

**RECOMMENDATIONS FOR A GROUND-WATER
MONITORING PROGRAM FOR ASH PONDS
LOCATED AT GREENIDGE, HICKLING, AND
JENNISON GENERATING STATIONS**

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1.0 INTRODUCTION

1.1 PURPOSE

In order to satisfy permit requirements of the New York Department of Environmental Conservation (NYSDEC) for Greenidge, Hickling and Jennison Stations (see Figure 1), New York State Electric and Gas Corporation (NYSEG) will be required to monitor both ground water quality and ground water discharge of ash ponds at each of these stations. To develop an adequate monitoring program, NYSEG previously directed Woodward-Clyde Consultants (WCC) to conduct hydrogeologic investigations at each of these stations (Woodward-Clyde Consultants 1982, 1985a, and 1985b). In a separate submission to NYSDEC, NYSEG will propose a specific ground water monitoring program for each station. This report provides a generic, conceptual framework as a basis for specific programs.

The objectives of this report are to 1) review briefly the stratigraphy and hydrogeology at each site to develop a ground water flow model; 2) estimate the effectiveness of the strata underlying the ash ponds as filters of ash-pond sediment; 3) determine whether ground water samples collected downgradient of the ash pond are representative of ground water discharge; and 4) recommend a methodology to sample representative ground water and discharges to ground water.

The outline of the report follows, in general, the objectives as stated previously. The geology, hydrogeology, and hydrologic model of flow from the ash ponds is described for each station in Section 2.0. Data on ash particle grain-size and subsurface strata and effectiveness of the subsurface strata as a filter bed are described in Section 3.1. The suitability of utilizing wells downgradient of the ash ponds as representative of ground water discharge is evaluated in Sections 3.2 and 3.3. A recommended method for collection of ash pond and ground water samples suitable for analysis is described in Section 3.3

2.0 GEOLOGY AND HYDROGEOLOGY

2.1 GREENIDGE STATION

2.1.1 Facility Description

Greenidge Station is a coal-fired generating plant located on the western shore of Seneca Lake in Dresden, N.Y. (Figures 1 and 2). The 110 acre site is bounded by Seneca Lake to the east, N.Y. State Route 14 to the west, Keuka Lake Outlet to the north, and a New York Central railroad line to the south.

Site facilities are shown in Figure 3. Coal is stored at the southern end of the site in a pile lined with fabric-reinforced Hypalon. The coal storage area has a runoff and leachate collection system. The collected leachate and runoff as well as air heater washes are routed to an on-site treatment facility. Fly ash is alternately sluiced into two ponds designated A and B which are located northeast and north of the power station, respectively. Bottom ash is sluiced into pond C which is located east of the power station. In addition, pond C receives a continuous flow of evaporator blowdown. Ponds A and B were designed to facilitate percolation of sluice waters and are cleaned every two years. Percolation rates average 500,000 gallons per day (gpd) for ponds A and B, and 224,000 gpd for pond C. The ash and associated materials are disposed of off-site or sold.

2.1.2 Site Stratigraphy

Greenidge Station is underlain by deposits of Recent alluvium, glacial outwash, lacustrine sediments, glacial till, and fill. A geologic cross-section showing inferred subsurface conditions is shown in Figure 4. Thin till deposits overlie bedrock in the southern part of the site, south of the coal pile storage area (Figure 3). Borings in this area encountered 5 to 8 feet of till.

A deposit of clean sand about 5 feet thick was observed (Empire Soils Investigations, Inc. 1977; Gilbert Associates, 1951), at the ground surface just north of the coal storage pile and near the northeastern corner of the plant. This deposit was underlain by varved silt and clay. Sand and gravel were also encountered at depth in the area between A Pond and C Pond (E.M. Gilbert Engineering, 1937; Gilbert Associates, 1951). The upper surface of these deeper deposits was generally 10 to 20 feet below the original ground surface. A maximum thickness of 43 feet of sand and gravel was reported. The deposits were typically overlain by clay and underlain by clay and gravel, and they appeared to become thinner and deeper toward Keuka Lake Outlet and Seneca Lake.

The natural site relief has been significantly modified by excavation and fill placed for the construction and operation of the plant. Fill material, including coal, bottom ash, fly ash, and natural soil, was encountered in thicknesses of more than 34 feet during Woodward-Clyde's investigation (Woodward-Clyde Consultants, 1982). In some places, fill material extends to the bedrock surface. Extensive areas of fill overlying the natural soil or rock are expected to characterize much of the site subsurface profile.

The Moscow Shale Formation of the Hamilton Group is the rock directly underlying the site. The Moscow Shale is generally thin-bedded, pyritic, and contains scattered beds of limestone. Borings by Empire Soils Investigations (1977) and E.M. Gilbert Engineering (1937) report limestone underlying sections of the plant and coal storage area. This limestone may be a calcareous phase of the Moscow Shale, or it may be the Portland Point or Menteth Limestone Members, which have been defined in the lower portion of the Moscow Shale (Rickard, 1970; 1975; Wright, 1973). The Moscow Shale transmits water through fractures, including joints and bedding planes. The Formation is not prone to solution by percolating ground water.

2.1.3 Site Hydrogeology

Ground water at the Greenidge Station site occurs both in unconsolidated deposits and in bedrock. As shown in the geologic section, Figure 4, the 5-foot thick clean sand deposit near the ground surface just north of the coal pile is believed to be generally above the water table but is likely to allow significant infiltration of precipitation. This sand appears to grade vertically into varved silt and clay deposits and laterally is in contact with sand and silt and with fill.

The extent and nature of the deeper water-bearing sand and gravel deposits north of Pond C are not well defined. Although early investigations (E.M. Gilbert Engineering, 1937) indicated a maximum thickness of 43 feet, more recent investigations on the west side of Pond C (Empire Soils Investigations, 1977) described sand and gravel deposits 12 feet thick. It appears likely that these two deposits are continuous, but the degree of hydraulic connection between them is not known. Both deposits are underlain by glacial till.

Fill material, consisting of varying proportions of soil, fly ash, bottom ash, and coal, is extensive across the site and may in places be functioning as a water-bearing deposit. Fill was observed to be in contact with bedrock, the near-surface sand, and the deeper sand and gravel. The degree of interconnection, continuity, and recharge source for water-bearing deposits at Greenidge Station are not well understood.

The elevation of the uppermost water table in new and existing wells was measured on 18 November 1981 and is plotted and contoured on Figure 3. The contours indicate a general pattern of flow of ground water toward Keuka Lake Outlet and Seneca Lake, with overall flow to the north and northeast. There is some ground water mounding beneath the ash ponds. Local variations in permeability may cause significant variations in ground water flow across the site.

Ground water levels in wells penetrating the permeable sand and gravel beds in the vicinity of the ash ponds indicate a 2.0-3.3% flow gradient towards Seneca Lake and Kueka Lake Outlet. The ash ponds may recharge the sand and gravel beds in places, such as immediately south of well CP-77-8 (see Figure 3) where fill material directly overlies highly permeable sand and gravel. In other cases, silt and clay bodies underlie the fill material, and prevent direct infiltration of ash pond water into the sand and gravel beds.

Bedrock at the site is not likely to yield significant quantities of ground water except where fractured. Rock boring information (Empire Soils Investigations, 1977) indicate that the shale and limestone bedrock underlying the unconsolidated deposits has a fractured zone extending to a depth of about 20 feet below the top of rock. Additional scattered fractured zones were observed to depths of 50 feet below the rock surface.

Hydraulic conductivity values range from 1.7×10^{-5} cm/sec to 1.3×10^{-2} cm/sec. The highest values, on the order of 10^{-2} to 10^{-3} cm/sec, were measured in wells completed in natural sands at the eastern end of the site, near Seneca Lake. The lowest values, on the order of 10^{-5} cm/sec, were measured in wells where the entire test length was in bedrock. Hydraulic conductivity in glacial till and fill were intermediate. Thus, bedrock comprises the least conductive strata underlying the site.

While porosity of sand and silt sediments can range from 25% to 50% (Freeze and Cherry, 1979), it is believed that the porosity of the relatively poorly sorted materials at the site is likely to be close to 25%. Average linear velocity, or the rate at which a water particle travels along a linearized path, is directly proportional to hydraulic conductivity and gradient and inversely proportional to porosity. Average linear velocity was computed for ground-water flow in the saturated outwash deposits adjacent to the fly ash and bottom ash ponds. Assuming a hydraulic gradient of 2.0 to 3.3%, hydraulic conductivity of 1.3×10^{-2} cm/sec to 1.7×10^{-5} cm/sec, and

porosity of 25% (Freeze and Cherry, 1979) average linear velocity may range from 1.4 to 1775 feet per year depending on permeability and gradient.

2.1.4 Hydrologic Model of Ground-Water Flow near the Ash Pond

Water percolating from the Greenidge Station ash ponds infiltrates the unconsolidated deposits underlying the site. The highly permeable clean sand unit exposed north of the coal pile is believed to underlie the ash pond area, providing a conduit for the infiltrated water (see Figure 4). Ground water gradients measured within the clean sand body indicate a flow direction to the north and northeast, toward Seneca Lake and Keuka Lake Outlet. Thus ash pond water infiltrating subsurface sediments at the Greenidge Station site are believed to be rapidly transported and discharged to these adjacent surface water bodies. Vertical gradients are unknown, but the contrast between the hydraulic conductivities of the bedrock and the overlying strata suggest that little, if any, of the infiltrated ash pond water infiltrates the bedrock.

2.2 HICKLING STATION

2.2.1 Facility Description

Hickling Station is a stoker-fired coal generating plant located on the Chemung River, approximately 1/2 mile south of Route 17, in East Corning, New York (Figures 1 and 5). The site is bounded by the Chemung River to the south and west, the power plant access road to the north and privately owned land to the east.

Site facilities are shown in Figure 6. Coal is delivered to the site by truck and stored in the coal pile storage area. Although the coal pile is unlined and has no leachate collection system, runoff is directed towards the bottom ash pond.

Bottom ash is sluiced into a pond designed to allow natural percolation of sluice waters. The bottom ash pond also receives an intermittent flow of boiler and

evaporator blowdown, and plant floor drains, as well as sporadic flow from maintenance cleaning waste water and backwash waste water from the water treatment facility. Bottom ash is removed from the receiving end of the sluice pond daily and temporarily stored in the ash storage areas. Percolation rates from the bottom ash ponds average 1,030,000 gpd. All bottom ash is loaded onto trucks and disposed of off-site or sold. Fly ash is temporarily stored dry in a silo and transferred to trucks for permanent off-site disposal.

2.2.2 Site Stratigraphy

Hickling Station is underlain by deposits of Recent alluvium, glacial outwash, and glacial till. A geologic cross-section showing inferred subsurface conditions is shown in Figure 7. Recent alluvial silt and fine sand overlies glacial outwash in the southern part of the site, generally south of the power plant building (Figure 6). Borings in this area encountered 10 to 18 feet of alluvium.

Glacial outwash consisting of a variable mixture of sand, gravel, and some silt directly underlies the northern portion of the site, with no overlying alluvium. The outwash deposits appear to be in hydraulic contact with the Chemung River and may be seasonally recharged by the river. The maximum thickness of outwash deposits underlying the site is judged to be about 20 feet. The measured groundwater table was generally near the top of the outwash deposits. Dense glacial till, consisting of clay, silt, sand, and gravel, underlies the glacial outwash deposits.

Construction and operation activities have significantly modified the natural relief of the site. Fill thicknesses as great as 15 feet were encountered in several borings. Extensive areas of fill, including ash fill, are expected to be presented over much of the site. South of Hickling Station (south of the Chemung River), upland slopes are mantled by till deposits.

Based on the mapped bedrock geology of the adjacent uplands (Fisher et.al., 1970) and on the reported thickness of the West Falls Group in the site vicinity

(2,600 ft.; Rickard, 1975) it is anticipated that the underlying bedrock is sandstone and/or shale of the Devonian West Falls Group. Boring logs and well records in the site vicinity report bedrock in the Chemung River Valley at depths ranging from 60 feet to 80 feet (Randall, 1972). The consistent depths reported both upstream and downstream of the site indicate relatively little variation in the depth to bedrock in this area.

2.2.3 Site Hydrogeology

The glacial outwash deposit underlying the Hickling Station site forms a productive surficial aquifer, and is in direct hydraulic contact with the Chemung River. Ground-water flow in the surficial aquifer is towards the southeast, however, infiltration of water from the ash pond appears to have caused a local perturbation in the regional ground water gradient. A contour map of ground-water elevations measured in six on-site monitoring wells is shown in Figure 6. A ground-water mound beneath the bottom ash pond forms a ground-water high from which localized flow extends outward in all directions. Some ground-water mounding also appears to be present at the coal storage pile.

Data are insufficient to determine the lateral extent of effects of mounding at the bottom ash pond and coal storage pile. However, from regional information and the local configuration of the water table, monitoring well OW-76-3, at the north end of the site, does not appear to be significantly affected. This well is considered to be upgradient of site coal and ash storage facilities, and may represent the lateral extent of mounding due to ash-pond water infiltration. Likewise, some distance beyond the existing wells northeast and southeast of the bottom ash pond and coal storage pile, ground-water flow is expected to rejoin the general site gradient from northwest to southeast.

Short-term aquifer tests were conducted in seven monitoring wells at Hickling Station to determine in-situ hydraulic conductivity (permeability) of sediments underlying the site. Generally, hydraulic conductivity in the sand and gravel outwash

deposits alone was on the order of 1×10^{-3} cm/sec, with values ranging from 6×10^{-2} cm/sec to 6×10^{-4} cm/sec.

Based on the ground-water elevation contour map, the gradient of the ground-water mound extending radially outward from the bottom ash pond and the coal storage pile is approximately 2.9% (155 feet per mile). This gradient is expected to decrease rapidly with distance from the pond and the coal pile. The gradient between monitoring well OW-76-2, near the northern edge of the coal storage pile, and well OW-76-3, which is believed to be beyond ground-water mounding effects, is only approximately 0.1% (6 feet per mile). The gradient for ground-water flow to the southeast, beyond all influence of ground-water mounding due to the bottom ash pond and coal storage pile, is not known. From regional information, gradients of 0.01% to 0.1% would be expected.

While porosity of sand and silt sediments can range from 25% to 50% (Freeze and Cherry, 1979), it is believed that the porosity of the relatively poorly sorted materials at the site is likely to be close to 25%. Average linear velocity, or the rate at which a water particle travels along a linearized path, is directly proportional to hydraulic conductivity and gradient and inversely proportional to porosity. Average linear velocity was computed for ground-water flow in the saturated outwash deposits adjacent to the bottom ash pond and coal storage pile. Assuming a hydraulic gradient of 2.9%, hydraulic conductivity of 6×10^{-2} cm/sec to 6×10^{-4} cm/sec, and porosity of 25% (Freeze and Cherry, 1979) average linear velocity may range from 72 to 7200 feet per year depending on permeability.

2.2.4 Hydrologic Model of Ground-Water Flow near the Ash Pond

Water percolating from the Hickling Station bottom ash pond quickly infiltrates the unconsolidated sediments underlying the site. The highly permeable glacial outwash aquifer encountered at 8 to 18 feet below ground surface provides a conduit for the escaping pond water (see Figure 7). Ground water gradients measured within this aquifer indicate a regional flow direction to the southeast, toward the Chemung

River. Thus ash pond water infiltrating subsurface sediments at Hickling Station is rapidly transported and discharged into the Chemung River. Vertical gradients at the site are unknown, but the till underlying the near-surface sandy strata are judged to have low permeability. Due to the contrast in hydraulic conductivities between the sands and till, essentially all of the ash pond effluent is judged to flow toward the Chemung River.

2.3 JENNISON STATION

2.3.1 Facility Description

Jennison Station is a stoker-fired coal generating plant located on the Susquehanna River in the Town of Bainbridge, New York (Figures 1 and 8). The site is bounded by the Delaware and Hudson Railroad and Route 7 to the west and the Susquehanna River to the east. To the south the property terminates at private lots.

A plan of site facilities is shown in Figure 9. Coal is delivered to the site by truck and stored in the coal storage pile. The coal pile is unlined with no system for runoff or leachate collection. Fly ash is temporarily stored in a silo and transferred to trucks for permanent disposal off site.

Bottom ash is sluiced into a pond which is partitioned into three sections. The sluice pond is unlined, however, 810,000 gallons per day of sluice water is recirculated to Jennison Station. Percolation rates from the ash pond average 259,000 gpd. The bottom ash pond also receives an intermittent flow from boiler and evaporator blowdown and floor drains, and a sporadic flow from maintenance cleaning washes. An emergency outlet to prevent overtopping of the sluice pond embankments is located in the north end of the sluice pond. This outlet has not been used since its construction in 1978.

Bottom ash is removed from the "receiving" section of the sluice pond daily and temporarily stored in the ash storage area, which drains towards the ash pond. Bottom ash is loaded into trucks and disposed of off-site or sold.

2.3.2 Site Stratigraphy

Jennison Station is underlain by silty sediments believed to be Recent alluvium deposited by the Susquehanna River. A geologic cross-section showing inferred subsurface conditions is shown in Figure 10. The lower part of these deposits may include glacial lacustrine fine sand and silt, which is similar in texture to the alluvium. The fine grained alluvium and/or lacustrine deposits overlie glacial outwash at depths of approximately 15 feet to 25 feet. The outwash consists of gravel and sand with some silt, grading to fine sand with a trace of silt. The saturated zone at the site was generally encountered at or near the top of the outwash deposits.

Glacial outwash deposits are believed to directly underlie fill material at the western edge of the coal pile and in the area west of the generating station. West of the site boundary, bedrock slopes are mantled by glacial till.

Construction and operation activities have significantly modified the original topography of the site. Fill, including coal and ash as thick as 10 feet, has been encountered and is expected to overlie the natural deposits over most of the site. Preconstruction test borings in the area of the generating station show the presence of thick clay and clay-sand layers in the alluvium which may act as local confining layers. These strata were not encountered in any subsequent investigations.

Based on reported thicknesses of unconsolidated deposits in this area (Hollyday, 1969) and on available boring logs and well records in the site vicinity (Randall, 1972), depth to bedrock at the site area is expected to be more than 200 feet. Bedrock underlying the surficial deposits was not encountered in any of the borings completed as part of WCC's 1981-1982 investigation. Based on the reported thickness of the surficial deposits in this area (greater than 200 feet, Hollyday, 1969) and on

available boring logs and well records in the site vicinity (Randall, 1972) depth to bedrock underlying the site area is expected to be 200 feet or more. It is anticipated that the underlying bedrock consists of sandstone and shale of the Devonian Genesee Group.

2.3.3 Site Hydrogeology

Ground-water flow in the Jennison Station area is expected to follow approximately the gradient of the Susquehanna River. Between the city of Sidney, which is upstream of the site, and the New York-Pennsylvania boundary, which is downstream of the site, the Susquehanna River generally flows southwest. Local stretches flow south, southeast, or west. Adjacent to the site the river flows southeast, and thus the regional ground-water gradient in unconsolidated deposits within approximately one-quarter mile of the site is expected to be the southeast, down-valley and toward the river.

Locally, ground-water flow at the site has components both to the east toward the Susquehanna River, and to the south, in the river's downstream direction. A contour map of ground-water elevations measured in eight on-site monitoring wells is shown in Figure 9. The general flow direction across the site is southeast from west of the ash stockpile area toward the plant building. However, in the area of the bottom ash pond, the relatively high water levels at OW-76-3, MW-81-2, and OW-76-4, indicate that infiltration of sluice waters has produced a ground-water mounding effect. Ground water appears to flow outward from the pond area on at least the north, east, and south sides. Data are insufficient to determine the lateral extent of mounding. However, except for well OW-76-3, wells south of the bottom ash pond do not appear to be significantly affected, and local ground-water elevation contours in that area conform to expected regional patterns.

Short-term aquifer tests were conducted in eight monitoring wells at Jennison Station to determine in-situ hydraulic conductivity (permeability) of sediments underlying the site. Hydraulic conductivity in the outwash deposits ranged from

1×10^{-3} cm/sec to 1×10^{-5} cm/sec. Falling head tests conducted with test intervals spanning both the fine grained alluvial/lacustrine sediments as well as coarser glacial outwash indicate that hydraulic conductivity of the fine grained material is likely to be on the order of 1×10^{-5} cm/sec or less.

The gradient of the ground-water mound extending radially outward from the bottom ash pond is approximately 30% (1584 feet per mile). This gradient appears to decrease rapidly with distance from the pond. The gradient between monitoring well OW-76-3 at the south end of the bottom ash pond, and well MW-81-1, which is believed to be beyond ground-water mounding effects, is approximately 1.0% (53 feet per mile).

While porosity of sand and silt sediments can range from 25% to 50% (Freeze and Cherry, 1979), it is believed that porosity of the relatively poorly sorted materials at the site is close to 25%. Average linear velocity or the rate at which water particle travels along a linearized path, is directly proportional to hydraulic conductivity and gradient and inversely proportional to porosity. Assuming a hydraulic gradient of 1.0% to 30%, hydraulic conductivity of 2.9×10^{-5} cm/sec to 3.4×10^{-3} cm/sec, and porosity of 25% (Freeze and Cherry, 1979), average linear velocity may be as low as 1 foot per year to as high as 3700 feet per year.

2.3.4 Hydrologic Model of Ground Water Flow near the Ash Pond

Drainage from the Jennison Station bottom ash pond infiltrates the unconsolidated sediments underlying the site. The highly permeable glacial outwash aquifer encountered at 16 to 22 feet below ground surface provides an effective conduit for the escaping pond water (see Figure 10). Ground water gradients measured within this aquifer indicate a regional flow direction to the southeast, toward the Susquehanna River. Thus, ash pond water infiltrating subsurface sediments at Jennison Station is rapidly transported and discharged into the Susquehanna River. Vertical gradients are unknown, but expected contrasts in hydraulic conductivities between permeable outwash and underlying strata with probable interbeds of clay

are likely to influence ground-water flow. Ground-water flow from the pond is likely to flow horizontally toward the river preferentially to vertical flow into bedrock.

3.0 CONCLUSIONS

3.1 MOVEMENT OF ASH PARTICLES THROUGH POROUS SUBSURFACE MEDIA

The ability of ash particles to be transported through subsurface sediments is dependent upon the grain size of the ash particles in relation to the size of the subsurface pores through which they must pass. Grain size analyses of ash particles and subsurface sediments have been conducted by Woodward-Clyde Consultants, and the resultant grain size distribution curves are presented in Appendix A. Filtration criteria developed by Terzaghi and Peck (1948) and the U.S. Corps of Engineers (1941), later modified by LaFleur (1948), were applied to the grain size data to determine whether ash particles suspended in the ash pond water are effectively filtered out during percolation of pond water into the ground.

Basically, these criteria address two fundamental requirements of filtration: 1) Piping Requirement: pore spaces must be small enough to prevent particles from being washed through them; 2) Permeability Requirement: pore spaces must be large enough to let all water freely escape (Cedergren, 1977). If both these requirements are met, the tested material will serve as an effective filtration medium. The permeability requirement is known to have been satisfied at all three NYSEG ash ponds under consideration, because ongoing discharge of sluice water into the ponds is actively being drained through subsurface materials.

To satisfy the piping requirement, three ratios comparing subsurface grain size to ash grain size must be evaluated. These are expressed as:

$$\frac{D_{15S}}{D_{85A}} < 5, \frac{D_{50S}}{D_{50A}} < 25, \frac{D_{15S}}{D_{15A}} < 20$$

where: D15S = 15th percentile of subsurface sediment grain size distribution, etc.
and D85A = 85th percentile of ash grain size distribution, etc.
Source: U.S. Corps. of Engineers, 1948

Table 1 lists the grain size percentiles from materials at each NYSEG ash pond site needed to calculate piping requirement ratios. Subsurface sediment samples were obtained from borings adjacent to the ash ponds, and are considered representative of the water-bearing units underlying each pond.

Table 2 presents the results of the piping requirement tests for each NYSEG ash pond site. All values calculated are far below the threshold limits observed by Terzaghi and Peck (1948) and the U.S. Corps. of Engineers (1948), thus all subsurface materials underlying the ash ponds are considered to be effective filtration media, thereby preventing the migration of suspended ash particles into subjacent ground-water aquifers.

3.2 RECOMMENDED GROUNDWATER MONITORING NEAR ASH POND SITES

3.2.1 Groundwater Monitoring System

Hydrogeologic investigations at each NYSEG ash pond site have revealed several important similarities in the conditions at each site:

1. The surficial aquifer is situated in unconsolidated sediments underlying the ash pond;
2. Ground-water flow in the surficial aquifer is directed toward, and discharged into an adjacent surface water body;
3. Most water entering the ground flows rapidly toward the surface water body;
4. Percolation of ash pond water into subsurface sediments has produced a localized ground-water mounding effect.

With these hydrogeologic similarities in mind, a generalized approach to ground water monitoring at ash pond sites may be developed. Figure 11 presents a conceptual model for a ground water monitoring system at a typical NYSEG ash pond site. Ground water entering the site can be monitored by a well located upgradient from all generating station facilities and beyond the mounding effect. This upgradient well can be used to assess the background quality of ground water before it is influenced by ash pond percolation.

A downgradient monitoring well located between the ash pond and the adjacent surface water receiving body can be used to evaluate the quality of discharge provided there is minimal change in the quality of water from the ash pond to the ground water discharge point. As will be shown in the following section, there is little difference between the quality of pond water and downgradient well water.

3.2.2 Ground Water Quality and Sampling Techniques

Chemical analyses for concentrations of trace metal constituents have been performed on filtered and unfiltered samples from each NYSEG ash pond site, and the results of these analyses are presented in Appendix B. Filtered and unfiltered samples were collected from ash pond water, and filtered samples were collected from downgradient wells at each site. The 'dissolved metals' analysis is derived from filtered samples, while the 'total metals' analysis is derived from unfiltered samples.

Comparisons between the dissolved and total metals analyses at each site indicate that filtered well samples generally contain similar concentrations of trace metals to filtered ash pond samples. Thus, filtered downgradient well samples can be considered representative of discharge to ground water of ash pond effluent.

In contrast, total metals analysis of downgradient well samples cannot be considered representative of groundwater discharge from the ash ponds. As demonstrated in Section 3.1, suspended ash particles are not transported with ground

water through subsurface sediments. Therefore, any suspended sediment in the well sample is not derived from the ash pond, but is a result of well construction in unconsolidated fine-grained sediment. Total metals analysis of such a sample would indicate artificially escalated trace metals concentrations, due to dissolution of adsorbed metals on particle surfaces.

Sampling devices used to monitor the quality of discharge to ground water of ash pond effluent should employ several filtration mechanisms to ensure that all suspended sediments are removed from the samples prior to fixation of samples for metals analysis. Sampling devices should be fitted with porous polyethylene tips with a 50-micron pore size, and should be installed with a suitably-graded sand filter. After the sample has been removed from the device, it should be filtered with a 0.45 micron pore size membrane. This pore size has been found to be experimentally satisfactory (Gibb et.al., 1981), and is recommended by the U.S. Environmental Protection Agency (1984). Analysis should be performed on a filtered sample that has been fixed, after filtration, in accordance with accepted analytical procedures.

Current requirements of the SPDES permits for the NYSEG generating stations stipulate that NYSEG monitor total metals concentrations of ash pond water. As demonstrated in this report, chemical quality of ash pond discharge to ground water is best represented by the concentration of dissolved metals in the ash pond, because suspended particulates included in the total metals analysis do not enter ground water. Therefore, any samples of ash pond water that will be collected to measure the quality of effluent discharge to ground water must be filtered through a 0.45 micron filter before fixation.

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TABLE I
GRAIN SIZE PERCENTILES OF FLY ASH,
BOTTOM ASH AND SUBSURFACE SEDIMENT

	ASH PARTICLES		
	<u>D15A</u>	<u>D50A</u>	<u>D85A</u>
Greenidge Fly ash	0.005	0.009	0.058
Greenidge Bottom ash	0.07	0.6	5.5
Hickling Bottom ash	0.21	2.2	9.7
Jennison Bottom ash	3.2	10	22
	SUBSURFACE SEDIMENT		
	<u>D15S</u>	<u>D50S</u>	
Greenidge	0.004	0.01	
Hickling	0.55	14	
Jennison	0.02	0.45	

Note: D15, D50, D55 are diameters for given percentile
All measurements in mm.

TABLE 2
 FILTRATION EFFECTIVENESS
 OF SUBSURFACE SEDIMENTS

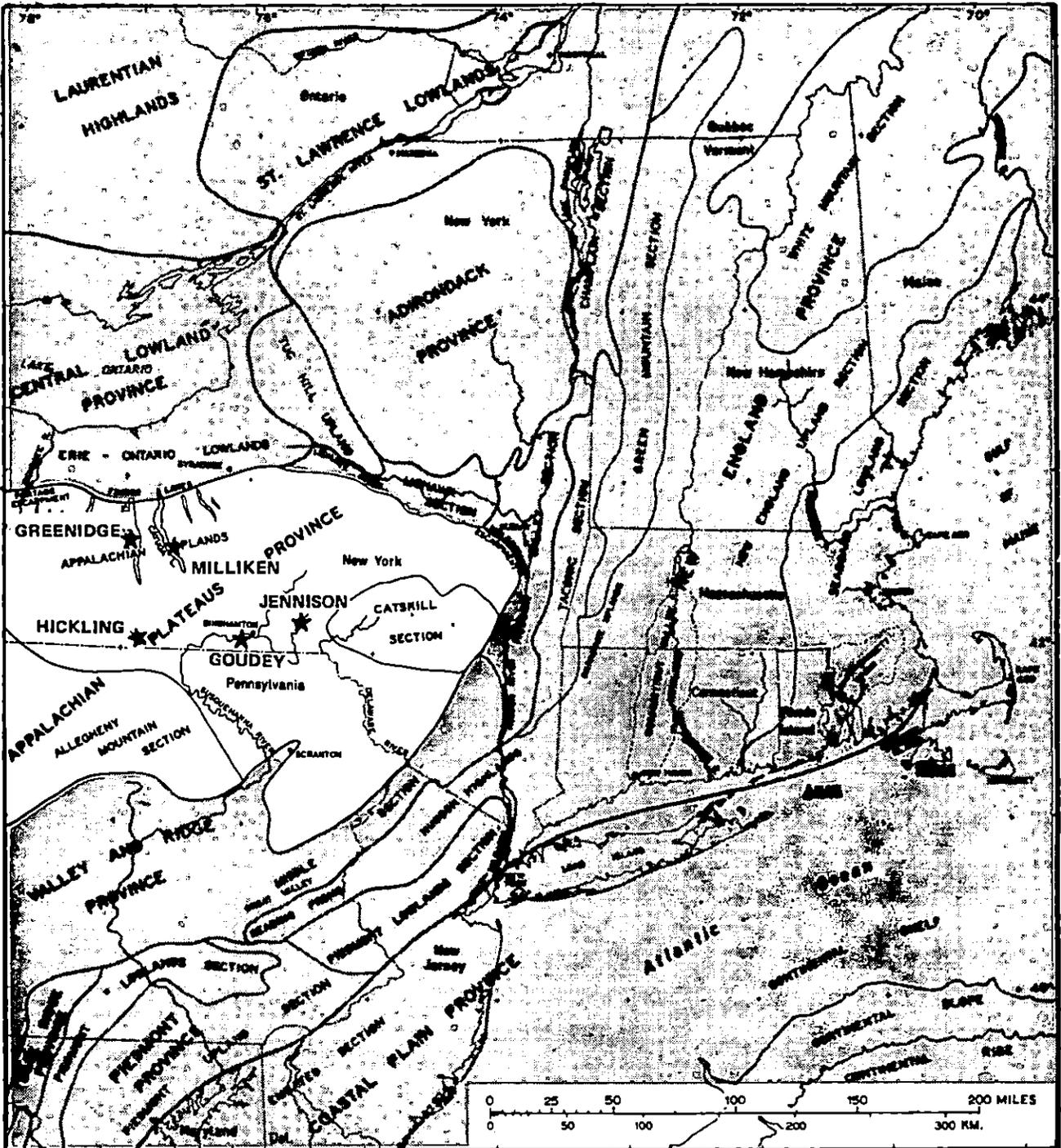
	$\frac{D15S}{D85A}$	$\frac{D50S}{D50A}$	$\frac{D15S}{D15A}$
Criterion	<5	<25	<20
Greenidge Fly ash	0.0689	1.11	0.8
Greenidge Bottom ash	0.00072	0.0167	0.143
Hickling Bottom ash	0.057	6.36	2.62
Jennison Bottom ash	0.00091	0.045	0.00625
Conclusion*	S	S	S

*Note: S/U - successful/unsuccessful filter

TABLE I
GRAIN SIZE PERCENTILES OF FLY ASH,
BOTTOM ASH AND SUBSURFACE SEDIMENT

	ASH PARTICLES		
	<u>D15A</u>	<u>D50A</u>	<u>D85A</u>
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Greenidge	0.004	0.01	
Hickling	0.55	14	
Jennison	0.02	0.45	

Note: D15, D50, D55 are diameters for given percentile
All measurements in mm.



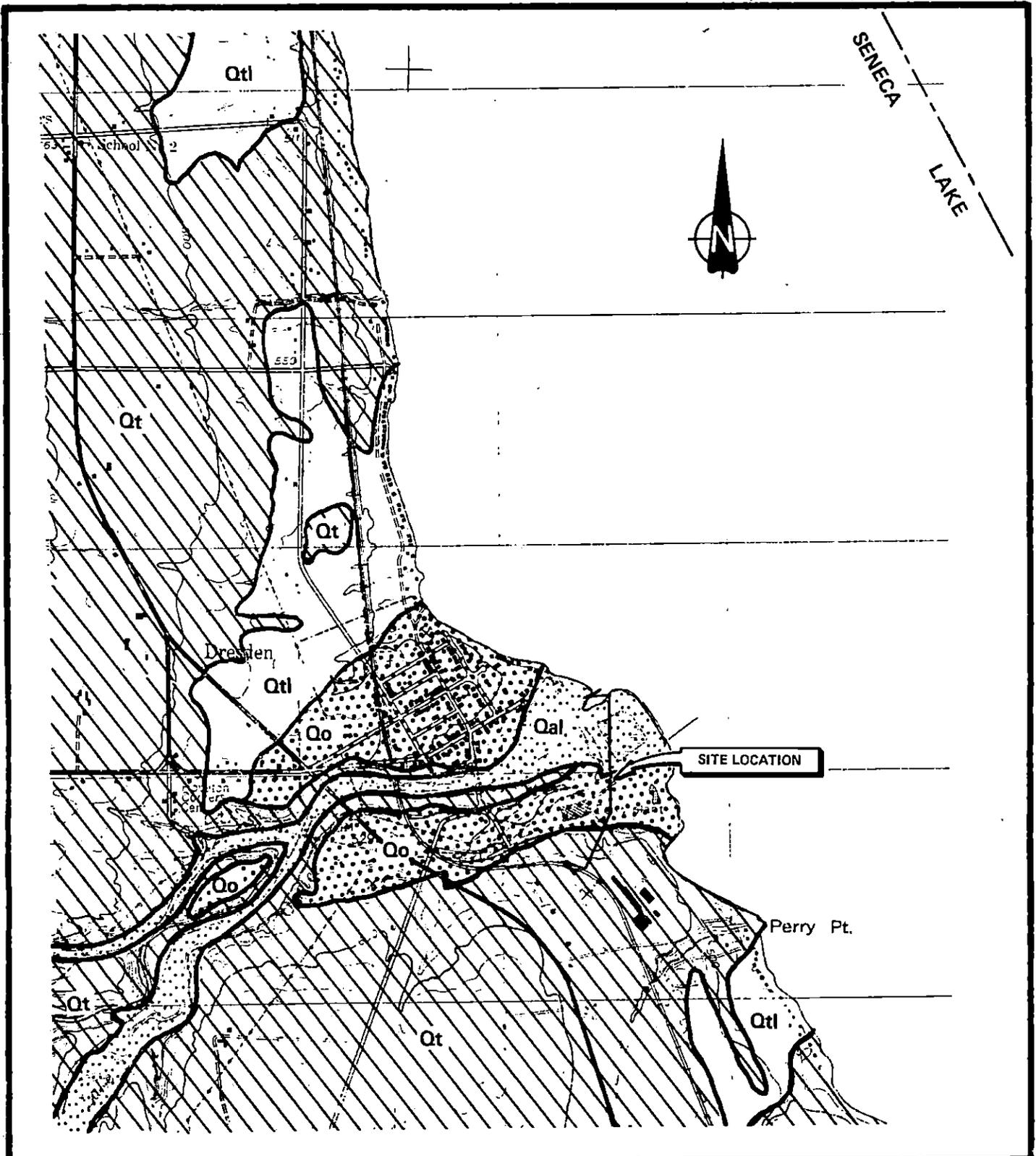
AFTER - WESTON GEOPHYSICAL RESEARCH CORP., 1979

**REGIONAL PHYSIOGRAPHY AND SITE LOCATION MAP
NEW YORK STATE ELECTRIC & GAS CORPORATION**

WOODWARD—CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

DR. BY: DRS	SCALE: AS SHOWN	PROJ. NO.: B1C4139
CK'D. BY: ND	DATE: 4 DEC 1981	FIG. NO.: 1



LEGEND

-  Qal = Alluvium
-  Qt = Till
-  Qtl = Till overlain by lacustrine deposits
-  Qo = Outwash
-  = Location of geologic section (Fig. 4)

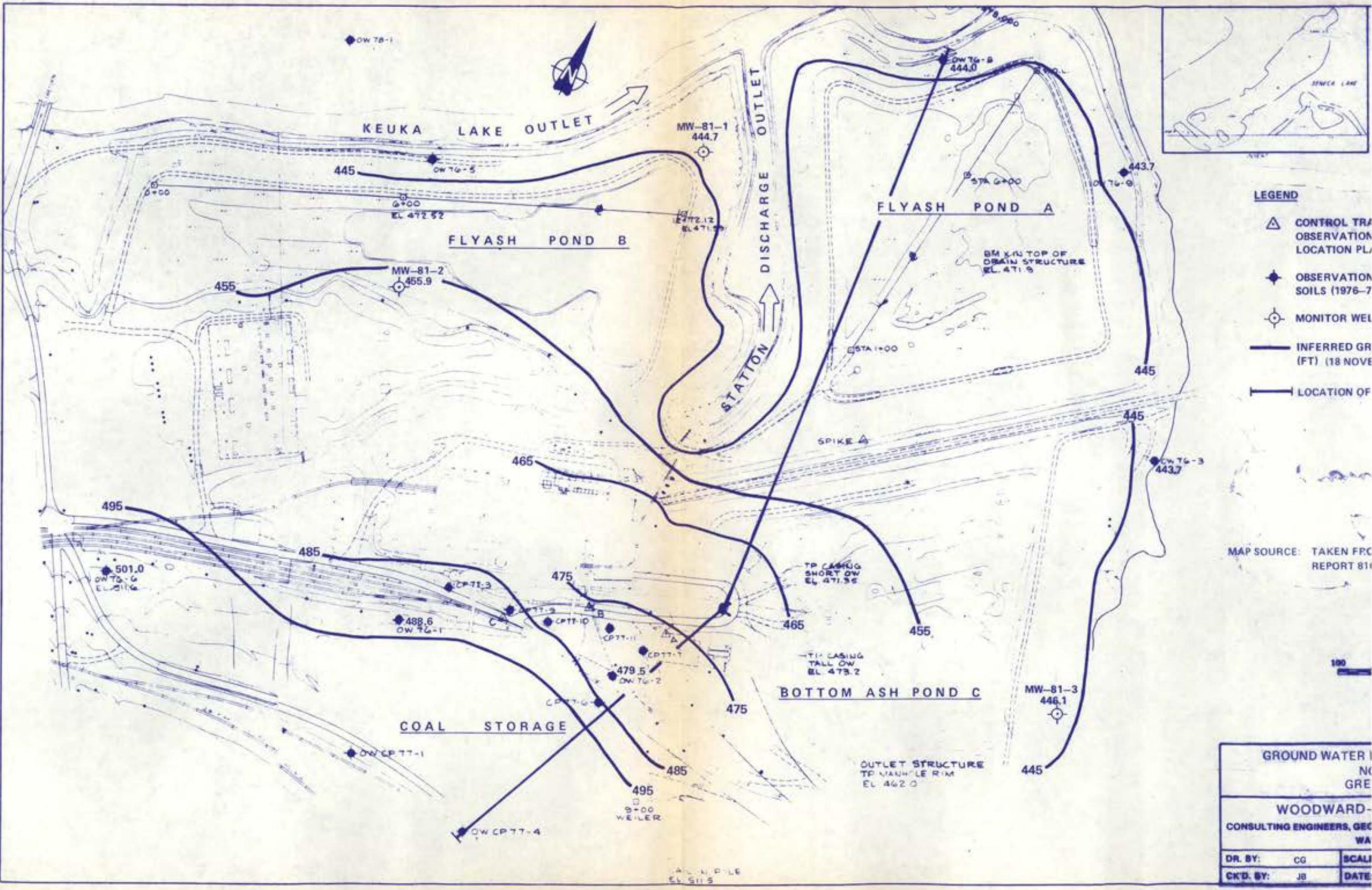
NOTES:

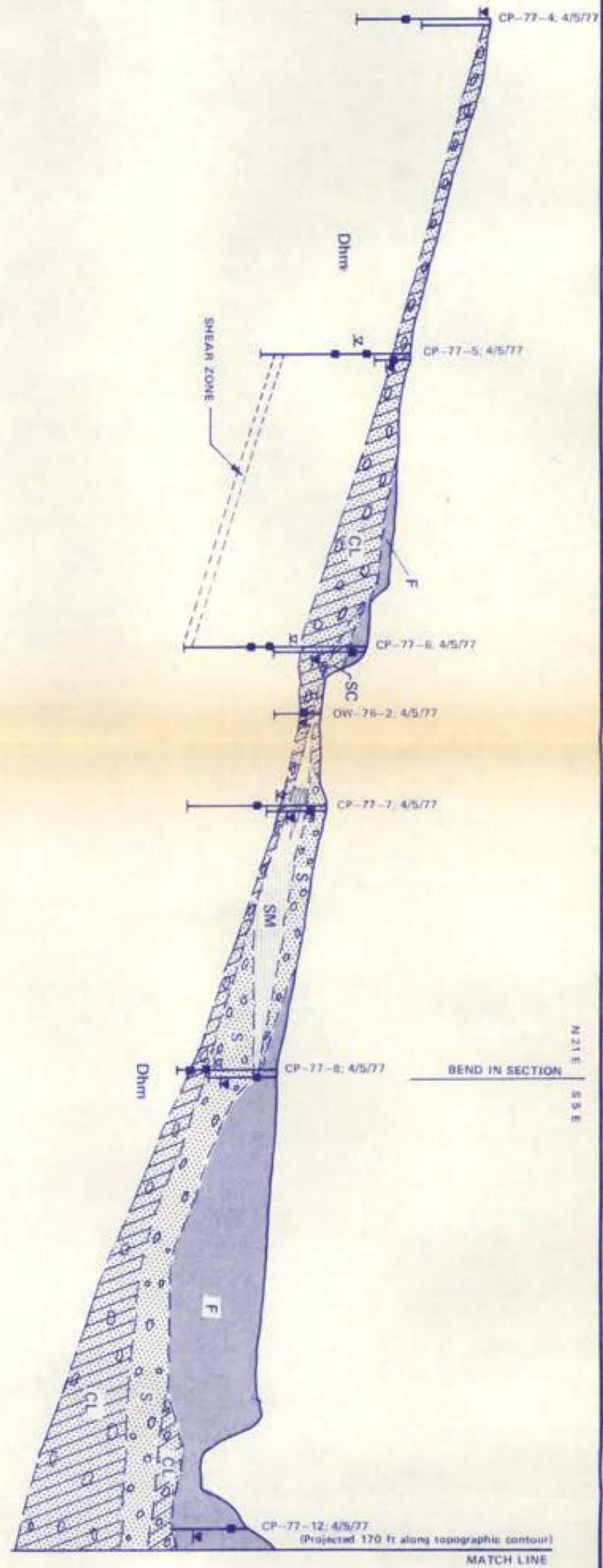
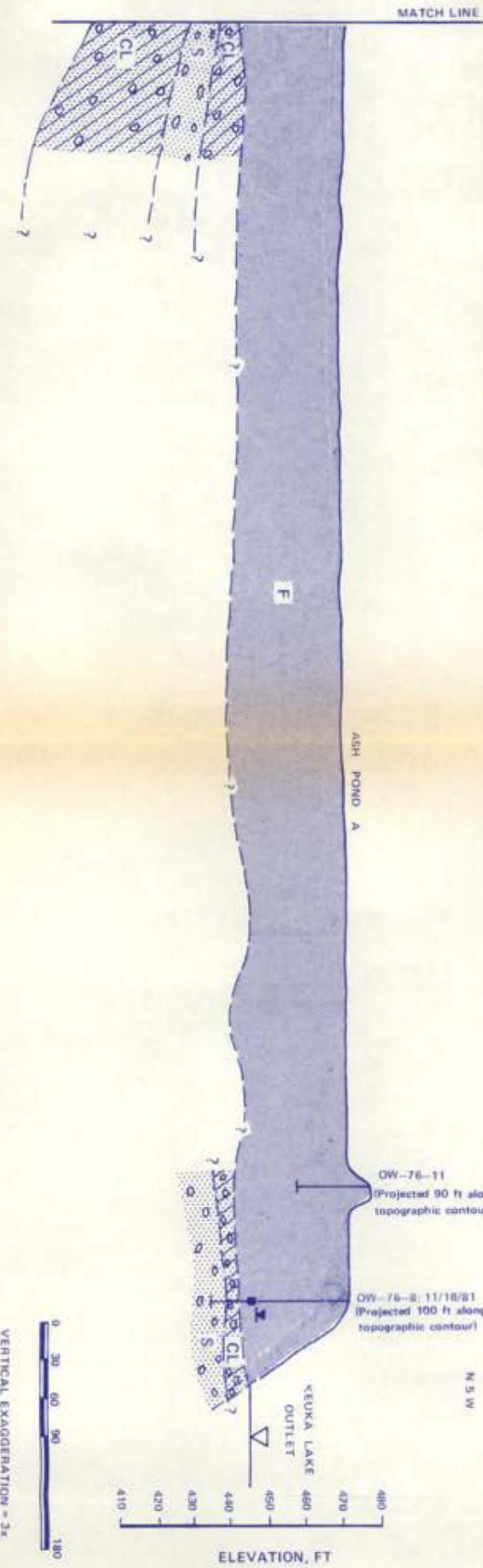
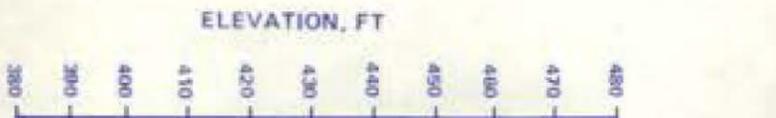
1. BASE MAP: USGS 7.5 minute topographic map, Dresden Quadrangle, NY (1878)
2. Geologic information from Pearson and Cline, 1968

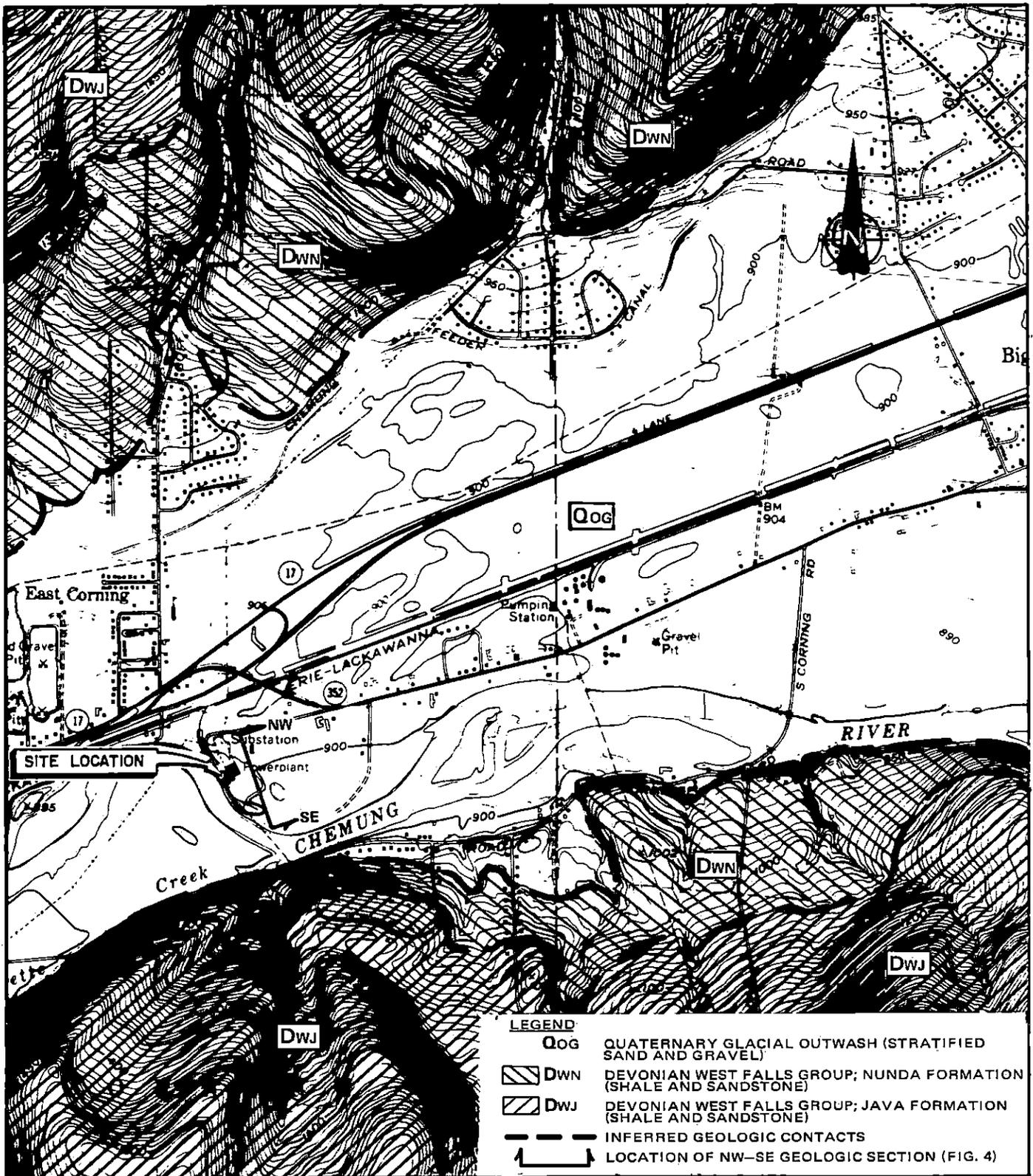
**SURFICIAL GEOLOGIC MAP OF SITE VICINITY
GREENIDGE STATION**

WOODWARD—CLYDE CONSULTANTS
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

DR. BY: AS	SCALE: 1 IN. = 2000 FT	PROJ. NO.: 81C4139-66
CK'D. BY: DRG	DATE: 8 FEB 1982	FIG. NO.: 2







NOTES:

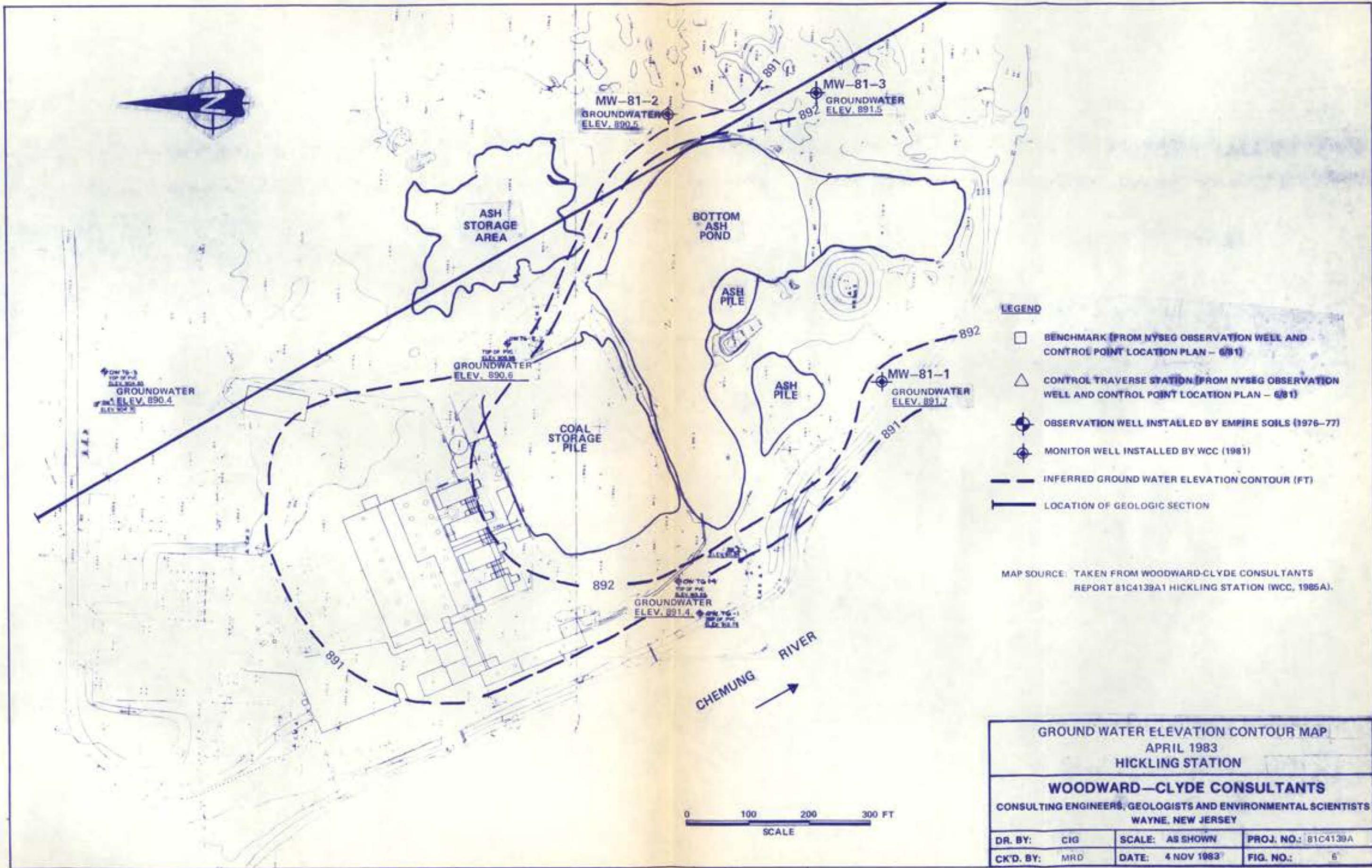
1. MAP SOURCE: TOPOGRAPHIC MAP TAKEN FROM U.S.G.S. SEELEY CREEK AND BIG FLATS 7.5 MINUTE QUADRANGLES
2. GEOLOGIC CONTACTS AFTER RICKARD, L.V. AND FISCHER, D.W., "GEOLOGIC MAP OF NEW YORK"; 1970 AND HOLLYDAY, E.F. "AN APPRAISAL OF THE GROUND WATER RESOURCES OF THE SUSQUEHANNA RIVER BASIN IN NEW YORK STATE", 1969
3. GLACIAL OUTWASH OVERLAIN BY RECENT ALLUVIUM IN SOME AREAS; DETAILED RELATIONSHIP SHOWN ON FIGURE 4

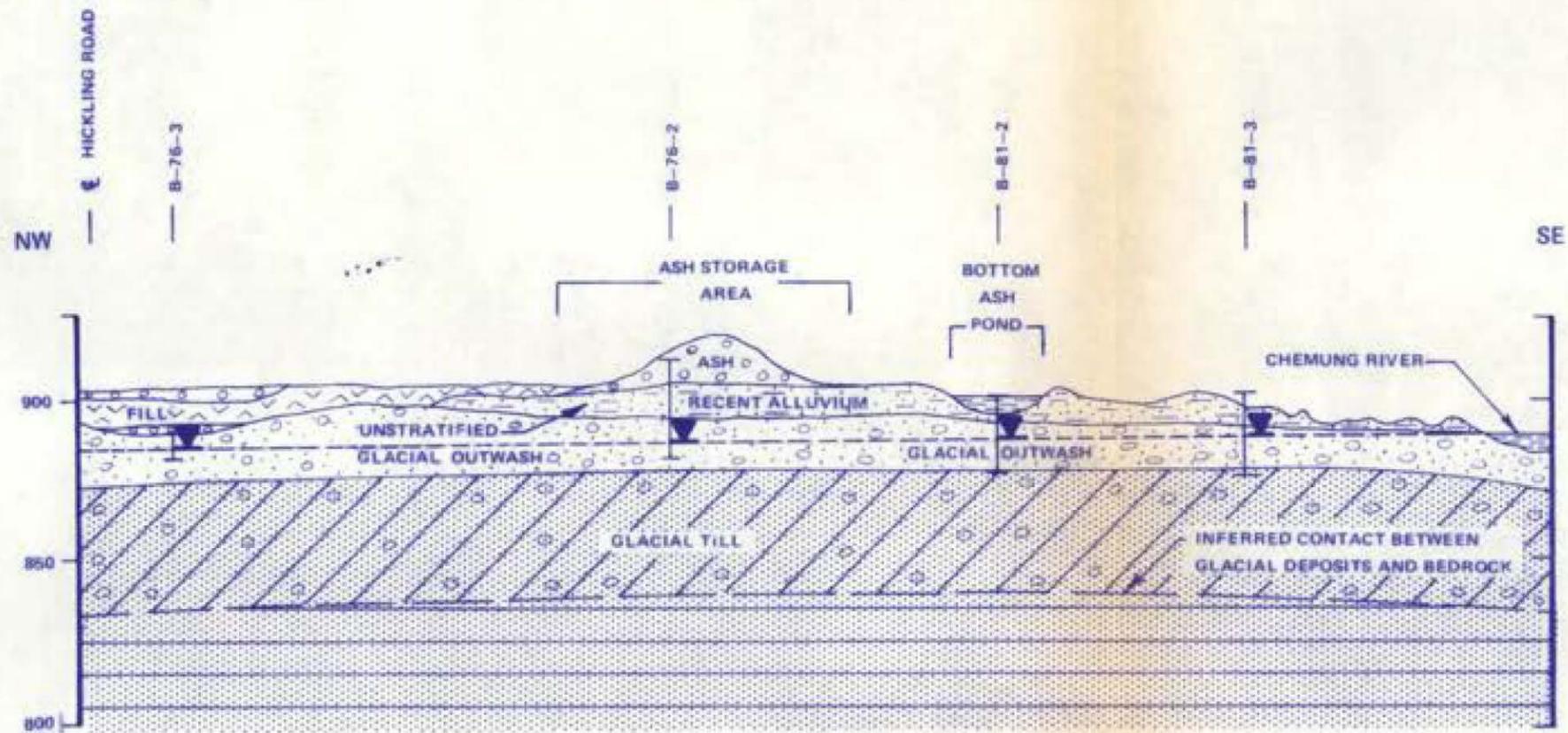
**GEOLOGIC MAP OF SITE VICINITY
HICKLING STATION**

WOODWARD—CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

DR. BY:	CIG	SCALE: 1 IN. = 2000 FT	PROJ. NO.: 81C4139-26
CK'D. BY:	DRG	DATE: 13 NOV 1981	FIG. NO.: 5





LEGEND

- ASH
- EARTHEN FILL
- VARIABLE SAND, SILT MIXTURE
- SAND AND GRAVEL
- VARIABLE SILT-CLAY-SAND-GRAVEL MIXTURE
- DEVONIAN NUNDA FORMATION SANDSTONE WITH INTERBEDDED SHALE
- OBSERVED GROUND WATER LEVEL
- INFERRED GROUND WATER TABLE

NOTES

1. SEE FIGURE 6 FOR LOCATION OF SECTION LINE
2. PROFILE IS INTENDED AS AN AID IN VISUALIZING CONTINUITY OF SUBSURFACE CONDITIONS, BOUNDARY LINES HAVE BEEN INFERRED FROM THE BORING DATA AND FROM HOLLYDAY, 1969 AND REISENAUER, 1977b. VARIATION IN THE LOCATIONS OF THE BOUNDARIES CAN BE ANTICIPATED.
3. BORING LOCATIONS SHOWN MAY BE PROJECTED TO PROFILE.
4. TAKEN FROM WOODWARD-CLYDE CONSULTANTS REPORT 81C4139A1 HICKLING STATION (WCC, 1985A).

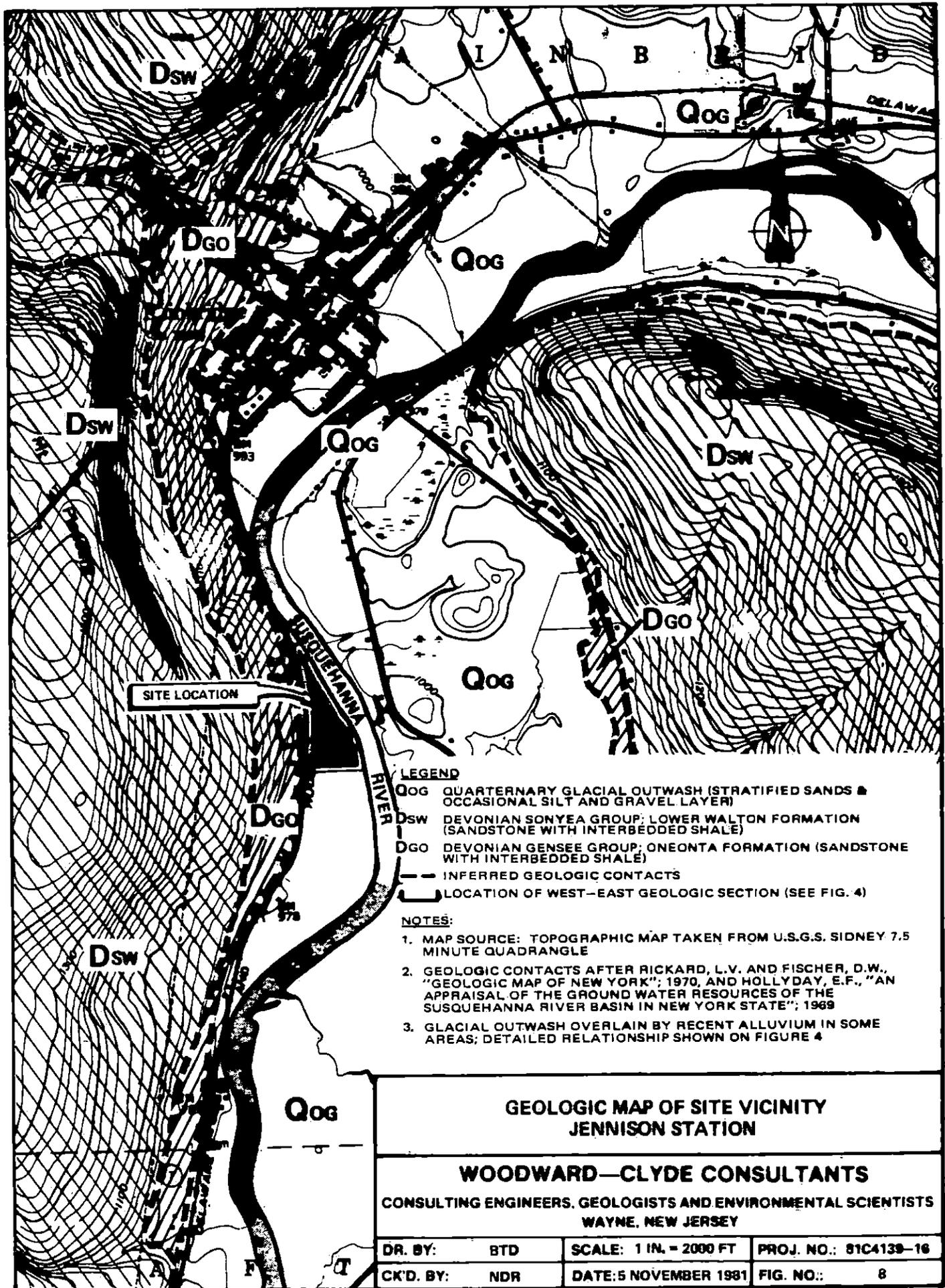


**NW-SE GEOLOGIC SECTION
HICKLING STATION**

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

DR. BY: AS	SCALE: AS SHOWN	PROJ. NO.: 81C4139-26
CK'D. BY: DRG	DATE: 2 DECEMBER 1981	FIG. NO.: 7

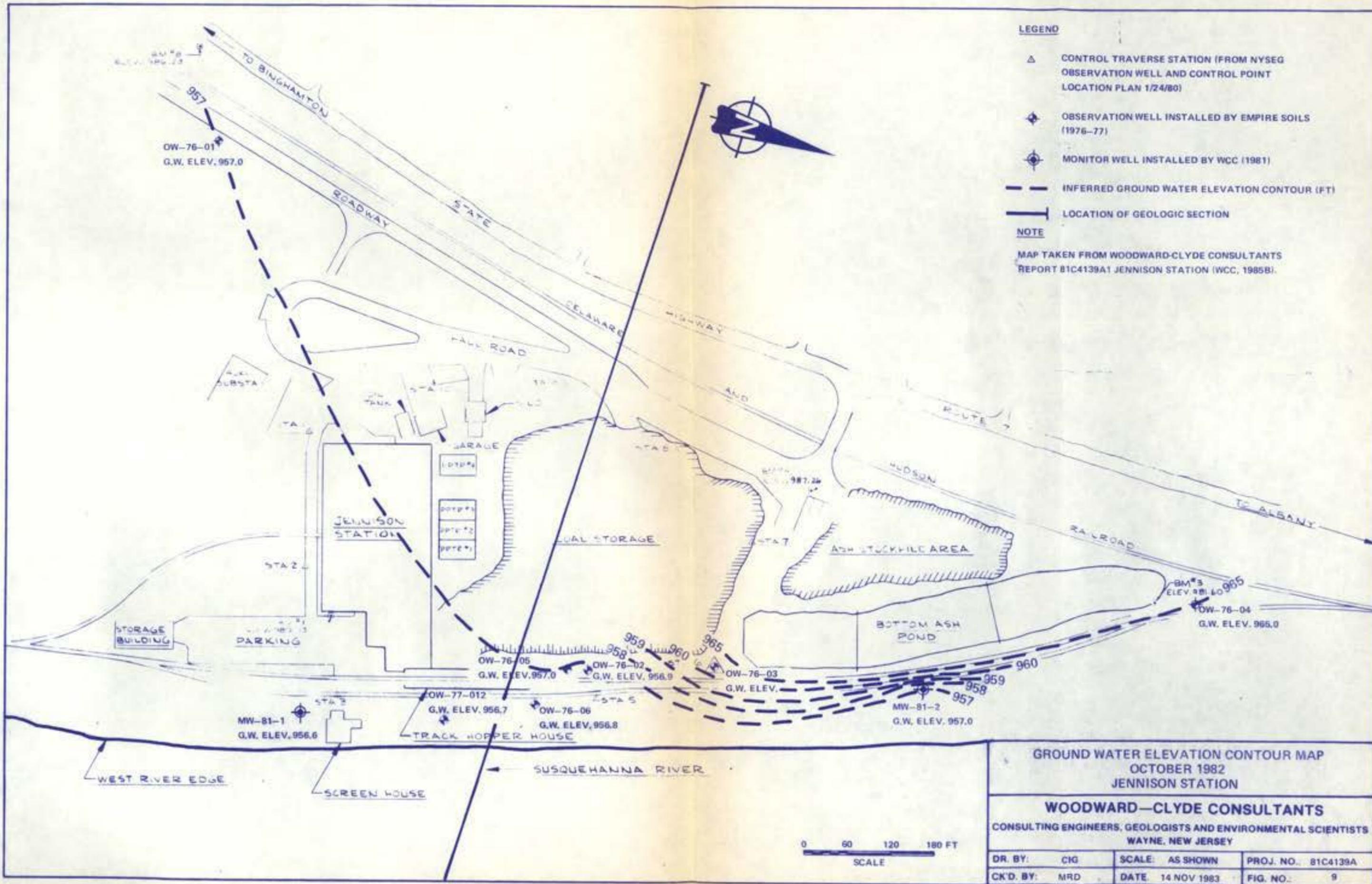


**GEOLOGIC MAP OF SITE VICINITY
JENNISON STATION**

WOODWARD—CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

DR. BY:	BTD	SCALE: 1 IN. = 2000 FT	PROJ. NO.: 81C4139-16
CK'D. BY:	NDR	DATE: 5 NOVEMBER 1981	FIG. NO.: 8



LEGEND

- △ CONTROL TRAVERSE STATION (FROM NYSEG OBSERVATION WELL AND CONTROL POINT LOCATION PLAN 1/24/80)
- ◆ OBSERVATION WELL INSTALLED BY EMPIRE SOILS (1976-77)
- ⊕ MONITOR WELL INSTALLED BY WCC (1981)
- - - INFERRED GROUND WATER ELEVATION CONTOUR (FT)
- |— LOCATION OF GEOLOGIC SECTION

NOTE

MAP TAKEN FROM WOODWARD-CLYDE CONSULTANTS REPORT B1C4139A1 JENNISON STATION (WCC, 1985B).

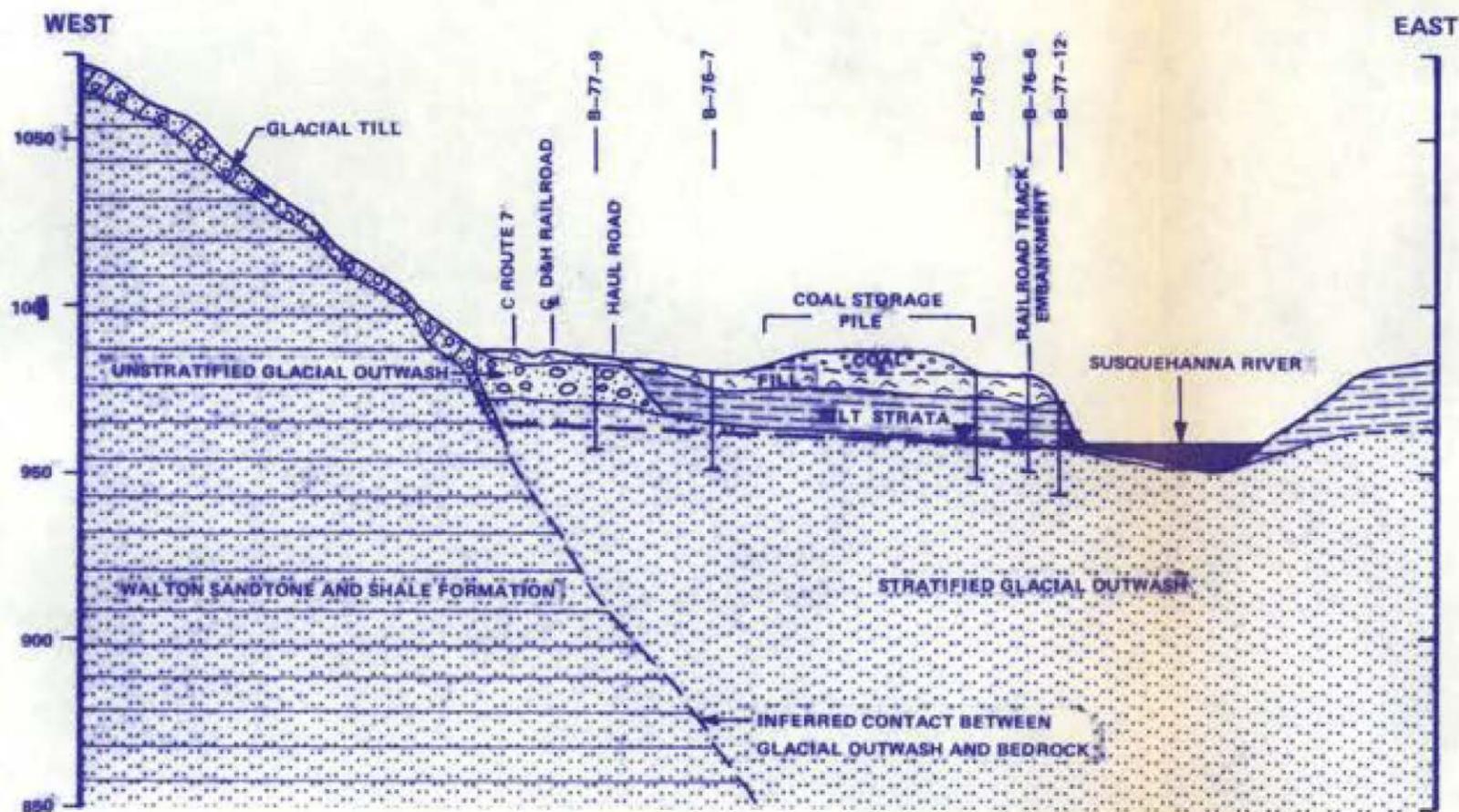
GROUND WATER ELEVATION CONTOUR MAP
OCTOBER 1982
JENNISON STATION

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

DR. BY: CIG	SCALE: AS SHOWN	PROJ. NO.: B1C4139A
CK'D. BY: MRD	DATE: 14 NOV 1983	FIG. NO.: 9





LEGEND

- SILT (OCCASIONAL FINE SAND LAYERS)
- SAND (OCCASIONAL SILT AND GRAVEL LAYERS)
- VARIABLE SILT-SAND-GRAVEL-MIXTURE
- VARIABLE SILT-CLAY-SAND-GRAVEL MIXTURE
- DEVONIAN WALTON FORMATION: SANDSTONE WITH INTERBEDDED SHALE
- INFERRED GROUND WATER TABLE
- GROUND WATER LEVEL

NOTES:

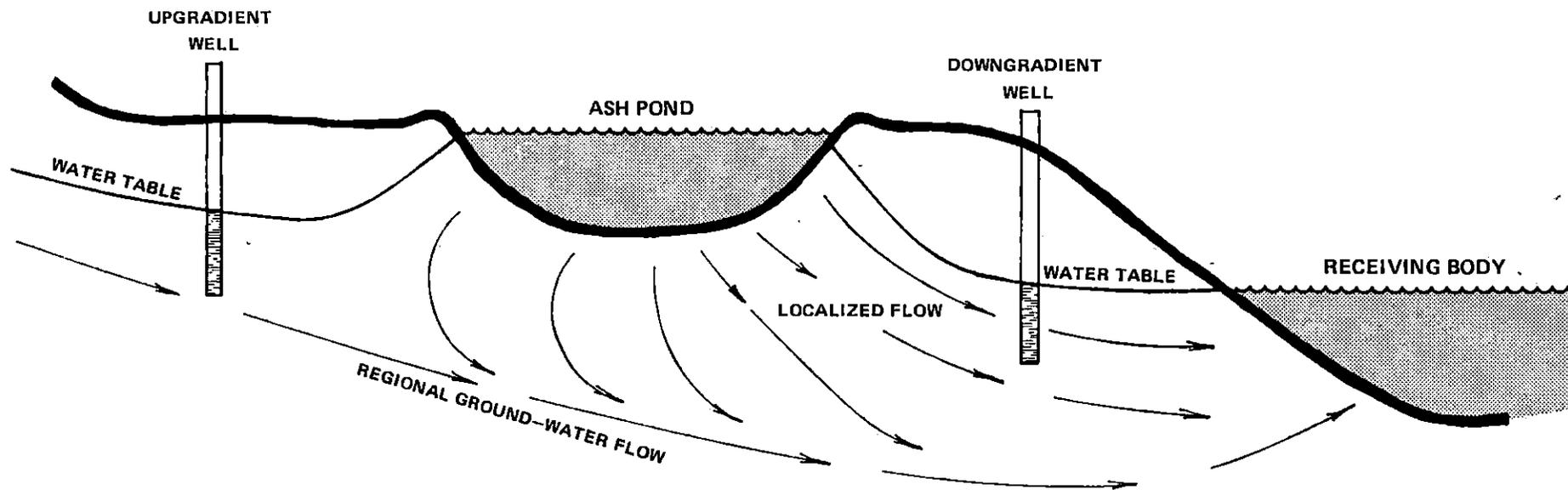
1. SEE FIGURE 9 FOR LOCATION OF GEOLOGIC SECTION
2. PROFILE IS INTENDED AS AN AID IN VISUALIZING CONTINUITY OF SUBSURFACE CONDITIONS. BOUNDARY LINES HAVE BEEN INFERRED FROM THE BORING DATA AND FROM HOLLYDAY, 1969. VARIATION IN THE LOCATIONS OF THE BOUNDARIES CAN BE ANTICIPATED
3. BORING LOCATIONS SHOWN MAY BE PROJECTED TO PROFILE
4. TAKEN FROM WOODWARD-CLYDE CONSULTANTS REPORT 81C4139A1 JENNISON STATION (WCC, 1985B).



**WEST-EAST GEOLOGIC SECTION
JENNISON STATION**

WOODWARD-CLYDE CONSULTANTS
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

DR. BY: AS	SCALE: AS SHOWN	PROJ. NO.: 81C4139-16
CK'D. BY: DRG	DATE: 12 NOV, 1987	FIG. NO.: 10



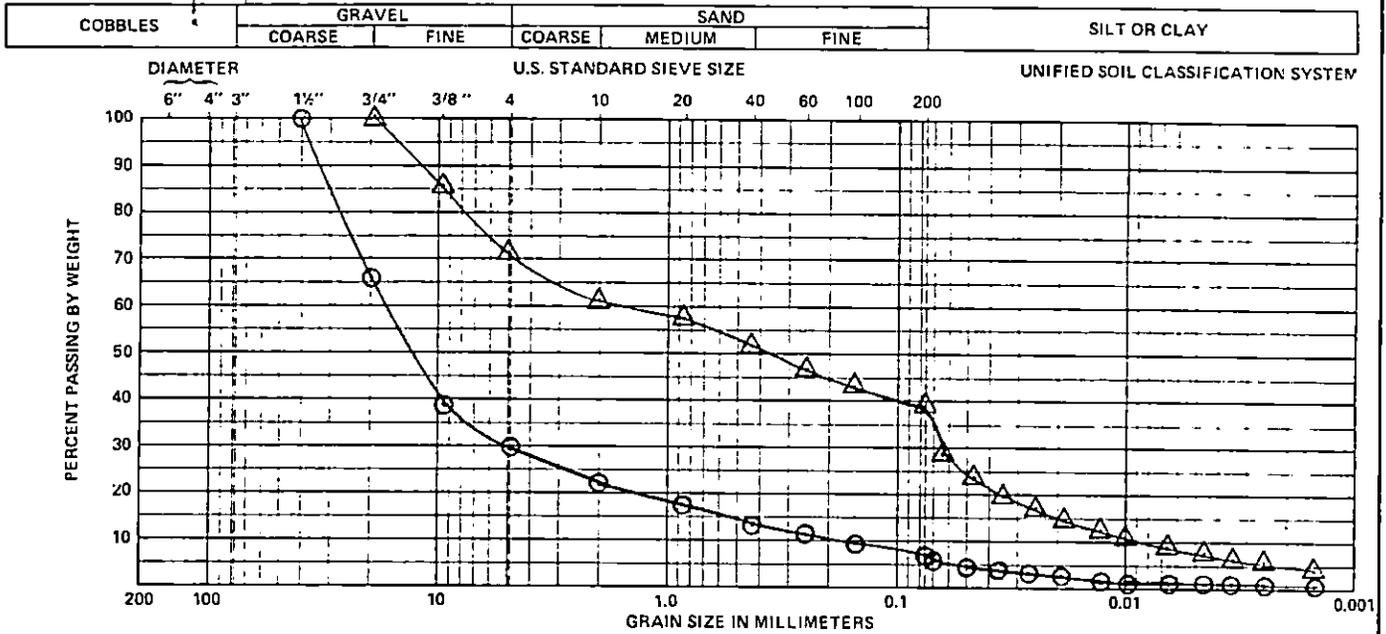
**RECOMMENDED GROUND-WATER
MONITORING SYSTEM NEAR
A TYPICAL ASH POND**

WOODWARD—CLYDE CONSULTANTS
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

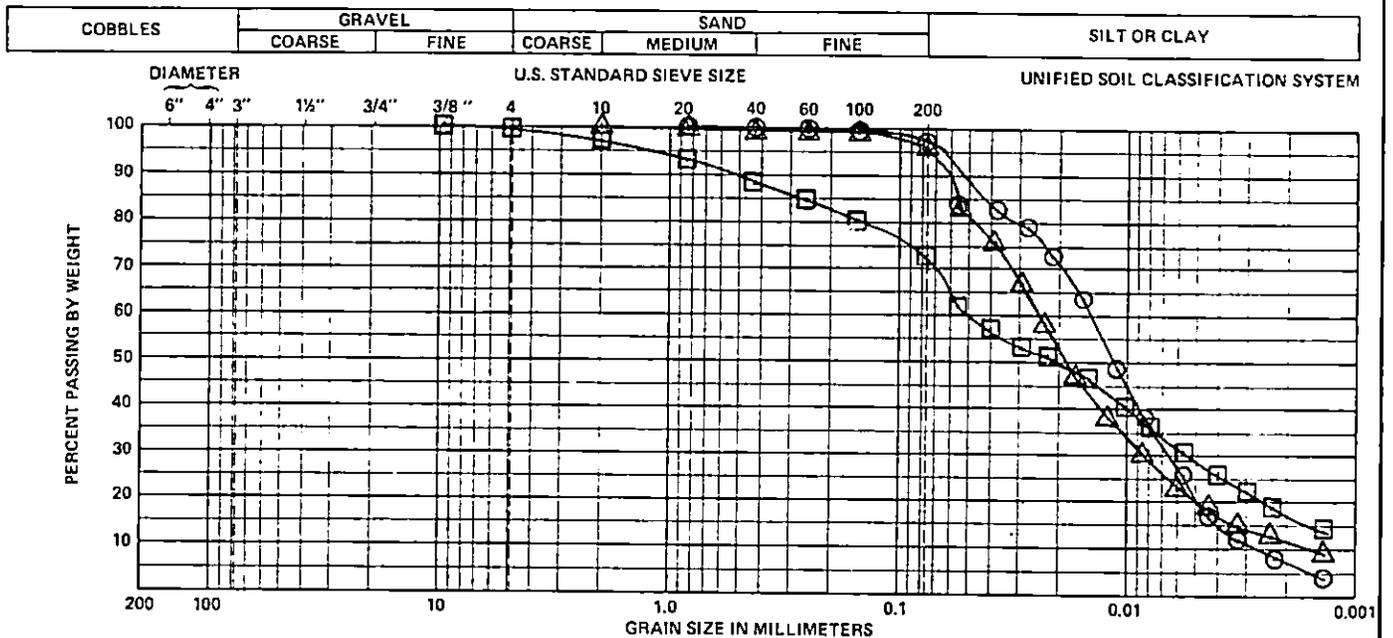
DR. BY: MKS	SCALE: NONE	PROJ. NO.: 81C4139C
CK'D. BY: AMH	DATE: 21 AUG 1985	FIG. NO.: 11

APPENDIX A
GRAIN SIZE DISTRIBUTION CURVES

PARTICLE-SIZE DISTRIBUTION

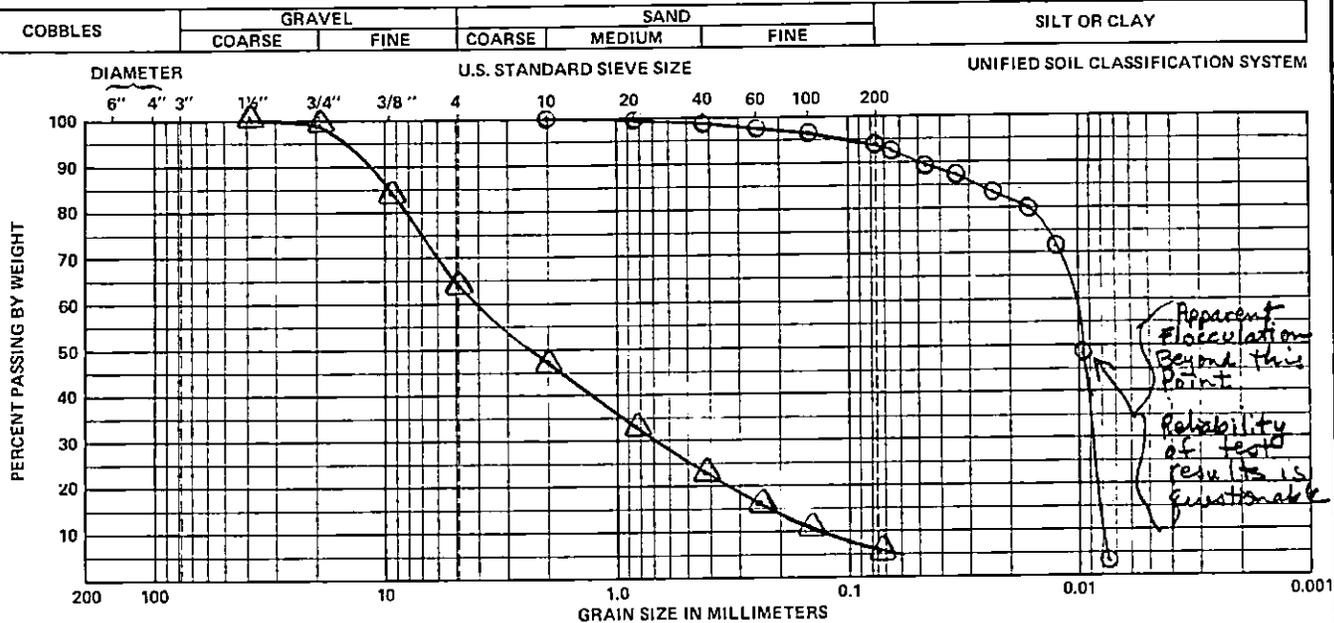


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w _L (%)	w _p (%)
B-1	S-6	25 to 26.5	⊙	GP-GM, brown GRAVEL, some c-f sand trace silt			
	Hickling						
J-1	S-5	20 to 21.5	△	SM, brown silty c-f SAND, some f. gravel			
	Jennison						

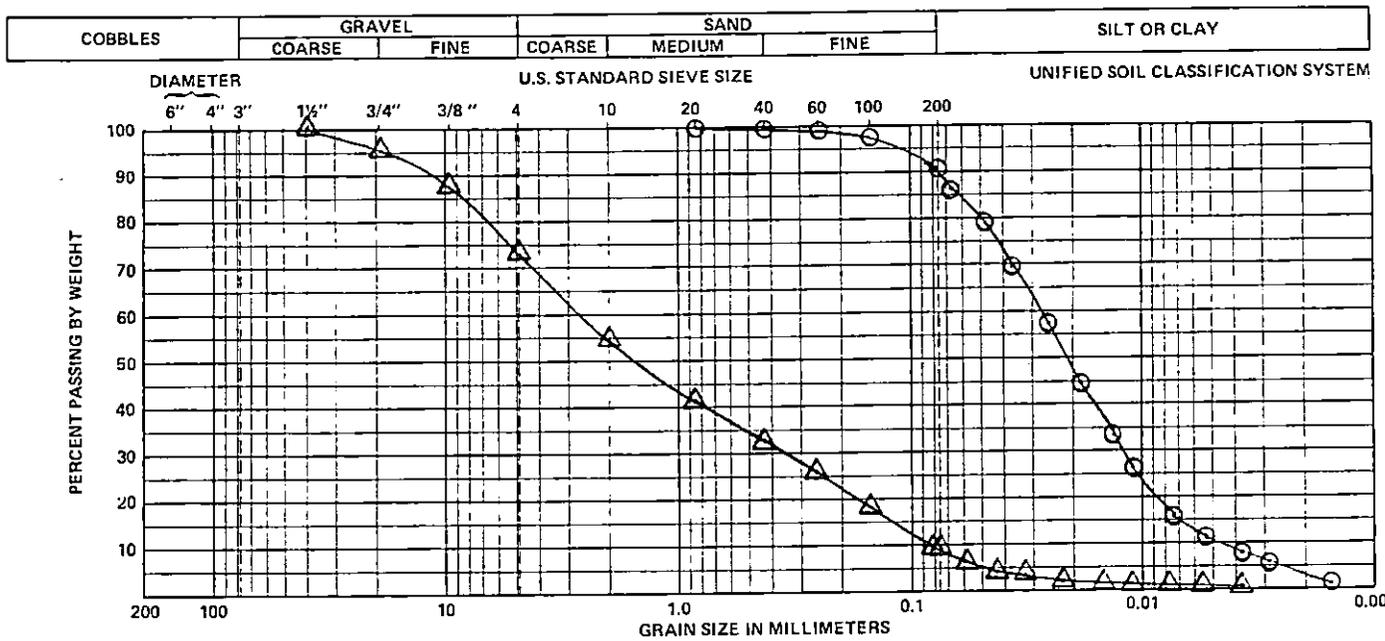


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w _L (%)	w _p (%)
OW81-2	S-5	20 to 21.5	⊙	ML, gray-brown non-plastic SILT, trace f. sand			
	Greenidge						
OW81-2	S-7	30 to 31.5	△	ML, gray-brown non-plastic SILT, trace f. sand			
	Goudey						
TMW1d	S-7	25 to 26.5	□	CL, gray-brown med. plastic silty CLAY, some c-f sand			
	Milliken						

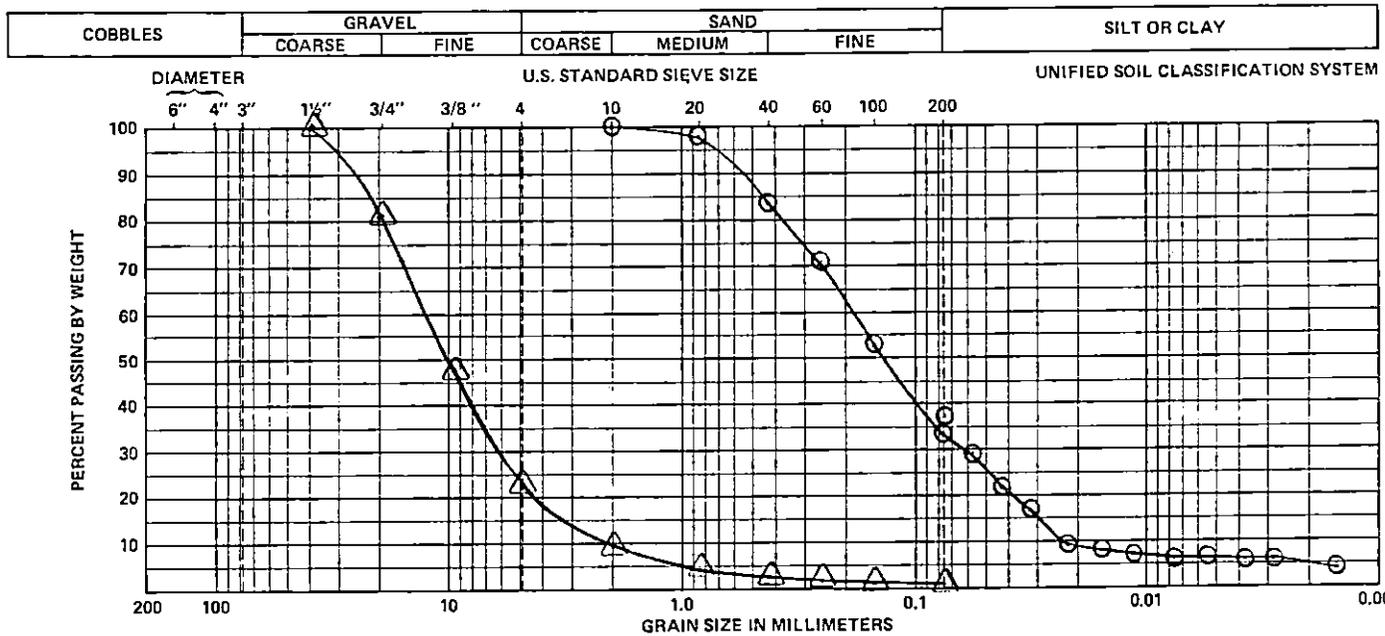
PARTICLE-SIZE DISTRIBUTION



PARTICLE-SIZE DISTRIBUTION



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w _L (%)	w _p (%)
	Fly Ash S-1	-	⊙	Lt. gray-brown Fly Ash			
	Bottom Ash S-2	-	△	Dk. gray Bottom Ash			
Goudey Station							



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w _L (%)	w _p (%)
	Fly Ash S-3	-	⊙	Dk. gray Fly Ash			
	Bottom Ash S-4	-	△	Dk. gray Bottom Ash			
Jennison Station							

JECT 10/1/57 BY [unclear] D. -10 II

APPENDIX B
GROUND WATER CHEMICAL ANALYSIS DATA

DATA SUMMARY

Note - Treatment of Data:

Use of the "less than" delimiter in the "maximum" and "average" readings columns in the following data summary reflect the widespread use of this delimiter in the raw data. Where "less than" symbols appear in the maximum reading column, the value represents a conservative, highest possible concentration of the observed metal. Thus, "average" values calculated on the basis of these maxima also represent conservative or "upper limit" averages of each metal. Where the "less than" delimiter is used in the average reading column, all values in the raw data were identical, and contained the "less than" symbol.

GREENIDGE STATION - DISSOLVED METALS ANALYSIS

BOTTOM ASH POND

1/83 - 6/85

	Diss Avg.	TOTAL	Diss Min.	TOTAL	Diss Max.	TOTAL
Arsenic	0.0232	.0252	< 0.0100	<.0100	0.0660	.0800
Cadmium	-	-	-	-	-	-
Chromium	< 0.0100	.0110	< 0.0100	<.0100	< 0.0100	.0270
Copper	0.0300	.0306	< 0.0300	<.0300	0.0300	.0400
Iron	0.0526	.5188	< 0.0500	0.1500	0.0700	1.6600
Lead	-	-	-	-	-	-
Manganese	-	-	-	-	-	-
Mercury	-	-	-	-	-	-
Nickel	0.1020	.0900	< 0.1000	<.0100	0.1300	.1200
Zinc	0.0186	.1188	< 0.0100	<.0100	0.0400	.9600

GREENIDGE STATION - TOTAL METALS ANALYSIS

BOTTOM ASH POND

1/83 - 6/85

	Avg.	Min.	Max.
Arsenic	0.0252	< 0.0100	0.0800
Cadmium	-	-	-
Chromium	0.0110	< 0.0100	0.0270
Copper	0.0306	< 0.0300	0.0400
Iron	0.5188	0.1500	1.6600
Lead	-	-	-
Manganese	-	-	-
Mercury	-	-	-
Nickel	0.0900	< 0.0100	0.1200
Zinc	0.1188	< 0.0100	0.9600

GREENIDGE STATION - DISSOLVED METALS ANALYSIS

OBSERVATION WELLS, 81-01, 81-02

	<u>81-01</u> <u>7/7/82</u>	<u>81-02</u> <u>7/7/82</u>
Arsenic	0.0320	0.0820
Cadmium	< 0.0100	< 0.0100
Chromium	< 0.0500	< 0.0500
Copper	0.0500	0.0400
Iron	< 0.0500	0.2100
Lead	< 0.0100	< 0.0100
Manganese	1.1200	0.4600
Mercury	< 0.0002	< 0.0002
Nickel	< 0.1000	< 0.1000
Zinc	< 0.0300	0.0800

GREENIDGE STATION - DISSOLVED METALS ANALYSIS

OBSERVATION WELL 81-03

	<u>7/7/82</u>	<u>3/29/85</u>
Arsenic	< 0.0100	--
Cadmium	< 0.0100	< 0.0100
Chromium	< 0.0500	< 0.0100
Copper	0.0300	< 0.0300
Iron	< 0.0500	< 0.0500
Lead	< 0.0100	--
Manganese	0.0600	0.0400
Mercury	< 0.0002	0.0002
Nickel	< 0.1000	< 0.1000
Zinc	< 0.0300	0.0400

HICKLING STATION - DISSOLVED METALS ANALYSIS

BOTTOM ASH POND

3/82 - 1/84

	<u>Avg.</u>	<u>Min.</u>	<u>Max.</u>
Arsenic	0.0173 - .0182	<0.0100 .0002	0.0460 <.0450
Cadmium	< 0.0100 .0086	<0.0100 <.0005	< 0.0100 .01
Chromium	0.0148 .0131	<0.0100 .0095	< 0.0500 .013
Copper	< 0.0300 .0250	<0.0300 <.03	< 0.0300 <.1
Iron	0.0531 1.0271	<0.0500 <.05	0.0820 2.9
Lead	< 0.0100 .0123	<0.0100 <.01	< 0.0100 .0220
Manganese	0.0586 .1543	<0.0300 0.1	0.1300 .200
Mercury	<.0002 .0005	<0.0002 <.0002	< 0.0002 .0013
Nickel	0.1000 <.1000	<0.1000 <.1	0.1000 .1
Zinc	0.0424 .0693	<0.0100 .0002	0.1000 .34

HICKLING STATION - TOTAL METALS ANALYSIS

BOTTOM ASH POND

3/82 - 1/84

	<u>Avg.</u>	<u>Min.</u>	<u>Max.</u>
Arsenic	0.0182	0.0002	< 0.0450
Cadmium	0.0086	<0.0005	0.0100
Chromium	0.0131	0.0095	0.0130
Copper	0.0350	<0.0300	< 0.1000
Iron	1.0271	<0.0500	2.9000
Lead	0.0123	<0.0100	0.0220
Manganese	0.1543	0.1000	0.2000
Mercury	0.0005	<0.0002	0.0013
Nickel	< 0.1000	<0.1000	< 0.1000
Zinc	0.0693	0.0002	0.3400

HICKLING STATION - DISSOLVED METALS ANALYSIS

OBSERVATION WELL 81-01

7/82 - 4/85

	<u>Avg.</u>	<u>Min.</u>	<u>Max.</u>
Arsenic	< 0.0100	< 0.0100	< 0.0100
Cadmium	0.0092	< 0.0002	< 0.0100
Chromium	0.0123	< 0.0002	< 0.0100
Copper	0.0010	< 0.0002	0.0400
Iron	0.0508	< 0.0500	0.0600
Lead	< 0.0100	< 0.0100	< 0.0100
Manganese	0.0885	0.0002	0.2600
Mercury	< 0.0002	< 0.0002	< 0.0002
Nickel	0.0946	< 0.0100	0.1200
Zinc	0.0308	< 0.0100	0.1300

HICKLING STATION - TOTAL METALS ANALYSIS

OBSERVATION WELL 81-01

	<u>1/4/85</u>	<u>4/2/85</u>
Arsenic	< 0.0100	< 0.0100
Cadmium	< 0.0100	< 0.0100
Chromium	< 0.0100	< 0.0100
Copper	< 0.0300	< 0.0300
Iron	0.6000	0.0400
Lead	< 0.0100	< 0.0100
Manganese	0.2900	0.0500
Mercury	< 0.0002	< 0.0002
Nickel	< 0.1000	< 0.1000
Zinc	0.0200	< 0.0100

E539.T9/138

81C4139C

HICKLING STATION - DISSOLVED METALS ANALYSIS

OBSERVATION WELL 81-02

7/82 - 4/85

	<u>Avg.</u>	<u>Min.</u>	<u>Max.</u>
Arsenic	0.0092	< 0.0002	< 0.01
Cadmium	0.0092	< 0.0002	0.01
Chromium	0.0148	< 0.0100	0.0330
Copper	0.0285	< 0.0002	0.0400
Iron	0.0708	< 0.0500	0.2200
Lead	< 0.0100	< 0.0100	< 0.0100
Manganese	0.1439	0.0002	0.5700
Mercury	0.0004	< 0.0002	0.0013
Nickel	< 0.1000	< 0.1000	< 0.1000
Zinc	0.0216	< 0.0100	0.0700

HICKLING STATION - TOTAL METALS ANALYSIS

OBSERVATION WELL 81-02

	<u>1/4/85</u>	<u>4/2/85</u>
Arsenic	< 0.0100	< 0.0100
Cadmium	< 0.0100	< 0.0100
Chromium	< 0.0100	< 0.0100
Copper	< 0.0300	< 0.0300
Iron	3.4900	5.5000
Lead	< 0.0100	< 0.0100
Manganese	0.2400	0.3800
Mercury	< 0.0002	0.0003
Nickel	< 0.1000	< 0.1000
Zinc	0.0900	< 0.0100

E539.T9/138

81C4139C

HICKLING STATION - DISSOLVED METALS ANALYSIS

OBSERVATION WELL 81-03

7/82 - 4/85

	<u>Avg.</u>	<u>Min.</u>	<u>Max.</u>
Arsenic	< 0.0100	<0.0100	< 0.0100
Cadmium	< 0.0100	<0.0100	< 0.0100
Chromium	0.0200	<0.0100	< 0.0500
Copper	0.0325	<0.0300	0.0400
Iron	0.0700	<0.0500	0.1300
Lead	< 0.0100	<0.0100	< 0.0100
Manganese	0.0675	<0.0300	0.1700
Mercury	< 0.0002	<0.0002	< 0.0002
Nickel	< 0.0100	<0.1000	< 0.1000
Zinc	0.0226	<0.0002	0.0300

E539.T9/138

81C4139C

JENNISON STATION - DISSOLVED METALS ANALYSIS

BOTTOM ASH POND

3/82 - 1/83

	<u>Avg.</u>	<u>Min.</u>	<u>Max.</u>
Arsenic	0.0171	0.0002	0.0530
Cadmium	0.0161	< 0.01	0.0240
Chromium	0.0180	< 0.01	< 0.05
Copper	0.0333	< 0.03	0.05
Iron	0.0917	0.0002	0.580
Lead	0.0102	< 0.01	0.012
Manganese	0.0931	< 0.03	0.162
Mercury	< 0.0002	< 0.0002	< 0.0002
Nickel	0.3347	< 0.1	3.060
Zinc	0.2027	< 0.0002	0.810

JENNISON STATION - TOTAL METALS ANALYSIS

BOTTOM ASH POND

3/82 - 1/83

	<u>Avg.</u>	<u>Min.</u>	<u>Max.</u>
Arsenic	0.0234	< 0.0100	0.0750
Cadmium	0.0122	< 0.0100	0.0170
Chromium	0.0194	0.0002	0.0140
Copper	0.0808	< 0.0300	0.4400
Iron	5.0269	0.2350	43.0000
Lead	0.0704	< 0.0100	0.5900
Manganese	0.1610	< 0.0300	0.5100
Mercury	0.0003	< 0.0002	0.0006
Nickel	0.1000	< 0.1000	0.1500
Zinc	0.3155	< 0.0300	0.8300

E539.T9/138

81C4139C

JENNISON STATION - DISSOLVED METALS ANALYSIS

OBSERVATION WELL 81-01

7/82 - 4/85

	<u>Avg.</u>	<u>Min.</u>	<u>Max.</u>
Arsenic	0.0100	< 0.0100	0.0100
Cadmium	0.0009	0.0002	0.0100
Chromium	0.0149	< 0.0100	< 0.0500
Copper	0.0300	< 0.0002	0.0600
Iron	0.0523	< 0.0500	0.0700
Lead	0.0100	< 0.0100	0.0100
Manganese	0.4285	< 0.0300	1.0200
Mercury	0.0005	< 0.0002	0.0020
Nickel	0.0923	< 0.0002	< 0.1000
Zinc	0.0515	< 0.0100	0.3400

JENNISON STATION - DISSOLVED METALS ANALYSIS

OBSERVATION WELL 81-02

7/82 - 4/85

	<u>Avg.</u>	<u>Min.</u>	<u>Max.</u>
Arsenic	< 0.0100	< 0.0100	< 0.0100
Cadmium	0.0161	< 0.0002	< 0.1000
Chromium	0.0174	< 0.0002	0.0390
Copper	0.0277	< 0.0002	0.0300
Iron	0.0533	< 0.0500	0.1100
Lead	0.0100	< 0.0100	0.0100
Manganese	0.0292	< 0.0002	0.0400
Mercury	0.0003	< 0.0002	0.0008
Nickel	< 0.1000	< 0.1000	< 0.1000
Zinc	0.0338	< 0.0100	0.0900

E539.T9/138

81C4139C

RAW DATA

NEW YORK STATE ELECTRIC & GAS CORP.

GREENIDGE STATION

WATER QUALITY MONITORING PROGRAM 1982 - 1985

SURFACE WATER BOTTOM ASH POND DISCHARGE
01

-----PARAMETERS-----

SAMPLING DATE	AS-D MG/L	CD-D MG/L	CU-D MG/L	CR-D MG/L	FE-D MG/L	HG-D MG/L	MN-D MG/L	NI-D MG/L	PB-D MG/L	SE-D MG/L
1/ 5/83	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
3/ 1/83	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
4/ 5/83	-0.0100	*****	-0.0300	-0.0100	0.0700	*****	*****	-0.1000	*****	-0.0100
5/ 4/83	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
6/ 6/83	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
7/ 5/83	-0.0100	*****	-0.0300	-0.0100	-0.0500	*****	*****	-0.1000	*****	-0.0100
7/ 6/83	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
8/ 1/83	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
8/ 9/83	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
9/ 6/83	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
10/ 3/83	-0.1000	*****	-0.0300	-0.0100	-0.0500	*****	*****	-0.1000	*****	-0.0100
10/ 4/83	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
11/ 1/83	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
11/29/83	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
11/30/83	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
1/ 4/84	0.0340	*****	-0.0300	-0.0100	-0.0500	*****	*****	-0.1000	*****	-0.0100
1/30/84	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
1/31/84	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
3/ 5/84	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
4/ 2/84	0.0110	*****	-0.0300	-0.0100	0.0500	*****	*****	-0.1000	*****	-0.0100
6/ 8/84	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
7/ 3/84	0.0310	*****	0.0300	-0.0100	-0.0500	*****	*****	-0.1000	*****	*****
8/ 2/84	0.0130	*****	-0.0300	-0.0100	0.0500	*****	*****	-0.1000	*****	*****
8/ 5/84	0.0100	*****	0.0300	-0.0100	0.0500	*****	*****	-0.1000	*****	*****

NEW YORK STATE ELECTRIC & GAS CORP.
 GREENIDGE STATION
 WATER QUALITY MONITORING PROGRAM 1982 - 1985
 SURFACE WATER BOTTOM ASH POND DISCHARGE
 01

-----PARAMETERS-----

SAMPLING DATE	ZN-D MG/L	PH-L	PH-F	0&G-MG/L
1/ 5/83	*****	7.20	*****	-1.00
3/ 1/83	*****	8.10	*****	1.00
4/ 5/83	-0.0300	7.40	*****	1.52
5/ 4/83	*****	6.80	*****	1.00
6/ 6/83	*****	7.70	*****	*****
7/ 5/83	0.0100	7.76	*****	*****
7/ 6/83	*****	*****	*****	1.00
8/ 1/83	*****	*****	*****	*****
8/ 9/83	*****	7.60	*****	*****
9/ 6/83	*****	7.40	*****	1.00
10/ 3/83	0.0200	7.50	*****	*****
10/ 4/83	*****	*****	*****	1.00
11/ 1/83	*****	7.50	*****	1.00
11/29/83	*****	7.50	*****	*****
11/30/83	*****	*****	*****	22.40
1/ 4/84	0.0100	7.30	*****	1.00
1/30/84	*****	7.50	*****	*****
1/31/84	*****	*****	*****	1.00
3/ 5/84	*****	7.30	*****	1.00
4/ 2/84	0.0400	7.50	*****	1.00
6/ 8/84	*****	7.90	*****	1.20
7/ 3/84	-0.0100	8.10	*****	2.20
8/ 2/84	0.0200	8.30	*****	1.00
9/ 5/84	0.0300	7.50	*****	16.00

10/11/84	-0.0100	8.10	*****	-1.00
11/ 7/84	*****	8.00	*****	*****
11/ 8/84	*****	*****	*****	1.00
12/ 3/84	-0.0300	7.00	*****	1.00
1/ 3/85	0.0200	7.80	*****	1.00
2/ 4/85	-0.0200	8.40	*****	1.00
3/11/85	0.0100	7.50	*****	*****
3/12/85	*****	*****	*****	1.00
4/ 3/85	*****	*****	*****	*****
04/03/85	*****	*****	*****	*****
05/06/85	-0.0100	7.40	*****	6.95
06/05/85	-0.0100	7.20	*****	*****

PARM -- O&G- OIL AND GREASE (PPH)
 PARM -- PH-F PH-FIELD (PH UNITS)
 PARM -- PH-L PH-LAB (PH UNITS)
 PARM -- ZN-D DISSOLVED ZINC (PPM)

- INDICATES LESS THAN
 * INDICATES NO DATA AVAILABLE

NEW YORK STATE ELECTRIC & GAS CORP.

GREENIDGE STATION

WATER QUALITY MONITORING PROGRAM 1982 - 1985

SURFACE WATER BOTTOM ASH POND DISCHARGE
01

-----PARAMETERS-----

SAMPLING DATE	AS-T MG/L	CD-T MG/L	CU-T MG/L	CR-T MG/L	FE-T MG/L	HG-T MG/L	MN-T MG/L	NI-T MG/L	PB-T MG/L	SE-T
1/ 5/83	0.0210	*****	0.0400	-0.0100	0.2900	*****	*****	-0.1000	*****	-0.0100
3/ 1/83	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
4/ 5/83	-0.0100	*****	-0.0300	-0.0100	0.3500	*****	*****	-0.0100	*****	-0.0100
5/ 4/83	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
6/ 6/83	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
7/ 5/83	-0.0100	*****	-0.0300	-0.0100	0.1500	*****	*****	-0.0100	*****	-0.0100
7/ 6/83	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
8/ 1/83	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
8/ 9/83	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
9/ 6/83	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
10/ 3/83	-0.0100	*****	-0.0300	-0.0100	0.3200	*****	*****	-0.1000	*****	-0.0100
10/ 4/83	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
11/ 1/83	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
11/29/83	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
11/30/83	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
1/ 4/84	0.0560	*****	-0.0300	-0.0100	0.3000	*****	*****	-0.1000	*****	-0.0100
1/30/84	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
1/31/84	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
3/ 5/84	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
4/ 2/84	-0.0100	*****	-0.0300	-0.0100	0.6600	*****	*****	-0.1000	*****	-0.0100
6/ 8/84	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
7/ 3/84	0.0390	*****	0.0300	-0.0100	0.2900	*****	*****	-0.1000	*****	*****
8/ 2/84	0.0110	*****	-0.0300	-0.0100	0.6400	*****	*****	-0.1000	*****	*****
9/ 5/84	0.0800	*****	-0.0300	-0.0100	1.6600	*****	*****	-0.1000	*****	*****

10/11/84	-0.0100	*****	-0.0300	-0.0100	0.3400	*****	*****	-0.1000	*****	*****
11/ 7/84	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
11/ 8/84	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
12/ 3/84	-0.0100	*****	-0.0300	-0.0100	0.4900	*****	*****	0.1200	*****	*****
1/ 3/85	0.0290	*****	-0.0300	0.0270	0.3400	*****	*****	-0.1000	*****	*****
2/ 4/85	0.0690	*****	*****	-0.0100	0.1900	*****	*****	-0.1000	*****	*****
3/11/85	0.0190	*****	-0.0300	-0.0100	0.9000	*****	*****	-0.1000	*****	*****
3/12/85	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
4/ 3/85	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
04/03/85	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
05/06/85	-0.0100	*****	-0.0300	-0.0100	0.9800	*****	*****	-0.1000	*****	*****
06/05/85	-0.0100	*****	-0.0300	-0.0100	0.4000	*****	*****	-0.1000	*****	*****

PARM -- AS-T TOTAL ARSENIC (PPM)
 PARM -- CD-T TOTAL CADMIUM (PPM)
 PARM -- CR-T TOTAL CHROMIUM (PPM)
 PARM -- CU-T TOTAL COPPER (PPM)
 PARM -- FE-T TOTAL IRON (PPM)
 PARM -- HG-T TOTAL MERCURY (PPM)
 PARM -- MN-T TOTAL MANGANESE (PPM)
 PARM -- NI-T TOTAL NICKEL (PPM)
 PARM -- PB-T TOTAL LEAD (PPM)
 PARM -- SE-T TOTAL SELENIUM (PPM)

- INDICATES LESS THAN
 * INDICATES NO DATA AVAILABLE

NEW YORK STATE ELECTRIC & GAS CORP.

GREENIDGE STATION

WATER QUALITY MONITORING PROGRAM 1982 - 1985

SURFACE WATER BOTTOM ASH POND DISCHARGE
01

-----PARAMETERS-----

SAMPLING DATE	SO4- MG/L	ZN-T MG/L	PH-L MG/L	PH-F	TDS-	TSS- MG/L	0&G- MG/L
1/ 5/83	106.60	-0.0300	7.20	*****	*****	4.90	-1.00
3/ 1/83	*****	*****	8.10	*****	*****	5.70	1.00
4/ 5/83	129.00	-0.0300	7.40	*****	*****	1.40	1.52
5/ 4/83	*****	*****	6.80	*****	*****	2.40	1.00
6/ 6/83	*****	*****	7.70	*****	*****	11.80	*****
7/ 5/83	71.90	-0.0100	7.76	*****	*****	-1.00	*****
7/ 6/83	*****	*****	*****	*****	*****	*****	1.00
8/ 1/83	*****	*****	*****	*****	*****	*****	*****
8/ 9/83	*****	*****	7.60	*****	*****	44.10	*****
9/ 6/83	*****	*****	7.40	*****	*****	7.50	1.00
10/ 3/83	68.50	0.1500	7.50	*****	*****	8.70	*****
10/ 4/83	*****	*****	*****	*****	*****	*****	1.00
11/ 1/83	*****	*****	7.50	*****	*****	6.10	1.00
11/29/83	*****	*****	7.50	*****	*****	6.10	*****
11/30/83	*****	*****	*****	*****	*****	*****	22.40
1/ 4/84	99.80	0.3500	7.30	*****	*****	3.40	1.00
1/30/84	*****	*****	7.50	*****	*****	5.70	*****
1/31/84	*****	*****	*****	*****	*****	*****	1.00
3/ 5/84	*****	*****	7.30	*****	*****	-1.00	1.00
4/ 2/84	132.60	0.0400	7.50	*****	*****	2.90	1.00
6/ 8/84	*****	*****	7.90	*****	*****	3.20	1.20
7/ 3/84	*****	0.0200	8.10	*****	*****	5.10	2.20
8/ 2/84	*****	0.0200	8.30	*****	*****	13.00	1.00
9/ 5/84	81.70	0.9600	7.50	*****	*****	-1.00	16.00

10/11/84	6.10	-0.0100	8.10	*****	*****	5.60	-1.00
11/ 7/84	*****	*****	8.00	*****	*****	2.20	*****
11/ 8/84	*****	*****	*****	*****	*****	*****	1.00
12/ 3/84	90.90	0.0400	7.00	*****	*****	7.90	1.00
1/ 3/85	*****	0.0200	7.80	*****	*****	5.40	1.00
2/ 4/85	*****	0.0300	8.40	*****	*****	-1.00	1.00
3/11/85	*****	0.1600	7.50	*****	*****	14.60	*****
3/12/85	*****	*****	*****	*****	*****	*****	1.00
4/ 3/85	*****	*****	*****	*****	*****	*****	*****
04/03/85	*****	*****	*****	*****	*****	*****	*****
05/06/85	*****	-0.0100	7.40	*****	*****	24.60	6.95
06/05/85	*****	0.0200	7.20	*****	*****	1.70	*****

PARM -- DEG- OIL AND GREASE (PPM)
 PARM -- PH-F PH-FIELD (PH UNITS)
 PARM -- PH-L PH-LAB (PH UNITS)
 PARM -- SO4- SULFATE (PPM)
 PARM -- TDS- TOTAL DISSOLVED SOLIDS (PPM)
 PARM -- TSS- TOTAL SUSPENDED SOLIDS (PPM)
 PARM -- ZN-T TOTAL ZINC (PPM)

- INDICATES LESS THAN
 * INDICATES NO DATA AVAILABLE

NEW YORK STATE ELECTRIC & GAS CORP.

MONITORING STATION

WATER QUALITY MONITORING PROGRAM 1987 - 1995

NO. OF OBSERVATION WELL POINT NO. 91-11

-----PARAMETERS-----

SAMPLING DATE	PH-L	PH-F	COND UMH/CM	TDS- MG/L	SO4- MG/L	ALKA MG/L	AL-D MG/L	AS-D MG/L	CA-D MG/L	CD-D MG/L
11/17/92	6.70	*****	935.00	507.70	949.00	*****	*****	0.0370	*****	-0.0100

PARAM -- ALKA ALKALINITY (PPM)
 PARAM -- AL-D DISSOLVED ALUMINUM (PPM)
 PARAM -- AS-D DISSOLVED ARSENIC (PPM)
 PARAM -- CA-D DISSOLVED CALCIUM (PPM)
 PARAM -- CD-D DISSOLVED CADMIUM (PPM)
 PARAM -- COND CONDUCTIVITY @ 25C (UMH/CM)
 PARAM -- TDS- TOTAL DISSOLVED SOLIDS (PPM)
 PARAM -- PH-F PH-FIELD (PH UNITS)
 PARAM -- PH-L PH-LAB (PH UNITS)
 PARAM -- SO4- SULFATE (PPM)

- INDICATES LESS THAN
 * INDICATES NO DATA AVAILABLE

NEW YORK STATE ELECTRIC & GAS CORP.

ONE TONE STATION

WATER QUALITY MONITORING PROGRAM 1982 - 1985

ADGRADIENT OBSERVATION WELL POINT NO. 81-01

-----PARAMETERS-----

SAMPLING DATE	CU-D MG/L	CR-D MG/L	FE-D MG/L	PB-D MG/L	MG-D MG/L	MN-D MG/L	NI-D MG/L	HG-D MG/L	ZN-D MG/L
7/ 7/82	0.0500	-0.0500	-0.0500	-0.0100	*****	1.1200	-0.1000	-0.0002	-0.0300

PARAM -- CU-D DISSOLVED COPPER (PPM)
 PARAM -- CR-D DISSOLVED CHROMIUM (PPM)
 PARAM -- FE-D DISSOLVED IRON (PPM)
 PARAM -- PB-D DISSOLVED LEAD (PPM)
 PARAM -- MG-D DISSOLVED MAGNESIUM (PPM)
 PARAM -- MN-D DISSOLVED MANGANESE (PPM)
 PARAM -- NI-D DISSOLVED NICKEL (PPM)
 PARAM -- PB-D DISSOLVED LEAD (PPM)
 PARAM -- ZN-D DISSOLVED ZINC (PPM)

- INDICATES LESS THAN

* INDICATES NO DATA AVAILABLE

NEW YORK STATE ELECTRIC & GAS CORP.
 CANTONMENT STATION
 WATER QUALITY MONITORING PROGRAM 1982 - 1985
 OBSERVATION WELL POINT NO. 01-02

-----PARAMETERS-----

SAMPLING DATE	PH-L	PH-F	COND UMHO-CM	TDS- MG/L	SO4- MG/L	ALKA MG/L	AL-D MG/L	AS-D MG/L	CA-D MG/L	CD-D MG/L
11/7/82	6.20	7.80	1200.00	253.50	284.00	*****	*****	0.0870	*****	-0.0100

- PARAM -- ALKA ALKALINITY (PPM)
- PARAM -- AL-D DISSOLVED ALUMINUM (PPM)
- PARAM -- AS-D DISSOLVED ARSENIC (PPM)
- PARAM -- CA-D DISSOLVED CALCIUM (PPM)
- PARAM -- CD-D DISSOLVED CADMIUM (PPM)
- PARAM -- COND CONDUCTIVITY @ 25C (UMHO/CM)
- PARAM -- TDS- TOTAL DISSOLVED SOLIDS (PPM)
- PARAM -- PH-F PH-FIELD (PH UNITS)
- PARAM -- PH-L PH-LEAD (PH UNITS)
- PARAM -- SO4- SULFATE (PPM)

- INDICATES LESS THAN
 * INDICATES NO DATA AVAILABLE

NEW YORK STATE ELECTRIC & GAS CORP.

TRENTON STATION

WATER QUALITY MONITORING PROGRAM 1987 - 1995

GRADIENT OBSERVATION WELL POINT NO. 91-02

-----PARAMETERS-----

SAMPLING DATE	CU-D MG/L	CR-D MG/L	FE-D MG/L	PB-D MG/L	HC-D MG/L	MN-D MG/L	NI-D MG/L	HG-D MG/L	ZN-D MG/L
7/ 7/82	0.0400	0.0000	0.2100	0.0100	*****	0.4600	0.1000	0.0002	0.0800

- PARAM -- CR-D DISSOLVED CHROMIUM (PPM)
- PARAM -- CU-D DISSOLVED COPPER (PPM)
- PARAM -- FE-D DISSOLVED IRON (PPM)
- PARAM -- HG-D DISSOLVED MERCURY (PPM)
- PARAM -- HC-D DISSOLVED CADMIUM (PPM)
- PARAM -- MN-D DISSOLVED MANGANESE (PPM)
- PARAM -- NI-D DISSOLVED NICKEL (PPM)
- PARAM -- PB-D DISSOLVED LEAD (PPM)
- PARAM -- ZN-D DISSOLVED ZINC (PPM)

- INDICATES LESS THAN

* INDICATES NO DATA AVAILABLE

NEW YORK STATE ELECTRIC & GAS CORP.
 THE BRIDGE STATION
 WATER QUALITY MONITORING PROGRAM 1992 - 1995
 NONRADIANT OBSERVATION WELL POINT NO. 91-03

-----PARAMETERS-----

SAMPLING DATE	PH-L	PH-F	COND UMHO-25C	TDS- MG/L	SO4- MG/L	ALKA MG/L	AL-D MG/L	AS-D MG/L	CA-D MG/L	CD-D MG/L
7/ 7/02	*****	6.30	349.00	519.50	136.00	*****	*****	-0.0100	*****	-0.0100
3/27/03	6.20	6.40	915.10	532.10	70.50	*****	*****	*****	*****	-0.0100

PARAM -- ALKA ALKALINITY (PPM)
 PARAM -- AL-D DISSOLVED ALUMINUM (PPM)
 PARAM -- AS-D DISSOLVED ARSENIC (PPM)
 PARAM -- CA-D DISSOLVED CALCIUM (PPM)
 PARAM -- CD-D DISSOLVED CADMIUM (PPM)
 PARAM -- COND CONDUCTIVITY @ 25C (UMHO/CM)
 PARAM -- COND CONDUCTIVITY @ 25C (UMHO/CM)
 PARAM -- PH-F PH-FIELD (PH UNITS)
 PARAM -- PH-L PH-LAB (PH UNITS)
 PARAM -- SO4- SULFATE (PPM)
 PARAM -- TDS- TOTAL DISSOLVED SOLIDS (PPM)

- INDICATES LESS THAN
 * INDICATES NO DATA AVAILABLE

NEW YORK STATE ELECTRIC & GAS CORP.

CELESTINE STATION

WATER QUALITY MONITORING PROGRAM 1982 - 1995

QUADRANT OBSERVATION WELL POINT NO. 91-03

-----PARAMETERS-----

SAMPLE NO DATE	CU-D MG/L	CR-D MG/L	FE-D MG/L	PB-D MG/L	MG-D MG/L	MN-D MG/L	NI-D MG/L	HG-D MG/L	ZN-D MG/L
1/ 7/82	0.0300	-0.0000	-0.0500	-0.0100	*****	0.0600	-0.1000	-0.0002	-0.0300
3/27/83	-0.0300	-0.0100	-0.0500	*****	*****	0.0400	-0.0100	0.0002	0.0400

- PARAM -- CR-D DISSOLVED CHROMIUM (PPM)
- PARAM -- CU-D DISSOLVED COPPER (PPM)
- PARAM -- FE-D DISSOLVED IRON (PPM)
- PARAM -- HG-D DISSOLVED MERCURY (PPM)
- PARAM -- MG-D DISSOLVED MAGNESIUM (PPM)
- PARAM -- MN-D DISSOLVED MANGANESE (PPM)
- PARAM -- NI-D DISSOLVED NICKEL (PPM)
- PARAM -- PB-D DISSOLVED LEAD (PPM)
- PARAM -- ZN-D DISSOLVED ZINC (PPM)

- INDICATES LESS THAN
* INDICATES NO DATA AVAILABLE

NEW YORK STATE ELECTRIC & GAS CORP.

HICKLING STATION

WATER QUALITY MONITORING PROGRAM 1982 - 1985

SURFACE WATER

BOTTOM ASH POND
01

-----PARAMETERS-----

SAMPLING DATE	AS-D MG/L	CD-D MG/L	CU-D MG/L	CR-D MG/L	FE-D MG/L	HG-D MG/L	MN-D MG/L	NI-D MG/L	PB-D MG/L	SE-D MG/L
3/31/82	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
6/10/82	0.0460	-0.0100	-0.0300	-0.0500	0.0500	-0.0002	0.0500	0.1000	-0.0100	-0.0050
7/ 2/82	-0.0100	-0.0100	-0.0300	-0.0100	-0.0500	-0.0002	-0.0300	-0.1000	-0.0100	-0.0050
7/ 6/82	-0.0100	-0.0100	-0.0300	-0.0100	-0.0500	-0.0002	-0.0300	-0.1000	-0.0100	-0.0050
7/ 7/82	-0.0100	-0.0100	-0.0300	-0.0500	-0.0500	-0.0002	0.0900	-0.0100	-0.0100	-0.0050
7/ 8/82	-0.0100	-0.0100	-0.0300	-0.0100	-0.0500	-0.0002	0.1300	-0.1000	-0.0100	-0.0050
7/ 9/82	-0.0100	-0.0100	-0.0300	-0.0100	0.0500	-0.0002	-0.0300	-0.1000	-0.0100	-0.0050
8/ 2/82	0.0460	*****	-0.0300	-0.0100	-0.0500	*****	*****	-0.1000	*****	-0.0050
9/13/82	0.0260	*****	-0.0300	-0.0100	0.0820	*****	*****	-0.1000	*****	-0.0050
10/ 6/82	-0.0100	*****	-0.0300	-0.0100	-0.0500	*****	*****	-0.1000	*****	-0.0100
10/28/82	0.0210	*****	-0.0300	-0.0100	-0.0500	*****	*****	-0.1000	*****	-0.0100
12/ 2/82	0.0120	-0.0100	-0.0300	-0.0100	-0.0500	-0.0002	0.0500	-0.1000	-0.0100	-0.0100
1/ 7/83	0.0002	*****	-0.0300	-0.0100	-0.0500	*****	*****	-0.1000	*****	-0.0002
4/ 5/83	-0.0100	*****	-0.0300	-0.0100	-0.0500	*****	*****	-0.1000	*****	-0.0100
6/ 4/83	-0.0100	*****	*****	-0.0100	0.0700	*****	*****	-0.1000	*****	*****
7/ 7/83	0.0260	*****	-0.0300	0.0110	0.0500	*****	*****	-0.1000	*****	-0.0100
10/ 4/83	0.0250	*****	-0.0300	-0.0100	-0.0500	*****	*****	-0.1000	*****	-0.0100
1/ 4/84	0.0120	*****	-0.0300	-0.0100	-0.0500	*****	*****	-0.1000	*****	-0.0100

PARM -- AS-D DISSOLVED ARSENIC (PPM)
 PARM -- CD-D DISSOLVED CADMIUM (PPM)
 PARM -- CR-D DISSOLVED CHROMIUM (PPM)
 PARM -- CU-D DISSOLVED COPPER (PPM)
 PARM -- FE-D DISSOLVED IRON (PPM)
 PARM -- HG-D DISSOLVED MERCURY (PPM)
 PARM -- MN-D DISSOLVED MANGANESE (PPM)
 PARM -- NI-D DISSOLVED NICKEL (PPM)
 PARM -- PB-D DISSOLVED LEAD (PPM)

NEW YORK STATE ELECTRIC & GAS CORP.

HICKLING STATION

WATER QUALITY MONITORING PROGRAM 1982 - 1985

SURFACE WATER BOTTOM ASH POND

01

-----PARAMETERS-----

SAMPLING DATE ZN-D PH-L PH-F DGC- MG/L

3/31/82 ***** 6.30 *****

6/10/82 -0.0300 ***** 7.60 *****

7/ 2/82 0.0600 *****

7/ 6/82 0.0600 *****

7/ 7/82 0.0500 ***** 6.50 *****

7/ 8/82 0.0500 *****

7/ 9/82 -0.0300 *****

8/ 2/82 0.0500 ***** 8.50 *****

9/13/82 -0.0300 *****

10/ 6/82 -0.0300 ***** 8.10 *****

10/28/82 0.0300 ***** 7.90 *****

12/ 2/82 0.0800 ***** 7.80 *****

1/ 7/83 -0.0300 ***** 7.40 *****

4/ 5/83 0.0500 ***** 7.10 *****

6/ 4/83 -0.0100 *****

7/ 7/83 -0.0100 ***** 7.10 *****

10/ 4/83 0.0300 ***** 6.70 *****

1/ 4/84 0.1000 ***** 7.25 *****

PARM -- OGC- OIL AND GREASE (PPM)
 PARM -- PH-F PH-FIELD (PH UNITS)
 PARM -- PH-L PH-LAB (PH UNITS)
 PARM -- ZN-D DISSOLVED ZINC (PPM)

- INDICATES LESS THAN

* INDICATES NO DATA AVAILABLE

NEW YORK STATE ELECTRIC & GAS CORP.

HICKLING STATION

WATER QUALITY MONITORING PROGRAM 1982 - 1985

SURFACE WATER BOTTOM ASH POND
01

-----PARAMETERS-----

SAMPLING DATE	AS-T MG/L	CD-T MG/L	CU-T MG/L	CR-T MG/L	FE-T MG/L	HG-T MG/L	MN-T MG/L	NI-T MG/L	PB-T MG/L	SE-T
3/31/82	0.0200	-0.0005	-0.1000	0.0095	1.1400	0.0013	0.1200	-0.1000	0.0220	-0.0100
6/10/82	0.0450	-0.0100	0.0300	-0.0500	2.7400	0.0006	0.1800	-0.1000	0.0140	-0.0050
7/ 2/82	0.0260	-0.0100	-0.0300	-0.0100	1.2500	-0.0002	0.1000	-0.1000	-0.0100	0.0060
7/ 6/82	0.0140	-0.0100	-0.0300	0.0110	1.1500	0.0002	0.1500	-0.1000	-0.0100	-0.0050
7/ 7/82	-0.0100	-0.0100	-0.0300	-0.0100	2.0500	0.0003	0.1600	-0.1000	-0.0100	-0.0050
7/ 8/82	-0.0100	-0.0100	-0.0300	-0.0100	0.9800	0.0003	0.1700	-0.1000	-0.0100	-0.0050
7/ 9/82	0.0120	-0.0100	-0.0300	-0.0100	0.6000	0.0003	0.2000	-0.1000	-0.0100	-0.0050
8/ 2/82	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
10/ 6/82	-0.0100	*****	-0.0300	-0.0100	-0.0500	*****	*****	-0.1000	*****	-0.0100
10/28/82	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
12/ 2/82	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
1/ 7/83	0.0002	*****	-0.0300	-0.0100	0.3500	*****	*****	-0.1000	*****	-0.0002
4/ 5/83	-0.0100	*****	-0.0300	-0.0100	0.5000	*****	*****	-0.1000	*****	-0.0100
6/ 4/83	-0.0100	*****	-0.0300	-0.0100	2.9000	*****	*****	-0.1000	*****	*****
7/ 7/83	0.0330	*****	-0.0300	0.0130	0.2800	*****	*****	-0.1000	*****	-0.0100
10/ 4/83	0.0320	*****	0.0300	-0.0100	0.2200	*****	*****	-0.1000	*****	-0.0100
1/ 4/84	0.0220	*****	-0.0300	-0.0100	0.1700	*****	*****	-0.1000	*****	-0.0100

PARM -- AS-T TOTAL ARSENIC (PPM)
 PARM -- CD-T TOTAL CADMIUM (PPM)
 PARM -- CR-T TOTAL CHROMIUM (PPM)
 PARM -- CU-T TOTAL COPPER (PPM)
 PARM -- FE-T TOTAL IRON (PPM)
 PARM -- HG-T TOTAL MERCURY (PPM)
 PARM -- MN-T TOTAL MANGANESE (PPM)
 PARM -- NI-T TOTAL NICKEL (PPM)
 PARM -- PB-T TOTAL LEAD (PPM)
 PARM -- SE-T TOTAL SELENIUM (PPM)

WET YEAR STATE ELECTRIC & GAS CORP.

ROCKLEDGE STATION

WATER QUALITY MONITORING PROGRAM 1982 - 1985

ADJUTANT GENERAL'S OFFICE WETLAND REPORT NO. 91-01

-----PARAMETERS-----

DATE	PH-P	CU-10	TC-P	SU4-	ALKA	AL-D	AS-D	CA-D	CD-D
	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
11/17/82	6.10	300.00	212.00	03.00	*****	*****	-0.0100	*****	-0.0100
10/06/82	0.30	430.00	25.00	90.00	*****	*****	-0.0100	*****	-0.0100
11/17/82	0.80	350.00	24.40	31.90	*****	*****	-0.0100	*****	-0.0002
4/06/83	0.50	300.00	27.50	45.80	*****	*****	-0.0100	*****	-0.0100
11/17/82	0.20	320.00	212.50	07.50	*****	*****	-0.0100	*****	0.0100
10/04/83	0.00	400.00	203.40	41.90	*****	*****	-0.0100	*****	-0.0100
11/04/82	0.00	315.00	200.40	45.60	*****	*****	-0.0100	*****	-0.0100
4/3/84	0.40	200.00	213.90	40.00	*****	*****	-0.0100	*****	-0.0100
11/27/84	0.45	230.00	186.20	75.00	*****	*****	-0.0100	*****	-0.0100
10/27/84	0.60	380.00	247.80	64.40	*****	*****	-0.0100	*****	-0.0100
11/03/82	0.70	320.00	207.30	50.70	*****	*****	-0.0100	*****	-0.0100
4/27/83	0.20	400.00	291.90	50.10	*****	*****	-0.0100	*****	-0.0100
04/02/85	*****	7.20	300.00	291.20	56.10	*****	-0.0100	*****	-0.0100

ALKA -- ALKALINITY (PPM)

ALU -- DISSOLVED ALUMINUM (PPM)

AS-D -- DISSOLVED ARSENIC (PPM)

CA-D -- DISSOLVED CALCIUM (PPM)

CD-D -- DISSOLVED CADMIUM (PPM)

CONDUCTIVITY @ 25C (UMH/CM)

COND -- CONDUCTIVITY @ 25C (UMH/CM)

PH-P -- PH (PH UNITS)

PH-L -- PH (PH UNITS)

SO4- -- SULFATE (PPM)

TC-P -- TOTAL DISSOLVED SOLIDS (PPM)

* INDICATES LESS THAN

INDICATES NO DATA AVAILABLE

NEW YORK STATE ELECTRIC & GAS CORP.

HOURLING STATION

WATER QUALITY MONITORING PROGRAM 1982 - 1995

CONCENTRANT OBSERVATION WELL POINT NO. 91-01

-----PARAMETERS-----

SAMPLING DATE	CU-D MG/L	CR-D MG/L	FE-D MG/L	PB-D MG/L	MC-D MG/L	MN-D MG/L	NI-D MG/L	HG-D MG/L	ZN-D MG/L
7/ 7/82	0.0400	-0.0500	-0.0500	-0.0100	*****	0.2100	-0.0100	-0.0002	0.1300
10/ 5/82	-0.0300	-0.0100	0.0500	-0.0100	*****	0.2600	-0.1000	-0.0002	0.0300
1/ 7/83	-0.0002	-0.0002	-0.0500	-0.0100	*****	0.0002	-0.1000	-0.0002	0.0300
4/ 5/83	-0.0300	-0.0100	-0.0500	-0.0100	*****	0.0300	-0.1000	-0.0002	0.0400
7/ 7/83	-0.0300	-0.0100	-0.0500	-0.0100	*****	0.1400	-0.1000	-0.0002	0.0200
10/ 4/83	-0.0300	-0.0100	0.0500	-0.0100	*****	0.2100	-0.1000	-0.0002	0.0300
1/ 4/84	-0.0300	-0.0100	-0.0500	-0.0100	*****	-0.0300	-0.1000	-0.0002	0.0200
4/ 3/84	-0.0300	-0.0100	-0.0500	-0.0100	*****	-0.0300	-0.1000	-0.0002	0.0200
7/ 2/84	-0.0300	-0.0100	-0.0500	-0.0100	*****	-0.0300	-0.1000	-0.0002	0.0300
10/ 2/84	-0.0300	-0.0100	-0.0500	-0.0100	*****	0.1000	0.1200	-0.0002	0.0200
1/ 4/85	-0.0300	-0.0100	-0.0500	-0.0100	*****	0.0500	-0.1000	-0.0002	0.0100
4/ 2/85	-0.0300	-0.0100	-0.0500	-0.0100	*****	0.0300	-0.1000	-0.0002	-0.0100
04/02/85	-0.0300	-0.0100	-0.0500	-0.0100	*****	0.0300	-0.1000	-0.0002	-0.0100

PARAM -- CR-D DISSOLVED CHROMIUM (PPM)
 PARAM -- CU-D DISSOLVED COPPER (PPM)
 PARAM -- FE-D DISSOLVED IRON (PPM)
 PARAM -- HG-D DISSOLVED MERCURY (PPM)
 PARAM -- MC-D DISSOLVED MANGANESE (PPM)
 PARAM -- MN-D DISSOLVED MANGANESE (PPM)
 PARAM -- NI-D DISSOLVED NICKEL (PPM)
 PARAM -- PB-D DISSOLVED LEAD (PPM)
 PARAM -- ZN-D DISSOLVED ZINC (PPM)

- INDICATES LESS THAN
 * INDICATES NO DATA AVAILABLE

NEW YORK STATE ELECTRIC CONTROL BOARD

MONITORING STATION

WATER QUALITY MONITORING PROGRAM 1982 - 1985

QUANTITATIVE OBSERVATIONS. ALL DATA IN U.S. UNITS

-----PARAMETERS-----

SAMPLING DATE	NI-T UG/L	HG-T UG/L	ZN-T UG/L
1/ 4/85	-0.1000	-0.0002	0.0210
4/ 2/85	-0.1000	-0.0002	-0.0170

PARAM -- HG-T TOTAL MERCURY (PPM)
PARAM -- NI-T TOTAL NICKEL (PPM)
PARAM -- ZN-T TOTAL ZINC (PPM)

- INDICATES LESS THAN
* INDICATES NO DATA AVAILABLE

NEW YORK STATE ELECTRIC & GAS CORP.

WICFIELD STATION

WATER QUALITY MONITORING PROGRAM 1982 - 1985

NO GRADIENT OBSERVATION WELL POINT NO. 91-02

-----PARAMETERS-----

SAMPLING DATE	PH-L	PH-F	COND UMHO-CM	TDS- MG/L	SO4- MG/L	ALKA MG/L	AL-D MG/L	AS-D MG/L	CA-D MG/L	CD-D MG/L
7/ 1/82	6.70	*****	300.00	210.00	59.00	*****	*****	-0.0100	*****	-0.0100
10/ 6/82	*****	7.70	450.00	245.00	67.00	*****	*****	-0.0100	*****	-0.0100
1/ 1/83	*****	6.90	400.00	317.70	60.00	*****	*****	-0.0002	*****	-0.0002
4/ 5/83	*****	7.10	335.00	220.40	36.20	*****	*****	-0.0100	*****	-0.0100
1/ 7/83	*****	7.20	300.00	276.00	52.50	*****	*****	-0.0100	*****	0.0100
10/ 4/83	*****	6.00	350.00	246.70	51.10	*****	*****	-0.0100	*****	-0.0100
1/ 4/84	*****	7.20	435.00	245.30	57.30	*****	*****	-0.0100	*****	-0.0100
4/ 3/84	*****	7.00	250.00	206.00	42.70	*****	*****	-0.0100	*****	-0.0100
1/ 2/84	*****	7.35	310.00	243.00	55.40	*****	*****	-0.0100	*****	0.0100
10/ 2/84	*****	7.50	405.00	242.00	50.70	*****	*****	-0.0100	*****	-0.0100
1/ 4/85	*****	7.20	300.00	272.00	44.50	*****	*****	-0.0100	*****	-0.0100
4/ 2/85	*****	7.90	300.00	222.50	53.10	*****	*****	-0.0100	*****	-0.0100
04/22/85	*****	7.90	300.00	222.50	53.10	*****	*****	-0.0100	*****	-0.0100

- PARAM -- ALKA ALKALINITY (PPH)
- PARAM -- AL-D DISSOLVED ALUMINUM (PPH)
- PARAM -- AS-D DISSOLVED ARSENIC (PPH)
- PARAM -- CA-D DISSOLVED CALCIUM (PPH)
- PARAM -- CD-D DISSOLVED CADMIUM (PPH)
- PARAM -- COND CONDUCTIVITY @ 25C (UMHO/CM)
- PARAM -- COND CONDUCTIVITY @ 25C (UMHO/CM)
- PARAM -- PH-F PH-FIELD (PH UNITS)
- PARAM -- PH-L PH-LAB (PH UNITS)
- PARAM -- SO4- SULFATE (PPH)
- PARAM -- TDS- TOTAL DISSOLVED SOLIDS (PPH)

- INDICATES LESS THAN
* INDICATES NO DATA AVAILABLE

NEW YORK STATE ELECTRIC & GAS CORP.

PICKLING STATION

WATER QUALITY MONITORING PROGRAM 1987 - 1988

DISCHARGE POINT OBSERVATION WELL POINT NO. 31-02

-----PARAMETERS-----

SAMPLING DATE	CU-D MG/L	CR-D UG/L	FE-D MG/L	PB-D MG/L	HG-D MG/L	MN-D MG/L	NI-D MG/L	HG-D MG/L	ZN-D MG/L
7/ 7/82	0.0400	-0.0500	0.1300	-0.0100	*****	-0.0300	-0.1000	-0.0002	-0.0300
10/ 6/82	-0.0300	-0.0100	-0.0500	-0.0100	*****	0.5700	-0.1000	-0.0002	-0.0300
1/ 7/83	-0.0002	-0.0100	-0.0500	-0.0100	*****	0.0002	-0.1000	-0.0002	-0.0300
4/ 5/83	-0.0300	-0.0100	-0.0500	-0.0100	*****	0.0900	-0.1000	-0.0002	0.0600
7/ 7/83	-0.0300	0.0300	0.2200	-0.0100	*****	0.1900	-0.1000	*****	0.0100
10/ 4/83	-0.0300	-0.0100	-0.0500	-0.0100	*****	0.3300	-0.1000	-0.0002	0.0100
1/ 4/84	-0.0300	-0.0100	-0.0500	-0.0100	*****	0.7000	-0.1000	-0.0002	0.0700
4/ 3/84	-0.0300	-0.0100	-0.0500	-0.0100	*****	-0.0300	-0.1000	-0.0002	0.0200
7/ 2/84	-0.0300	-0.0100	-0.0500	-0.0100	*****	0.0300	-0.1000	-0.0002	-0.0100
10/ 2/84	-0.0300	-0.0100	-0.0500	-0.0100	*****	0.7900	0.1100	-0.0002	0.0100
1/ 4/85	-0.0300	-0.0100	-0.0500	-0.0100	*****	0.0500	-0.1000	-0.0002	0.0100
4/ 2/85	-0.0300	-0.0100	0.0000	-0.0100	*****	-0.0300	-0.1000	0.0013	-0.0100
04/02/85	-0.0300	-0.0100	0.0000	-0.0100	*****	-0.0300	-0.1000	0.0013	-0.0100

PARAM -- CR-D DISSOLVED CHROMIUM (PPM)
 PARAM -- CU-D DISSOLVED COPPER (PPM)
 PARAM -- FE-D DISSOLVED IRON (PPM)
 PARAM -- HG-D DISSOLVED MERCURY (PPM)
 PARAM -- MN-D DISSOLVED MANGANESE (PPM)
 PARAM -- NI-D DISSOLVED NICKEL (PPM)
 PARAM -- PB-D DISSOLVED LEAD (PPM)
 PARAM -- ZN-D DISSOLVED ZINC (PPM)

- INDICATES LESS THAN

* INDICATES NO DATA AVAILABLE

WYOMING STATE DEPARTMENT OF GAS & OIL,
 WASHINGTON STATE,
 WATER QUALITY MONITORING PROGRAM - 1982 - 1985
 25. TRANSIENT OBSERVATION WELL POINT NO. 81-02

-----PARAMETERS-----

SAMPLING DATE	AL-T MG/L	AS-T MG/L	CA-T MG/L	CO-T MG/L	CU-T MG/L	CR-T MG/L	FE-T MG/L	PB-T MG/L	MG-T MG/L	MN-T MG/L
1/ 4/85	*****	-0.0100	*****	-0.0100	-0.0300	-0.0100	3.4900	-0.0100	*****	0.2400
4/ 2/85	*****	-0.0100	*****	-0.0100	-0.0300	-0.0100	5.5000	-0.0100	*****	0.3800

PAK1 -- AL-T TOTAL ALUMINUM (PPM)
 PAK2 -- AS-T TOTAL ARSENIC (PPM)
 PAK3 -- CA-T TOTAL CALCIUM (PPM)
 PAK4 -- CO-T TOTAL CADMIUM (PPM)
 PAK5 -- CR-T TOTAL CHROMIUM (PPM)
 PAK6 -- CU-T TOTAL COPPER (PPM)
 PAK7 -- FE-T TOTAL IRON (PPM)
 PAK8 -- MG-T TOTAL MAGNESIUM (PPM)
 PAK9 -- MN-T TOTAL MANGANESE (PPM)
 PAK0 -- PB-T TOTAL LEAD (PPM)

- INDICATES LESS THAN
 * INDICATES NO DATA AVAILABLE

NEW YORK STATE ELECTRIC & GAS CORP.

ORLEANS STATE

WATER QUALITY MONITORING PROGRAM 1982 - 1995

UNDESIRABLE ION DETECTION WELL POINT NO. 91-02

-----PARAMETERS-----

ANALYSIS DATE	HI-T MG/L	LO-T MG/L	ZN-T MG/L
12/4/89	-1.1000	-1.0000	0.0900
07/2/89	-1.1000	0.0000	-1.0100

AND -- HI-T TOTAL MERCURY (PPM)

AND -- HI-T TOTAL NICKEL (PPM)

AND -- ZN-T TOTAL ZINC (PPM)

- INDICATES LESS THAN

* INDICATES NO DATA AVAILABLE

STATE ELECTRIC & GAS CORP.

QUALITY SERVICE

ANALYSIS REPORT - 1985

CONCENTRATION OF SUBSTANCE IN WELL POINT NO. 81-03

-----PARAMETERS-----

SAMPLE NO	DATE	PH-F	COND	UMH-D-SEC	TS-S	SO4-	ALKA	AL-D	AS-D	CA-D	CD-D
			MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
17	7/22	6.70	500.00	476.50	190.00	*****	*****	*****	*****	*****	-0*0100
107	6/22	*****	420.00	288.10	189.00	*****	*****	*****	*****	*****	-0*0100
17	7/23	*****	330.00	253.40	54.50	*****	*****	*****	*****	*****	-0*0100
47	6/23	*****	236.00	166.50	33.00	*****	*****	*****	*****	*****	-0*0100

ALKA ALKALINITY (PPM)
 AL-D DISSOLVED ALUMINUM (PPM)
 AL-S DISSOLVED SILICIC ACID (PPM)
 CA-D DISSOLVED CALCIUM (PPM)
 CA-S DISSOLVED CALCIUM (PPM)
 CD-D DISSOLVED CADMIUM (PPM)
 CD-S DISSOLVED CADMIUM (PPM)
 COND CONDUCTIVITY @ 25C (UMH/CM)
 COND CONDUCTIVITY @ 25C (UMH/CM)
 PH-F PH-PH-ELECTRIC (PH UNITS)
 PH-S PH-PH-ELECTRIC (PH UNITS)
 PH-L PH-PH-ELECTRIC (PH UNITS)
 SO4- SULFATE (PPM)
 TS-S TOTAL DISSOLVED SOLIDS (PPM)
 UMH-D-SEC TOTAL DISSOLVED SOLIDS (PPM)

* INDICATES LESS THAN
 * INDICATES NO DATA AVAILABLE

NEW YORK STATE ELECTRIC & GAS CORP.

WINDLETS STATION

WATER QUALITY MONITORING PROGRAM 1982 - 1985

DOWNGRADIENT OBSERVATION WELL POINT NO. 01-03

-----PARAMETERS-----

SAMPLING DATE	CU-D MG/L	CR-D MG/L	FE-D MG/L	PB-D MG/L	HG-D MG/L	MN-D MG/L	NI-D MG/L	MG-D MG/L	ZN-D MG/L
1/ 7/82	0.0400	-0.0000	0.1300	-0.0100	*****	0.1700	-0.1000	-0.0002	-0.0300
10/ 5/82	-0.0000	-0.0100	-0.0500	-0.0100	*****	0.0400	-0.1000	-0.0002	-0.0300
1/ 7/83	-0.0000	-0.0100	-0.0500	-0.0100	*****	-0.0300	-0.1000	-0.0002	-0.0002
4/ 5/83	-0.0000	-0.0100	-0.0500	-0.0100	*****	-0.0300	-0.1000	-0.0002	0.0300

PAR1 -- CR-D DISSOLVED CHROMIUM (PPM)
 PAR1 -- CU-D DISSOLVED COPPER (PPM)
 PAR1 -- FE-D DISSOLVED IRON (PPM)
 PAR1 -- HG-D DISSOLVED MERCURY (PPM)
 PAR1 -- MG-D DISSOLVED MAGNESIUM (PPM)
 PAR1 -- MN-D DISSOLVED MANGANESE (PPM)
 PAR1 -- NI-D DISSOLVED NICKEL (PPM)
 PAR1 -- PB-D DISSOLVED LEAD (PPM)
 PAR1 -- ZN-D DISSOLVED ZINC (PPM)

- INDICATES LESS THAN
 * INDICATES NO DATA AVAILABLE

NEW YORK STATE ELECTRIC & GAS CORP.

JENNISON STATION

WATER QUALITY MONITORING PROGRAM 1982 - 1985

SURFACE WATER BOTTOM ASH POND
01

-----PARAMETERS-----

SAMPLING DATE	AS-D MG/L	CD-D MG/L	CU-D MG/L	CR-D MG/L	FE-D MG/L	HG-D MG/L	MN-D MG/L	NI-D MG/L	PB-D MG/L	SE-D MG/L
3/31/82	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
5/13/82	0.0530	-0.0100	-0.0300	-0.0500	0.5800	-0.0002	-0.0300	3.0600	-0.0100	-0.0100
6/ 9/82	0.0340	-0.0100	-0.0300	-0.0500	-0.0500	-0.0002	0.0400	-0.1000	-0.0100	-0.0050
7/ 8/82	0.0200	-0.0100	-0.0300	-0.0500	-0.0500	*****	0.0400	-0.1000	-0.0200	-0.0050
8/ 5/82	0.0150	*****	-0.0300	-0.0100	0.0600	*****	*****	-0.1000	*****	-0.0050
8/13/82	-0.0100	0.0140	0.0300	0.0110	0.0530	-0.0002	-0.0300	-0.1000	-0.0100	-0.0050
8/14/82	-0.0100	0.0160	0.0400	-0.0100	0.0900	-0.0002	0.1360	0.1600	-0.0100	-0.0050
8/15/82	-0.0100	0.0190	0.0500	-0.0100	0.0970	-0.0002	0.1410	0.1700	-0.0100	-0.0050
8/16/82	-0.0100	0.0210	0.0400	-0.0100	-0.0500	-0.0002	0.1620	0.1300	-0.0100	-0.0050
8/17/82	-0.0100	0.0210	0.0400	-0.0100	0.0600	-0.0002	0.1170	0.1300	-0.0100	-0.0050
8/19/82	-0.0100	0.0240	0.0400	-0.0100	0.0750	-0.0002	0.1420	0.1200	0.0120	-0.0050
9/ 1/82	0.0300	*****	0.0500	-0.0100	-0.0500	*****	*****	0.4500	*****	-0.0050
10/ 5/82	-0.0100	*****	-0.0300	-0.0100	-0.0500	*****	*****	-0.1000	*****	-0.0100
10/29/82	-0.0200	*****	-0.0300	-0.0100	-0.0500	*****	*****	-0.1000	*****	-0.0100
11/30/82	0.0150	*****	-0.0300	-0.0100	0.0600	*****	*****	-0.1000	*****	-0.0100
1/ 6/83	0.0002	*****	-0.0300	-0.0100	-0.0002	*****	*****	-0.1000	*****	-0.0100

PARM -- AS-D DISSOLVED ARSENIC (PPM)
 PARM -- CD-D DISSOLVED CADMIUM (PPM)
 PARM -- CR-D DISSOLVED CHROMIUM (PPM)
 PARM -- CU-D DISSOLVED COPPER (PPM)
 PARM -- FE-D DISSOLVED IRON (PPM)
 PARM -- HG-D DISSOLVED MERCURY (PPM)
 PARM -- MN-D DISSOLVED MANGANESE (PPM)
 PARM -- NI-D DISSOLVED NICKEL (PPM)
 PARM -- PB-D DISSOLVED LEAD (PPM)
 PARM -- SE-D DISSOLVED SELENIUM (PPM)

- INDICATES LESS THAN
 * INDICATES NO DATA AVAILABLE

NEW YORK STATE ELECTRIC & GAS CORP.

JENNISON STATION

WATER QUALITY MONITORING PROGRAM 1982 - 1985

SURFACE WATER BOTTOM ASH POND

01

-----PARAMETERS-----

SAMPLING DATE	ZN-D MG/L	PH-L	PH-F	O&G- MG/L
3/31/82	*****	*****	4.50	*****
5/13/82	0.0900	*****	6.90	*****
6/ 9/82	-0.0300	*****	7.70	*****
7/ 8/82	-0.0300	*****	7.20	*****
8/ 5/82	-0.0300	*****	8.20	*****
8/13/82	0.1300	*****	*****	*****
8/14/82	0.7100	*****	*****	*****
8/15/82	0.8100	*****	*****	*****
8/16/82	0.6500	*****	*****	*****
8/17/82	0.2600	*****	*****	*****
8/19/82	0.1800	*****	*****	*****
9/ 1/82	0.0300	*****	8.10	*****
10/ 5/82	-0.0300	*****	7.80	*****
10/29/82	-0.0300	*****	6.60	*****
11/30/82	-0.0300	*****	7.90	*****
1/ 6/83	-0.0002	*****	8.50	*****

PARM -- O&G- OIL AND GREASE (PPM)
 PARM -- PH-F PH-FIELD (PH UNITS)
 PARM -- PH-L PH-LAB (PH UNITS)
 PARM -- ZN-D DISSOLVED ZINC (PPM)

- INDICATES LESS THAN

* INDICATES NO DATA AVAILABLE

NEW YORK STATE ELECTRIC & GAS CORP.

JENNISON STATION

WATER QUALITY MONITORING PROGRAM 1982 - 1985

SURFACE WATER BOTTOM ASH POND
01

-----PARAMETERS-----

SAMPLING DATE	AS-T MG/L	CD-T MG/L	CU-T MG/L	CR-T MG/L	FE-T MG/L	HG-T MG/L	MN-T MG/L	NI-T MG/L	PB-T MG/L	SE-T
3/31/82	0.0580	0.0035	0.4400	0.0090	43.0000	0.0006	0.5100	0.1200	0.5900	0.0100
5/13/82	0.0750	*****	-0.0300	-0.0500	*****	0.0003	*****	*****	0.0150	-0.0100
6/ 9/82	0.0270	-0.0100	0.0500	-0.0500	3.9900	0.0006	0.0700	-0.1000	0.0110	-0.0050
7/ 8/82	0.0100	-0.0100	-0.0300	-0.0500	0.3300	0.0006	0.0500	-0.1000	-0.0100	-0.0050
8/ 5/82	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
8/13/82	0.0250	0.0130	0.0700	-0.0100	1.0960	*****	-0.0300	-0.1000	0.0110	-0.0050
8/14/82	0.0160	0.0130	0.0700	0.0140	2.1600	-0.0002	0.1610	0.1200	0.0150	-0.0050
8/15/82	-0.0100	0.0140	0.0600	-0.0100	0.5850	-0.0002	0.1610	0.1100	0.0110	-0.0050
8/16/82	0.0160	0.0140	0.0500	-0.0100	0.2350	-0.0002	0.1620	0.1500	0.0120	-0.0050
8/17/82	0.0240	0.0160	0.0700	-0.0100	0.2610	-0.0002	0.1470	-0.1000	0.0140	-0.0050
8/19/82	-0.0100	0.0170	0.0400	-0.0100	0.6590	0.0002	0.1580	-0.1000	0.0150	-0.0050
9/ 1/82	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
10/ 5/82	-0.0100	*****	0.0300	-0.0100	1.7000	*****	*****	-0.1000	*****	-0.0100
1/ 6/83	0.0002	*****	-0.0300	0.0002	1.2800	*****	*****	-0.0002	*****	-0.0100

PARM -- AS-T TOTAL ARSENIC (PPM)
 PARM -- CD-T TOTAL CADMIUM (PPM)
 PARM -- CR-T TOTAL CHROMIUM (PPM)
 PARM -- CU-T TOTAL COPPER (PPM)
 PARM -- FE-T TOTAL IRON (PPM)
 PARM -- HG-T TOTAL MERCURY (PPM)
 PARM -- MN-T TOTAL MANGANESE (PPM)
 PARM -- NI-T TOTAL NICKEL (PPM)
 PARM -- PB-T TOTAL LEAD (PPM)
 PARM -- SE-T TOTAL SELENIUM (PPM)

- INDICATES LESS THAN
 * INDICATES NO DATA AVAILABLE

NEW YORK STATE ELECTRIC & GAS CORP.

REHOBOTH STATION

WATER QUALITY MONITORING PROGRAM 1967 - 1975

GRADIENT OBSERVATION WELL POINT NO. 01-01

-----PARAMETERS-----

SAMPLE NO DATE	CU-D MG/L	CR-D MG/L	FE-D MG/L	PB-D MG/L	MG-D MG/L	MN-D MG/L	NI-D MG/L	HG-D MG/L	ZN-D MG/L
7/ 5/62	0.0300	-0.0500	-0.0500	-0.0100 *****	0.1600	-0.1000	-0.0002	0.0400	
10/ 5/62	-0.0300	-0.0100	0.0600	-0.0100 *****	0.0600	-0.1000	-0.0002	-0.0300	
1/ 6/63	-0.0302	-0.0062	-0.0500	-0.0100 *****	0.1400	-0.0002	-0.0002	-0.0300	
4/ 4/63	-0.0300	-0.0100	0.0700	-0.0100 *****	0.1800	-0.1000	-0.0002	0.0800	
7/ 6/63	-0.0300	0.0190	-0.0500	0.0100 *****	-0.0300	-0.1000	-0.0002	0.0600	
10/ 7/63	-0.0300	-0.0100	-0.0500	-0.0100 *****	-0.0300	-0.1000	-0.0002	0.0100	
1/ 5/64	-0.0300	-0.0100	-0.0500	-0.0100 *****	0.0400	-0.1000	-0.0002	0.3400	
4/ 6/64	-0.0300	-0.0100	-0.0500	-0.0100 *****	-0.0300	-0.1000	-0.0002	-0.0100	
7/12/64	-0.0300 *****		-0.0500	-0.0100 *****	1.1000	-0.1000	-0.0002	0.0200	
10/ 1/64	-0.0300 *****		-0.0500	-0.0100 *****	0.9200	-0.1000	-0.0002	0.0200	
1/ 2/65	0.0600 *****		-0.0500	-0.0100 *****	0.9400	-0.1000	-0.0002	-0.0100	
4/ 3/65	-0.0300 *****		-0.0500	-0.0100 *****	1.0200	-0.1000	0.0000	-0.0100	
6/03/65	-0.0300 *****		-0.0500	-0.0100 *****	1.0200	-0.1000	0.0000	-0.0100	

PARAM -- CR-D DISSOLVED CHROMIUM (PPM)
 PARAM -- CU-D DISSOLVED COPPER (PPM)
 PARAM -- FE-D DISSOLVED IRON (PPM)
 PARAM -- PB-D DISSOLVED MERCURY (PPM)
 PARAM -- MG-D DISSOLVED MAGNESIUM (PPM)
 PARAM -- MN-D DISSOLVED MANGANESE (PPM)
 PARAM -- NI-D DISSOLVED NICKEL (PPM)
 PARAM -- PB-D DISSOLVED LEAD (PPM)
 PARAM -- ZN-D DISSOLVED ZINC (PPM)

- INDICATES LESS THAN
 * INDICATES NO DATA AVAILABLE

NEW YORK STATE ELECTRIC & GAS CORP.

JENNISON STATION

WATER QUALITY MONITORING PROGRAM 1982 - 1985

CONCENTRANT OBSERVATION WELL POINT NO. 91-01

-----PARAMETERS-----

SAMPLING DATE	PH-L	PH-F	COND UMPO-25C	TDS- MG/L	SO4- MG/L	ALKA MG/L	AL-D MG/L	AS-D MG/L	CA-D MG/L	CO-D MG/L
7/ 6/82	*****	5.90	360.00	231.00	56.60	*****	*****	-0.0100	*****	-0.0100
10/ 5/82	*****	5.70	355.00	174.00	42.00	*****	*****	-0.0100	*****	-0.0100
1/ 6/83	*****	7.50	332.00	157.10	5.97	*****	*****	-0.0100	*****	-0.0002
4/ 4/83	*****	5.70	375.00	270.50	75.40	*****	*****	-0.0100	*****	-0.0100
7/ 8/83	*****	6.00	335.00	224.10	40.00	*****	*****	-0.0100	*****	-0.0100
10/ 7/83	*****	5.80	330.00	260.50	87.90	*****	*****	-0.0100	*****	-0.0100
1/ 3/84	*****	6.10	465.00	209.10	54.70	*****	*****	-0.0100	*****	0.0100
4/ 6/84	6.20 *****	*****	330.00	235.60	30.90	*****	*****	0.0100	*****	-0.0100
7/12/84	*****	6.00	270.00	229.60	51.10	*****	*****	-0.0100	*****	-0.0100
10/ 1/84	*****	6.20	335.00	217.00	40.50	*****	*****	-0.0100	*****	-0.0100
1/ 2/85	*****	6.20	350.00	267.50	42.90	*****	*****	-0.0100	*****	-0.0100
4/ 3/85	*****	6.60	440.00	290.00	57.50	*****	*****	-0.0100	*****	0.0100
04/03/85	*****	6.60	440.00	288.00	57.50	*****	*****	-0.0100	*****	0.0100

PARM -- ALKA ALKALINITY (PPM)
 PARM -- AL-D DISSOLVED ALUMINUM (PPM)
 PARM -- AS-D DISSOLVED ARSENIC (PPM)
 PARM -- CA-D DISSOLVED CALCIUM (PPM)
 PARM -- CO-D DISSOLVED CADMIUM (PPM)
 PARM -- COND CONDUCTIVITY @ 25C (UMHO/CM)
 PARM -- CU-D CONDUCTIVITY @ 25C (UMHO/CM)
 PARM -- PH-F PH-FIELD (PH UNITS)
 PARM -- PH-L PH-LAB (PH UNITS)
 PARM -- SO4- SULFATE (PPM)
 PARM -- TDS- TOTAL DISSOLVED SOLIDS (PPM)

- INDICATES LESS THAN
 * INDICATES NO DATA AVAILABLE

NEW YORK STATE ELECTRIC & GAS CORP.

DELTA 33 STATION

WATER QUALITY MONITORING PROGRAM 1982 - 1995

DOWN GRADIENT OBSERVATION WELL POINT NO. 01-02

-----PARAMETERS-----

SAMPLING DATE	PH-L	PH-F	COND UMHO-25C	TDS-MG/L	SO4-MG/L	ALKA MG/L	AL-D MG/L	AS-D MG/L	CA-D MG/L	CD-D MG/L
1/ 6/82	*****	6.60	200.00	172.30	66.10	*****	*****	-0.0100	*****	-0.0100
10/ 5/82	*****	6.70	370.00	285.10	64.00	*****	*****	-0.0100	*****	-0.0100
1/ 6/83	*****	8.00	203.00	237.50	6.97	*****	*****	-0.0100	*****	-0.0002
4/ 4/83	*****	6.20	240.00	163.10	123.40	*****	*****	-0.0100	*****	-0.0100
7/ 8/83	*****	6.40	230.10	155.40	53.80	*****	*****	-0.0100	*****	-0.1000
10/ 7/83	*****	6.40	255.00	177.00	45.40	*****	*****	-0.0100	*****	-0.0100
1/ 5/84	*****	6.50	460.00	175.00	57.30	*****	*****	-0.0100	*****	-0.0100
4/ 6/84	6.20 *****	*****	230.00	170.60	32.70	*****	*****	-0.0100	*****	-0.0100
7/12/84	*****	6.55	220.00	176.70	51.60	*****	*****	-0.0100	*****	-0.0100
10/ 1/84	*****	6.60	265.00	157.10	42.20	*****	*****	-0.0100	*****	-0.0100
1/ 2/85	*****	6.40	280.00	170.30	40.30	*****	*****	-0.0100	*****	-0.0100
4/ 5/85	*****	6.90	300.00	204.00	63.20	*****	*****	-0.0100	*****	0.0100
04/03/85	*****	6.90	300.00	204.00	63.20	*****	*****	-0.0100	*****	0.0100

- PARAM -- ALKA ALKALINITY (PPM)
- PARAM -- AL-D DISSOLVED ALUMINUM (PPM)
- PARAM -- AS-D DISSOLVED ARSENIC (PPM)
- PARAM -- CA-D DISSOLVED CALCIUM (PPM)
- PARAM -- CD-D DISSOLVED CADMIUM (PPM)
- PARAM -- COND CONDUCTIVITY @ 25C (UMHO/CM)
- PARAM -- COND CONDUCTIVITY @ 25C (UMHO/CM)
- PARAM -- PH-F PH-FIELD (PH UNITS)
- PARAM -- PH-L PH-LAS (PH UNITS)
- PARAM -- SO4- SULFATE (PPM)
- PARAM -- TDS- TOTAL DISSOLVED SOLIDS (PPM)

- INDICATES LESS THAN
 * INDICATES NO DATA AVAILABLE

WEST VIRGIN STATE ELECTRIC & GAS CORP.

JACKSON STATION

WATER QUALITY MONITORING PROGRAM 1982 - 1985

DOWNGRADIENT OBSERVATION WELL POINT NO. 81-02

-----PARAMETERS-----

SAMPLING DATE	CU-D MG/L	CR-D MG/L	FE-D MG/L	PB-D MG/L	MG-D MG/L	MN-D MG/L	NI-D MG/L	HG-D MG/L	ZN-D MG/L
7/ 5/82	0.0300	-0.0500	-0.0570	-0.0100	*****	0.0400	-0.1000	-0.0002	0.0300
10/ 5/82	-0.0300	-0.0100	0.0570	-0.0170	*****	-0.0300	-0.1000	-0.0002	-0.0300
1/ 5/83	-0.0002	-0.0002	-0.0500	-0.0100	*****	-0.0002	-0.1000	-0.0002	0.0300
4/ 4/83	-0.0300	-0.0100	-0.0500	-0.0100	*****	0.0400	-0.1000	-0.0002	0.0600
7/ 6/83	-0.0300	0.0390	0.1100	0.0170	*****	-0.0300	-0.1000	-0.0002	0.0400
10/ 7/83	-0.0300	-0.0100	-0.0500	-0.0100	*****	-0.0300	-0.1000	-0.0002	0.0500
1/ 3/84	0.0300	-0.0100	-0.0500	-0.0100	*****	0.0300	-0.1000	-0.0002	0.0900
4/ 5/84	-0.0300	-0.0100	-0.0500	-0.0100	*****	-0.0300	-0.1000	-0.0002	0.0600
7/12/84	-0.0300	*****	-0.0500	-0.0100	*****	-0.0300	-0.1000	-0.0002	-0.0100
10/ 1/84	-0.0300	*****	-0.0500	-0.0100	*****	0.0300	-0.1000	-0.0002	0.0100
1/ 2/85	0.0300	*****	-0.0500	-0.0100	*****	-0.0300	-0.1000	-0.0002	0.0100
4/ 3/85	-0.0300	*****	-0.0500	-0.0100	*****	-0.0300	-0.1000	0.0008	-0.0100
04/03/85	-0.0300	*****	-0.0500	-0.0100	*****	-0.0300	-0.1000	0.0008	-0.0100

- PARAM -- CR-D DISSOLVED CHROMIUM (PPM)
- PARAM -- CU-D DISSOLVED COPPER (PPM)
- PARAM -- FE-D DISSOLVED IRON (PPM)
- PARAM -- HG-D DISSOLVED MERCURY (PPM)
- PARAM -- MG-D DISSOLVED MAGNESIUM (PPM)
- PARAM -- MN-D DISSOLVED MANGANESE (PPM)
- PARAM -- NI-D DISSOLVED NICKEL (PPM)
- PARAM -- PB-D DISSOLVED LEAD (PPM)
- PARAM -- ZN-D DISSOLVED ZINC (PPM)

- INDICATES LESS THAN
* INDICATES NO DATA AVAILABLE