



GROUNDWATER MONITORING PLAN

for the

TOMOKA FARMS ROAD LANDFILL



August, 1991

VC 91114-6 E

BWA
BRILEY, WILD
AND ASSOCIATES

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July 10, 1991

1/31/91
7/9/91

Mr. Lee A. Powell, P.E.
Briley, Wild & Associates, Inc.
P. O. Box 607
Ormond Beach, FL 32175

Re: Tomoka Landfill - Information requested in connection with
renewal of operating permit

Dear Lee:

This letter addresses items 1 and 3 of the Jan. 31, 1991 letter from Richard Tedder, P.E. of the DER to you, concerning groundwater contour mapping and a revised Groundwater Monitoring Plan for Tomoka Landfill.

Groundwater Mapping

1. There are two aquifers of principal interest: The Water Table or Surficial aquifer and The Floridan aquifer. There are also some thin water-bearing zones between The Water Table and Floridan aquifers, but these are unnamed, not formally recognized as hydrologic units, and unused in the vicinity of the site.
2. Figure 1 shows the elevation of the water table in mid-March, 1991. The map is based on twelve groundwater and five surface water measuring points, as given in the following table.

Table 1. Tomoka Landfill Water Levels, March, 1991

<u>Site</u>	<u>Water Level (ft. NGVD)</u>	<u>Site</u>	<u>Water Level (ft. NGVD)</u>
B-1	16.27	B-9	22.68
B-2	26.38	B-10	27.18
B-3B	16.17	B-11	24.53
B-4	16.64	MO5	16.22
B-5	25.74	SW-2	25.0
B-6	16.23	SW-3	21.7
B-7	24.43	SW-5	24.5
B-8	16.02	SW-6	23.5
		¹ b.p.	15.0±

¹ b.p. = new borrow pit area

Shallow groundwater flows generally to the east-northeast, towards the lowlands near and beyond the eastern property boundary. Two anomalies are present. One, northwest of the active landfilling area, results from dewatering of the "new" borrow area, in which water levels are depressed by about 10-12 feet. The impact of dewatering is especially pronounced at monitor site B-8, where the water table is approximately 10 feet lower than might otherwise be expected. A lowered water level of about 2 feet can also be noted in well B-11.

The other anomaly occurs along the southern boundary of the active and closed waste disposal areas, where the water level in the perimeter ditch is considerably higher than the water table (for example, compare surface water site SW-3 with well site B-3B). This condition results from discharge into the ditch of runoff collected from the active disposal area, and creates the somewhat unusual condition of a drainage ditch acting to recharge the Water Table aquifer.

3. Potentiometric levels in the Floridan aquifer are given in Figures 2A and 2B. The relationship of Tomoka Landfill to the regional setting is shown in Figure 2A, which illustrates a general east-northeastward flow in the artesian aquifer, and heads in the vicinity of the landfill of 10-15 ft. NGVD. The figure is part of the May, 1988 Potentiometric Map of the St. Johns River Water Management District, prepared by the U. S. Geological Survey.

Figure 2B shows the locations of the two Floridan monitoring wells at the landfill, with potentiometric levels determined in March of this year. The level in FA-1B, on the southwest part of the site, was 15.26 ft. NGVD. The head determined in well FA-2B, to the northeast, was 12.84 ft. NGVD. This is consistent with regional data, shows a lateral northeastward gradient in the Floridan aquifer of approximately 2.4 feet over the 5400-foot distance between the two wells, and indicates a vertical downward gradient between the Water Table and Floridan aquifer that decreases eastward, from about 11 feet at FA-1B to 3.5 feet at FA-2B.

Groundwater Monitoring Plan

1. The current groundwater monitoring network consists of 12 shallow and 2 Floridan monitor wells, as shown on Figure 3 and given in the following table.

Table 2. Existing Monitoring Wells

<u>Well</u>	<u>Year Installed</u>	<u>Screened or Open Interval (ft.)</u>	<u>DER #</u>
B-1B	1987	28-33	3064A14965
B-2	1980	19-24	3064A12081
B-3B	1987	17-22	3064A14966
B-4	1980	20-25	3064A12087
B-5	1980	18-23	3064A12082
B-6	1980	25-30	3064A12090
B-7	1980	27-32	3064A14970
B-8	1987	43-48	3064A14971
B-9	1987	28-33	3064A14972
B-10	1988	15-25	3064A15206
B-11	1990	4-10	3064A15502
M05B	1987	27-32	3064A14964
FA-1B	1987	91-92	3064A14968
FA-2B	1987	91-94	3064A14969

2. Fifteen shallow and one Floridan well are proposed here as additions to the groundwater monitoring network. These wells are also shown on Figure 3, and are listed in Table 3, below. Locations for the shallow wells were selected to provide comprehensive monitoring for the eastern and northern ("downgradient") boundaries of the waste disposal areas (wells B-19 through B-24), to increase coverage along the southern and southwestern boundaries (wells B-12 through B-18), and to monitor water quality near the northeastern property boundary (wells B-25 and B-26). Floridan well FA-4 (at the same site as proposed shallow well B-22) is positioned to provide downgradient monitoring nearer to the waste disposal boundaries than existing monitor FA-2B. Except for wells B-12, B-25 and B-26, all new wells will be located at a distance of 100 feet or less from the margins of the active or closed waste disposal areas.
3. The screened intervals given in Table 3 are estimates, to be used primarily for planning and budgeting. They were selected by reviewing test boring data nearest to the proposed well locations. Actual screened intervals will be selected at the time of monitor well construction, by sampling periodically with a split-spoon

at the bottom of the advancing hollow-stem auger. This will insure that the selected interval is as shallow as possible, yet sufficiently permeable to yield water for purging and sampling.

Table 3. Proposed Monitoring Wells

<u>Well</u>	<u>Approx. Screened or Open Interval (ft.)</u>	<u>Test Borings used to Estimate Interval¹</u>
B-12	18-28	TB-24
B-13	20-30	B5-19, B-10
B-14	23-33	B5-19
B-15	23-33	B5-19
B-16	30-40	B5-19, V-17
B-17	30-40	V-17
B-18	30-40	V-17
B-19	30-40	V-17
B-20	25-35	V-17, V-19, V-20
B-21	20-30	V-19, V-20
B-22	10-20	V-4
B-23	10-20	V-3, V-14
B-24	10-20	V-3, TB-21
B-25	10-20	V-6, V-18
B-26	20-30	V-6, V-13
FA-4	95-100	FA-2B

¹borings with a "V" prefix are from Brooks' 1980 investigation

4. Construction techniques, materials, and finishing specifications will conform to guidelines sent to me recently by Barbara Sellers, P.G. of the DER. This is a document entitled "Monitoring Well Design and Installation," dated 1-24-89 (revised). Relevant details of that document are not repeated here.

Please call me if you have comments or questions.

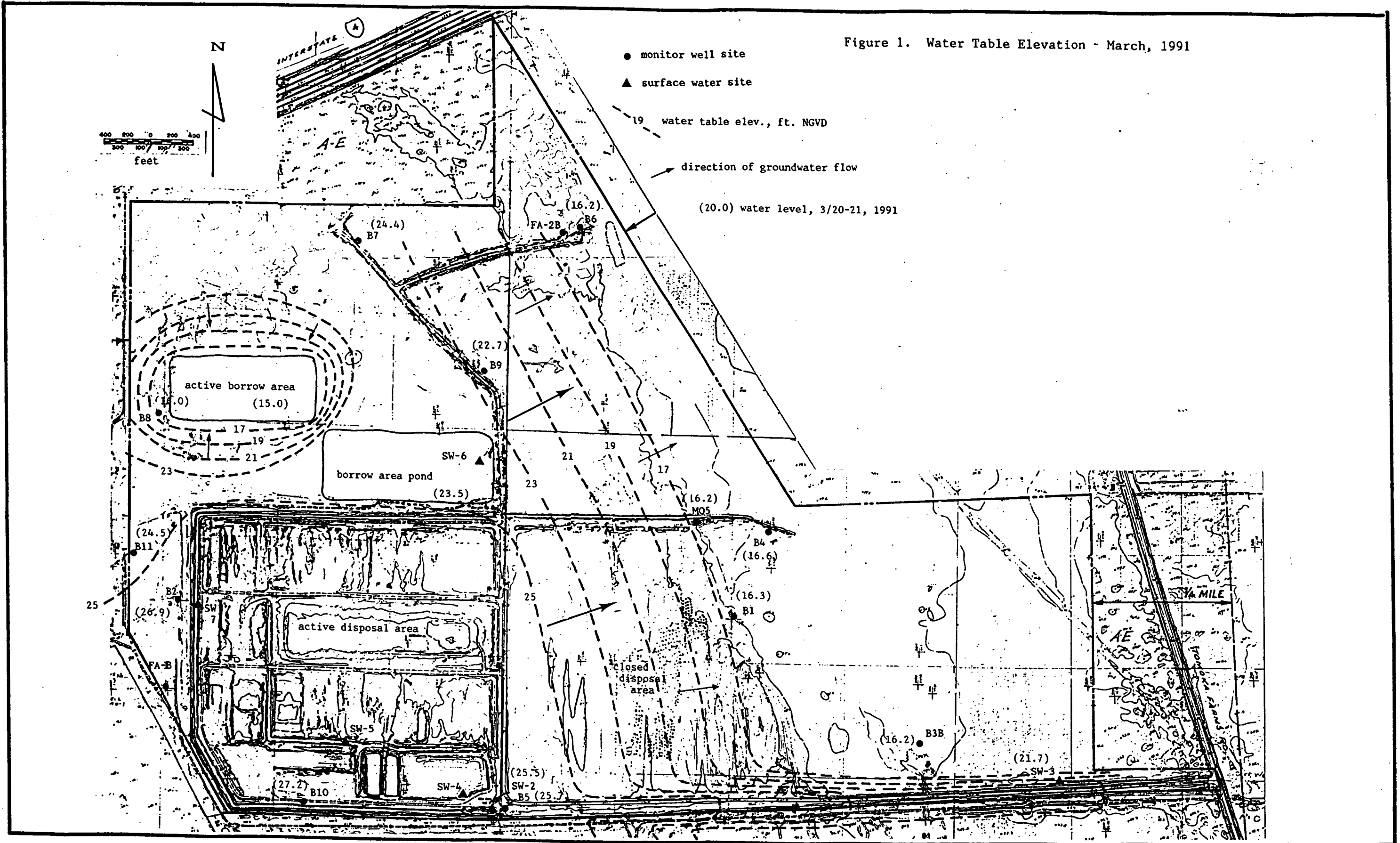
Sincerely,



David N. Gomberg

attached: 3 Figs. as described

Figure 1. Water Table Elevation - March, 1991



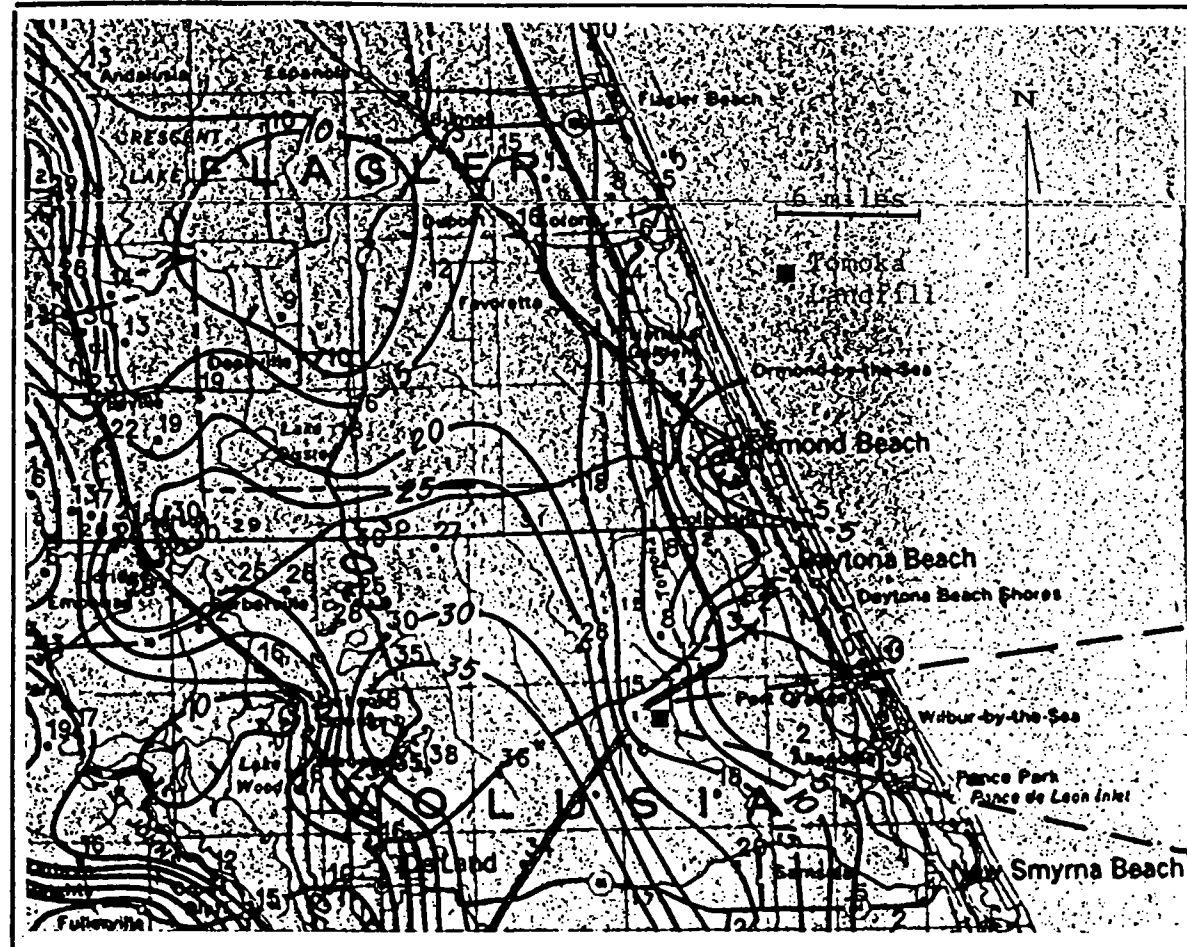


Figure 2A. Potentiometric Map of the Floridan Aquifer, May, 1988

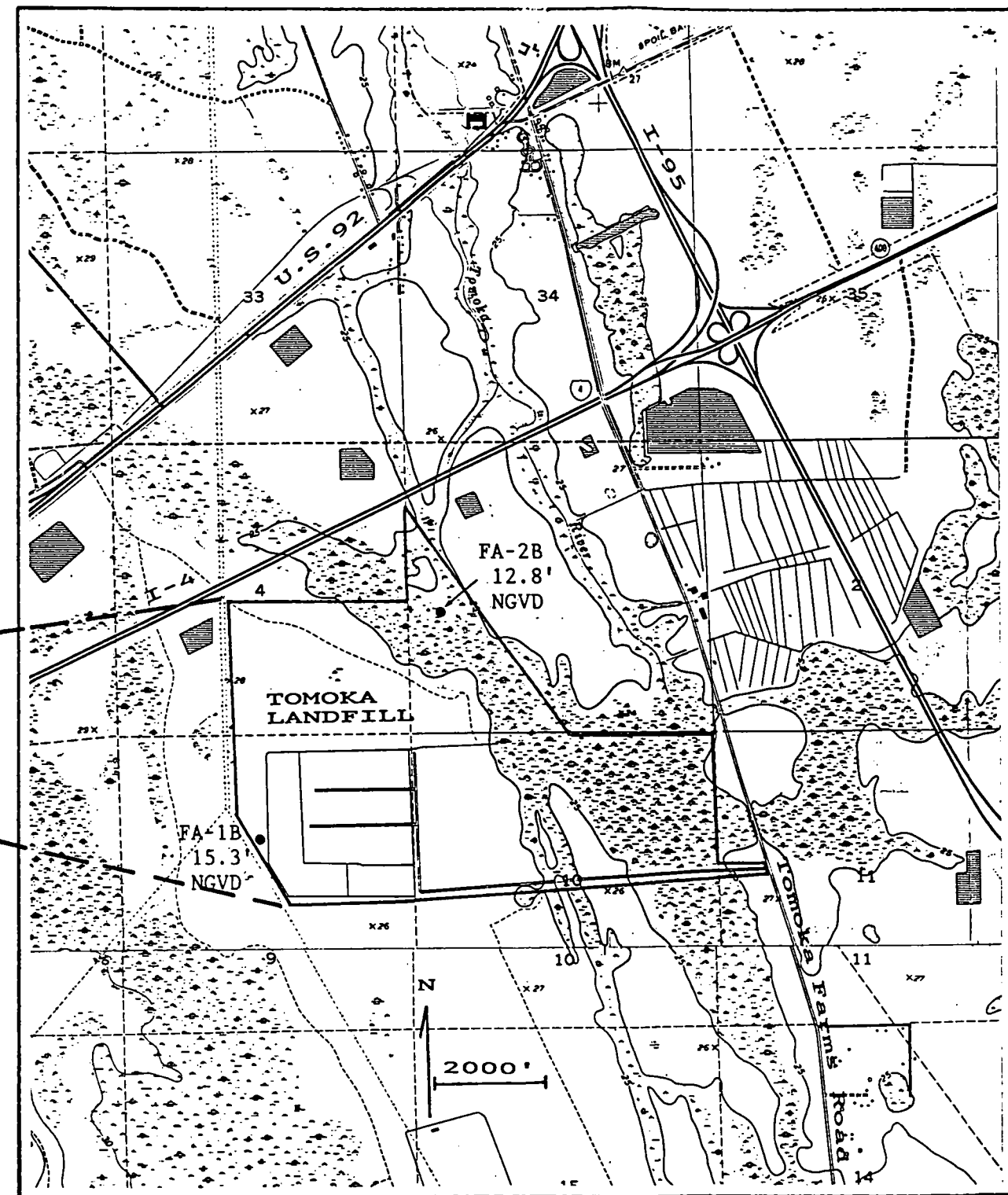


Figure 2B. Location of Floridan Aquifer Wells and Potentiometric Levels in March, 1991

Figure 3. Proposed Groundwater Monitoring Network

- monitor well site - existing
- ▲ surface water site
- ◻ monitor well site - proposed

