



# WATER-RIGHT DOCKET

## Fire Island National Seashore

Docket No: 1

WHALE HOUSE POINT WELL

Supporting Hydro Data

00-00-0000: description of work done; whalehouse point - well s31112t.

### DESCRIPTION OF WORK DONE

#### Whalehouse Point - Well S31112T

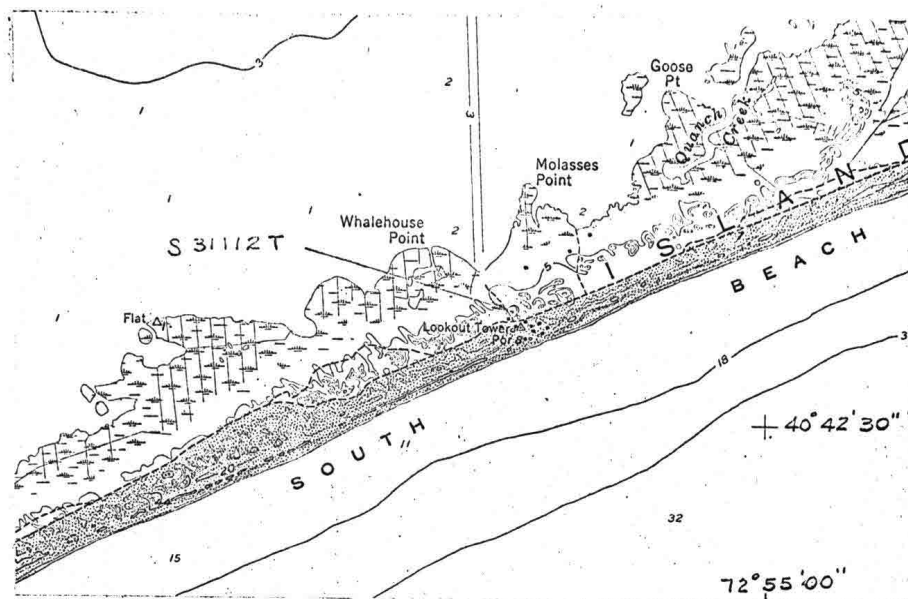
The Whalehouse Point site is about four miles west of the development at Smith Point West at Fire Island National Seashore (enclosure 1). The site is in the interdunal area about 400 feet north of the crest of high dunes. Altitude of the land surface at the well site is about 7 feet above mean sea level (msl).

Construction of well S31112T was preceded by drilling a 16-inch diameter, 510 foot-deep test hole by the hydraulic-rotary method. Ground water high in dissolved-iron and chloride content is common at certain depths in the aquifers beneath Fire Island. Therefore, before installing a permanent well screen, a water sample was obtained from a temporary screen setting in the test hole to evaluate the water quality. The water-bearing material at the depth of the temporary screen setting (442-445 feet below land surface) is fine to medium gray sand containing thin stringers of clay and lignite. The temporary screen was installed by emplacing a 5-foot layer of gravel at the desired depth and jetting a well-point into the gravel. The results of a chemical analysis of a water sample from this zone indicated that the water was of acceptable chemical quality, except that the iron content, 1.68 mg/l (milligrams per liter), was somewhat higher than optimum and the pH 5.9, was lower than optimum (enclosure 9).

Core and flume (mud-ditch) samples were collected during drilling, and a single-point electric resistivity log was made in the hole. A driller's log, description of cores, and geologic and resistivity logs are shown in enclosures 2, 3, and 4, respectively. The hole was cased with 6-inch-diameter steel pipe to a depth of 440 feet below land surface (enclosure 5). The screen zone, screen-slot, and gravel-pack sizes were selected on the basis of an examination of core samples, mechanical analyses of selected cores (enclosures 6 and 7), and the logs. A 6-inch (nominal), by 25-foot, type 304 stainless-steel, 30-slot, wire-wound screen was attached to the bottom of the casing from 440 to 465 feet below land surface.

After development with air by surging, the well was test-pumped for 5 hours. The pumping rate was 108 gpm (gallons per minute) and the total drawdown was 22 feet (enclosure 8). Accordingly, the specific capacity of the well was about 5 gpm per foot of drawdown. Chemical analyses of water collected during pumping from the permanent and the temporary screen settings are given in enclosure 9.

The well at Whalehouse Point, when equipped with a proper pump, should be adequate for the contemplated needs of the National Park Service. The water has a moderately high dissolved-iron content (1.00 mg/l) and a low pH (6.0). Therefore, treatment of the water might be desirable to remove some of the iron and to adjust the pH.



SCALE 1:24000  
0 1/2 1 MILE

ENCLOSURE 1.-- LOCATION OF WELL S-31112 T.

## Enclosure 2.--Driller's log of well S31112T

| <u>Lithologic Description</u>                          | <u>Thickness<br/>(feet)</u> | <u>Depth<br/>(feet)</u> |
|--------------------------------------------------------|-----------------------------|-------------------------|
| Sand, coarse.....                                      | 0                           | 12                      |
| Bog accumulation--roots, grass etc.....                | 4                           | 16                      |
| Sand, coarse; grits and shells.....                    | 126                         | 142                     |
| Sand, fine; grits.....                                 | 10                          | 152                     |
| Clay, silt, sand, and shells.....                      | 51                          | 203                     |
| Clay, solid, black.....                                | 36                          | 239                     |
| Sand, fine; silt and clay.....                         | 14                          | 253                     |
| Clay, solid, black; lignite.....                       | 43                          | 296                     |
| Clay, black; fine sand; mica; lignite.....             | 11                          | 307                     |
| Sand, fine, micaceous; clay and lignite streaks.....   | 66                          | 373                     |
| Sand, very fine; mica; lignite.....                    | 12                          | 385                     |
| Sand, fine to coarse; clay streaks; mica; lignite..... | 37                          | 422                     |
| Clay, solid, gray to black; thin sand streaks.....     | 13                          | 435                     |
| Sand, fine to medium; clay streaks; lignite; mica..... | 23                          | 458                     |
| Sand, fine; clay streaks; mica.....                    | 11                          | 469                     |
| Sand, fine; clay streaks; lignite; mica.....           | 21                          | 490                     |
| Clay, solid, gray.....                                 | 3                           | 493                     |
| Sand, fine; clay; lignite; mica.....                   | 1                           | 494                     |
| Clay, solid, black.....                                | 16                          | 510                     |

## Enclosure 3.--Description of cores of well S33112T

| Core Number | Depth (Feet) | Lithologic Description                                                                                                |
|-------------|--------------|-----------------------------------------------------------------------------------------------------------------------|
| 1           | 152-153      | Silt, sandy, grayish-green to greenish-black; glauconitic, micaceous. Brown oxidized inclusions related to glauconis. |
| 2           | 200-201      | Silt, sandy and clayey, greenish-black to grayish black, glauconitic. Very fine grained sand inclusions.              |
| 3           | 250-251      | Clay, solid, black, upper 6-inches. Sand, fine silty, gray, lower 6-inches.                                           |
| 4           | 300-301      | Clay, solid, black. Sand, fine silty, brownish to grayish-white.                                                      |
| 5           | 310-311      | Sand, fine, silty, grayish-white; lignite inclusions.                                                                 |
| 6           | 320-321      | Clay, solid, black; sand, very fine to fine, silty micaceous, grayish-white; lignite.                                 |
| 7           | 330-331      | Sand, very fine to fine, grayish-white to grayish black; clay and lignite stringers, black.                           |
| 8           | 340-341      | Sand, fine to medium, silty, quartzitic, grayish-white, lignite and pyrite inclusions.                                |
| 9           | 350-351      | Sand, fine, silty, micaceous, lignitic, grayish-white; 6-inch lignite bed at top of core.                             |
| 10          | 355-356      | Sand, very fine to fine, silty and somewhat clayey; lignite.                                                          |
| 11          | 360-361      | Sand, very fine to medium, micaceous, grayish-white; lignite.                                                         |
| 12          | 365-366      | Sand, very fine, silty, grayish-white; lignite, (wood fragments at bottom of core).                                   |

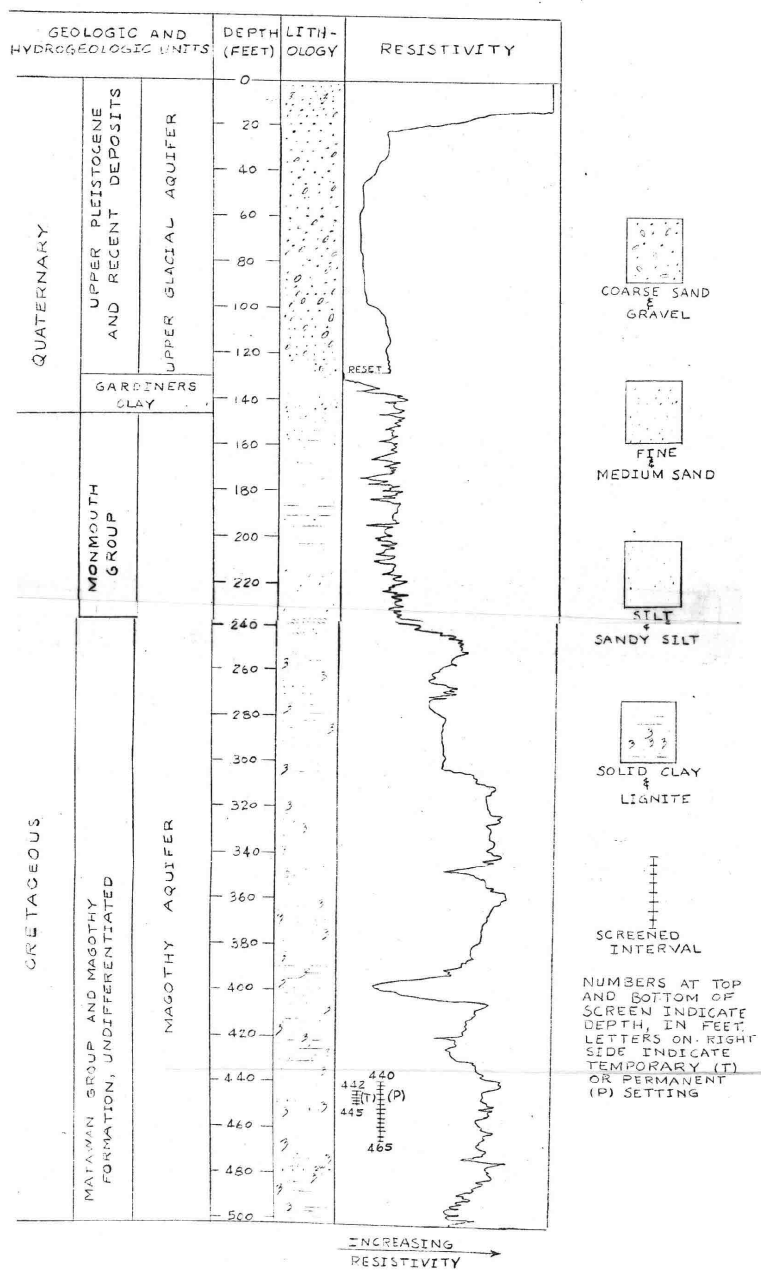
## Enclosure 3.--Description of cores of well S33112T

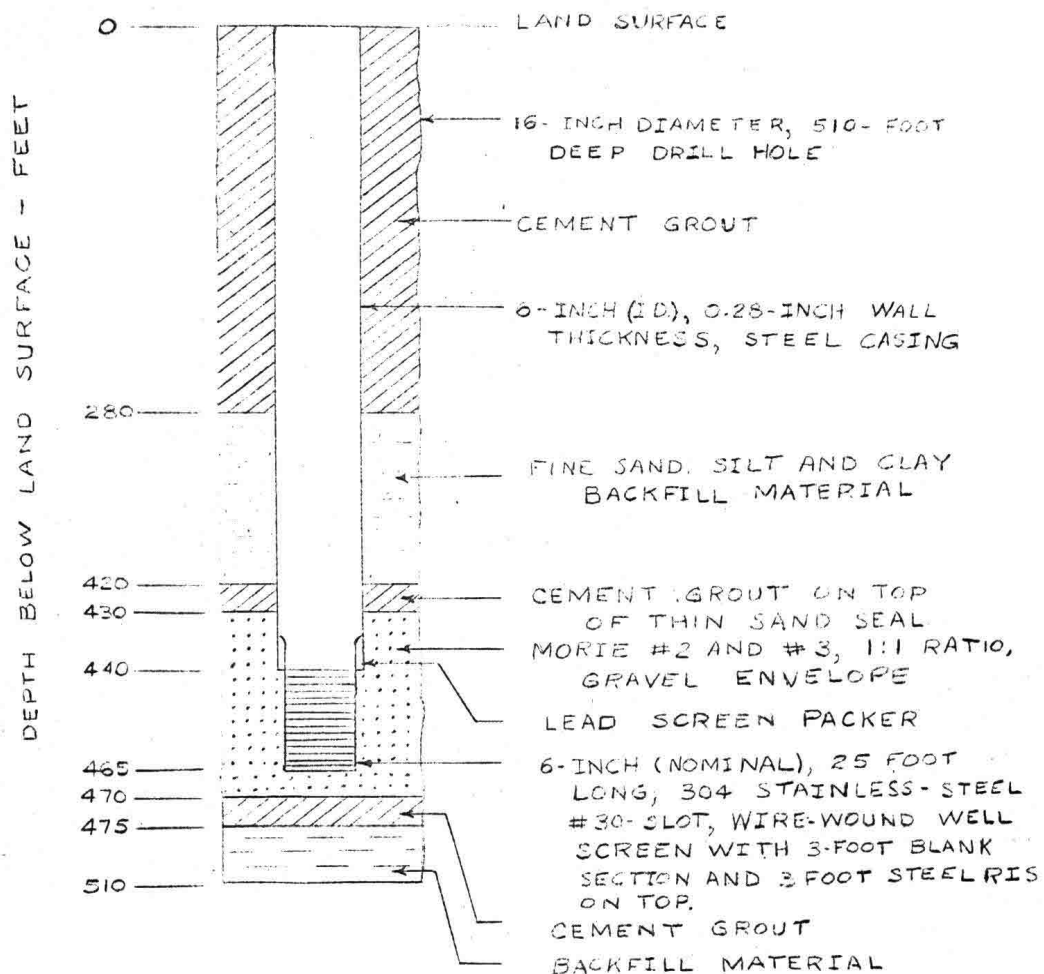
| Core Number | Depth (feet) | Lithologic Description                                                                                                                     |
|-------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| 13          | 370-371      | Sand, very fine to fine, quartzitic, silty, micaceous, grayish-white; lignite.                                                             |
| 14          | 375-376      | Sand, very fine to fine, grayish-white; with interbedded stringers of gray-black lignitic sand and lignite.                                |
| 15          | 380-381      | Sand, very fine to fine, silty and somewhat clayey, micaceous, gray to grayish-black; interbedded with thin stringers of lignite material. |
| 16          | 385-386      | Sand, very fine to medium, silty to clean gray and white.                                                                                  |
| 17          | 390-391      | Clay, silty, sandy, and solid, gray-black to brownish-black and brown; interbedded.                                                        |
| 18          | 395-396      | Clay, solid, black to grayish-black; lignite.                                                                                              |
| 19          | 400-401      | Clay, solid and silty, gray to grayish black; interbedded with fine gray, micaceous sand and lignite.                                      |
| 20          | 405-406      | Clay, silty and sandy, gray to grayish-black with interbedded fine, gray, sand.                                                            |
| 21          | 410-411      | Sand, very fine to fine, silty, micaceous, gray to grayish-white.                                                                          |
| 22          | 415-416      | Sand, very fine to fine, silty, micaceous, gray to grayish-white.                                                                          |
| 23          | 420-421      | Sand, very fine to fine, very silty and micaceous, gray to grayish-white.                                                                  |
| 24          | 425-426      | Clay, solid, gray to grayish-black; interbedded with thin stringers of gray silt and very fine micaceous sand.                             |
| 25          | 430-431      | Clay, solid and silty, gray to dark-gray; thin stringers of fine, silty, micaceous, sand.                                                  |

## Enclosure 3.--Description of cores of well S33112T

| Core Number | Depth (feet) | Lithologic Description                                                                                                                                   |
|-------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 26          | 435-436      | Sand, very fine to medium, gray to grayish-white; with interbedded dark-gray, silty clay.                                                                |
| 27          | 440-441      | Sand, very fine to medium, silty, gray and grayish-white.                                                                                                |
| 28          | 445-446      | Sand, very fine to medium, gray to grayish white; with thin stringers of interbedded gray clay.                                                          |
| 29          | 450-451      | Sand, very fine to medium, gray to grayish-white clean; some lignite.                                                                                    |
| 30          | 455-456      | Sand, fine to coarse, micaceous, gray; lignite and pyrite.                                                                                               |
| 31          | 460-461      | Sand, fine to medium, silty, gray; interbedded stringers of gray clay and lignite.                                                                       |
| 32          | 465-466      | Sand, fine to medium, silty, micaceous, gray to grayish-white.                                                                                           |
| 33          | 470-471      | Sand, very fine to medium, silty, dirty, micaceous, gray to grayish-white.                                                                               |
| 34          | 475-476      | Sand, fine to medium, silty, micaceous, gray to grayish-white; thin stringers of lignitic material.                                                      |
| 35          | 480-481      | Sand, fine to medium with thin stringers of coarse, silty to clean, micaceous, gray to grayish-white; thin lignite stringers.                            |
| 36          | 485-486      | Sand, fine to medium, silty to clean, gray to grayish-white; thin stringers of lignitic material.                                                        |
| 37          | 490-491      | Sand, very fine to fine, silty, clayey, dark-gray to gray-black; dark-gray to black clay containing thin stringers of very fine micaceous sand; lignite. |
| 38          | 495-496      | Clay, solid, dark-gray to black.                                                                                                                         |
| 39          | 500-501      | Clay, solid, dark-gray to black; trace of pyrite and mica.                                                                                               |

ENCLOSURE 4-- GEOLOGIC AND RESISTIVITY  
LOGS OF WELL S-31112T





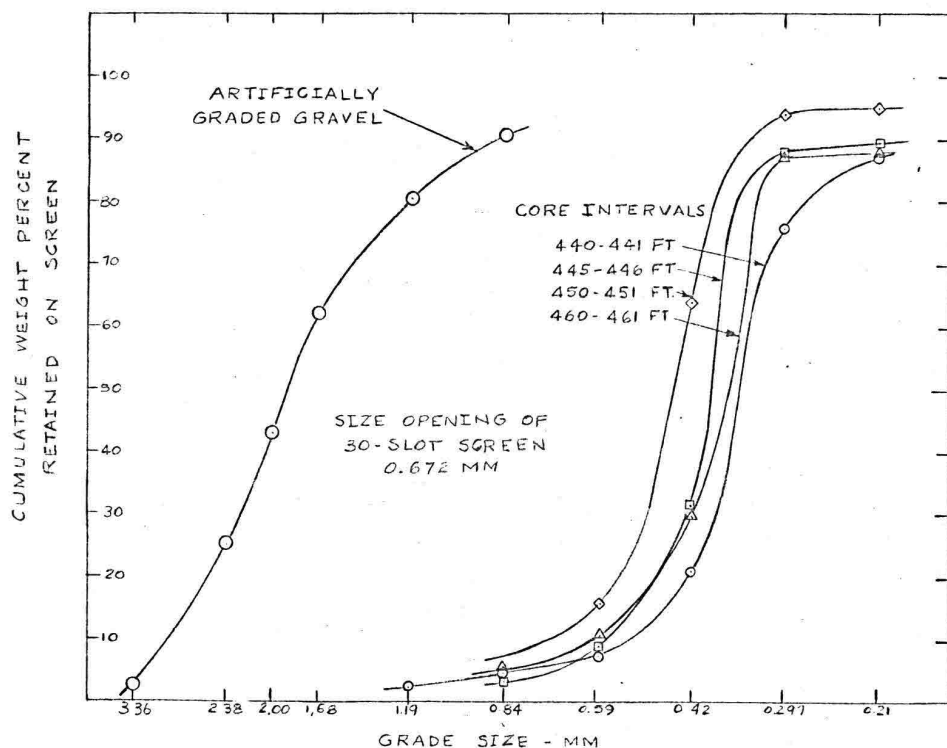
ENCLOSURE 5 -- DIAGRAM OF WELL S-31112T

Enclosure 6.--Results of mechanical analyses of artificially graded gravel envelope and selected cores from well S31112T 1/

| Sieve opening<br>(inches) (mm) | Cumulative weight percent of samples retained by indicated sieve opening <u>2/</u> |                                          |         |         |         |         |         |         |         |         |         |
|--------------------------------|------------------------------------------------------------------------------------|------------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                | Artificially<br>graded<br>gravel                                                   | Depth of cores below land surface (feet) |         |         |         |         |         |         |         |         |         |
|                                |                                                                                    | 420-421                                  | 440-441 | 445-446 | 450-451 | 455-456 | 460-461 | 465-466 | 470-471 | 475-476 | 480-481 |
| 0.132 3.36                     | 3.4                                                                                |                                          |         |         |         |         |         |         |         |         |         |
| 0.0937 2.38                    | 25.4                                                                               |                                          |         |         |         |         |         |         |         |         |         |
| 0.0787 2.00                    | 43.1                                                                               |                                          |         |         |         |         |         |         |         |         |         |
| 0.0561 1.68                    | 62.0                                                                               |                                          |         |         |         |         |         |         |         |         |         |
| 0.0469 1.19                    | 80.2                                                                               | 2.63                                     | 2.29    | -       | -       | -       | -       | -       | -       | -       | -       |
| 0.0331 0.84                    | 90.8                                                                               | 6.32                                     | 4.57    | 3.95    | -       | 5.56    | 4.67    | 3.42    | -       | 5.47    | 4.16    |
| 0.0232 0.59                    | -                                                                                  | 9.5                                      | 7.43    | 8.87    | 5.5     | 11.1    | 10.3    | 5.97    | -       | 7.81    | 7.64    |
| 0.0165 0.42                    | -                                                                                  | 14.2                                     | 21.2    | 31.6    | 64.0    | 42.9    | 29.9    | 16.2    | 5.63    | 15.6    | 35.4    |
| 0.0117 0.297                   | -                                                                                  | 41.0                                     | 76.0    | 87.8    | 94.0    | 73.8    | 87.0    | 98.3    | 98.6    | 97.6    | 98.2    |
| 0.0083 0.210                   | -                                                                                  | 75.9                                     | 86.9    | 89.7    | 95.0    | 77.0    | 87.9    | 98.9    | 99.0    | 98.0    | 98.7    |
| Retained in pan                | 100.0                                                                              | 100.0                                    | 100.0   | 100.0   | 100.0   | 100.0   | 100.0   | 100.0   | 100.0   | 100.0   | 100.0   |

1/ Mechanical analyses conducted by Mathies Well and Pump Co., Inc.

2/ Expressed as percent of total weight of sample.



ENCLOSURE 7--CUMULATIVE FREQUENCY CURVES OF ARTIFICIALLY GRADED GRAVEL ENVELOPE AND SELECTED CORES FROM WELL S-31112T

## Enclosure 8.--Pumping-test data from well S31112T, December 29, 1967

| Time<br>(EST) | Duration<br>(min)   | Drawdown <u>1</u> /<br>(feet)                            |       | Yield<br>(gpm)      | Specific<br>Capacity<br>(gpm per<br>of drawd |
|---------------|---------------------|----------------------------------------------------------|-------|---------------------|----------------------------------------------|
|               |                     | Below Measuring<br>point                                 | Total |                     |                                              |
| 0848          | 0                   | Static water level 10.5 feet above land surface <u>1</u> |       |                     |                                              |
| 0850          | 2                   | 14.29                                                    | 18.79 | 111                 | 5.91                                         |
| 0852          | 4                   | 16.03                                                    | 20.53 | Adjusting Dischar   |                                              |
| 0856          | 8                   | 14.40                                                    | 18.9  | 106                 | 5.6                                          |
| 0900          | 12                  | 15.0                                                     | 19.5  | 108                 | 5.54                                         |
| 0903          | 15                  | 14.5                                                     | 19.0  |                     |                                              |
| 0908          | 20                  | 15.2                                                     | 19.7  | 108                 | 5.48                                         |
| 0913          | 25                  | 15.28                                                    | 19.78 | 106                 | 5.37                                         |
| 0918          | 30                  | 16.0                                                     | 20.5  | 108                 | 5.27                                         |
| 0923          | 35                  | 16.1                                                     | 20.6  | 108                 | 5.24                                         |
| 0928          | 45                  | 16.07                                                    | 20.57 | 108                 | 5.26                                         |
| 0948          | 60                  | 15.25                                                    | 19.75 | 106                 | 5.36                                         |
| 1003          | 75                  | 15.23                                                    | 19.73 | 106                 | 5.37                                         |
| 1018          | 90                  | 16.04                                                    | 20.54 | 108                 | 5.26                                         |
| 1032          | Pump off 10 minutes |                                                          |       |                     |                                              |
| 1100          | 102                 | 17.2                                                     | 21.7  | 111                 | 5.1                                          |
| 1130          | 132                 | 17.05                                                    | 21.55 | Adjusting discharge |                                              |
| 1215          | 177                 | 16.40                                                    | 20.90 | 108                 | 5.17                                         |
| 1300          | 212                 | 16.85                                                    | 21.35 | 108                 | 5.07                                         |
| 1330          | 242                 | 16.98                                                    | 21.48 | 108                 | 5.03                                         |
| 1350          | 262                 | 17.50                                                    | 22.0  | 108                 | 4.92                                         |

1/ Static water level 4.5 feet above measuring point and approximately 17.5 feet above msl.

## Enclosure 9.--Chemical analyses of ground water from wells S31112T and S31113T.

Results given in milligrams per liter except as indicated 1/

|                                                | Well number and screen interval in feet<br>below land surface |                                  |                                  |                                  |
|------------------------------------------------|---------------------------------------------------------------|----------------------------------|----------------------------------|----------------------------------|
|                                                | S-31112T                                                      |                                  | S-31113T                         |                                  |
|                                                | Temporary<br>screen<br>(442-445)                              | Permanent<br>screen<br>(440-465) | Temporary<br>screen<br>(466-469) | Permanent<br>screen<br>(464-484) |
| Date sampled                                   | 12-7-67                                                       | 12-29-67                         | 10-9-67                          | 11-1-67                          |
| Yield of well, in gpm (pump or flow)           | 15 (pumped)                                                   | 108 (pumped)                     | 6 (pump)                         | 100 (pum)                        |
| Color                                          | Clear                                                         | Clear                            | Clear                            | Clear                            |
| Odor                                           | None                                                          | None                             | None                             | None                             |
| Turbidity ( $\text{SiO}_2$ )                   | 1.7                                                           | 4.7                              | 10.5                             | 0.6                              |
| pH                                             | 5.9                                                           | 6.0                              | 6.2                              | 6.0                              |
| Iron (Fe)                                      | 1.68                                                          | 1.00                             | 0.64                             | 0.50                             |
| Manganese (Mn)                                 | 0.05                                                          | 0.05                             | 0.05                             | 0.05                             |
| Chloride (Cl)                                  | 5                                                             | 6                                | 7                                | 8                                |
| Total hardness ( $\text{CaCO}_3$ )             | 12                                                            | 16                               | 0                                | 0                                |
| Alkalinity ( $\text{CaCO}_3$ )                 | 12                                                            | 8                                | 24                               | 16                               |
| Carbon dioxide ( $\text{CO}_2$ )               | 24                                                            | 13                               | 24                               | 25                               |
| Flouride (F)                                   | -                                                             | -                                | -                                | -                                |
| Nitrate ( $\text{NO}_3$ as N)                  | 0.02                                                          | 0.02                             | 0.02                             | 0.30                             |
| Dissolved solids<br>(residue on evaporation)   | 110                                                           | 40                               | -                                | 36                               |
| Specific Conductance<br>(in micromhos at 25°C) | 42                                                            | 36                               | 62                               | 48                               |

1/ Analyses conducted by Suffolk County Water Authority

Because of the prevailing high water table.

care should be exercised in the sizing, location and design of buildings and other facilities to provide for the installation of acceptable disposal systems. Factors which must be considered are the prevailing high ground water level on the island, the proximity to bathing, boating and shellfish areas. Comfort stations and change houses should be limited in size by the potential size of the disposal facilities which serve them.

Comfort stations should be constructed to allow for required slopes of the sewage disposal system and to keep the unit above the ground water level.

Major developed areas of the Seashore shall be provided with commercial electric power where it can be procured or existing lines can be extended at reasonable cost. Power lines shall be placed underground wherever possible.

Major and minor developed areas where power is required but cannot be procured shall have their requirements filled by the use of gasoline or diesel electric generating systems. These systems shall be furnished with sufficient spare parts, have adequate housing and be removed from the visitor use area.

#### POWER:

Electric power is furnished to the Seashore developed areas by the Long Island Lighting Company by means of submarine cables under the bay located at various points along the island with substations located on the island. Overhead transmission lines use company poles and poles of the U.S. Coast Guard where available.

Power is available in highly developed areas only; however, lines can be extended to serve most of the Seashore area.

#### COMMUNICATION:

##### Telephone:

The New York Telephone Company furnishes service to the highly developed areas of the Seashore by means of submarine cables under the bay which are located at various points along the island and lead to transmitter stations on the island. Overhead transmission lines are then carried on company poles, Long Island Lighting Company poles or poles of the U.S. Coast Guard where available. Direct burial cables are used for a few short stretches where required by local conditions. At the present time, service is limited and most residences in the highly developed area are being served by eight party lines.

Telephone service may be extended by the installation of additional submarine cables and/or by extending existing facilities on the island.

The U.S. Coast Guard has a telephone line from their station near Captree Island to their Moriches station. This line is overhead except for three short stretches where it is buried and goes roughly down the center of the island. It leaves the island near the Coast Guard Forge River station and becomes a submarine cable to the Moriches station.

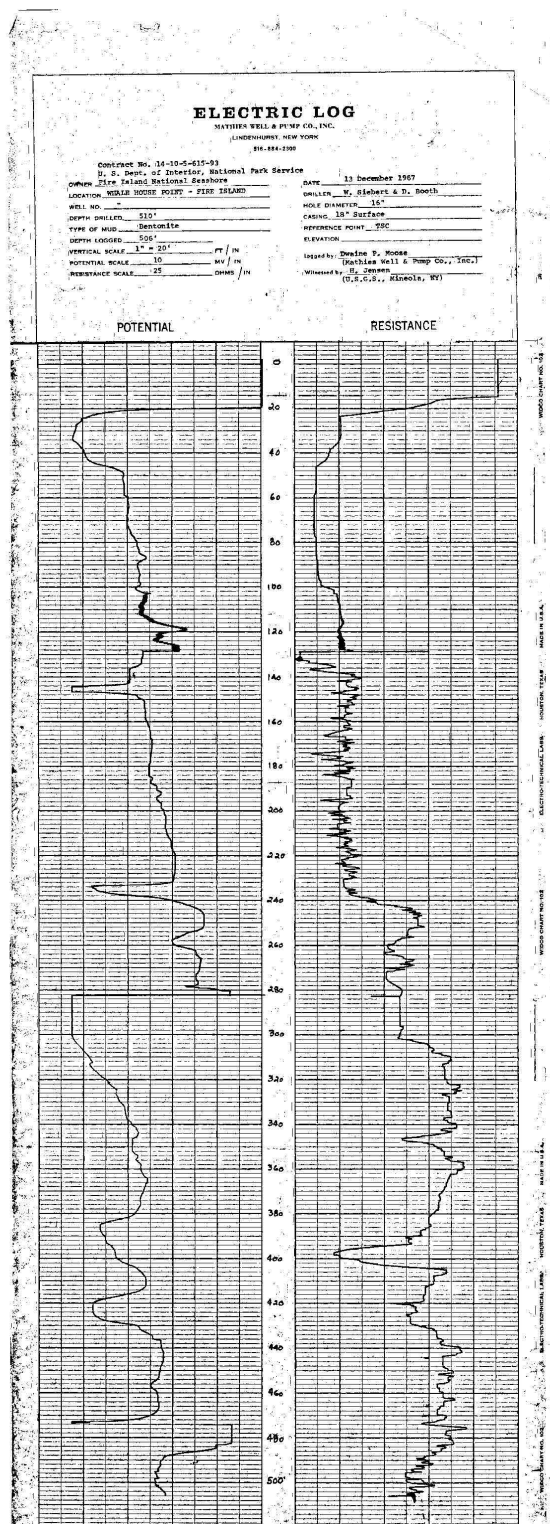
A rough sand road passable for four-wheel drive vehicles runs along the overhead transmission line. This road has been interrupted in certain developed areas and where the cables go underground. In these areas, vehicles must use the beach.

Telephone service shall be provided to all major developments within the present area of service and to points where it can be readily extended. Telephone lines in major development areas and heavy visitor use areas shall be placed underground when opportunity permits.

#### Other:

| DEVELOPED AREAS  | TYPES OF FACILITIES     |                        |            |              |                    |                     |                             |                   |                                        |                       |           |           |                 |             |               |
|------------------|-------------------------|------------------------|------------|--------------|--------------------|---------------------|-----------------------------|-------------------|----------------------------------------|-----------------------|-----------|-----------|-----------------|-------------|---------------|
|                  | MAINLAND FERRY TERMINAL | LATERAL FERRY TERMINAL | BOAT DOCKS | RENTAL BOATS | BOAT BEACHING AREA | BOAT LAUNCHING RAMP | BOAT TRAILER & AUTO PARKING | AUTO PARKING AREA | U.S. COAST GUARD STATION-RANGER OFFICE | INTERPRETIVE FACILITY | BATHHOUSE | SNACK BAR | COMFORT STATION | PICNIC AREA | RESTROOM AREA |
| MORICHES INLET   | EXIST.                  |                        |            |              |                    |                     |                             |                   |                                        |                       |           |           |                 |             |               |
| EAST LEAD        | PROP.                   |                        |            |              |                    |                     |                             |                   |                                        |                       |           |           |                 |             |               |
| PATTERNSQUASH    | EXIST.                  |                        |            |              |                    |                     |                             |                   |                                        |                       |           |           |                 |             |               |
| SMITH POINT EAST | EXIST.                  |                        |            |              |                    |                     |                             |                   |                                        |                       |           |           |                 |             |               |
| SMITH POINT WEST | EXIST.                  |                        |            |              |                    |                     |                             |                   |                                        |                       |           |           |                 |             |               |
| PELICAN          | EXIST.                  |                        |            |              |                    |                     |                             |                   |                                        |                       |           |           |                 |             |               |
| WHALEHOUSE POINT | EXIST.                  |                        |            |              |                    |                     |                             |                   |                                        |                       |           |           |                 |             |               |
| LONG COVE        | EXIST.                  |                        |            |              |                    |                     |                             |                   |                                        |                       |           |           |                 |             |               |
| WATCH HILL       | EXIST.                  |                        |            |              |                    |                     |                             |                   |                                        |                       |           |           |                 |             |               |
| TALISMAN         | EXIST.                  |                        |            |              |                    |                     |                             |                   |                                        |                       |           |           |                 |             |               |
| SAILORS HAVEN    | EXIST.                  |                        |            |              |                    |                     |                             |                   |                                        |                       |           |           |                 |             |               |
| WEST BEACH       | EXIST.                  |                        |            |              |                    |                     |                             |                   |                                        |                       |           |           |                 |             |               |
|                  | EXIST.                  |                        |            |              |                    |                     |                             |                   |                                        |                       |           |           |                 |             |               |
|                  | PROP.                   |                        |            |              |                    |                     |                             |                   |                                        |                       |           |           |                 |             |               |

DISTRIBUTION OF DEVELOPMENT



Other Supporting Information

211  
10/6/67

October 6, 1967

154-OLW

Memorandum

To: Chief, Office of Land and Water Rights, WSC  
Attention: Mr. Ketcham

From: Chief, Branch of Water Resources

Subject: Application for permit from State for wells at Fire Island

Please refer to your letter of October 5 to the New York State Department of Conservation on the above subject.

To my knowledge, this is the first time the Park Service has applied for a permit in New York State. Although the Service has authority to make such application this action is permissive and not mandatory. Because this is a precedent, the matter should be discussed with the Solicitor's Office before any formal application is made.

When the forms are received, it is suggested that they be filled out and together with all other pertinent material, made into a package for the Solicitor's information. The matter can be discussed with the Associate Solicitor for Parks informally and, if desirable, a formal memorandum requesting his advice can be prepared later.

(Signed)

E. W. Reed

cc:  
Mr. Reed - OLWW

EWReed:ljc

705-10-5-67

L54 WSC-OLW

October 5, 1967

New York State Department of Conservation  
Water Resources commission  
373 Maple Avenue  
Westbury, New York 11590

Dear Sirs:

Our National Seashore Superintendent at Fire Island has advised us that use of a recently drilled well in his area is contingent upon application to your commission for a permit. We have in our files an information circular and one on rules and regulations as a guide, but it would appear from sample applications shown that you would provide pertinent forms for such an application upon request. This letter requests a nominal supply of 10 or 15 copies of these forms and any pertinent data that will serve to aid this agency to make a proper application to use groundwater from a successful test well in the aforementioned park area.

Sincerely yours,

~~Richard L. Stanton~~

Richard L. Stanton  
Chief, Office of Land  
and Water Rights, WSC

cc:  
WASO, Mr. Reed  
OLW  
OLW (Water Rights) Corres.

RWKetcham:mf 10/5/67

Maps and Miscellaneous Information

