1	190 230 108	.01 .17 .04	.51 .43 .03	.85 .03 1.90	.80 .66	11.0
MINIMUM FOR ALL DATA	16.60	8.36	5.3	51	<.01	<.01	<.01	<.10	.i
AVERAGE FOR ALL DATA	17.03	8.83	6.2	165	.01	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	17.50	9.26	9.3	435	.82	1.90	5.30	5.60	40.0

RECORD OF WATER QUALITY DATA

WELL #6c DEPTH (FT) 70

DATE	DEPTH TO WATER	WATER ELEVATION	рH	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
UNITS	(PT)	(FT)	SU	uMHOS	MG/L	MG/L	MG/L	MG/L	NG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	17.00 17.70 16.80	8.86 8.16 9.06	6.8 6.2 6.2	120 109 119	.08 .17 .05	.15 .03 .03	.39 <.01 .49	.10 .11	9.0
MINIMUM FOR ALL DATA	16.80	8.16	5.3	51	<.01	<.01	<.01	<.10	.1
AVERAGE FOR ALL DATA	17.16	8.69	6.2	165	.01	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	17.70	9.06	9.3	435	.82	1.90	5.30	5.60	40.0

WELL #7a DEPTH (FT) 25

DATE	DEPTH TO WATER	WATER ELEVATION	pli	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL Kjeldahl	SODIUM
UNITS	(PT)	(FT)	SU	uNHOS	NG/L	HG/L	MG/L	MG/L	HG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	14.70 15.10 14.10	9.16 8.76 9.76	6.8 6.1 5.9	140 175 151	.05 .15 .05	.34 .16 .05	.01 .38 .01	.26 .18	12.0
MINIMUM FOR ALL DATA	14.10	8.76	5.3	51	<.01	<.01	<.0i	<.10	.1
AVERAGE FOR ALL DATA	14.63	9.23	6.2	165	.01	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	15.10	9.76	9.3	435	.82	1.90	5.30	5.60	40.0

RECORD OF WATER QUALITY DATA

WELL #76 DEPTH (FT) 45

DATE	DEPTH TO WATER	WATER ELEVATION	pH	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
UNITS	(FT)	(FT)	SU	uMHOS	MG/L	MG/L	MG/L	MG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	12.90 13.50 12.40	10.96 10.36 11.46	6.6 6.2 6.8	220 228 210	.05 .11 .05	.69 .75 .13	.03 .04 .26	.26 .85	16.0
MINIMUM FOR ALL DATA	12.40	10.36	5.3	51	<.01	<.01	<.01	<.10	.1
AVERAGE FOR ALL DATA	12.93	10.93	6.2	165	.01	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	12.40	10.36	9.3	435	.82	1.90	5.30	5.60	40.0

RECORD OF WATER QUALITY DATA

WELL \$7c DEPTH (FT) 63

DATE	DEPTH TO WATER	WATER ELEVATION	pil	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	total Kjeldahl	SODIUM
UNITS	(PT)	(PT)	SU	uMHOS	MG/L	MG/L	MG/L	MG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	12.90 13.50 12.40	10.96 10.36 11.46	6.9 6.5 7.1	120 108 97	.04 .06 .05	.24 .05 .14	.12 .02 .03	.18 <.10	11.0
MINIMUM FOR ALL DATA	12.40	10.36	5.3	51	<.01	<.01	<.01	<.10	.1
AVERAGE FOR ALL DATA	12.93	10.93	6.2	165	.01	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	13.50	11.46	9.3	435	.82	1.90	5.30	5.60	40.0

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WELL #11 DEPTH (FT) 45

DATE	DEPTH TO WATER	VATER ELEVATION	Hq	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
UNITS	(FT)	(PT)	SU	uNHOS	MG/L	MG/L	MG/L	MG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	29.80 30.50 29.50	13.13 12.43 13.43	6.4 5.9 5.7	259 252 268	.10 .11 .07	.27 .13 .19	2.70 1.70 .78	<.10 <.10	39.0
MINIMUM FOR ALL DATA	29.50	12.43	5.3	51	<.01	<.01	<.01	<.10	.6
AVERAGE FOR ALL DATA	29.93	12.99	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	30.50	13.43	9.3	435	.82	1.90	5.30	5.60	40.0

WELL #12a DEPTH (FT) 45

DATE	DEPTH TO WATER	WATER ELEVATION	рH	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
UNITS	(FT)	(FT)	SU	uMHOS	MG/L	MG/L	MG/L	MG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	30.80 31.60 30.70	14.38 13.58 14.48	6.3 5.7 6.0	165 184 179	.06 .16 .05	.12 .01 .19	.29 .23 .38	<.10 <.10	20.0
MINIMUM FOR ALL DATA	30.70	13.58	5.3	51	<.01	<.01	<.01	<.10	.6
AVERAGE FOR ALL DATA	31.03	14.15	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	31.60	14.48	9.3	435	.82	1.90	5.30	5.60	40.0

RECORD OF WATER QUALITY DATA

WELL #12b DEPTH (FT) 65

DATE	DEPTH TO WATER	WATER ELEVATION	рН	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
UNITS	(FT)	(FT)	SU	uMHOS	NG/L	MG/L	MG/L	MG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	30.80 31.60 30.80	14.38 13.58 14.38	6.5 5.6 6.0	262 346 240	.01 .04 .05	.05 <.01 .18	3.70 2.20 .78	<.10 <.10	42.0
MINIMUM FOR ALL DATA	30.80	13.58	5.3	51	<.01	<.01	<.01	<.10	.6
AVERAGE FOR ALL DATA	31.06	14.11	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	31.60	14.38	9.3	435	.82	1.90	5.30	5,60	40.0

RECORD OF WATER QUALITY DATA

WELL #12c DEPTH (PT) 85

DATE	DEPTH TO WATER	WATER ELEVATION	pĦ	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
UNITS	(FT)	(FT)	SU	uMHOS	MG/L	MG/L	MG/L	MG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	31.40 32.00 31.50	13.78 13.18 13.68	6.5 5.7 5.9	320 350 183	.04 .06 .05	.18 .46 .16	3.00 3.00 .25	<.10 .52	21.0
MININUM FOR ALL DATA	31.40	13.18	5.3	51	<.01	<.01	<.01	<.10	.6
AVERAGE FOR ALL DATA	31.63	13.54	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	32.00	13.78	9.3	435	.82	1.90	5.30	5.60	40.0

WELL #13a DEPTH (FT) 44

DATE	DEPTH TO WATER	WATER ELEVATION	Вq	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
UNITS	(FT)	(FT)	SU	unhos	MG/L	MG/L	MG/L	MG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	31.80 32.60 31.90	14.75 13.95 14.65	6.2 6.2 5.9	130 151 131	.15 .82 .77	.18 .22 .08	.07 .05 .02	.14 .23	9.0
MINIMUM FOR ALL DATA	31.80	13.95	5.3	51	<.01	<.01	<.01	<.10	.6
AVERAGE FOR ALL DATA	32.10	14.45	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	32.60	14.75	9.3	435	.82	1.90	5.30	5.60	40.0

RECORD OF WATER QUALITY DATA

WELL #13b DEPTH (FT) 62

DATE	DEPTH TO WATER	WATER ELEVATION	рH	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUN
UNITS	(FT)	(FT)	SU	uMHOS	MG/L	MG/L	HG/L	MG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	31.90 32.60 31.90	14.65 13.95 14.65	6.5 5.8 6.1	82 114 113	.01 .18 .61	.05 .03 .02	.29 <.01 <.01	<.10 <.10	13.0
MINIMUM FOR ALL DATA	31.90	13.95	5.3	51	<.01	<.01	<.01	<.10	.6
AVERAGE FOR ALL DATA	32.13	14.42	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	32.60	14.65	9.3	435	.82	1.90	5,30	5.60	40.0

RECORD OF WATER QUALITY DATA

WELL #13c DEPTH (FT) 70

DATE	DEPTH TO WATER	WATER ELEVATION	рĦ	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
UNITS	(FT)	(FT)	SU	uMHOS	MG/L	MG/L	MG/L	MG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	35.00 35.40 34.20	11.50 11.10 12.30	6.1 6.7 9.3	152 142 129	.06 .14 .14	.04 .19 .47	3.10 1.30 .05	<.10 <.10	17.0
MINIMUM FOR ALL DATA	34.20	11.10	5.3	51	<.01	<.01	<.01	<.10	.6
AVERAGE FOR ALL DATA	34.86	11.63	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	35.40	12.30	9.3	435	.82	1.90	5.30	5.60	40.0

WELL #14a DEPTH (FT) 45

DATE	DEPTH TO WATER	WATER ELEVATION	рĦ	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	total Kjeldahl	SODIUM
UNITS	(FT)	(FT)	SU	uMHOS	MG/L	MG/L	MG/L	HG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	32.10 32.90 31.90	12.02 11.22 12.22	5.9 6.7 5.8	385 142 435	.04 .14 .09	.25 .19 .03	.04 1.30 .02	.20 <.10	50.0
MINIMUM FOR ALL DATA	31.90	11.22	5.3	51	<.01	<.01	<.01	<.10	.6
AVERAGE FOR ALL DATA	32.30	11.82	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	32.90	12.22	9.3	435	.82	1.90	5.30	5.60	40.0

RECORD OF WATER QUALITY DATA

WELL #14b DEPTH (FT) 65

DATE	DEPTH TO WATER	WATER BLEVATION	рH	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
UNITS	(FT)	(FT)	SU	uMHOS	MG/L	MG/L	MG/L	MG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	32.70 33.30 32.40	11.42 10.82 11.72	6.2 6.0 6.2	350 350 141	.04 .03 .08	.26 .14 .02	.02 .03 .23	.13 .16	14.0
MINIHUM FOR ALL DATA	32.40	10.82	5.3	51	<.01	<.01	<.01	<.10	.6
AVERAGE FOR ALL DATA	32.80	11.32	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	33.30	11.72	9.3	435	.82	1.90	5.30	5.60	40.0

RECORD OF WATER QUALITY DATA

WELL #14c DEPTH (FT) 83

DATE	DEPTH TO WATER	WATER ELEVATION	Вq	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	total Kjeldahl	SODIUN
UNITS	(FT)	(FT)	SU	uMHOS	MG/L	MG/L	MG/L	MG/L	NG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	33.60 34.20 33.30	10.52 9.92 10.82	6.6 6.2 6.2	115 130 115	.16 .15 .07	.06 .01 .02	.57 .46 .21	<.10 <.10	13.0
MINIMUM FOR ALL DATA	33.30	9.92	5.3	51	<.01	<.01	<.01	<.10	.6
AVERAGE FOR ALL DATA	33.70	10.42	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	34.20	10.82	9.3	435	.82	1.90	5.30	5.60	40.0

WELL #15 DEPTH (FT) 12.30

DATE	DEPTH TO WATER	WATER ELEVATION	pH	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
UNITS	(E)	(PT)	SU	uMHOS	MG/L	MG/L	MG/L	ng/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	5.2 6.0 4.8	11.55 10.75 11.95	6.9 6.9 6.1	195 195 121	.04 .07 .05	2.10 1.70 1.90	.82 .10 .01	3.45 2.70	4.0
HINIHUM FOR ALL DATA	4.8	10.75	5.3	51	<.01	<.01	<.01	<.10	.6
AVERAGE FOR ALL DATA	5.3	11.42	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	6.0	11.95	9.3	435	.82	1.90	5.30	5.60	40.0

RECORD OF WATER QUALITY DATA

WELL #16 DEPTH (FT) 55

DATE	DEPTH TO WATER	WATER ELEVATION	рĦ	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
UNITS	(FT)	(FT)	SU	uMHOS	MG/L	MG/L	MG/L	MG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	45.3 46.1 45.6	9.46 8.66 9.16	6.3 5.3 5.7	149 220 140	.12 .36 .05	.14 .03 .05	2.30 2.80 1.00	<.10 <.10	13.0
MINIMUM FOR ALL DATA	45.3	8.66	5.3	51	<.01	<.01	<.01	<.10	.6
AVERAGE FOR ALL DATA	45.6	9.09	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	46.1	9.46	9.3	435	.82	1.90	5.30	5.60	40.0

RECORD OF WATER QUALITY DATA

WELL #17 DEPTH (FT) 7.9

DATE	DEPTH TO WATER	WATER ELEVATION	pH	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL Kjeldahl	SODIUM
UNITS	(FT)	(FI)	SU	uMHOS	MG/L	MG/L	MG/L	HG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	5.6 6.2 5.7	13.78 13.18 13.68	6.7 5.8 6.0	70 114 62	.04 .11 .07	.50 .08 .03	.89 2.40 .52	.18 <.10	4.0
MINIMUM FOR ALL DATA	5.6	13.18	5.3	51	<.01	<.01	. <.01	<.10	.6
AVERAGE FOR ALL DATA	5.8	13.54	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	6.2	13.78	9.3	435	.82	1.90	5.30	5.60	40.0

WELL #18 DEPTH (FT) 15

DATE	DEPTH TO WATER	WATER ELEVATION	рH	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL Kjeldahl	SODIUM
UNITS	(FT)	(FT)	SU	uMHOS	HG/L	MG/L	HG/L	HG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	12.7 13.3 12.8	14.88 14.28 14.78	6.7	100	.05	.61	1.20	.25	
MINIMUM FOR ALL DATA	12.7	14.28	5.3	51	<.01	<.01	<.01	<.10	.6
AVERAGE FOR ALL DATA	12.9	14.64	6.2	165	.10	.18	.78	.34	16.1
MAXINUM FOR ALL DATA	13.3	14.88	9.3	435	.82	1.90	5.30	5.60	40.0

WELL #19a DEPTH (FT) 45

DATE	DEPTH TO WATER	WATER ELEVATION	рН	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
UNITS	(FT)	(PT)	SU	u MHOS	MG/L	HG/L	HG/L	MG/L	NG/L
AUG. 14, 1989 OCT. 14, 1989	22.8 23.8	15.15 14.15	6.3	190	.06	.25	.85	.18	
MAY 15, 1990	22.9	15.05	5.8	208	.05	.05	1.60	. •	11.0
MINIMUM FOR ALL DATA	22.8	14.15	5.3	51	<.01	<.01	<.01	<.10	.6
Average for ALL DATA	23.2	14.77	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	23.8	15.15	9.3	435	.82	1.90	5.30	5.60	40.0

RECORD OF WATER QUALITY DATA

WELL #19b DEPTH (FT) 60

DATE	DEPTH TO WATER	WATER ELEVATION	pH	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
UNITS	(PT)	(FT)	SU	uMHOS	MG/L	MG/L	MG/L	MG/L	HG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	22.8 23.8 22.9	15.15 14.15 15.05	6.4	190	.04	.10	.51	<.10	
MINIMUM FOR ALL DATA	22.8	14.15	5.3	51	<,01	<.01	<.01	<.10	.6
AVERAGE FOR ALL DATA	23.2	14.78	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	23.8	15.15 -	9.3	435	.82	1.90	5.30	5.60	40.0

RECORD OF WATER QUALITY DATA

WELL #19c DEPTH (FT) 80

DATE	DEPTH TO WATER	WATER ELEVATION	Hq	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
UNITS	(FT)	(FT)	SU	uMHOS	MG/L	MG/L	MG/L	NG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	22.8 23.7 22.9	15.15 14.25 15.05	6.6 6.2 6.0	130 148 153	.04 .28 .04	.09 <.01 .04	<.01 .07 .09	<.10 <.10	11.0
MINIMUM FOR ALL DATA	22.8	14.25	5.3	51	<.01	<.01	<.01	<.10	.6
AVERAGE FOR ALL DATA	23.1	14.82	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	23.7	15.15	9,3	435	.82	1.90	5.30	5.60	40.0

WELL #20a DEPTH (FT) 35

DATE	DEPTH TO WATER	Water Elevation	рH	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
UNITS	(FT)	(FT)	SU	uMHOS	MG/L	MG/L	MG/L	HG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 HAY 15, 1990	22.6 23.3 22.6	15.23 14.53 15.23	6.6 5.6 5.7	119 148 83	.02 .06 .05	.09 .46 .10	.05 .13 .01	<.10 .55	6.0
MINIMUM FOR ALL DATA	22.6	14.53	5.3	51	<.01	<.01	<.01	<.1 0	.6
AVERAGE FOR ALL DATA	22.8	14.99	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	23.3	15.23	9.3	435	.82	1.90	5.30	5.60	40.0

RECORD OF WATER QUALITY DATA

WELL \$20b DEPTH (PT) 55

DATE	DEPTH TO WATER	WATER ELEVATION	рĦ	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
UNITS	(PT)	(FI)	SU	unhos	MG/L	MG/L	MG/L	NG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	22.6 23.3 22.6	15.23 14.53 15.23	6.4 5.5 5.9	295 309 215	.02 .20 .05	.45 .14 .22	<.01 .02 .01	1.25 .66	40.0
MINIMUM FOR ALL DATA	22.6	14.53	5.3	51	. <.01	<.01	<.01	<.10	.6
AVERAGE FOR ALL DATA	22.8	14.99	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	23.3	15.23	9.3	435	.82	1.90	5.30	5.60	40.0

RECORD OF WATER QUALITY DATA

WELL #20c DEPTH (FT) 75

DATE	DEPTH TO WATER	WATER ELEVATION	рĦ	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL Kjeldahl	SODIUM
UNITS	(FT)	(FT)	SU	uMHOS	MG/L	MG/L	MG/L	MG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	22.6 23.3 22.7	15.23 14.53 15.13	5.9 6.0 5.7	370 429 284	<.01 .08 .05	.06 .02 <.01	.03 .15 .03	.10 .30	40.0
MINIMUM FOR ALL DATA	22.6	14.53	5.3	51	<.01	<.01	<.01	<.10	.6
AVERAGE FOR ALL DATA	22.8	14.96	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	23.3	15.23	9.3	435	.82	1.90	5.30	5.60	40.0

VELL 121 DEPTH (FT) 40

DATE	DEPTH TO WATER	WATER ELEVATION	pH	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUN
UNITS	(PT)	(FT)	SU	uMHOS	MG/L	MG/L	MG/L	MG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	25.6 26.3 25.3	12.50 11.80 12.80	6.6 5.9 5.9	89 81 100	.01 .14 .06	.01 <.01 <.01	.05 .06 .02	<.10 <.10	10.0
MINIMUM FOR ALL DATA	25.3	11.80	5.3	51	<.0i	<.01	<.01	<.10	.6
average for ALL DATA	25.7	12.36	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	26.3	12.8	9.3	435	.82	1.90	5.30	5.60	40.0

RECORD OF WATER QUALITY DATA

WELL #22 DEPTH (FT) 40

	DATE	DEPTH TO WATER	WATER ELEVATION	рĦ	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
į	NITS	(FT)	(FT)	SU	uMHOS	MG/L	MG/L	MG/L	MG/L	MG/L
- <i>I</i>	NUG. 14, 1989 XCT. 14, 1989 NAY 15, 1990	26.7 27.4 26.7	15.62 14.92 15.62	6.7 6.1 5.9	72 162 107	.01 .11 .10	.03 .03 .02	.57 .63 .09	<.10 <.10	8.0
1	MINIMUM FOR ALL DATA	26.7	14.92	5.3	51	<.01	<.01	<.01	<.10	.6
i	AVERAGE FOR ALL DATA	26.9	15.38	6.2	165	.10	.18	.78	.34	16.1
• [MAXINUM FOR ALL DATA	27.4	15.62	9.3	435	.82	1.90	5,30	5.60	40.0

VELL (23a DEPTH (PT) 50

DATE	DEPTH TO WATER	WATER ELEVATION	pH	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	total Kjeldahl	SODIUM
UNITS	(FT)	(FT)	SU	uMHOS	MG/L	NG/L	MG/L	MG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	38.8 39.4 39.1	15.21 14.61 14.91	6.2 5.6 6.0	171 199 160	.01 .08 .06	.05 <.01 .02	.29 .35 .06	<.10 .12	20.0
MININUM FOR ALL DATA	38.8	14.61	5.3	51	<.01	<.01	<.01	<.10	.6
AVERAGE FOR ALL DATA	39.4	14.91	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	39.4	15.21	9.3	435	.82	1.90	5.30	5.60	40.0

RECORD OF WATER QUALITY DATA

WELL #23b DEPTH (FT) 70

DATE	DEPTH TO WATER	WATER ELEVATION	pH	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
UNITS	(FT)	(FT)	SU	uMHOS	MG/L	MG/L	MG/L	MG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	38.8 39.4 38.9	15.21 14.61 15.11	6.6 5.8 6.2	79 98 81	.02 .12 .05	.05 .05 .01	.57 .42 .09	<.10 <.10	8.0
MINIMUM POR ALL DATA	38.9	14.61	5.3	51	<.01	<.01	<.01	<.10	.6
AVERAGE FOR ALL DATA	39.0	14.97	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	39.4	15.21	9.3	435	.82	1.90	5.30	5.60	40,0

RECORD OF WATER QUALITY DATA

WELL #23c DEPTH (FT) 90

DATE	DEPTH TO WATER	WATER ELEVATION	pH	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
UNITS	(FT)	(FT)	SU	uMHOS	MG/L	MG/L	MG/L	MG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	38.8 39.4 38.9	15.21 14.61 15.11	6.3 5.9 6.1	115 128 103	.01 .08 .12	.09 .05 .01	<.01 .04 .02	<.10 .12	10.0
MINIMUM FOR ALL DATA	38.8	14.61	5.3	51	<.01	<.01	<.01	<.10	.6
AVERAGE FOR ALL DATA	39.0	14.97	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	39.4	15.21	9.3	435	.82	1.90	5.30	5.60	40.0

WELL #24a DEPTH (FT) 50

DATE	DEPTH TO WATER	WATER ELEVATION	pli	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA Nitrogen	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
UNITS	(FT)	(FT)	SU	uMHOS	MG/L	MG/L	MG/L	MG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	31.1 31.9 31.3	16.07 15.27 15.87	6.3 6.4 5.7	130 135 142	.01 .10 .13	.07 .02 .05	<.01 <.01 <.01	<.10 <.10	11.0
MINIMUM FOR ALL DATA	31.1	15.27	5.3	51	<.01	<.01	<.01	<.10	.6
AVERAGE FOR ALL DATA	31.4	15.73	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	31.9	16.07	9.3	435	.82	1.90	5.30	5.60	40.0

RECORD OF WATER QUALITY DATA

WELL #24b DEPTH (FT) 70

DATE	DEPTH TO WATER	WATER ELEVATION	pH	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
UNITS	(FT)	(FT)	SU	uMHOS	MG/L	MG/L	MG/L	MG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	31.1 31.9 31.3	16.07 15.27 15.87	6.4 6.3 6.0	190 94 95	.01 .12 .12	.08 .17 .05	.02 .03 .01	<.10 .10	10.0
MINIMUM FOR ALL DATA	31.1	15.27	5.3	51	<.01	<.01	<.01	<.10	.6
AVERAGE FOR ALL DATA	31.4	15.73	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	31.9	16.07	9.3	435	.82	1.90	5.30	5.60	40.0

RECORD OF WATER QUALITY DATA

WELL #24c DEPTH (FT) 90

DATE	DEPTH TO WATER	WATER ELEVATION	pH	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
UNITS	(FT)	(PT)	SU	uMHOS	MG/L	MG/L	MG/L	MG/L	HG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	31.1 38.3 31.3	16.07 8.87 15.87	6.2 6.4 5.8	330 378 240	.01 .02 .11	.21 <.01 .03	<.01 .01 .01	<.10 <.10	32.0
MINIMUM FOR ALL DATA	31,1	8.87	5.3	51	<.01	<.01	<.01	<.10	.6
AVERAGE FOR ALL DATA	33.56	13.60	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	38.3	16.07	9.3	435	.82	1.90	5.30	5.60	40.0

WELL #25 DEPTH (FT) 40

DATE	DEPTH TO WATER	WATER ELEVATION	pH	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	hitrate Nitrogen	TOTAL Kjeldahl	SODIUM
UNITS	(FT)	(PT)	SU	uMHOS	MG/L	MG/L	MG/L	MG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	26.1 26.8 26.0	15.76 15.06 15.86	6.7 5.6 5.9	120 113 98	.05 .14 .10	.04 <.01 <.01	1.90 1.30 .36	<.10 <.10	11.0
MINIMUM FOR ALL DATA	26.0	15.06	5.3	51	<.01	<.01	<.01	<.10	.6
AVERAGE FOR ALL DATA	26.3	15.56	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	26.8	15.86	9.3	435	.82	1.90	5.30	5.60	40.0

RECORD OF WATER QUALITY DATA

WELL #26 DEPTH (FT) 45

DATE	DEPTH TO WATER	WATER ELEVATION	рH	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL Kjeldahl	SODIUM
UNITS	(FT)	(FT)	SU	UNHOS	MG/L	MG/L	MG/L	MG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	31.1 31.7 31.2	15.90 15.30 15.80	6.9 5.9 6.1	70 68 51	<.01 .14 .06	.02 .03 <.01	.45 .31 .38	<.10 <.10	4.0
MINIMUM FOR ALL DATA	31.1	15.30	5.3	51	<.01	<.01	<.01	<.10	.6
AVERAGE FOR ALL DATA	31.3	15.66	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	31.7	15.90	9.3	435	.82	1.90	5.30	5.60	40.0

RECORD OF WATER QUALITY DATA

WELL \$27 DEPTH (PT) 46

DATE	DEPTH TO WATER	WATER ELEVATION	pH	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	total Kjeldahl	SODIUM
UNITS	(FT)	(PT)	SU	uMHOS	MG/L	MG/L	MG/L	MG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	33.7 34.2 33.9	17.27 16.77 17.07	6.3 5.7 5.7	189 235 168	.01 .08 .04	.03 <.01 .02	6.20 5.30 3.00	<.10 <.10	15.0
MINIMUM FOR ALL DATA	33.7	16.77	5.3	51	<.01	<.01	<.01	<.10	.6
AVERAGE FOR ALL DATA	33.9	17.03	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	34.2	17.27	9.3	435	.82	1.90	5.30	5.60	40.0

WELL #28 DEPTH (FT) 30

DATE	DEPTH TO WATER	WATER ELEVATION	Rq	CONDUCTIVITY	TOTAL PHOSPHORUS	AMMONIA NITROGEN	NITRATE NITROGEN	TOTAL KJELDAHL	SODIUM
UNITS	(FT)	(PT)	SU	uMHOS	MG/L	MG/L	HG/L	HG/L	MG/L
AUG. 14, 1989 OCT. 14, 1989 MAY 15, 1990	20.1 21.0 19.9	10.07 9.17 10.27	6.9 5.8 6.3	202 200 199	.01 .14 .03	.16 <.01 .03	.02 .10 .05	<.10 .11	28.0
MINIMUM POR ALL DATA	19.9	9.17	5.3	51	<.01	<.01	<.01	<.10	.6
AVERAGE POR ALL DATA	20.3	9.83	6.2	165	.10	.18	.78	.34	16.1
MAXIMUM FOR ALL DATA	21.0	10.27	9.3	435	.82	1.90	5.30	5.60	40.0

QUALITY CONTROL SAMPLES: AUGUST 1989

	VALUE FOR DISTILLED	REPLICATE	WELL VALU	JES	WELL	
PARAMETER	WATER (MG/L)	VALUE #1 (MG/L)	VALUE #2 (MG/L)	VALUE #3 (MG/L)	MEAN (MG/L)	STD.DEV
Tot. Filt. Phosphorus Ammonium Nitrogen Nitrate Nitrogen Total Kjeldahl Nitrogen Sodium	.01 .01 .01 .10	.09 .09 2.40 .10	.09 .13 2.60 .10	.06 .13 3.40 .10	.08 .12 2.80 .10	.017 .023 .529 0.000

QUALITY CONTROL SAMPLES: OCTOBER 1989

	VALUE FOR DISTILLED	REPLICATE	WELL VALU		,	
PARAMETER	WATER (MG/L)	VALUE #1 (MG/L)	VALUE #2 (MG/L)	VALUE #3 (MG/L)	MEAN (MG/L)	STD. DEV
Tot. Filt. Phosphorus Ammonium Nitrogen Nitrate Nitrogen Total Kjeldahl Nitrogen Sodium	.1 .0 .0	3 2.20	.41 .10 2.20 .10	.36 .03 2.80 .10	.31 .05 2.40 .10	.127 .047 .346 0.000

QUALITY CONTROL SAMPLES: MAY 1990

	VALUE FOR DISTILLED	REPLICATE	WELL VALU	JES		
PARAMETER	WATER (MG/L)	VALUE #1 (MG/L)	VALUE #2 (MG/L)	VALUE #3 (MG/L)	MEAN (MG/L)	STD.DEV
Tot. Filt. Phosphorus Ammonium Nitrogen Nitrate Nitrogen Total Kjeldahl Nitrogen	.0. .0.	1 .10	.05 .06 1.30	.05 .02 2.10	.05 .06 1.16	0.000 .040 1.023
Sodium		6 12.0	14.0	10.0	12.0	2.000



DATE OF THE COURTY HEALTH AND ENVIRONMENTAL DEPARTME

BARNSTABLE, MASSACHUSETTS 02630

VOLATILE ORGANIC COMPOUNDS REPORT

PH EX EA: CLI

	Mailing Address: Town (P. 0. Telephone: Eastha Sample Location: Great	am Board of Healt Office Box 385 am, MA 02642 Pond Watershed ct)Eastham, MA	hCollector: Type of Supply: Date Collected: Date Received: Analyst: Date Analyzed: LOCATION	K. Wagner/J. Moobservation well 8/14/16/89 8/16/89 Eric Butler \$8/23/89	
		C55	C35	C36	-
j	СОМРОИНО	30 ClarksPt.Rd.	30 ClarksPt.Rd.	30 ClarksPt.Rd.	-
		35 ft. GP /a(11-085€)	55 ft. GP-16 (11-085C)	6.0-1-c (11-085C)	-
					_
_	Dichlorodifluoromethan	NOTHING		NOTHING	
	Vinyl Chloride	DETECTABLE		DETECTABLE	
	Trichlorofluoromethane				-
:	Chloroform		0.6		-
	Tetrachloroethene				-
· -	Tert butyl methyl ethe	r			_
-					_
	PID normalized respons	e			_
	of unidentified compou	n I			· ·
-	RT 16.9				
					_
£					_
-			-		—
! :					
Ę.J.,		_ •			

All values are in micrograms per liter (equivalent to parts per billion, or ppb). EPA Method 502.1 was used and only those compounds listed above were detected. Attach is a list of chemicals which the method is capable of detecting. Detection limits for these compounds are stated on the attachment. Chloroform is commonly found in Cape Cogroundwater at levels ranging from 0.2 to several ppb. The drinking water limit for lotal Trihalomethanes, of which chloroform is an example, is 100 ppb.

DARIUSTABLE COURTY HEALTH AND ENVIRONMENTAL DEPARTMENT SUPERIOR COURT HOUSE

HARHSTALLE, MASSACHUSETTS 02630

VOLATILE ORGANIC COMPOUNDS REPORT

PHONE: EXT. 330 LAB 337 CLINIC 3.

latiting Address: <u>To</u>	astham Board of Healt own Office	Type of Supply:	K. Wagner/J.	Morai.
elephone: \overline{G}	. 0. Box 385 astham, MA 02642 reat Pond Watershed	Date Collected: Date Received: Analyst:.	8/14/16/89 8/16/89 Eric Butler	<u> </u>
<u>(F.</u>	roject) Eástham , MA	Date Analyzed:	8/23/89; 8/24	/89
•	C 90	LOCATION C89	C 85	C56
Сонроино	305GreatPondRd. 15 ft.	305GreatPondRd. WILEY PARK 20 ft.	360GreatPondRd.	35Spl.t RailRd.
	GP-2 (14-094)	GP-3 (14-031)	GP-4 (11-173	GP-3 (11-065)
ichlorodifluoromet	thane NOTHING	≦0.3	· ·	The state of the s
inyl Chloride	DETECTABLE	≦0.5		4 4 9 9 9 9
richlorofluorometh	nane			North Articles
hloroform		0.2		0.2
etrachloroethene			0.2	
ert butyl methyl e	ether			
				•
ID normalized resp	oonse	12	• .	
f unidentified com	npound			
T 16.9				
			-	

values are in micrograms per liter (equivalent to parts per billion, or ppb). Method 502.1 was used and only those compounds listed above were detected. Attached a list of chemicals which the method is capable of detecting. Detection limits for se compounds are stated on the attachment. Chloroform is commonly found in Cape Code undwater at levels ranging from 0.2 to several ppb. The drinking water limit for al Trihalomethanes, of which chloroform is an example, is 100 ppb.



DATE SUPERIOR COURT HOUSE

BARHSTABLE, MASSACHUSETTS 02630

VOLATHE ORGANIC COMPOUNDS REPORT

PHO: EXT. LAB CLIN

	Hailing Address: Town (P. 0. Telephone: Eastha Sample Location: Great	am Board of Healt Office Box 385 am, MA 02642 Pond Watershed ct) Eastham , MA	hCollector: Type of Supply: Date Collected: Date Received: Analyst: Date Analyzed:	K. Wagner/J. observation w 8/14/16/89 8/16/89 Eric Butler ← 9/12/89	e11:
٠.		C 5 2	LOCATION C33	C37	C 4
i .	Сонроино	320 Weir Road 30H	65 DeborahDoane Way. 30 ft.	65DeborahDoane Way 50 ft.	65D Doa 70
		GP-8 (11-257)	GP-6a (12-028)	GP-66 (2-028)	GP-6
	Dichlorodifluoromethane	2		NOTHING	ТОИ
	Vinyl Chloride		·	DETECTABLE	DET
	Trichlorofluoromethane				
:	Chloroform	4.7			
:	Tetrachloroethene				
	Tert butyl methyl ether				
	PID normalized response	e 15	1.4		
	of unidentified compoun	n I			
	RT 16.9				
				-	
:	·				
. 1					_

All values are in micrograms per liter (equivalent to parts per billion, or ppb).

TPA Method 502.1 was used and only those compounds listed above were detected. Attache s a list of chemicals which the method is capable of detecting. Detection limits for these compounds are stated on the attachment. Chloroform is commonly found in Cape Cod roundwater at levels ranging from 0.2 to several ppb. The drinking water limit for otal Trihalomethanes, of which chloroform is an example, is 100 ppb.



Telephone: 1

Sample Location:

BARTISTABLE COUNTY HEALTH AND ENVIRONMENTAL DEPARTM

BARNSTABLE, MASSACHUSETTS 02630

VOLATILE ORGANIC COMPOUNDS REPORT

Client: Eastham Board of HealthCollector: Hailing Address: Town Office. Type of Su

P. O. Box 385 Pate Co Eastham, MA 02642 Pate Re

Great Pond Watershed (Project) Eastham, MA

Type of Supply: Date Collected: Date Received:

Analyst: Date Analyzed: K. Wagner/J. 1, observation well 8/14/16/89

8/16/89 Eric Butler co

LOCATION C44 C23 C20 25 Great Pond Place 25 Great Pond Place 25 Great Pond COMPOUND Place 25 ft. 45 ft. 63 ft. (11-202)GP-76-(11-20Z) GP-7-C (11-202 Dichlorodifluoromethane NOTHING Vinyl Chloride DETECTABLE Trichlorofluoromethane Chloroform 0.2 Tetrachloroethene Tert butyl methyl ether PID normalized response 4.6 of unidentified compound RT 16.9

All values are in micrograms per liter (equivalent to parts per billion, or ppb). EPA Method 502.1 was used and only those compounds listed above were detected. Attack is a list of chemicals which the method is capable of detecting. Detection limits for these compounds are stated on the attachment. Chloroform is commonly found in Cape conductor at levels ranging from 0.2 to several ppb. The drinking water limit for Total Trihalomethanes, of which chloroform is an example, is 100 ppb.



BAHRSTABLE COUNTY HEALTH AND ENVIRONMENTAL DEPARTME. SUPERIOR COURT HOUSE

HARNSTAULE, MASSACHUSETTS 02630

VOLATILE ORGANIC COMPONIOS REPORT

PHO EXT. LAB CLII:

Hailing Address: Town 0 P. 0. Telephone: Eastha Sample Location: Great	n Board of Healt ffice Box 385 m, MA 02642 Pond Watershed t) Eastham, MA	Collector: Type of Supply: Date Collected: Date Received: Analyst: Date Analyzed:	K. Wagner/J. Mo observation well 8/14/16/89 8/16/89 Eric Butler & 9/11/89
	C67	LOCATION B910	B997
COMPOUND	230 Kingsbury Beach Road	55 Grove Road	55 Wood Song Drive
	GP-9 (11-090)	GP-10 (11-060)	GP-11 (11-438)
Dichlorodifluoromethane		•	
Vinyl Chloride			
Trichlorofluoromethane			
Chloroform	0.9	0.5	0.3
Tetrachloroethene			
Tert butyl methyl ether	•		
PID normalized respons	е		
of unidentified compou	nd		
RT 16.9			
			billion, or ppb).

All values are in micrograms per liter (equivalent to parts per billion, or ppb). EPA Method 502.1 was used and only those compounds listed above were detected. Attacing a list of chemicals which the method is capable of detecting. Detection limits for these compounds are stated on the attachment. Chloroform is commonly found in Cape C groundwater at levels ranging from 0.2 to several ppb. The drinking water limit for Total Trihalomethanes, of which chloroform is an example; is 100 ppb.



Client.

HARRISTABLE COURTY HEALTH AND ENVIRONMENTAL DEPARTME

BARHSTABLE, MASSACHUSETTS 02630

VOLATILE ORGANIC COMPOUNDS REPORT

PH EX i, 3 LAB 1

Sample Location:	Town O P. O. Eastha Great	Box 385 m, MA 02642 Pond Watershed	Type of Supply: Date Collected: Date Received: Analyst:	K. Wagner/J. observation wo 8/14/16/89 8/16/89 Eric Butler	Mc. ells
(rrojec	t)-Eastham , MA	Date Analyzed:	.8/24/89	
		C30	LOCATION C19	C18	. !
COMPOUND			Kingswood Drive	Kingswood Drive	
		45 ft. GP-12a (11-355)	65 ft. GP-126(11-355)	85 ft. GP-12/C(11-355)	
Dichlorodifluorom	ethane		· .		
Vinyl Chloride		·	·		
Trichlorofluorome	thane				
Chloroform	-	1.6	0.6	0.8	- To man at the
Tetrachloroethene					-
Tert butyl methyl	ether				
		• • •			<u> </u>
PID normalized re	sponse				 .
of unidentified co	ompoun	4			
RT 16.9			- 		<u> </u>
				-	<u></u>
•					:

All values are in micrograms per liter (equivalent to parts per billion, or ppb). EPA Method 502.1 was used and only those compounds listed above were detected. Attachis a list of chemicals which the method is capable of detecting. Detection limits for these compounds are stated on the attachment. Chloroform is commonly found in Cape Cod groundwater at levels ranging from 0.2 to several ppb. The drinking water limit for lotal Trihalomethanes, of which chloroform is an example, is 100 ppb.



BARRISTABLE COUNTY HEALTH AND ENVIRONMENTAL DEPARTMENT

SUPERIOR COURT HOUSE BARNSTABLE, MASSACHUSETTS 02630

VOLATILE ORGANIC COMPOUNDS REPORT

PHONE: EXT, 331 LAB 331

167

l liam's	e'					<u>.</u>		CLINIC :
lient: Mailing Address:	Lastha	am Board	of Healt	hCollec	tor:	K. Wa	gner/J	. Mora
- varing variezz:	Town C	office Box 385	· · · · · · · · · · · · · · · · · · ·	Type o	f Supply:	observ	ation	wells
elephone:		m, MA			ollected:	8/14/1		• .
Sample Location:					eceived:	8/16/8		
	Droice	Pond Wa	tershed	Analys	t:	_Eric B	_	नु
<u>'</u>	(<u>rrojec</u>	t) East	ham , MA	Date Ar	nalyzed:	9/07/8	9; 9/11	/89
			-		OCATION			:
	· · · · · · · · · · · · · · · · · · ·	C34		C 2	4	C58		C47
COMBOUND		Herrin	g Brook	Gift	Barn	Atlantic	Naks	1 At1.(
COMPOUND		МсК ф у	Road	Route		Camp G		Camp
		1		4180 5	tate Hwy		ft.	62 ft
	•	GP-21	(10-090)	GP-ZZ	(08-137)		11-001)	GP-13
								11-001
ichlorodifluorom	ie thane	· .				МОТН	ING	13270
Vinyl Chloride						DETEC	TABLE	-
richlorofluorome	thano			· · · · · · · · · · · · · · · · · · ·	 -			
	. chane	·				<u>.</u>		
ıloroform		0	. 8					2.0
			 	ļ				2.0
Tert butyl methyl	ether		· · · · · · · · · · · · · · · · · · ·	1	. 9		<u> </u>	-
	<u>.</u>	Ī			. J			
			••					,
r D normalized re	sponse					,		
of unidentified c	Ompour		<u> </u>		·		 	-\ <u>-</u>
16.9							•	
								
	·					-		
·					-			1
		} —		ļ ———	 .			-
	-							
					 			-
	 .	l		l				<u> </u>
Il values are in mic	rograms	per lite	er (equival	ent to p	arts per b	oillion, or	· ppb).	
Method 502.1 was	used an	donly th	iose compou	ınds list	ed above w	ere detect	ed. At	tached

list of chemicals which the method is capable of detecting. Detection limits for nese compounds are stated on the attachment. Chloroform is commonly found in Cape Code indwater at levels ranging from 0.2 to several ppb. The drinking water limit for

il Trihalomethanes, of which chloroform is an example, is 100 ppb.



DATE SUPERIOR COURT HEALTH AND ENVIRONMENTAL DEPARTMEN SUPERIOR COURT HOUSE

HARHSTABLE, MASSACHUSETTS 02630

VOLATILE ORGANIC COMPOUNDS REPORT

PHO EXT. J.

Hailing Address: Town 0 P. 0. Telephone: Eastha Sample Location: Great	m Board of Healt ffice Box 385 m, MA 02642 Pond Watershed t)Eastham, MA	hCollector: Type of Supply: Date Collected: Date Received: Analyst: Date Analyzed:	K. Wagner/Jobservation (8/14/16/89) 8/16/89 Eric Butler 9/11/89	Mo wells
	C60	C91	B915	B91
COMPOUND	Town Crier Mote 3620 State Hwy	25 ft.	3976 State Hwy -55 ft.	Rt∈. 75
	GP-13c(11-002)	GP-20a (08-170)	GP-206 (08-170)	GP-i
Dichlorodifluoromethane			NOTHING	NOTI
Vinyl Chloride			DETECTABLE	DETF
Trichlorofluoromethane				-
Chloroform	1.2	0.2	·	
Tetrachloroethene				
Tert butyl methyl ether				
PID normalized response				
of unidentified compour	n I			
RT 16.9				
		·		

Il values are in micrograms per liter (equivalent to parts per billion, or ppb). EPA Method 502.1 was used and only those compounds listed above were detected. Attached is a list of chemicals which the method is capable of detecting. Detection limits for these compounds are stated on the attachment. Chloroform is commonly found in Cape Coaproundwater at levels ranging from 0.2 to several ppb. The drinking water limit for lotal Trihalomethanes, of which chloroform is an example, is 100 ppb.



BAHIISTABLE COUNTY HEALTH AND ENVIRONMENTAL DEPARTI

BARNSTABLE, MASSACHUSETTS 02630

VOLATILE ORGANIC COMPONIOS REPORT

Client: Eastham Board of HealthCollector: K. Wagner/J. Mailing Address: Town Office observation we Type of Supply: P. O. Box 385 Date Collected: 87.14716789 Eastham, MA 02642 Telephone: Date Received: 8/16/89 Sample Location: Great Pond Watershed Analyst: Eric Butler (Project) Eastham, MA 9/12/89 Date Analyzed: LOCATION B212 C44 C59 Nauset Haven Nauset Haven Nauset Haven COMPOUND Cottages Cottages Cottages 45 ft. 65 ft. 83 ft. GP-14 6 (11-049) GP-14a (11-049) Dichlorodifluoromethane NOTHING NOTHING Vinyl Chloride DETECTABLE DETECTABLE Trichlorofluoromethane 0.4 Chloroform 1.0 Tetrachloroethene Tert butyl methyl ether PID normalized response of unidentified compound RT 16.9

All values are in micrograms per liter (equivalent to parts per billion, or ppb). EPA Method 502.1 was used and only those compounds listed above were detected. Atta is a list of chemicals which the method is capable of detecting. Detection limits for these compounds are stated on the attachment. Chloroform is commonly found in Cape of groundwater at levels ranging from 0.2 to several ppb. The drinking water limit for Total Trihalomethanes, of which chloroform is an example, is 100 ppb.



DAHUSTABLE COUNTY HEALTH AND ENVIRONMENTAL DEPARTMEN

SUPERIOR COURT HOUSE
BARRISTABLE, MASSACHUSETTS 02630

VOLATILE ORGANIC COMPOUNDS REPORT

PHO EXT, : LAB 33 CLINI

Client: Mailing Address:

Telephone: Sample Location: Eastham Board of HealthCollector:

Town Office Type of Su

P. O. Box 385 Eastham, MA 02642

Great Pond Watershed (Project) Eastham, MA

Type of Supply: Date Collected: Date Received:

Analyst:

Date Analyzed:

K. Wagner/J. Molobservation wells
8/14/16/89
8/16/89
Eric Butler \$\mathcal{G}\$
9/12/89

		LOCATION		-
	C83	C51	C53	C?
Соньопио	Town Landfill 165 Old Orchard 1254	320 Old Orchard Road, Martin 55ft	Town Landfill 555 Old Orchard Rd. 7.9 ft.	Town Landi 15
	GP-15 (11-012) (HJ-2)	GP-16 (08-110G)	GP-17 (08-089) (HJ-1)	GP. (HJ-3)
Dichlorodifluoromethane		≦0.3	NOTHING	NOT
Vinyl Chloride		≤0.6	DETECTABLE	DET
Trichlorofluoromethane		·		
Chloroform	0.2	3.3		
Tetrachloroethene				
Tert butyl methyl ether				
	*			
PID normalized response	1.3		•	111
of unidentified compoun	i .			
RT 16.9				:.
				:

All values are in micrograms per liter (equivalent to parts per billion, or ppb). EPA Method 502.1 was used and only those compounds listed above were detected. Attached is a list of chemicals which the method is capable of detecting. Detection limits for these compounds are stated on the attachment. Chloroform is commonly found in Cape Cou groundwater at levels ranging from 0.2 to several ppb. The drinking water limit for lotal Trihalomethanes, of which chloroform is an example, is 100 ppb.



BARNSTABLE COUNTY HEALTH AND ENVIRONMENTAL DEPARTMENT

BARNSTAULE, MASSACHUSETTS 02630

VOLATILE ORGANIC COMPOUNDS REPORT

PHONE: EXT. 330 LAB 337

elephone: Fastr sample Location: Great	nam Board of Healt Office Box 385 nam, MA 02642 Pond Watershed ct) Eastham , MA	thCollector: Type of Supply: Date Collected: Date Received: Analyst: Date Analyzed:	K. Wagner/J. observation we 8/14/16/89 8/16/89 Eric Butler 8/24/89	Morai ells
	B228	LOCATION B973	B227	•
COMPOUND	Eastham Ready 45 ft.	Mix,Holmes Rd.	Mix, Holmes Rd. 80 ft.	
e de la companya del companya de la companya del companya de la co	GP-194 (08-172)	GP-196-(D8-172)	GP-19C (08-172)	
ichlorodifluoromethan	е	NOTHING	NOTHING	
Vinyl Chloride		DETECTABLE	DETECTABLE	
richlorofluoromethane				
ıloroform	0.3			· · · · · ·
trachloroethene				·
Tert butyl methyl ethe	r			
F-D normalized respons	e			
of unidentified compou	nl			
16.9				
			-	
	_			· · · · · · · · · · · · · · · · · · ·
ll values are in microgram ? Method 502.1 was used a	is per liter (equiva and only those compo	lent to parts per unds listed above	billion, or ppb). were detected. Att	ached

list of chemicals which the method is capable of detecting. Detection limits for nese compounds are stated on the attachment. Chloroform is commonly found in Cape Cod rundwater at levels ranging from 0.2 to several ppb. The drinking water limit for

il Trihalomethanes, of which chloroform is an example, is 100 ppb.



Client:

BARTHE COURTY HEALTH AND ENVIRONMENTAL DEPARTMENT SUPERIOR COURT HOUSE

DARHSTADLE, MASSACHUSETTS 02630

VOLATTIE ORGANIC COMPOUNDS REPORT

Eastham Board of HealthCollector:

EXT.
LAB 33

K. Wagner/J. Mor

Mailing Address: Telephone: Sample Location:	P. O. Box 385 elephone: Eastham, MA O		Date Co Date Ro Analys	Type of Supply: Date Collected: Date Received: Analyst: Date Analyzed:		ition wel 5/89 Julier <i>ÇB</i>	
		8909		.OCATION 912	B199	9	
COMPOUND	1	0 01d Orchard Road 50 ft.		d Orchard Road	I	rchard Road	and the state of t
	GP.	50 ft. 23a (08- 064)	GP-236	(08-064)	GP-23 C	(08-064)	1 mm mm mm mm mm mm mm mm mm mm mm mm mm
Dichlorodifluoro	methane	. '			нтои	ING	:
Vinyl Chloride				-	DETECT	ABLE	
Trichlorofluorom	ethane		-				
Chloroform		5.9		0.9			,
Tetrachloroethen	ie						·
Tert butyl methy	l ether						
PID normalized r	response				•		
of unidentified	compound					·	
RT 16.9						•	*
					_	·	
	·			· · · · · · · · · · · · · · · · · · ·			
				-			
							-

All values are in micrograms per liter (equivalent to parts per billion, or ppb). EPA Method 502.1 was used and only those compounds listed above were detected. Attached is a list of chemicals which the method is capable of detecting. Detection limits for these compounds are stated on the attachment. Chloroform is commonly found in Cape Country groundwater at levels ranging from 0.2 to several ppb. The drinking water limit for Total Trihalomethanes, of which chloroform is an example, is 100 ppb.



DANITSTABLE COUNTY HEALTH AND ENVIRONMENTAL DEPARTS

HARRISTABLE, MASSACHUSETTS 02630

VOLATILE ORGANIC COMPOUNDS REPORT

Client: Eastham Board of HealthCollector: K. Wagner/J. Mailing Address: Town Office observation we Type of Supply: P. O. Box 385 Date Collected: 8714/16/89 Eastham, MA 02642 Telephone: 1 Date Received: 8/16/89 Sample Location: Great Pond Watershed Analyst: Eric Butler Co (Project) Eastham, MA 8/24/89 Date Analyzed: LOCATION C6C80 C64 25 DanielleDr. 25 Danielle Dr. COMPOUND 25 Danielle Dr 50 ft. 70 ft. 90 ft. (08-030) CP-246 (08-030 GP-24× (08-030) Dichlorodifluoromethane NOTHING Vinyl Chloride DETECTABLE. Trichlorofluoromethane Chloroform 0.8 4.8 Tetrachloroethene Tert butyl methyl ether PID normalized response of unidentified compound RT 16.9

All values are in micrograms per liter (equivalent to parts per billion, or ppb). EPA Method 502.1 was used and only those compounds listed above were detected. Attacks a list of chemicals which the method is capable of detecting. Detection limits for these compounds are stated on the attachment. Chloroform is commonly found in Cape (groundwater at levels ranging from 0.2 to several ppb. The drinking water limit for Total Trihalomethanes, of which chloroform is an example, is 100 ppb.



BARNSTABLE COUNTY HEALTH AND ENVIRONMENTAL DEPARTMENT

BARRISTABLE, MASSACHUSETTS 02630

VOLATILE ORGANIC COMPOUNDS REPORT

PHONE: EXT. 336 LAB 337 CLINIC 3

			<u>-</u>	CLINIC 34"	
lailing Address: Town P. 0 East ample Location: Grea	ham Board of Healt Office Box 385 ham, MA. 02642 t Pond Watershed ect) Eastham., MA	thCollector: Type of Supply: Date Collected: Date Received: Analyst: Date Analyzed:	K. Wagner/J. observation w 8/14/16/89 8/16/89 Eric Butler 9/07/89	Mora	
	C66	1.0CAT10H C68	C 6 5	C84	
Сонроино	540 Massasoit Ro	.15 Bishop Rd.	Capt.Quarter Motel,_Route 6	Wiley Park, Beehi	
	SP-25 (08-154)	GP-26 (08-001)	GP-27 (05-12UA)	GP-28R (11-223)	
ichlorodifluorometha	ne NOTHING				
inyl Chloride	DETECTABLE				
richlorofluoromethan	е				
hloroform		0.2	1.5	3.3	
etrachloroethene					
ert butyl methyl eth	er				
'ID normalized respor	s e			-	
of unidentified compo	un!				
RT 16.9					
·				_	

I values are in micrograms per liter (equivalent to parts per billion, or ppb).

I Method 502.1 was used and only those compounds listed above were detected. Attached a list of chemicals which the method is capable of detecting. Detection limits for use compounds are stated on the attachment. Chloroform is commonly found in Cape Cod bundwater at levels ranging from 0.2 to several ppb. The drinking water limit for tal Trihalomethanes, of which chloroform is an example, is 100 ppb.



BARNSTABLE COUNTY HEALTH AND ENVIRONMENT SUPERIOR COURT HOUSE

BARNSTABLE, MASSACHUSETTS 02630

OCT 3 0 1989

PHONE: 362-2 EXT. 330 TAB 337

VOLATILE ORGANIC COMPOUNDS REPORT

CLINIC 340

Client: Mailing Address:	Eastham Board of Health P. O. Box 385	Collector: Type of Supply:	Joseph Moran observation wells
	Eastham, MA 02642	Date Collected:	10/4/89
Telephone:	255-0333	Date Received:	10/5/89
Sample Location:	Great Pond Group Landfill	Analyst:	Eric Butler
	Area, Eastham, MA	Date Analyzed:	10/16/89

	GP	WELL **	13a (44		(70 / 13c)		16(55)) 17 (7.9))
	СОМРОИПО	LOCATION VIAL #	L-40	3700 StateHigh C88	U28	165 Old Orchard Road Cl6	Martin B959	555 01d Orchard Road	
-			(11-001)	(11-001)	(11-002)				
	Chloroform		ND · :	1.7	0.7	0.4	4.0	ND	
	Chlorobenzene	<u></u>	ND	ND	ND	0.2	ND	ND .	
-	Dichlorodifluoro	methane	ND]	ND	ND .	ND	0.3	ND	
:	Dichloromethane	<u> </u>	ND	ND	0.4	ND	ND	ND	-
					· <u>.</u>				
:									
			-						
						·			
		•							
								-	
	cc Joseph Mora	1 .							
• !	cc Eastham Boa	rd of Heal	th						

11 values are in micrograms per liter (equivalent to parts per billion, or ppb). A Method 502.1 was used and only those compounds listed above were detected. Attached s a list of chemicals which the method is capable of detecting. Detection limits for hese compounds are stated on the attachment. Chloroform is commonly found in Cape Cod groundwater at levels ranging from 0.2 to several ppb. The drinking water limit for Total Trihalomethanes, of which chloroform is an example, is 100 ppb.

175



BARNSTABLE COUNTY HEALTH AND ENVIRONMENTAL DEPARTMENT

SUPERIOR COURT HOUSE
BARNSTABLE, MASSACHUSETTS 02630

VOLATILE ORGANIC COMPOUNDS REPORT

PHONE: 36 EXT. 330 LAB 337 CLINIC 340

Client: Mailing Address: Telephone: Sample Location:	Eastham Board ofHealt P. O. Box 385 Eastham, MA 02642 255-0333 Old Orchard Eastham, MA (Martin) E637	hCollector: Type of Supply: Date Collected: Date Received: Analyst: Date Analyzed: LOCATION	J.Moran/E.Butler monitoring well 10/27/89 10/27/89 E. Butler		
COMPOUND	01d Orchard Eastham, MA (Martin) 55				
Chloroform	GP-16 (08-1106)				
Dichlorodifluor					
*					
<u> </u>	ly the previous analyse ler works fine.	es were correct i	ndicating that the		
			· · · · · · · · · · · · · · · · · · ·		
		F	ECEIVED		
			NOV 6-1989		
cc Joseph Mora					

All values are in micrograms per liter (equivalent to parts per billion, or ppb). A Method 502.1 was used and only those compounds listed above were detected. Attached is a list of chemicals which the method is capable of detecting. Detection limits for these compounds are stated on the attachment. Chloroform is commonly found in Cape Cod groundwater at levels ranging from 0.2 to several ppb. The drinking water limit for Total Trihalomethanes, of which chloroform is an example, is 100 ppb.



TABLE 1.

SUPERIOR COURT HOUSE BARNSTABLE, MASSACHUSETTS 02630

Compounds Detectable by EPA Method 502.1*

PHONE: 362-2511 EXT. 330 LAB 337

	•		LAB 337	
COMPOUND	D.L.	<u>COMPOUND</u> -	D.L. CLINIC 3	140
Benzene	0.5	1,1-Dichloroethane	0.5	
Carbontetrachloride	0.5	1,1-Dichloropropene	0.5	
1,1-Dichloroethylene	0.5	1,3-Dichloropropene	0.5	
1,2-Dichloroethane	0.5	1,2-Dichloropropane	0.5	
para Dichlorobenzene	0.5	1,3-Dichloropropane	0.5	
Trichloroethylene	0.5	2,2-Dichloropropane	0.5	
1,1,1-Trichloroethane	0.5	Ethylbenzene	0.5	
Vinyl Chloride	0.5	Styrene	0.5	
Bromobenzene	0.5	1,1,2-Trichloroethane	0.5	
Bromodichloromethane	0.5	1,1,1,2-Tetrachloroethane	0.5	
Bromoform	0.5	1,1,2,2-Tetrachloroethane	0.5	
Bromomethane	0.5	Tetrachloroethylene	0.5	
Chlorobenzene	0.5	1,2,3-Trichloropropane	0.5	
Chlorodibromomethane	0.5	Toluene	0.5	
Chloroethane	0.5	para Xylene	0.5	
Chloroform	0.5	ortho Xylene	0.5	
Chloromethane	0.5	meta Xylene	0.5	
ortho Chlorotoluene	0.5	Bromochloromethane	0.5	
para Chlorotoluene	0.5	Dichlorodifluoromethane	0.5	
Dibromomethane	0.5	Fluorotrichloromethane	0.5	
meta Dichlorobenzene	0.5	Hexachlorobutadiene	0.5	
ortho Dichlorobenzene	0.5	Isopropylbenzene	0.5	
trans-1,2 Dichloroethylene	0.5	n-Propylbenzene	0.5	
	0.5	Sec-butylbenzene	0.5	
cis-1,2 Dichloroethylene	0.5	Tert-butylbenzene	0.5	
Dichloromethane	0.0	ter e bucy i believing		

D.L. is Detection Limit in micrograms per liter or parts per billion (ppb). This table lists our normal limits of detection. If we report a smaller amount, then our detection limit was lower for that analysis.

*A photoionization detector is used in series with the electroconductivity detector, thus allowing for the analysis of most of the compounds listed in EPA Method 503.1 as well.

TABLE 2. Compounds which have Maximum Contaminant Levels (MCLs) set by the Environmental Protection Agency.

COMPOUND	MCL (in ppb)
Benzene	5.0
Carbontetrachloride	5.0
1,2-Dichloroethane	5.0
1.1-Dichloroethylene	7.0
para Dichlorobenzene	75
1,1,1-Trichloroethane	200
Trichloroethylene	5.0
Vinyl Chloride	2.0
Total Trihalomethanes	100

Chloroform, Bromodichloromethane, Chlorodibromomethane, and Bromoform comprise the total trihalomethanes.

TABLE 1

LOCATIONS, ELEVATIONS AND DEPTHS OF INSTALLED WELLS WELL DEPTH VOC VIAL VOC VIAL MAP/ WELL # LOCATION (ft.) NUMBER PARCEL # NUMBER WELL 30 Clark's Point Rd. 14-085 C l a 35 la Ъ 55 _b__ 75 c c 2 305 Great Pond Rd. 15 14-094 2 (EGW-37) Entrance to Wiley Park 20 14-031 3 (360 Great Pond Rd. 40 11-173 4 25 5 35 Split Rail Rd. 5 11-065 65 Deborah Doane Way 30 6 a 12-028 6а 50 Ъ __b 70 С c 7 a 25 25 Great Pond Place 11-202 7 a 45 Ъ Ъ 63 c Ċ 8 320 Weir Rd. 30 11-257 43 347- Kingsbury Beach Rd. G. a. 9 230 11-090 9 37 1.0 55 Grove Rd. 10-060 1.0 45 55 Wood Song Drive 11-438 11 11 45 12a Kingswood Rd. Dr 11-355 12a 65 b Ь 85 C Atlantic Oaks Camp Ground 3700 State Hwy 4.4 13a 11-001 13a 62 Ъ 11-00 1 Ъ 70 11- CCZ Town Crier Motel 3620 Stote Huy c C R2-3280 (Rt. 6) state Hwy Nausot Haven Cottages 45 14a 11-049 14a 65 Ъ 4.2 Ъ 83 С Town Landfill 16501d Orchaix Rd 12.3 15 (HJ-2)11-012 15 320 Old Orchard Rd. Martin 08 55 16 C8-110G 16 Town Landfill 555 of Orchord Pd 17 (HJ-1)08-089 17 15 18 (HJ-3) Town Landfill 08-089 18 45 08-172 19a 19a Eastham Ready Mix, Holmes Rd 60 Ъ 175 Ъ 80 c 25 Eastham, Common, Rt.6 3970 Stote Hwy 08-170 20a 20a 55 .. b Ъ 75 c 4 U Herring Brook & McKoy Rd (1456) Gift Land, Rt.6 4180 Stole Hwy 21 10-090 21 40 22 08-137 22 50 23a 720 Old Orchard Rd. 08-064 23a 70 Ъ Ъ 90 17 c 50 24a 08-030 24a 25 Danielle Drive 70 b D. 90 40 2.5 08-154 25 540 Massasoit Rd. 45 08-00 26 26 15 Bishop Rd. 46 05-120A 27 27 Captains Quarter Motel, Rt.6 30 11-223 28 28 Wiley Park, Beehive Rd.

Wells designated with a, b or c are part of wells within a cluster are at the same elements.

WELL WATER ELEVATIONS ON MAY 9, 1989

		WELL DEPTH	ELEV. AT	DEPTH OF	WATER ELEV.
WELL #	LOCATION	(FT)	TOP OF CASING		(FT ABOVE MSL)
la	30 Clark's Point Rd.	35	23.76	14.9	8.86
b 🕟		55 35	23.76	15.1	8.66
c		75	23.75	15.1	8.65 9.23
2	305 Great Pond Rd.	15	13.13	3.9	9.23
3 (EGW-37)	Entrance to Wiley Park	20	26.86	17.8	
4	360 Great Pond Rd.	40	34.45	24.4 9.7	10.05 11.93
5	35 Split Rail Rd.	25	21.63 25.86	15.9	9.96
6 <u>a</u>	65 Deborah Doane Way	30 50	25.86	16.3	9.56
b	•	70	25.86	16.8	9.06
C .	OF Court Donal Diams	70 25	23.86	14.1	9.76
7a	25 Great Pond Place	25 45	23.86	12.8	11.06
b		63	23.86	12.8	11.06
C	200 Main Dd	30	28.78	16.9	11.88
8	320 Weir Rd.	43	45.53	31.8	13.73
9	347 Kingsbury Beach Rd. 55 Grove Rd.	37	35.59	19.4	16.19
10	55 Wood Song Drive	45	42.93	29.7	13.23
11	Kingswood Rd.	45 45	45.18	31.2	13.98
12a b	Kingswood ka:	65	45.18	31.2	13.98
		-85	45.18	31.6	13.58
с 13a	Atlantic Oaks Camp Ground	44	46.55	32.6	13.95
b	actancie daks camp dround	62	46.55	32.5	14.05
Ç	Town Crier Motel	70	46.50	35.0	11.50
14a	R2-3280 Rt.6	45	44.12	31.9	12.22
b	KZ 0200 KC:0	65	44.12	32.5	11.62
C		83	44.12	33.6	10.52
15 (HJ-2)	Town Landfill	12.3	16.75	5.6	11.15
16 (110 27	320 Old Orchard Rd.	55	54.76	46.1	8.66
17 (HJ-1)	Town Landfill	7.9	19.38	6,3	13.08
18 (HJ-3)	Town Landfill	15	27.58	13.6	13.98
19a	Eastham Ready Mix, Holmes Rd.	45	37.95	23.4	14.55
b		60	37.95	23.4	14.55
c		80	37.95	23.6	14.35
20a	Eastham Common, Rt.6	35	37.83	23.3	14.53
b		55	37.83	23.3	14.53
c *		75	37.83	23.3	14.53
21	Herring Brook & McKoy Rd.	40	38.10	25.7	12.40
22	Gift Land, Rt.6	40	42.32	27.4	14.92
23a	720 Old Orchard Rd.	50	54.01	39.7	14.31
b		70	54.01	3 9 .7	14.31
C		90	54.01	39.7	14.31
24a	25 Danielle Drive	50	47.17	32.2	14.97
þ		70	47.17	32.2	14.97
С	•	90	47.17	32.2	14.97
25	540 Massasolt Rd.	40	41.86	26.9	14.96
26	15 Bishop Rd.	45	47.00	32.1	14.90
27	Captains Quarter Motel, Rt.6	.46	50.97	35.0	15.97
28	Wiley Park, Beehive Rd.	` 30	30.17	19.5	10.67

WELL WATER ELEVATIONS ON AUGUST 14-16, 1989

•	LOCATION 30 Clark's Point Rd. 305 Great Pond Rd. Entrance to Wiley Park 360 Great Pond Rd. 35 Split Rail Rd. 65 Deborah Doane Way 25 Great Pond Place 320 Weir Rd. 347 Kingsbury Beach Rd. 55 Grove Rd. 55 Wood Song Drive Kingswood Rd. Atlantic Oaks Camo Ground Town Crier Motel R2-32BO Rt.6 Town Landfill 320 Old Orchard Rd. Town Landfill Town Landfill Eastham Ready Mix, Holmes Rd. Eastham Common. Rt.6 Herring Brook & McKoy Rd. Gift Land, Rt.6 720 Old Orchard Rd. 25 Danielle Drive 540 Massasoit Rd. 15 Bishop Rd. Captains Quarter Motel, Rt.6 Wiley Park, Beehive Rd.	WELL DEPTH	ELEV, AT	DEPTH OF	WATER ELEV.
WELL #	LOCATION	(FT)	TOP_OF_CASING	WATER (FT)	(FT ABOVE MSL)
ia h	30 Clark's Point Ro.	ಚರಿ ಇವ	23.76 22.71	15.4	8.36
Ç		75	23.75	15.7	8.06 9.05
2	305 Great Pond Rd.	i5	13.13	4.6.	8.53
3 (EG₩-37)	Entrance to Wiley Park	20	25.96	18.5	8.36
4	360 Great Pond Rd.	40	34.45	24.9	9.55
Aa	AS Dehorah Deans Way	30 20	Z1.63 95 07	10.5	11.13
b	oo bebor air beare way	50	25.86 25.86	17.0	0.00 AA 8
_c		7ō	25.86	17.ŏ	8.84
∕a	25 Great Pond Place	25	23.86	14.7	7.16
n G		45 / 2	23.86	12.9	10.96
8	370 Weir Rd.	90 30	43.88 29.79	12.9	10.76
9	347 Kingsbury Beach Rd.	43	45.53	31.8 -	11.00
10	55 Grove Rd.	37	35.59	24.8	10.79
11	55 Wood Song Drive	45	42.93	29.8	13.13
12a h	Kingswood Ka.	40 45	45.18	30.8	14.38
		85 85	43.18 45 18	30.8 31 A	14.38
13a	Atlantic Oaks Camo Ground	44	46.55	31.8	14.75
р	A	62	46.55	31.9	14.65
C	lown Urier Motel	70	46.50	35.0	11.50
h h	RZ-SZOV RC.6	40 45	44.1Z AA 17	32.1	12.02
Č	•	83	44.17	33.4	10.52
15 (HJ-2)	Town Landfill	12.3	16.75	5.2	11.55
16	320 Old Orchard Rd.	_55	54.74	45.3	9.46
17 (HJ=1)	OWN LANDII!! Town andfill	/.Y	19.38	.5. <u>6</u>	13.78
19 (10 07 19a	Fastham Ready Mix. Holmes Rd.	1.J 45	27.08 27.95	12.7	14.88 (도 1도
b		άŏ	37.95	22.8 22.8	15.15
c		80	37 . 95	22,8	15.15
20a	Eastham Common, Rt.6	35	37.83	22.6;	15.23
υ Γ		00 75	კ/.გკ ეე იე	22.6 22.4	15.23
21	Herring Brook & McKoy Rd.	40	38.10	22.0 25.A	13.23 12.50
22	Gift Land, Rt.6	40	42.32	24.7	15.62
ZJą	/20 UId Urchard Rd.	50	54.01	38.8	15.21
и г.		/V	54.01 54.01	38.8 30.0	15.21
24a	25 Danielle Drive	70 50	34.01 47.17	აი.გ შე ე	10.21 16.07
b-	·	ŽŎ	47.17	ăi.î	16.07
C	Pao Maria de Est	90	47.17	31.1	16.07
20 26	04V Massasolt Kd. 15 Richar Dd	40 45	41.86	26.1	15.76
27	Cantains Quarter Motel. Rt A	64 70	47.00 50.97	31.1 22.7	15.70 17.27
28	Wiley Park, Beehive Rd.	30	30.17	20.1	10.07
	•				

WELL WATER ELEVATIONS ON OCTOBER 2-5, 1989

·la	LOCATION 30 Clark's Point Rd.	WELL DEPTH (FT) 35	ELEV. AT TOP OF CASING 23.76	DEPTH OF WATER (FT) 15.8	WATER ELEV. (FT ABOVE MSL) 7.96
6 2 3 (EGW-37) 4 5 6a	305 Great Pond Rd. Entrance to Wiley Park 360 Great Pond Rd. 35 Split Rail Rd. 65 Deborah Doane Way	35 75 15 20 40 25 30	23.75 23.75 13.13 26.86 34.45 21.63 25.86	16.1 15.8 4.8 19.1 25.3 11.6 18.0	7.66 7.95 8.33 7.76 9.15 10.03 7.86
5 7a 5 6 8 9	LOCATION 30 Clark's Point Rd. 305 Great Pond Rd. Entrance to Wiley Park 360 Great Pond Rd. 35 Split Rail Rd. 65 Deborah Doane Way 25 Great Pond Place 320 Weir Rd. 347 Kingsbury Beach Rd. 55 Grove Rd. 55 Wood Song Drive Kingswood Rd. Atlantic Oaks Camp Ground Town Crier Motel R2-3280 Rt.6 Town Landfill 320 Old Orchard Rd. Town Landfill Town Landfill Eastham Ready Mix, Holmes Rd. Eastham Common, Rt.6	50 70 25 45 63 30 43	ELEV. AT TOP OF CASING 23.76 23.76 23.76 23.76 23.75 13.13 26.86 25.86 25.86 25.86 25.86 25.86 25.87 45.57 45.18 45.55 44.12 44.75 45.76 27.58 27.88 2	17.5 17.7 15.1 13.5 13.5 18.0 32.5	8.36 8.16 8.76 10.36 10.36 10.78 13.03
10 11 12a b c 13a	55 Grove Rd. 55 Wood Song Drive Kingswood Rd. Atlantic Oaks Camp Ground	37 45 45 65 85 44	35.59 42.93 45.18 45.18 45.18 45.55	25.8 30.5 31.6 31.6 32.0 32.6	9.79 12.43 13.58 13.58 13.18 13.18
ь с 14а ь	Town Crier Motel R2-3280 Rt.6	62 70 45 65 83	44.12 44.12 44.12 44.12	32.6 35.4 32.9 33.3 34.0	13.95 11.10 11.22 10.82 9.92 10.75
18 (HJ+3) 19a b	Town Landfill 320 Old Orchard Rd. Town Landfill Town Landfill Eastham Ready Mix. Holmes Rd.	55 8 15 45 60	54.76 19.38 27.58 37.95	46.1 6.2 13.3 23.8 23.8	8.66 13.16 14.28 14.15 14.15
с 20а b с	Eastham Common, Rt.6	50 35 55 75	37.95 37.83 37.83 37.83	23.7 23.3 23.3 23.3	14,25 14,53 14,53 14,53
21 22 23a b c	Herring Brook & McKoy Rd. Gift Land. Rt.6 720 Old Orchard Rd.	79	34.VI	26.3 27.4 39.4 39.4	14.01
24a b. c	25 Danielle Drive	50 70 90	54.01 47.17 47.17 47.17	31.9 31.9 31.9 38.3	14.61 15.27 15.27 8.87
25 26 27 28	540 Massasoit Rd. 15 Bishop Rd. Captains Quarter Motel, Rt.6 Wiley Park, Beehive Rd.	40 45 46 30	41.86 47.00 50.97 30.17	39.4 39.4 31.9 31.9 38.3 26.8 31.7 34.2 21.0	8.87 15.06 15.30 16.77 9.17

WELL WATER ELEVATIONS ON MAY 15-17, 1990

WELL # la b	LOCATION 30 Clark's Point Rd.	(FT)	ELEV. AT TOP OF CASING 23.76 23.76		WATER ELEV. (FT ABOVE MSL) 8.76 8.56
c 2 3 (EGW-37) 4 5 6a	360 Great Pond Rg. 35 Split Rail Rd.	35 55 75 15 20 42 30 45 45 45 45 45 45 45 45 45 45 45 45 45	TOP OF CASING 23.76 23.76 23.76 23.75 13.13 26.86 21.63 25.86 23.86 23.86 23.86 23.86 23.86 23.86 23.878 45.53 35.59 42.93 45.18	WATER (FT) 15.0 15.2 15.1 3.6 18.1 24.3 9.8 16.0 16.6	8.45 9.53 8.76
6a . b ∈ 7a	65 Deborah Doane Way	30 50 70	25.86 25.86 25.86	16.0 16.6 16.8	10.15 11.83 9.86 9.26 9.06
b C	25 Great Pond Place	25 45 63	23,86 23,86 23,86	14.1 12.4 12.4	9.76 11.46 11.46
8 9 10	320 Weir Rd. 347 Kingsbury Beach Rd. 55 Grove Rd.	30 43 37	28.78 45.53 35.59	16.0 16.6 16.8 14.1 12.4 12.7 31.7 24.4 29.5	12.08 13.83 11.19 13.43
ii i2a b c	55 Wood Song Drive Kingswood Rd.	45 45 65 55	45.18	29.5 30.7 30.8	13.43 14.48 14.38 13.68
13a b c	Atlantic Caks Camp Ground Town Crier Motel	62 70	45.18 46.55 46.55 44.56	31.9 31.9 31.9	13.68 14.65 14.65 12.30
14a b	R2-3280 Rt.6	45 65 83	44.12 44.12 44.12	31.9 32.4 33.3	12.22 11.72 10.82 11.95
15 (HJ-2) 16 17 (HJ-1)	Town Landfill 320 Old Orchard Rd. Town Landfill	12:3 55 7 . 9	16.75 54.76 19.38	4.8 45.6 5.7	7.16 13.48
18 (HJ-3) 19a b	Town Landfill Eastham Ready Mix, Holmes Rd.	15 45 60	27.58 37.95 37.95 37.95	12.8 22.9 22.9	14.78 15.05 15.05
. с 20а ъ с	Eastham Common, Rt.6	35 55 75	37.83 37.83 37.83	22.6 22.6 22.6 22.7	15.05 15.23 15.23 15.13
21 22 23a 0 c	Herring Brook & McKoy Rd. Gift Land, Rt.6 720 Old Orchard Rd.	40 40 50 70 90	46,50 44,12 44,12 16,75 54,76 19,38 27,58 37,95 37,95 37,83 37,83 37,83 37,83 37,83 37,83 37,83 37,83	30.7 30.5 31.9 31.9 32.3 45.7 8.6 7 8.9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	12.80 15.62 14.91 15.11 15.11
24a b c	25 Danielle Drive	90 50 70 90	54.01 47.17 47.17 47.17	31.3 31.3 31.3	15.87 15.67 15.87
25 26 27 28	540 Massasoit Rd. 15 Bishop Rd. Captains Quarter Motel, Rt.6 Wiley Park, Beehive Rd.	40 45 46 30	41.86 47.00 50.97 30.17	26.0 31.2 33.9 19.9	15.86 15.80 17.07 10.27

APPENDIX D

1991 WELL MONITORING DATA

WELL WATER ELEVATIONS ON JUNE 27, 1991, WITH ASSOCIATED WATER CHEMISTRY DATA

	· w	ELL DEPTH	ELEV. AT	DEPTH OF	WATER ELEV.	PH	CONDUCT.	NITRATE-N
WELL #	LOCATION	(FT)	TOP OF CASING	• •			(UMHO/CM)	(MG/L)
la	30 Clark's Point Rd.	35	23.76	15.8	7 . 96	6.6	72	•02
b	·	55	23.76	15.8	7.96	7.2	300	1.00
c		75	23.75	14.3	9.45	6.8	75	•75
2	305 Great Pond Rd.	15	13.13	5.3	7.83	5.7	269	•06
3 (EGW-37)	Entrance to Wiley Park	20	26.86	17.0	9.86	6.2	353	•02
4	360 Great Pond Rd.	40	34 .45	25.0	9.45	5.6	352	4.60
5	35 Split Rail Rd.	25	21.63	***			£	
6a	65 Deborah Doane Way	30	25.86	17.0	8.86	5.6	123	3.20
b		50	25.86	16.5	9.36	5.8	146	2.60
c		70	25.86	16.5	9.36	6.2	455	.30
7a	25 Great Pond Place	25	23.86	14.0	9.86	6.3	150	.25
ь	X.	45	23.86	13.5	10.36	6.0	228	2.53
c	•	63	23,86	13.3	10.56	6.2	120	-44
8	320 Weir Rd.	30	28.78	17.0	11.78	6.0	232	.14
- 9	347 Kingsbury Beach Rd.	43	45.53	***				. 70
10	55 Grove Rd.	37	35 - 59	20.3	15 . 29	6.2		1.70
11	55 Wood Song Drive	45	42.93	31.0	11.93	6.5	452	3.20
12a	Kingswood Rd.	45	45.18	31.0	14.18	6.5		.40
Ъ		65	45.18	31.3	13.88	6.0	181	1.60
c		85	45.18	31.8	13.38	6.0	230	1.40
13a	Atlantic Oaks Camp Ground	44	46.55	30.8	15.75	6.1	138.	-02
ь		62	46 •55	30.8	15.75	6.0	113	•02
c .	Town Crier Motel	70	46 -50	33.9	12.60	7.7	133	.02
14a	R2-3280 Rt.6	45	44.12	32.2	11.92	5-6	390	.44
b		65	44.12	32.2	11.92	5.5	385	.40
c		83	44.12	32.2	11.92	6.0	135	.45
15 (HJ-2)	Town Landfill	12.3	16.75	***				1.00
16	320 Old Orchard Rd.	55	54.76	47 •9	6.86	5.4		1.60
17 (HJ+1)	Town Landfill	7.9	19.38	7.2	12.18	6.4	183	•80
18 (HJ-3)	Town Landfill	15	27 -58	DRY				1 00
19a	Eastham Ready Mix, Holmes Rd.	45	37 . 95	23.5	14.45	6.6		1.80
b		60	37.95	23.7	14.25	5.7		1.92
c		80	37 .9 5	24.0	13 . 95	5.5		.49
20a	Eastham Common, Rt.6	35	37.83	24.0	13.83	5.9		.10
ь	•	55	37.83	23.7	14.13	5.8		•02
c		75	37 •83	23.4	14.43	5.9		.18
21	Herring Brook & McKoy Rd.	40	38.10	26 •4	11.70	6.3		
22	Gift Land, Rt.6	40	42.32	27.0	15.32	5.9		
23a	720 Old Orchard Rd.	50	54.01	38.7	15-31	5-8		
ь		70	54.01	38.5	15.51	6.1		
c .	•	90	54.01	38.3	15.71	6.0		
24a	25 Danielle Drive	50	47.17	31.7	15.47	5.9		
b	44	70	47.17	31.7	15.47	6.1		
c		90	47.17	31.5	15.67	5.9		
25	540 Massasolt Rd.	40	41.86	26.9	14.96	5.9		
26	15 Bishop Rd.	45	47.00	32.8	14.20	6.		
27	Captains Quarter Motel, Rt.6		50.97	31.9	19.07	5.		
28	Wiley Park, Beehive Rd.	30	30.17	20.6	9.57	5.9	9 418	.05

*** Well inaccessible

