

# **FIELD EVALUATION OF HOPPER DREDGE OVERFLOW FOR THE DELAWARE RIVER**

**By**

**Jerry L. Miller<sup>1</sup>, Michael R. Palermo<sup>1</sup>, and Thomas W. Groff<sup>2</sup>**

**<sup>1</sup>Environmental Laboratory  
Engineering Research and Development Center  
Waterways Experiment Station  
3909 Halls Ferry Road  
Vicksburg, MS 39180**

**<sup>2</sup>Philadelphia District  
US Army Engineer District, Philadelphia  
Operations Division**

**July 1999**

**Working Draft**

**Prepared for**

**US Army Engineer District, Philadelphia  
Philadelphia, Pennsylvania 19107-3390**

## **TABLE OF CONTENTS**

**Abstract**

**List of Figures**

**List of Tables**

**List of Appendices**

**1 - Introduction**

    Background

    Study Location

    Purpose and Scope

**2 - Field Monitoring**

    Dredging Equipment and Sampling Operations

    Dredge Operation Variables

    Collection of In-Situ Sediment and Site Water

    Hopper Inflow Monitoring

    Hopper Contents Monitoring

    Hopper Overflow Monitoring

    Plume Monitoring

    Sedimentation Assessment

    Bioassay

**3 - Data Analysis**

    Hopper Loading Characteristics

        Coarse-Grained Site

        Fine-Grained Site

        Economics

    In-Situ Sediment and Background Water Samples

        Coarse-Grained Site

        Fine-Grained Site

    Hopper Inflow

        Coarse-Grained Site

        Fine-Grained Site

    Hopper Contents

        Coarse-Grained Site

        Fine-Grained Site

    Hopper Overflow

        Coarse-Grained Site

        Fine-Grained Site

    Plume Monitoring

        Coarse-Grained Site

        Fine-Grained Site

    Sedimentation Results

        Coarse-Grained Site

        Fine-Grained Site

    Standard Elutriate Tests

        Coarse-Grained Site

        Fine-Grained Site

    Technical Findings of a 96-hr Bioassay

        Coarse-Grained Site

        Fine-Grained Site

**4 - Conclusions**

**Figures 1 through 22**

**Tables 1 through 3**

**Appendices A through E**

## **FIELD EVALUATION OF HOPPER DREDGE OVERFLOW FOR THE DELAWARE RIVER**

Jerry L. Miller, Michael R. Palermo, Ph.D., and Thomas W. Groff

### **ABSTRACT**

Hopper Dredges are often loaded past the point of overflow for economic reasons. As the hopper is filled, dredged material is stored in the hopper until overflow begins. The density of the hopper contents is increased by allowing the low density supernatant to overflow back into the waterway. As the low-density supernatant overflows, the average density of the hopper contents increases. Thus, more material can be transported per trip to the disposal site or facility resulting in an economical loading.

There is normally a tradeoff between the potential economic benefits and potential environmental effects. Overflow results in increased water column turbidity, and supernatant solids may be re-deposited near the dredge site. Also, if sediments are contaminated, the overflow may result in some release of contaminants to the water column. Therefore, the relationship between dredge production, density of the hopper load, and the rate of material overflow are important variables in maximizing the efficiency of the dredging operation while minimizing harmful contaminant release.

A field study was conducted during hopper dredging operations in the Delaware River and Delaware Bay area to quantify the potential load gains realized by overflow, the degree of suspended solids and contaminant release generated by overflow, and the dispersion of the overflow plume. Monitoring was conducted at two sites, one of

predominately fine-grained material in the Delaware River, and the other of predominately coarse-grained material in Delaware Bay. This report summarizes the results of the study and describes the potential economic and environmental considerations for overflow at these sites.

Keywords: Hopper dredges, dredged material, dredge production, dredging, overflow.

# **1      Introduction**

---

## **Background**

The US Army Engineer District, Philadelphia, has an extensive navigation responsibility throughout the Delaware River Basin. Maintenance dredging averages four million cubic yards of material annually of which about 250,000 cubic yards is removed by the Hopper Dredge McFarland (Figure 1). The dredging provides a safe navigation channel, which supports the shipping of nearly 150 million tons of cargo per year.

Hopper dredges, like the McFarland, are self-propelled ships equipped with propulsion machinery, hoppers for dredged material storage, and dredge pumps. Dredged material is hydraulically raised through trailing dragarms in contact with the channel bottom and is discharged into the hoppers. The material is then held in the hoppers until placed at the disposal site.

Hopper dredges are often loaded past the point of overflow for economic reasons. As the hopper is filled, dredged material is stored in the hopper bins until overflow begins. The density of the hopper contents is increased by allowing the low

density supernatant to overflow back into the waterway. As the low-density supernatant overflows, the average density of the hopper contents increase. Thus, more material can be transported per trip to the disposal site or facility. This practice of overflowing hoppers to achieve a high-density load is referred to as economic loading.

In considering overflow, there is normally a tradeoff between the potential economic benefits and potential environmental effects. Overflow results in increased water column turbidity, and supernatant solids may be re-deposited near the dredge site. Also, if sediments are contaminated, the overflow may result in some release of contaminants to the water column. Therefore, the relationship between dredge production, density of the hopper load, and the rate of material overflow are important variables in maximizing the efficiency of the dredging operation while minimizing contaminant release.

The state environmental resource agencies have expressed concerns regarding the turbidity, sedimentation of suspended solids, and potential contaminant release from overflow due to the presence of oyster seedbeds in the area. Currently, overflow is not permitted at any location within the Delaware River Basin.

There is a significant potential for economic benefits to overflow in certain reaches of the project if the impact due to overflow is environmentally acceptable. The Philadelphia District has requested that the practice of overflow for select portions

of the Delaware River and Delaware Bay be evaluated to determine if overflow for those reaches can meet applicable water quality standards. The District requested assistance from the Environmental Laboratory, U.S. Army Engineer Research and Development Center in conducting a study of overflow in the Delaware River/Delaware Bay system.

This study will help quantify the degree of turbidity, suspended solids and contaminant release generated by overflow and the dispersion of the overflow plume in reaches near the seedbeds. Reaches in the Delaware River Basin where overflow would be acceptable will be determined.

## **Study Location**

Two test areas were selected in the Delaware River Philadelphia to the Sea Federal Navigation Channel (Figure 2). Study areas were selected in conjunction with recommendations from the New Jersey Department of Environmental Protection (NJDEP) and Delaware's Department of Natural Resources and Environmental Control (DNREC). These areas were selected on the basis of historical knowledge of the Delaware Basin, and known locations of material types (sand, silt and clay) within the river. The first site was located at the Brandywine range (R1) in the lower Delaware Bay (mile marker 17.7), and was selected to represent a predominantly coarse-grained material. The second site was located at the Deepwater Point range (R2) just below the Delaware Memorial Bridge (mile marker 67.9), and was selected

to represent a typical fine-grained material. All the proposed activities for the study were reviewed with members of the Delaware River Fish Cooperative Technical Committee prior to submitting applications to the respective regulatory offices for Water Quality Certification (WQC) approvals.

## Purpose and Scope

The purpose of this study was to evaluate the efficiency of economic loading of a hopper dredge and the physical and chemical characteristics of hopper overflow for the Delaware River dredging project. The study was designed to evaluate the effectiveness of increasing the hopper load during overflow and to determine the physical and chemical characteristics of the overflow into the Delaware River.

The study involved the following activities:

- a. Loading data collection - measurements of the load in the hopper at and following overflow
- b. Characterization of in-situ sediment - physical and chemical analysis including elutriate testing
- c. Hopper inflow monitoring - physical and chemical analysis
- d. Hopper contents monitoring - physical and chemical analysis
- e. Hopper overflow monitoring - physical and chemical analysis
- f. Plume monitoring - physical and chemical analysis; and in-situ turbidity measurements

- g. Sedimentation assessment - photo imagery of recent sediment deposits
- h. Elutriate and Bioassay Testing - elutriate tests and acute toxicity testing on a fish and a crustacean species were performed for purposes of prediction and potential effects of overflow for the entire project

These activities provided information in order to characterize the in-situ sediment, hopper inflow as pumped from the draghead, and hopper overflow. Measurement of the material density in the hopper, the solids concentration, and particle size and rate of overflow provided information for the development of hopper filling relationships. Elutriate tests were performed to predict the contaminant release back into the water column. These test results can also be compared with the data results of the hopper overflow for consistency in sample analysis. Samples taken from the water column defined the relative difference between sediment re-suspended by the draghead and that caused by overflow. One overflow and one non-overflow dredge pass or overflow event was monitored in each of the two reaches of the river.

## **2 Field Monitoring**

---

### **Dredging Equipment and Sampling Operations**

The Dredge McFarland was used on September 15<sup>th</sup> and 16<sup>th</sup> 1998 to dredge in the two test reaches. The field sampling and monitoring was conducted during representative hopper operations with and without overflow in both reaches.

The tasks described herein were the responsibility of the U.S. Army Engineer Waterways Experiment Station (WES), with support provided by the Philadelphia District. The Philadelphia District provided the necessary boats and personnel to assist the WES in all field monitoring, in-situ data collection and sample collection. WES provided transportation of samples back to WES for testing. WES personnel were present at the dredging site during the monitoring effort to direct the field efforts and assist in data and sample collection. WES performed all subsequent laboratory testing of samples, data analysis, and report preparation.

## **Dredge Operation Variables**

At a minimum, it was necessary to have a complete record of the dredge operating variables during the monitoring and sampling periods. In addition to this standard dredge data, the time and duration of overflow during sampling events were recorded along with loading charts using the dredge McFarland's automated charts.

## **Collection of In-Situ Sediment and Site Water**

On September 14<sup>th</sup>, in-situ sediment and site water were collected at the two study sites prior to dredging to provide samples for sediment and water characterization and elutriate testing. Fifteen (15) sediment samples were taken at even intervals in a transect along which the dredge was expected to pass during overflow and non-overflow conditions. Samples were collected with a grab-type apparatus. A 200-milliliter portion of the sample was retained from each of the 15 samples for water content and density analysis (15 individual analyses). The remaining material of the 15 samples, was composited for sediment and water characterization and elutriate tests.

The composited samples were obtained by combining material from 3 sampling locations in a 5-gallon bucket. Thus, 5 buckets and 15, 250-milliliter bottles of sediment were obtained and shipped to WES to characterize the in-situ sediment. The 5 buckets of sediment were further composited to produce a single uniform

composite. From this composite, standard elutriate testing was performed using the site water to prepare the samples. Density (or water content) estimates were made on all 15 samples and the other physical and chemical tests were performed on the composite sediment sample.

### **Hopper Inflow Monitoring**

The sediment slurry that was picked up by the draghead and transported through the hydraulic suction line was sampled as it entered the hopper (in 3-minute intervals during filling and overflow). Grab samples at the inflow port(s) were obtained by using an 8-quart stainless steel container attached to a rope. These samples were analyzed for solids concentration and appropriately composited and analyzed for grain size distribution, particle size distribution of fines, and chemical concentrations. The composited samples represented sediment from 5 equal time intervals during hopper loading.

### **Hopper Contents Monitoring**

The hopper bins function as a clarifier for solids separation. However, hoppers are not specifically designed as clarifiers, and they can be expected to exhibit rapid overflow velocities, short-circuiting, and excessive turbulence and scouring. As material is pumped into the hoppers, a layer of high density settled material is formed in the lower portion of the hopper with a layer of water with suspended material in the upper portion of the hopper. The vertical distribution of suspended material density or

concentration in the upper portion of the hopper was measured. These data, in conjunction with overflow concentration data, can be used to determine when an economic load is achieved and when material density in the hopper is at a maximum. A second use for hopper vertical density measurements is to examine the potential for equipment modification, such as introducing settling tubes to enhance solids settling rates in hopper bins. Hopper sampling at 3 depths was taken at the beginning of overflow and at the end of overflow. Three locations in the hopper were sampled.

### **Hopper Overflow Monitoring**

Because of the high-expected variability of the hopper overflow, 40 samples were taken for suspended solids determination for each overflow period. Samples were composited for chemical contaminant determination of chemical concentrations, grain size, particle size distribution of fines and toxicity testing.

### **Plume Monitoring**

Plume monitoring provided an evaluation of the amount of sediment in the water column resuspended by the operating draghead vs. the amount of sediment contributed by overflow. Data on plume concentrations as a function of distance and time provided information to determine an appropriate buffer distance from the oyster beds in which overflow should be restricted. Differentiation between the magnitude of sediment plumes caused by the draghead and plumes from overflow materials required monitoring both overflow and non-overflow periods. Monitoring one dredge pass

without overflow and one dredge pass with overflow was the minimal plume monitoring effort. To reduce the variability of results between tests, the dredge was required to be moving in the same direction relative to the current flow for every overflow and non-overflow test monitored. Plume monitoring also provided information on contaminant dispersion in the water column.

Plume monitoring required two boats. One boat was positioned behind the hopper dredge in its path immediately after it passed and began sampling the water column to evaluate the rate of settling of the plume. The other boat towed a turbidimeter (in-situ type probe) across the plume to give information on lateral plume dispersion. Thus, the duration and geometry of the plume could be estimated. Both boats in the monitoring area carried out background sampling immediately before the dredging began.

Lateral plume dispersion measurements were made at mid-depth by locating the turbidimeter probe at the mid-point of the water column. Background turbidity was extensively measured. The boat towing the turbidimeter monitored distance from the dredge, using a range finder and hand bearing compass, and distance from the anchored sample boat. The whole plume was traversed, going outside of the plume at each extreme of the turbidity plume.

While the mobile boat was measuring lateral plume dispersion, the anchored boat measured decay of the plume as it settled through the water column. Water

samples were taken at the surface (less than 1 meter deep), mid-depth, and near bottom (within 1 to 2 meters of the bottom). Fifteen samples at 3 depths for a 50-minute period were taken to characterize background TSS conditions and about 30 samples at 3 depths in a 30-minute timeframe were taken to characterize the overflow plume after the dredging pass. The latter sampling protocol was also used for the non-overflow sediment plume measurements

TSS was measured for all samples and a compositing scheme was used to reduce the number of samples for chemical analysis. Three composite samples for the plume monitoring was obtained (one at each of the three depths) by mixing portions of the samples taken at all three depths over one-third of the plume monitoring effort.

Chemical analysis of the composite background samples and 3 composite plume samples included heavy metals, PCBs and PAHs and provided data on potential contamination of the water column by the dredging operation.

## Sedimentation Assessment

One difficulty in assessing potential impacts of sedimentation resulting from hopper overflow is detection of thin overburdens in habitats in the vicinity of the dredging operation. Although thin (< 5cm) overburdens could have detrimental impacts, for example on the settlement and attachment of oyster larvae, this exceeds the detection limits of most conventional techniques. One method found to be

effective in measuring sedimentation events of less than 1 cm is sediment-profiling imagery using a sediment profile camera. This technique involves insertion of a prism into the substrate through which images of the sediment-water interface are obtained. The images provide rapid, accurate measures of recent sedimentation, particularly if the overburden sediments are dissimilar from the ambient substrate. The images also provide indications of impacts to benthic communities (e.g., distribution and position of annelid worms and bivalve mollusks relative to the relict and overburden surface) and changes in physical/chemical conditions of the sediment (e.g., altered redox potential discontinuity, evidence of hypoxia). This camera system is unaffected by ambient turbidity. A plan-view underwater camera will have the ability to yield surface photographs at the sediment profile stations.

The sediment profiling camera system was deployed at the Delaware River overflow operation site. Because the area is tidally influenced, stations were occupied both up and down current from the dredging project. Stations were allocated to gather information for transects across several cross-sections of the river reach potentially influenced by overflow, including any charted oyster bars.

## Bioassay

Samples were taken at the hopper overflow for use in a 96-hr bioassay. This portion of the study will help in determining the possible biological effects of water column exposure to Delaware River sediment.

## **3 Data Analysis**

### **Hopper Loading Characteristics**

#### **Coarse-Grained Site**

The loading data provided by the Philadelphia District for the coarse-grained site is shown in Figure 3, and the summary data for the load increase can be found in Table 3. Loading volumes are based on calculations using historical density data in the area being dredged.

It took nine minutes of dredging to reach overflow status. During the first nine minutes, material increased at a rate of 146 CY per min. Once overflow began, the increase in material loading was determined to be 30 CY per min. Overflow continued for 57 minutes with a gain of 130% realized. At the end of the overflow period the hopper was full of sediment. Since we do not have information as to a continuous loading curve for the test, it was not possible to determine an optimal economic loading based on minutes of overflow. However, it is likely that the loading rate during overflow was much higher in the initial period of overflow, as compared to the average value over the total of 57 minutes.

## Fine-Grained Site

The loading diagram for the fine-grained site is shown in Figure 4 and the summary data for the load increase can be found in Table 3. For this site the dredge operated 13 minutes before overflow began. During this first 13 minutes of dredging, material increased at a rate of 87 CY per min. Once overflow began, the increase in material loading was determined to be 10 CY per min. Overflow continued for 21 minutes with a gain of 18% realized. The percent gain realized for the coarse reach was interpolated for 21 minutes and was found to be 48% so that a comparison could be made during the same timeframe between the two sites.

## Economics

These results are consistent with the material composition at the two sites. The coarse-grained site would be expected to settle at a more rapid rate, therefore, showing a significant gain in material. Whereas, the fine-grained material would tend to stay in suspension, resulting in most of the sediment being discharged out the overflow. Because of the large amount of gain realized at the coarse-grained site, a rate of return of about 50 to 60 percent may be realized based on the amount of material retained in the hopper and the round trip travel time required to the dump site. Basically, for every three days of non-overflow dredging, approximately the same amount of material can be removed by allowing overflow dredging in a two-day period. This percent return also assumes that the material being discharged in the overflow settles in the navigation channel and will require re-dredging the area. At the fine-grained site the rate of return is

about 0 percent because of the small gain in load achieved. This is also based on round trip travel time required to the pump-out site, material being discharged in the overflow settling in the navigation channel and requiring re-dredging of the area. If re-dredging the area at either site is not required, then the percent return estimated at those sites may increase.

## **In-Situ Sediment and Background Water Samples**

### **Coarse-Grained Reach**

The five composited sediment samples at the coarse-grained site show the proposed dredged area to average 97 percent sand (Figure 5). The range was less than 1 percent  $\pm$  of the average value (96.5 to 97.7 percent). Background water chemical concentrations were compared with the contaminants of concern as listed in the acute marine objectives for toxic pollutants for the protection of aquatic life in the Delaware River estuary. This information can be found in the Delaware River Basin Commission West Trenton, New Jersey, Administrative Manual-Part III, Water Quality Regulations, October 23, 1996. The only parameter found to be above the standard was background dissolved copper (Table 1). The standard for copper is 5.3  $\mu\text{g/l}$  and the background value was 13  $\mu\text{g/l}$ . The water quality and sediment data for the coarse-grained reach can be found in Appendix A.

## **Fine-Grained Reach**

The five composited sediment samples at the fine-grained site show the proposed dredged area to average 33 percent sand (Figure 6). The range for sand was from 18 to 50 percent. Background water concentrations for the contaminants of concern were all below the more stringent of the freshwater or marine stream quality objectives for acute toxicity standards as found in the Delaware River Basin Commission West Trenton, New Jersey, Administrative Manual-Part III, Water Quality Regulations, October 23, 1996. Only two exceedances were found in the dissolved overflow water. Endrin was measured at a concentration of 0.0754 µg/l as compared to the standard of 0.019 µg/l. Zinc was measured at a concentration of 131 µg/l as compared to the standard of 95 µg/l. See Appendix A for the Delaware River water quality and sediment analysis for the fine-grained site.

## **Hopper Inflow**

### **Coarse-grained Site**

Samples collected for grain-size distribution at the hopper inflow at the coarse-grained site averaged 84 percent sand (Figure 7). The range was from 52 to 98 percent. Eliminating the 52 percent sample resulted in a sandy composition of 92 percent with a range from 86 to 98 percent. This is more representative of that collected from the in-situ sampling. Suspended solids concentrations in the hopper inflow could not be accurately

determined because the coarse-grained material rapidly settled to the bottom of the sampling buckets and the total bucket sample was not retained for analysis.

### **Fine-grained Site**

Samples collected for grain-size distribution at the hopper inflow at the fine-grained site averaged 12 percent sand (Figure 8). The range was from 9 to 15 percent. This is much less than the 33 percent represented by the in-situ sampling.

## **Hopper Contents**

### **Coarse-grained Site**

Suspended solids concentrations in the hopper at the coarse-grained reach were <15 g/l (Figure 9). This indicates that settling was occurring very rapidly. Although the samples should be representative of the water column, it should be realized that the agitation occurring inside the hopper will keep the material in suspension for an extended period of time. Therefore, when the sample was collected, the material being agitated quickly settled and was not collected in the 250 ml sample bottle.

### **Fine-grained Site**

Suspended solids concentrations in the hopper at the fine-grained reach were upwards of 150 g/l at the bottom and approximately 80 g/l at the surface (Figure 10). It would be expected that high concentrations of suspended solids would be found in the water column as the hopper agitates the fine-grained material and keeps it in suspension.

The high concentrations of suspended solids at the surface indicate that a large amount of the material will be lost to overflow in the fine-grained reach.

## **Hopper Overflow**

### **Coarse-grained Site**

Samples collected for grain-size distribution at the hopper overflow at the coarse-grained site averaged 81.1 percent sand with a range from 24.4 to 96.1 percent (Figure 11). Composites of five samples were obtained and the average grain-size distribution was 78.1 percent with a range from 66.7 to 87.7 percent (Figure 12). This shows that a large amount of the sandy material was being agitated in the hopper and being washed out during overflow. This is consistent with the loading data that shows a loading of about 147 cu.yds/min before overflow and an average loading of about 30 cu.yds/min over the 57 minute period during overflow. However, the rate of loading in the initial stages of overflow was likely much higher with the material in the overflow increasing as the hopper filled and retention time was decreased. None of the chemistry parameters analyzed in the overflow samples collected at the coarse-grained site exceeded marine acute objectives as listed in the Delaware River Basin Water Quality Regulations for dissolved criteria limits. Although the background value for copper (13 µg/l) exceeded the criteria (5.3 µg/l) as shown above, the dissolved value for copper in the overflow was 5 µg/l, indicating a scavenging of metals by the suspended material during the dredging and overflow process.

### **Fine-grained Site**

Samples collected for grain-size distribution at the hopper overflow at the fine-grained site averaged 12.2 percent sand with a range from 6.2 to 31.2 percent (Figure 13). Composites of five samples were obtained and the average grain-size distribution was 10.6 percent with a range from 9.3 to 11.6 percent (Figure 14). The suspended solids concentrations in the overflow averaged 110 g/l over the total overflow period of 21 minutes. The solids concentrations were essentially consistent throughout the overflow period, indicating little retention of the fine material in the hopper once overflow began. A large amount of material, about 78 cu.yds/min or about 89 percent of the inflow is being lost to overflow. Zinc (131 µg/l) and endrin (0.0754 µg/l) were the only two chemical parameters measured in the overflow that exceeded the more stringent acute objectives of the freshwater and marine stream quality standards (95 µg/l for zinc and 0.019 µg/l for endrin) as listed in the Delaware River Basin Water Quality Regulations for dissolved criteria limits. The value for endrin exceeded standards only by a factor of 4, indicating that both water quality objectives could be met a short distance from the point of overflow. None of the other chemistry parameters analyzed in the overflow samples collected at the fine-grained site exceeded the acute objectives.

### **Plume Monitoring**

Monitoring of the sediment plumes was accomplished using a boat-mounted instrument (1200-kHz Broad-Band Acoustic Doppler Current Profiler (ADCP). The instrument collects velocity vectors in the water column together with backscatter levels to

determine the position and relative intensity of the sediment plume. Along with the ADCP, a MicroLite recording instrument with an Optical Backscatterance (OBS) Sensor was towed by the vessel at a depth of fifteen feet. The MicroLite recorded data at 0.5 sec intervals. Navigation data for monitoring was obtained by a Starlink differential Global Positioning System (GPS). The GPS monitors the boat position from the starting and ending points along each transect.

### **Coarse-grained reach**

Transects were monitored in each test area to obtain the background levels of suspended materials prior to dredging activities. Eight minutes following the dredge passing during non-overflow dredging shows the level of suspended material to be returning to background levels. No lateral dispersion of the plume out of the channel was observed during the non-overflow dredging operation.

During overflow dredging, a wider transect was performed to determine the lateral extent of the plume. No significant change above background levels could be detected. At 1-hour elapsed time following the end of the overflow dredging operation, the levels of suspended material were found to have returned to background conditions. Again, no lateral dispersion of the plume out of the channel area was observed. A complete analysis of the plume study can be found in Appendix B.

Figure 15 is a surface profile of the solids concentrations measured during non-overflow and overflow conditions. Both sets of data fall within the minimum and maximum range of the background solids concentrations measured prior to dredging. Figure 16 is a mid-depth profile of the solids concentrations. Because of the narrow range between the measured values of the minimum and maximum range, both the non-overflow and the overflow measured solids concentrations were above the maximum range. Figure 17 is a bottom profile of the solids concentrations and can be described much like that of the surface profile in that both sets of data fall within the minimum and maximum range of the background solids concentrations. In all three instances, there is not a significant difference in the solids concentrations measured during non-overflow and the solids concentrations measured during overflow. Figure 18 shows that all solids concentrations measured during non-overflow and overflow fell within the total minimum and maximum range measured in the background prior to dredging.

### Fine-grained reach

During the non-overflow dredging operation the tidal flow in the dredging area reversed from flood flow to ebb flow conditions. This accounts for the relative change in observed background levels taken before the non-overflow and overflow test dredging. At 19-minutes following the end of non-overflow dredging, the levels of suspended material had returned to background conditions. Despite the change in direction of flow in the dredging area, no lateral movement of the plume beyond the channel limits was observed.

Immediately prior to overflow conditions, an increase in the suspended material was observed. This increase is assumed to be due to the increase in the ebb flow velocities and the resulting disturbance of bottom materials from near bottom velocities and not dredge plume dispersion. When hopper overflow conditions began the width of the transect was increased to observe the lateral extent of the dispersion of the dredge plume. After an elapsed time of 1-hour following the completion of the overflow dredging operation, levels of suspended materials had returned to background conditions. As in the previous dredge operations, no lateral dispersion of the dredge plume beyond the channel limits was observed to have occurred. A complete analysis of the plume study can be found in Appendix B.

Figure 19 shows the solids concentration as measured at the surface during non-overflow and overflow conditions. The overflow solids concentrations oscillate outside the maximum background solids concentration. Toward the end of overflow the concentrations fall back within the background range. Figure 20 shows the solids concentration as measured at mid-depth. The same pattern as the surface profile is exhibited. Figure 21 shows the solids concentration as measured at the bottom. The non-overflow solids concentrations remain within the measured range of the background; however, the overflow solids concentrations remain above the maximum background range throughout the duration of overflow. Figure 22 shows the maximum background range of solids concentration measured. The non-overflow solids measured are well within the total range while the overflow solids concentrations oscillate outside the

maximum range. This is consistent since 70 percent or more of the material is fine-grained and would settle slowly.

## **Sedimentation Results**

### **Coarse-grained Site**

Sediment profile images from a total of 14 stations were analyzed from the coarse-grained site as shown in Figure 2 of Appendix C. There was evidence that recent sedimentation had occurred at several of the stations, possibly a result of the dredging operations. Gray colored suspended material, indicative of hopper overflow material, was observed at two of the stations. Four of the stations had layering from grain-sized changes, but are assumed to have occurred because of normal sediment transport processes rather than hopper overflow operations.

### **Fine-grained Site**

Sediment profile images from a total of 41 stations were analyzed from the fine-grained site as shown in Figure 3 of Appendix C. No evidence of recent physical disturbance was detected at any of the stations, but material that could have come from the hopper overflow was observed at one station. Five of the stations on the edge of the channel had grain-sized layering with sands on the surface overlaying clayey sediments. Since the sediments in the channel were finer silts and clays it was unlikely that the layers at the channel edge stations were the result of the dredging operations. Three of the

stations on the edge of the channel had sediment layering with amphipod and worm tubes which could not have re-established living position in the short interval between dredging and sampling. Flocculent sediment layers, thin layers of unconsolidated surface sediments, occurred at six shoal stations and one channel edge station. Based on their color tones, all flock layers appeared to be composed of background sediments and not hopper overflow or dredged material.

No indication of newly deposited dredged material was observed at stations outside the edge of the navigation channel at either study site. Although the sampling station coverage was not extensive, given the relatively short duration of the tests, the risk of significant sedimentation as a consequence of the hopper dredging operations appears largely restricted to the bottom and side slopes of the channel. The full report on the sedimentation analysis is attached as Appendix C.

## Standard Elutriate Tests

The standard elutriate analysis was performed using the composited in-situ sediment and site water. The purpose of the standard elutriate testing was to gain data on possible application of the test for prediction of overflow contaminant concentrations. The mean predicted dissolved values from the elutriates were calculated using the EFQUAL computer program, a module of the ADDAMS software package. The elutriate test was conducted using standard procedures (US Army Corps of Engineers/USEPA 1977).

## **Coarse-grained Site**

At the coarse-grained site, background dissolved copper was the only contaminant of concern that was predicted to be above the standard (Table 1). The program predicted that copper would be discharged at 7 µg/l which is above the marine objective acute criteria, but is well below the background value of 13 µg/l. Therefore, a dilution of the background with respect to copper would naturally occur due to the dredging operation and a mixing zone would not be required. The actual value recorded at the hopper overflow (effluent) for copper was 5 µg/l, which was below both the background and the standard of 5.3 µg/l

## **Fine-grained Site**

At the fine-grained site, the predicted dissolved value of selenium was 24.3 µg/l (Table 2). The more stringent acute value of the freshwater or marine stream quality standard for selenium 20 µg/l and the background was found to be 19 µg/l. The actual value recorded at the hopper overflow for selenium was 14.2 µg/l, which is below the criteria and the background value, which would indicate a natural dilution of the contaminant of concern during dredging operations. Again, because of this natural dilution, a mixing zone would not be required.

At both reaches, the predicted elutriate values appear somewhat conservative when compared with the overflow values. The close agreement of the elutriate values

with the actual overflow values (Tables 1 and 2) indicate that the elutriate test can be used as a valid predictor of overflow quality for the Delaware River. Summaries of the standard elutriate and predicted effluent quality results for the two sites can be found in Tables 1 and 2. A complete listing of the water quality, sediment, and elutriate analysis for both sites can be found in Appendix A.

## Technical Findings of a 96-hr Bioassay

This test was performed in order to determine the possible biological effects of water column exposure to Delaware River overflow. Two species were used in performing the bioassays, the mysid shrimp, a crustacean species, *Mysidopsis bahia* and the inland silverside, a fish species, *Menidia beryllina*. These species were selected based on conversations with personnel from the Delaware Department of Natural Resources and Environmental Control. The filtered elutriate was diluted with standard laboratory control seawater (6 ppt salinity for the fine-grained site and 30 ppt salinity for the coarse-grained site) to yield the following concentrations: 0%; 6.25%; 12.5%; 25%; 50%; and 100% elutriate. Each treatment was replicated five times. The trimmed spearman-karber method was used to calculate LC<sub>50</sub> values. The bioassay report is attached as Appendix D.

### Coarse-grained Site

Survival in test concentrations from the coarse-grained site ranged from 100 to 88 percent for *Mysidopsis bahia* and from 88 to 68 percent for *Menidia beryllina*.

Exposures in elutriate test concentrations from the coarse-grained site did not adversely affect survival of either test species. Since neither test species had mortality values greater than 50 percent, an LC<sub>50</sub> value could not be calculated.

### Fine-grained Site

Survival in test concentrations from the fine-grained site ranged from 90 to 0 percent with 0 percent survival in the 50 and 100 percent exposures for *Mysidopsis bahia*. Survival for *Menidia beryllina* ranged from 98 to 0 percent with 4 to 0 percent survival in the 50 and 100 percent elutriate treatments. An LC<sub>50</sub> value of 30.04 percent was calculated for *Mysidopsis bahia* and an LC<sub>50</sub> value of 31.66 percent was calculated for *Menidia beryllina*. Mortality observed from exposures in elutriate test concentrations was attributed to the high level of NH<sub>3</sub>. In the short term, high levels of NH<sub>3</sub> are common in predominately fine-grained sites during dredging operations.

## **4 Summary and Conclusions**

Based on the results of the study, the following conclusions can be made:

- a. Loading data at the coarse-grained site shows a gain of 130 percent over a period of 57 minutes after overflow began. Based on the round trip travel time required to the dump site and the amount of material retained in the hopper, rates of return greater than 50 percent may be realized. Loading data at the fine-grained site shows a gain of 18 percent over a period of 21 minutes after overflow began. Based on the round trip travel time required to the pump-out site and the amount of material retained in the hopper, there was no economic benefit to overflow. In both instances, rates of return are also base on the assumption that all material in the overflow will return to the channel and will require re-dredging.
- b. Using the same economic assumptions as discussed above, about a 20 percent return may be realized from a material containing about 60 percent sand and about a 40 percent return may be realized from a material containing about 80 percent sand.
- c. Based on the water chemistry analysis at the two sites, no contaminants of concern were found to be a problem because of the dredging operation. None of the

contaminants of concern exceeded water quality objectives in the overflow at the coarse-grained site. At the coarse-grained site only dissolved copper was found in the background to be above the standard. Samples taken for dissolved copper at the hopper overflow, however, were within standards. This indicates a scavenging of the metal by the suspended material during the dredging and overflow process. At the fine-grained site, only zinc and endrin were measured at the overflow to be above the standard. However, the predicted elutriate for both zinc and endrin were measured at below detection.

d. The plume study results showed that the coarse-grained material settled quite rapidly and that no lateral dispersion of the plume out of the channel was observed. No significant change above background levels could be detected. At 1-hour elapsed time following the end of the overflow dredging operation, the levels of suspended material were found to have returned to background conditions. At the fine-grained site, an increase in the suspended material was observed. However, after an elapsed time of 1-hour following the completion of the overflow dredging operation, levels of suspended materials had returned to background conditions. Again, no lateral dispersion of the dredge plume beyond the channel limits was observed to have occurred

e.. The sedimentation portion of the study only confirms what was observed during the plume study. At the coarse-grained site, there was evidence that recent sedimentation had occurred at several of the stations, possibly a result of dredging operations. But no indication of newly deposited dredged material was observed at

stations outside the edge of the navigation channel. At the fine-grained site, some sediment layering was found even though no evidence of recent physical disturbance was detected at any of the stations. Again, no indication of newly deposited dredged material was observed at stations outside the edge of the navigation channel.

f. Although the sampling station coverage was not extensive, the risk of significant sedimentation as a consequence of the hopper dredging operations appear to be restricted to the bottom and side slopes of the channel.

g. The elutriate test results were consistent with and slightly conservative as compared to the overflow samples, indicating that the elutriate test is a valid prediction of overflow quality for the Delaware system.

h. The bioassay analysis showed no adverse effects to exposures of fish and crustaceans species being exposed to the elutriate samples from the coarse-grained site. Some species mortality were observed using elutriates from the fine-grained site, but was determined to be caused from high levels of  $\text{NH}_3$ , which is a common short term byproduct of dredging in fine-grained material.

i. The overall results of the study indicate that overflow meets the applicable water quality objectives and has no measurable physical impact outside the navigation channels. The loading data indicate that overflow in coarse-grained reaches results in

significant load gains, while load gains in fine-grained reaches are small. Based on these results, overflow in coarse-grained reaches should be considered for future operations.

## APPENDIX A

### Delaware River Sediment and Water Quality Analysis (Coarse and Fine-Grained Sites)

Metscoar	- Metals (Coarse-Grained Site)
PAHscoar	- PAH's (Coarse-Grained Site)
Pestcoar	- Pesticides (Coarse-Grained Site)
PCBscoar	- PCB's (Coarse-Grained Site)
Tsscoar	- Total Suspended Solids (Coarse-Grained Site)
Nutcoar	- Nutrients (Coarse-Grained Site)
Spgrcoar	- Specific Gravity and %Moisture (Coarse-Grained Site)
Metsfine	- Metals (Fine-Grained Site)
PAHsfine	- PAH's (Fine-Grained Site)
Pestfine	- Pesticides (Fine-Grained Site)
PCBsfine	- PCB's (Fine-Grained Site)
Tssfine	- Total Suspended Solids (Fine-Grained Site)
Nutfine	- Nutrients (Fine-Grained Site)
Spgrfine	- Specific Gravity and % Moisture (Fine-Grained Site)

TABLE 3: Delaware River Coarse and Fine Grained Loading Data

Coarse-grain Material			Fine-grain Material		
Time (min.)	Loading (cu.yds.)		Time (min.)	Loading (cu.yds.)	
0	0		0	0	
9	1320	Begin Overflow (9 min)	13	1139	Begin Overflow (13 min)
66	3039	Overflow (57 min)	34	1348	Overflow 21 min)
				0	0
			13	1139	Begin Overflow (13 min)
			18	1257	Overflow (5 min)
Losing to Overflow			Losing to Overflow		
Time (min.)	Loading (cu.yds./min)		Time (min.)	Loading (cu.yds./min)	% Gain
9	146.7		13	87.6	
57	30.2	116.5	21	10.0	77.7
		130.2	5	23.6	64.0
					43.5

PARAMETER	SEDIMENT CONC mg/kg	DETECTION LIMIT μg/l	<sup>1</sup> WATER QUALITY STANDARDS μg/l	BACKGROUND CONC μg/l	ELUTRIATE CONC μg/l	OVERFLOW CONC μg/l
PCB 64	0.000	0.0010	NL	BD	BD	BD
PCB 66	0.000	0.0010	NL	BD	BD	BD
PCB 70	0.002	0.0010	NL	BD	0.0014	BD
PCB 74	0.000	0.0010	NL	BD	BD	BD
PCB 77	0.000	0.0010	NL	BD	BD	BD
PCB 8	0.000	0.0010	NL	BD	BD	BD
PCB 80	0.000	0.0010	NL	BD	BD	BD
PCB 81	0.000	0.0010	NL	BD	BD	BD
PCB 82	0.000	0.0010	NL	BD	BD	BD
PCB 84	0.000	0.0010	NL	BD	BD	BD
PCB 86	0.000	0.0010	NL	BD	BD	BD
PCB 87	0.000	0.0010	NL	BD	BD	BD
PCB 91	0.000	0.0010	NL	BD	BD	BD
PCB 92	0.000	0.0010	NL	BD	BD	BD
PCB 95	0.000	0.0010	NL	BD	0.0010	0.0017
PCB 97	0.000	0.0010	NL	BD	BD	BD
PCB 99	0.001	0.0010	NL	BD	BD	BD
PHENANTHRENE	0.085	0.3000	NL	BD	BD	BD
POTASSIUM (K)	2340.000	200.0000	NL	56400.000	39066.6680	32220
PPDDD	0.011	0.1000	NL	BD	BD	BD
PPDDE	0.008	0.1000	NL	BD	BD	BD
PPDTT	0.010	0.1000	NL	BD	BD	BD
PYRENE	0.164	0.3000	NL	BD	BD	BD
SELENIUM (Se)	1.630	2.0000	20	19.000	24.3333	14
SILVER (Ag)	0.683	1.0000	2.3	BD	1.3333	1
THALLIUM (Tl)	0.000	2.0000	NL	BD	BD	BD
TOC-TOTAL ORGANIC CARBON	7603.000	3000.0000	BD	BD		
TOXAPHENE	0.000	0.0500	0.21	BD	BD	BD
VANADIUM (V)	37.800	2.0000	NL	4.0000	6.6667	BD
ZINC	131.000	10.0000	95	53.0000	74.6667	131
a-CHLORDANE	0.001	0.0500	0.045	BD	BD	BD
b-CHLORDANE	0.004	0.0500	0.045	BD	BD	BD

BD = below detection

NL = not listed

0.0 = below detection for sediment conc. (mg/kg)

<sup>1</sup>More stringent acute value of the freshwater or marine stream quality objectives.

## Metscoar

## Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	SB	AS	BE	CD	CR	CU	PB	HG
		Detection Limit (mg/l)	0.003	0.002	0.002	0.0002	0.002	0.001	0.001	0.00020
Water	80827	Plume Monitoring Background, dissolved	<b>0.003</b>	0.044	<b>0.002</b>	<b>0.0002</b>	<b>0.002</b>	0.013	<b>0.001</b>	<b>0.00020</b>
Water	80735	Background, total	<b>0.003</b>	0.044	<b>0.001</b>	<b>0.0002</b>	<b>0.002</b>	0.012	0.003	<b>0.00020</b>
Water	80828	0-10 min, overflow, dissolved	<b>0.003</b>	0.044	<b>0.002</b>	<b>0.0002</b>	<b>0.002</b>	0.011	<b>0.001</b>	<b>0.00020</b>
Water	80829	10-20 min, overflow, dissolved	<b>0.003</b>	0.044	<b>0.002</b>	<b>0.0002</b>	<b>0.002</b>	0.010	<b>0.001</b>	<b>0.00020</b>
Water	80830	20-30 min, overflow, dissolved	<b>0.003</b>	0.046	<b>0.002</b>	<b>0.0002</b>	<b>0.002</b>	0.013	<b>0.001</b>	<b>0.00020</b>
Water	80736	0-10 min, overflow, total	0.006	0.045	<b>0.001</b>	<b>0.0002</b>	<b>0.002</b>	0.011	0.001	<b>0.00020</b>
Water	80737	10-20 min, overflow, total	<b>0.003</b>	0.046	<b>0.001</b>	<b>0.0002</b>	<b>0.002</b>	0.012	0.001	<b>0.00020</b>
Water	80738	20-30 min, overflow, total	<b>0.003</b>	0.045	<b>0.001</b>	<b>0.0002</b>	<b>0.002</b>	0.011	<b>0.001</b>	<b>0.00020</b>
Water	80831	0-10 min, non-overflow, dissolved	<b>0.003</b>	0.047	<b>0.002</b>	<b>0.0002</b>	<b>0.002</b>	0.012	<b>0.001</b>	<b>0.00020</b>
Water	80832	10-20 min, non-overflow, dissolved	<b>0.003</b>	0.048	<b>0.002</b>	<b>0.0004</b>	<b>0.002</b>	0.011	<b>0.001</b>	<b>0.00020</b>
Water	80833	20-30 min, non-overflow, dissolved	<b>0.003</b>	0.047	<b>0.002</b>	<b>0.0002</b>	<b>0.002</b>	0.012	<b>0.001</b>	<b>0.00020</b>
Water	80739	0-10 min, non-overflow, total	<b>0.003</b>	0.044	<b>0.001</b>	<b>0.0002</b>	<b>0.002</b>	0.011	0.002	<b>0.00020</b>
Water	80740	10-20 min, non-overflow, total	<b>0.003</b>	0.048	<b>0.001</b>	<b>0.0002</b>	<b>0.002</b>	0.011	<b>0.001</b>	<b>0.00020</b>
Water	80741	20-30 min, non-overflow, total	<b>0.003</b>	0.044	<b>0.001</b>	<b>0.0002</b>	<b>0.002</b>	0.010	<b>0.001</b>	<b>0.00020</b>
		Hopper Inflow Monitoring								
Water	80780	3& 6 min, dissolved	<b>0.003</b>	0.051	<b>0.001</b>	<b>0.0002</b>	<b>0.002</b>	0.007	<b>0.001</b>	<b>0.00020</b>
Water	80781	9&12 min, dissolved	<b>0.003</b>	0.045	<b>0.001</b>	<b>0.0002</b>	<b>0.002</b>	0.005	<b>0.001</b>	<b>0.00020</b>
Water	80782	15&18 min, dissolved	<b>0.003</b>	0.046	<b>0.001</b>	<b>0.0002</b>	<b>0.002</b>	0.006	<b>0.001</b>	<b>0.00020</b>
Water	80783	21&24 min, dissolved	<b>0.003</b>	0.048	<b>0.001</b>	<b>0.0002</b>	<b>0.002</b>	0.007	0.001	<b>0.00020</b>
Water	80784	27&30 min, dissolved	<b>0.003</b>	0.050	<b>0.001</b>	<b>0.0002</b>	<b>0.002</b>	0.006	<b>0.001</b>	<b>0.00020</b>
Water	80658	3& 6 min, total	<b>0.003</b>	0.076	<b>0.002</b>	<b>0.0029</b>	0.088	0.090	0.168	0.00083
Water	80669	9&12 min, total	<b>0.003</b>	0.070	<b>0.002</b>	<b>0.0010</b>	0.088	0.062	0.140	0.00064
Water	80670	15&18 min, total	<b>0.003</b>	0.069	<b>0.002</b>	<b>0.0005</b>	0.140	0.094	0.132	0.00129
Water	80671	21&24 min, total	<b>0.003</b>	0.105	<b>0.007</b>	<b>0.0008</b>	0.332	0.127	0.292	0.00369
Water	80672	27&30 min, total	<b>0.003</b>	0.115	<b>0.008</b>	<b>0.0009</b>	0.392	0.158	0.208	0.00126
		Hopper Overflow Monitoring								
Water	80785	2& 4 min, dissolved	<b>0.003</b>	0.045	<b>0.001</b>	<b>0.0002</b>	<b>0.002</b>	0.005	<b>0.001</b>	<b>0.00020</b>
Water	80786	6& 8 min, dissolved	<b>0.003</b>	0.048	<b>0.001</b>	<b>0.0002</b>	<b>0.002</b>	0.005	<b>0.001</b>	<b>0.00020</b>
Water	80787	10&12 min, dissolved	<b>0.003</b>	0.047	<b>0.001</b>	<b>0.0002</b>	<b>0.002</b>	0.005	<b>0.001</b>	<b>0.00020</b>
Water	80788	14&16 min, dissolved	<b>0.003</b>	0.046	<b>0.001</b>	<b>0.0002</b>	<b>0.002</b>	0.005	<b>0.001</b>	<b>0.00020</b>
Water	80789	18&20 min, dissolved	<b>0.003</b>	0.045	<b>0.001</b>	<b>0.0002</b>	<b>0.002</b>	0.005	<b>0.001</b>	<b>0.00020</b>
Water	80674	2& 4 min, total	0.006	0.047	0.001	0.0027	0.059	0.031	0.080	0.00053
Water	80675	6& 8 min, total	<b>0.003</b>	0.052	<b>0.002</b>	<b>0.0017</b>	0.074	0.030	0.104	0.00113
Water	80676	10&12 min, total	<b>0.003</b>	0.066	<b>0.002</b>	<b>0.0013</b>	0.080	0.035	0.114	0.00086
Water	80677	14&16 min, total	0.007	0.052	0.001	0.0034	0.040	0.028	0.049	0.00056
Water	80678	18&20 min, total	<b>0.003</b>	0.046	<b>0.001</b>	<b>0.0002</b>	0.048	0.018	0.040	0.00048
		Site Water								
Water	81648	Sample 1 Total	<b>0.003</b>	0.034	<b>0.001</b>	<b>0.0002</b>	0.005	0.027	0.003	<b>0.00020</b>
Water	81649	Sample 2 Total	<b>0.003</b>	0.037	<b>0.001</b>	<b>0.0002</b>	<b>0.002</b>	0.021	0.002	<b>0.00020</b>
Water	81650	Sample 3 Total	<b>0.003</b>	0.037	<b>0.001</b>	<b>0.0002</b>	<b>0.002</b>	0.016	<b>0.001</b>	<b>0.00020</b>
		Elutriate								
Water	81654	Sample 1 Dissolved	<b>0.003</b>	0.050	<b>0.001</b>	<b>0.0002</b>	<b>0.002</b>	0.005	<b>0.001</b>	<b>0.00020</b>
Water	81655	Sample 2 Dissolved	<b>0.003</b>	0.052	<b>0.001</b>	<b>0.0002</b>	<b>0.002</b>	0.006	<b>0.001</b>	<b>0.00020</b>
Water	81656	Sample 3 Dissolved	<b>0.003</b>	0.047	<b>0.001</b>	<b>0.0002</b>	<b>0.002</b>	0.010	<b>0.001</b>	<b>0.00020</b>
Water	81651	Sample 1 Total	<b>0.003</b>	0.040	<b>0.001</b>	<b>0.0002</b>	<b>0.002</b>	0.006	0.002	<b>0.00020</b>
Water	81652	Sample 2 Total	<b>0.003</b>	0.042	<b>0.001</b>	<b>0.0002</b>	<b>0.002</b>	0.005	0.001	<b>0.00020</b>
Water	81653	Sample 3 Total	<b>0.003</b>	0.043	<b>0.001</b>	<b>0.0002</b>	<b>0.002</b>	0.005	0.001	<b>0.00020</b>
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	SB	AS	BE	CD	CR	CU	PB	HG
		Detection Limit (mg/kg)	0.30	0.20	0.1	0.020	0.2	0.10	1.0	0.020
		Insitu Sediment								
Sediment	81726	Sample #1	<b>0.30</b>	3.50	0.1	<b>0.020</b>	5.6	3.00	12.9	0.084
Sediment	81727	Sample #2	<b>0.30</b>	2.90	0.2	<b>0.020</b>	6.3	1.30	12.1	0.110
Sediment	81728	Sample #3	<b>0.30</b>	3.10	0.2	<b>0.020</b>	7.0	2.70	12.0	0.084

SB - Antimony    AS - Arsenic    BE - Beryllium    CD - Cadmium    CR - Chromium    CU - Copper    PB - Lead    HG - Mercury

BOLD - less than values  
Values below less than values are estimated results. Results are less than the reporting limit.

## Metscoar

## Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	NI	SE	AG	TL	ZN	AL	BA	CA
		Detection Limit (mg/l)	0.001	0.002	0.001	0.002	0.010	0.025	0.002	0.200
Water	80827	Plume Monitoring								
Water	80735	Background, dissolved	0.009	0.152	<b>0.001</b>	<b>0.002</b>	<b>0.010</b>	<b>0.025</b>	0.039	323
Water	80735	Background, total	0.009	0.138	0.003	<b>0.002</b>	0.017	0.644	0.016	254
Water	80828	0-10 min, overflow, dissolved	0.008	0.150	0.001	<b>0.002</b>	<b>0.010</b>	<b>0.025</b>	0.042	334
Water	80829	10-20 min, overflow, dissolved	0.008	0.146	0.001	<b>0.002</b>	<b>0.010</b>	<b>0.025</b>	0.061	369
Water	80830	20-30 min, overflow, dissolved	0.012	0.158	<b>0.001</b>	<b>0.002</b>	0.011	<b>0.025</b>	0.077	331
Water	80736	0-10 min, overflow, total	0.010	0.157	0.004	<b>0.002</b>	0.015	0.864	0.016	253
Water	80737	10-20 min, overflow, total	0.010	0.153	0.004	<b>0.002</b>	0.017	0.984	0.016	261
Water	80738	20-30 min, overflow, total	0.008	0.157	0.003	<b>0.002</b>	0.013	0.676	0.016	260
Water	80831	0-10 min, non-overflow, dissolved	0.009	0.158	<b>0.001</b>	<b>0.002</b>	<b>0.010</b>	<b>0.025</b>	0.038	319
Water	80832	10-20 min, non-overflow, dissolved	0.009	0.160	<b>0.001</b>	<b>0.002</b>	<b>0.010</b>	<b>0.025</b>	0.062	314
Water	80833	20-30 min, non-overflow, dissolved	0.008	0.153	<b>0.001</b>	<b>0.002</b>	<b>0.010</b>	<b>0.025</b>	0.043	319
Water	80739	0-10 min, non-overflow, total	0.007	0.149	0.003	<b>0.002</b>	<b>0.010</b>	0.716	0.016	243
Water	80740	10-20 min, non-overflow, total	0.009	0.163	0.003	<b>0.002</b>	0.017	1.100	0.016	242
Water	80741	20-30 min, non-overflow, total	0.008	0.154	0.003	<b>0.002</b>	0.012	0.664	0.016	247
		Hopper Inflow Monitoring								
Water	80780	3& 6 min, dissolved	0.010	0.175	<b>0.001</b>	<b>0.002</b>	0.038	<b>0.025</b>	0.209	374
Water	80781	9&12 min, dissolved	0.008	0.149	<b>0.001</b>	<b>0.002</b>	0.025	<b>0.025</b>	0.100	329
Water	80782	15&18 min, dissolved	0.009	0.161	<b>0.001</b>	<b>0.002</b>	0.034	<b>0.025</b>	0.152	342
Water	80783	21&24 min, dissolved	0.009	0.163	<b>0.001</b>	<b>0.002</b>	0.043	<b>0.025</b>	0.139	360
Water	80784	27&30 min, dissolved	0.009	0.167	<b>0.001</b>	<b>0.002</b>	0.048	0.107	0.207	393
Water	80668	3& 6 min, total	0.076	0.069	0.006	<b>0.002</b>	1.120	32.6	0.157	1610
Water	80669	9&12 min, total	0.060	0.062	0.012	<b>0.002</b>	0.728	29.9	0.090	648
Water	80670	15&18 min, total	0.072	0.103	0.014	<b>0.002</b>	0.366	52.4	0.147	460
Water	80671	21&24 min, total	0.152	0.113	0.015	<b>0.002</b>	1.100	120.0	0.223	1120
Water	80672	27&30 min, total	0.184	0.129	0.019	<b>0.002</b>	0.719	147.0	0.316	1020
		Hopper Overflow Monitoring								
Water	80785	2& 4 min, dissolved	0.008	0.155	<b>0.001</b>	<b>0.002</b>	0.038	<b>0.025</b>	0.148	345
Water	80786	6& 8 min, dissolved	0.009	0.165	<b>0.001</b>	<b>0.002</b>	0.028	<b>0.025</b>	0.108	347
Water	80787	10&12 min, dissolved	0.009	0.166	<b>0.001</b>	<b>0.002</b>	0.042	<b>0.025</b>	0.166	361
Water	80788	14&16 min, dissolved	0.009	0.162	<b>0.001</b>	<b>0.002</b>	0.015	<b>0.025</b>	0.080	376
Water	80789	18&20 min, dissolved	0.008	0.153	0.003	<b>0.002</b>	0.012	<b>0.025</b>	0.084	319
Water	80674	2& 4 min, total	0.044	0.053	0.007	<b>0.002</b>	0.330	20.9	0.088	480
Water	80675	6& 8 min, total	0.048	0.064	0.006	<b>0.002</b>	0.399	25.2	0.090	460
Water	80676	10&12 min, total	0.050	0.089	0.006	<b>0.002</b>	0.609	25.8	0.077	476
Water	80677	14&16 min, total	0.035	0.113	0.054	0.002	0.155	18.6	0.066	380
Water	80678	18&20 min, total	0.026	0.118	0.011	<b>0.002</b>	0.118	18.2	0.060	345
		Site Water								
Water	81648	Sample 1 Total	0.005	0.115	0.003	<b>0.002</b>	0.012	1.260*	0.015	322
Water	81649	Sample 2 Total	0.008	0.124	0.005	<b>0.002</b>	<b>0.010</b>	0.056	0.012	305
Water	81650	Sample 3 Total	0.004	0.134	0.004	<b>0.002</b>	<b>0.010</b>	0.064	0.012	307
		Elutriate								
Water	81654	Sample 1 Dissolved	0.005	0.172	0.001	<b>0.002</b>	0.022	<b>0.025</b>	0.073	318
Water	81655	Sample 2 Dissolved	0.005	0.170	0.001	<b>0.002</b>	0.031	<b>0.025</b>	0.097	318
Water	81656	Sample 3 Dissolved	0.005	0.161	0.001	<b>0.002</b>	0.031	<b>0.025</b>	0.105	314
Water	81651	Sample 1 Total	0.006	0.135	0.004	<b>0.002</b>	<b>0.010</b>	1.140	0.018	309
Water	81652	Sample 2 Total	0.005	0.140	0.003	<b>0.002</b>	<b>0.010</b>	1.140	0.018	304
Water	81653	Sample 3 Total	0.005	0.141	0.003	<b>0.002</b>	<b>0.010</b>	1.590	0.026	437
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	NI	SE	AG	TL	ZN	AL	BA	CA
		Detection Limit (mg/kg)	0.5	0.200	0.100	0.200	1.0	1	0.1	20
		Insitu Sediment								
Sediment	81726	Sample #1	3.2	0.800	0.100	<b>0.200</b>	29.9	1580	5.7	19600
Sediment	81727	Sample #2	3.3	0.900	0.400	<b>0.200</b>	29.0	1720	4.8	11600
Sediment	81728	Sample #3	3.5	0.899	0.499	<b>0.200</b>	28.7	1720	4.3	9820

NI - Nickel    SE - Selenium    AG - Silver    TL - Thallium    ZN - Zinc    AL - Aluminum    BA - Barium    CA - Calcium

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## Metscoar

## Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	CO	FE	MG	MN	K	NA	V
		Detection Limit (mg/l)	0.002	0.020	0.200	0.001	0.200	0.200	0.001
		Plume Monitoring							
Water	80827	Background, dissolved	0.001	<b>0.020</b>	961	0.006	284	9,540	0.002
Water	80735	Background, total	0.001	0.204	968	0.012	291	7,970	0.004
Water	80828	0-10 min, overflow, dissolved	0.001	<b>0.020</b>	994	0.002	294	8,280	0.002
Water	80829	10-20 min, overflow, dissolved	0.001	<b>0.020</b>	985	0.002	290	9,230	0.002
Water	80830	20-30 min, overflow, dissolved	0.001	<b>0.020</b>	1030	0.004	302	8,890	0.002
Water	80736	0-10 min, overflow, total	0.001	0.312	940	0.012	300	9,560	0.004
Water	80737	10-20 min, overflow, total	0.001	0.364	1030	0.015	368	8,580	0.004
Water	80738	20-30 min, overflow, total	0.001	0.184	944	0.009	324	7,880	0.004
Water	80831	0-10 min, non-overflow, dissolved	0.001	<b>0.020</b>	992	0.005	292	8,930	0.002
Water	80832	10-20 min, non-overflow, dissolved	0.001	<b>0.020</b>	986	0.006	288	8,510	0.002
Water	80833	20-30 min, non-overflow, dissolved	0.001	<b>0.020</b>	957	0.005	282	9,040	0.002
Water	80739	0-10 min, non-overflow, total	0.001	0.256	908	0.014	318	7,480	0.005
Water	80740	10-20 min, non-overflow, total	0.001	0.572	912	0.015	272	8,480	0.004
Water	80741	20-30 min, non-overflow, total	0.001	0.192	916	0.008	334	8,120	0.003
		Hopper Inflow Monitoring							
Water	80780	3& 6 min, dissolved	0.002	<b>0.020</b>	1003	0.011	308	10,900	0.003
Water	80781	9&12 min, dissolved	0.002	<b>0.020</b>	1007	0.002	306	8,950	0.004
Water	80782	15&18 min, dissolved	0.002	0.029	1023	0.002	310	9,110	0.004
Water	80783	21&24 min, dissolved	0.002	<b>0.020</b>	1052	0.002	317	10,200	0.004
Water	80784	27&30 min, dissolved	0.002	0.074	1035	0.099	315	9,150	0.006
Water	80668	3& 6 min, total	0.060	98.0	1050	3.770	316	8,400	0.128
Water	80669	9&12 min, total	0.042	31.3	1040	2.170	319	8,570	0.124
Water	80670	15&18 min, total	0.020	71.7	968	1.500	311	8,020	0.172
Water	80671	21&24 min, total	0.062	288.0	1090	4.440	338	8,530	0.328
Water	80672	27&30 min, total	0.056	218.0	1020	3.200	349	8,660	0.408
		Hopper Overflow Monitoring							
Water	80785	2& 4 min, dissolved	0.002	<b>0.020</b>	993	<b>0.001</b>	299	8,750	0.004
Water	80786	6& 8 min, dissolved	0.002	<b>0.020</b>	962	<b>0.001</b>	290	9,240	0.004
Water	80787	10&12 min, dissolved	0.002	<b>0.020</b>	999	<b>0.001</b>	302	8,750	0.004
Water	80788	14&16 min, dissolved	0.002	<b>0.020</b>	1,000	<b>0.001</b>	303	8,960	0.004
Water	80789	18&20 min, dissolved	0.002	<b>0.020</b>	990	<b>0.001</b>	294	8,870	0.004
Water	80674	2& 4 min, total	0.023	66.4	1,060	1.130	333	8,800	0.084
Water	80675	6& 8 min, total	0.026	70.4	1,060	1.470	335	9,170	0.104
Water	80676	10&12 min, total	0.034	92.0	968	1.420	308	7,980	0.105
Water	80677	14&16 min, total	0.015	29.8	1,000	0.608	309	8,640	0.064
Water	80678	18&20 min, total	0.009	28.2	984	0.544	310	9,170	0.060
		Site Water							
Water	81648	Sample 1 Total	0.002	0.837	998	0.028	306	8,370	0.003
Water	81649	Sample 2 Total	0.002	0.048	974	0.004	289	8,780	0.001
Water	81650	Sample 3 Total	0.002	0.039	968	0.005	289	8,980	0.001
		Elutriate							
Water	81654	Sample 1 Dissolved	0.002	<b>0.020</b>	1,020	0.002	303	8,820	0.002
Water	81655	Sample 2 Dissolved	0.002	<b>0.020</b>	1,030	0.001	304	9,250	0.001
Water	81656	Sample 3 Dissolved	0.002	<b>0.020</b>	1,030	0.002	304	9,040	0.002
Water	81651	Sample 1 Total	0.002	0.742	982	0.024	292	8,620	0.004
Water	81652	Sample 2 Total	0.002	0.632	991	0.019	294	8,760	0.003
Water	81653	Sample 3 Total	0.002	0.799	1,400	0.024	423	12,300	0.004
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	CO	FE	MG	MN	K	NA	V
		Detection Limit (mg/kg)	0.1	2	20	0.1	20	20	0.10
		Insitu Sediment							
Sediment	81726	Sample #1	2.2	5,810	1,260	\$1.7	443	2180	4.10
Sediment	81727	Sample #2	2.4	6,040	1,330	95.2	474	1920	4.30
Sediment	81728	Sample #3	2.4	5,860	1,320	97.4	482	1900	4.00
		% Moisture							

CO - Cobalt FE - Iron

MG - Magnesium

MN - Manganese

K - Potassium

NA - Sodium

V - Vanadium

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## PAHscoar

## Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	NAPHTH	ACENAY	ACENAP	FLUORE	PHENAN	ANTRAC	FLANTHE
		Detection Limit (mg/l)	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	80848	Plume Monitoring							
Water	80763	Background, dissolved	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	80849	Background, total	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	80850	0-10 min, overflow, dissolved	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	80851	10-20 min, overflow, dissolved	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	80764	20-30 min, overflow, dissolved	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	80765	0-10 min, overflow, total	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	80766	10-20 min, overflow, total	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	80767	20-30 min, overflow, total	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	80768	0-10 min, non-overflow, dissolved	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	80769	10-20 min, non-overflow, dissolved	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	80770	20-30 min, non-overflow, dissolved	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	80771	0-10 min, non-overflow, total	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	80772	10-20 min, non-overflow, total	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	80773	20-30 min, non-overflow, total	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	80774	Hopper Inflow Monitoring							
Water	80810	38-6 min, dissolved	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	80811	98-12 min, dissolved	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	80812	158-18 min, dissolved	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	80813	218-24 min, dissolved	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	80814	278-30 min, dissolved	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	80716	38-6 min, total	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	80717	98-12 min, total	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	80718	158-18 min, total	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00015
Water	80719	218-24 min, total	0.0003	0.0003	0.0003	0.0003	0.00016	0.00030	0.00024
Water	80720	278-30 min, total	0.0003	0.0003	0.0003	0.0003	0.00012	0.00030	0.00019
Water	80721	Hopper Overflow Monitoring							
Water	80815	28-4 min, dissolved	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	80816	68-8 min, dissolved	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	80817	108-12 min, dissolved	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	80818	148-16 min, dissolved	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	80819	188-20 min, dissolved	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	80722	28-4 min, total	0.0006	0.0003	0.0003	0.0003	0.00030	0.00030	0.00014
Water	80723	68-8 min, total	0.0006	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	80724	108-12 min, total	0.0006	0.0003	0.0003	0.0003	0.00073	0.00018	0.00075
Water	80725	148-16 min, total	0.0006	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	80726	188-20 min, total	0.0006	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	81630	Site Water							
Water	81631	Sample 1 Total	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	81632	Sample 2 Total	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	81633	Sample 3 Total	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	81636	Elutriate							
Water	81637	Sample 1 Dissolved	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	81638	Sample 2 Dissolved	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	81639	Sample 3 Dissolved	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	81643	Sample 1 Total	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	81644	Sample 2 Total	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
Water	81645	Sample 3 Total	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	NAPHTH	ACENAY	ACENAP	FLUORE	PHENAN	ANTRAC	FLANTHE
		Detection Limit (mg/kg)	0.011	0.011	0.011	0.011	0.0110	0.011	0.0110
		In situ Sediment							
Sediment	81702	Sample #1	0.011	0.011	0.011	0.011	0.0110	0.011	0.0110
Sediment	81703	Sample #2	0.011	0.011	0.011	0.011	0.0038	0.011	0.0267
Sediment	81704	Sample #3	0.011	0.011	0.011	0.011	0.0110	0.011	0.0042

NAPHTH - Naphthalene      ACENAY - Acenaphthylene      ACENAP - Acenaphthene      FLUORE - Fluorene      PHENAN - Phenanthrene  
 ANTRAC - Anthracene      FLANTHE - Fluoranthene

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## PAHscoar

## Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PYRENE	CHRYSE	BAANTHR	BBFLANT	BKFLANT	BAPYRE	I123PYR
		Detection Limit (mg/l)	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80848	Plume Monitoring Background, dissolved	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80763	Background, total	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80849	0-10 min, overflow, dissolved	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80850	10-20 min, overflow, dissolved	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80851	20-30 min, overflow, dissolved	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80764	0-10 min, overflow, total	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80765	10-20 min, overflow, total	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80766	20-30 min, overflow, total	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80852	0-10 min, non-overflow, dissolved	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80853	10-20 min, non-overflow, dissolved	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80854	20-30 min, non-overflow, dissolved	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80767	0-10 min, non-overflow, total	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80768	10-20 min, non-overflow, total	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80769	20-30 min, non-overflow, total	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
		Hopper Inflow Monitoring							
Water	80810	3& 6 min, dissolved	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80811	9&12 min, dissolved	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80812	15&18 min, dissolved	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80813	21&24 min, dissolved	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80814	27&30 min, dissolved	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80716	3& 6 min, total	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80717	9&12 min, total	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80718	15&18 min, total	0.00013	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80719	21&24 min, total	0.00019	0.00016	0.0003	0.00010	0.00012	0.00030	0.00030
Water	80720	27&30 min, total	0.00017	0.00012	0.0003	0.00010	0.00010	0.00030	0.00030
		Hopper Overflow Monitoring							
Water	80815	2& 4 min, dissolved	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80816	6& 8 min, dissolved	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80817	10&12 min, dissolved	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80818	14&16 min, dissolved	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80819	18&20 min, dissolved	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80722	2& 4 min, total	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80723	6& 8 min, total	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80724	10&12 min, total	0.00062	0.00041	0.00030	0.00019	0.00028	0.00025	0.00019
Water	80725	14&16 min, total	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	80726	18&20 min, total	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
		Site Water							
Water	81630	Sample 1 Total	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	81631	Sample 2 Total	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	81632	Sample 3 Total	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
		Elutriate							
Water	81636	Sample 1 Dissolved	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	81637	Sample 2 Dissolved	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	81638	Sample 3 Dissolved	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	81633	Sample 1 Total	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	81634	Sample 2 Total	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
Water	81635	Sample 3 Total	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PYRENE	CHRYSE	BAANTHR	BBFLANT	BKFLANT	BAPYRE	I123PYR
		Detection Limit (mg/kg)	0.0110	0.0110	0.0110	0.0110	0.0110	0.0110	0.0110
		Insitu Sediment							
Sediment	81702	Sample #1	0.0110	0.0110	0.0110	0.0110	0.0110	0.0110	0.0110
Sediment	81703	Sample #2	0.0332	0.0583	0.0514	0.0617	0.0671	0.0644	0.0621
Sediment	81704	Sample #3	0.0042	0.0110	0.0110	0.0110	0.0110	0.0110	0.0110

PYRENE - Pyrene      CHRYSE - Chrysene      BAANTHR - Benzo(a)Anthracene      BBFLANT - Benzo(b)Fluoranthene  
 BKFLANT - Benzo(k)Fluoranthene      BAPYRE - Benzo(a)Pyrene      I123PYR - Indeno(1,2,3-C,D)Pyrene

**BOLD** - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## PAHscoar

## Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	DBAHANT	B-GHI-PY	2MeNAPH	2FIBP-S	PTERP-S
		Detection Limit (mg/l)	0.0003	0.00030	0.0003		
Water	80848	Plume Monitoring Background, dissolved	0.0003	0.00030	0.0003	89.8%	71.9%
Water	80763	Background, total	0.0003	0.00030	0.0003	95.4%	73.8%
Water	80849	0-10 min, overflow, dissolved	0.0003	0.00030	0.0003	88.8%	68.8%
Water	80850	10-20 min, overflow, dissolved	0.0003	0.00030	0.0003	91.2%	76.0%
Water	80851	20-30 min, overflow, dissolved	0.0003	0.00030	0.0003	89.0%	65.8%
Water	80764	0-10 min, overflow, total	0.0003	0.00030	0.0003	59.1%	76.3%
Water	80765	10-20 min, overflow, total	0.0003	0.00030	0.0003	36.6%	31.1%
Water	80766	20-30 min, overflow, total	0.0003	0.00030	0.0003	92.1%	71.0%
Water	80852	0-10 min, non-overflow, dissolved	0.0003	0.00030	0.0003	94.3%	74.7%
Water	80853	10-20 min, non-overflow, dissolved	0.0003	0.00030	0.0003	83.1%	65.0%
Water	80854	20-30 min, non-overflow, dissolved	0.0003	0.00030	0.0003	90.4%	69.1%
Water	80767	0-10 min, non-overflow, total	0.0003	0.00030	0.0003	36.5%	27.1%
Water	80768	10-20 min, non-overflow, total	0.0003	0.00030	0.0003	77.5%	69.9%
Water	80769	20-30 min, non-overflow, total	0.0003	0.00030	0.0003	73.2%	72.0%
		Hopper Inflow Monitoring					
Water	80810	38-6 min, dissolved	0.0003	0.00030	0.0003	76.0%	67.4%
Water	80811	9&12 min, dissolved	0.0003	0.00030	0.0003	77.5%	69.2%
Water	80812	15&18 min, dissolved	0.0003	0.00030	0.0003	94.5%	76.8%
Water	80813	21&24 min, dissolved	0.0003	0.00030	0.0003	83.0%	63.8%
Water	80814	27&30 min, dissolved	0.0003	0.00030	0.0003	61.7%	54.8%
Water	80716	38-6 min, total	0.0003	0.00030	0.0003	48.0%	60.3%
Water	80717	9&12 min, total	0.0003	0.00030	0.0003	60.0%	58.4%
Water	80718	15&18 min, total	0.0003	0.00030	0.0003	72.2%	66.1%
Water	80719	21&24 min, total	0.0003	0.00030	0.0003	67.0%	62.9%
Water	80720	27&30 min, total	0.0003	0.00030	0.0003	58.0%	66.6%
		Hopper Overflow Monitoring					
Water	80815	28-4 min, dissolved	0.0003	0.00030	0.0003	63.0%	60.7%
Water	80816	68-8 min, dissolved	0.0003	0.00030	0.0003	63.8%	84.8%
Water	80817	108-12 min, dissolved	0.0003	0.00030	0.0003	64.4%	67.7%
Water	80818	148-16 min, dissolved	0.0003	0.00030	0.0003	75.4%	81.3%
Water	80819	188-20 min, dissolved	0.0003	0.00030	0.0003	48.3%	65.8%
Water	80722	28-4 min, total	0.0003	0.00030	0.0003	56.5%	69.7%
Water	80723	68-8 min, total	0.0003	0.00030	0.0003	66.9%	70.5%
Water	80724	108-12 min, total	0.0003	0.00014	0.0003	60.8%	67.6%
Water	80725	148-16 min, total	0.0003	0.00030	0.0003	74.2%	65.0%
Water	80726	188-20 min, total	0.0003	0.00030	0.0003	57.7%	68.1%
		Site Water					
Water	81630	Sample 1 Total	0.0003	0.00030	0.0003	39.7%	61.9%
Water	81631	Sample 2 Total	0.0003	0.00030	0.0003	61.3%	62.4%
Water	81632	Sample 3 Total	0.0003	0.00030	0.0003	68.0%	66.8%
		Elutriate					
Water	81636	Sample 1 Dissolved	0.0003	0.00030	0.0003	55.8%	678.0%
Water	81637	Sample 2 Dissolved	0.0003	0.00030	0.0003	79.2%	56.1%
Water	81638	Sample 3 Dissolved	0.0003	0.00030	0.0003	63.3%	58.3%
Water	81633	Sample 1 Total	0.0003	0.00030	0.0003	65.9%	64.0%
Water	81634	Sample 2 Total	0.0003	0.00030	0.0003	37.7%	71.0%
Water	81635	Sample 3 Total	0.0003	0.00030	0.0003	53.8%	71.2%
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	DBAHANT	B-GHI-PY	2MeNAPH	2FIBP-S	PTERP-S
		Detection Limit (mg/kg)	0.0110	0.0110	0.011		
		In situ Sediment					
Sediment	81702	Sample #1	0.0110	0.0110	0.011	62.7%	46.1%
Sediment	81703	Sample #2	0.0046	0.0514	0.011	76.0%	49.7%
Sediment	81704	Sample #3	0.0110	0.0110	0.011	68.8%	52.0%

DBAHANT - Dibenz(A,H)Anthracene      B-GHI-PY - Benzo(G,H,I)Perylene      2MeNAPH - 2-Methylnaphthalene  
 2FIBP-S - 2-Fluorobiphenyl(Surrogate (43-116 W))      PTERP-S - p-Terphenyl-D14(Surrogate (33-141 W))

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	ALDRIN	A-BHC	B-BHC	G-BHC	D-BHC	PPDDD
		Detection Limit (mg/l)	0.000035	0.000035	0.000035	0.000035	0.000035	0.000070
		Plume Monitoring						
Water	80841	Background, dissolved	0.000025	0.000025	0.000025	0.000025	0.000025	0.000050
Water	80756	Background, total	0.000025	0.000025	0.000025	0.000025	0.000025	0.000050
Water	80842	0-10 min, overflow, dissolved	0.000025	0.000025	0.000025	0.000025	0.000025	0.000050
Water	80843	10-20 min, overflow, dissolved	0.000025	0.000025	0.000025	0.000025	0.000025	0.000050
Water	80844	20-30 min, overflow, dissolved	0.000024	0.000024	0.000024	0.000024	0.000024	0.000049
Water	80757	0-10 min, overflow, total	0.000025	0.000025	0.000025	0.000025	0.000025	0.000050
Water	80758	10-20 min, overflow, total	0.000025	0.000025	0.000025	0.000025	0.000025	0.000050
Water	80759	20-30 min, overflow, total	0.000025	0.000025	0.000025	0.000025	0.000025	0.000050
Water	80845	0-10 min, non-overflow, dissolved	0.000025	0.000025	0.000025	0.000025	0.000025	0.000050
Water	80846	10-20 min, non-overflow, dissolved	0.000025	0.000025	0.000025	0.000025	0.000025	0.000050
Water	80847	20-30 min, non-overflow, dissolved	0.000035	0.000035	0.000035	0.000035	0.000035	0.000070
Water	80760	0-10 min, non-overflow, total	0.000025	0.000025	0.000025	0.000025	0.000025	0.000050
Water	80761	10-20 min, non-overflow, total	0.000025	0.000025	0.000025	0.000025	0.000025	0.000050
Water	70762	20-30 min, non-overflow, total	0.000028	0.000028	0.000028	0.000028	0.000028	0.000055
		Hopper Inflow Monitoring						
Water	80800	3& 6 min, dissolved	0.000025	0.000025	0.000025	0.000025	0.000025	0.000050
Water	80801	9&12 min, dissolved	0.000025	0.000020	0.000025	0.000025	0.000025	0.000050
Water	80802	15&18 min, dissolved	0.000025	0.000025	0.000046	0.000025	0.000025	0.000050
Water	80803	21&24 min, dissolved	0.000025	0.000011	0.000036	0.000025	0.000025	0.000050
Water	80804	27&30 min, dissolved	0.000025	0.000025	0.000043	0.000025	0.000025	0.000050
Water	80704	3& 6 min, total	0.000025	0.000031	0.000075	0.000021	0.000039	0.000035
Water	80705	9&12 min, total	0.000025	0.000018	0.000025	0.000025	0.000022	0.000095
Water	80706	15&18 min, total	0.000027	0.000046	0.000027	0.000027	0.000023	0.000060
Water	80707	21&24 min, total	0.000027	0.000027	0.000027	0.000027	0.000027	0.000110
Water	80708	27&30 min, total	0.000025	0.000025	0.000025	0.000025	0.000025	0.000016
		Hopper Overflow Monitoring						
Water	80805	2& 4 min, dissolved	0.000025	0.000025	0.000025	0.000025	0.000025	0.000050
Water	80806	6& 8 min, dissolved	0.000025	0.000025	0.000025	0.000025	0.000025	0.000050
Water	80807	10&12 min, dissolved	0.000025	0.000013	0.000025	0.000025	0.000025	0.000050
Water	80808	14&16 min, dissolved	0.000025	0.000025	0.000025	0.000025	0.000025	0.000050
Water	80809	18&20 min, dissolved	0.000025	0.000025	0.000025	0.000025	0.000025	0.000050
Water	80710	2& 4 min, total	0.000025	0.000025	0.000025	0.000025	0.000025	0.000050
Water	80711	6& 8 min, total	0.000025	0.000025	0.000025	0.000025	0.000025	0.000050
Water	80712	10&12 min, total	0.000027	0.000027	0.000027	0.000027	0.000027	0.000053
Water	80713	14&16 min, total	0.000027	0.000027	0.000027	0.000027	0.000027	0.000012
Water	80714	18&20 min, total	0.000025	0.000025	0.000025	0.000025	0.000025	0.000050
		Site Water						
Water	81612	Sample 1 Total	0.000025	0.000025	0.000025	0.000025	0.000025	0.000050
Water	81613	Sample 2 Total	0.000025	0.000025	0.000025	0.000025	0.000025	0.000050
Water	81614	Sample 3 Total	0.000025	0.000025	0.000025	0.000025	0.000025	0.000050
		Elutriate						
Water	81618	Sample 1 Dissolved	0.000025	0.000025	0.000025	0.000025	0.000025	0.000050
Water	81619	Sample 2 Dissolved	0.000025	0.000025	0.000025	0.000011	0.000025	0.000050
Water	81620	Sample 3 Dissolved	0.000025	0.000025	0.000025	0.000025	0.000025	0.000050
Water	81615	Sample 1 Total	0.000025	0.000025	0.000025	0.000025	0.000025	0.000050
Water	81616	Sample 2 Total	0.000025	0.000025	0.000025	0.000025	0.000025	0.000050
Water	81617	Sample 3 Total	0.000025	0.000025	0.000025	0.000025	0.000025	0.000050
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	ALDRIN	A-BHC	B-BHC	G-BHC	D-BHC	PPDDD
		Detection Limit (mg/kg)	0.00096	0.00096	0.00096	0.0018	0.00096	0.0019
		In situ Sediment						
Sediment	81708	Sample #1	0.00096	0.00096	0.0012	0.0021	0.00096	0.0019
Sediment	81709	Sample #2	0.00096	0.00096	0.0013	0.0034	0.00096	0.0019
Sediment	81710	Sample #3	0.00096	0.00096	0.0012	0.0027	0.00096	0.0019

ALDRIN - Aldrin

A-BHC

- A-BHC

B-BHC

- B-BHC

G-BHC

- G-BHC

D-BHC

- D-BHC PPDDD

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## Pestcoar

## Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	DESCRIPTION	PPDDE	PPDDT	HPTCL	DIELDRIN	ENDOI	ENDOII	
	Detection Limit (mg/l)	0.000070	0.000070	0.0000350	0.000070	0.000035	0.000070	
	Plume Monitoring							
Water	80841 Background, dissolved	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80756 Background, total	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80842 0-10 min, overflow, dissolved	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80843 10-20 min, overflow, dissolved	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80844 20-30 min, overflow, dissolved	0.000050	0.000049	0.0000240	0.000049	0.000024	0.000049	
Water	80757 0-10 min, overflow, total	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80758 10-20 min, overflow, total	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80759 20-30 min, overflow, total	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80845 0-10 min, non-overflow, dissolved	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80846 10-20 min, non-overflow, dissolved	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80847 20-30 min, non-overflow, dissolved	0.000070	0.000070	0.0000350	0.000070	0.000035	0.000070	
Water	80760 0-10 min, non-overflow, total	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80761 10-20 min, non-overflow, total	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	70762 20-30 min, non-overflow, total	0.000055	0.000055	0.0000280	0.000055	0.000028	0.000055	
	Hopper Inflow Monitoring							
Water	80800 3& 6 min, dissolved	0.000050	0.000050	0.0000100	0.000050	0.000025	0.000050	
Water	80801 9&12 min, dissolved	0.000050	0.000050	0.0000140	0.000050	0.000025	0.000050	
Water	80802 15&18 min, dissolved	0.000050	0.000050	0.0000270	0.000050	0.000025	0.000050	
Water	80803 21&24 min, dissolved	0.000050	0.000050	0.0000100	0.000050	0.000025	0.000050	
Water	80804 27&30 min, dissolved	0.000050	0.000050	0.0000130	0.000050	0.000010	0.000050	
Water	80704 3& 6 min, total	0.000050	0.000042	0.0000270	0.000050	0.000025	0.000050	
Water	80705 9&12 min, total	0.000024	0.000660	0.0000160	0.000050	0.000025	0.000050	
Water	80706 15&18 min, total	0.000023	0.000053	0.0000190	0.000053	0.000027	0.000053	
Water	80707 21&24 min, total	0.000017	0.000053	0.0000070	0.000053	0.000027	0.000053	
Water	80708 27&30 min, total	0.000029	0.000036	0.0000130	0.000027	0.000025	0.000050	
	Hopper Overflow Monitoring							
Water	80805 28 4 min, dissolved	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80806 6& 8 min, dissolved	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80807 10&12 min, dissolved	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80808 14&16 min, dissolved	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80809 18&20 min, dissolved	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80710 28 4 min, total	0.000010	0.000024	0.0000040	0.000050	0.000025	0.000050	
Water	80711 6& 8 min, total	0.000005	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80712 10&12 min, total	0.000053	0.000053	0.0000270	0.000053	0.000027	0.000053	
Water	80713 14&16 min, total	0.001100	0.000053	0.0000270	0.000053	0.000027	0.000053	
Water	80714 18&20 min, total	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
	Site Water							
Water	81612 Sample 1 Total	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	81613 Sample 2 Total	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	81614 Sample 3 Total	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
	Elutriate							
Water	81618 Sample 1 Dissolved	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	81619 Sample 2 Dissolved	0.000050	0.000050	0.0000039	0.000050	0.000025	0.000050	
Water	81620 Sample 3 Dissolved	0.000050	0.000050	0.0000050	0.000050	0.000025	0.000050	
Water	81615 Sample 1 Total	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	81616 Sample 2 Total	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	81617 Sample 3 Total	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PPDDE	PPDDT	HPTCL	DIELDRIN	ENDOI	ENDOII
		Detection Limit (mg/kg)	0.0019	0.0019	0.00096	0.0036	0.00096	0.0019
		In situ Sediment						
Sediment	81708 Sample #1	0.0019	0.0019	0.00059	0.00046	0.00096	0.0019	
Sediment	81709 Sample #2	0.0019	0.0019	0.00052	0.00067	0.00096	0.0019	
Sediment	81710 Sample #3	0.0019	0.0019	0.00049	0.00058	0.00096	0.0019	

PPDDE - PPDDE    PPDDT - PPDDT    HPTCL - Heptachlor    DIELDRIN - Dieldrin    ENDOI - A-Endosulfan    ENDOII - B-Endosulfan

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## Pestcoar

## Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	ENDOSU	ENDRIN	ENDALD	HPTCLE	METOXYCL	CLORDANE
		Detection Limit (mg/l)	0.000070	0.000070	0.000070	0.000035	0.00035	0.000035
		Plume Monitoring						
Water	80841	Background, dissolved	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	<b>0.000025</b>
Water	80756	Background, total	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	<b>0.000025</b>
Water	80842	0-10 min, overflow, dissolved	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	<b>0.000025</b>
Water	80843	10-20 min, overflow, dissolved	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	<b>0.000025</b>
Water	80844	20-30 min, overflow, dissolved	<b>0.000049</b>	<b>0.000049</b>	<b>0.000049</b>	<b>0.000024</b>	<b>0.00024</b>	<b>0.000024</b>
Water	80757	0-10 min, overflow, total	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	<b>0.000025</b>
Water	80758	10-20 min, overflow, total	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	<b>0.000025</b>
Water	80759	20-30 min, overflow, total	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	<b>0.000025</b>
Water	80845	0-10 min, non-overflow, dissolved	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	<b>0.000025</b>
Water	80846	10-20 min, non-overflow, dissolved	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	<b>0.000025</b>
Water	80847	20-30 min, non-overflow, dissolved	<b>0.000070</b>	<b>0.000070</b>	<b>0.000070</b>	<b>0.000035</b>	<b>0.00035</b>	<b>0.000035</b>
Water	80760	0-10 min, non-overflow, total	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	<b>0.000025</b>
Water	80761	10-20 min, non-overflow, total	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	<b>0.000025</b>
Water	70762	20-30 min, non-overflow, total	<b>0.000055</b>	<b>0.000055</b>	<b>0.000055</b>	<b>0.000028</b>	<b>0.00028</b>	<b>0.000028</b>
		Hopper Inflow Monitoring						
Water	80800	3& 6 min, dissolved	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	
Water	80801	9&12 min, dissolved	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	
Water	80802	15&18 min, dissolved	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	
Water	80803	21&24 min, dissolved	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	
Water	80804	27&30 min, dissolved	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	
Water	80704	3& 6 min, total	<b>0.000050</b>	<b>0.000018</b>	<b>0.000050</b>	<b>0.000020</b>	<b>0.00025</b>	
Water	80705	9&12 min, total	<b>0.000750</b>	<b>0.000012</b>	<b>0.000560</b>	<b>0.000011</b>	<b>0.00025</b>	
Water	80706	15&18 min, total	<b>0.000260</b>	<b>0.000020</b>	<b>0.000053</b>	<b>0.000023</b>	<b>0.00027</b>	
Water	80707	21&24 min, total	<b>0.000320</b>	<b>0.000053</b>	<b>0.000053</b>	<b>0.000027</b>	<b>0.00027</b>	
Water	80708	27&30 min, total	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	
		Hopper Overflow Monitoring						
Water	80805	2& 4 min, dissolved	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	
Water	80806	6& 8 min, dissolved	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	
Water	80807	10&12 min, dissolved	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	
Water	80808	14&16 min, dissolved	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	
Water	80809	18&20 min, dissolved	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	
Water	80710	2& 4 min, total	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000009</b>	<b>0.00025</b>	
Water	80711	6& 8 min, total	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000590</b>	<b>0.00025</b>	
Water	80712	10&12 min, total	<b>0.000053</b>	<b>0.000053</b>	<b>0.000053</b>	<b>0.000027</b>	<b>0.00027</b>	
Water	80713	14&16 min, total	<b>0.000053</b>	<b>0.000053</b>	<b>0.000053</b>	<b>0.000027</b>	<b>0.00027</b>	
Water	80714	18&20 min, total	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	
		Site Water						
Water	81612	Sample 1 Total	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	
Water	81613	Sample 2 Total	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	
Water	81614	Sample 3 Total	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	
		Elutriate						
Water	81618	Sample 1 Dissolved	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	
Water	81619	Sample 2 Dissolved	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	
Water	81620	Sample 3 Dissolved	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	
Water	81615	Sample 1 Total	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	
Water	81616	Sample 2 Total	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	
Water	81617	Sample 3 Total	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000025</b>	<b>0.00025</b>	
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	ENDOSU	ENDRIN	ENDALD	HPTCLE	METOXYCL	
		Detection Limit (mg/kg)	0.0036	0.0036	0.0036	0.0018	0.018	
		Insitu Sediment						
Sediment	81708	Sample #1	<b>0.00083</b>	<b>0.0019</b>	<b>0.0019</b>	<b>0.0014</b>	<b>0.0083</b>	
Sediment	81709	Sample #2	<b>0.00083</b>	<b>0.0019</b>	<b>0.0019</b>	<b>0.0020</b>	<b>0.0083</b>	
Sediment	81710	Sample #3	<b>0.00083</b>	<b>0.0019</b>	<b>0.0019</b>	<b>0.0020</b>	<b>0.0083</b>	

ENDOSU - Endosulfan sulfate    ENDRIN - Endrin    ENDALD - Endrin Aldehyde    HPTCLE - Heptachlor Epoxide    METOXYCL - Methoxychlor

CLORDANE - Chlordane

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	TOXAPHEN	TcLXYL-S	DCLBP	a-CHLORD	g-CHLORD
		Detection Limit (mg/l)	0.000350				
		Plume Monitoring					
Water	80841	Background, dissolved	0.000250	81.60%	88.70%		
Water	80756	Background, total	0.000250	90.10%	93.00%		
Water	80842	0-10 min, overflow, dissolved	0.000250	87.70%	91.60%		
Water	80843	10-20 min, overflow, dissolved	0.000250	93.90%	102.00%		
Water	80844	20-30 min, overflow, dissolved	0.000240	92.30%	97.90%		
Water	80757	0-10 min, overflow, total	0.000250	88.00%	95.70%		
Water	80758	10-20 min, overflow, total	0.000250	82.40%	82.60%		
Water	80759	20-30 min, overflow, total	0.000250	89.20%	92.20%		
Water	80845	0-10 min, non-overflow, dissolved	0.000250	91.60%	101.00%		
Water	80846	10-20 min, non-overflow, dissolved	0.000250	74.70%	86.30%		
Water	80847	20-30 min, non-overflow, dissolved	0.000350	96.00%	103.00%		
Water	80760	0-10 min, non-overflow, total	0.000250	90.60%	95.30%		
Water	80761	10-20 min, non-overflow, total	0.000250	53.40%	72.90%		
Water	70762	20-30 min, non-overflow, total	0.000280	99.10%	101.00%		
		Hopper Inflow Monitoring					
Water	80800	3 & 6 min, dissolved	0.000025	79.14%	90.86%	0.000025	0.000025
Water	80801	98.12 min, dissolved	0.000025	77.94%	88.38%	0.000025	0.000025
Water	80802	158.18 min, dissolved	0.000025	65.90%	73.58%	0.000013	0.000025
Water	80803	218.24 min, dissolved	0.000025	75.24%	69.59%	0.000025	0.000025
Water	80804	278.30 min, dissolved	0.000025	78.33%	70.11%	0.000011	0.000016
Water	80704	3 & 16 min, total	0.000250	68.25%	81.31%	0.000018	0.000048
Water	80705	98.12 min, total	0.000250	62.04%	99.59%	0.000014	0.000051
Water	80706	158.18 min, total	0.000270	68.15%	89.41%	0.000021	0.000052
Water	80707	218.24 min, total	0.000270	56.42%	69.56%	0.000025	0.000009
Water	80708	278.30 min, total	0.000250	52.93%	64.41%	0.000008	0.000018
		Hopper Overflow Monitoring					
Water	80805	2 & 4 min, dissolved	0.000025	93.56%	98.19%	0.000025	0.000025
Water	80806	6 & .8 min, dissolved	0.000025	87.07%	92.15%	0.000025	0.000011
Water	80807	10&12 min, dissolved	0.000025	90.84%	97.36%	0.000016	0.000012
Water	80808	148.16 min, dissolved	0.000025	87.46%	95.06%	0.000025	0.000025
Water	80809	188.20 min, dissolved	0.000025	91.71%	94.46%	0.000025	0.000025
Water	80710	2 & 4 min, total	0.000250	69.36%	69.00%	0.000025	0.000007
Water	80711	6 & .8 min, total	0.000250	81.76%	75.25%	0.000025	0.000025
Water	80712	10&12 min, total	0.000270	73.21%	68.25%	0.000027	0.000071
Water	80713	148.16 min, total	0.000270	73.06%	66.74%	0.000027	0.000027
Water	80714	188.20 min, total	0.000250	82.29%	68.42%	0.000025	0.000025
		Site Water					
Water	81612	Sample 1 Total	0.000250	79.55%	79.71%	0.000025	0.000025
Water	81613	Sample 2 Total	0.000250	83.16%	76.81%	0.000025	0.000025
Water	81614	Sample 3 Total	0.000250	80.62%	73.55%	0.000025	0.000025
		Elutriate					
Water	81618	Sample 1 Dissolved	0.000250	82.64%	76.37%	0.000025	0.000025
Water	81619	Sample 2 Dissolved	0.000250	82.61%	74.72%	0.000025	0.000025
Water	81620	Sample 3 Dissolved	0.000250	82.47%	74.18%	0.000025	0.000025
Water	81615	Sample 1 Total	0.000250	81.55%	75.14%	0.000025	0.000025
Water	81616	Sample 2 Total	0.000250	79.75%	70.89%	0.000025	0.000025
Water	81617	Sample 3 Total	0.000250	80.50%	74.51%	0.000025	0.000025
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	TOXAPHEN	TcLXYL-S	DCLBP	a-CHLORD	g-CHLORD
		Detection Limit (mg/kg)	0.018			0.00096	0.0019
		Insitu Sediment					
Sediment	81708	Sample #1	0.0096	90.16%	90.52%	0.00096	0.0011
Sediment	81709	Sample #2	0.0096	85.69%	90.13%	0.00096	0.0013
Sediment	81710	Sample #3	0.0096	84.81%	90.56%	0.00096	0.0022

TOXAPHEN - Toxaphene TcLXYL-S - 2,4,5,6-Tetrachloro-m-xylene(Surrogate(60-150 WS)) DCLBP - Decachlorobiphenyl(Surrogate (60-150 WS))

a-CHLORD - a-CHLORDANE g-CHLORD - g-CHLORDANE

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## PCBscoar

## Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 22	PCB 33	PCB 37	PCB 42	PCB 47	PCB 64	PCB 74
		Detection Limit (mg/l)	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80834	Plume Monitoring							
Water	80749	Background; dissolved	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80749	Background; total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80835	0-10 min, overflow, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80836	10-20 min, overflow, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80837	20-30 min, overflow, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80750	0-10 min, overflow, total	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80751	10-20 min, overflow, total	0.0000004	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80752	20-30 min, overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80838	0-10 min, non-overflow, dissolve	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80839	10-20 min, non-overflow, dissolve	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80840	20-30 min, non-overflow, dissolve	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80753	0-10 min, non-overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80754	10-20 min, non-overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80755	20-30 min, non-overflow, total	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
		Hopper Inflow Monitoring							
Water	80790	3& 6 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000022	0.0000010	0.0000010	0.0000010
Water	80791	9&12 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000020	0.0000010	0.0000010	0.0000010
Water	80792	15&18 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000014	0.0000005	0.0000010	0.0000010
Water	80793	21&24 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000012	0.0000015	0.0000010	0.0000010
Water	80794	27&30 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000009	0.0000008	0.0000010	0.0000010
Water	80692	3& 6 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80693	9&12 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80694	15&18 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80695	21&24 min, total	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000027	0.0000011
Water	80696	27&30 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000020	0.0000010
		Hopper Overflow Monitoring							
Water	80795	2& 4 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000017	0.0000010	0.0000010	0.0000010
Water	80796	6& 8 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000019	0.0000010	0.0000010	0.0000010
Water	80797	10&12 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000011	0.0000010	0.0000010	0.0000010
Water	80798	14&16 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000015	0.0000010	0.0000010	0.0000010
Water	80799	18&20 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80698	2& 4 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80699	6& 8 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80700	10&12 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80701	14&16 min, total	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80702	18&20 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
		Site Water							
Water	81594	Sample 1 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81595	Sample 2 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81596	Sample 3 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
		Elutriate							
Water	81600	Sample 1 Dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81601	Sample 2 Dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81602	Sample 3 Dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81597	Sample 1 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81598	Sample 2 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81599	Sample 3 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 22	PCB 33	PCB 37	PCB 42	PCB 47	PCB 64	PCB 74
		Detection Limit (mg/kg)	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
		Insitu Sediment							
Sediment	81714	Sample #1	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
Sediment	81715	Sample #2	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
Sediment	81716	Sample #3	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## PCBscoar

## Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 80	PCB 81	PCB 84	PCB 91	PCB 92	PCB 95	PCB 99
		Detection Limit (mg/l)	0.0000011	0.0000011	0.00000110	0.0000011	0.0000011	0.00000110	0.00000110
Water	80834	Plume Monitoring							
Water	80749	Background, dissolved	<b>0.0000011</b>	<b>0.0000011</b>	<b>0.00000110</b>	<b>0.0000011</b>	<b>0.0000011</b>	0.00000080	<b>0.00000110</b>
Water	80749	Background, total	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	<b>0.0000010</b>	<b>0.0000010</b>	0.00000060	<b>0.00000100</b>
Water	80835	0-10 min, overflow, dissolved	<b>0.0000010</b>	<b>0.0000010</b>	0.00000060	<b>0.0000010</b>	<b>0.0000010</b>	0.00000090	<b>0.00000100</b>
Water	80836	10-20 min, overflow, dissolved	<b>0.0000010</b>	<b>0.0000010</b>	0.00000060	<b>0.0000010</b>	<b>0.0000010</b>	0.00000080	<b>0.00000040</b>
Water	80837	20-30 min, overflow, dissolved	<b>0.0000010</b>	<b>0.0000010</b>	0.00000050	<b>0.0000010</b>	<b>0.0000010</b>	0.00000090	<b>0.00000070</b>
Water	80750	0-10 min, overflow, total	<b>0.0000011</b>	<b>0.0000011</b>	<b>0.00000110</b>	<b>0.0000011</b>	<b>0.0000011</b>	<b>0.00000110</b>	<b>0.00000110</b>
Water	80751	10-20 min, overflow, total	<b>0.0000010</b>	<b>0.0000010</b>	0.00000040	<b>0.0000010</b>	<b>0.0000010</b>	0.00000090	<b>0.00000100</b>
Water	80752	20-30 min, overflow, total	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	<b>0.0000010</b>	<b>0.0000010</b>	0.00000050	<b>0.00000100</b>
Water	80838	0-10 min, non-overflow, dissolve	<b>0.0000010</b>	<b>0.0000010</b>	0.00000080	<b>0.0000010</b>	<b>0.0000010</b>	0.00000080	<b>0.00000050</b>
Water	80839	10-20 min, non-overflow, dissolve	<b>0.0000011</b>	<b>0.0000011</b>	0.00000050	<b>0.0000011</b>	<b>0.0000011</b>	0.00000090	<b>0.00000040</b>
Water	80840	20-30 min, non-overflow, dissolve	<b>0.0000011</b>	<b>0.0000011</b>	0.00000050	<b>0.0000011</b>	<b>0.0000011</b>	0.00000110	<b>0.00000040</b>
Water	80753	0-10 min, non-overflow, total	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	<b>0.0000010</b>	<b>0.0000010</b>	0.00000050	<b>0.00000100</b>
Water	80754	10-20 min, non-overflow, total	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	<b>0.0000010</b>	<b>0.0000010</b>	0.00000070	<b>0.00000100</b>
Water	80755	20-30 min, non-overflow, total	<b>0.0000011</b>	<b>0.0000011</b>	<b>0.00000110</b>	<b>0.0000011</b>	<b>0.0000011</b>	0.00000110	<b>0.00000050</b>
		Hopper Inflow Monitoring							
Water	80790	3& 6 min, dissolved	<b>0.0000010</b>	<b>0.0000010</b>	0.00000140	<b>0.0000010</b>	<b>0.0000010</b>	0.00000120	<b>0.00000050</b>
Water	80791	9&12 min, dissolved	<b>0.0000010</b>	<b>0.0000010</b>	0.00000110	<b>0.0000010</b>	<b>0.0000010</b>	0.00000110	<b>0.00000040</b>
Water	80792	15&18 min, dissolved	<b>0.0000010</b>	<b>0.0000010</b>	0.00000100	<b>0.0000010</b>	<b>0.0000010</b>	0.00000100	<b>0.00000100</b>
Water	80793	21&24 min, dissolved	<b>0.0000010</b>	<b>0.0000010</b>	0.00000110	<b>0.0000010</b>	<b>0.0000010</b>	0.00000160	<b>0.00000060</b>
Water	80794	27&30 min, dissolved	<b>0.0000010</b>	<b>0.0000010</b>	0.00000170	<b>0.0000010</b>	<b>0.0000010</b>	0.00000160	<b>0.00000100</b>
Water	80692	3& 6 min, total	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	<b>0.0000010</b>	<b>0.0000010</b>	0.00000120	<b>0.00000100</b>
Water	80693	9&12 min, total	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	<b>0.0000010</b>	<b>0.0000010</b>	0.00000140	<b>0.00000100</b>
Water	80694	15&18 min, total	<b>0.0000010</b>	<b>0.0000010</b>	0.00000280	<b>0.0000010</b>	<b>0.0000010</b>	0.00000230	<b>0.00000100</b>
Water	80695	21&24 min, total	<b>0.0000011</b>	<b>0.0000011</b>	0.00000330	<b>0.0000011</b>	<b>0.0000011</b>	0.00000290	<b>0.00000060</b>
Water	80696	27&30 min, total	<b>0.0000010</b>	<b>0.0000010</b>	0.00000240	<b>0.0000010</b>	<b>0.0000010</b>	0.00000200	<b>0.00000130</b>
		Hopper Overflow Monitoring							
Water	80795	2& 4 min, dissolved	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	<b>0.00000100</b>
Water	80796	6& 8 min, dissolved	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	<b>0.0000010</b>	<b>0.0000010</b>	0.00000050	<b>0.00000100</b>
Water	80797	10&12 min, dissolved	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	<b>0.0000010</b>	<b>0.0000010</b>	0.00000050	<b>0.00000100</b>
Water	80798	14&16 min, dissolved	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	<b>0.0000010</b>	<b>0.0000010</b>	0.00000060	<b>0.00000100</b>
Water	80799	18&20 min, dissolved	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	<b>0.0000010</b>	<b>0.0000010</b>	0.00000060	<b>0.00000100</b>
Water	80698	2& 4 min, total	<b>0.0000010</b>	<b>0.0000010</b>	0.00000120	<b>0.0000010</b>	<b>0.0000010</b>	0.00000130	<b>0.00000100</b>
Water	80699	6& 8 min, total	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	<b>0.0000010</b>	<b>0.0000010</b>	0.00000090	<b>0.00000100</b>
Water	80700	10&12 min, total	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	<b>0.0000010</b>	<b>0.0000010</b>	0.00000140	<b>0.00000100</b>
Water	80701	14&16 min, total	<b>0.0000011</b>	<b>0.0000011</b>	<b>0.00000110</b>	<b>0.0000011</b>	<b>0.0000011</b>	0.00000110	<b>0.00000110</b>
Water	80702	18&20 min, total	<b>0.0000010</b>	<b>0.0000010</b>	0.00000080	<b>0.0000010</b>	<b>0.0000010</b>	0.00000180	<b>0.00000100</b>
		Site Water							
Water	81594	Sample 1 Total	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	<b>0.00000100</b>
Water	81595	Sample 2 Total	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	<b>0.0000010</b>	<b>0.0000010</b>	0.00000090	<b>0.00000047</b>
Water	81596	Sample 3 Total	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	<b>0.00000100</b>
		Elutriate							
Water	81600	Sample 1 Dissolved	<b>0.0000010</b>	<b>0.0000010</b>	0.00000043	<b>0.0000010</b>	<b>0.0000010</b>	0.00000086	<b>0.00000100</b>
Water	81601	Sample 2 Dissolved	<b>0.0000010</b>	<b>0.0000010</b>	0.00000034	<b>0.0000010</b>	<b>0.0000010</b>	0.00000065	<b>0.00000100</b>
Water	81602	Sample 3 Dissolved	<b>0.0000010</b>	<b>0.0000010</b>	0.00000035	<b>0.0000010</b>	<b>0.0000010</b>	0.00000069	<b>0.00000032</b>
Water	81597	Sample 1 Total	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	<b>0.0000010</b>	<b>0.0000010</b>	0.00000048	<b>0.00000100</b>
Water	81598	Sample 2 Total	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	<b>0.0000010</b>	<b>0.0000010</b>	0.00000150	<b>0.00000049</b>
Water	81599	Sample 3 Total	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	<b>0.0000010</b>	<b>0.0000010</b>	0.00000100	<b>0.00000100</b>
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 80	PCB 81	PCB 84	PCB 91	PCB 92	PCB 95	PCB 99
		Detection Limit (mg/kg)	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
		Insitu Sediment							
Sediment	81714	Sample #1	<b>0.00033</b>	<b>0.00033</b>	<b>0.00033</b>	<b>0.00033</b>	<b>0.00033</b>	<b>0.00033</b>	<b>0.00033</b>
Sediment	81715	Sample #2	<b>0.00033</b>	<b>0.00033</b>	<b>0.00033</b>	<b>0.00033</b>	<b>0.00033</b>	<b>0.00033</b>	<b>0.00033</b>
Sediment	81716	Sample #3	<b>0.00033</b>	<b>0.00033</b>	<b>0.00033</b>	<b>0.00033</b>	<b>0.00033</b>	<b>0.00033</b>	<b>0.00033</b>

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## PCBscoar

## Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 110	PCB 119	PCB 120	PCB 123	PCB 126	PCB 127	PCB 132
		Detection Limit (mg/l)	0.00000110	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80834	Plume Monitoring							
Water	80749	Background, dissolved	0.00000100	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80749	Background, total	0.00000050	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80835	0-10 min, overflow, dissolved	0.00000090	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80836	10-20 min, overflow, dissolved	0.00000110	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80837	20-30 min, overflow, dissolved	0.00000080	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80750	0-10 min, overflow, total	0.00000050	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80751	10-20 min, overflow, total	0.00000070	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80752	20-30 min, overflow, total	0.00000050	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80838	0-10 min, non-overflow, dissolve	0.00000110	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80839	10-20 min, non-overflow, dissolve	0.00000070	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80840	20-30 min, non-overflow, dissolve	0.00000110	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80753	0-10 min, non-overflow, total	0.00000050	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80754	10-20 min, non-overflow, total	0.00000060	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80755	20-30 min, non-overflow, total	0.00000090	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000005
		Hopper Inflow Monitoring							
Water	80790	3& 6 min; dissolved	0.00000210	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80791	9&12 min; dissolved	0.00000160	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80792	15&18 min; dissolved	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80793	21&24 min; dissolved	0.00000160	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80794	27&30 min; dissolved	0.00000160	0.0000010	0.0000007	0.0000010	0.0000010	0.0000010	0.0000010
Water	80692	3& 6 min; total	0.00000160	0.0000010	0.0000026	0.0000010	0.0000010	0.0000010	0.0000010
Water	80693	9&12 min; total	0.00000200	0.0000010	0.0000019	0.0000010	0.0000010	0.0000010	0.0000010
Water	80694	15&18 min; total	0.00000260	0.0000010	0.0000054	0.0000010	0.0000010	0.0000010	0.0000010
Water	80695	21&24 min; total	0.00000260	0.0000011	0.0000061	0.0000011	0.0000011	0.0000011	0.0000011
Water	80696	27&30 min; total	0.00000230	0.0000010	0.0000071	0.0000010	0.0000010	0.0000010	0.0000010
		Hopper Overflow Monitoring							
Water	80795	2& 4 min; dissolved	0.00000070	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80796	6& 8 min; dissolved	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80797	10&12 min; dissolved	0.00000050	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80798	14&16 min; dissolved	0.00000060	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80799	18&20 min; dissolved	0.00000050	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80698	2& 4 min; total	0.00000150	0.0000010	0.0000008	0.0000010	0.0000010	0.0000010	0.0000010
Water	80699	6& 8 min; total	0.00000120	0.0000010	0.0000005	0.0000010	0.0000010	0.0000010	0.0000010
Water	80700	10&12 min; total	0.00000150	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80701	14&16 min; total	0.00000110	0.0000011	0.0000006	0.0000011	0.0000011	0.0000011	0.0000011
Water	80702	18&20 min; total	0.00000160	0.0000010	0.0000005	0.0000010	0.0000010	0.0000010	0.0000010
		Site Water							
Water	81594	Sample 1 Total	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81595	Sample 2 Total	0.00000097	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81596	Sample 3 Total	0.00000077	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
		Elutriate							
Water	81600	Sample 1 Dissolved	0.00000091	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81601	Sample 2 Dissolved	0.00000063	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81602	Sample 3 Dissolved	0.00000064	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81597	Sample 1 Total	0.00000061	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81598	Sample 2 Total	0.00000110	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81599	Sample 3 Total	0.00000059	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 110	PCB 119	PCB 120	PCB 123	PCB 126	PCB 127	PCB 132
		Detection Limit (mg/kg)	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
		Insitu Sediment							
Sediment	81714	Sample #1	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
Sediment	81715	Sample #2	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
Sediment	81716	Sample #3	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## PCBscoar

## Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 135	PCB 146	PCB 149	PCB 157	PCB 158	PCB 166	PCB 168
		Detection Limit (mg/l)	0.0000011	0.00000110	0.00000110	0.0000011	0.0000011	0.0000011	0.00000110
Water	80834	Plume Monitoring							
Water	80749	Background, dissolved	0.0000011	0.00000110	0.00000110	0.0000011	0.0000011	0.0000011	0.00000110
Water	80749	Background, total	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	80835	0-10 min, overflow, dissolved	0.0000010	0.00000100	0.00000040	0.0000010	0.0000010	0.0000010	0.00000100
Water	80836	10-20 min, overflow, dissolved	0.0000010	0.00000050	0.00000040	0.0000010	0.0000010	0.0000010	0.00000100
Water	80837	20-30 min, overflow, dissolved	0.0000010	0.00000100	0.00000040	0.0000010	0.0000010	0.0000010	0.00000100
Water	80750	0-10 min, overflow, total	0.0000011	0.00000110	0.00000110	0.0000011	0.0000011	0.0000011	0.00000110
Water	80751	10-20 min, overflow, total	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	80752	20-30 min, overflow, total	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	80838	0-10 min, non-overflow, dissolve	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	80839	10-20 min, non-overflow, dissolve	0.0000011	0.00000110	0.00000110	0.0000011	0.0000011	0.0000011	0.00000110
Water	80840	20-30 min, non-overflow, dissolve	0.0000011	0.00000110	0.00000110	0.0000011	0.0000011	0.0000011	0.00000110
Water	80753	0-10 min, non-overflow, total	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	80754	10-20 min, non-overflow, total	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	80755	20-30 min, non-overflow, total	0.0000011	0.00000110	0.00000110	0.0000011	0.0000011	0.0000011	0.00000110
		Hopper Inflow Monitoring							
Water	80790	3& 6 min, dissolved	0.0000010	0.00000100	0.00000040	0.0000010	0.0000010	0.0000010	0.00000100
Water	80791	9&12 min, dissolved	0.0000010	0.00000100	0.00000040	0.0000010	0.0000010	0.0000010	0.00000100
Water	80792	15&18 min, dissolved	0.0000010	0.00000100	0.00000040	0.0000010	0.0000010	0.0000010	0.00000100
Water	80793	21&24 min, dissolved	0.0000010	0.00000100	0.00000070	0.0000010	0.0000010	0.0000010	0.00000100
Water	80794	27&30 min, dissolved	0.0000010	0.00000100	0.00000130	0.0000010	0.0000010	0.0000010	0.00000100
Water	80692	3& 6 min, total	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000075
Water	80693	9&12 min, total	0.0000010	0.00000100	0.00000130	0.0000010	0.0000010	0.0000010	0.00000075
Water	80694	15&18 min, total	0.0000010	0.00000100	0.00000290	0.0000010	0.0000010	0.0000010	0.00000160
Water	80695	21&24 min, total	0.0000011	0.00000100	0.00000300	0.0000011	0.0000011	0.0000011	0.00000140
Water	80696	27&30 min, total	0.0000010	0.00000097	0.00000300	0.0000010	0.0000010	0.0000010	0.00000100
		Hopper Overflow Monitoring							
Water	80795	2& 4 min, dissolved	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	80796	6& 8 min, dissolved	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	80797	10&12 min, dissolved	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	80798	14&16 min, dissolved	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	80799	18&20 min, dissolved	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	80698	2& 4 min, total	0.0000010	0.00000070	0.00000160	0.0000010	0.0000010	0.0000010	0.00000061
Water	80699	6& 8 min, total	0.0000010	0.00000100	0.00000088	0.0000010	0.0000010	0.0000010	0.00000100
Water	80700	10&12 min, total	0.0000010	0.00000100	0.00000120	0.0000010	0.0000010	0.0000010	0.00000100
Water	80701	14&16 min, total	0.0000011	0.00000067	0.00000240	0.0000011	0.0000011	0.0000011	0.00000110
Water	80702	18&20 min, total	0.0000010	0.00000084	0.00000110	0.0000010	0.0000010	0.0000010	0.00000100
		Site Water							
Water	81594	Sample 1 Total	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	81595	Sample 2 Total	0.0000010	0.00000100	0.00000050	0.0000010	0.0000010	0.0000010	0.00000100
Water	81596	Sample 3 Total	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
		Elutriate							
Water	81600	Sample 1 Dissolved	0.0000010	0.00000100	0.00000038	0.0000010	0.0000010	0.0000010	0.00000100
Water	81601	Sample 2 Dissolved	0.0000010	0.00000100	0.00000037	0.0000010	0.0000010	0.0000010	0.00000100
Water	81602	Sample 3 Dissolved	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	81597	Sample 1 Total	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	81598	Sample 2 Total	0.0000010	0.00000100	0.00000066	0.0000010	0.0000010	0.0000010	0.00000100
Water	81599	Sample 3 Total	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 135	PCB 146	PCB 149	PCB 157	PCB 158	PCB 166	PCB 168
		Detection Limit (mg/kg)	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
		Insitu Sediment							
Sediment	81714	Sample #1	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
Sediment	81715	Sample #2	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
Sediment	81716	Sample #3	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## PCBscoar

## Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 169	PCB 174	PCB 177	PCB 178	PCB 179	PCB 8	PCB 18
		Detection Limit (mg/l)	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.00000110
Water	80834	Plume Monitoring							
Water	80749	Background, dissolved	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.00000110
Water	80749	Background, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80835	0-10 min, overflow, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80836	10-20 min, overflow, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80837	20-30 min, overflow, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80750	0-10 min, overflow, total	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.00000110
Water	80751	10-20 min, overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80752	20-30 min, overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80838	0-10 min, non-overflow, dissolve	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80839	10-20 min, non-overflow, dissolve	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.00000110
Water	80840	20-30 min, non-overflow, dissolve	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.00000110
Water	80753	0-10 min, non-overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80754	10-20 min, non-overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80755	20-30 min, non-overflow, total	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.00000110
		Hopper Inflow Monitoring							
Water	80790	3& 6 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000460
Water	80791	9&12 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80792	15&18 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80793	21&24 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80794	27&30 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80692	3& 6 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80693	9&12 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80694	15&18 min, total	0.0000010	0.0000084	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80695	21&24 min, total	0.0000011	0.0000058	0.0000011	0.0000011	0.0000011	0.0000011	0.00000110
Water	80696	27&30 min, total	0.0000010	0.0000042	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
		Hopper Overflow Monitoring							
Water	80795	2& 4 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80796	6& 8 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80797	10&12 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80798	14&16 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80799	18&20 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80698	2& 4 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80699	6& 8 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80700	10&12 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80701	14&16 min, total	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.00000110
Water	80702	18&20 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
		Site Water							
Water	81594	Sample 1 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000070
Water	81595	Sample 2 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000063
Water	81596	Sample 3 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000082
		Elutriate							
Water	81600	Sample 1 Dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	81601	Sample 2 Dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	81602	Sample 3 Dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	81597	Sample 1 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000052
Water	81598	Sample 2 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000058
Water	81599	Sample 3 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 169	PCB 174	PCB 177	PCB 178	PCB 179	PCB 8	PCB 18
		Detection Limit (mg/kg)	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
		In situ Sediment							
Sediment	81714	Sample #1	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
Sediment	81715	Sample #2	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
Sediment	81716	Sample #3	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## PCBscoar

## Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 28	PCB 31	PCB 40	PCB 44	PCB 49	PCB 52	PCB 60
		Detection Limit (mg/l)	0.0000011	0.0000011	0.0000011	0.00000110	0.0000011	0.00000110	0.0000011
Water	80834	Plume Monitoring							
Water	80749	Background, dissolved	0.0000011	0.0000011	0.0000011	0.00000140	0.0000011	0.00000090	0.0000011
Water	80749	Background, total	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.00000060	0.0000010
Water	80835	0-10 min, overflow, dissolved	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.00000090	0.0000010
Water	80836	10-20 min, overflow, dissolved	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.00000110	0.0000010
Water	80837	20-30 min, overflow, dissolved	0.0000010	0.0000010	0.0000010	0.00000080	0.0000010	0.00000100	0.0000010
Water	80750	0-10 min, overflow, total	0.0000011	0.0000011	0.0000011	0.00000110	0.0000011	0.00000060	0.0000011
Water	80751	10-20 min, overflow, total	0.0000010	0.0000051	0.0000010	0.00000100	0.0000010	0.00000090	0.0000010
Water	80752	20-30 min, overflow, total	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.00000050	0.0000010
Water	80838	0-10 min, non-overflow, dissolve	0.0000010	0.0000010	0.0000010	0.00000130	0.0000010	0.00000090	0.0000010
Water	80839	10-20 min, non-overflow, dissolve	0.0000011	0.0000011	0.0000011	0.00000110	0.0000011	0.00000090	0.0000011
Water	80840	20-30 min, non-overflow, dissolve	0.0000011	0.0000011	0.0000011	0.00000070	0.0000011	0.00000100	0.0000011
Water	80753	0-10 min, non-overflow, total	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.00000060	0.0000010
Water	80754	10-20 min, non-overflow, total	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.00000080	0.0000010
Water	80755	20-30 min, non-overflow, total	0.0000011	0.0000011	0.0000010	0.00000110	0.0000011	0.00000110	0.0000011
		Hopper Inflow Monitoring							
Water	80790	3& 6 min, dissolved	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.00000050	0.0000010
Water	80791	9&12 min, dissolved	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.00000080	0.0000010
Water	80792	15&18 min, dissolved	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.00000440	0.0000010
Water	80793	21&24 min, dissolved	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.00000000	0.0000010
Water	80794	27&30 min, dissolved	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.00000100	0.0000010
Water	80692	3& 6 min, total	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.00000100	0.0000010
Water	80693	9&12 min, total	0.0000010	0.0000010	0.0000010	0.00000110	0.0000041	0.00000100	0.0000010
Water	80694	15&18 min, total	0.0000010	0.0000010	0.0000010	0.00000170	0.0000010	0.00000200	0.0000010
Water	80695	21&24 min, total	0.0000011	0.0000011	0.0000011	0.00000210	0.0000011	0.00000280	0.0000011
Water	80696	27&30 min, total	0.0000010	0.0000010	0.0000010	0.00000470	0.0000010	0.00000390	0.0000010
		Hopper Overflow Monitoring							
Water	80795	28-4 min, dissolved	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.00000100	0.0000010
Water	80796	6& 8 min, dissolved	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.00000060	0.0000010
Water	80797	10&12 min, dissolved	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.00000050	0.0000010
Water	80798	14&16 min, dissolved	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.00000060	0.0000010
Water	80799	18&20 min, dissolved	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.00000060	0.0000010
Water	80698	2& 4 min, total	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.00000100	0.0000010
Water	80699	6& 8 min, total	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.00000094	0.0000010
Water	80700	10&12 min, total	0.0000010	0.0000010	0.0000010	0.00000063	0.0000010	0.00000100	0.0000010
Water	80701	14&16 min, total	0.0000011	0.0000011	0.0000011	0.00000110	0.0000011	0.00000089	0.0000011
Water	80702	18&20 min, total	0.0000010	0.0000010	0.0000010	0.00000060	0.0000010	0.00000140	0.0000010
		Site Water							
Water	81594	Sample 1 Total	0.0000010	0.0000022	0.0000010	0.00000100	0.0000010	0.00000082	0.0000010
Water	81595	Sample 2 Total	0.0000010	0.0000033	0.0000010	0.00000064	0.0000010	0.00000096	0.0000010
Water	81596	Sample 3 Total	0.0000010	0.0000036	0.0000010	0.00000073	0.0000010	0.00000078	0.0000010
		Elutriate							
Water	81600	Sample 1 Dissolved	0.0000010	0.0000032	0.0000010	0.00000100	0.0000010	0.00000100	0.0000010
Water	81601	Sample 2 Dissolved	0.0000010	0.0000022	0.0000010	0.00000100	0.0000010	0.00000084	0.0000010
Water	81602	Sample 3 Dissolved	0.0000010	0.0000032	0.0000010	0.00000100	0.0000010	0.00000095	0.0000010
Water	81597	Sample 1 Total	0.0000010	0.0000021	0.0000010	0.00000100	0.0000010	0.00000054	0.0000010
Water	81598	Sample 2 Total	0.0000010	0.0000040	0.0000010	0.00000130	0.0000010	0.00000170	0.0000010
Water	81599	Sample 3 Total	0.0000010	0.0000025	0.0000010	0.00000100	0.0000010	0.00000058	0.0000010
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 28	PCB 31	PCB 40	PCB 44	PCB 49	PCB 52	PCB 60
		Detection Limit (mg/kg)	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
		In situ Sediment							
Sediment	81714	Sample #1	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
Sediment	81715	Sample #2	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
Sediment	81716	Sample #3	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## PCBscoar

## Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 70	PCB 77	PCB 82	PCB 86	PCB 87	PCB 97	PCB 101
		Detection Limit (mg/l)	0.00000110	0.0000011	0.0000011	0.00000110	0.00000110	0.00000110	0.00000110
Water	80834	Plume Monitoring							
Water	80749	Background, dissolved	<b>0.00000110</b>	<b>0.0000011</b>	<b>0.0000011</b>	0.00000090	0.00000080	0.00000090	0.00000090
Water	80749	Background, total	<b>0.00000100</b>	<b>0.0000010</b>	<b>0.0000010</b>	0.00000080	0.00000050	0.00000080	0.00000050
Water	80835	0-10 min, overflow, dissolved	0.00000040	0.0000010	0.0000010	0.00000070	0.00000080	0.00000070	0.00000090
Water	80836	10-20 min, overflow, dissolved	0.00000040	0.0000010	0.0000010	0.00000070	0.00000050	0.00000070	0.00000110
Water	80837	20-30 min, overflow, dissolved	0.00000040	0.0000010	0.0000010	0.00000060	0.00000040	0.00000060	0.00000090
Water	80750	0-10 min, overflow, total	0.00000050	0.0000011	0.0000011	<b>0.00000110</b>	0.00000040	<b>0.00000110</b>	0.00000060
Water	80751	10-20 min, overflow, total	0.00000050	0.0000010	0.0000010	0.00000040	0.00000080	0.00000040	0.00000060
Water	80752	20-30 min, overflow, total	0.00000040	0.0000010	0.0000010	0.00000050	<b>0.00000100</b>	0.00000050	0.00000050
Water	80838	0-10 min, non-overflow, dissolve	0.00000050	0.0000010	0.0000010	0.00000080	0.00000070	0.00000080	0.00000090
Water	80839	10-20 min, non-overflow, dissolve	0.00000050	<b>0.0000011</b>	<b>0.0000011</b>	0.00000060	0.00000070	0.00000060	0.00000090
Water	80840	20-30 min, non-overflow, dissolve	0.00000060	0.0000011	0.0000011	0.00000100	0.00000080	0.00000100	0.00000090
Water	80753	0-10 min, non-overflow, total	<b>0.00000100</b>	<b>0.0000010</b>	<b>0.0000010</b>	0.00000040	0.00000050	0.00000040	0.00000050
Water	80754	10-20 min, non-overflow, total	<b>0.00000100</b>	<b>0.0000010</b>	<b>0.0000010</b>	0.00000040	0.00000050	0.00000040	0.00000070
Water	80755	20-30 min, non-overflow, total	0.00000050	<b>0.0000010</b>	<b>0.0000011</b>	0.00000100	0.00000070	<b>0.00000110</b>	0.00000110
		Hopper Inflow Monitoring							
Water	80790	3& 6 min, dissolved	0.00000040	<b>0.0000010</b>	<b>0.0000010</b>	0.00000080	0.00000110	0.00000080	0.00000140
Water	80791	9&12 min, dissolved	0.00000100	<b>0.0000010</b>	<b>0.0000010</b>	0.00000060	0.00000090	0.00000060	0.00000120
Water	80792	15&18 min, dissolved	0.00000040	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	0.00000130	<b>0.00000100</b>	<b>0.00000100</b>
Water	80793	21&24 min, dissolved	0.00000060	<b>0.0000010</b>	<b>0.0000010</b>	0.00000130	0.00000150	0.00000130	0.0000030
Water	80794	27&30 min, dissolved	0.00000090	<b>0.0000010</b>	<b>0.0000010</b>	0.00000180	0.00000110	0.00000180	0.00000100
Water	80692	3& 6 min, total	0.00000280	<b>0.0000010</b>	<b>0.0000010</b>	0.00000190	<b>0.00000100</b>	0.00000190	0.00000430
Water	80693	9&12 min, total	0.00000180	<b>0.0000010</b>	<b>0.0000010</b>	0.00000088	<b>0.00000100</b>	0.00000088	0.00000300
Water	80694	15&18 min, total	0.00000250	<b>0.0000010</b>	<b>0.0000010</b>	0.00000290	<b>0.00000100</b>	0.00000290	0.00000390
Water	80695	21&24 min, total	0.00000150	<b>0.0000011</b>	<b>0.0000011</b>	0.00000049	<b>0.00000110</b>	0.00000049	0.00000360
Water	80696	27&30 min, total	0.00000140	<b>0.0000010</b>	<b>0.0000010</b>	0.00000220	<b>0.00000100</b>	0.00000220	0.00000380
		Hopper Overflow Monitoring							
Water	80795	2& 4 min, dissolved	<b>0.00000100</b>	<b>0.0000010</b>	<b>0.0000010</b>	0.00000100	0.00000100	0.00000100	0.00000080
Water	80796	6& 8 min, dissolved	<b>0.00000100</b>	<b>0.0000010</b>	<b>0.0000010</b>	0.00000100	0.00000100	0.00000100	0.00000100
Water	80797	10&12 min, dissolved	0.00000030	<b>0.0000010</b>	<b>0.0000010</b>	0.00000100	0.00000050	0.00000100	0.00000100
Water	80798	14&16 min, dissolved	0.00000050	<b>0.0000010</b>	<b>0.0000010</b>	0.00000040	<b>0.00000100</b>	0.00000040	0.00000100
Water	80799	18&20 min, dissolved	0.00000040	<b>0.0000010</b>	<b>0.0000010</b>	0.00000100	<b>0.00000100</b>	0.00000100	0.00000100
Water	80698	2& 4 min, total	<b>0.00000100</b>	<b>0.0000010</b>	<b>0.0000010</b>	0.00000061	<b>0.00000100</b>	0.00000061	0.00000240
Water	80699	6& 8 min, total	0.00000073	<b>0.0000010</b>	<b>0.0000010</b>	0.00000044	<b>0.00000100</b>	0.00000044	0.00000140
Water	80700	10&12 min, total	<b>0.00000100</b>	<b>0.0000010</b>	<b>0.0000010</b>	0.00000051	0.00000063	0.00000051	0.00000200
Water	80701	14&16 min, total	<b>0.00000110</b>	<b>0.0000011</b>	<b>0.0000011</b>	0.00000052	<b>0.00000110</b>	0.00000052	0.00000210
Water	80702	18&20 min, total	<b>0.00000100</b>	<b>0.0000010</b>	<b>0.0000010</b>	0.00000063	<b>0.00000100</b>	0.00000063	0.00000240
		Site Water							
Water	81594	Sample 1 Total	0.00000058	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	<b>0.00000100</b>	<b>0.00000100</b>	0.00000079
Water	81595	Sample 2 Total	0.00000078	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	<b>0.00000100</b>	<b>0.00000100</b>	0.00000130
Water	81596	Sample 3 Total	0.00000078	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	<b>0.00000100</b>	<b>0.00000100</b>	0.00000110
		Elutriate							
Water	81600	Sample 1 Dissolved	<b>0.00000100</b>	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	0.00000038	<b>0.00000100</b>	0.00000100
Water	81601	Sample 2 Dissolved	<b>0.00000100</b>	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	0.00000062	<b>0.00000100</b>	0.00000071
Water	81602	Sample 3 Dissolved	0.00000049	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	<b>0.00000100</b>	<b>0.00000100</b>	0.00000077
Water	81597	Sample 1 Total	0.00000053	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	<b>0.00000100</b>	<b>0.00000100</b>	0.00000054
Water	81598	Sample 2 Total	0.00000120	<b>0.0000010</b>	<b>0.0000010</b>	0.00000057	0.00000068	0.00000057	0.00000160
Water	81599	Sample 3 Total	0.00000052	<b>0.0000010</b>	<b>0.0000010</b>	<b>0.00000100</b>	<b>0.00000100</b>	<b>0.00000100</b>	0.00000078
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 70	PCB 77	PCB 82	PCB 86	PCB 87	PCB 97	PCB 101
		Detection Limit (mg/kg)	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
		Insitu Sediment							
Sediment	81714	Sample #1	0.00033	<b>0.00033</b>	<b>0.00033</b>	<b>0.00033</b>	<b>0.00033</b>	<b>0.00033</b>	<b>0.00033</b>
Sediment	81715	Sample #2	0.00033	<b>0.00033</b>	<b>0.00033</b>	<b>0.00033</b>	<b>0.00033</b>	<b>0.00033</b>	<b>0.00033</b>
Sediment	81716	Sample #3	0.00033	<b>0.00033</b>	<b>0.00033</b>	<b>0.00033</b>	<b>0.00033</b>	<b>0.00033</b>	<b>0.00033</b>

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## PCBscoar

## Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 105	PCB 114	PCB 118	PCB 121	PCB 128	PCB 136	PCB 137
		Detection Limit (mg/l)	0.00000110	0.0000011	0.00000110	0.0000011	0.0000011	0.0000011	0.0000011
Water	80834	Plume Monitoring Background, dissolved	0.00000110	0.0000011	0.00000110	0.0000011	0.0000011	0.0000011	0.0000011
Water	80749	Background, total	0.00000100	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80835	0-10 min, overflow, dissolved	0.00000100	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80836	10-20 min, overflow, dissolved	0.00000100	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80837	20-30 min, overflow, dissolved	0.00000100	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80750	0-10 min, overflow, total	0.00000110	0.0000011	0.00000110	0.0000011	0.0000011	0.0000011	0.0000011
Water	80751	10-20 min, overflow, total	0.00000100	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80752	20-30 min, overflow, total	0.00000100	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80838	0-10 min, non-overflow, dissolve	0.00000100	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80839	10-20 min, non-overflow, dissolve	0.00000110	0.0000011	0.00000110	0.0000011	0.0000011	0.0000011	0.0000011
Water	80840	20-30 min, non-overflow, dissolve	0.00000110	0.0000011	0.00000110	0.0000011	0.0000011	0.0000011	0.0000011
Water	80753	0-10 min, non-overflow, total	0.00000100	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80754	10-20 min, non-overflow, total	0.00000100	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80755	20-30 min, non-overflow, total	0.00000110	0.0000011	0.00000110	0.0000011	0.0000011	0.0000011	0.0000011
		Hopper Inflow Monitoring							
Water	80790	3& 6 min, dissolved	0.00000100	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80791	9&12 min, dissolved	0.00000100	0.0000010	0.00000100	0.0000010	0.0000010	0.0000007	0.0000010
Water	80792	15&18 min, dissolved	0.00000100	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80793	21&24 min, dissolved	0.00000100	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80794	27&30 min, dissolved	0.00000100	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80692	3& 6 min, total	0.00000100	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80693	9&12 min, total	0.00000100	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80694	15&18 min, total	0.00000250	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80695	21&24 min, total	0.00000240	0.0000011	0.00000110	0.0000011	0.0000011	0.0000011	0.0000011
Water	80696	27&30 min, total	0.00000250	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
		Hopper Overflow Monitoring							
Water	80795	2& 4 min, dissolved	0.00000100	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80796	6& 8 min, dissolved	0.00000100	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80797	10&12 min, dissolved	0.00000100	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80798	14&16 min, dissolved	0.00000100	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80799	18&20 min, dissolved	0.00000100	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80698	2& 4 min, total	0.00000100	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80699	6& 8 min, total	0.00000100	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80700	10&12 min, total	0.00000100	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80701	14&16 min, total	0.00000110	0.0000011	0.00000110	0.0000011	0.0000011	0.0000011	0.0000011
Water	80702	18&20 min, total	0.00000100	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
		Site Water							
Water	81594	Sample 1 Total	0.00000100	0.0000010	0.00000054	0.0000010	0.0000010	0.0000010	0.0000010
Water	81595	Sample 2 Total	0.00000047	0.0000010	0.00000097	0.0000010	0.0000010	0.0000010	0.0000010
Water	81596	Sample 3 Total	0.00000100	0.0000010	0.00000057	0.0000010	0.0000010	0.0000010	0.0000010
		Elutriate							
Water	81600	Sample 1 Dissolved	0.00000036	0.0000010	0.00000062	0.0000010	0.0000010	0.0000010	0.0000010
Water	81601	Sample 2 Dissolved	0.00000032	0.0000010	0.00000046	0.0000010	0.0000010	0.0000010	0.0000010
Water	81602	Sample 3 Dissolved	0.00000042	0.0000010	0.00000065	0.0000010	0.0000010	0.0000010	0.0000010
Water	81597	Sample 1 Total	0.00000100	0.0000010	0.00000049	0.0000010	0.0000010	0.0000010	0.0000010
Water	81598	Sample 2 Total	0.00000100	0.0000010	0.00000086	0.0000010	0.0000010	0.0000010	0.0000010
Water	81599	Sample 3 Total	0.00000100	0.0000010	0.00000049	0.0000010	0.0000010	0.0000010	0.0000010
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 105	PCB 114	PCB 118	PCB 121	PCB 128	PCB 136	PCB 137
		Detection Limit (mg/kg)	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
		In situ Sediment							
Sediment	81714	Sample #1	0.00033	0.00033	0.00010	0.00033	0.00033	0.00033	0.00033
Sediment	81715	Sample #2	0.00033	0.00033	0.00016	0.00033	0.00033	0.00033	0.00033
Sediment	81716	Sample #3	0.00033	0.00033	0.00020	0.00033	0.00033	0.00033	0.00033

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## PCBscoar

## Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 138	PCB 141	PCB 151	PCB 153	PCB 156	PCB 167	PCB 170
		Detection Limit (mg/l)	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.00000110
		Plume Monitoring							
Water	80834	Background, dissolved	0.0000011	0.0000011	0.0000011	0.0000007	0.0000011	0.0000011	0.00000110
Water	80749	Background, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80835	0-10 min, overflow, dissolved	0.0000004	0.0000010	0.0000010	0.0000009	0.0000010	0.0000010	0.00000100
Water	80836	10-20 min, overflow, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80837	20-30 min, overflow, dissolved	0.0000010	0.0000010	0.0000010	0.0000005	0.0000010	0.0000010	0.00000100
Water	80750	0-10 min, overflow, total	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.00000110
Water	80751	10-20 min, overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80752	20-30 min, overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80838	0-10 min, non-overflow, dissolve	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80839	10-20 min, non-overflow, dissolve	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.00000110
Water	80840	20-30 min, non-overflow, dissolve	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.00000110
Water	80753	0-10 min, non-overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80754	10-20 min, non-overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80755	20-30 min, non-overflow, total	0.0000011	0.0000011	0.0000011	0.0000010	0.0000011	0.0000011	0.00000110
		Hopper Inflow Monitoring							
Water	80790	3& 6 min, dissolved	0.0000006	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80791	9&12 min, dissolved	0.0000005	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80792	15&18 min, dissolved	0.0000006	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80793	21&24 min, dissolved	0.0000007	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80794	27&30 min, dissolved	0.0000014	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80692	3& 6 min, total	0.0000019	0.0000010	0.0000010	0.0000030	0.0000010	0.0000010	0.00000074
Water	80693	9&12 min, total	0.0000019	0.0000010	0.0000010	0.0000028	0.0000010	0.0000010	0.00000100
Water	80694	15&18 min, total	0.0000043	0.0000010	0.0000010	0.0000048	0.0000010	0.0000010	0.00000140
Water	80695	21&24 min, total	0.0000034	0.0000011	0.0000011	0.0000055	0.0000011	0.0000011	0.00000110
Water	80696	27&30 min, total	0.0000029	0.0000010	0.0000010	0.0000036	0.0000010	0.0000010	0.00000100
		Hopper Overflow Monitoring							
Water	80795	2& 4 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80796	6& 8 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80797	10&12 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80798	14&16 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80799	18&20 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80698	2& 4 min, total	0.0000018	0.0000010	0.0000010	0.0000026	0.0000010	0.0000010	0.00000100
Water	80699	6& 8 min, total	0.0000013	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80700	10&12 min, total	0.0000011	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	80701	14&16 min, total	0.0000020	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.00000110
Water	80702	18&20 min, total	0.0000015	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
		Site Water							
Water	81594	Sample 1 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	81595	Sample 2 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	81596	Sample 3 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
		Elutriate							
Water	81600	Sample 1 Dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	81601	Sample 2 Dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	81602	Sample 3 Dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	81597	Sample 1 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	81598	Sample 2 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
Water	81599	Sample 3 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 138	PCB 141	PCB 151	PCB 153	PCB 156	PCB 167	PCB 170
		Detection Limit (mg/kg)	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
		Insitu Sediment							
Sediment	81714	Sample #1	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
Sediment	81715	Sample #2	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
Sediment	81716	Sample #3	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## PCBscoar

## Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 171	PCB 180	PCB 182	PCB 183	PCB 185	PCB 187	PCB 189
		Detection Limit (mg/l)	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
		Plume Monitoring							
Water	80834	Background, dissolved	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80749	Background, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80835	0-10 min, overflow, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80836	10-20 min, overflow, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80837	20-30 min, overflow, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80750	0-10 min, overflow, total	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80751	10-20 min, overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80752	20-30 min, overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80838	0-10 min, non-overflow, dissolve	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80839	10-20 min, non-overflow, dissolve	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80840	20-30 min, non-overflow, dissolve	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80753	0-10 min, non-overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80754	10-20 min, non-overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80755	20-30 min, non-overflow, total	0.0000011	0.0000011	0.0000011	0.0000010	0.0000011	0.0000011	0.0000029
		Hopper Inflow Monitoring							
Water	80790	3& 6 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80791	9&12 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80792	15&18 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80793	21&24 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80794	27&30 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80692	3& 6 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000021	0.0000010
Water	80693	9&12 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000017	0.0000010
Water	80694	15&18 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000033	0.0000010
Water	80695	21&24 min, total	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80696	27&30 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
		Hopper Overflow Monitoring							
Water	80795	2& 4 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80796	6& 8 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80797	10&12 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80798	14&16 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80799	18&20 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80698	2& 4 min, total	0.0000010	0.0000015	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80699	6& 8 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80700	10&12 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80701	14&16 min, total	0.0000011	0.0000024	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80702	18&20 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
		Site Water							
Water	81594	Sample 1 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81595	Sample 2 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81596	Sample 3 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
		Elutriate							
Water	81600	Sample 1 Dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81601	Sample 2 Dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81602	Sample 3 Dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81597	Sample 1 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81598	Sample 2 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81599	Sample 3 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 171	PCB 180	PCB 182	PCB 183	PCB 185	PCB 187	PCB 189
		Detection Limit (mg/kg)	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
		Insitu Sediment							
Sediment	81714	Sample #1	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
Sediment	81715	Sample #2	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
Sediment	81716	Sample #3	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## PCBscoar

## Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 191	PCB 194	PCB 195	PCB 196	PCB 201	PCB 203	PCB 205
		Detection Limit (mg/l)	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80834	Plume Monitoring							
Water	80749	Background, dissolved	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80749	Background, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80835	0-10 min, overflow, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80836	10-20 min, overflow, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80837	20-30 min, overflow, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80750	0-10 min, overflow, total	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80751	10-20 min, overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80752	20-30 min, overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80838	0-10 min, non-overflow, dissolve	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80839	10-20 min, non-overflow, dissolve	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80840	20-30 min, non-overflow, dissolve	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80753	0-10 min, non-overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80754	10-20 min, non-overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80755	20-30 min, non-overflow, total	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
		Hopper Inflow Monitoring							
Water	80790	3& 6 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80791	9&12 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80792	15&18 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80793	21&24 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80794	27&30 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80692	3& 6 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80693	9&12 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80694	15&18 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80695	21&24 min, total	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80696	27&30 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
		Hopper Overflow Monitoring							
Water	80795	2& 4 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80796	6& 8 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80797	10&12 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80798	14&16 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80799	18&20 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80698	2& 4 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80699	6& 8 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80700	10&12 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80701	14&16 min, total	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80702	18&20 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
		Site Water							
Water	81594	Sample 1 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81595	Sample 2 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81596	Sample 3 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
		Elutriate							
Water	81600	Sample 1 Dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81601	Sample 2 Dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81602	Sample 3 Dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81597	Sample 1 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81598	Sample 2 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81599	Sample 3 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 191	PCB 194	PCB 195	PCB 196	PCB 201	PCB 203	PCB 205
		Detection Limit (mg/kg)	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
		Insitu Sediment							
Sediment	81714	Sample #1	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
Sediment	81715	Sample #2	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
Sediment	81716	Sample #3	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033

**BOLD - less than values**

Values below less than values are estimated results. Results are less than the reporting limit.

## PCBscoar

## Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 206	PCB 207	PCB 208	PCB 209	PCB 66	PCB 190	PCB 198
		Detection Limit (mg/l)	0.0000011	0.00000110	0.00000110		0.0000011	0.0000011	0.0000011
Water	80834	Plume Monitoring							
Water	80749	Background, dissolved	0.0000020	0.00000040	0.00000080	110.02%	0.0000011	0.0000011	0.0000011
Water	80749	Background, total	0.0000015	0.00000100	0.00000060	95.61%	0.0000010	0.0000010	0.0000010
Water	80835	0-10 min, overflow, dissolved	0.0000017	0.00000100	0.00000050	100.35%	0.0000010	0.0000010	0.0000010
Water	80836	10-20 min, overflow, dissolved	0.0000018	0.00000100	0.00000080	110.93%	0.0000010	0.0000010	0.0000010
Water	80837	20-30 min, overflow, dissolved	0.0000020	0.00000100	0.00000060	109.27%	0.0000010	0.0000010	0.0000010
Water	80750	0-10 min, overflow, total	0.0000017	0.00000110	0.00000070	96.69%	0.0000011	0.0000011	0.0000011
Water	80751	10-20 min, overflow, total	0.0000017	0.00000100	0.00000050	89.46%	0.0000010	0.0000010	0.0000010
Water	80752	20-30 min, overflow, total	0.0000017	0.00000100	0.00000060	99.52%	0.0000010	0.0000010	0.0000010
Water	80838	0-10 min, non-overflow, dissolve	0.0000020	0.00000100	0.00000070	111.00%	0.0000010	0.0000010	0.0000010
Water	80839	10-20 min, non-overflow, dissolve	0.0000019	0.00000110	0.00000080	109.59%	0.0000011	0.0000011	0.0000011
Water	80840	20-30 min, non-overflow, dissolve	0.0000022	0.00000110	0.00000070	105.27%	0.0000011	0.0000011	0.0000011
Water	80753	0-10 min, non-overflow, total	0.0000017	0.00000100	0.00000060	94.00%	0.0000010	0.0000010	0.0000010
Water	80754	10-20 min, non-overflow, total	0.0000016	0.00000100	0.00000050	92.43%	0.0000010	0.0000010	0.0000010
Water	80755	20-30 min, non-overflow, total	0.0000017	0.00000110	0.00000060	103.87%	0.0000011	0.0000011	0.0000011
		Hopper Inflow Monitoring							
Water	80790	3& 6 min, dissolved	0.0000016	0.00000100	0.00000060	102.69%	0.0000010	0.0000010	0.0000010
Water	80791	9&12 min, dissolved	0.0000015	0.00000100	0.00000050	93.31%	0.0000010	0.0000010	0.0000010
Water	80792	15&18 min, dissolved	0.0000014	0.00000100	0.00000050	83.49%	0.0000010	0.0000010	0.0000010
Water	80793	21&24 min, dissolved	0.0000013	0.00000100	0.00000040	83.82%	0.0000010	0.0000010	0.0000010
Water	80794	27&30 min, dissolved	0.0000013	0.00000100	0.00000040	74.65%	0.0000011	0.0000010	0.0000010
Water	80692	3& 6 min, total	0.0000013	0.00000100	0.00000100	75.42%	0.0000010	0.0000010	0.0000010
Water	80693	9&12 min, total	0.0000015	0.00000100	0.00000040	83.26%	0.0000010	0.0000010	0.0000010
Water	80694	15&18 min, total	0.0000019	0.00000100	0.00000100	74.76%	0.0000010	0.0000010	0.0000010
Water	80695	21&24 min, total	0.0000022	0.00000130	0.00000048	77.49%	0.0000011	0.0000011	0.0000011
Water	80696	27&30 min, total	0.0000018	0.00000150	0.00000064	61.74%	0.0000010	0.0000010	0.0000010
		Hopper Overflow Monitoring							
Water	80795	2& 4 min, dissolved	0.0000016	0.00000100	0.00000050	97.89%	0.0000010	0.0000010	0.0000010
Water	80796	6& 8 min, dissolved	0.0000017	0.00000100	0.00000050	99.86%	0.0000010	0.0000010	0.0000010
Water	80797	10&12 min, dissolved	0.0000017	0.00000100	0.00000050	100.24%	0.0000010	0.0000010	0.0000010
Water	80798	14&16 min, dissolved	0.0000017	0.00000100	0.00000050	105.68%	0.0000010	0.0000010	0.0000010
Water	80799	18&20 min, dissolved	0.0000017	0.00000100	0.00000050	105.68%	0.0000010	0.0000010	0.0000010
Water	80698	2& 4 min, total	0.0000016	0.00000100	0.00000055	60.08%	0.0000010	0.0000010	0.0000010
Water	80699	6& 8 min, total	0.0000015	0.00000100	0.00000100	51.08%	0.0000010	0.0000010	0.0000010
Water	80700	10&12 min, total	0.0000031	0.00000100	0.00000100	145.37%	0.0000010	0.0000010	0.0000010
Water	80701	14&16 min, total	0.0000020	0.00000110	0.00000110	98.00%	0.0000011	0.0000011	0.0000011
Water	80702	18&20 min, total	0.0000016	0.00000100	0.00000100	88.00%	0.0000010	0.0000010	0.0000010
		Site Water							
Water	81594	Sample 1 Total	0.0000026	0.00000110	0.00000130	95.54%	0.0000010	0.0000010	0.0000010
Water	81595	Sample 2 Total	0.0000027	0.00000100	0.00000140	100.33%	0.0000010	0.0000010	0.0000010
Water	81596	Sample 3 Total	0.0000024	0.00000085	0.00000120	98.44%	0.0000010	0.0000010	0.0000010
		Elutriate							
Water	81600	Sample 1 Dissolved	0.0000025	0.00000088	0.00000140	110.94%	0.0000010	0.0000010	0.0000010
Water	81601	Sample 2 Dissolved	0.0000022	0.00000083	0.00000120	92.51%	0.0000010	0.0000010	0.0000010
Water	81602	Sample 3 Dissolved	0.0000024	0.00000066	0.00000110	98.83%	0.0000010	0.0000010	0.0000010
Water	81597	Sample 1 Total	0.0000022	0.00000064	0.00000110	97.19%	0.0000010	0.0000010	0.0000010
Water	81598	Sample 2 Total	0.0000021	0.00000051	0.00000097	100.67%	0.0000010	0.0000010	0.0000010
Water	81599	Sample 3 Total	0.0000022	0.00000100	0.00000110	103.83%	0.0000010	0.0000010	0.0000010
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 206	PCB 207	PCB 208	PCB 209	PCB 66	PCB 190	PCB 198
		Detection Limit (mg/kg)	0.00033	0.00033	0.00033		0.00033	0.00033	0.00033
		Insitu Sediment							
Sediment	81714	Sample #1	0.00019	0.00033	0.00015	109.80%	0.00033	0.00033	0.00033
Sediment	81715	Sample #2	0.00044	0.00033	0.00033	109.30%	0.00033	0.00033	0.00033
Sediment	81716	Sample #3	0.00020	0.00033	0.00015	106.21%	0.00033	0.00033	0.00033

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 200
-------------	-----------	-------------	---------

		Detection Limit (mg/l)	0.0000011
--	--	------------------------	-----------

Water	80834	Plume Monitoring Background, dissolved	<b>0.0000011</b>
Water	80749	Background, total	<b>0.0000010</b>
Water	80835	0-10 min, overflow, dissolved	<b>0.0000010</b>
Water	80836	10-20 min, overflow, dissolved	<b>0.0000010</b>
Water	80837	20-30 min, overflow, dissolved	<b>0.0000010</b>
Water	80750	0-10 min, overflow, total	<b>0.0000011</b>
Water	80751	10-20 min, overflow, total	<b>0.0000010</b>
Water	80752	20-30 min, overflow, total	<b>0.0000010</b>
Water	80838	0-10 min, non-overflow, dissolve	<b>0.0000010</b>
Water	80839	10-20 min, non-overflow, dissolve	<b>0.0000011</b>
Water	80840	20-30 min, non-overflow, dissolve	<b>0.0000011</b>
Water	80753	0-10 min, non-overflow, total	<b>0.0000010</b>
Water	80754	10-20 min, non-overflow, total	<b>0.0000010</b>
Water	80755	20-30 min, non-overflow, total	<b>0.0000011</b>

		Hopper Inflow Monitoring	
--	--	--------------------------	--

Water	80790	3& 6 min, dissolved	<b>0.0000010</b>
Water	80791	9&12 min, dissolved	<b>0.0000010</b>
Water	80792	15&18 min, dissolved	<b>0.0000010</b>
Water	80793	21&24 min, dissolved	<b>0.0000010</b>
Water	80794	27&30 min, dissolved	<b>0.0000010</b>
Water	80692	3& 6 min, total	<b>0.0000010</b>
Water	80693	9&12 min, total	<b>0.0000010</b>
Water	80694	15&18 min, total	<b>0.0000010</b>
Water	80695	21&24 min, total	<b>0.0000011</b>
Water	80696	27&30 min, total	<b>0.0000010</b>

		Hopper Overflow Monitoring	
--	--	----------------------------	--

Water	80795	2& 4 min, dissolved	<b>0.0000010</b>
Water	80796	6& 8 min, dissolved	<b>0.0000010</b>
Water	80797	10&12 min, dissolved	<b>0.0000010</b>
Water	80798	14&16 min, dissolved	<b>0.0000010</b>
Water	80799	18&20 min, dissolved	<b>0.0000010</b>
Water	80698	2& 4 min, total	<b>0.0000010</b>
Water	80699	6& 8 min, total	<b>0.0000010</b>
Water	80700	10&12 min, total	<b>0.0000010</b>
Water	80701	14&16 min, total	<b>0.0000011</b>
Water	80702	18&20 min, total	<b>0.0000010</b>

		Site Water	
--	--	------------	--

Water	81594	Sample 1 Total	<b>0.0000010</b>
Water	81595	Sample 2 Total	<b>0.0000010</b>
Water	81596	Sample 3 Total	<b>0.0000010</b>

		Elutriate	
--	--	-----------	--

Water	81600	Sample 1 Dissolved	<b>0.0000010</b>
Water	81601	Sample 2 Dissolved	<b>0.0000010</b>
Water	81602	Sample 3 Dissolved	<b>0.0000010</b>
Water	81597	Sample 1 Total	<b>0.0000010</b>
Water	81598	Sample 2 Total	<b>0.0000010</b>
Water	81599	Sample 3 Total	<b>0.0000010</b>

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 200
-------------	-----------	-------------	---------

		Detection Limit (mg/kg)	0.00033
--	--	-------------------------	---------

		In situ Sediment	
Sediment	81714	Sample #1	<b>0.00033</b>
Sediment	81715	Sample #2	<b>0.00033</b>
Sediment	81716	Sample #3	<b>0.00033</b>

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## tsscoar

## Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	TSS										TS mg/l	
		Detection Limit (mg/l)	4.0										Det Limit 4	
-Water	81134	Plume Monitoring Background	10 min	20 min	30 min	40 min	50 min						Plume Monitoring Background	34
-Water	81135	TSS Top Depth	8.5	28.0	7.5	25.0	8.0							
-Water	81137	TSS Mid-Depth	10.5	10.0	10.0	9.5	9.0							
-Water	81137	TSS Bottom Depth	14.0	12.5	11.0	31.5	13.0							
Water	81179	Plume Monitoring Non-Overflow	1 min	3 min	5 min	7 min	9 min	12 min	15 min	20 min	25 min	30 min	Plume Monitoring NOF	
Water	81180	TSS Top Depth	11.5	12.0	10.5	10.0	8.5	12.0	12.0	8.0	12.0	12.0	Sample 1	33544
Water	81181	TSS Mid-Depth	12.5	18.0	10.0	11.0	11.0	21.0	17.5	21.0	29.0	8.5	Sample 2	31586
Water	81181	TSS Bottom Depth	10.5	17.5	15.5	12.0	27.0	29.0	15.5	28.5	11.5	13.0	Sample 3	32556
Water	81149	Plume Monitoring Overflow	1 min	3 min	5 min	7 min	9 min	12 min	15 min	20 min	25 min	30 min	Plume Monitoring OF	
Water	81150	TSS Top Depth	8.0	6.0	24.5	10.5	9.0	9.0	15.5	14.0	24.0	14.5	Sample 1	40788
Water	81151	TSS Mid-Depth	8.5	32.0	10.5	10.0	10.0	12.5	20.0	18.5	13.5	16.0	Sample 2	40478
Water	81151	TSS Bottom Depth	13.5	26.0	12.5	12.0	12.5	18.0	19.0	15.0	14.0	14.5	Sample 3	32490
Water	81314	Hopper Inflow	3 min	6 min	9 min	12 min	15 min	18 min	21 min	24 min	27 min	30 min	Hopper Inflow	
		TSS (mg/l)	1840	1890	1310	1220	640	1300	1320	1045	2040	26160	Sample 1	35080
												Sample 2	34753	
												Sample 3	34980	
												Sample 4	37973	
												Sample 5	40853	
Water	81334	Hopper Contents Beginning of Overflow	Location 1	Location 2	Location 3									
Water	81335	TSS Top Depth	14000	870	1827									
Water	81336	TSS Mid-Depth	6470	1290	1395									
		TSS Bottom Depth	2880	1300	1600									
Water	81343	Hopper Contents End of Overflow	Location 1	Location 2	Location 3									
Water	81344	TSS Top Depth	690	837	1290									
Water	81345	TSS Mid-Depth	807	14810	303									
		TSS Bottom Depth	633	887	657									
Water	81004	Hopper Overflow	0.5 min	1.0 min	1.5 min	2.0 min	2.5 min	3.0 min	3.5 min	4.0 min	4.5 min	5.0 min	Hopper Overflow	
		TSS (mg/l)	926	920	982	2808	836	862	800	800	1416	1048	Sample 1	39427
Water	81014	Hopper Overflow	5.5 min	6.0 min	6.5 min	7.0 min	7.5 min	8.0 min	8.5 min	9.0 min	9.5 min	10.0 min	Sample 2	35180
		TSS (mg/l)	986	970	728	690	800	1048	780	620	780	1184	Sample 3	42653
Water	81024	Hopper Overflow	10.5 min	11.0 min	11.5 min	12.0 min	12.5 min	13.0 min	13.5 min	14.0 min	14.5 min	15.0 min	Sample 4	34600
		TSS (mg/l)	932	638	634	772	954	732	688	642	788	688	Sample 5	35127
Water	81034	Hopper Overflow	15.5 min	16.0 min	18.5 min	17.0 min	17.5 min	18.0 min	18.5 min	19.0 min	19.5 min	20.0 min		
		TSS (mg/l)	722	894	1424	1076	914	1112	2080	2468	8084	9590		
		TSS											TS	
Water	81666	Site Water											Site Water	
Water	81667	Sample 1 Total	38										Sample 1 T	31216
Water	81668	Sample 2 Total	22										Sample 2 T	30896
		Sample 3 Total	22										Sample 3 T	30662
Water	81672	Elutriate											Elutriate	
Water	81673	Sample 1 Dissolved	11										Sample 1 D	30900
Water	81673	Sample 2 Dissolved	16										Sample 2 D	30870
Water	81674	Sample 3 Dissolved	9										Sample 3 D	30624
Water	81669	Sample 1 Total	59										Sample 1 T	30720
Water	81670	Sample 2 Total	32										Sample 2 T	30862
Water	81671	Sample 3 Total	21										Sample 3 T	31016

## Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	TOC
		Detection Limit (mg/l)	3.00
		Plume Monitoring	
Water	80820	Background, dissolved	5.67
Water	80728	Background, total	8.00
Water	80821	0-10 min, overflow, dissolved	8.98
Water	80822	10-20 min, overflow, dissolved	11.30
Water	80823	20-30 min, overflow, dissolved	9.35
Water	80729	0-10 min, overflow, total	7.92
Water	80730	10-20 min, overflow, total	7.59
Water	80731	20-30 min, overflow, total	8.86
Water	80824	0-10 min, non-overflow, dissolved	10.20
Water	80825	10-20 min, non-overflow, dissolved	10.30
Water	80826	20-30 min, non-overflow, dissolved	10.10
Water	80732	0-10 min, non-overflow, total	6.80
Water	80733	10-20 min, non-overflow, total	10.30
Water	80734	20-30 min, non-overflow, total	8.52
		Hopper Inflow Monitoring	
Water	80770	3& 6 min, dissolved	14.80
Water	80771	9&12 min, dissolved	3.45
Water	80772	15&18 min, dissolved	13.50
Water	80773	21&24 min, dissolved	14.50
Water	80774	27&30 min, dissolved	16.20
Water	80656	3& 6 min, total	216.00
Water	80657	9&12 min, total	46.80
Water	80658	15&18 min, total	16.50
Water	80659	21&24 min, total	28.60
Water	80660	27&30 min, total	54.20
		Hopper Overflow Monitoring	
Water	80775	2& 4 min, dissolved	12.40
Water	80776	6& 8 min, dissolved	11.20
Water	80777	10&12 min, dissolved	13.80
Water	80778	14&16 min, dissolved	11.80
Water	80779	18&20 min, dissolved	16.60
Water	80662	2& 4 min, total	41.90
Water	80663	6& 8 min, total	4.56
Water	80664	10&12 min, total	12.10
Water	80665	14&16 min, total	70.00
Water	80666	18&20 min, total	59.40
		Site Water	
Water	81684	Sample 1 Total	5.12
Water	81685	Sample 2 Total	1.21
Water	81686	Sample 3 Total	3.00
		Elutriate	
Water	81690	Sample 1 Dissolved	1.07
Water	81691	Sample 2 Dissolved	3.00
Water	81692	Sample 3 Dissolved	3.00
Water	81687	Sample 1 Total	1.32
Water	81688	Sample 2 Total	3.00
Water	81689	Sample 3 Total	3.00
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	TOC
		Detection Limit (mg/kg)	3.0
		In situ Sediment	
Sediment	81720	Sample #1	174.0
Sediment	81721	Sample #2	155.0
Sediment	81722	Sample #3	170.0

**BOLD** - less than valuesValues below **less than** values are estimated results. Results are less than the reporting limit.

## Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	Sp. Gr.	%Moisture
In situ Sediment				
Sediment	81209	Sample #1	2.71	22.57%
Sediment	81210	Sample #2	2.70	25.39%
Sediment	81211	Sample #3	2.71	22.00%
Sediment	81212	Sample #4	2.71	23.83%
Sediment	81213	Sample #5	2.71	21.04%
Sediment	81214	Sample #6	2.72	20.33%
Sediment	81215	Sample #7	2.71	20.06%
Sediment	81216	Sample #8	2.72	21.82%
Sediment	81217	Sample #9	2.72	21.30%
Sediment	81218	Sample #10	2.72	19.87%
Sediment	81219	Sample #11	2.74	23.49%
Sediment	81220	Sample #12	2.74	20.47%
Sediment	81221	Sample #13	2.73	23.70%
Sediment	81222	Sample #14	2.74	20.90%
Sediment	81223	Sample #15	2.73	21.95%
Average			2.72	21.91%

## Metsfine

## Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	SB	AS	BE	CD	CR	CU	PB	HG
		Detection Limit (mg/l)	0.0030	0.002	0.002	0.0002	0.002	0.001	0.0010	0.0002
Water	80976	Plume Monitoring								
Water	80934	Background, dissolved	0.0030	0.007	0.001	0.0002	0.002	0.004	0.0045	0.0002
Water	80934	Background, total	0.0030	0.011	0.001	0.0002	0.006	0.004	0.0060	0.0002
Water	80977	0-10 min, overflow, dissolved	0.0030	0.006	0.001	0.0002	0.002	0.001	0.0010	0.0002
Water	80978	10-20 min, overflow, dissolved	0.0030	0.006	0.001	0.0002	0.002	0.001	0.0010	0.0002
Water	90979	20-30 min, overflow, dissolved	0.0030	0.006	0.001	0.0002	0.002	0.003	0.0010	0.0002
Water	80935	0-10 min, overflow, total	0.0030	0.011	0.001	0.0002	0.019	0.009	0.0190	0.0002
Water	80936	10-20 min, overflow, total	0.0030	0.013	0.001	0.0002	0.018	0.008	0.0160	0.0002
Water	80937	20-30 min, overflow, total	0.0030	0.011	0.001	0.0002	0.012	0.004	0.0100	0.0002
Water	80980	0-10 min, non-overflow, dissolved	0.0030	0.008	0.001	0.0002	0.002	0.003	0.0010	0.0002
Water	80981	10-20 min, non-overflow, dissolved	0.0030	0.008	0.001	0.0002	0.002	0.003	0.0017	0.0002
Water	80982	20-30 min, non-overflow, dissolved	0.0030	0.008	0.001	0.0002	0.002	0.001	0.0010	0.0002
Water	80938	0-10 min, non-overflow, total	0.0030	0.011	0.001	0.0002	0.004	0.001	0.0020	0.0002
Water	90939	10-20 min, non-overflow, total	0.0030	0.010	0.001	0.0002	0.004	0.008	0.0030	0.0002
Water	80940	20-30 min, non-overflow, total	0.0030	0.011	0.001	0.0002	0.003	0.005	0.0030	0.0002
		Hopper Inflow Monitoring								
Water	81094	3& 6 min, dissolved	0.0030	0.009	0.001	0.0002	0.002	0.001	0.0015	0.0002
Water	81095	9&12 min, dissolved	0.0030	0.019	0.001	0.0002	0.002	0.001	0.0017	0.0002
Water	81096	15&18 min, dissolved	0.0030	0.023	0.001	0.0002	0.002	0.001	0.0011	0.0002
Water	81097	21&24 min, dissolved	0.0030	0.009	0.001	0.0002	0.002	0.001	0.0011	0.0002
Water	81098	27&30 min, dissolved	0.0030	0.019	0.001	0.0002	0.002	0.001	0.0010	0.0002
Water	80867	3& 6 min, total	0.0156	0.392	0.040	0.0206	1.810	1.080	1.7800	0.0019
Water	80868	9&12 min, total	0.0504	0.844	0.088	0.0527	3.980	2.520	4.4000	0.0182
Water	80869	15&18 min, total	0.0870	1.470	0.140	0.0974	6.550	4.120	7.7500	0.0422
Water	80870	21&24 min, total	0.0288	0.528	0.056	0.0376	2.510	1.580	2.6800	0.0110
Water	80871	27&30 min, total	0.1090	1.990	0.210	0.1750	9.600	6.900	12.0000	0.0578
		Hopper Overflow Monitoring								
Water	81099	2& 4 min, dissolved	0.0030	0.009	0.001	0.0002	0.002	0.001	0.0012	0.0002
Water	81100	6& 8 min, dissolved	0.0030	0.009	0.001	0.0002	0.002	0.001	0.0010	0.0002
Water	81101	10&12 min, dissolved	0.0030	0.008	0.001	0.0002	0.002	0.001	0.0011	0.0002
Water	81102	14&16 min, dissolved	0.0030	0.010	0.001	0.0002	0.002	0.001	0.0016	0.0002
Water	81103	18&20 min, dissolved	0.0030	0.010	0.001	0.0002	0.002	0.001	0.0010	0.0002
Water	80873	2& 4 min, total	0.0895	1.460	0.145	0.0661	6.700	4.410	7.9500	0.0354
Water	80874	6& 8 min, total	0.0950	1.440	0.140	0.0555	6.640	4.300	7.9000	0.0281
Water	80875	10&12 min, total	0.0840	1.290	0.130	0.0299	6.000	4.000	6.0500	0.0244
Water	80876	14&16 min, total	0.0905	1.640	0.160	0.1260	7.550	5.100	7.6000	0.0360
Water	80877	18&20 min, total	0.0815	1.600	0.160	0.1170	7.450	4.980	7.9500	0.0372
		Site Water								
Water	81657	Sample 1 Total	0.0030	0.010	0.001	0.0002	0.005	0.005	0.0040	0.0002
Water	81658	Sample 2 Total	0.0030	0.009	0.001	0.0002	0.004	0.004	0.0060	0.0002
Water	81659	Sample 3 Total	0.0030	0.002	0.001	0.0002	0.004	0.001	0.0010	0.0002
		Elutriate								
Water	81663	Sample 1 Dissolved	0.0030	0.011	0.001	0.0002	0.002	0.002	0.0010	0.0002
Water	81664	Sample 2 Dissolved	0.0030	0.010	0.001	0.0002	0.002	0.002	0.0010	0.0002
Water	81665	Sample 3 Dissolved	0.0030	0.009	0.001	0.0002	0.002	0.003	0.0010	0.0002
Water	81660	Sample 1 Total	0.0030	0.015	0.001	0.0002	0.024	0.007	0.0140	0.0002
Water	81661	Sample 2 Total	0.0030	0.014	0.001	0.0002	0.025	0.007	0.0140	0.0002
Water	81662	Sample 3 Total	0.0030	0.014	0.001	0.0002	0.024	0.009	0.0130	0.0002
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	SB	AS	BE	CD	CR	CU	PB	HG
		Detection Limit (mg/kg)	0.30	0.2	0.1	0.020	0.2	0.1	1.0	0.020
		Insitu Sediment								
Sediment	81729	Sample #1	0.36	10.3	0.9	0.330	41.4	16.2	32.1	0.154
Sediment	81730	Sample #2	0.49	10.7	0.9	0.310	42.2	16.8	34.2	0.152
Sediment	81731	Sample #3	0.37	10.1	0.8	0.230	41.0	16.2	32.4	0.166

SB - Antimony

AS - Arsenic

BE - Beryllium

CD - Cadmium

CR - Chromium

CU - Copper

PB - Lead

HG - Mercury

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## Metsfine

## Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	NI	SE	AG	TL	ZN	AL	BA	CA
		Detection Limit (mg/l)	0.001	0.002	0.001	0.0020	0.010	0.025	0.002	0.200
Water	80976	Plume Monitoring								
Water	80934	Background, dissolved	0.001	0.019	<b>0.001</b>	<b>0.0020</b>	0.053	<b>0.025</b>	0.223	70.2
Water	80934	Background, total	0.004	0.025	<b>0.001</b>	<b>0.0020</b>	0.071	2.900	0.050	67.4
Water	80977	0-10 min, overflow, dissolved	<b>0.001</b>	0.013	0.001	<b>0.0020</b>	0.014	<b>0.025</b>	0.094	57.1
Water	80978	10-20 min, overflow, dissolved	<b>0.001</b>	0.013	0.001	<b>0.0020</b>	0.013	<b>0.025</b>	0.086	58.3
Water	90979	20-30 min, overflow, dissolved	<b>0.001</b>	0.014	<b>0.001</b>	<b>0.0020</b>	0.013	<b>0.025</b>	0.089	53.1
Water	80935	0-10 min, overflow, total	0.007	0.019	0.001	<b>0.0020</b>	0.059	7.920	0.061	56.5
Water	80936	10-20 min, overflow, total	0.008	0.023	0.001	<b>0.0020</b>	0.060	7.640	0.065	57.7
Water	80937	20-30 min, overflow, total	0.004	0.021	0.001	<b>0.0020</b>	0.036	5.140	0.048	53.8
Water	80980	0-10 min, non-overflow, dissolved	0.001	0.021	<b>0.001</b>	<b>0.0020</b>	0.058	<b>0.025</b>	0.245	70.9
Water	80981	10-20 min, non-overflow, dissolved	0.001	0.023	<b>0.001</b>	0.0021	0.046	<b>0.025</b>	0.193	69.6
Water	80982	20-30 min, non-overflow, dissolved	<b>0.001</b>	0.021	0.001	<b>0.0020</b>	0.048	<b>0.025</b>	0.207	70.8
Water	80938	0-10 min, non-overflow, total	<b>0.001</b>	0.027	<b>0.001</b>	<b>0.0020</b>	0.013	1.800	0.170	70.6
Water	90939	10-20 min, non-overflow, total	0.003	0.027	0.001	<b>0.0020</b>	0.017	2.160	0.040	67.6
Water	80940	20-30 min, non-overflow, total	0.003	0.028	0.001	<b>0.0020</b>	0.010	1.790	0.038	66.1
		Hopper Inflow Monitoring								
Water	81094	3&16 min, dissolved	0.003	0.015	<b>0.001</b>	<b>0.0020</b>	0.074	0.025	0.435	82.7
Water	81095	9&12 min, dissolved	0.004	0.015	0.002	<b>0.0020</b>	0.084	0.092	0.549	93.8
Water	81096	15&18 min, dissolved	0.005	0.014	0.001	<b>0.0020</b>	0.076	0.033	0.529	111.0
Water	81097	21&24 min, dissolved	0.003	0.014	0.001	<b>0.0020</b>	0.057	0.028	0.380	73.4
Water	81098	27&30 min, dissolved	0.005	0.015	0.001	<b>0.0020</b>	0.089	<b>0.025</b>	0.636	108.0
Water	80867	3& 6 min, total	0.912	0.068	0.004	0.0110	5.880	744.0	3.000	178.0
Water	80868	9&12 min, total	1.950	0.116	0.076	0.0160	13.300	1856.0	6.440	392.0
Water	80869	15&18 min, total	3.240	0.180	0.098	0.0310	21.400	3320.0	10.200	640.0
Water	80870	21&24 min, total	1.270	0.084	0.044	0.0110	8.760	1110.0	4.200	241.0
Water	80871	27&30 min, total	4.750	0.255	0.150	0.0540	34.800	5440.0	16.800	1000.0
		Hopper Overflow Monitoring								
Water	81099	2& 4 min, dissolved	0.005	0.015	<b>0.001</b>	<b>0.0020</b>	0.145	<b>0.025</b>	0.607	117.0
Water	81100	6& 8 min, dissolved	0.005	0.015	<b>0.001</b>	<b>0.0020</b>	0.157	<b>0.025</b>	0.713	121.0
Water	81101	10&12 min, dissolved	0.005	0.015	0.001	<b>0.0020</b>	0.130	<b>0.025</b>	0.748	112.0
Water	81102	14&16 min, dissolved	0.005	0.013	<b>0.001</b>	<b>0.0020</b>	0.138	<b>0.025</b>	0.749	119.0
Water	81103	18&20 min, dissolved	0.004	0.013	0.002	<b>0.0020</b>	0.085	<b>0.025</b>	0.551	116.0
Water	80873	2& 4 min, total	3.350	0.010	0.007	0.0020	23.400	3450.0	11.000	590.0
Water	80874	6& 8 min, total	3.310	0.010	0.005	0.0020	22.900	3080.0	10.700	615.0
Water	80875	10&12 min, total	3.030	0.141	0.053	0.0230	21.200	2860.0	10.000	565.0
Water	80876	14&16 min, total	3.820	0.195	0.114	0.0340	27.100	3930.0	12.800	745.0
Water	80877	18&20 min, total	3.760	0.191	0.078	0.0360	26.800	3740.0	12.500	760.0
		Site Water								
Water	81657	Sample 1 Total	0.002	0.026	0.003	<b>0.0020</b>	0.019	2.330	0.043	59.7
Water	81658	Sample 2 Total	0.003	0.024	0.002	<b>0.0020</b>	0.019	2.060	0.042	60.7
Water	81659	Sample 3 Total	<b>0.001</b>	<b>0.002</b>	0.002	<b>0.0020</b>	0.018	2.340	0.042	60.2
		Elutriate								
Water	81663	Sample 1 Dissolved	0.003	0.028	<b>0.001</b>	<b>0.0020</b>	0.073	0.185	0.280	65.8
Water	81664	Sample 2 Dissolved	0.002	0.024	<b>0.001</b>	<b>0.0020</b>	0.075	0.118	0.209	67.6
Water	81665	Sample 3 Dissolved	0.002	0.021	0.002	<b>0.0020</b>	0.076	0.105	0.214	66.1
Water	81660	Sample 1 Total	0.011	0.030	0.002	<b>0.0020</b>	0.075	12.900	0.104	61.3
Water	81661	Sample 2 Total	0.011	0.028	0.002	<b>0.0020</b>	0.074	13.200	0.107	62.8
Water	81662	Sample 3 Total	0.012	0.030	0.002	<b>0.0020</b>	0.072	13.000	0.113	61.9
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	NI	SE	AG	TL	ZN	AL	BA	CA
		Detection Limit (mg/kg)	0.5	0.20	0.100	0.200	1	1	0.1	20
		Insitu Sediment								
Sediment	81729	Sample #1	21.7	1.60	0.700	<b>0.200</b>	131	13300	51.4	2180
Sediment	81730	Sample #2	22.2	1.60	0.700	<b>0.200</b>	133	13800	53.5	2260
Sediment	81731	Sample #3	21.5	1.70	0.649	<b>0.200</b>	130	13000	51.7	2230

NI - Nickel    SE - Selenium    AG - Silver    TL - Thallium    ZN - Zinc    AL - Aluminum    BA - Barium    CA - Calcium

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## Metstfine

## Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	CO	FE	MG	MN	K	NA	V
		Detection Limit (mg/l)	0.002	0.020	0.200	0.001	0.20	0.20	0.002
Water	80976	Plume Monitoring							
Water	80934	Background, dissolved	<b>0.001</b>	<b>0.020</b>	180	0.002	56.4	1540	0.004
Water		Background, total	<b>0.001</b>	2.420	162	0.118	49.6	1350	0.008
Water	80977	0-10 min, overflow, dissolved	<b>0.001</b>	<b>0.020</b>	121	0.062	41.8	1030	0.003
Water	80978	10-20 min, overflow, dissolved	<b>0.001</b>	<b>0.020</b>	116	0.027	41.1	973	0.003
Water	90979	20-30 min, overflow, dissolved	<b>0.001</b>	<b>0.020</b>	112	0.010	36.4	942	0.003
Water	80935	0-10 min, overflow, total	0.002	9.710	120	0.465	37.6	916	0.020
Water	80936	10-20 min, overflow, total	0.002	9.260	121	0.450	38.5	920	0.020
Water	80937	20-30 min, overflow, total	<b>0.001</b>	5.730	109	0.278	34.0	857	0.013
Water	80980	0-10 min, non-overflow, dissolved	<b>0.001</b>	0.027	179	0.011	57.8	1570	0.003
Water	80981	10-20 min, non-overflow, dissolved	<b>0.001</b>	<b>0.020</b>	171	0.011	55.6	1520	0.003
Water	80982	20-30 min, non-overflow, dissolved	<b>0.001</b>	<b>0.020</b>	160	0.005	55.7	1380	0.002
Water	80938	0-10 min, non-overflow, total	<b>0.001</b>	1.420	180	0.073	54.9	1470	0.006
Water	90939	10-20 min, non-overflow, total	<b>0.001</b>	1.820	175	0.098	53.8	1370	0.007
Water	80940	20-30 min, non-overflow, total	<b>0.001</b>	1.140	159	0.061	48.8	1280	0.006
		Hopper Inflow Monitoring							
Water	81094	3& 6 min, dissolved	0.002	0.928	150	7.600	45.1	1240	<b>0.001</b>
Water	81095	9&12 min, dissolved	<b>0.004</b>	6.850	144	9.200	38.9	1030	0.001
Water	81096	15&18 min, dissolved	0.006	10.200	148	11.200	36.1	1030	0.001
Water	81097	21&24 min, dissolved	0.004	0.467	123	3.840	40.0	1060	<b>0.001</b>
Water	81098	27&30 min, dissolved	0.006	11.600	127	6.920	33.6	940	0.002
Water	80867	3& 6 min, total	0.480	1,180.0	370	58.0	160.0	1070	1.800
Water	80868	9&12 min, total	1.030	2,860.0	725	132.0	289.0	1104	3.950
Water	80869	15&18 min, total	1.700	5,130.0	1180	244.0	451.0	1060	6.550
Water	80870	21&24 min, total	0.684	1,630.0	476	74.8	188.0	1020	3.130
Water	80871	27&30 min, total	2.510	9,200.0	1830	412.0	700.0	970	9.650
		Hopper Overflow Monitoring							
Water	81099	2& 4 min, dissolved	0.004	2.930	151	9.580	32.9	1000	<b>0.001</b>
Water	81100	6& 8 min, dissolved	0.004	3.600	153	9.500	33.4	1030	<b>0.001</b>
Water	81101	10&12 min, dissolved	0.005	5.980	133	7.310	32.3	956	<b>0.001</b>
Water	81102	14&16 min, dissolved	0.006	10.900	140	6.460	30.0	932	0.001
Water	81103	18&20 min, dissolved	0.006	6.410	133	6.810	32.5	895	<b>0.001</b>
Water	80873	2& 4 min, total	1.760	4,750.0	1,040	225.0	474.0	885	6.650
Water	80874	6& 8 min, total	1.740	2,700.0	1,060	224.0	389.0	970	6.600
Water	80875	10&12 min, total	1.620	4,160.0	965	197.0	415.0	960	5.900
Water	80876	14&16 min, total	2.030	5,600.0	1,205	265.0	520.0	930	7.400
Water	80877	18&20 min, total	1.980	6,150.0	1,320	287.0	510.0	960	7.350
		Site Water							
Water	81657	Sample 1 Total	0.002	2.420	135	0.120	39.80	1130	0.007
Water	81658	Sample 2 Total	<b>0.002</b>	2.370	134	0.121	36.90	1140	0.007
Water	81659	Sample 3 Total	0.002	2.470	133	0.119	38.30	1130	0.008
		Elutriate							
Water	81663	Sample 1 Dissolved	0.003	0.043	146	8.280	40.40	1140	0.006
Water	81664	Sample 2 Dissolved	0.002	0.042	153	8.100	40.40	1180	0.007
Water	81665	Sample 3 Dissolved	0.002	0.037	144	8.310	36.40	1160	0.007
Water	81660	Sample 1 Total	0.008	12.900	61	8.160	36.70	1060	0.032
Water	81661	Sample 2 Total	0.008	13.200	140	8.360	37.70	1060	0.034
Water	81662	Sample 3 Total	0.008	13.000	136	8.430	33.00	1020	0.034
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	CO	FE	MG	MN	K	NA	V % Moisture
		Detection Limit (mg/kg)	0.1	2	20	0.1	20	20	0.1
		In situ Sediment							
Sediment	81729	Sample #1	11.1	25,300	5,050	1,070.0	2,290	2110	33.8
Sediment	81730	Sample #2	11.2	26,200	5,120	1,150.0	2,380	2160	42.6
Sediment	81731	Sample #3	11.0	25,200	5,070	1,120.0	2,350	2140	37.1

CO - Cobalt

FE - Iron

MG - Magnesium

MN - Manganese

K - Potassium

NA - Sodium

V - Vanadium

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## PAHs fine

## Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	NAPHTH	ACENAY	ACENAP	FLUORE	PHENAN	ANTRAC	FLANTHE
		Detection Limit (mg/l)	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	80997	Plume Monitoring Background, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	80962	Background, total	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	80998	0-10 min, overflow, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	80999	10-20 min, overflow, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81000	20-30 min, overflow, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	80963	0-10 min, overflow, total	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	80964	10-20 min, overflow, total	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	80965	20-30 min, overflow, total	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81001	0-10 min, non-overflow, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81002	10-20 min, non-overflow, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81003	20-30 min, non-overflow, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	80966	0-10 min, non-overflow, total	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	80967	10-20 min, non-overflow, total	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	80968	20-30 min, non-overflow, total	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
		Hopper Inflow Monitoring							
Water	81124	3&6 min, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81125	9&12 min, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81126	15&18 min, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81127	21&24 min, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81128	27&30 min, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	80915	3&6 min, total	0.00043	0.00030	0.00030	0.00014	0.00054	0.00031	0.00221
Water	80916	9&12 min, total	0.00110	0.00030	0.00029	0.00057	0.00349	0.00103	0.00758
Water	80917	15&18 min, total	0.00057	0.00030	0.00017	0.00036	0.00217	0.00061	0.00484
Water	80918	21&24 min, total	0.00053	0.00030	0.00012	0.00023	0.00158	0.00048	0.00370
Water	80919	27&30 min, total	0.00183	0.00015	0.00047	0.00085	0.00582	0.00183	0.01320
		Hopper Overflow Monitoring							
Water	81129	2&4 min, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81130	6&8 min, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81131	10&12 min, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81132	14&16 min, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81133	18&20 min, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	80921	2&4 min, total	0.00120	0.00011	0.00031	0.00051	0.00377	0.00104	0.00900
Water	80922	6&8 min, total	0.00121	0.00012	0.00042	0.00068	0.00529	0.00311	0.01260
Water	80923	10&12 min, total	0.00062	0.00030	0.00020	0.00054	0.00325	0.00083	0.00838
Water	80924	14&16 min, total	0.00052	0.00030	0.00015	0.00047	0.00267	0.00074	0.00657
Water	80925	18&20 min, total	0.00257	0.00023	0.00073	0.00124	0.00923	0.00259	0.02030
		Site Water							
Water	81639	Sample 1 Total	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81640	Sample 2 Total	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81641	Sample 3 Total	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
		Elutriate							
Water	81645	Sample 1 Dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81646	Sample 2 Dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81647	Sample 3 Dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81642	Sample 1 Total	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00012
Water	81643	Sample 2 Total	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00011
Water	81644	Sample 3 Total	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00010
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	NAPHTH	ACENAY	ACENAP	FLUORE	PHENAN	ANTRAC	FLANTHE
		Detection Limit (mg/kg)	0.0220	0.022	0.022	0.022	0.0220	0.0220	0.022
		Insitu Sediment							
Sediment	81705	Sample #1	0.0640	0.022	0.022	0.015	0.0921	0.0367	0.188
Sediment	81706	Sample #2	0.0591	0.022	0.022	0.014	0.0800	0.0303	0.126
Sediment	81707	Sample #3	0.0581	0.022	0.022	0.015	0.0828	0.0327	0.136

NAPHTH - Naphthalene    ACENAY - Acenaphthylene    ACENAP - Acenaphthene    FLUORE - Fluorene    PHENAN - Phenanthrene  
 ANTRAC - Anthracene    FLANTHE - Fluoranthene

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## PAHs fine

## Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PYRENE	CHRYSE	BAANTHR	B3FLANT	BKFLANT	BAPYRE	I123PYR
		Detection Limit (mg/l)	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	80997	Plume Monitoring Background, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	80962	Background, total	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	80998	0-10 min, overflow, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	80999	10-20 min, overflow, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81000	20-30 min, overflow, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	80963	0-10 min, overflow, total	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	80964	10-20 min, overflow, total	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	80965	20-30 min, overflow, total	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81001	0-10 min, non-overflow, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81002	10-20 min, non-overflow, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81003	20-30 min, non-overflow, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	80966	0-10 min, non-overflow, total	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	80967	10-20 min, non-overflow, total	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	80968	20-30 min, non-overflow, total	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
		Hopper Inflow Monitoring							
Water	81124	3& 6 min, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81125	9&12 min, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81126	15&18 min, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81127	21&24 min, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81128	27&30 min, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	80915	3& 6 min, total	0.00227	0.00159	0.00118	0.00177	0.00120	0.00088	0.00309
Water	80916	9&12 min, total	0.00782	0.00547	0.00451	0.00492	0.00385	0.00519	0.00549
Water	80917	15&18 min, total	0.00465	0.00341	0.00276	0.00371	0.00227	0.00360	0.00436
Water	80918	21&24 min, total	0.00364	0.00256	0.00204	0.00236	0.00183	0.00246	0.00255
Water	80919	27&30 min, total	0.01400	0.00948	0.00841	0.00785	0.00629	0.00838	0.00701
		Hopper Overflow Monitoring							
Water	81129	2& 4 min, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81130	6& 8 min, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81131	10&12 min, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81132	14&16 min, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81133	18&20 min, dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	80921	2& 4 min, total	0.00903	0.00642	0.00576	0.00548	0.00433	0.00614	0.00542
Water	80922	6& 8 min, total	0.01270	0.00907	0.00868	0.00823	0.00614	0.00838	0.00741
Water	80923	10&12 min, total	0.00711	0.00643	0.00543	0.00653	0.00438	0.00596	0.00579
Water	80924	14&16 min, total	0.00611	0.00566	0.00472	0.00555	0.00437	0.00019	0.00547
Water	80925	18&20 min, total	0.02000	0.01380	0.01290	0.01160	0.00953	0.01220	0.01050
		Site Water							
Water	81639	Sample 1 Total	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81640	Sample 2 Total	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81641	Sample 3 Total	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
		Elutriate							
Water	81645	Sample 1 Dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81646	Sample 2 Dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81647	Sample 3 Dissolved	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81642	Sample 1 Total	0.00010	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81643	Sample 2 Total	0.00010	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Water	81644	Sample 3 Total	0.00009	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PYRENE	CHRYSE	BAANTHR	B3FLANT	BKFLANT	BAPYRE	I123PYR
		Detection Limit (mg/kg)	0.022	0.022	0.0220	0.0220	0.0220	0.0220	0.0220
		In situ Sediment							
Sediment	81705	Sample #1	0.196	0.145	0.1290	0.0871	0.1090	0.1120	0.0899
Sediment	81706	Sample #2	0.146	0.107	0.0865	0.0742	0.0850	0.0793	0.0699
Sediment	81707	Sample #3	0.150	0.108	0.0858	0.0770	0.0727	0.0828	0.0749

PYRENE - Pyrene      CHRYSE - Chrysene      BAANTHR - Benzo(a)Anthracene      B3FLANT - Benzo(b)Fluoranthene  
 BKFLANT - Benzo(k)Fluoranthene      BAPYRE - Benzo(a)Pyrene      I123PYR - Indeno(1,2,3-C,D)Pyrene

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## PAHsfine

## Delaware River Water Analysis (Plume Monitoring)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	DBAHANT	B-GHI-PY	2MeNAPH	2FIBP-S	PTERP-S
		Detection Limit (mg/l)	0.00030	0.00030	0.00030		
Water	80997	Plume Monitoring					
Water	80962	Background, dissolved	0.00030	0.00030	0.00030	56.0%	84.1%
Water	80962	Background, total	0.00030	0.00030	0.00030	73.2%	85.1%
Water	80998	0-10 min, overflow, dissolved	0.00030	0.00030	0.00030	64.7%	87.3%
Water	80999	10-20 min, overflow, dissolved	0.00030	0.00030	0.00030	83.0%	87.8%
Water	81000	20-30 min, overflow, dissolved	0.00030	0.00030	0.00030	65.1%	81.5%
Water	80963	0-10 min, overflow, total	0.00030	0.00030	0.00030	63.2%	79.3%
Water	80964	10-20 min, overflow, total	0.00030	0.00030	0.00030	63.4%	85.5%
Water	80965	20-30 min, overflow, total	0.00030	0.00030	0.00030	58.7%	88.4%
Water	81001	0-10 min, non-overflow, dissolved	0.00030	0.00030	0.00030	69.4%	84.7%
Water	81002	10-20 min, non-overflow, dissolved	0.00030	0.00030	0.00030	63.4%	87.5%
Water	81003	20-30 min, non-overflow, dissolved	0.00030	0.00030	0.00030	61.6%	86.0%
Water	80966	0-10 min, non-overflow, total	0.00030	0.00030	0.00030	66.5%	91.6%
Water	80967	10-20 min, non-overflow, total	0.00030	0.00030	0.00030	68.1%	88.6%
Water	80968	20-30 min, non-overflow, total	0.00030	0.00030	0.00030	87.1%	90.5%
		Hopper Inflow Monitoring					
Water	81124	3&6 min, dissolved	0.00030	0.00030	0.00030	72.4%	85.9%
Water	81125	9&12 min, dissolved	0.00030	0.00030	0.00030	43.8%	80.7%
Water	81126	15&18 min, dissolved	0.00030	0.00030	0.00030	51.7%	80.2%
Water	81127	21&24 min, dissolved	0.00030	0.00030	0.00030	62.9%	88.0%
Water	81128	27&30 min, dissolved	0.00030	0.00030	0.00030	62.0%	83.8%
Water	80915	3&6 min, total	0.00019	0.00167	0.00029	58.2%	48.6%
Water	80916	9&12 min, total	0.00231	0.00424	0.00068	68.6%	60.4%
Water	80917	15&18 min, total	0.00217	0.00312	0.00038	64.5%	60.7%
Water	80918	21&24 min, total	0.00111	0.00197	0.00035	57.9%	51.3%
Water	80919	27&30 min, total	0.00169	0.00629	0.00116	67.5%	53.6%
		Hopper Overflow Monitoring					
Water	81129	2&4 min, dissolved	0.00030	0.00030	0.00030	62.8%	83.2%
Water	81130	6&8 min, dissolved	0.00030	0.00030	0.00030	76.4%	82.0%
Water	81131	10&12 min, dissolved	0.00030	0.00030	0.00030	47.2%	65.7%
Water	81132	14&16 min, dissolved	0.00030	0.00030	0.00030	70.7%	71.0%
Water	81133	18&20 min, dissolved	0.00030	0.00030	0.00030	46.2%	66.7%
Water	80921	2&4 min, total	0.00153	0.00460	0.00073	69.1%	58.1%
Water	80922	6&8 min, total	0.00204	0.00607	0.00076	67.1%	62.3%
Water	80923	10&12 min, total	0.00175	0.00473	0.00037	41.5%	59.6%
Water	80924	14&16 min, total	0.00165	0.00431	0.00030	36.4%	61.5%
Water	80925	18&20 min, total	0.00240	0.00883	0.00163	66.5%	61.5%
		Site Water					
Water	81639	Sample 1 Total	0.00030	0.00030	0.00030	50.6%	61.9%
Water	81640	Sample 2 Total	0.00030	0.00030	0.00030	60.2%	62.4%
Water	81641	Sample 3 Total	0.00030	0.00030	0.00030	46.3%	66.8%
		Elutriate					
Water	81645	Sample 1 Dissolved	0.00030	0.00030	0.00030	43.3%	67.8%
Water	81646	Sample 2 Dissolved	0.00030	0.00030	0.00030	83.7%	56.1%
Water	81647	Sample 3 Dissolved	0.00030	0.00030	0.00030	28.2%	58.3%
Water	81642	Sample 1 Total	0.00030	0.00030	0.00030	62.7%	64.0%
Water	81643	Sample 2 Total	0.00030	0.00030	0.00030	56.7%	71.0%
Water	81644	Sample 3 Total	0.00030	0.00030	0.00030	65.9%	71.2%
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	DBAHANT	B-GHI-PY	2MeNAPH	2FIBP-S	PTERP-S
		Detection Limit (mg/kg)	0.0220	0.0220	0.0220		
		Insitu Sediment					
Sediment	81705	Sample #1	0.0086	0.0748	0.0353	60.3%	48.6%
Sediment	81706	Sample #2	0.0072	0.0605	0.0324	63.0%	49.1%
Sediment	81707	Sample #3	0.0087	0.0647	0.0342	61.2%	51.1%

DBAHANT - Dibenz(A,H)Anthracene      B-GHI-PY - Benzo(G,H,I)Perylene      2MeNAPH - 2-Methylnaphthalene  
 2FIBP-S - 2-Fluorobiphenyl(Surrogate (43-116 W))      PTERP-S - p-Terphenyl-D14(Surrogate (33-141 W))

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## Pestfine

## Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	ALDRIN	A-BHC	B-BHC	G-BHC	D-BHC	PPDDD
		Detection Limit (mg/l)	0.000028	0.000028	0.000028	0.000028	0.000028	0.000055
		Plume Monitoring						
Water	80990	Background, dissolved	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000050</b>
Water	80955	Background, total	<b>0.000028</b>	<b>0.000028</b>	<b>0.000028</b>	<b>0.000028</b>	<b>0.000028</b>	<b>0.000055</b>
Water	80991	0-10 min, overflow, dissolved	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000050</b>
Water	80992	10-20 min, overflow, dissolved	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000050</b>
Water	80993	20-30 min, overflow, dissolved	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000050</b>
Water	80956	0-10 min, overflow, total	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000050</b>
Water	80957	10-20 min, overflow, total	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000050</b>
Water	80958	20-30 min, overflow, total	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000050</b>
Water	80994	0-10 min, non-overflow, dissolved	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000050</b>
Water	80995	10-20 min, non-overflow, dissolved	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000050</b>
Water	80996	20-30 min, non-overflow, dissolved	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000050</b>
Water	80959	0-10 min, non-overflow, total	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000050</b>
Water	80960	10-20 min, non-overflow, total	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000050</b>
Water	80961	20-30 min, non-overflow, total	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000050</b>
		Hopper Inflow Monitoring						
Water	81114	3& 6 min, dissolved	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000050</b>
Water	81115	9&12 min, dissolved	<b>0.000026</b>	<b>0.000026</b>	<b>0.000026</b>	<b>0.000026</b>	<b>0.000026</b>	<b>0.000052</b>
Water	81116	15&18 min, dissolved	<b>0.000027</b>	<b>0.000027</b>	<b>0.000027</b>	<b>0.000027</b>	<b>0.000027</b>	<b>0.000054</b>
Water	81117	21&24 min, dissolved	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000050</b>
Water	81118	27&30 min, dissolved	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000050</b>
Water	80903	3& 6 min, total	0.000016	0.000025	0.000025	0.000025	0.000025	0.000120
Water	80904	9&12 min, total	0.000024	0.000025	0.000025	0.000009	0.000025	0.000160
Water	80905	15&18 min, total	0.000024	0.000027	0.000027	0.000027	0.000027	0.000200
Water	80906	21&24 min, total	0.000022	0.000027	0.000027	0.000014	0.000027	0.000130
Water	80907	27&30 min, total	0.000026	0.000025	0.000025	0.000025	0.000025	0.000130
		Hopper Overflow Monitoring						
Water	81119	2& 4 min, dissolved	<b>0.000026</b>	<b>0.000026</b>	<b>0.000026</b>	<b>0.000026</b>	<b>0.000026</b>	<b>0.000052</b>
Water	81120	6& 8 min, dissolved	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000050</b>
Water	81121	10&12 min, dissolved	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000050</b>
Water	81122	14&16 min, dissolved	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000050</b>
Water	81123	18&20 min, dissolved	<b>0.000024</b>	<b>0.000024</b>	<b>0.000024</b>	<b>0.000024</b>	<b>0.000024</b>	<b>0.000049</b>
Water	80909	2& 4 min, total	0.000030	0.000027	0.000027	0.000010	0.000027	0.000740
Water	80910	6& 8 min, total	0.000045	0.000027	0.000027	0.000027	0.000027	0.000300
Water	80911	10&12 min, total	Broken	Broken	Broken	Broken	Broken	Broken
Water	80912	14&16 min, total	0.000062	0.000025	0.000025	0.000015	0.000025	0.000540
Water	80913	18&20 min, total	0.000043	0.000027	0.000027	0.000027	0.000027	0.000320
		Site Water						
Water	81621	Sample 1 Total	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	0.000017	<b>0.000025</b>	<b>0.000050</b>
Water	81622	Sample 2 Total	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000050</b>
Water	81623	Sample 3 Total	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000025</b>	<b>0.000050</b>
		Elutriate						
Water	81627	Sample 1 Dissolved	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000100</b>
Water	81628	Sample 2 Dissolved	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000100</b>
Water	81629	Sample 3 Dissolved	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000050</b>	<b>0.000100</b>
Water	81624	Sample 1 Total	0.000025	0.000025	0.000025	0.000025	0.000025	0.000050
Water	81625	Sample 2 Total	0.000025	0.000025	0.000025	0.000025	0.000025	0.000016
Water	81626	Sample 3 Total	0.000025	0.000025	0.000025	0.000025	0.000025	0.000015
SAMPLE	SAMPLE	DESCRIPTION	ALDRIN	A-BHC	B-BHC	G-BHC	D-BHC	PPDDD
		Detection Limit (mg/kg)	0.0018	0.0018	0.00095	0.0018	0.0018	0.0019
		In situ Sediment						
Sediment	81711	Sample #1	0.0018	0.0018	0.00067	0.0018	0.0018	0.0063
Sediment	81712	Sample #2	0.0018	0.0018	0.00062	0.0018	0.0018	0.0054
Sediment	81713	Sample #3	0.0018	0.0018	0.00092	0.0018	0.0018	0.0210

ALDRIN - Aldrin

A-BHC - A-BHC

B-BHC - B-BHC

G-BHC - G-BHC

D-BHC - D-BHC

PPDDD - PPDDD

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## Pestfine

## Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	DESCRIPTION	PPDDE	PPDDT	HPTCL	DIELDRIN	ENDOI	ENDOII	
	Detection Limit (mg/l)	0.000055	0.000055	0.0000280	0.000055	0.000028	0.000055	
	Plume Monitoring							
Water	80990 Background, dissolved	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80955 Background, total	0.000055	0.000055	0.0000280	0.000055	0.000028	0.000055	
Water	80991 0-10 min, overflow, dissolved	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80992 10-20 min, overflow, dissolved	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80993 20-30 min, overflow, dissolved	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80956 0-10 min, overflow, total	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80957 10-20 min, overflow, total	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80958 20-30 min, overflow, total	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80994 0-10 min, non-overflow, dissolved	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80995 10-20 min, non-overflow, dissolved	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80996 20-30 min, non-overflow, dissolved	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80959 0-10 min, non-overflow, total	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80960 10-20 min, non-overflow, total	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80961 20-30 min, non-overflow, total	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
	Hopper Inflow Monitoring							
Water	81114 3& 6 min, dissolved	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	81115 9&12 min, dissolved	0.000052	0.000052	0.0000260	0.000052	0.000026	0.000052	
Water	81116 15&18 min, dissolved	0.000054	0.000054	0.0000270	0.000054	0.000027	0.000054	
Water	81117 21&24 min, dissolved	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	81118 27&30 min, dissolved	0.000050	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80903 3& 6 min, total	0.000079	0.000050	0.0000250	0.000050	0.000025	0.000050	
Water	80904 9&12 min, total	0.000110	0.000082	0.0000130	0.000050	0.000029	0.000050	
Water	80905 15&18 min, total	0.000150	0.000050	0.0000130	0.000053	0.000033	0.000053	
Water	80906 21&24 min, total	0.000120	0.000075	0.0000207	0.000053	0.000032	0.000053	
Water	80907 27&30 min, total	0.000110	0.000068	0.0000290	0.000050	0.000032	0.000050	
	Hopper Overflow Monitoring							
Water	81119 2& 4 min, dissolved	0.000052	0.000052	0.0000260	0.000052	0.000026	0.000052	
Water	81120 6& 8 min, dissolved	0.000050	0.000066	0.0000250	0.000050	0.000025	0.000050	
Water	81121 10&12 min, dissolved	0.000050	0.000069	0.0000250	0.000050	0.000025	0.000050	
Water	81122 14&16 min, dissolved	0.000050	0.000065	0.0000250	0.000050	0.000025	0.000050	
Water	81123 18&20 min, dissolved	0.000049	0.000049	0.0000240	0.000049	0.000024	0.000049	
Water	80909 2& 4 min, total	0.000190	0.000110	0.0000170	0.000053	0.000017	0.000053	
Water	80910 6& 8 min, total	0.000180	0.000360	0.0000270	0.000053	0.000050	0.000053	
Water	80911 10&12 min, total	Broken	Broken	Broken	Broken	Broken	Broken	
Water	80912 14&16 min, total	0.000470	0.000340	0.0000280	0.000050	0.000033	0.000050	
Water	80913 18&20 min, total	0.000300	0.000140	0.0000270	0.000053	0.000020	0.000053	
	Site Water							
Water	81621 Sample 1 Total	0.000050	0.000050	0.0000037	0.000050	0.000025	0.000050	
Water	81622 Sample 2 Total	0.000050	0.000050	0.0000340	0.000050	0.000025	0.000050	
Water	81623 Sample 3 Total	0.000050	0.000050	0.0000370	0.000050	0.000025	0.000050	
	Elutriate							
Water	81627 Sample 1 Dissolved	0.000100	0.000100	0.0000170	0.000100	0.000050	0.000100	
Water	81628 Sample 2 Dissolved	0.000100	0.000100	0.0000180	0.000100	0.000050	0.000100	
Water	81629 Sample 3 Dissolved	0.000100	0.000100	0.0000290	0.000100	0.000050	0.000100	
Water	81624 Sample 1 Total	0.000050	0.000050	0.0000130	0.000050	0.000025	0.000050	
Water	81625 Sample 2 Total	0.000050	0.000050	0.0000350	0.000050	0.000025	0.000050	
Water	81626 Sample 3 Total	0.000050	0.000050	0.0000330	0.000050	0.000025	0.000050	
SAMPLE	SAMPLE	DESCRIPTION	PPDDE	PPDDT	HPTCL	DIELDRIN	ENDOI	ENDOII
		Detection Limit (mg/kg)	0.0019	0.0019	0.00096	0.0036	0.00096	0.0036
		Insitu Sediment						
Sediment	81711 Sample #1	0.0061	0.0120	0.00058	0.0036	0.0030	0.0055	
Sediment	81712 Sample #2	0.0110	0.0059	0.00038	0.0036	0.0030	0.0036	
Sediment	81713 Sample #3	0.0075	0.0120	0.00051	0.0036	0.0030	0.0036	

PPDDE - PPDDE      PPDDT - PPDDT      HPTCL - Heptachlor      DIELDRIN - Dieldrin      ENDOI - A-Endosulfan      ENDOII - B-Endosulfan

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## Pestfine

## Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	DESCRIPTION	ENDOSU	ENDRIN	ENDALD	HPTCLE	METOXYCL	CLORDANE
	Detection Limit (mg/l)	0.000055	0.000050	0.000055	0.000028	0.00028	0.000028
Water	80990 Plume Monitoring Background, dissolved	0.000050	0.000050	0.000050	0.000025	0.00025	0.000025
Water	80955 Background, total	0.000055	0.000110	0.000055	0.000028	0.00028	0.000028
Water	80991 0-10 min, overflow, dissolved	0.000050	0.000050	0.000050	0.000025	0.00025	0.000025
Water	80992 10-20 min, overflow, dissolved	0.000050	0.000050	0.000050	0.000025	0.00025	0.000025
Water	80993 20-30 min, overflow, dissolved	0.000050	0.000050	0.000050	0.000025	0.00025	0.000025
Water	80956 0-10 min, overflow, total	0.000050	0.000110	0.000050	0.000025	0.00025	0.000025
Water	80957 10-20 min, overflow, total	0.000050	0.000120	0.000050	0.000025	0.00025	0.000025
Water	80958 20-30 min, overflow, total	0.000050	0.000100	0.000050	0.000025	0.00025	0.000025
Water	80994 0-10 min, non-overflow, dissolved	0.000050	0.000050	0.000050	0.000025	0.00025	0.000025
Water	80995 10-20 min, non-overflow, dissolved	0.000050	0.000110	0.000050	0.000025	0.00025	0.000025
Water	80996 20-30 min, non-overflow, dissolved	0.000050	0.000110	0.000050	0.000025	0.00025	0.000025
Water	80959 0-10 min, non-overflow, total	0.000050	0.000100	0.000050	0.000025	0.00025	0.000025
Water	80960 10-20 min, non-overflow, total	0.000050	0.000120	0.000050	0.000025	0.00025	0.000025
Water	80961 20-30 min, non-overflow, total	0.000050	0.000130	0.000050	0.000025	0.00025	0.000025
	Hopper Inflow Monitoring						
Water	81114 3& 6 min, dissolved	0.000050	0.000081	0.000050	0.000025	0.00025	0.000025
Water	81115 9&12 min, dissolved	0.000052	0.000061	0.000052	0.000026	0.00026	0.000026
Water	81116 15&18 min, dissolved	0.000054	0.000060	0.000054	0.000027	0.00027	0.000027
Water	81117 21&24 min, dissolved	0.000050	0.000081	0.000050	0.000025	0.00025	0.000025
Water	81118 27&30 min, dissolved	0.000050	0.000069	0.000050	0.000025	0.00025	0.000025
Water	80903 3& 6 min, total	0.000022	0.000050	0.000050	0.000013	0.00025	
Water	80904 9&12 min, total	0.000050	0.000050	0.000050	0.000025	0.00025	
Water	80905 15&18 min, total	0.000047	0.000053	0.000053	0.000027	0.00027	
Water	80906 21&24 min, total	0.000041	0.000053	0.000053	0.000027	0.00027	
Water	80907 27&30 min, total	0.000050	0.000050	0.000050	0.000025	0.00025	
	Hopper Overflow Monitoring						
Water	81119 28-4 min, dissolved	0.000052	0.000095	0.000052	0.000026	0.00026	0.000026
Water	81120 6& 8 min, dissolved	0.000050	0.000079	0.000050	0.000025	0.00025	0.000025
Water	81121 10&12 min, dissolved	0.000050	0.000085	0.000050	0.000025	0.00025	0.000025
Water	81122 14&16 min, dissolved	0.000050	0.000063	0.000050	0.000025	0.00025	0.000025
Water	81123 18&20 min, dissolved	0.000049	0.000055	0.000049	0.000024	0.00024	0.000024
Water	80909 28-4 min, total	0.000053	0.000053	0.000053	0.000014	0.00027	
Water	80910 6& 8 min, total	0.000053	0.000053	0.000053	0.000027	0.00027	
Water	80911 10&12 min, total	Broken	Broken	Broken	Broken	Broken	
Water	80912 14&16 min, total	0.000140	0.000050	0.000050	0.000020	0.00025	
Water	80913 18&20 min, total	0.000053	0.000053	0.000053	0.000027	0.00027	
	Site Water						
Water	81621 Sample 1 Total	0.000050	0.000050	0.000050	0.000025	0.00025	
Water	81622 Sample 2 Total	0.000050	0.000050	0.000050	0.000025	0.00025	
Water	81623 Sample 3 Total	0.000050	0.000050	0.000050	0.000025	0.00025	
	Elutriate						
Water	81627 Sample 1 Dissolved	0.000100	0.000100	0.000100	0.000050	0.00050	
Water	81628 Sample 2 Dissolved	0.000100	0.000100	0.000100	0.000050	0.00050	
Water	81629 Sample 3 Dissolved	0.000100	0.000100	0.000100	0.000050	0.00050	
Water	81624 Sample 1 Total	0.000050	0.000050	0.000050	0.000025	0.00025	
Water	81625 Sample 2 Total	0.000050	0.000050	0.000050	0.000025	0.00025	
Water	81626 Sample 3 Total	0.000050	0.000050	0.000050	0.000025	0.00025	
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	ENDOSU	ENDRIN	ENDALD	HPTCLE	METOXYCL
		Detection Limit (mg/kg)	0.0036	0.0036	0.0036	0.0018	0.018
		In situ Sediment					
Sediment	81711 Sample #1	0.0036	0.0036	0.0036	0.0018	0.018	
Sediment	81712 Sample #2	0.0019	0.0036	0.0036	0.0018	0.018	
Sediment	81713 Sample #3	0.0036	0.0036	0.0036	0.0018	0.018	

ENDOSU - Endosulfan sulfate ENDRIN - Endrin ENDALD - Endrin Aldehyde HPTCLE - Heptachlor Epoxide METOXYCL - Methoxychlor

CLORDANE - Chlordane

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

**Pestfine**

**Delaware River Water Analysis (Fine-Grained Site)**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	TOXAPHEN	TcLXYL-S	DCLBP	a-CHLORD	g-CHLORD
		Detection Limit (mg/l)	0.00028			0.000025	0.000025
		Plume Monitoring					
Water	80990	Background, dissolved	0.00025	83.00%	92.60%		
Water	80955	Background, total	0.00028	87.40%	72.90%		
Water	80991	0-10 min, overflow, dissolved	0.00025	75.70%	92.20%		
Water	80992	10-20 min, overflow, dissolved	0.00025	75.10%	81.70%		
Water	80993	20-30 min, overflow, dissolved	0.00025	73.20%	83.20%		
Water	80956	0-10 min, overflow, total	0.00025	83.50%	70.90%		
Water	80957	10-20 min, overflow, total	0.00025	92.40%	72.10%		
Water	80958	20-30 min, overflow, total	0.00025	74.40%	63.90%		
Water	80994	0-10 min, non-overflow, dissolved	0.00025	73.30%	84.10%		
Water	80995	10-20 min, non-overflow, dissolved	0.00025	79.50%	87.40%		
Water	80996	20-30 min, non-overflow, dissolved	0.00025	73.40%	84.10%		
Water	80959	0-10 min, non-overflow, total	0.00025	82.40%	75.20%		
Water	80960	10-20 min, non-overflow, total	0.00025	86.80%	79.50%		
Water	80961	20-30 min, non-overflow, total	0.00025	82.30%	80.60%		
		Hopper Inflow Monitoring					
Water	81114	3& 6 min, dissolved	0.00025	80.80%	78.00%		
Water	81115	9&12 min, dissolved	0.00026	82.20%	75.20%		
Water	81116	15&18 min, dissolved	0.00027	82.10%	73.50%		
Water	81117	21&24 min, dissolved	0.00025	95.30%	85.80%		
Water	81118	27&30 min, dissolved	0.00025	91.60%	80.70%		
Water	80903	3& 6 min, total	0.00025	35.50%	45.20%	0.000034	0.000026
Water	80904	9&12 min, total	0.00025	31.64%	43.66%	0.000043	0.000032
Water	80905	15&18 min, total	0.00027	39.39%	59.50%	0.000052	0.000032
Water	80906	21&24 min, total	0.00027	44.21%	59.72%	0.000046	0.000029
Water	80907	27&30 min, total	0.00025	44.04%	41.07%	0.000043	0.000025
		Hopper Overflow Monitoring					
Water	81119	2& 4 min, dissolved	0.00026	88.10%	80.40%		
Water	81120	6& 8 min, dissolved	0.00025	92.10%	76.20%		
Water	81121	10&12 min, dissolved	0.00025	91.70%	81.80%		
Water	81122	14&16 min, dissolved	0.00025	72.30%	56.10%		
Water	81123	18&20 min, dissolved	0.00024	73.50%	61.10%		
Water	80909	2& 4 min, total	0.00027	40.11%	58.27%	0.000068	0.000050
Water	80910	6& 8 min, total	0.00027	47.04%	64.93%	0.000069	0.000048
Water	80911	10&12 min, total	Broken	Broken	Broken	Broken	Broken
Water	80912	14&16 min, total	0.00025	48.41%	78.19%	0.000130	0.000093
Water	80913	18&20 min, total	0.00027	44.62%	83.94%	0.000088	0.000059
		Site Water					
Water	81621	Sample 1 Total	0.00025	76.88%	68.76%	0.000025	0.000025
Water	81622	Sample 2 Total	0.00025	60.17%	69.83%	0.000025	0.000025
Water	81623	Sample 3 Total	0.00025	71.76%	68.80%	0.000025	0.000025
		Elutriate					
Water	81627	Sample 1 Dissolved	0.00050	75.82%	87.54%	0.000050	0.000050
Water	81628	Sample 2 Dissolved	0.00050	85.13%	88.79%	0.000050	0.000050
Water	81629	Sample 3 Dissolved	0.00050	76.31%	87.53%	0.000050	0.000050
Water	81624	Sample 1 Total	0.00025	81.58%	64.33%	0.000025	0.000025
Water	81625	Sample 2 Total	0.00025	60.65%	55.24%	0.000025	0.000025
Water	81626	Sample 3 Total	0.00025	67.60%	61.90%	0.000025	0.000025
SAMPLE	SAMPLE ID	DESCRIPTION	TOXAPHEN	TcLXYL-S	DCLBP	a-CHLORD	g-CHLORD
		Detection Limit (mg/kg)	0.018			0.00096	0.0019
		In situ Sediment					
Sediment	81711	Sample #1	0.018	86.90%	92.01%	0.0011	0.0035
Sediment	81712	Sample #2	0.018	91.01%	92.77%	0.0016	0.0035
Sediment	81713	Sample #3	0.018	84.77%	102.76%	0.0011	0.0038

TOXAPHEN - Toxaphene      TcLXYL-S - 2,4,5,6-Tetrachloro-m-xylene(Surrogate(60-150 WS))  
 a-CHLORD - a-CHLORDANE      g-CHLORD - g-CHLORDANE      DCLBP - Decachlorobiphenyl(Surrogate (60-150 WS))

BOLD - less than values

Values below less than values,are estimated results. Results are less than the reporting limit.

## PCBs fine

## Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 22	PCB 33	PCB 37	PCB 42	PCB 47	PCB 64	PCB 74
		Detection Limit (mg/l)	0.0000011	0.0000011	0.0000011	0.0000011	0.00000110	0.0000011	0.0000011
Water	80983	Plume Monitoring Background, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	80948	Background, total	0.0000011	0.0000011	0.0000011	0.0000011	0.00000110	0.0000011	0.0000011
Water	80984	0-10 min, overflow, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	80985	10-20 min, overflow, dissolved	0.0000011	0.0000011	0.0000011	0.0000011	0.00000110	0.0000011	0.0000011
Water	80986	20-30 min, overflow, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	80949	0-10 min, overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	80950	10-20 min, overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	80951	20-30 min, overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	80987	0-10 min, non-overflow, dissolve	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	80988	10-20 min, non-overflow, dissolve	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	80989	20-30 min, non-overflow, dissolve	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	80952	0-10 min, non-overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	80953	10-20 min, non-overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	80954	20-30 min, non-overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
		Hopper Inflow Monitoring							
Water	81104	3& 6 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	81105	9&12 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	81106	15&18 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.00000050	0.0000010	0.0000010
Water	81107	21&24 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	81108	27&30 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	80891	3& 6 min, total	0.0000011	0.0000011	0.0000011	0.0000016	0.00000095	0.0000011	0.0000013
Water	80892	9&12 min, total	0.0000010	0.0000010	0.0000010	0.0000031	0.00000180	0.0000092	0.0000042
Water	80893	15&18 min, total	0.0000010	0.0000010	0.0000010	0.0000021	0.00000055	0.0000010	0.0000021
Water	80894	21&24 min, total	0.0000011	0.0000011	0.0000011	0.0000021	0.00000250	0.0000084	0.0000011
Water	80895	27&30 min, total	0.0000011	0.0000011	0.0000011	0.0000038	0.00000110	0.0000011	0.0000011
		Hopper Overflow Monitoring							
Water	81109	2& 4 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	81110	6& 8 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	81111	10&12 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	81112	14&16 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	81113	18&20 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	80897	2& 4 min, total	0.0000011	0.0000011	0.0000011	0.0000046	0.00000830	0.0000011	0.0000011
Water	80898	6& 8 min, total	0.0000011	0.0000011	0.0000011	0.0000011	0.00000110	0.00000150	0.0000061
Water	80899	10&12 min, total	0.0000011	0.0000011	0.0000011	0.0000011	0.00000110	0.00000160	0.0000064
Water	80900	14&16 min, total	0.0000011	0.0000011	0.0000011	0.0000069	0.00000110	0.0000200	0.0000080
Water	80901	18&20 min, total	0.0000010	0.0000010	0.0000010	0.0000058	0.00000100	0.00000190	0.0000074
		Site Water							
Water	81603	Sample 1 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	81604	Sample 2 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	81605	Sample 3 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
		Elutriate							
Water	81609	Sample 1 Dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	81610	Sample 2 Dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	81611	Sample 3 Dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	81606	Sample 1 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	81607	Sample 2 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.00000057	0.0000010	0.0000010
Water	81608	Sample 3 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.00000051	0.0000010	0.0000010
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 22	PCB 33	PCB 37	PCB 42	PCB 47	PCB 64	PCB 74
		Detection Limit (mg/kg)	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
		Insitu Sediment							
Sediment	81717	Sample #1	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
Sediment	81718	Sample #2	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
Sediment	81719	Sample #3	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## PCBs fine

## Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 80	PCB 81	PCB 84	PCB 91	PCB 92	PCB 95	PCB 99
		Detection Limit (mg/l)	0.0000011	0.0000011	0.00000110	0.00000110	0.0000011	0.00000110	0.00000110
Water	80983	Plume Monitoring Background, dissolved	0.0000010	0.0000010	0.00000100	0.00000100	0.0000010	0.00000058	0.00000100
Water	80948	Background, total	0.0000011	0.0000011	0.00000110	0.00000110	0.0000011	0.00000110	0.00000110
Water	80984	0-10 min, overflow, dissolved	0.0000010	0.0000010	0.00000100	0.00000100	0.0000010	0.00000058	0.00000100
Water	80985	10-20 min, overflow, dissolved	0.0000011	0.0000011	0.00000110	0.00000110	0.0000011	0.00000085	0.00000110
Water	80986	20-30 min, overflow, dissolved	0.0000010	0.0000010	0.00000100	0.00000100	0.0000010	0.00000049	0.00000100
Water	80949	0-10 min, overflow, total	0.0000010	0.0000010	0.00000100	0.00000100	0.0000010	0.00000100	0.00000100
Water	80950	10-20 min, overflow, total	0.0000010	0.0000010	0.00000100	0.00000100	0.0000010	0.00000100	0.00000100
Water	80951	20-30 min, overflow, total	0.0000010	0.0000010	0.00000100	0.00000100	0.0000010	0.00000100	0.00000100
Water	80987	0-10 min, non-overflow, dissolve	0.0000010	0.0000010	0.00000100	0.00000100	0.0000010	0.00000049	0.00000100
Water	80988	10-20 min, non-overflow, dissolve	0.0000010	0.0000010	0.00000100	0.00000100	0.0000010	0.00000120	0.00000100
Water	80989	20-30 min, non-overflow, dissolve	0.0000010	0.0000010	0.00000100	0.00000100	0.0000010	0.00000056	0.00000100
Water	80952	0-10 min, non-overflow, total	0.0000010	0.0000010	0.00000100	0.00000100	0.0000010	0.00000100	0.00000100
Water	80953	10-20 min, non-overflow, total	0.0000010	0.0000010	0.00000100	0.00000100	0.0000010	0.00000100	0.00000100
Water	80954	20-30 min, non-overflow, total	0.0000010	0.0000010	0.00000100	0.00000100	0.0000010	0.00000100	0.00000100
		Hopper Inflow Monitoring							
Water	81104	3& 6 min, dissolved	0.0000010	0.0000010	0.00000100	0.00000100	0.0000010	0.00000084	0.00000060
Water	81105	9&12 min, dissolved	0.0000010	0.0000010	0.00000100	0.00000100	0.0000010	0.00000110	0.00000100
Water	81106	15&18 min, dissolved	0.0000010	0.0000010	0.00000100	0.00000100	0.0000010	0.00000095	0.00000100
Water	81107	21&24 min, dissolved	0.0000010	0.0000010	0.00000100	0.00000100	0.0000010	0.00000084	0.00000045
Water	81108	27&30 min, dissolved	0.0000010	0.0000010	0.00000100	0.00000100	0.0000010	0.00000072	0.00000100
Water	80891	3& 6 min, total	0.0000011	0.0000011	0.00000110	0.00000110	0.0000011	0.00000110	0.00000110
Water	80892	9&12 min, total	0.0000010	0.0000010	0.00000100	0.00000100	0.0000010	0.00000100	0.00000100
Water	80893	15&18 min, total	0.0000010	0.0000010	0.00000100	0.00000100	0.0000084	0.00000100	0.00000100
Water	80894	21&24 min, total	0.0000011	0.0000011	0.00000110	0.00000320	0.0000068	0.00001200	0.00000730
Water	80895	27&30 min, total	0.0000011	0.0000011	0.00000110	0.00000830	0.0000150	0.00002400	0.00001300
		Hopper Overflow Monitoring							
Water	81109	2& 4 min, dissolved	0.0000010	0.0000010	0.00000100	0.00000100	0.0000010	0.00000250	0.00000046
Water	81110	6& 8 min, dissolved	0.0000010	0.0000010	0.00000100	0.00000100	0.0000010	0.00000120	0.00000058
Water	81111	10&12 min, dissolved	0.0000010	0.0000010	0.00000100	0.00000100	0.0000010	0.00000300	0.00000058
Water	81112	14&16 min, dissolved	0.0000010	0.0000010	0.00000100	0.00000100	0.0000010	0.00000097	0.00000037
Water	81113	18&20 min, dissolved	0.0000010	0.0000010	0.00000100	0.00000100	0.0000010	0.00000170	0.00000063
Water	80897	2& 4 min, total	0.0000011	0.0000011	0.00000110	0.00000110	0.00000150	0.000002700	0.000001500
Water	80898	6& 8 min, total	0.0000011	0.0000011	0.00000110	0.00000980	0.0000180	0.00002700	0.00001400
Water	80899	10&12 min, total	0.0000011	0.0000011	0.00000110	0.00000110	0.0000160	0.00003100	0.00001900
Water	80900	14&16 min, total	0.0000011	0.0000011	0.00000110	0.000001400	0.0000250	0.00003700	0.00002100
Water	80901	18&20 min, total	0.0000010	0.0000010	0.00000100	0.000001200	0.0000170	0.00003300	0.00001700
		Site Water							
Water	81603	Sample 1 Total	0.0000010	0.0000010	0.00000100	0.0000046	0.0000010	0.00000093	0.00000100
Water	81604	Sample 2 Total	0.0000010	0.0000010	0.00000100	0.00000100	0.0000010	0.00000100	0.00000100
Water	81605	Sample 3 Total	0.0000010	0.0000010	0.00000100	0.0000046	0.0000010	0.00000095	0.00000100
		Elutriate							
Water	81609	Sample 1 Dissolved	0.0000010	0.0000010	0.00000100	0.0000054	0.0000010	0.00000110	0.00000038
Water	81610	Sample 2 Dissolved	0.0000010	0.0000010	0.00000100	0.0000068	0.0000010	0.00000094	0.00000047
Water	81611	Sample 3 Dissolved	0.0000010	0.0000010	0.0000091	0.0000093	0.0000010	0.00000057	0.00000028
Water	81606	Sample 1 Total	0.0000010	0.0000010	0.00000100	0.00000100	0.0000010	0.00000110	0.00000100
Water	81607	Sample 2 Total	0.0000010	0.0000010	0.00000100	0.00000100	0.0000010	0.00000140	0.00000100
Water	81608	Sample 3 Total	0.0000010	0.0000010	0.00000100	0.00000100	0.0000010	0.00000110	0.00000100
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 80	PCB 81	PCB 84	PCB 91	PCB 92	PCB 95	PCB 99
		Detection Limit (mg/kg)	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
		Insitu Sediment							
Sediment	81717	Sample #1	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00046
Sediment	81718	Sample #2	0.00077	0.00077	0.00077	0.00040	0.00049	0.00077	0.00071
Sediment	81719	Sample #3	0.00077	0.00077	0.00077	0.00052	0.00062	0.00077	0.00074

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## PCBs fine

## Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 110	PCB 119	PCB 120	PCB 123	PCB 126	PCB 127	PCB 132
		Detection Limit (mg/l)	0.00000110	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80983	Plume Monitoring Background, dissolved	0.00000062	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80948	Background, total	0.00000078	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80984	0-10 min, overflow, dissolved	0.00000060	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80985	10-20 min, overflow, dissolved	0.00000087	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80986	20-30 min, overflow, dissolved	0.00000065	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80949	0-10 min, overflow, total	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80950	10-20 min, overflow, total	0.00000110	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80951	20-30 min, overflow, total	0.00000110	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80987	0-10 min, non-overflow, dissolve	0.00000074	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80988	10-20 min, non-overflow, dissolve	0.00000068	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80989	20-30 min, non-overflow, dissolve	0.00000065	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80952	0-10 min, non-overflow, total	0.00000095	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80953	10-20 min, non-overflow, total	0.00000120	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80954	20-30 min, non-overflow, total	0.00000073	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
		Hopper Inflow Monitoring							
Water	81104	3& 6 min, dissolved	0.00000095	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81105	9&12 min, dissolved	0.00000068	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81106	15&18 min, dissolved	0.00000076	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81107	21&24 min, dissolved	0.00000090	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81108	27&30 min, dissolved	0.00000076	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80891	3& 6 min, total	0.00000990	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80892	9&12 min, total	0.00000250	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000088
Water	80893	15&18 min, total	0.00001200	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80894	21&24 min, total	0.00001400	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000066
Water	80895	27&30 min, total	0.00002900	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000110
		Hopper Overflow Monitoring							
Water	81109	2& 4 min, dissolved	0.00000095	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81110	6& 8 min, dissolved	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81111	10&12 min, dissolved	0.00000120	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81112	14&16 min, dissolved	0.00000095	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81113	18&20 min, dissolved	0.00000110	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80897	2& 4 min, total	0.00003500	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000140
Water	80898	6& 8 min, total	0.00003500	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000230
Water	80899	10&12 min, total	0.00004100	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000150
Water	80900	14&16 min, total	0.00004900	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000300
Water	80901	18&20 min, total	0.00004100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000170
		Site Water							
Water	81603	Sample 1 Total	0.00000077	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81604	Sample 2 Total	0.00000099	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81605	Sample 3 Total	0.00000110	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
		Elutriate							
Water	81609	Sample 1 Dissolved	0.00000091	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81610	Sample 2 Dissolved	0.00000088	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81611	Sample 3 Dissolved	0.00000057	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81606	Sample 1 Total	0.00000120	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81607	Sample 2 Total	0.00000130	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81608	Sample 3 Total	0.00000110	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 110	PCB 119	PCB 120	PCB 123	PCB 126	PCB 127	PCB 132
		Detection Limit (mg/kg)	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
		Insitu Sediment							
Sediment	81717	Sample #1	0.00100	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
Sediment	81718	Sample #2	0.00087	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
Sediment	81719	Sample #3	0.00100	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## PCBs fine

## Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 135	PCB 146	PCB 149	PCB 157	PCB 158	PCB 166	PCB 168
		Detection Limit (mg/l)	0.0000011	0.00000110	0.00000110	0.0000011	0.0000011	0.0000011	0.00000110
		Plume Monitoring							
Water	80983	Background, dissolved	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	80948	Background, total	0.0000011	0.00000110	0.00000110	0.0000011	0.0000011	0.0000011	0.00000110
Water	80984	0-10 min, overflow, dissolved	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	80985	10-20 min, overflow, dissolved	0.0000011	0.00000110	0.00000110	0.0000011	0.0000011	0.0000011	0.00000110
Water	80986	20-30 min, overflow, dissolved	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	80949	0-10 min, overflow, total	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	80950	10-20 min, overflow, total	0.0000010	0.00000064	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	80951	20-30 min, overflow, total	0.0000010	0.00000057	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	80987	0-10 min, non-overflow, dissolve	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	80988	10-20 min, non-overflow, dissolve	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	80989	20-30 min, non-overflow, dissolve	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	80952	0-10 min, non-overflow, total	0.0000010	0.00000140	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	80953	10-20 min, non-overflow, total	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	80954	20-30 min, non-overflow, total	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
		Hopper Inflow Monitoring							
Water	81104	3 & 6 min, dissolved	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	81105	9&12 min, dissolved	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	81106	15&18 min, dissolved	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	81107	21&24 min, dissolved	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	81108	27&30 min, dissolved	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	80891	38 6 min, total	0.0000011	0.00000260	0.000001100	0.0000011	0.0000011	0.0000011	0.00000110
Water	80892	9&12 min, total	0.0000010	0.00000650	0.000002500	0.0000010	0.0000010	0.0000010	0.00000100
Water	80893	15&18 min, total	0.0000010	0.00000460	0.000001800	0.0000010	0.0000010	0.0000010	0.00000100
Water	80894	21&24 min, total	0.0000011	0.00000110	0.000001800	0.0000011	0.0000011	0.0000011	0.00000110
Water	80895	27&30 min, total	0.0000076	0.00000110	0.000003200	0.0000011	0.0000011	0.0000011	0.00000110
		Hopper Overflow Monitoring							
Water	81109	2& 4 min, dissolved	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
Water	81110	6& 8 min, dissolved	0.0000010	0.00000100	0.00000043	0.0000010	0.0000010	0.0000010	0.00000100
Water	81111	10&12 min, dissolved	0.0000010	0.00000100	0.00000054	0.0000010	0.0000010	0.0000010	0.00000100
Water	81112	14&16 min, dissolved	0.0000010	0.00000100	0.00000056	0.0000010	0.0000010	0.0000010	0.00000100
Water	81113	18&20 min, dissolved	0.0000010	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000040
Water	80897	2& 4 min, total	0.0000088	0.00000110	0.000003800	0.0000011	0.0000011	0.0000011	0.00000110
Water	80898	6& 8 min, total	0.0000083	0.00000110	0.00000110	0.0000011	0.0000011	0.0000011	0.00000110
Water	80899	10&12 min, total	0.00000100	0.00000110	0.00000110	0.0000011	0.0000011	0.0000011	0.00000110
Water	80900	14&16 min, total	0.0000140	0.00000110	0.00000110	0.0000011	0.0000011	0.0000011	0.00000110
Water	80901	18&20 min, total	0.0000150	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100
		Site Water							
Water	81603	Sample 1 Total	0.0000010	0.00000100	0.00000051	0.0000010	0.0000010	0.0000010	0.00000100
Water	81604	Sample 2 Total	0.0000010	0.00000100	0.00000053	0.0000010	0.0000010	0.0000010	0.00000056
Water	81605	Sample 3 Total	0.0000010	0.00000100	0.00000055	0.0000010	0.0000010	0.0000010	0.00000043
		Elutriate							
Water	81609	Sample 1 Dissolved	0.0000010	0.00000100	0.00000047	0.0000010	0.0000010	0.0000010	0.00000140
Water	81610	Sample 2 Dissolved	0.0000010	0.00000100	0.00000046	0.0000010	0.0000010	0.0000010	0.00000100
Water	81611	Sample 3 Dissolved	0.0000010	0.00000100	0.00000044	0.0000010	0.0000010	0.0000010	0.00000100
Water	81606	Sample 1 Total	0.0000010	0.00000100	0.00000091	0.0000010	0.0000010	0.0000010	0.00000100
Water	81607	Sample 2 Total	0.0000010	0.00000100	0.00000090	0.0000010	0.0000010	0.0000010	0.00000100
Water	81608	Sample 3 Total	0.0000010	0.00000100	0.00000076	0.0000010	0.0000010	0.0000010	0.00000100
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 135	PCB 146	PCB 149	PCB 157	PCB 158	PCB 166	PCB 168
		Detection Limit (mg/kg)	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
		In situ Sediment							
Sediment	81717	Sample #1	0.00077	0.00077	0.00120	0.00077	0.00077	0.00077	0.00077
Sediment	81718	Sample #2	0.00077	0.00077	0.00120	0.00077	0.00077	0.00077	0.00077
Sediment	81719	Sample #3	0.00077	0.00077	0.00100	0.00077	0.00077	0.00077	0.00077

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## PCBs fine

## Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 169	PCB 174	PCB 177	PCB 178	PCB 179	PCB 8	PCB 18
		Detection Limit (mg/l)	0.0000011	0.00000110	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80983	Plume Monitoring							
Water	80948	Background, dissolved	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80948	Background, total	0.0000011	0.00000110	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80984	0-10 min, overflow, dissolved	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80985	10-20 min, overflow, dissolved	0.0000011	0.00000110	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80986	20-30 min, overflow, dissolved	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80949	0-10 min, overflow, total	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80950	10-20 min, overflow, total	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80951	20-30 min, overflow, total	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80987	0-10 min, non-overflow, dissolve	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80988	10-20 min, non-overflow, dissolve	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80989	20-30 min, non-overflow, dissolve	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80952	0-10 min, non-overflow, total	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80953	10-20 min, non-overflow, total	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80954	20-30 min, non-overflow, total	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000015
		Hopper Inflow Monitoring							
Water	81104	3& 6 min, dissolved	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81105	9&12 min, dissolved	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81106	15&18 min, dissolved	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81107	21&24 min, dissolved	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81108	27&30 min, dissolved	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80891	3& 6 min, total	0.0000011	0.00000390	0.0000024	0.0000011	0.0000011	0.0000011	0.0000011
Water	80892	9&12 min, total	0.0000010	0.00000970	0.0000067	0.0000010	0.0000010	0.0000010	0.0000010
Water	80893	15&18 min, total	0.0000010	0.00000620	0.0000042	0.0000010	0.0000010	0.0000010	0.0000010
Water	80894	21&24 min, total	0.0000011	0.00000820	0.0000023	0.0000011	0.0000017	0.0000011	0.0000051
Water	80895	27&30 min, total	0.0000011	0.00000110	0.0000011	0.0000011	0.0000069	0.0000063	0.0000011
		Hopper Overflow Monitoring							
Water	81109	2& 4 min, dissolved	0.0000010	0.00000049	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81110	6& 8 min, dissolved	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81111	10&12 min, dissolved	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81112	14&16 min, dissolved	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81113	18&20 min, dissolved	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80897	2& 4 min, total	0.0000011	0.00000110	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80898	6& 8 min, total	0.0000011	0.000001700	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80899	10&12 min, total	0.0000011	0.000001700	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80900	14&16 min, total	0.0000011	0.00000110	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80901	18&20 min, total	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
		Site Water							
Water	81603	Sample 1 Total	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81604	Sample 2 Total	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81605	Sample 3 Total	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000015
		Elutriate							
Water	81609	Sample 1 Dissolved	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81610	Sample 2 Dissolved	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81611	Sample 3 Dissolved	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81606	Sample 1 Total	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81607	Sample 2 Total	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81608	Sample 3 Total	0.0000010	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 169	PCB 174	PCB 177	PCB 178	PCB 179	PCB 8	PCB 18
		Detection Limit (mg/kg)	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
		Insitu Sediment							
Sediment	81717	Sample #1	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
Sediment	81718	Sample #2	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
Sediment	81719	Sample #3	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## PCBs fine

## Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 28	PCB 31	PCB 40	PCB 44	PCB 49	PCB 52	PCB 60
		Detection Limit (mg/l)	0.0000011	0.0000011	0.0000011	0.0000011	0.00000110	0.00000110	0.00000110
Water	80983	Plume Monitoring							
Water	80948	Background, dissolved	0.0000010	0.0000017	0.0000010	0.0000010	0.00000100	0.00000046	0.00000100
Water	80948	Background, total	0.0000011	0.0000011	0.0000011	0.0000011	0.00000110	0.00000110	0.00000110
Water	80984	0-10 min, overflow, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.00000100	0.00000100
Water	80985	10-20 min, overflow, dissolved	0.0000011	0.0000011	0.0000011	0.0000011	0.00000110	0.00000110	0.00000110
Water	80986	20-30 min, overflow, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.00000100	0.00000100
Water	80949	0-10 min, overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.00000120	0.00000100
Water	80950	10-20 min, overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.00000095	0.00000100
Water	80951	20-30 min, overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.00000077	0.00000100
Water	80987	0-10 min, non-overflow, dissolve	0.0000010	0.0000010	0.0000010	0.0000010	0.00000085	0.00000100	0.00000100
Water	80988	10-20 min, non-overflow, dissolve	0.0000010	0.0000010	0.0000010	0.0000010	0.00000044	0.00000100	0.00000100
Water	80989	20-30 min, non-overflow, dissolve	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.00000100	0.00000100
Water	80952	0-10 min, non-overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.00000097	0.00000100
Water	80953	10-20 min, non-overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.00000100	0.00000100
Water	80954	20-30 min, non-overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.00000074	0.00000100
		Hopper Inflow Monitoring							
Water	81104	3& 6 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.00000083	0.00000100
Water	81105	9&12 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.00000093	0.00000100
Water	81106	15&18 min, dissolved	0.0000010	0.0000029	0.0000010	0.0000014	0.00000072	0.00000094	0.00000100
Water	81107	21&24 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.00000180	0.00000080	0.00000100
Water	81108	27&30 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.00000046	0.00000070	0.00000100
Water	80891	3& 6 min, total	0.0000067	0.0000011	0.0000011	0.0000057	0.00000410	0.000001100	0.00000040
Water	80892	9&12 min, total	0.0000080	0.0000010	0.0000010	0.00000150	0.000000960	0.000002500	0.00000130
Water	80893	15&18 min, total	0.0000080	0.0000010	0.0000010	0.00000092	0.000000630	0.000001600	0.00000076
Water	80894	21&24 min, total	0.0000067	0.0000011	0.0000041	0.00000080	0.000000600	0.000001500	0.00000075
Water	80895	27&30 min, total	0.0000130	0.0000011	0.0000079	0.00000170	0.000001200	0.000002600	0.00000150
		Hopper Overflow Monitoring							
Water	81109	2& 4 min, dissolved	0.0000010	0.0000031	0.0000010	0.0000010	0.00000110	0.00000086	0.00000100
Water	81110	6& 8 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.00000047	0.00000082	0.00000100
Water	81111	10&12 min, dissolved	0.0000010	0.0000038	0.0000010	0.0000010	0.00000077	0.00000120	0.00000100
Water	81112	14&16 min, dissolved	0.0000010	0.0000029	0.0000010	0.0000010	0.00000065	0.00000110	0.00000100
Water	81113	18&20 min, dissolved	0.0000010	0.0000037	0.0000010	0.0000010	0.00000060	0.00000140	0.00000100
Water	80897	2& 4 min, total	0.00001200	0.0000011	0.0000011	0.00000160	0.000001400	0.000003600	0.000002000
Water	80898	6& 8 min, total	0.0000011	0.0000011	0.0000088	0.00000200	0.000001400	0.000003400	0.00000190
Water	80899	10&12 min, total	0.00000130	0.0000011	0.00000120	0.00000260	0.000001600	0.000003700	0.00000220
Water	80900	14&16 min, total	0.00000180	0.0000011	0.00000140	0.00000300	0.000002000	0.000004300	0.00000270
Water	80901	18&20 min, total	0.00000180	0.0000010	0.00000130	0.00000270	0.000001800	0.000003900	0.00000270
		Site Water							
Water	81603	Sample 1 Total	0.0000010	0.0000024	0.0000010	0.0000014	0.00000065	0.00000092	0.00000100
Water	81604	Sample 2 Total	0.0000010	0.0000022	0.0000010	0.0000015	0.00000100	0.00000100	0.00000100
Water	81605	Sample 3 Total	0.0000010	0.0000025	0.0000010	0.0000014	0.00000047	0.00000110	0.00000100
		Elutriate							
Water	81609	Sample 1 Dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.00000100	0.00000100
Water	81610	Sample 2 Dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.00000077	0.00000100
Water	81611	Sample 3 Dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.00000100	0.00000054	0.00000100
Water	81606	Sample 1 Total	0.0000010	0.0000039	0.0000010	0.0000010	0.000000300	0.00000150	0.00000100
Water	81607	Sample 2 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.000000330	0.00000180	0.00000100
Water	81608	Sample 3 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.000000290	0.00000160	0.00000100
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 28	PCB 31	PCB 40	PCB 44	PCB 49	PCB 52	PCB 60
		Detection Limit (mg/kg)	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
		Insitu Sediment							
Sediment	81717	Sample #1	0.00077	0.00077	0.00077	0.00077	0.00061	0.00250	0.00057
Sediment	81718	Sample #2	0.00077	0.00077	0.00077	0.00077	0.00081	0.00250	0.00047
Sediment	81719	Sample #3	0.00077	0.00077	0.00077	0.00077	0.00069	0.00240	0.00039

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## PCBs fine

## Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 70	PCB 77	PCB 82	PCB 86	PCB 87	PCB 97	PCB 101
		Detection Limit (mg/l)	0.00000110	0.0000011	0.0000011	0.00000110	0.00000110	0.00000110	0.00000110
Water	80983	Plume Monitoring Background, dissolved	0.00000040	0.0000010	0.0000010	0.00000100	0.00000100	0.00000100	0.00000110
Water	80948	Background, total	0.00000110	0.0000011	0.0000011	0.00000057	0.00000110	0.00000057	0.00000160
Water	80984	0-10 min, overflow, dissolved	0.00000100	0.0000010	0.0000010	0.00000100	0.00000100	0.00000100	0.00000064
Water	80985	10-20 min, overflow, dissolved	0.00000051	0.0000011	0.0000011	0.00000110	0.00000110	0.00000110	0.00000093
Water	80986	20-30 min, overflow, dissolved	0.00000044	0.0000010	0.0000010	0.00000100	0.00000100	0.00000100	0.00000074
Water	80949	0-10 min, overflow, total	0.00000100	0.0000010	0.0000010	0.00000100	0.00000100	0.00000100	0.00000180
Water	80950	10-20 min, overflow, total	0.00000048	0.0000010	0.0000010	0.00000063	0.00000100	0.00000063	0.00000200
Water	80951	20-30 min, overflow, total	0.00000038	0.0000010	0.0000010	0.00000053	0.00000100	0.00000053	0.00000190
Water	80987	0-10 min, non-overflow, dissolve	0.00000037	0.0000010	0.0000010	0.00000100	0.00000100	0.00000100	0.00000093
Water	80988	10-20 min, non-overflow, dissolve	0.00000050	0.0000010	0.0000010	0.00000100	0.00000100	0.00000100	0.00000085
Water	80989	20-30 min, non-overflow, dissolve	0.00000056	0.0000010	0.0000010	0.00000100	0.00000100	0.00000100	0.00000091
Water	80952	0-10 min, non-overflow, total	0.00000041	0.0000010	0.0000010	0.00000041	0.00000100	0.00000041	0.00000150
Water	80953	10-20 min, non-overflow, total	0.00000038	0.0000010	0.0000010	0.00000047	0.00000100	0.00000047	0.00000230
Water	80954	20-30 min, non-overflow, total	0.00000038	0.0000010	0.0000010	0.00000043	0.00000054	0.00000043	0.00000190
		Hopper Inflow Monitoring							
Water	81104	3& 6 min, dissolved	0.00000062	0.0000010	0.0000010	0.00000100	0.00000038	0.00000100	0.00000120
Water	81105	9&12 min, dissolved	0.00000042	0.0000010	0.0000010	0.00000100	0.00000100	0.00000100	0.00000061
Water	81106	15&18 min, dissolved	0.00000053	0.0000010	0.0000010	0.00000100	0.00000100	0.00000100	0.00000085
Water	81107	21&24 min, dissolved	0.00000059	0.0000010	0.0000010	0.00000100	0.00000042	0.00000100	0.00000120
Water	81108	27&30 min, dissolved	0.00000041	0.0000010	0.0000010	0.00000100	0.00000100	0.00000100	0.00000074
Water	80891	3& 6 min, total	0.00000420	0.0000011	0.0000014	0.00000300	0.00000310	0.00000300	0.00000900
Water	80892	9&12 min, total	0.00000890	0.0000010	0.0000010	0.00000600	0.00000420	0.00000600	0.00001900
Water	80893	15&18 min, total	0.00000660	0.0000010	0.0000010	0.00000420	0.00000290	0.00000420	0.00001100
Water	80894	21&24 min, total	0.00000640	0.0000011	0.0000011	0.00000730	0.00000290	0.00000730	0.00001200
Water	80895	27&30 min, total	0.00001100	0.0000011	0.0000011	0.00000730	0.00000110	0.00000730	0.00002500
		Hopper Overflow Monitoring							
Water	81109	2& 4 min, dissolved	0.00000086	0.0000010	0.0000010	0.00000100	0.00000064	0.00000100	0.00000090
Water	81110	6& 8 min, dissolved	0.00000120	0.0000010	0.0000010	0.00000100	0.00000058	0.00000100	0.00000100
Water	81111	10&12 min, dissolved	0.00000084	0.0000010	0.0000010	0.00000100	0.00000065	0.00000100	0.00000120
Water	81112	14&16 min, dissolved	0.00000059	0.0000010	0.0000010	0.00000100	0.00000036	0.00000100	0.00000097
Water	81113	18&20 min, dissolved	0.00000074	0.0000010	0.0000010	0.00000100	0.00000050	0.00000100	0.00000100
Water	80897	2& 4 min, total	0.00001200	0.0000011	0.0000011	0.00000870	0.00000110	0.00000870	0.00002900
Water	80898	6& 8 min, total	0.00001300	0.0000011	0.0000011	0.00000950	0.00000110	0.00000950	0.00002900
Water	80899	10&12 min, total	0.00001500	0.0000011	0.0000011	0.00000960	0.00000110	0.00000960	0.00003400
Water	80900	14&16 min, total	0.00001600	0.0000011	0.0000011	0.00001100	0.00000980	0.00001100	0.00004000
Water	80901	18&20 min, total	0.00001600	0.0000010	0.0000010	0.00000980	0.00000100	0.00000980	0.00003400
		Site Water							
Water	81603	Sample 1 Total	0.00000100	0.0000010	0.0000010	0.00000100	0.00000054	0.00000100	0.00000110
Water	81604	Sample 2 Total	0.00000140	0.0000010	0.0000010	0.00000100	0.00000049	0.00000100	0.00000140
Water	81605	Sample 3 Total	0.00000130	0.0000010	0.0000010	0.00000100	0.00000038	0.00000100	0.00000150
		Elutriate							
Water	81609	Sample 1 Dissolved	0.00000110	0.0000010	0.0000010	0.00000100	0.00000052	0.00000100	0.00000120
Water	81610	Sample 2 Dissolved	0.00000160	0.0000010	0.0000010	0.00000100	0.00000063	0.00000100	0.00000075
Water	81611	Sample 3 Dissolved	0.00000150	0.0000010	0.0000010	0.00000100	0.00000100	0.00000100	0.00000060
Water	81606	Sample 1 Total	0.00000100	0.0000010	0.0000010	0.00000100	0.00000100	0.00000100	0.00000075
Water	81607	Sample 2 Total	0.00000100	0.0000010	0.0000010	0.00000100	0.00000100	0.00000100	0.00000083
Water	81608	Sample 3 Total	0.00000100	0.0000010	0.0000010	0.00000100	0.00000100	0.00000100	0.00000079
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 70	PCB 77	PCB 82	PCB 86	PCB 87	PCB 97	PCB 101
		Detection Limit (mg/kg)	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
		Insitu Sediment							
Sediment	81717	Sample #1	0.00210	0.00077	0.00077	0.00077	0.00077	0.00077	0.00100
Sediment	81718	Sample #2	0.00200	0.00077	0.00077	0.00077	0.00077	0.00077	0.00120
Sediment	81719	Sample #3	0.00180	0.00077	0.00077	0.00077	0.00077	0.00077	0.00100

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## PCBs fine

## Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 105	PCB 114	PCB 118	PCB 121	PCB 128	PCB 136	PCB 137
		Detection Limit (mg/l)	0.00000110	0.00000110	0.00000110	0.0000011	0.0000011	0.0000011	0.0000011
Water	80983	Plume Monitoring							
Water	80948	Background, dissolved	0.00000041	0.00000100	0.00000077	0.0000010	0.0000010	0.0000010	0.0000010
Water	80948	Background, total	0.00000110	0.00000110	0.00000110	0.0000011	0.0000011	0.0000011	0.0000011
Water	80984	0-10 min, overflow, dissolved	0.00000037	0.00000066	0.00000051	0.0000010	0.0000010	0.0000010	0.0000010
Water	80985	10-20 min, overflow, dissolved	0.00000110	0.00000110	0.00000064	0.0000011	0.0000011	0.0000011	0.0000011
Water	80986	20-30 min, overflow, dissolved	0.00000041	0.00000060	0.00000045	0.0000010	0.0000010	0.0000010	0.0000010
Water	80949	0-10 min, overflow, total	0.00000100	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80950	10-20 min, overflow, total	0.00000100	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80951	20-30 min, overflow, total	0.00000100	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80987	0-10 min, non-overflow, dissolve	0.00000100	0.00000074	0.00000050	0.0000010	0.0000010	0.0000010	0.0000010
Water	80988	10-20 min, non-overflow, dissolve	0.00000040	0.00000100	0.00000046	0.0000010	0.0000010	0.0000010	0.0000010
Water	80989	20-30 min, non-overflow, dissolve	0.00000039	0.00000100	0.00000045	0.0000010	0.0000010	0.0000010	0.0000010
Water	80952	0-10 min, non-overflow, total	0.00000100	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80953	10-20 min, non-overflow, total	0.00000100	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80954	20-30 min, non-overflow, total	0.00000100	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
		Hopper Inflow Monitoring							
Water	81104	3& 6 min, dissolved	0.00000041	0.00000100	0.00000054	0.0000010	0.0000010	0.0000010	0.0000010
Water	81105	9&12 min, dissolved	0.00000056	0.00000100	0.00000045	0.0000010	0.0000010	0.0000010	0.0000010
Water	81106	15&18 min, dissolved	0.00000035	0.00000100	0.000000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	81107	21&24 min, dissolved	0.00000043	0.00000100	0.00000060	0.0000010	0.0000010	0.0000010	0.0000010
Water	81108	27&30 min, dissolved	0.00000037	0.00000100	0.000000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80891	3& 6 min, total	0.00000110	0.00000110	0.00000750	0.0000011	0.0000011	0.0000011	0.0000011
Water	80892	9&12 min, total	0.00000100	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80893	15&18 min, total	0.00000100	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	80894	21&24 min, total	0.00000110	0.00000110	0.00000110	0.0000011	0.0000011	0.0000011	0.0000011
Water	80895	27&30 min, total	0.00000110	0.00000110	0.00001900	0.0000011	0.0000011	0.0000011	0.0000011
		Hopper Overflow Monitoring							
Water	81109	2& 4 min, dissolved	0.00000047	0.00000100	0.00000065	0.0000010	0.0000010	0.0000010	0.0000010
Water	81110	6& 8 min, dissolved	0.00000090	0.00000100	0.00000065	0.0000010	0.0000010	0.0000010	0.0000010
Water	81111	10&12 min, dissolved	0.00000097	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
Water	81112	14&16 min, dissolved	0.00000036	0.00000100	0.00000068	0.0000010	0.0000010	0.0000010	0.0000010
Water	81113	18&20 min, dissolved	0.00000055	0.00000100	0.00000094	0.0000010	0.0000010	0.0000010	0.0000010
Water	80897	2& 4 min, total	0.00000110	0.00000110	0.00002400	0.0000011	0.0000011	0.0000011	0.0000011
Water	80898	6& 8 min, total	0.00000110	0.00000110	0.00002300	0.0000011	0.0000011	0.0000011	0.0000011
Water	80899	10&12 min, total	0.00000110	0.00000110	0.00003000	0.0000011	0.0000011	0.0000011	0.0000011
Water	80900	14&16 min, total	0.00000110	0.00000110	0.00003800	0.0000011	0.0000011	0.0000011	0.0000011
Water	80901	18&20 min, total	0.00000100	0.00000100	0.00003200	0.0000010	0.0000010	0.0000010	0.0000010
		Site Water							
Water	81603	Sample 1 Total	0.00000043	0.00000140	0.00000096	0.0000010	0.0000010	0.0000010	0.0000010
Water	81604	Sample 2 Total	0.00000054	0.00000140	0.00000093	0.0000010	0.0000010	0.0000010	0.0000010
Water	81605	Sample 3 Total	0.00000050	0.00000120	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
		Elutriate							
Water	81609	Sample 1 Dissolved	0.00000067	0.00000100	0.00000058	0.0000010	0.0000010	0.0000010	0.0000010
Water	81610	Sample 2 Dissolved	0.00000054	0.00000100	0.00000048	0.0000010	0.0000010	0.0000010	0.0000010
Water	81611	Sample 3 Dissolved	0.00000042	0.00000100	0.00000052	0.0000010	0.0000010	0.0000010	0.0000010
Water	81606	Sample 1 Total	0.00000068	0.00000100	0.00000120	0.0000010	0.0000010	0.0000010	0.0000010
Water	81607	Sample 2 Total	0.00000071	0.00000100	0.00000130	0.0000010	0.0000010	0.0000010	0.0000010
Water	81608	Sample 3 Total	0.00000064	0.00000100	0.00000100	0.0000010	0.0000010	0.0000010	0.0000010
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 105	PCB 114	PCB 118	PCB 121	PCB 128	PCB 136	PCB 137
		Detection Limit (mg/kg)	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
		In situ Sediment							
Sediment	81717	Sample #1	0.00077	0.00077	0.00098	0.00077	0.00077	0.00077	0.00077
Sediment	81718	Sample #2	0.00077	0.00077	0.00110	0.00077	0.00077	0.00077	0.00077
Sediment	81719	Sample #3	0.00077	0.00077	0.00100	0.00077	0.00077	0.00077	0.00077

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## PCBs fine

## Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 138	PCB 141	PCB 151	PCB 153	PCB 156	PCB 167	PCB 170
		Detection Limit (mg/l)	0.00000110	0.0000011	0.0000011	0.0000011	0.00000110	0.0000011	0.0000011
Water	80983	Plume Monitoring							
Water	80948	Background; dissolved	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	80948	Background; total	0.00000045	0.0000011	0.0000011	0.0000011	0.00000110	0.0000011	0.0000011
Water	80984	0-10 min, overflow, dissolved	0.00000100	0.0000010	0.0000010	0.0000010	0.00000030	0.0000010	0.0000010
Water	80985	10-20 min, overflow, dissolved	0.00000110	0.0000011	0.0000011	0.0000011	0.00000038	0.0000011	0.0000011
Water	80986	20-30 min, overflow, dissolved	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	80949	0-10 min, overflow, total	0.00000077	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	80950	10-20 min, overflow, total	0.00000066	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	80951	20-30 min, overflow, total	0.00000066	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	80987	0-10 min, non-overflow, dissolve	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	80988	10-20 min, non-overflow, dissolve	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	80989	20-30 min, non-overflow, dissolve	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	80952	0-10 min, non-overflow, total	0.00000061	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	80953	10-20 min, non-overflow, total	0.00000057	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	80954	20-30 min, non-overflow, total	0.00000045	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
		Hopper Inflow Monitoring							
Water	81104	3& 6 min, dissolved	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	81105	9&12 min, dissolved	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	81106	15&18 min, dissolved	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	81107	21&24 min, dissolved	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	81108	27&30 min, dissolved	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	80891	3& 6 min, total	0.00001400	0.0000011	0.0000027	0.0000011	0.00000110	0.0000011	0.0000011
Water	80892	9&12 min, total	0.00003400	0.0000010	0.0000058	0.0000010	0.00000100	0.0000010	0.0000010
Water	80893	15&18 min, total	0.00002300	0.0000010	0.0000062	0.0000010	0.00000100	0.0000010	0.0000010
Water	80894	21&24 min, total	0.00002400	0.0000011	0.0000045	0.0000011	0.00000350	0.0000021	0.0000086
Water	80895	27&30 min, total	0.00000110	0.0000011	0.0000089	0.0000011	0.00000110	0.0000011	0.0000011
		Hopper Overflow Monitoring							
Water	81109	2& 4 min, dissolved	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	81110	6& 8 min, dissolved	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	81111	10&12 min, dissolved	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	81112	14&16 min, dissolved	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	81113	18&20 min, dissolved	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	80897	2& 4 min, total	0.00000110	0.0000010	0.0000098	0.0000011	0.00000110	0.0000011	0.0000011
Water	80898	6& 8 min, total	0.00000110	0.0000010	0.0000094	0.0000011	0.00000760	0.0000011	0.0000011
Water	80899	10&12 min, total	0.00000110	0.0000010	0.00000120	0.0000011	0.00000790	0.0000011	0.0000011
Water	80900	14&16 min, total	0.00000110	0.0000010	0.00000190	0.0000011	0.00001200	0.0000011	0.0000011
Water	80901	18&20 min, total	0.00000100	0.0000010	0.00000110	0.0000010	0.00000790	0.0000010	0.0000010
		Site Water							
Water	81603	Sample 1 Total	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	81604	Sample 2 Total	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	81605	Sample 3 Total	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
		Elutriate							
Water	81609	Sample 1 Dissolved	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	81610	Sample 2 Dissolved	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	81611	Sample 3 Dissolved	0.00000100	0.0000010	0.0000010	0.0000010	0.00000100	0.0000010	0.0000010
Water	81606	Sample 1 Total	0.00000100	0.0000010	0.0000010	0.0000012	0.00000100	0.0000010	0.0000010
Water	81607	Sample 2 Total	0.00000100	0.0000010	0.0000010	0.0000012	0.00000100	0.0000010	0.0000010
Water	81608	Sample 3 Total	0.00000100	0.0000010	0.0000010	0.0000013	0.00000100	0.0000010	0.0000010
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 138	PCB 141	PCB 151	PCB 153	PCB 156	PCB 167	PCB 170
		Detection Limit (mg/kg)	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
		Insitu Sediment							
Sediment	81717	Sample #1	0.00077	0.00077	0.00077	0.00150	0.00077	0.00077	0.00077
Sediment	81718	Sample #2	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
Sediment	81719	Sample #3	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## PCBs fine

## Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 171	PCB 180	PCB 182	PCB 183	PCB 185	PCB 187	PCB 189
		Detection Limit (mg/l)	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80983	Plume Monitoring Background, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80948	Background, total	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80984	0-10 min, overflow, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80985	10-20 min, overflow, dissolved	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80986	20-30 min, overflow, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80949	0-10 min, overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80950	10-20 min, overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80951	20-30 min, overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80987	0-10 min, non-overflow, dissolve	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80988	10-20 min, non-overflow, dissolve	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80989	20-30 min, non-overflow, dissolve	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80952	0-10 min, non-overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80953	10-20 min, non-overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80954	20-30 min, non-overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
		Hopper Inflow Monitoring							
Water	81104	3& 6 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81105	9&12 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81106	15&18 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81107	21&24 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81108	27&30 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80891	3& 6 min, total	0.0000012	0.0000011	0.0000011	0.0000029	0.0000046	0.0000092	0.0000011
Water	80892	9&12 min, total	0.0000034	0.0000010	0.0000010	0.0000068	0.0000010	0.0000210	0.0000010
Water	80893	15&18 min, total	0.0000022	0.0000010	0.0000010	0.0000038	0.0000010	0.0000140	0.0000010
Water	80894	21&24 min, total	0.0000011	0.00000280	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80895	27&30 min, total	0.0000011	0.00000490	0.0000011	0.0000022	0.0000011	0.0000011	0.0000011
		Hopper Overflow Monitoring							
Water	81109	2& 4 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81110	6& 8 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81111	10&12 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81112	14&16 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81113	18&20 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80897	2& 4 min, total	0.0000011	0.0000590	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80898	6& 8 min, total	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80899	10&12 min, total	0.0000069	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80900	14&16 min, total	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80901	18&20 min, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
		Site Water							
Water	81603	Sample 1 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81604	Sample 2 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81605	Sample 3 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
		Elutriate							
Water	81609	Sample 1 Dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81610	Sample 2 Dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81611	Sample 3 Dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81606	Sample 1 Total	0.0000010	0.0000016	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81607	Sample 2 Total	0.0000010	0.0000018	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81608	Sample 3 Total	0.0000010	0.0000016	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 171	PCB 180	PCB 182	PCB 183	PCB 185	PCB 187	PCB 189
		Detection Limit (mg/kg)	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
		Insitu Sediment							
Sediment	81717	Sample #1	0.00077	0.00150	0.00077	0.00077	0.00077	0.00077	0.00077
Sediment	81718	Sample #2	0.00077	0.00140	0.00077	0.00077	0.00077	0.00077	0.00077
Sediment	81719	Sample #3	0.00077	0.00160	0.00077	0.00077	0.00077	0.00100	0.00077

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## PCBs fine

## Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 191	PCB 194	PCB 195	PCB 196	PCB 201	PCB 203	PCB 205
		Detection Limit (mg/l)	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80983	Plume Monitoring							
Water	80948	Background, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80948	Background, total	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80984	0-10 min, overflow, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80985	10-20 min, overflow, dissolved	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
Water	80986	20-30 min, overflow, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80949	0-10 min, overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80950	10-20 min, overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80951	20-30 min, overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80987	0-10 min, non-overflow, dissolve	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80988	10-20 min, non-overflow, dissolve	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80989	20-30 min, non-overflow, dissolve	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80952	0-10 min, non-overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80953	10-20 min, non-overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80954	20-30 min, non-overflow, total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
		Hopper Inflow Monitoring							
Water	81104	3& 6 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81105	9&12 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81106	15&18 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81107	21&24 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81108	27&30 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80891	3& 6 min, total	0.0000011	0.0000011	0.0000090	0.0000026	0.0000011	0.0000011	0.0000011
Water	80892	9&12 min, total	0.0000010	0.0000010	0.0000026	0.0000065	0.0000010	0.0000010	0.0000010
Water	80893	15&18 min, total	0.0000010	0.0000010	0.0000016	0.0000039	0.0000010	0.0000010	0.0000010
Water	80894	21&24 min, total	0.0000011	0.0000011	0.0000011	0.0000036	0.0000011	0.0000011	0.0000011
Water	80895	27&30 min, total	0.0000011	0.0000011	0.0000011	0.0000080	0.0000011	0.0000011	0.0000011
		Hopper Overflow Monitoring							
Water	81109	2& 4 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81110	6& 8 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81111	10&12 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81112	14&16 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81113	18&20 min, dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	80897	2& 4 min, total	0.0000011	0.0000011	0.0000041	0.0000110	0.0000011	0.0000011	0.0000011
Water	80898	6& 8 min, total	0.0000011	0.0000011	0.0000081	0.0000067	0.0000011	0.0000011	0.0000011
Water	80899	10&12 min, total	0.0000011	0.0000011	0.0000044	0.0000100	0.0000011	0.0000011	0.0000011
Water	80900	14&16 min, total	0.0000011	0.0000011	0.0000010	0.0000090	0.0000011	0.0000011	0.0000011
Water	80901	18&20 min, total	0.0000010	0.0000010	0.00000150	0.0000097	0.0000010	0.0000010	0.0000010
		Site Water							
Water	81603	Sample 1 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81604	Sample 2 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81605	Sample 3 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
		Elutriate							
Water	81609	Sample 1 Dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81610	Sample 2 Dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81611	Sample 3 Dissolved	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81606	Sample 1 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81607	Sample 2 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
Water	81608	Sample 3 Total	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 191	PCB 194	PCB 195	PCB 196	PCB 201	PCB 203	PCB 205
		Detection Limit (mg/kg)	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
		In situ Sediment							
Sediment	81717	Sample #1	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
Sediment	81718	Sample #2	0.00077	0.00077	0.00077	0.00033	0.00077	0.00082	0.00077
Sediment	81719	Sample #3	0.00077	0.00077	0.00077	0.00025	0.00077	0.00084	0.00077

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## PCBs fine

## Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 206	PCB 207	PCB 208	PCB 209	PCB 66	PCB 190	PCB 198
		Detection Limit (mg/l)	0.0000011	0.00000110	0.00000110		0.0000011	0.0000011	0.0000011
Water	80983	Plume Monitoring							
Water	80948	Background, dissolved	0.0000025	0.00000095	0.00000130	106.45%	0.0000010	0.0000010	0.0000010
Water	80948	Background, total	0.0000017	0.00000110	0.00000081	74.06%	0.0000011	0.0000011	0.0000011
Water	80984	0-10 min, overflow, dissolved	0.0000024	0.00000090	0.00000150	92.43%	0.0000010	0.0000010	0.0000010
Water	80985	10-20 min, overflow, dissolved	0.0000027	0.00000110	0.00000170	100.50%	0.0000011	0.0000011	0.0000011
Water	80986	20-30 min, overflow, dissolved	0.0000026	0.00000110	0.00000140	99.77%	0.0000010	0.0000010	0.0000010
Water	80949	0-10 min, overflow, total	0.0000020	0.00000100	0.00000092	64.53%	0.0000010	0.0000010	0.0000010
Water	80950	10-20 min, overflow, total	0.0000020	0.00000100	0.00000085	75.26%	0.0000010	0.0000010	0.0000010
Water	80951	20-30 min, overflow, total	0.0000020	0.00000100	0.00000089	81.36%	0.0000010	0.0000010	0.0000010
Water	80987	0-10 min, non-overflow, dissolve	0.0000026	0.00000095	0.00000140	101.88%	0.0000010	0.0000010	0.0000010
Water	80988	10-20 min, non-overflow, dissolve	0.0000025	0.00000074	0.00000130	104.87%	0.0000010	0.0000010	0.0000010
Water	80989	20-30 min, non-overflow, dissolve	0.0000024	0.00000071	0.00000120	112.74%	0.0000010	0.0000010	0.0000010
Water	80952	0-10 min, non-overflow, total	0.0000016	0.00000100	0.00000074	80.06%	0.0000010	0.0000010	0.0000010
Water	80953	10-20 min, non-overflow, total	0.0000017	0.00000100	0.00000075	88.73%	0.0000010	0.0000010	0.0000010
Water	80954	20-30 min, non-overflow, total	0.0000017	0.00000100	0.00000083	87.12%	0.0000010	0.0000010	0.0000010
		Hopper Inflow Monitoring							
Water	81104	3& 6 min, dissolved	0.0000016	0.00000049	0.00000077	90.09%	0.0000010	0.0000010	0.0000010
Water	81105	9&12 min, dissolved	0.0000019	0.00000056	0.00000087	86.49%	0.0000010	0.0000010	0.0000010
Water	81106	15&18 min, dissolved	0.0000019	0.00000040	0.00000150	87.34%	0.0000010	0.0000010	0.0000010
Water	81107	21&24 min, dissolved	0.0000021	0.00000065	0.00000100	94.48%	0.0000010	0.0000010	0.0000010
Water	81108	27&30 min, dissolved	0.0000017	0.00000054	0.00000094	72.89%	0.0000010	0.0000010	0.0000010
Water	80891	3& 6 min, total	0.0000410	0.00000280	0.00001700	97.66%	0.0000011	0.0000011	0.0000011
Water	80892	9&12 min, total	0.0000900	0.00000530	0.00004100	58.62%	0.0000010	0.0000010	0.0000010
Water	80893	15&18 min, total	0.0000580	0.00000650	0.00002500	108.63%	0.0000010	0.0000010	0.0000010
Water	80894	21&24 min, total	0.0000460	0.00000190	0.00001900	108.06%	0.0000011	0.0000011	0.0000011
Water	80895	27&30 min, total	0.0000920	0.00000620	0.00004000	124.79%	0.0000011	0.0000011	0.0000011
		Hopper Overflow Monitoring							
Water	81109	2& 4 min, dissolved	0.0000019	0.00000037	0.00000061	81.94%	0.0000010	0.0000010	0.0000010
Water	81110	6& 8 min, dissolved	0.0000016	0.00000100	0.00000061	78.71%	0.0000010	0.0000010	0.0000010
Water	81111	10&12 min, dissolved	0.0000017	0.00000100	0.00000084	88.72%	0.0000010	0.0000010	0.0000010
Water	81112	14&16 min, dissolved	0.0000018	0.00000043	0.00000086	83.24%	0.0000010	0.0000010	0.0000010
Water	81113	18&20 min, dissolved	0.0000016	0.00000043	0.00000077	80.18%	0.0000010	0.0000010	0.0000010
Water	80897	2& 4 min, total	0.0001700	0.00000960	0.00007400	220.34%	0.0000011	0.0000011	0.0000011
Water	80898	6& 8 min, total	0.0001200	0.00000720	0.00005100	213.26%	0.0000011	0.0000011	0.0000011
Water	80899	10&12 min, total	0.0001200	0.00000860	0.00005200	175.12%	0.0000011	0.0000011	0.0000011
Water	80900	14&16 min, total	0.0001300	0.00001000	0.00005800	216.74%	0.0000011	0.0000011	0.0000011
Water	80901	18&20 min, total	0.0001200	0.00000840	0.00005900	186.63%	0.0000010	0.0000010	0.0000010
		Site Water							
Water	81603	Sample 1 Total	0.0000028	0.00000062	0.00000110	101.92%	0.0000010	0.0000010	0.0000010
Water	81604	Sample 2 Total	0.0000024	0.00000100	0.00000100	90.51%	0.0000010	0.0000010	0.0000010
Water	81605	Sample 3 Total	0.0000022	0.00000100	0.00000092	90.22%	0.0000010	0.0000010	0.0000010
		Elutriate							
Water	81609	Sample 1 Dissolved	0.0000018	0.00000027	0.00000058	86.71%	0.0000010	0.0000010	0.0000010
Water	81610	Sample 2 Dissolved	0.0000021	0.00000029	0.00000085	96.44%	0.0000010	0.0000010	0.0000010
Water	81611	Sample 3 Dissolved	0.0000021	0.00000054	0.00000078	101.29%	0.0000010	0.0000010	0.0000010
Water	81606	Sample 1 Total	0.0000052	0.00000059	0.00000270	91.62%	0.0000010	0.0000010	0.0000010
Water	81607	Sample 2 Total	0.0000051	0.00000100	0.00000270	90.36%	0.0000010	0.0000010	0.0000010
Water	81608	Sample 3 Total	0.0000052	0.00000068	0.00000280	88.66%	0.0000010	0.0000010	0.0000010
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 206	PCB 207	PCB 208	PCB 209	PCB 66	PCB 190	PCB 198
		Detection Limit (mg/kg)	0.00077	0.00077	0.00077		0.00077	0.00077	0.00077
		Insitu Sediment							
Sediment	81717	Sample #1	0.00390	0.00048	0.00220	106.21%	0.00077	0.00077	0.00077
Sediment	81718	Sample #2	0.00120	0.00077	0.00210	105.19%	0.00077	0.00077	0.00077
Sediment	81719	Sample #3	0.00370	0.00077	0.00180	98.01%	0.00077	0.00077	0.00077

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 200
-------------	-----------	-------------	---------

		Detection Limit (mg/l)	0.0000011
--	--	------------------------	-----------

Water	80983	Plume Monitoring Background, dissolved	<b>0.0000010</b>
Water	80948	Background, total	<b>0.0000011</b>
Water	80984	0-10 min, overflow, dissolved	<b>0.0000010</b>
Water	80985	10-20 min, overflow, dissolved	<b>0.0000011</b>
Water	80986	20-30 min, overflow, dissolved	<b>0.0000010</b>
Water	80949	0-10 min, overflow, total	<b>0.0000010</b>
Water	80950	10-20 min, overflow, total	<b>0.0000010</b>
Water	80951	20-30 min, overflow, total	<b>0.0000010</b>
Water	80987	0-10 min, non-overflow, dissolve	<b>0.0000010</b>
Water	80988	10-20 min, non-overflow, dissolve	<b>0.0000010</b>
Water	80989	20-30 min, non-overflow, dissolve	<b>0.0000010</b>
Water	80952	0-10 min, non-overflow, total	<b>0.0000010</b>
Water	80953	10-20 min, non-overflow, total	<b>0.0000010</b>
Water	80954	20-30 min, non-overflow, total	<b>0.0000010</b>

Water	81104	Hopper Inflow Monitoring 3& 6 min, dissolved	<b>0.0000010</b>
Water	81105	9&12 min, dissolved	<b>0.0000010</b>
Water	81106	15&18 min, dissolved	<b>0.0000010</b>
Water	81107	21&24 min, dissolved	<b>0.0000010</b>
Water	81108	27&30 min, dissolved	<b>0.0000010</b>
Water	80891	3& 6 min, total	0.0000015
Water	80892	9&12 min, total	0.0000034
Water	80893	15&18 min, total	0.0000020
Water	80894	21&24 min, total	0.0000019
Water	80895	27&30 min, total	<b>0.0000011</b>

Water	81109	Hopper Overflow Monitoring 2& 4 min, dissolved	<b>0.0000010</b>
Water	81110	6& 8 min, dissolved	<b>0.0000010</b>
Water	81111	10&12 min, dissolved	<b>0.0000010</b>
Water	81112	14&16 min, dissolved	<b>0.0000010</b>
Water	81113	18&20 min, dissolved	<b>0.0000010</b>
Water	80897	2& 4 min, total	<b>0.0000011</b>
Water	80898	6& 8 min, total	0.0000033
Water	80899	10&12 min, total	0.0000064
Water	80900	14&16 min, total	<b>0.0000011</b>
Water	80901	18&20 min, total	<b>0.0000010</b>

Water	81603	Site Water Sample 1 Total	<b>0.0000010</b>
Water	81604	Sample 2 Total	<b>0.0000010</b>
Water	81605	Sample 3 Total	<b>0.0000010</b>

Water	81609	Elutriate Sample 1 Dissolved	<b>0.0000010</b>
Water	81610	Sample 2 Dissolved	<b>0.0000010</b>
Water	81611	Sample 3 Dissolved	<b>0.0000010</b>
Water	81606	Sample 1 Total	<b>0.0000010</b>
Water	81607	Sample 2 Total	<b>0.0000010</b>
Water	81608	Sample 3 Total	<b>0.0000010</b>

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 200
-------------	-----------	-------------	---------

		Detection Limit (mg/kg)	0.00077
--	--	-------------------------	---------

Sediment	81717	Insitu Sediment Sample #1	<b>0.00077</b>
Sediment	81718	Sample #2	<b>0.00077</b>
Sediment	81719	Sample #3	<b>0.00077</b>

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## tssfine

## Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	TSS										TS		
		Detection Limit (mg/l)	4										Det Limit	4	
Water	81224	Plume Monitoring Background	10 min	39	152	34	30	47	50 min				Plume Monitoring Background		
Water	81225	TSS Top Depth		48	91	55	45	50						5710	
Water	81226	TSS Mid-Depth		110	35	98	144	80							
Water	81269	Plume Monitoring Non-Overflow	1 min	3 min	5 min	7 min	9 min	12 min	15 min	20 min	25 min	30 min	Plume Monitoring NOF		
Water	81270	TSS Top Depth		41	35	28	33	36	23	28	27	21	Sample 1	5880	
Water	81271	TSS Mid-Depth		54	89	47	41	70	41	31	37	30	Sample 2	5740	
Water	81271	TSS Bottom Depth		116	105	78	47	83	68	57	82	53	Sample 3	5480	
Water	81239	Plume Monitoring Overflow	1 min	3 min	5 min	7 min	9 min	12 min	15 min	20 min	25 min	30 min	Plume Monitoring OF		
Water	81240	TSS Top Depth		102	314	55	204	90	280	147	83	57	Sample 1	4310	
Water	81241	TSS Mid-Depth		118	376	155	288	160	138	118	162	83	Sample 2	4200	
Water	81241	TSS Bottom Depth		206	177	335	388	504	275	186	247	287	Sample 3	3882	
Water	81324	Hopper Inflow	3 min	6 min	9 min	12 min	15 min	18 min	21 min	24 min	27 min	30 min	Hopper Inflow		
Water	81324	TSS (mg/l)		1760	12880	3140	27767	43933	27900	7290	28667	83933	47987	Sample 1	30787
Water	81324												Sample 2	84490	
Water	81324												Sample 3	127760	
Water	81324												Sample 4	37940	
Water	81324												Sample 5	151910	
Water	81352	Hopper Contents Beginning of Overflow	Location 1	93367	Location 2	65267	Location 3	69733							
Water	81353	TSS Top Depth		33233		55900		102433							
Water	81354	TSS Mid-Depth		127167		145200		119000							
Water	81361	Hopper Contents End of Overflow	Location 1	71067	Location 2	81233	Location 3	29067							
Water	81362	TSS Top Depth		108533		52033		93267							
Water	81363	TSS Mid-Depth		60467		121533		138033							
Water	81044	Hopper Overflow	0.5 min	1.0 min	1.5 min	2.0 min	2.5 min	3.0 min	3.5 min	4.0 min	4.5 min	5.0 min	Hopper Overflow		
Water	81044	TSS (mg/l)		64260	41733	95367	75333	57567	105900	110300	102600	72400	92800	Sample 1	154430
Water	81054	Hopper Overflow	5.5 min	6.0 min	6.5 min	7.0 min	7.5 min	8.0 min	8.5 min	9.0 min	9.5 min	10.0 min	Hopper Overflow		
Water	81054	TSS (mg/l)		117967	93833	66633	40233	56733	97167	44200	29233	50667	29233	Sample 2	145210
Water	81064	Hopper Overflow	10.5 min	11.0 min	11.5 min	12.0 min	12.5 min	13.0 min	13.5 min	14.0 min	14.5 min	15.0 min	Hopper Overflow		
Water	81064	TSS (mg/l)		48200	58000	15700	63700	78100	62400	27767	89033	41987	143333	Sample 3	126870
Water	81074	Hopper Overflow	15.5 min	16.0 min	16.5 min	17.0 min	17.5 min	18.0 min	18.5 min	19.0 min	19.5 min	20.0 min	Hopper Overflow		
Water	81074	TSS (mg/l)		52100	48267	137167	136467	79833	108600	159133	123700	128633	79167	Sample 4	167600
Water	81074												Sample 5	170300	
			TSS										TS		
Water	81675	Site Water											Site Water		
Water	81675	Sample 1 Total		58									Sample 1 T		
Water	81676	Sample 2 Total		63									Sample 2 T		
Water	81677	Sample 3 Total		65									Sample 3 T		
Water	81681	Elutriate											Elutriate		
Water	81681	Sample 1 Dissolved		8									Sample 1 D		
Water	81682	Sample 2 Dissolved		12									Sample 2 D		
Water	81683	Sample 3 Dissolved		11									Sample 3 D		
Water	81678	Sample 1 Total		304									Sample 1 T		
Water	81679	Sample 2 Total		282									Sample 2 T		
Water	81680	Sample 3 Total		292									Sample 3 T		

## Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	TOC
		Detection Limit (mg/l)	3.00
Water	80969	Plume Monitoring Background, dissolved	6.12
Water	80927	Background, total	7.30
Water	80970	0-10 min, overflow, dissolved	3.07
Water	80971	10-20 min, overflow, dissolved	2.91
Water	80972	20-30 min, overflow, dissolved	2.74
Water	80928	0-10 min, overflow, total	10.70
Water	80923	10-20 min, overflow, total	11.30
Water	80930	20-30 min, overflow, total	8.09
Water	80973	0-10 min, non-overflow, dissolved	4.68
Water	80974	10-20 min, non-overflow, dissolved	6.35
Water	80975	20-30 min, non-overflow, dissolved	5.19
Water	80931	0-10 min, non-overflow, total	6.92
Water	80932	10-20 min, non-overflow, total	7.44
Water	80933	20-30 min, non-overflow, total	8.69
		Hopper Inflow Monitoring	
Water	81084	3& 6 min, dissolved	24.80
Water	81085	9&12 min, dissolved	47.30
Water	81086	15&18 min, dissolved	64.60
Water	81087	21&24 min, dissolved	19.00
Water	81088	27&30 min, dissolved	63.00
Water	80855	3& 6 min, total	1010.00
Water	80856	9&12 min, total	3300.00
Water	80857	15&18 min, total	6030.00
Water	80858	21&24 min, total	1170.00
Water	80859	27&30 min, total	6460.00
		Hopper Overflow Monitoring	
Water	81089	2& 4 min, dissolved	14.10
Water	81090	6& 8 min, dissolved	11.90
Water	81091	10&12 min, dissolved	72.30
Water	81092	14&16 min, dissolved	79.20
Water	81093	18&20 min, dissolved	21.40
Water	80861	2& 4 min, total	6660.00
Water	80862	6& 8 min, total	5930.00
Water	80863	10&12 min, total	5280.00
Water	80864	14&16 min, total	6800.00
Water	80865	18&20 min, total	7150.00
		Site Water	
Water	81693	Sample 1 Total	3.00
Water	81694	Sample 2 Total	3.00
Water	81695	Sample 3 Total	3.00
		Elutriate	
Water	81699	Sample 1 Dissolved	3.00
Water	81700	Sample 2 Dissolved	3.00
Water	81701	Sample 3 Dissolved	3.00
Water	81696	Sample 1 Total	1.48
Water	81697	Sample 2 Total	1.43
Water	81698	Sample 3 Total	1.92
SAMPLE TYPE	SAMPLE ID	DESCRIPTION	TOC
		Detection Limit (mg/kg)	3.0
		Insitu Sediment	
Sediment	81723	Sample #1	8090.0
Sediment	81724	Sample #2	7200.0
Sediment	81725	Sample #3	7520.0

BOLD - less than values

Values below less than values are estimated results. Results are less than the reporting limit.

## spgrfine

## Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	Sp. Gr.	%Moisture
In situ Sediment				
Sediment	81299	Sample #1	2.73	191.58%
Sediment	81300	Sample #2	2.75	254.93%
Sediment	81301	Sample #3	2.76	203.04%
Sediment	81302	Sample #4	2.74	181.93%
Sediment	81303	Sample #5	2.75	166.58%
Sediment	81304	Sample #6	2.72	117.93%
Sediment	81305	Sample #7	2.71	164.93%
Sediment	81306	Sample #8	2.72	108.57%
Sediment	81307	Sample #9	2.71	94.57%
Sediment	81308	Sample #10	2.73	103.87%
Sediment	81309	Sample #11	2.73	102.13%
Sediment	81310	Sample #12	2.73	130.69%
Sediment	81311	Sample #13	2.71	172.19%
Sediment	81312	Sample #14	2.72	156.47%
Sediment	81313	Sample #15	2.73	79.16%
		Average	2.73	148.57%

**APPENDIX B**

**Plume Study Field Activities and Data Results**

## Preface

This section of the report describes field activities and data results from the relative acoustic backscatter channel cross-sections with the OBS overlay. The investigators who participated in this part of the project were Messrs. Timothy L. Fagerburg, Howard A. Benson, and Terry N. Waller, all of CHL, and William H. Dulaney, SL.

This section of the report was written by Messrs. Benson and Fagerburg, with assistance in data processing from Messrs. Waller, Martin T. Hebler, Mses. Clara J. Coleman and Jane M. Vaughan, all of CHL, and Mr. Daryl P. Cook, DIMCO, Inc.

## Field Procedure

Two test areas were selected for monitoring. Reach 1, was a coarse-grained material site located near the Brandywine Range, in lower Delaware Bay. Reach 2, was a fine-grained material site located at the Deepwater Pt. Range near New Castle, DE (Figure 1). Channel cross-sectional transects were conducted with the ADCP and OBS sensor at several pre-determined transect lines in the test areas for non-overflow and overflow dredge operations. Several transects were monitored prior to the dredge passing to establish background conditions. The dredge would then begin dredging operations and the transect boat would run continuous transects behind it to determine the extent and dispersion of the plume. The first set of transects at each test area were made during the hopper dredge filling without any overflow. The dredge would then proceed to the dumping area, empty his load, and return to the site for the second test. Prior to the second test, data would be collected at several transect line again to reestablish background conditions. The second dredging operation would include several minutes of hopper overflow while dredging. Again the transect boat would run continuous transects behind it to determine the extent and dispersion of the plume.

Monitoring the sediment plume was accomplished using a boat-mounted RD Instruments 1200-kHz Broad-Band Acoustic Doppler Current Profiler (ADCP). The instrument collects velocity vectors in the water column together with backscatter levels to determine the position and relative intensity of the sediment plume. A detailed description of the ADCP is presented in the Equipment section.

Along with the ADCP, a MicroLite recording instrument with an Optical Backscatterance (OBS) Sensor was towed by the vessel at a depth of fifteen feet. The MicroLite recorded data at 0.5 sec intervals. A detailed description of the MicroLite is also presented in the Equipment section.

Navigation data for monitoring was obtained by a Starlink differential Global Positioning System (GPS). The GPS monitors the boat position from the starting and ending points along each transect. The manufacturer stated accuracy of the navigation system is  $\pm 1$  m. The navigation data was recorded at 1-sec intervals for merging with the ADCP and OBS data.

In-Situ Sediment samples were collected prior to the dredging tests at both sites. Bottom samples were collected using a grab-type sampling bucket described in the Equipment section. Water samples for pore-water and toxicity tests were obtained using a portable pump sampler also described in the Equipment section. Types of samples, and the tests and analyses of the samples, are reported elsewhere in the report.

### Dredge Plume Monitoring

The data presented in Figures 2-15 represent a time history of the changes in suspended material levels in the water column resulting from dredge operations within each test area. The relative backscatter intensity of the ADCP acoustic signal is described as the strength of the return acoustic signal as it is affected by material suspended in the water column. Changes in levels of suspended material affect the acoustic reflectivity properties of the water column and in turn have an effect on the strength of the return signal intensity (decibels). High levels of suspended material in the water column result in high levels of acoustic intensity. The ADCP acoustic intensity data were utilized to identify levels of suspended material in the water column before, during, and following dredging operations.

As stated previously, transects were monitored in each test area to obtain the background levels of suspended materials prior to any dredging activities. The background levels shown in Figures 2 and 5 and in 9 and 12 are for the two test areas, Brandywine Range (Reach 1) and Deepwater Pt. Range (Reach 2), respectively.

Figures 2-4 illustrate the residence time of the sediment plume resulting from non-overflow dredging operation in the Reach 1. The background levels are shown in Figure 2. Figure 3 shows the vertical and horizontal dimensions of the sediment plume immediately behind the dredge. Figure 4 shows the level of suspended material in the water column 8 minutes following the dredge passing indicating that background levels of suspended material are returning to the site. No lateral dispersion of the plume out of channel was observed during the non-overflow dredging operation.

Figures 5-8 illustrate the residence time of the sediment plume created with hopper-overflow conditions during dredging operations in Reach 1. Background levels of suspended materials prior to the dredging operations are shown in Figure 5. The vertical and horizontal dimensions of the sediment plume immediately behind the dredge while hopper over-flow conditions are occurring are shown in Figure 6. Plume dimensions 4 min after the dredge passed are shown in Figure 7. A wider transect was performed, as seen in the horizontal distance scale, to determine the lateral extent of the plume. No significant change above background levels could be detected. At 1 hr elapsed time following the end of the overflow dredging operation, the levels of suspended material were found to have returned to background conditions as shown in Figure 8. Again, no lateral dispersion of the plume out of the channel area was observed.

Figures 9-11 illustrate the residence time of the sediment plume created from non-overflow conditions during dredging operations in the Reach 2 area. At the beginning of the dredging operations background suspended material levels are shown in Figure 9. The plume dimensions in the lateral and vertical directions immediately behind the dredge at the start of dredging operations are shown in Figure 10. After an elapsed time of 19 min (Figure 11), following the end of dredging operations, the levels of suspended material had returned to background conditions. During this dredging operation the tidal flow in the dredging area had reversed from flood flow to ebb flow conditions. This accounts for the relative change in background levels seen between Figure 9 and Figure 11. Despite the changes in background levels due to the change in direction of flow in the dredging area, no lateral movement of the plume beyond the channel limits was observed.

Figures 12-15 illustrate the residence time of the dredge plume resulting from hopper overflow dredging conditions in the Reach 2 area. Background levels prior to dredging operations are shown in Figure 12. The sediment plume dimensions immediately behind the dredge prior to overflow conditions can be seen in Figure 13. Note the increase in the suspended material levels within the first 400 ft of the transect. The increase in these levels is due to the increase in the ebb flow velocities and the resulting disturbance of bottom materials from near bottom velocities and not dredge plume dispersion. When hopper overflow conditions began another transect was performed located immediately behind the dredge as shown in Figure 14. The width of the transect was also increased, as indicated in the length of the horizontal distance scale, to observe the lateral extent of the dispersion of the dredge plume. After an elapsed time of 1 hr following the completion of the overflow dredging operation, Figure 15 indicates that the levels of suspended materials had returned to background conditions. Note the increase in sediment disturbance near the bottom in the shallow portions of the transect which are due to the increase in the velocities during the ebb cycle of the tide. As in the previous dredge operations,

no lateral dispersion of the dredge plume beyond the channel limits was observed to have occurred.

The OBS data shown in Figures 2-15 were used to see if there is a correlation between the relative acoustic backscatter from the ADCP with different levels of turbidity for the OBS sensor. The figures indicate a fairly good correlation as increases in the ADCP relative acoustic intensities correspond to similar increases in the turbidity levels from the OBS sensor. Since the OBS sensor was deployed at a fixed depth, relative changes in turbidity throughout the water column were not measured.

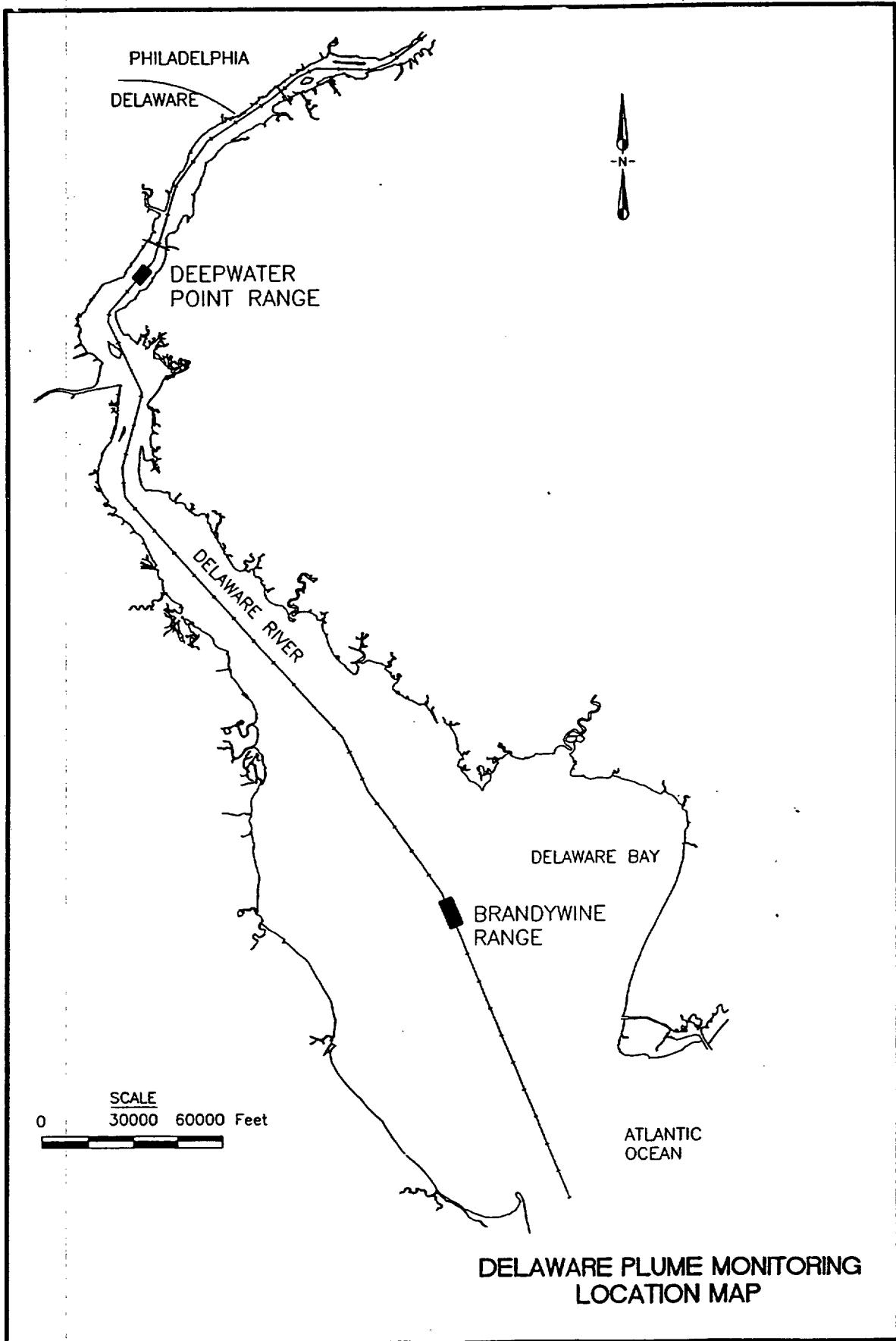


Figure 1

Figure 2

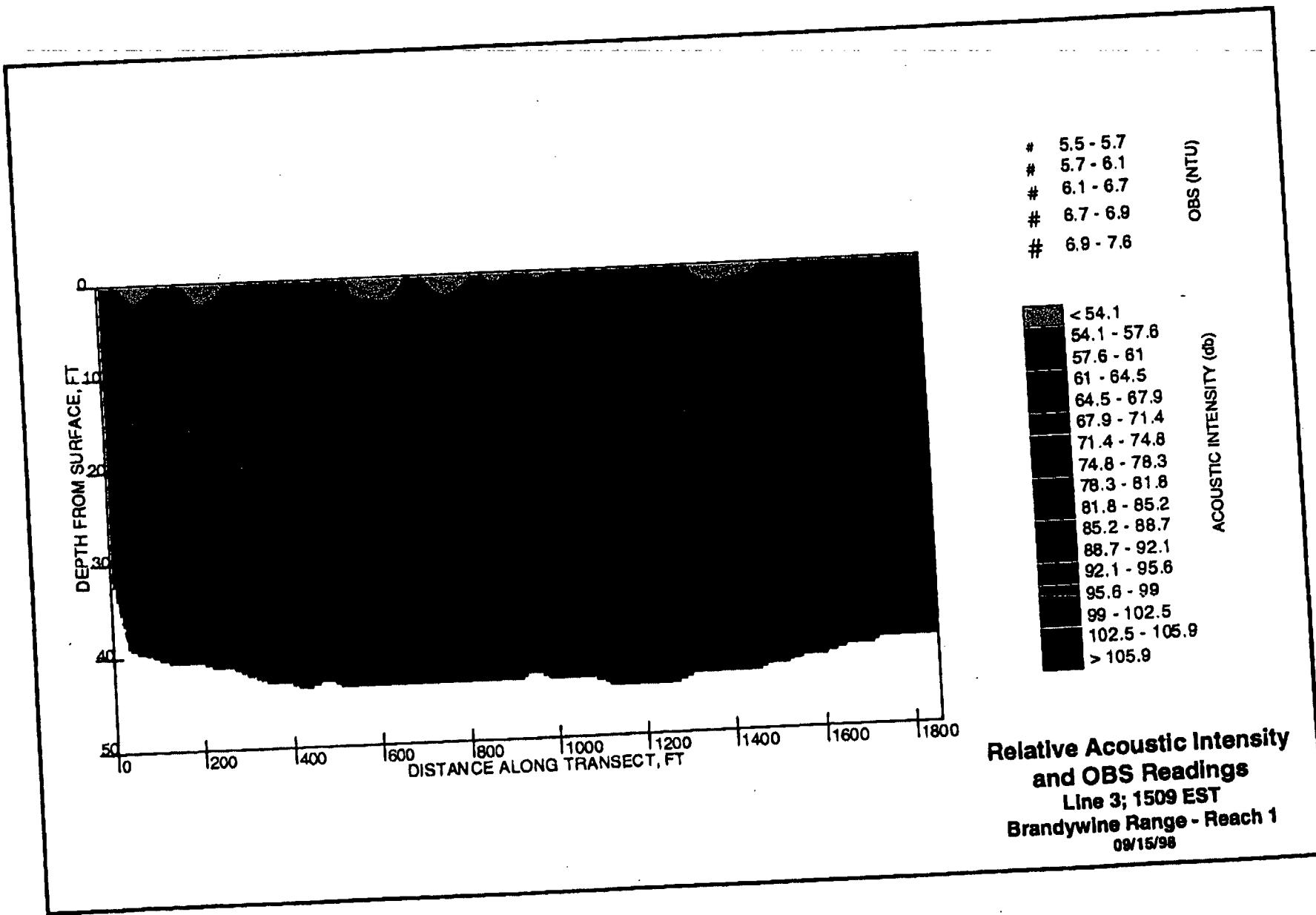
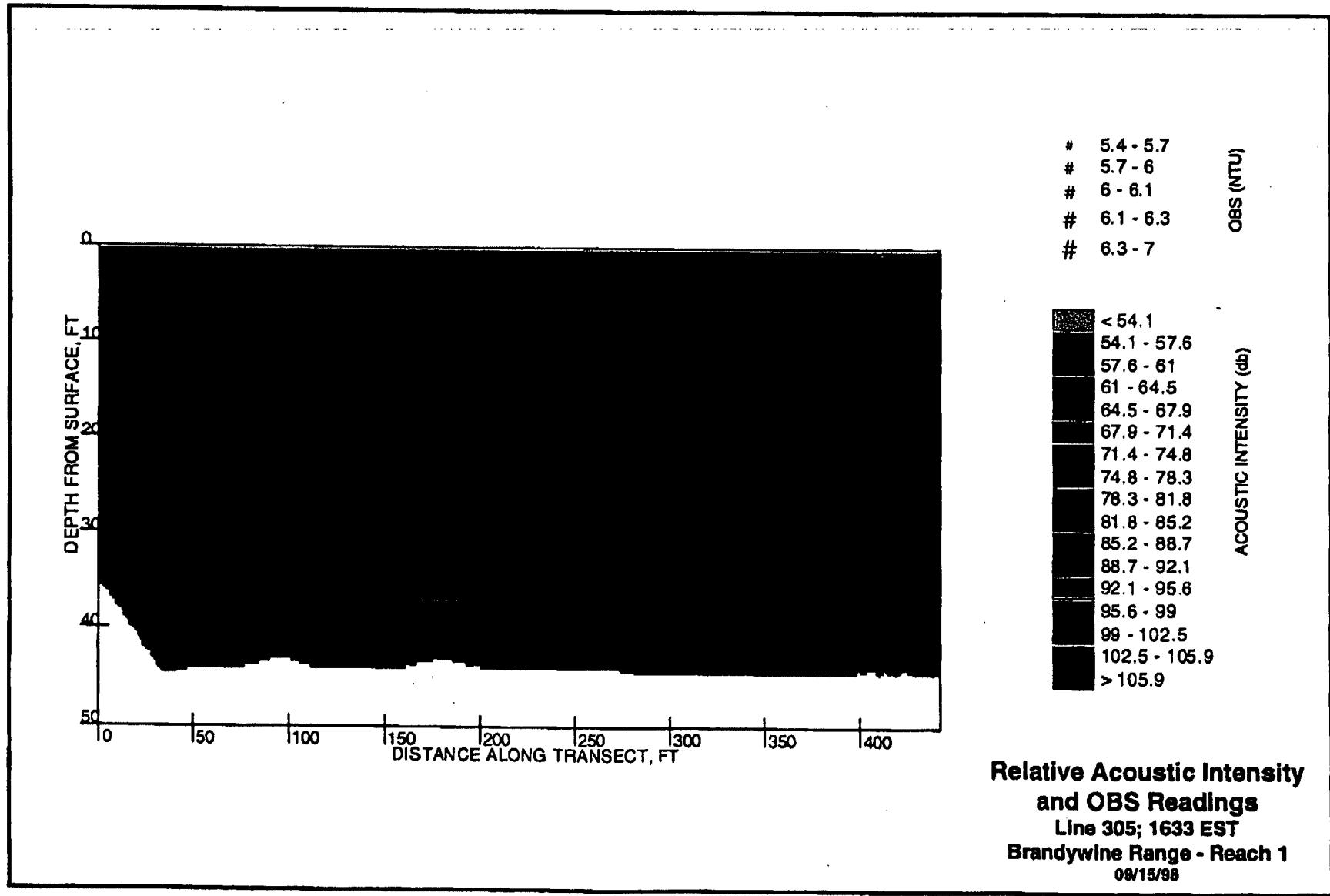
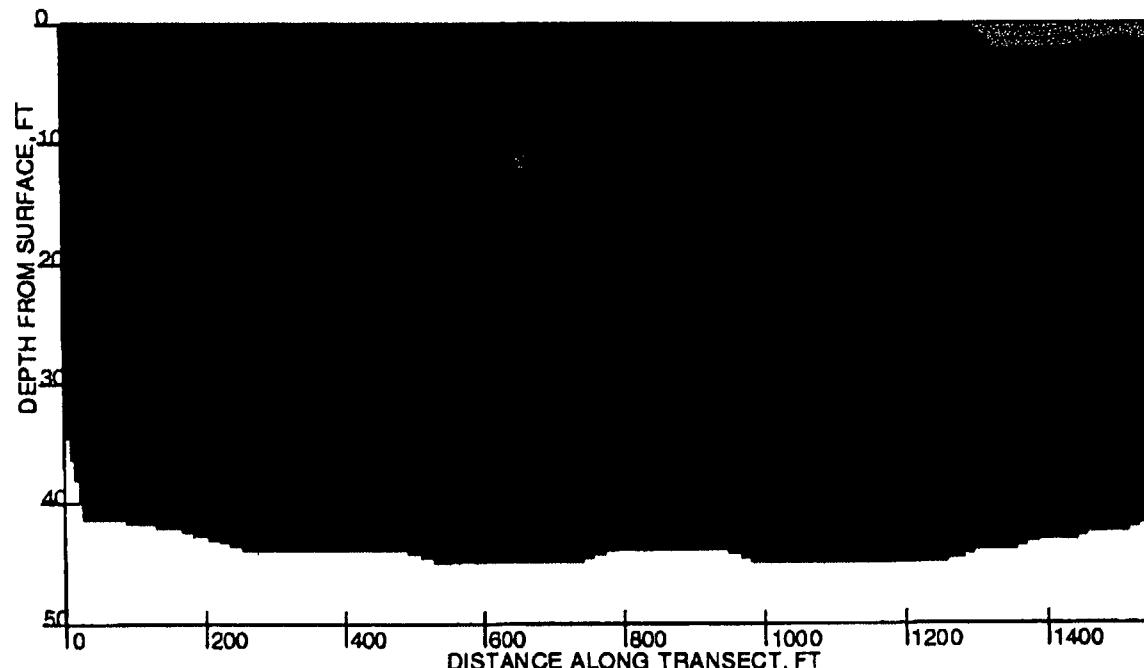
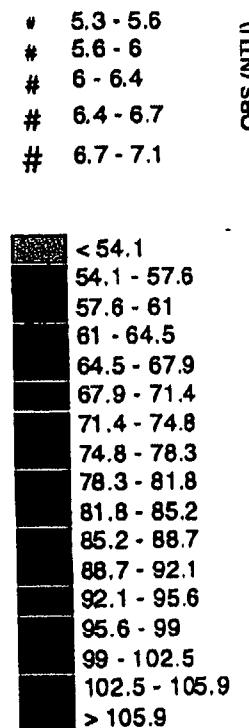


Figure 3





**Relative Acoustic Intensity  
and OBS Readings**  
Line 303; 1641 EST  
Brandywine Range - Reach 1  
09/15/98

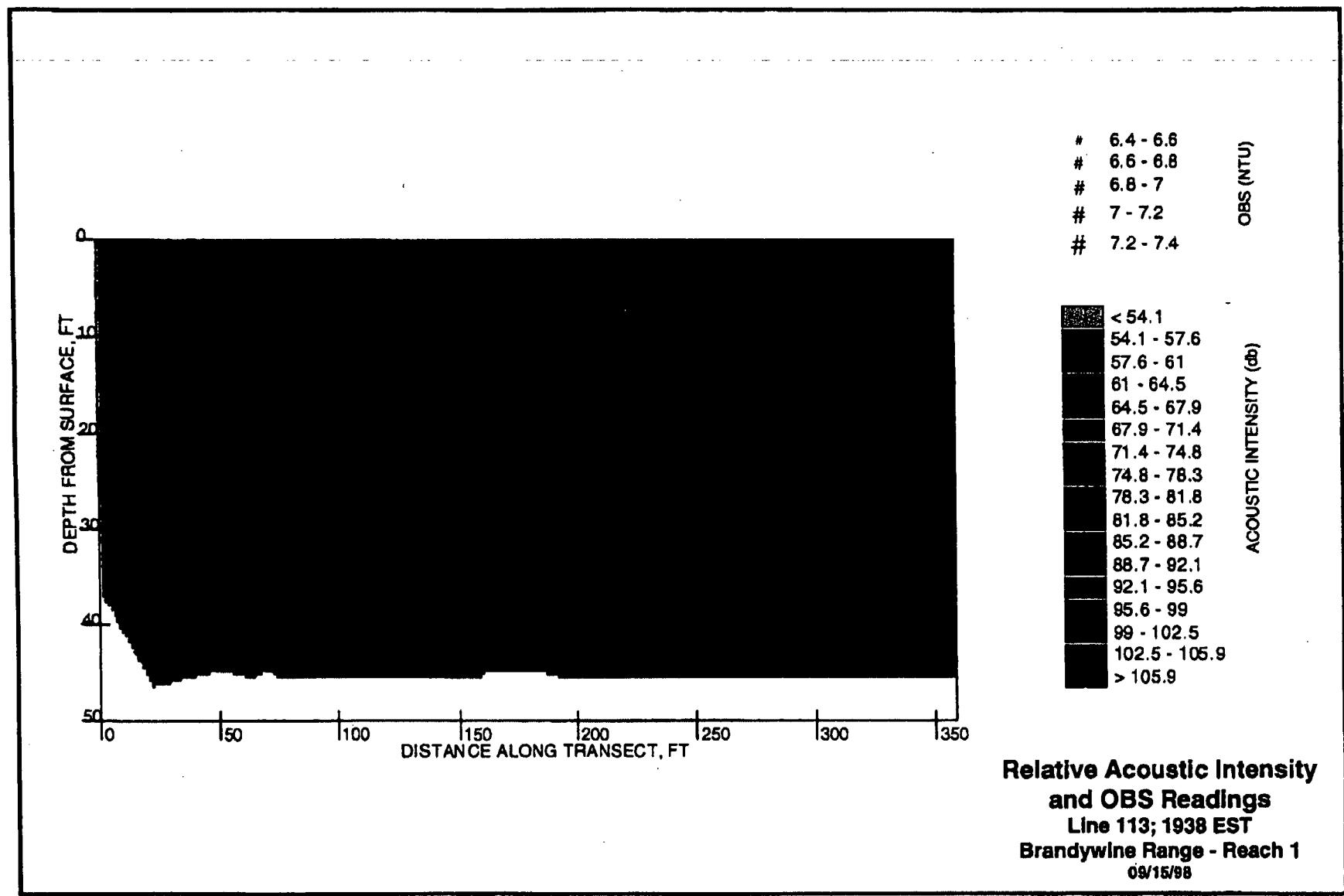
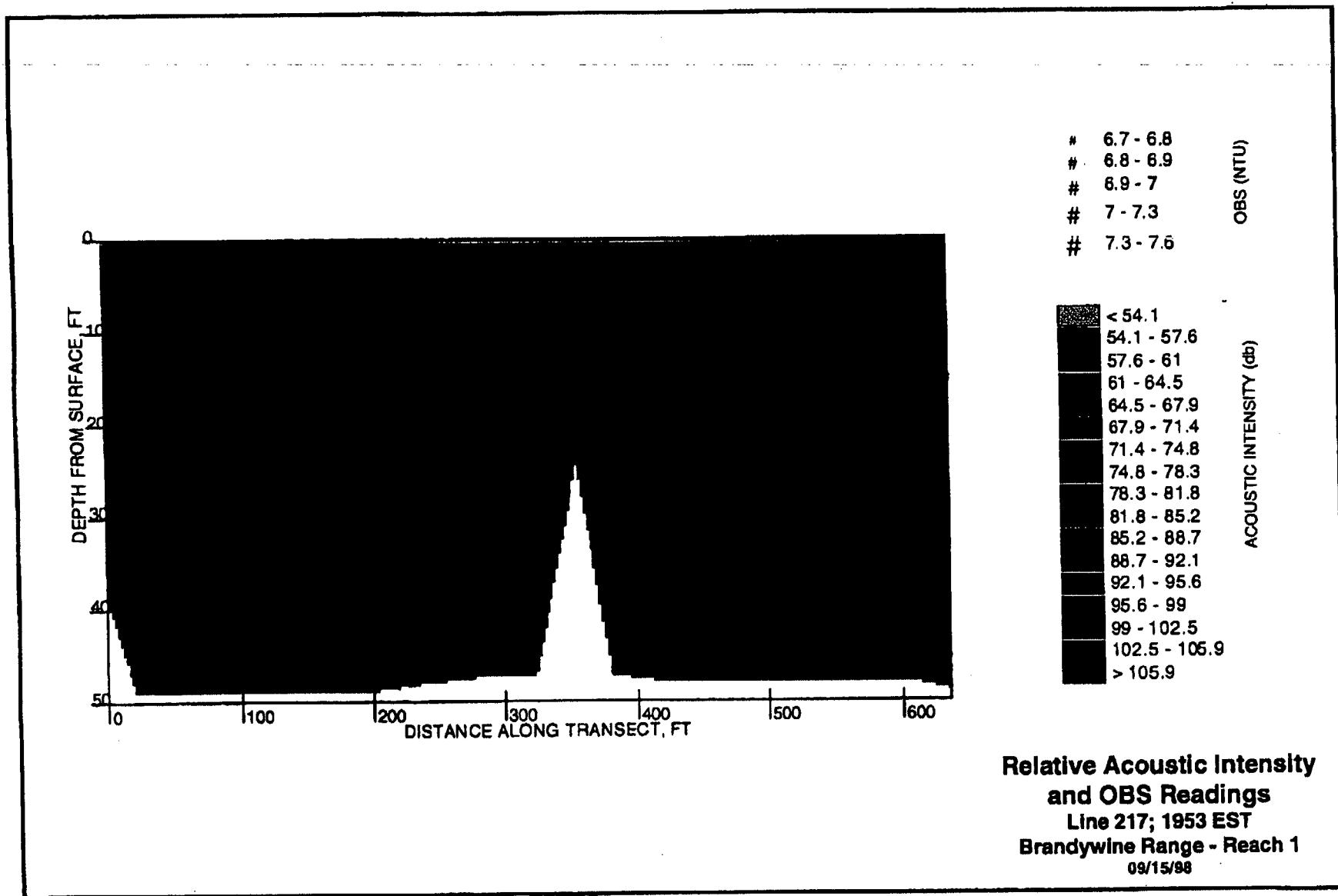


Figure 5



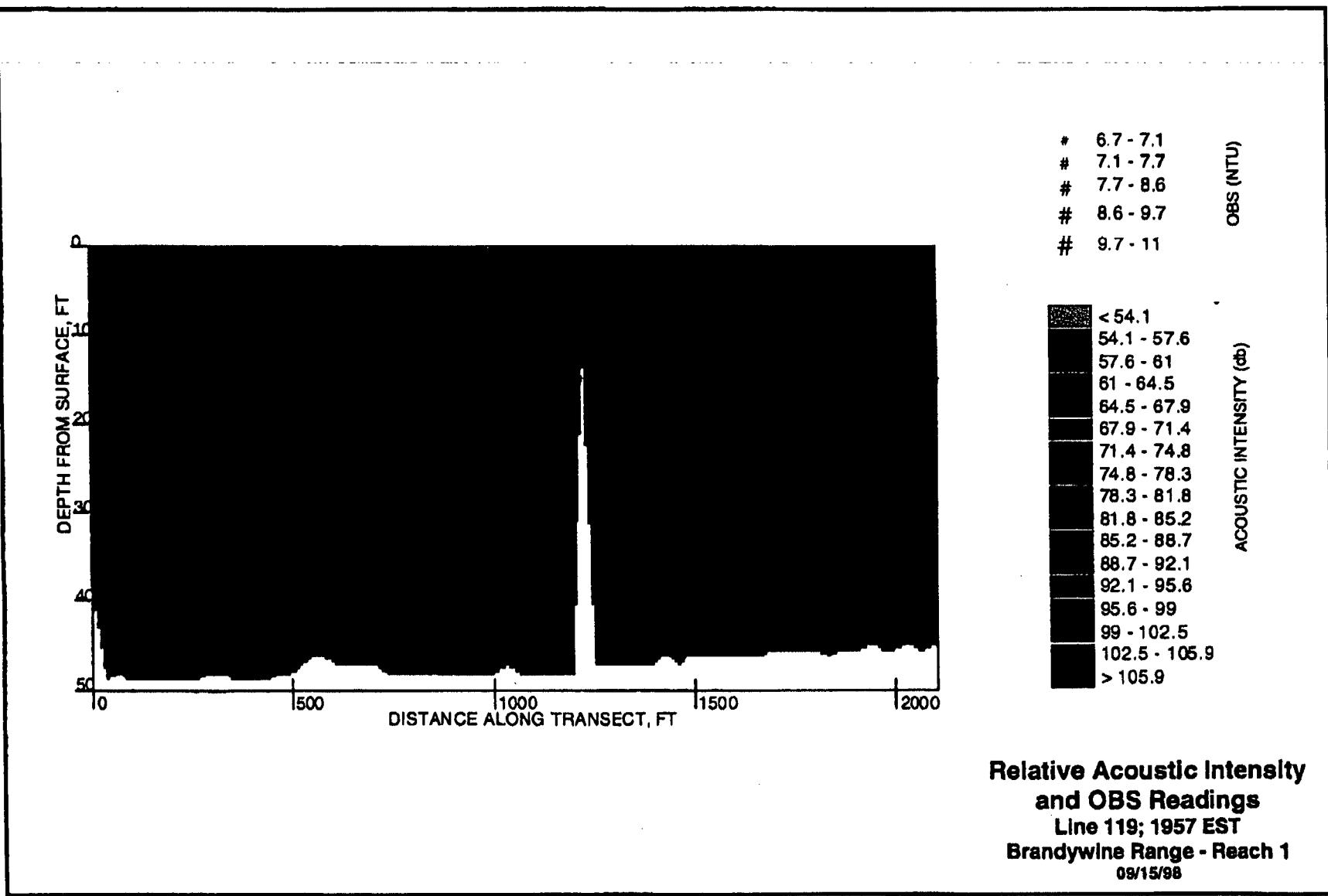
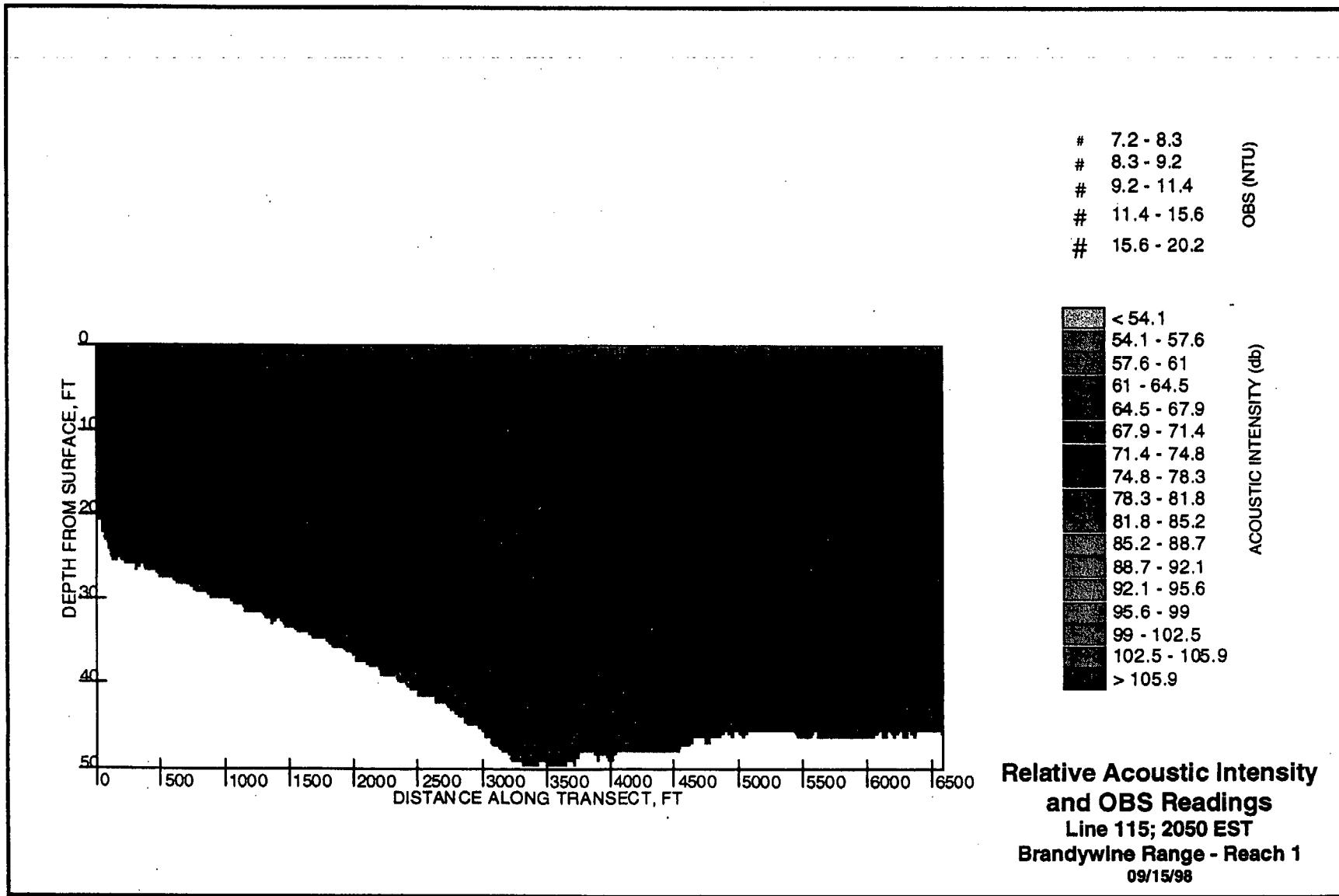
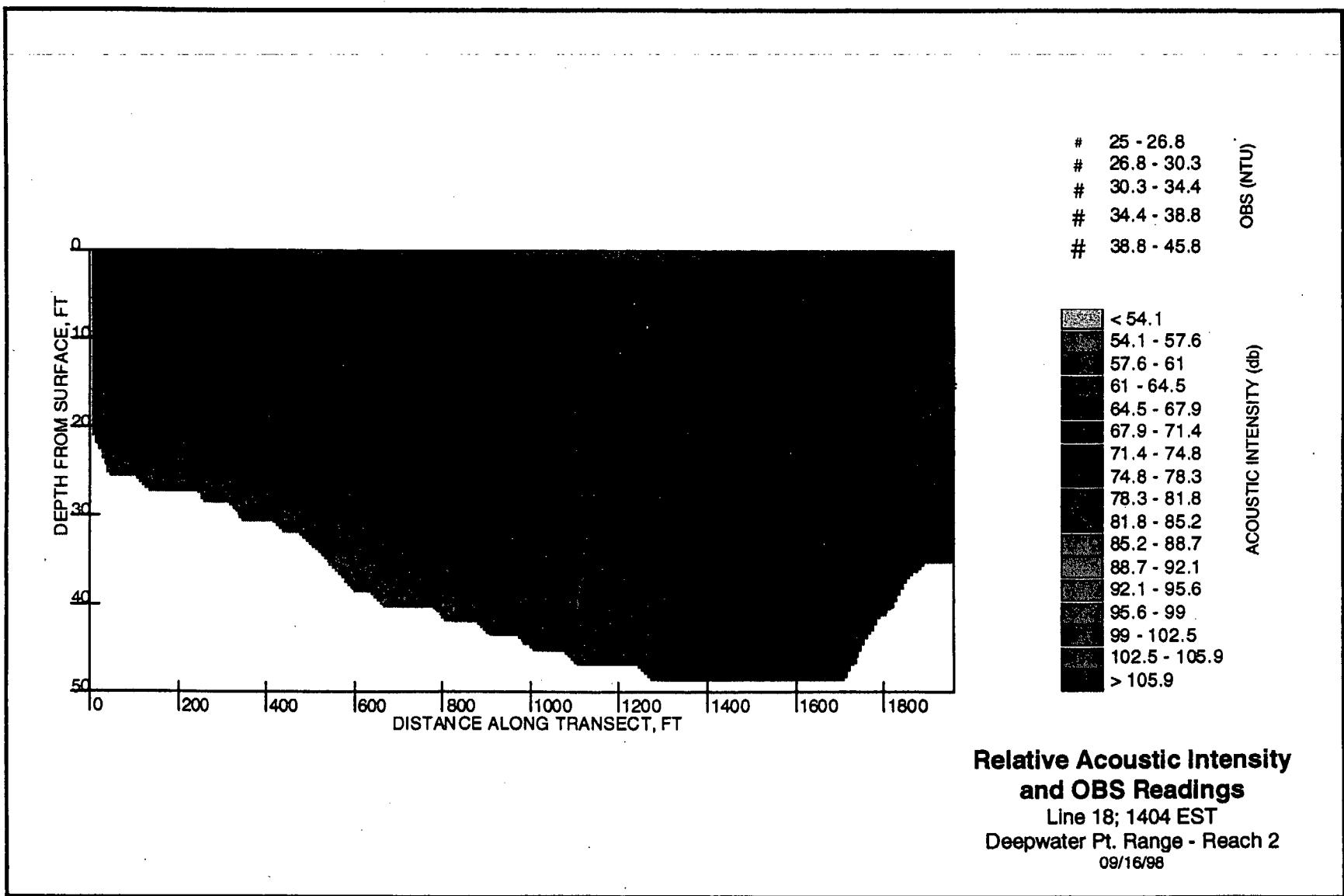
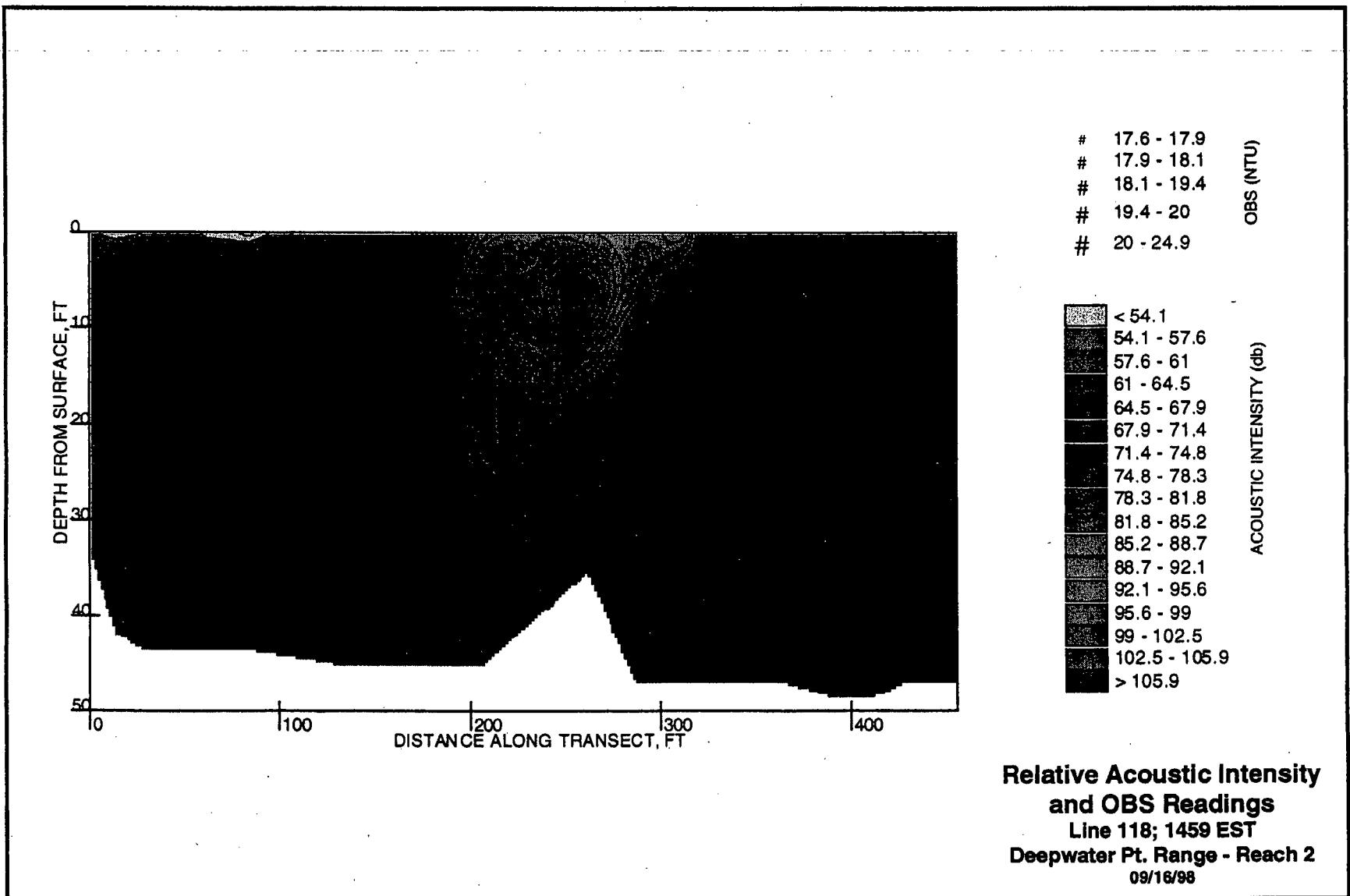


Figure 7

Figure 8







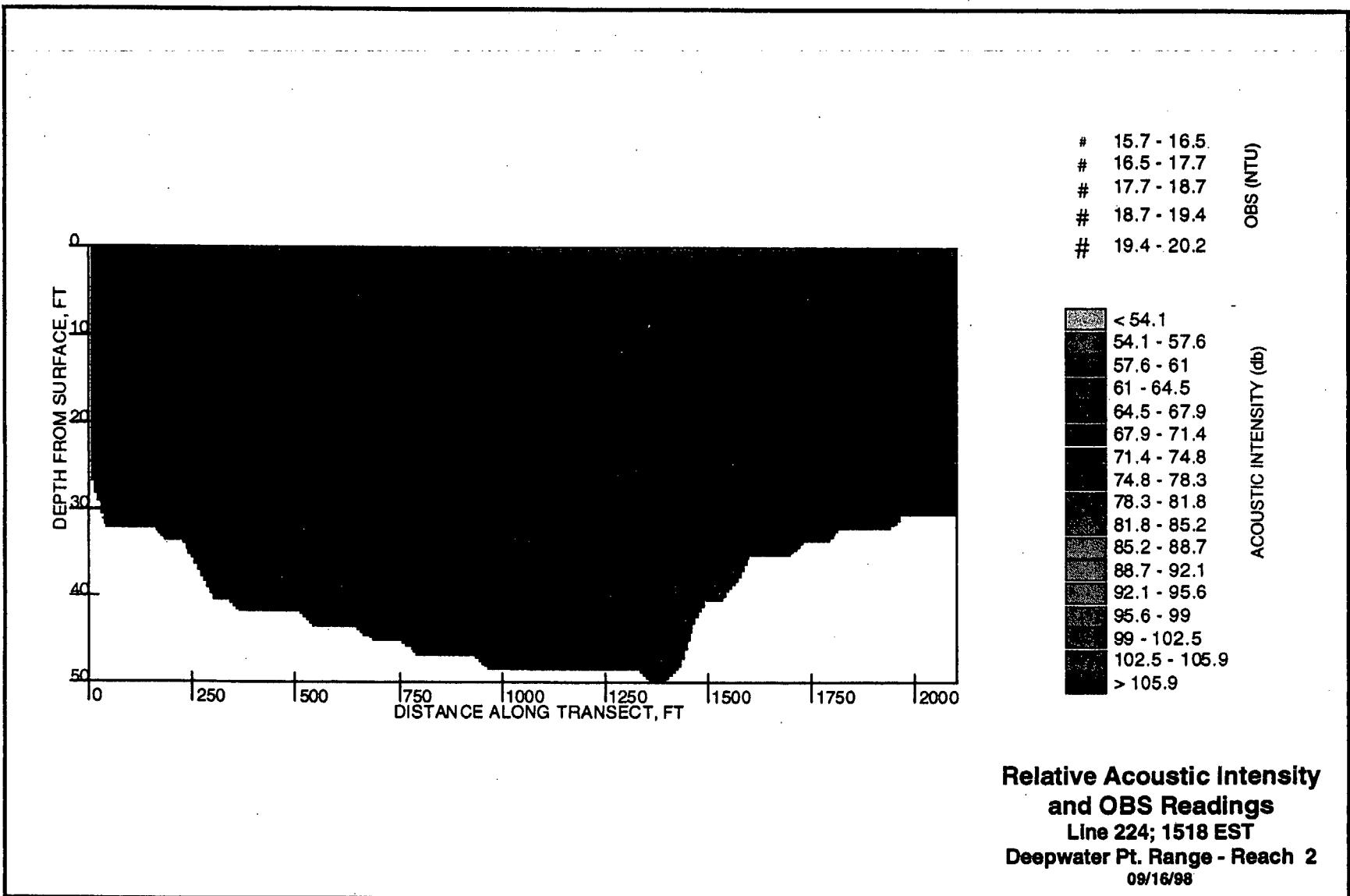


Figure 11

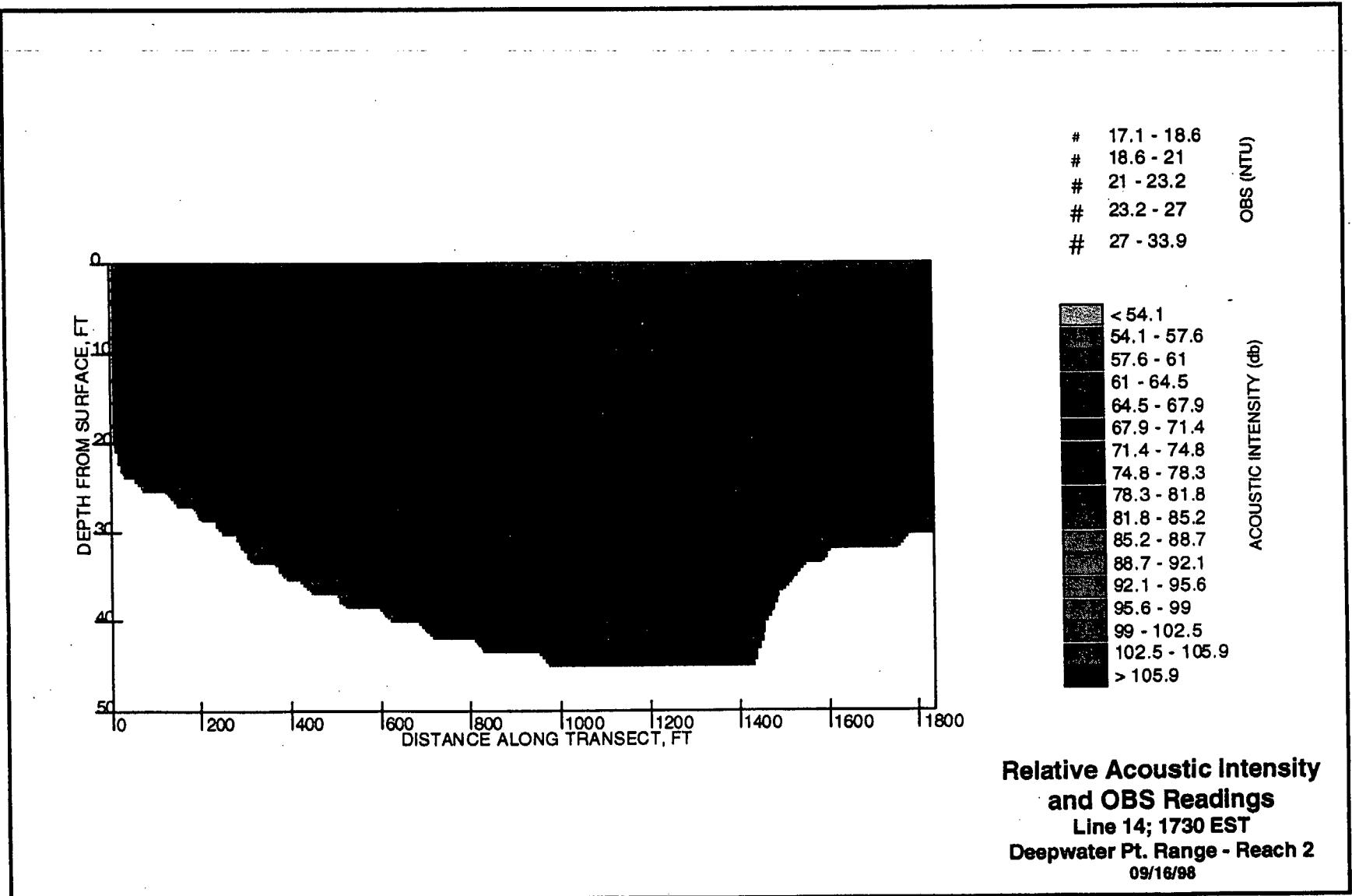


Figure 12

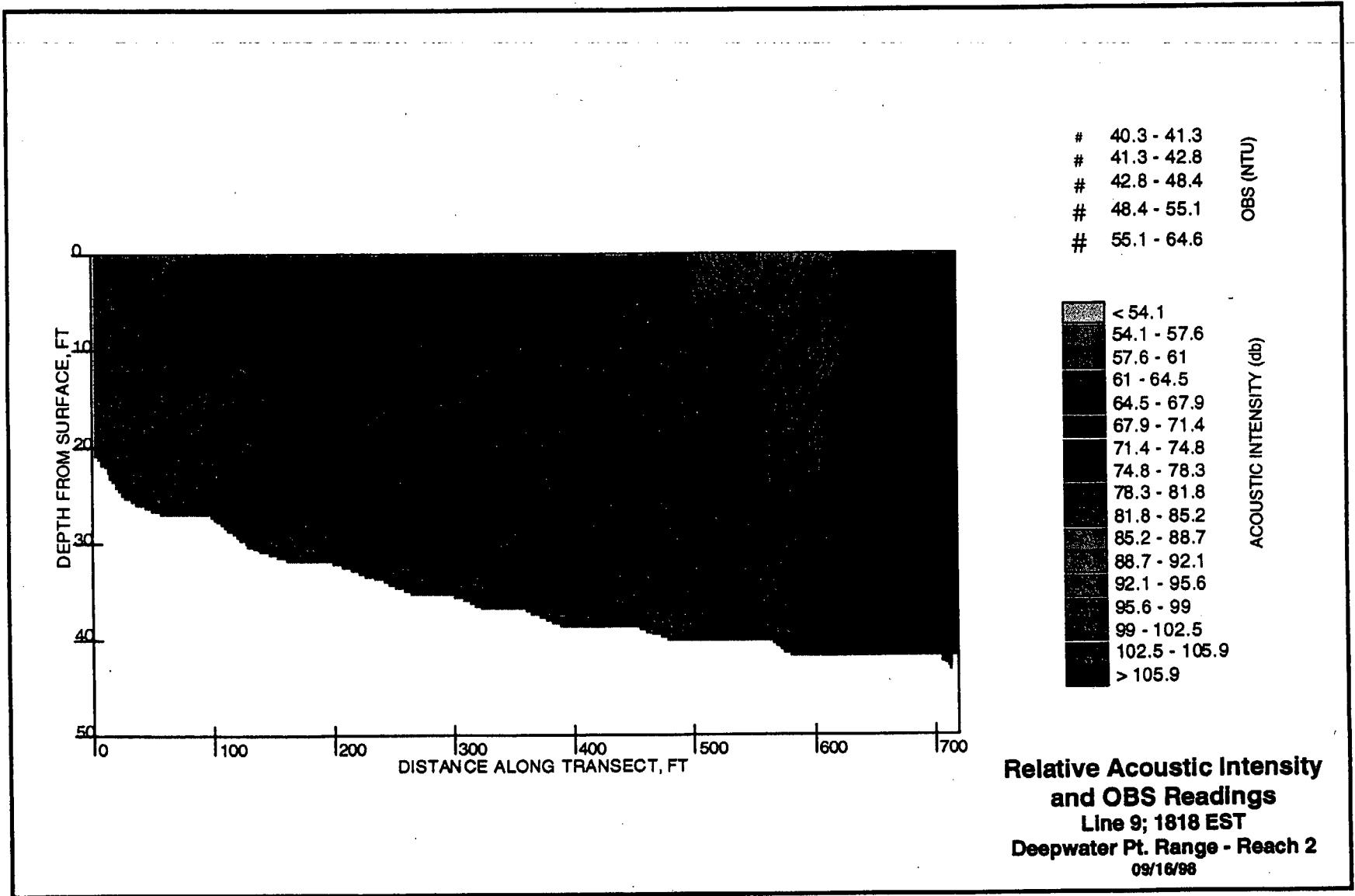


Figure 13

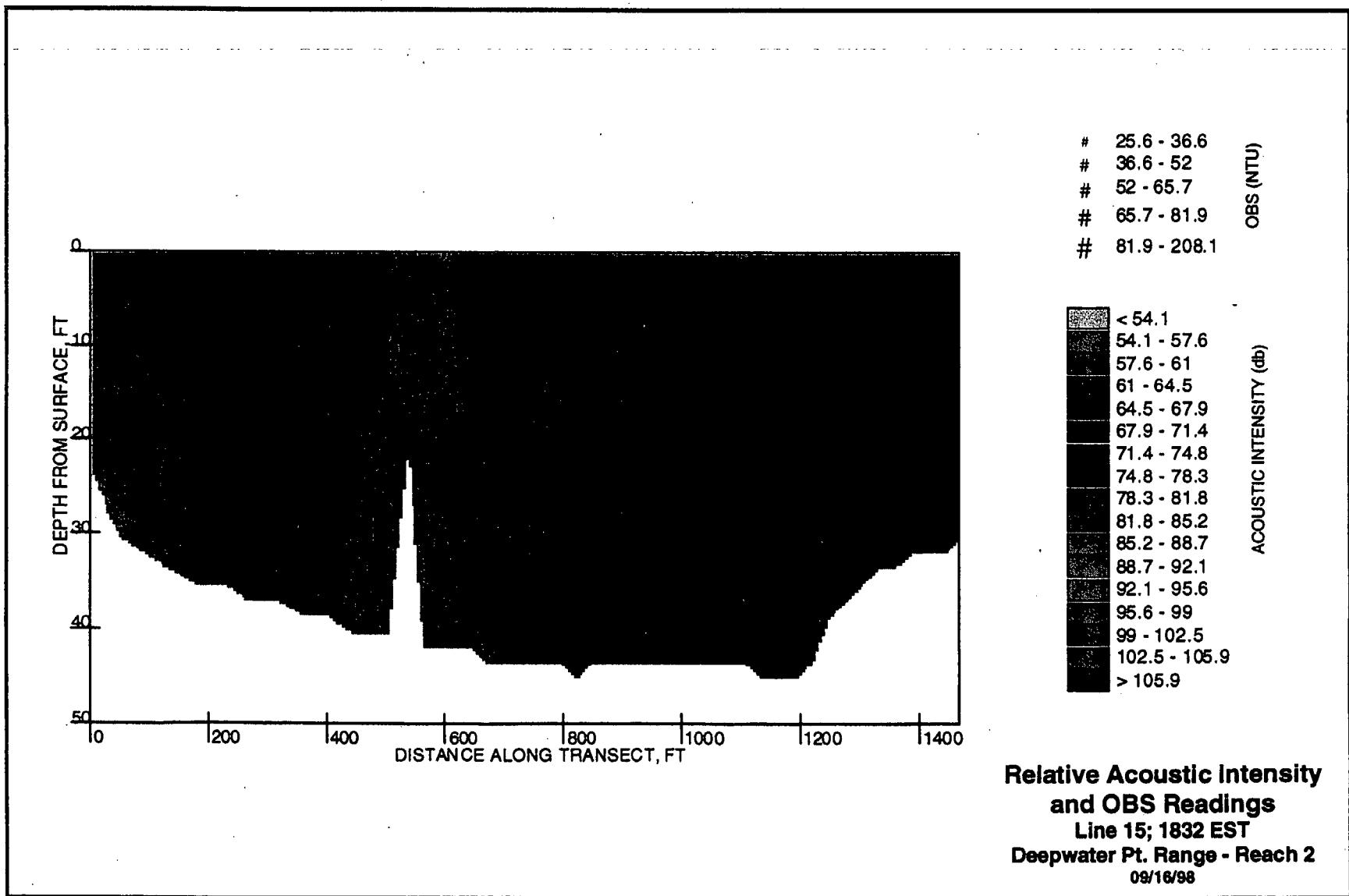


Figure 14

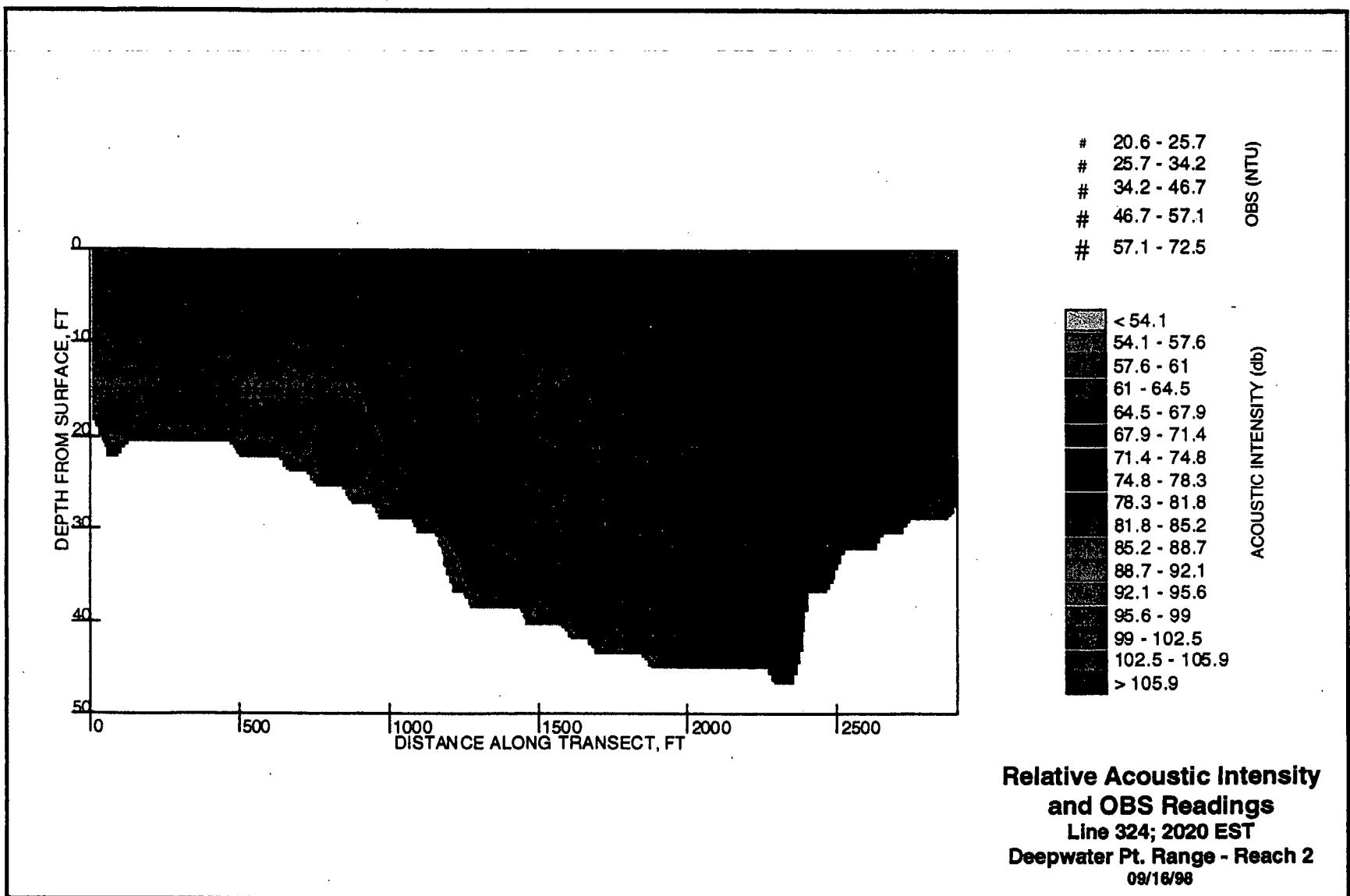


Figure 15

## EQUIPMENT DESCRIPTION

### Acoustic Doppler Current Profiler (ADCP)

Acoustic techniques are used to obtain current profiles fast and accurate profiling in the field. The equipment used was a BroadBand Acoustic Doppler Current Profiler (ADCP). The instrument's operating frequency was 1200 kHz. The boat with the acoustic transducers submerged and data being recorded is shown in Figure 17.

The ADCP transmits sound bursts into the water column. The instrument measures the time delay of the returning signal and assigns depths and velocity to the particles based on the frequency caused by the moving particles. This allows for a non-invasive measurement of the Doppler shift.

The ADCP is also capable of measuring vessel speed, temperature, and bottom depth. Communication with the instrument and data recording are performed with a portable computer using a serial port, communication hardware, and communication cables. The manufacturer claims a measurement accuracy of  $\pm 0.2$  cm/s; for vessel direction  $\pm 2^\circ$ ; and

### Tethered-drag sampler

The Tethered-drag sampler consists of a probe mounted on one side of a vertical frame. The sample accumulation is held in plastic bags or jars for later analysis. A photograph of the device is displayed in Figure 19.

### Optical Backscatter Sampler (OBS)

The OBS is a nephelometer for measuring light backscatter from suspended particles. It uses a series of silicon photodiodes to emit a beam at a range of particles by sensing the strong function of the signal return. The angle of the signal return is less than  $140^\circ$ . As water passes through the instrument, the size distribution of particles is monitored. For this reason, the instrument is being monitored. A microprocessor controls the instrument and a portable PC software is used to control the instrument.

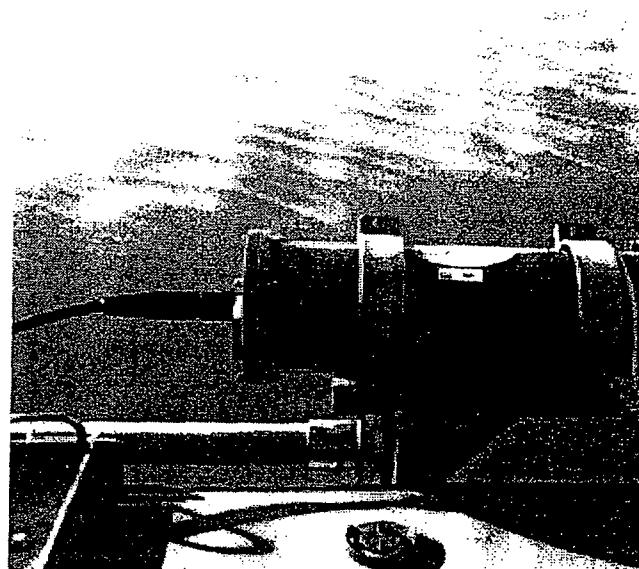


Figure 16. Acoustic Doppler Current Profiler (ADCP)

## **APPENDIX C**

### **Detection of Short-Term Sedimentation During Hopper Dredging Operations in Delaware Bay and the Delaware River**



**US Army Corps of Engineers**  
Engineer Research and Development Center  
Waterways Experiment Station  
Vicksburg, MS 39180

February 1999

---

## **Detection of Sort-Term Sedimentation During Hopper Dredging Operations in Delaware Bay and the Delaware River**

by *Robert J. Diaz*  
*Virginia Institute of Marine Science*  
*Greate Road*  
*Gloucester Point, Virginia 23062*

and

*Douglas G. Clarke*  
*Environmental Laboratory*  
*U.S. Army Engineer Waterways Experiment Station*  
*3909 Halls Ferry Road*  
*Vicksburg, Mississippi 39180*

---

Prepared for U.S. Army Corps of Engineers  
Philadelphia District  
Operations Division

## **DETECTION OF SHORT-TERM SEDIMENTATION DURING HOPPER DREDGING OPERATIONS IN DELAWARE BAY AND THE DELAWARE RIVER**

### **INTRODUCTION**

Navigation channel maintenance dredging projects employing hopper dredges can produce substantial water-column turbidity when *in situ* sediments contain a high proportion of fines and overflow practices are used. Most of the sediment resuspended during overflow operations has been shown to settle within several hundred meters of the channel (Nichols et al. 1990, Clarke et al. 1990). It has been hypothesized that even short-term pulses in sedimentation rates induced by overflow operations could negatively impact sensitive living resources, such as oyster beds, in the vicinity of dredged channels.

Detection and measurement of recently deposited thin layers of dredged material can be a severe technical challenge. Sediment overburdens with thicknesses on the scale of several millimeters can potentially raise concern for biological impacts. Precision bathymetry methods using acoustic technologies lack the sensitivity to detect low density thin overburdens less than 5 to 10 cm thick at best. However, direct *in situ* observations of very thin layers have effectively been done with sediment profile imaging (SPI). Nichols et al. (1990) demonstrated that SPI techniques could detect thin layers of sediment deposited from hopper dredge overflow operations in the Chesapeake Bay. SPI has also proven to be very effective in mapping the distribution of thin layers resulting from open-water dredged material disposal operations in Mobile Bay (Diaz et al. 1987a, Diaz and Schaffner 1988, Clarke and Miller-Way 1992), Mississippi Sound (Diaz et al. 1987b), and Long Island Sound (Morton et al. 1985).

The primary focus of this study was to determine if short-term sedimentation of dredged material occurred as a consequence of resuspension by the dragheads or during overflow from the hopper dredge. A secondary objective was to determine, if sedimentation was detected in sediment profile images, the distances from the navigation channel at which measurable sedimentation occurred. Two areas were selected by the Philadelphia District of the U. S. Army Corps of Engineers (CENAP) for conduct of the hopper dredging operations tests (Figure 1). These locations represent a relatively open-water site in the Delaware bay, designated the Lower Study site (LS), and a more riverine site in the Delaware River, designated the Upper Study site (US).

## MATERIALS AND METHODS

### Field Methods

On 15 and 16 September 1998 sediment profile images were collected at a series of stations at the two predetermined locations in Delaware Bay and the Delaware River (LS and US respectively). SPI data were successfully collected at stations in the LS site (Figure 2) and stations in the US site (Figure 3). At each station a Hulcher Model Wrenn sediment profile camera was deployed. During each deployment the profile camera obtained two images (Fujichrome 100P 35mm slides) at 5 and 15 seconds after bottom contact. The two-image sequence helps to insure that when deployment occurs in soft, unconsolidated sediments the sediment-water interface is captured in the image before the camera prism optical window descends too deeply into the substrate.

Stations were located based on considerations of prevailing wind, river discharge, and/or tidal flow conditions at the time of each hopper dredge test. At both study locations data were collected first while the dredge was operating without overflow, followed by a second test with overflow. Sampling proceeded for up to two hours after dredging ceased.

### Image Analysis

The sediment profile images were first analyzed visually by projecting the images and recording all features seen into a pre-formatted, standardized spread sheet file. The images were then digitized using a Polaroid Sprint Scan 35 Plus scanner and analyzed using Adobe Photoshop and NTIS Image programs. Steps in the computer analysis of each image were standardized consistent with procedures described in Viles and Diaz (1991). Data from each image were sequentially saved to a spread sheet file for later analysis. Details of how these data were obtained can be found in Diaz and Schaffner (1988) and Rhoads and Germano (1986), and in the standardized image analysis procedures of Viles and Diaz (1991).

## RESULTS AND DISCUSSION

SPI images from a total of 14 stations were analyzed from the LS site (Figure 2) and 41 stations from the US site (Figure 3). The approximate location of the hopper dredge in proximity to the sampling stations is shown in Figures 2 and 3. The LS site was sampled on 15 September from 1958 to 2208 hours. Tidal flows were flooding during the sampling period and winds were approximately 15 to 20 mph out of the east. Sea conditions were marginal for successful deployment of the camera system, with approximate wave heights of 2 to 3 ft. The US site was sampled on 16 September 1998 from 1507 to 2102 hours. This reach of the Delaware River is influenced by tidal currents, which were ebbing during the sampling period. Sea conditions were mild with wave heights less than 2 ft throughout the sampling period.

Presented below are explanations of each of the parameters produced from analysis of SPI images and an overview of observations of physical and biological features at the two study

sites. Complete listings of visual and computer analysis data for each study site are given in Tables 1 and 2.

### Prism Penetration

This parameter provided a geotechnical estimate of sediment compaction, with the profile camera prism acting as a dead weight penetrometer. The depth of prism penetration is therefore related to the "softness" or degree of sediment compaction or water content. Penetration was simply measured as the distance the sediment interface moved up the 23 cm length of the prism optical window as captured by the 15 sec image. The weight of the camera frame was kept constant at 95 lb in order to allow comparisons of relative sediment compaction between stations.

Sand bottoms typical of the LS site had comparatively shallow penetration depths, ranging from 0.0 to 10.9 cm (Table 1). When sandy sediments are poorly sorted, as was the case at channel station LS-09 (Figure 4), prism penetration was deeper. Silty-clay sediments prominent at the US site had comparatively deep penetration (loosely compacted) values, ranging from 9.8 to 25.0 cm (Table 2). Compacted clay sediments, as indicated by very shallow penetration, can be seen in the image from station US-14 (Figure 5).

### Surface Relief

Surface relief or boundary roughness was measured as the difference between the maximum and minimum distance (relative to the sediment-water interface) the prism penetrated and provided qualitative and quantitative data on habitat characteristics useful for evaluating existing conditions. Small scale bed roughness on the order of the width (15 cm) of the prism optical window can be estimated from the images. Factors contributing to observed roughness can often be inferred from visual analysis of the images.

In the open-water setting of the sandy LS site, physical factors (e.g., water current and wave generated turbulence) obviously dominated local sediment processes. Surface relief was typically present as small bed forms (e.g., LS-13, Figure 6) that ranged from 0.6 to 2.0 cm (Table 1). In contrast, the muddy habitats of the US site were primarily influenced by biological features, including mounds, pits, and tubes formed from the biogenic activity of benthic organisms (e.g., US-35, Figure 7). Here surface relief values ranged from 0.4 to 3.5 cm (Table 2).

### Apparent Color Redox Potential Discontinuity Layer

This parameter has been determined to be an important estimator of benthic habitat quality (Rhoads and Germano 1986, Diaz and Schaffner 1988), providing an estimate of the depth to which sediments are oxidized. The term "apparent" is used in describing this parameter because no direct chemical measurement is made of the redox potential. Rather an assumption is made that, given the complexities of iron and sulfate reduction-oxidation chemistry, reddish/greenish-brown sediment color tones (Diaz and Schaffner 1988) are indicative of oxic sediments, whereas reduced sediments have gray to black color tones. This is in accordance with the classical concept of redox potential discontinuity (RPD) depth, which associates RPD with

sediment color (Fenchel 1969, Vismann 1991).

The depth of the apparent color RPD was defined as the area of all the pixels in the image discerned as being oxidized divided by the width of the digitized image. The area of the image with oxic sediment was obtained by digitally manipulating the image to enhance characteristics associated with oxic sediment (reddish/greenish-brown color tones). The enhanced area was then measured from a density slice of the image.

The apparent color RPD has been a very useful parameter in assessing the quality of a benthic habitat for infauna and epifauna from both physical and biological perspectives. Rhoads and Germano (1986), Revelas et al. (1987), Day et al. (1988), Diaz and Schaffner (1988), Valente et al. (1992) and Bonsdorff et al. (1996) all found the depth of the RPD from profile images to be directly correlated to the quality of the benthic habitat in polyhaline and mesohaline estuarine zones. Controlling for differences in sediment type, habitats with relatively thin (<5 mm) RPD layers tend to be associated with some type of environmental stress. In contrast, habitats with relatively deep RPD values (>2 cm) usually have flourishing infaunal and epifaunal communities.

Porous sandy sediments (e.g., LS-09, Figure 4) and silty-clay sediments with evidence of high levels of biological activity (e.g., US-11, Figure 8) had the deepest RPD measurements in this study. Shallowest RPD measurements were associated with images that had signs of physical disturbance, possibly dredging related (e.g., LS-06, Figure 9), or were compact clays (e.g., US-33, Figure 10). In the LS site, average RPD depth ranged from 0.7 to 5.3 cm, and from 0.1 to 6.6 cm in the US site (Tables 1 and 2).

### Sediment Grain Size

Grain size is an important parameter for determining the nature of the physical forces acting on a sedimentary habitat. Grain size is also a major factor in determining benthic community structure (Rhoads 1974). The sediment type descriptors used for image analysis follow the Wentworth classification as described in Folk (1974) and represent the major modal class for each image. Grain size was determined by comparison of collected images with a set of standard images for which mean grain size had been determined in the laboratory.

Grain size ranged from medium-sand gravel (e.g., US-21, Figure 11) to clay (e.g., US-35, Figure 7). Traces of sand were also seen at a few fine-grained stations (e.g., US-29, Figure 12) and traces of fines at coarse-grained stations (e.g., US-32, Figure 13). Within study site variation in sediment type for the LS site was low, with the modal grain size being fine-medium-sand (e.g., LS-03, Figure 14). Shell hash was a major component of sediments in the LS site, particularly in the navigation channel (e.g., LS-06, Figure 9) (Table 1). In the US site sediments were more variable with the modal grain size being clay (e.g., US-09, Figure 4), which was closely followed by silty-clay (e.g., US-09, Figure 15). In addition to having finer sediments than the LS site, there was little evidence of shell hash in US site sediments (Table 2).

### Near Bottom Turbidity

The sediment profiling camera is also able to image water column turbidity immediately above the sediment-water interface. Light from the camera prism's internal strobe illuminates suspended sediment particles and allows qualitative estimation of turbidity. Turbidity was categorized as low (if the water column was clear with little or no suspended sediment, e.g., LS-02, Figure 16), moderate (e.g., US-09, Figure 15), and high (e.g., US-14, Figure 5). If plumes of resuspended sediment derived from either the dragheads of overflow were present at the sampling station, the camera would capture the near-bottom turbidity. Such turbidity can be distinguished from other sources, such as that frequently caused by camera frame contact with the substrate, by color tones. Dredge-induced turbidity has a gray color because the bulk of the sediments dredged are from the anoxic zone and in a reduced redox chemical state. Reduced iron and manganese sulfide compounds are dark gray to black in color which contrasts well with the reddish to brown color tones of their oxidized compounds. Background turbidity or that caused by the camera frame landing on the bottom would be brown in color because the suspended sediments were disturbed from the uppermost few millimeters of surficial sediments, which are typically in an oxic redox state.

Two stations in the LS site (LS-07 and LS-12, Figures 17 and 18) had grayish colored suspended material. Station LS-07 was located on the edge of the navigation channel and could have been affected by passage of the dragheads. This station was occupied prior to initiation of overflow. LS-12 was located in the channel and appeared to have been recently disturbed. All other LS images had brownish suspended materials (Table 2).

The relative amount of suspended material did not show any pattern relative to the dredging operation at either LS or US sites. In the US site high levels of turbidity seemed associated with shoal areas (<18 ft deep) to the northwest of the channel (Figure 3). The four channel stations in the US site had low turbidity levels (Table 2). Only one of the four channel stations in the LS site had moderate turbidity, while the remaining three had low turbidities (Table 1).

### Current Scour

While sitting on the bottom the prism and camera housing assembly present an obstruction to bottom currents. Deflection of currents can erode the sediment-water interface at the edges of the prism. This erosion can be seen in SPI images as small dips in the sediment-water interface at the edges of the image. When these dips occur it is reasonable to assume that bottom currents at the time the image was taken were >10 cm/sec.

Evidence of scour was seen at three of the four channel stations in the LS site (e.g., LS-12, Figure 18) and one shoal station (LS-03, Figure 14) (Table 1). In the US site only one of the 41 stations (US-31, on the channel edge, Figure 19) showed evidence of scour (Table 2). Scour patterns indicated that bottom currents are likely stronger in the LS site relative to the US site.

## Dredged Material

When recently deposited, dredged sediments from hopper overflow or open-water disposal are distinct in color from background sediments (Diaz and Schaffner 1988, Nichols et al. 1990), being grayer than background sediments. This is due in general to the more advanced diagenic state of deep sediments being dredged (Rhoads, personnel communication, as discussed in section on Near Bottom Turbidity).

SPI images from three of the four channel stations in the LS site appear to be recently disturbed and likely dredged material (e.g., LS-06, Figure 9) (Table 1). The channel sediments are sands with shell hash and contain little fine sediment so it is not likely that the surface sediments are from hopper overflow, but more likely associated with disturbance from the dragheads. In addition, the test dredging and overflow were not of sufficient quantity or duration to produce extensive layering from sands.

No station from the US site appeared to have recently deposited dredged material. Sediments at all US site stations appeared to be undisturbed and representative of background conditions.

## Sediment Layering

Sediment layering as indicated by color or grain-size changes are readily seen in SPI images. The presence of layers is indicative of physical disturbances or episodic events. Sediment layering is characteristic of hopper overflow and open-water disposal operations and can be readily seen in SPI images (Diaz and Schaffner 1988, Nichols et al. 1990).

In the LS site four stations had evidence of layering from grain-size changes (Table 1). Station LS-06 (Figure 9), in the channel, had a shell hash layer at 1.6 cm from the sediment surface. The other three stations, LS-11 (Figure 20) and LS-13 (Figure 6) on the edge of the channel and LS-10 (Figure 21) on the shoal near the channel, all had thin layers of sandy sediments overlaying silty sediments. Each case seemed indicative of recently deposited sediments, possibly from the dragheads or current induced transport of surface sands but not likely from hopper overflow operations since little sand sized sediment would have been discharged from the hopper during a single loading process.

In the US site about half of the stations had sediment layers (Table 2). However, none of the four stations in the channel had sediment layering. About half of the stations (8 of 17) on the edge of the channel had layers, three with color layering and five with grain-size layering. All five of the grain-size layered channel edge stations had sands on the surface overlying clayey sediments. Since the sediments in the channel were fine silts and clays, it is unlikely that layers observed in these images were attributable to the dredging operations or overflow, which contained little or no sand. In addition, grain-size layered channel edge stations US-22 (Figure 22), US-23 (Figure 23), and US-33 (Figure 10) had amphipod and/or worm tubes which could not have re-established living positions in the approximately one hour interval between dredging operations and sampling. Color layering was represented by varying hues of grays and found

deeper in the sediments, ranging from 2.5 to 9.0 cm from the surface (Table 2). These deeper color layers are not likely due to recent dredging operations and may represent episodic events such as seasonal high river discharges or storm deposits. Detritus appeared to be mixed into the uppermost sediment layer at shoal stations US-09 (Figure 15), US-10 (Figure 24), and US-11 (Figure 8).

### **Surface Features**

Surface features include a variety of physical and biological parameters, each providing different information on the type of habitat and its quality for supporting benthic species. The presence of certain features is indicative of the overall nature of a habitat. For example, bedforms are always associated with physically dominated habitats, whereas the presence of worm tubes or feeding pits would be indicative of a more biologically accommodated habitat (Rhoads and Germano 1986, Diaz and Schaffner 1988). Surface features were visually evaluated from each image and compiled by type and frequency of occurrence.

The sediment surface at stations in the LS site was dominated by bed forms and shell hash (Table 1). In the US site biogenic pits and mounds were the dominant surface features (Table 2). No epifauna were seen in either area. Flock layers, thin layers of unconsolidated sediments, occurred at six shoal stations (e.g., US-09, Figure 15) and one channel edge station (US-34, Figure 25) in the US site (Table 2). All flock layers appeared to be composed of background sediments and not dredged material, as evidenced by their respective color tones.

Tubes were seen at only one of the LS site stations (LS-11, Figure 20). At the US site stations worm or amphipod tubes occurred at 12 of 41 stations (Table 2). Amphipod tube mats occurred at US-05 (Figure 26), US-06 (Figure 27), and US-22 (Figure 22), which were channel and channel edge stations.

### **Subsurface Features**

These parameters include a wide variety of features and provide insights into physical and biological processes influencing the bottom. For example, the presence of methane gas voids has been found to be an indication of anaerobic metabolism (Rhoads and Germano 1986) and associated with high rates of bacterial activity. Muddy habitats with large amounts of methane gas are generally associated with areas of oxygen stress or high organic loading. On the other hand, habitats with burrows, infaunal feeding voids, and/or actual infauna visible in SPI images are generally more biologically accommodated and considered "healthy" (Rhoads and Germano 1986, Diaz and Schaffner 1988, Valente et al. 1992). Subsurface features were visually evaluated from each image and compiled by type and frequency of occurrence.

No infauna, burrows, or voids were seen at the LS site stations (Table 1). This was due in part to the prevalence of coarse sediments, which are not generally associated with fauna that form burrows or voids, and by shallow camera prism penetration.

In the US site, four stations had infaunal organisms, 12 had active burrows, two had active feeding voids, and three had anaerobic voids (Table 2). Gas filled voids occurred at nine stationss and were abundant at most of these stations (e.g., US-26, Figure 28), indicating relatively high concentrations of organic matter in the sediments. Evidence of hydrocarbon contamination was seen at station US-03 (Figure 29) in the form of "oil spots." Diaz et al. (1992) found that sediments containing high concentrations of hydrocarbons had a unique signature in the SPI images and that this signature was significantly related to the occurrence of hydrocarbons.

## SUMMARY AND CONCLUSIONS

The LS site was more physically accommodated than the US site which was more biologically accommodated (Table 3). Sediments in the LS site were coarser and had more shell hash than the US site which was characterized by finer sediments and more biologically reworked.

There was evidence that recent physical disturbance had occurred at several of the LS stations (LS-06, LS-09, LS-12), possibly a result of the dredging operations. Gray colored suspended material, indicative of hopper overflow material, was also observed at two stations (LS-07, LS-12). However, since this gray suspended material was also associated with recently disturbed sediments at LS-12, it could also have resulted from draghead activity. This leaves LS-07 as the station with the clearest signature of hopper overflow, but this was in the form of turbidity and not accumulation of overflow material on the sediment surface. Four LS stations had layering from grain-size changes. Station LS-06, in the channel, had a shell hash layer at 1.6 cm from the sediment surface. The other stations, LS-11 and LS-13 on the edge of the channel and LS-10 on the shoal near the channel, all had thin layers of sandy sediments overlying silty sediments. Although such layers are indicative of recently deposited sediments, those seen in the SPI images are likely due to normal sediment transport processes rather than hopper overflow operations. Little sand would be discharged from overflow in a single pass of the hopper dredge.

In the US site no evidence of recent physical disturbance was detected at any of the stations, but material that could have come from the hopper overflow was observed at one station (US-33). About half of the US stations had sediment layers, but none of the stations in the channel had sediment layers. About half of the stations on the edge of the channel had layers, three with color layering and five with grain-size layering. All five of the sediment layered channel edge stations had sands on the surface overlaying clayey sediments. Since the sediments in the channel were finer silts and clays it was unlikely that the layers at the channel edge stations were the result of the dredging operations. In addition, sediment layered channel edge stations US-22, US-23, and US-33 had amphipod and/or worm tubes which could not have re-established living position in the short interval between dredging and sampling. Flocculent sediment layers, thin layers of unconsolidated surface sediments, occurred at six shoal stations and one channel edge station in the US site. Based on their color tones, all flock layers appeared to be composed

of background sediments and not hopper overflow or dredged material. Evidence of hydrocarbon contamination was seen at station US-03 in the form of "oil spots."

No indication of newly deposited dredged material was observed at stations outside the edge of the navigation channel at either study site. Although the sampling station coverage was not extensive, given the relatively short duration of the tests, the risk of significant sedimentation as a consequence of the hopper dredging operations appears largely restricted to the bottom and side slopes of the channel.

## LITERATURE CITED

- Bonsdorff, E., R. J. Diaz, R. Rosenberg, A. Norkko and G. R. Cutter. 1996. Characterization of soft-bottom benthic habitats of the Aland Islands, northern Baltic Sea. *Marine Ecology Progress Series* 142:235-245.
- Clarke, D. G., J. Homziak, R. L. Lazor, M. R. Palermo, G. E. Banks, H. A. Benson, B. H. Johnson, T. Smith-Dozier, G. Revelas, and M. R. Dardeau. 1990. Engineering design and environmental assessment of dredged material from hydraulically filled hopper barges in Mobile Bay, Alabama. *Dredging Operations Technical Support Program Miscellaneous Paper D-90-4*, U. S. Army Engineer waterways Experiment Station, Vicksburg, MS. 306pp.
- Clarke, D. G. and T. Miller-Way. 1992. An environmental assessment of the effects of open-water disposal of maintenance dredged material on benthic resources in Mobile bay, Alabama. *Dredging Operations Technical Support Program Miscellaneous Paper D-92-1*, U. S. Army Engineer Waterways Experiment Station, Vicksburg, MS. 40pp.
- Day, M. E., L. C. Schaffner, and R. J. Diaz. 1988. Long Island Sound sediment quality survey and analyses. Tetra Tec, Report to NOAA, NOS, OMA, Rockville, MD. 113pp.
- Diaz, R. J., L. C. Schaffner and K. Kiley. 1987a. Sediment profile camera survey of the Fowl River open-water dredged material disposal area, Mobile Bay, Alabama. Virginia Institute of Marine Science Contract Report to Taxonomic Associates, Mobile, AL.
- Diaz, R. J., L. C. Schaffner and K. Kiley. 1987b. Sediment profile camera survey of the Gulfport, Mississippi open-water dredged material disposal site. Science Applications International Inc. Report No. SAIC-88/5703-176 to Taxonomic Associates, Mobile, AL.
- Diaz, R. J. and L. C. Schaffner. 1988. Comparison of sediment landscapes in the Chesapeake Bay as seen by surface and profile imaging. Pp.222-240 in M. P. Lynch and E. C. Krome (eds.) *Understanding the Estuary; Advances in Chesapeake Bay Research*. Chesapeake Research Consortium Publication 129, CBP/TRS 24/88.
- Diaz, R. J., L. J. Hannsson, R. Rosenberg, P. Gapcynski and M. Unger. 1993. Rapid assessment of sedimentological and biological characteristics of a hydrocarbon pollution gradient. *Water, Air and Soil Pollution* 66:251-266.
- Fenchel, T. 1969. The ecology of marine microbenthos. IV. Structure and function of the benthic ecosystem, its chemical and physical factors and microfauna communities with special reference to the ciliated Protozoa. *Ophelia* 6:1-182.
- Folk, R. L. 1974. *Petrology of Sedimentary Rocks*. Hemphill's, Austin, TX. 170pp.

- Morton, R. W., J. H. Parker and W. H. Richmond. 1987. DAMOS. Summary of program results, 1981-1984. Science Applications International Inc. Report No. SAIC-84/7521-C46 to the U. S. Army Corps of Engineers New England Division, Waltham, MA.
- Nichols, M. M., R. J. Diaz and L. C. Schaffner. 1990. Effects of hopper dredging and sediment dispersion, Chesapeake Bay. *Environmental Geology and Water Science* 15:31-43.
- Revelas, E. C., D. C. Rhoads, and J. D. Germano. 1987. San Francisco Bay sediment quality survey and analysis. NOAA Technical Memorandum NOS OMA 35. Rockville, MD. 127pp.
- Rhoads, D. C. 1974. Organism-sediment relations on the muddy sea floor. *Oceanography and Marine Biology Annual Review* 12:263-300.
- Rhoads, D. C. and J. D. Germano. 1982. Characterization of organism-sediment relations using sediment profile imaging: an efficient method of remote ecological monitoring of the sea floor (REMOTS system). *Marine Ecology Progress Series* 8:115-128.
- Rhoads, D. C. and J. D. Germano. 1986. Interpreting long-term changes in benthic community structure: a new protocol. *Hydrobiologia* 142:291-308.
- Valente, R. M., D. C. Rhoads, J. D. Germano and V. J. Cabelli. 1992. Mapping of benthic enrichment patterns in Narragansett Bay, Rhode Island. *Estuaries* 15:1-17.
- Viles, C. and R. J. Diaz. 1991. Bencore, an image analysis system for measuring sediment profile camera slides. School of Marine Science, Virginia Institute of Marine Science, College of William and Mary, Gloucester Point, VA. 13pp.
- Vismann, B. 1991. Sulfide tolerance: Physiological mechanisms and ecological implications. *Ophelia* 34:1-27

Table 1. SPI data from the Lower Study (LS) site in Delaware Bay, September 1998.

Sta.	Descriptor	Penetration (cm)			Surface Relief (cm)	Ave RPD Depth (cm)	Sediment Type	Turbidity	Suspended Sediment Color	Current Scour	Dredged Material	Sediment Layers	Surface Features	Tubes	Worms	Burrows	Voids
		Min	Max	Ave													
1	Shoal	0.8	1.7	1.3	0.9	>1.3	FSMS	Little	Brown	No	No	0	BED,SH	None	0	0	0
2	Shoal	3.3	4.1	3.7	0.8	>3.6	FSMS	Little	Brown	No	No	0	BED,SH	None	0	0	0
3	Shoal	6.1	8.0	7.0	1.8	2.9	FSMS	Moderate	Brown	Yes	No	0	BED,SH	None	0	0	0
4	Shoal	2.5	4.1	3.3	1.6	1.6	FS	Moderate	Brown	No	No	0	BED,SH	None	0	0	0
5	Shoal	0.0	0.0	0.0	0.0	-	FS	Little	Brown	No	No	-	BED,SH	None	-	-	-
6	Channel	5.7	6.3	6.0	0.6	0.7	FSMSSH	Moderate	Brown	Yes	Yes	1	SH,DIST	None	0	0	0
7	Edge	0.0	1.3	0.7	1.3	>0.7	FSSH	Low	Gray	No	No	-	BED,SH	None	-	-	-
8	Edge	1.6	2.5	2.0	0.8	>2.0	FSMSSH	Low	Brown	No	No	0	BED,SH	Some	0	0	0
9	Channel	9.8	11.9	10.9	2.0	5.3	FSMSSH	Low	Brown	Yes	Yes	0	SCOUR	None	0	0	0
10	Shoal	2.6	3.2	2.9	0.6	0.8	FS/SI	Low	Brown	No	No	1	BED,MD,SH	None	0	0	0
11	Edge	2.5	4.4	3.4	2.0	2.7	FSMS/SI	Low	Brown	No	No	1	BED,MD,SH	Few	0	0	0
12	Channel	3.3	4.1	3.7	0.8	2.9	FSMSSH	Low	Gray	Yes	Yes	0	SH	None	0	0	0
13	Edge	1.6	2.5	2.0	0.8	>2.0	FSMS/SI	Moderate	Brown	No	No	1	BED,SH	None	0	0	0
14	Channel	1.1	2.0	1.6	1.0	>1.6	FSMS	Low	Brown	No	No	0	BED,SH	None	0	0	0

KEY FOR TABLES 1 AND 2

Sta = Station, Descriptor = Location of station relative to navigation channel, CL = Clay, FS = Fine sand, FSMS = Fine to medium sand, GR = Gravel, SH = Shell hash, SI = Silt, SICL = Fine sand-silt-clay, SIFS = Silty fine sand, MSGR = Medium sand and gravel, / indicates sediments are layered, BED = Bedform, DIST = Disturbed, EVEN = Uniform flat surface, FLOC = Loose flocculent layer at surface, MD = Biogenic mound, PIT = Biogenic pit, FEW = 1 to 6, SOME = 7 to 24, MANY = >24, MAT = Tube mat

Table 2. SPI data from the Upper Study (US) site in the Delaware River, September 1998.

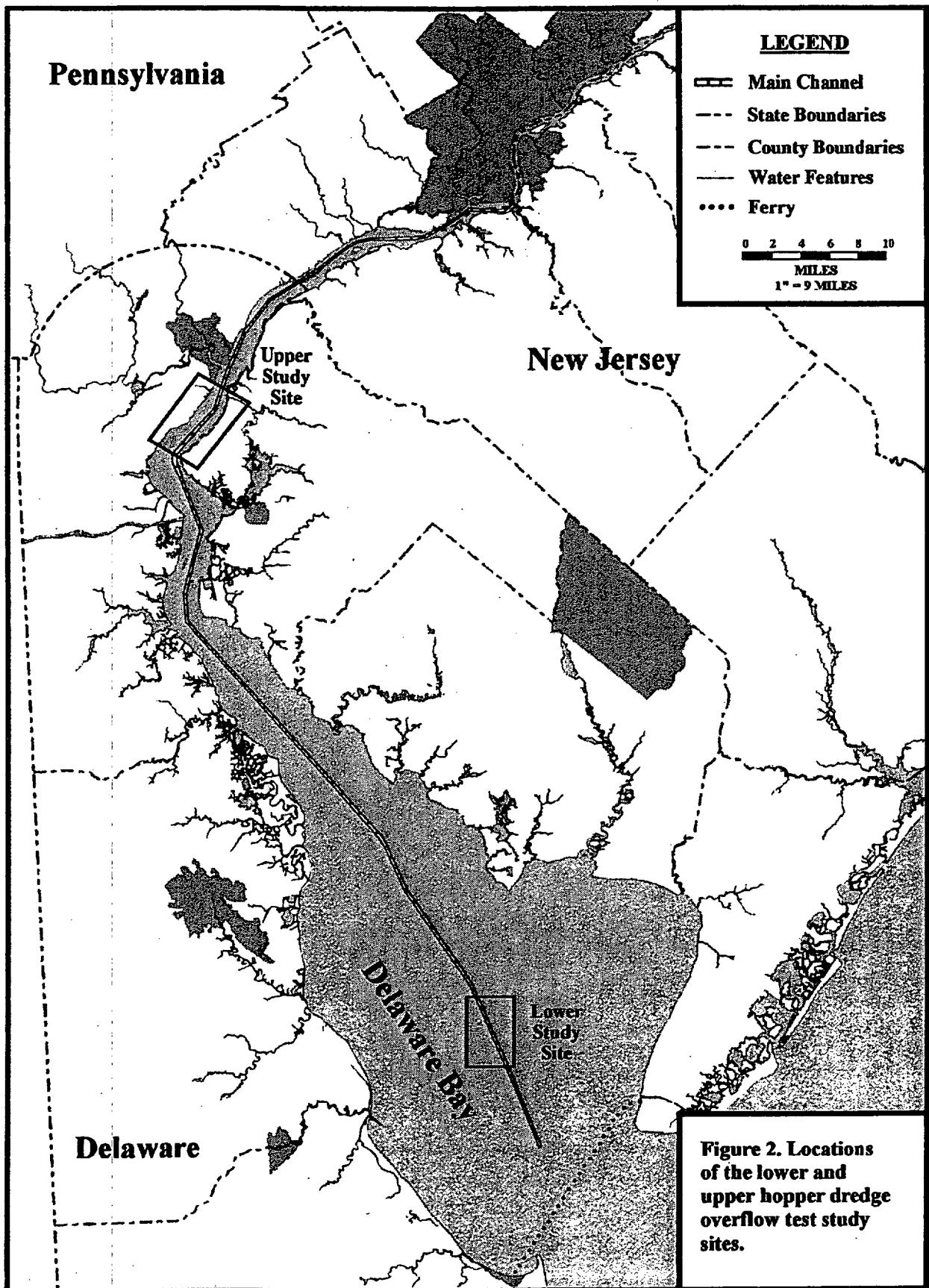
Sta	Descriptor	Penetration (cm)			Surface Relief (cm)	Ave RPD Depth (cm)	Sediment Type	Turbidity	Suspended Sediment Color	Current Scour	Dredged Material	Sediment Layers	Surface Features	Tubes	Worms	Burrows	Feeding /Gas Voids
		Min	Max	Ave													
1	Shoal	12.3	12.6	12.5	0.3	0.7	SI	Low	Brown	No	No	1	EVEN	None	0	4	1/8
2	Shoal	7.4	7.6	7.5	0.2	1.4	SI	Low	Brown	No	No	0	MD	None	0	5	0
3	Shoal	6.6	7.3	6.9	0.7	1.0	SI	Low	Brown	No	No	1	MD	None	2	3	0
4	Shoal	12.2	12.5	12.4	0.3	2.5	SI	High	Brown	No	No	2	MD	None	0	2	0
5	Edge	9.6	10.8	10.2	1.2	0.2	CL	Low	Brown	No	No	0	MD	Mat	0	0	0
6	Channel	12.3	13.4	12.9	1.1	0.4	CL	Low	Brown	No	No	0	MD	Mat	0	0	0
7	Channel	16.0	17.2	16.6	1.2	0.2	SICL	Low	Brown	No	No	0	PIT	None	0	0	0/4
8	Edge	20.2	21.6	20.9	1.5	-	SICL	High	Brown	No	No	0	PIT	None	0	0	0/1
9	Shoal	16.1	16.4	16.2	0.3	4.9	SICL	Moderate	Brown	No	No	1	FLOC	None	0	0	0/15
10	Shoal	9.2	10.3	9.8	1.1	2.3	SICL	Low	Brown	No	No	1	FLOC	None	0	0	0
11	Shoal	13.1	13.5	13.3	0.4	6.6	SICL	Moderate	Brown	No	No	1	FLOC	None	0	0	1/0
12	Shoal	9.0	9.3	9.2	0.3	0.7	CL	Low	Brown	No	No	1	MD	None	0	0	0
13	Shoal	2.5	6.6	4.5	4.1	-	CL	High	Brown	No	No	0	DIST	None	0	0	0
14	Shoal	1.5	3.0	2.2	1.5	0.3	CL	High	Brown	No	No	0	PB	None	0	1	0
15	Shoal	24.8	25.2	25.0	0.4	1.2	SICL	Moderate	Brown	No	No	1	PIT	None	1	0	0
16	Shoal	6.3	6.6	6.5	0.3	2.2	SI	High	Brown	No	No	1	PIT	None	0	0	0
17	Shoal	7.8	8.4	8.1	0.6	3.1	SI	Moderate	Brown	No	No	1	MD	None	0	2	0
18	Shoal	4.9	6.0	5.5	1.1	0.3	SIFS	High	Brown	No	No	1	PIT	None	1	5	0
19	Shoal	11.5	11.7	11.6	0.2	2.6	SI	Moderate	Brown	No	No	1	FLOC	None	0	2	1/0

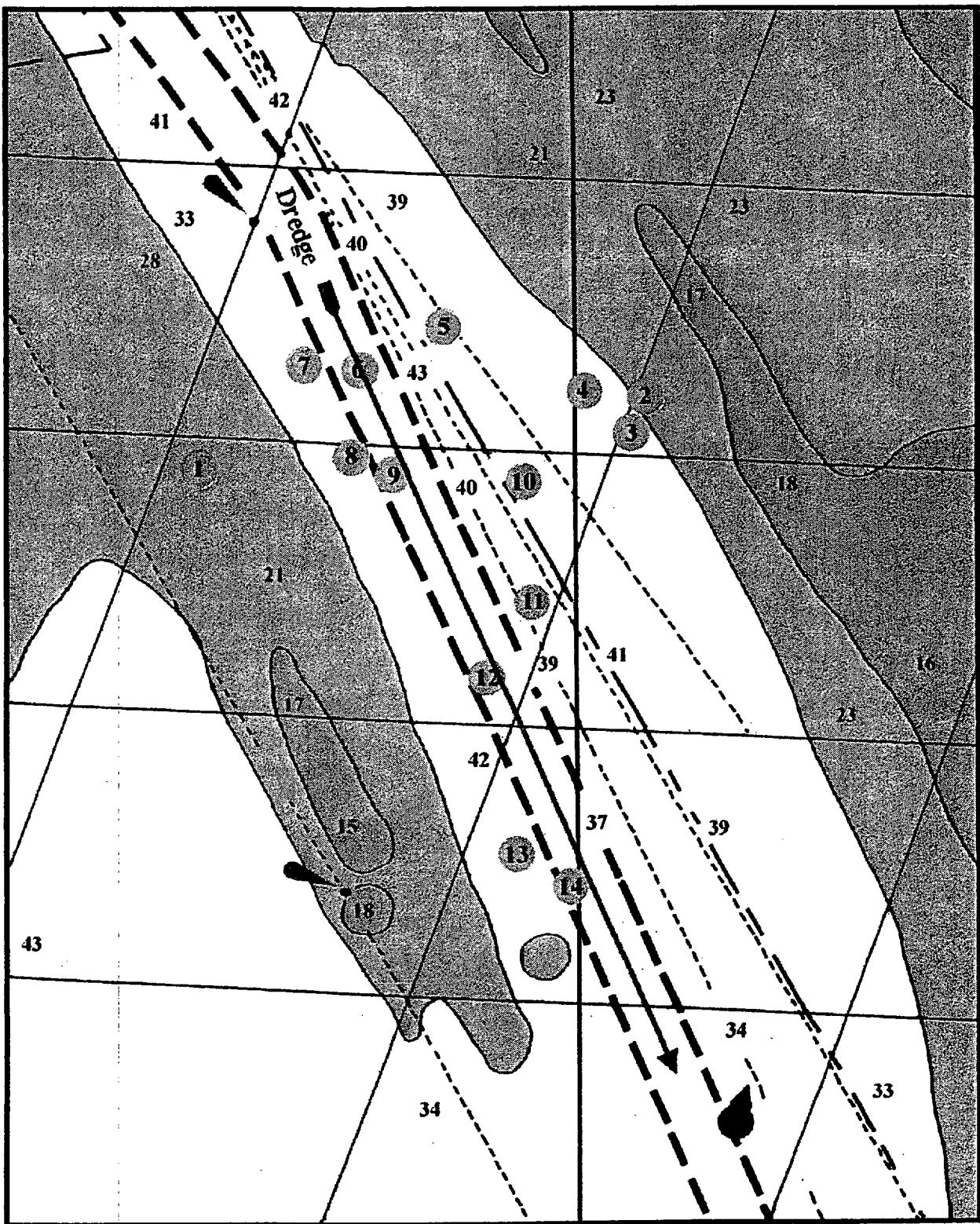
20	Shoal	17.2	18.0	17.6	0.8	4.5	SI	High	Brown	No	No	2	FLOC	None	0	1	0
21	Shoal	14.8	18.3	16.5	3.5	2.5	MSGR/CL	Low	Brown	No	No	1	GR	Some	0	0	2/0
22	Edge	6.2	8.0	7.1	1.8	0.6	FS/CL	Low	Brown	No	No	1	EVEN	Mat	0	0	0
23	Edge	9.5	11.1	10.3	1.6	0.7	FS/CL	Moderate	Brown	No	No	1	MD	Some	0	0	0
24	Channel	15.0	17.4	16.2	2.4	0.2	CL	Low	Brown	No	No	0	PIT	None	0	0	0
25	Channel	11.8	12.7	12.3	0.9	0.2	CL	Low	Brown	No	No	0	MD	FEW	0	0	0/25
26	Edge	14.5	15.0	14.8	0.5	0.2	SI	High	Brown	No	No	1	MD	None	1	3	0/40
27	Shoal																
28	Shoal																
29	Shoal	5.0	5.7	5.4	0.7	0.2	CL	High	Brown	No	No	0	PIT	None	0	0	0
30	Shoal	12.0	13.0	12.5	0.9	-	SI	High	Brown	No	No	2	DIST	None	0	0	0
31	Shoal	11.3	13.1	12.2	1.8	1.2	SICL	High	Brown	Yes	No	2	FLOC	None	0	0	1/10
32	Edge	2.3	3.9	3.1	1.6	>3.1	MS	Moderate	Brown	No	No	0	DED,GR	None	0	0	0
33	Edge	3.3	6.2	4.8	3.0	0.1	FS/CL	Moderate	Gray	No	No	1	MD	Many	0	0	0
34	Edge	6.4	8.2	7.3	1.8	0.4	SI	High	Brown	No	No	1	FLOC	None	0	0	0
35	Edge	3.8	4.8	4.3	1.1	0.2	CL	Low	Brown	No	No	0	MD	Many	0	0	0
36	Edge	8.2	12.5	10.4	4.3	0.7	CL	Low	Brown	No	No	0	DIST	Many	0	0	0
37	Edge	20.5	21.0	20.7	0.5	-	CL	Low	Brown	No	No	0	IND	None	0	0	0
38	Edge	5.7	10.3	8.0	4.6	0.2	CL	Low	Brown	No	No	0	DIST	Some	0	0	0
39	Edge	20.9	21.3	21.1	0.4	-	SICL	High	Brown	No	No	0	EVEN	None	0	0	0/1
40	Edge	12.7	13.1	12.9	0.4	0.2	SI	High	Brown	No	No	2	EVEN	None	0	2	0/17
41	Edge	0.7	1.1	0.9	0.4	0.2	FS/CL	Moderate	Brown	No	No	1	BED,DIST	None	0	0	0
42	Edge	12.3	13.2	12.7	0.9	0.8	MS/CL	Moderate	Brown	No	No	1	BED	None	0	1	0

43	Edge	11.8	12.1	12.0	0.3	0.9	SI	High	Brown	No	No	0	EVEN	None	0	0	0	0
----	------	------	------	------	-----	-----	----	------	-------	----	----	---	------	------	---	---	---	---

Table 3. General comparison of sediment profile image data from the Lower Study site (LS, Delaware Bay) and Upper Study site (US, Delaware River) sampled during hopper dredge loading and overflow tests.

Feature	LOCATION	
	Lower Study Site	Upper Study Site
Sediments	Homogeneous, Sands	Heterogeneous, Mainly Clays and Silt-Clays
Sediment Layering	Sediment Grain Size Changes	Color and Sediment Grain Size Changes
Prism Penetration	Shallow	Deep
Surface Relief	Physical Bed Forms	Biogenic Pits and Mounds
Suspended Material	Mostly Background Sediments	Mostly Background Sediments
Dredged Material	Detected at 3 Stations	Not Detected
Hopper Overflow	Detected at 1 Station	Detected at 1 Station
Hydrocarbon Contamination	Not Detected	Detected at 1 Station
Epifauna	Not Detected	Not Detected
Amphipod or Worm Tubes	Scarce	Common
Infauna	Not Detected	Common





**Figure 2.** Sediment profiling imagery stations occupied during hopper dredge loading and overflow tests at the lower study site. The figure has been modified from a NOAA navigation chart with depths indicated in feet. Approximate start and end of test locations of the dredge are indicated by the red arrow.

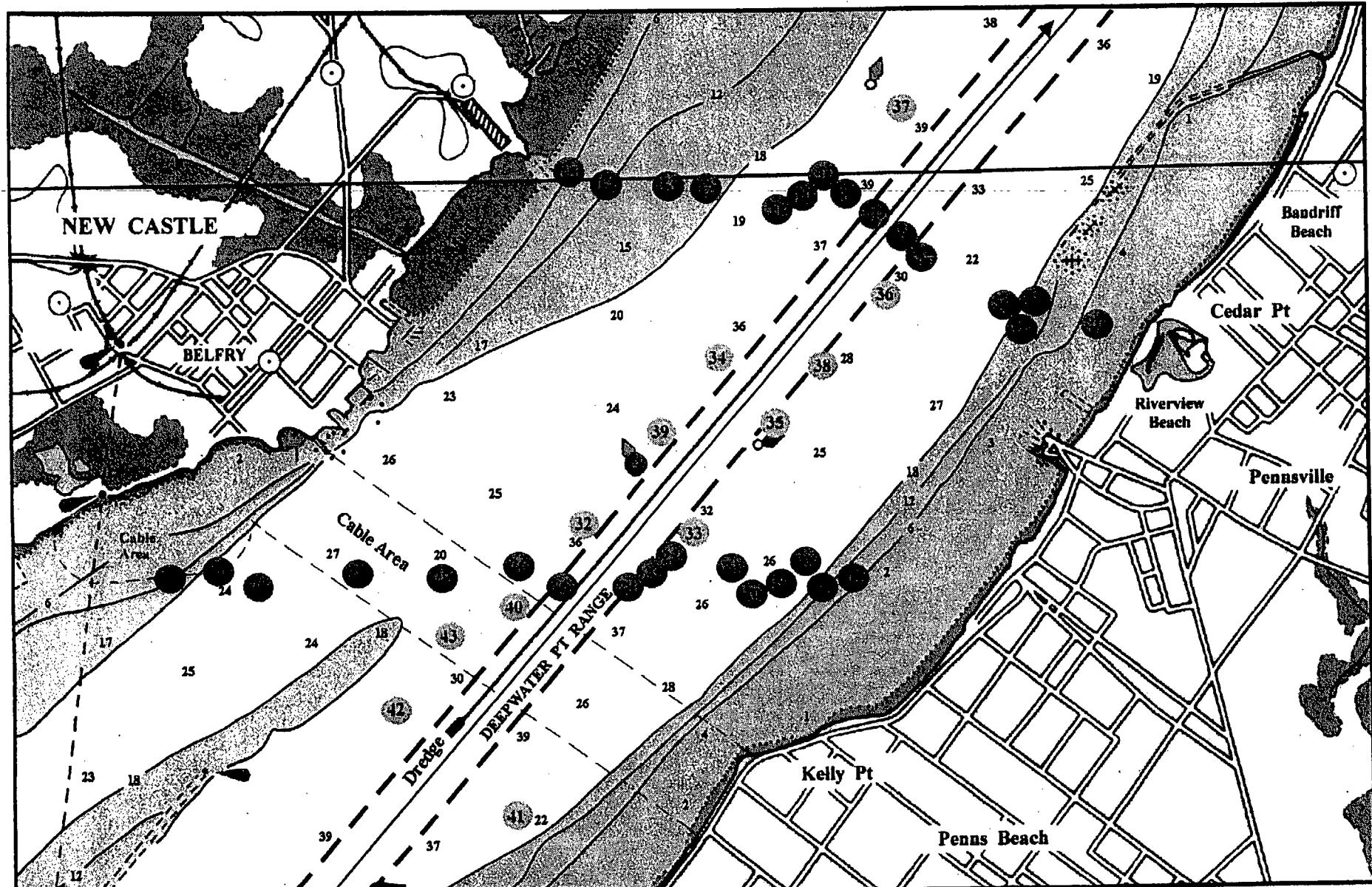
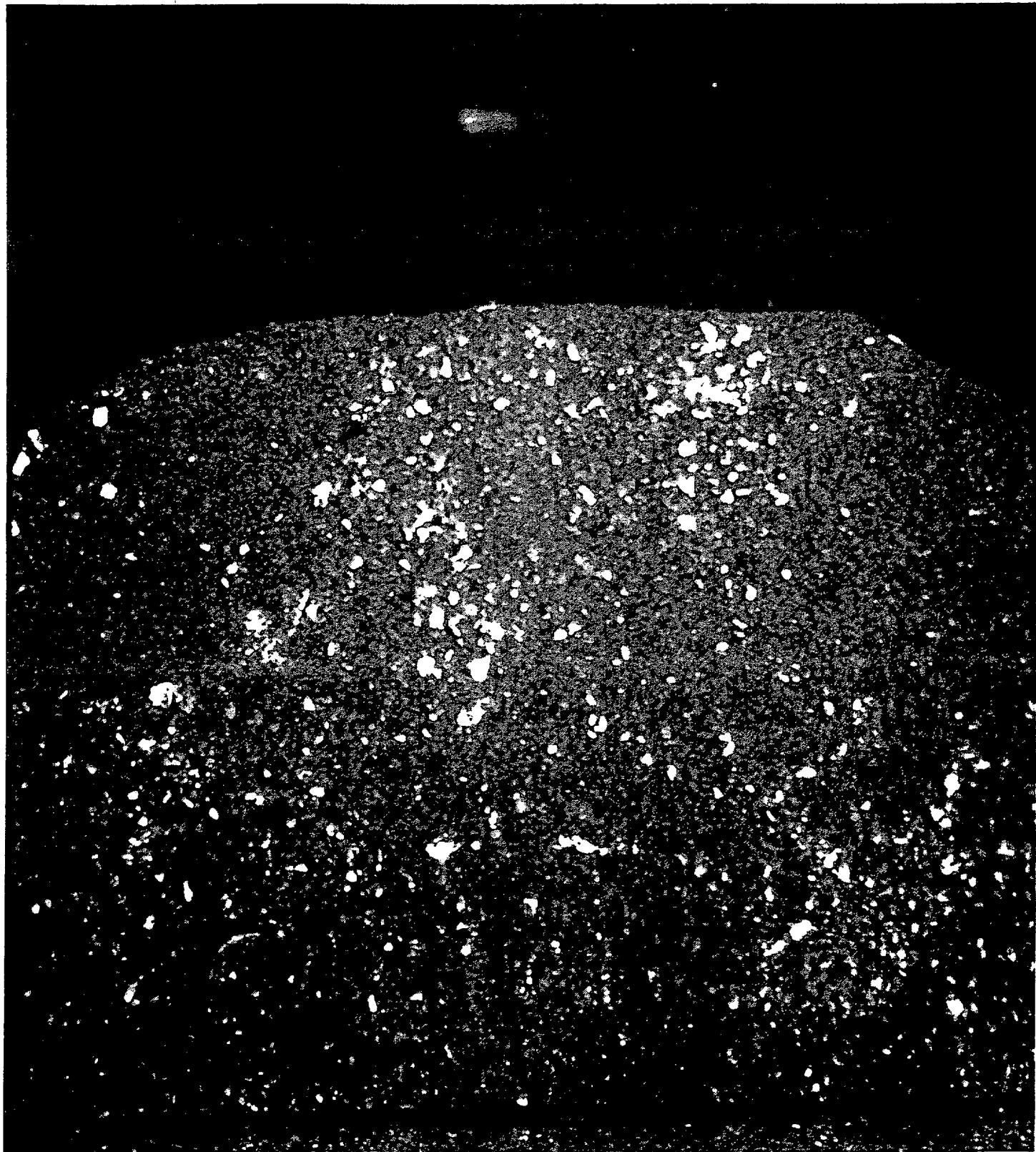
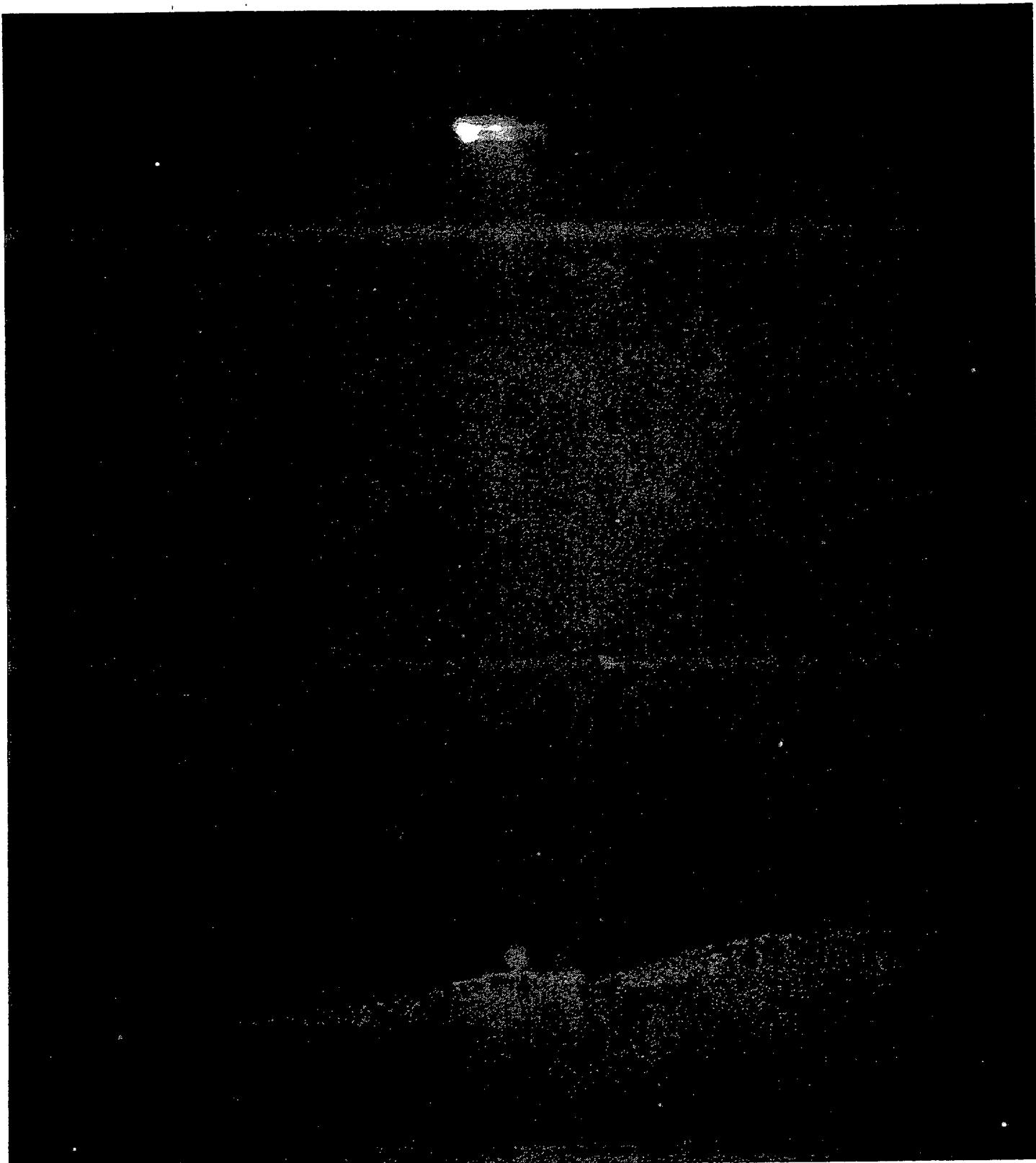


Figure 3. Sediment profiling imagery stations occupied during hopper dredge loading and overflow tests at the upper study site. Green stations (1-15) are pre-dredging stations, red stations (16-31) are during-dredging without overflow stations, and yellow stations (32-43) are during and post-overflow stations. The figure has been modified from a NOAA navigation chart with depths indicated in feet. Approximate start and end of test locations of the dredge are indicated by the red arrow.



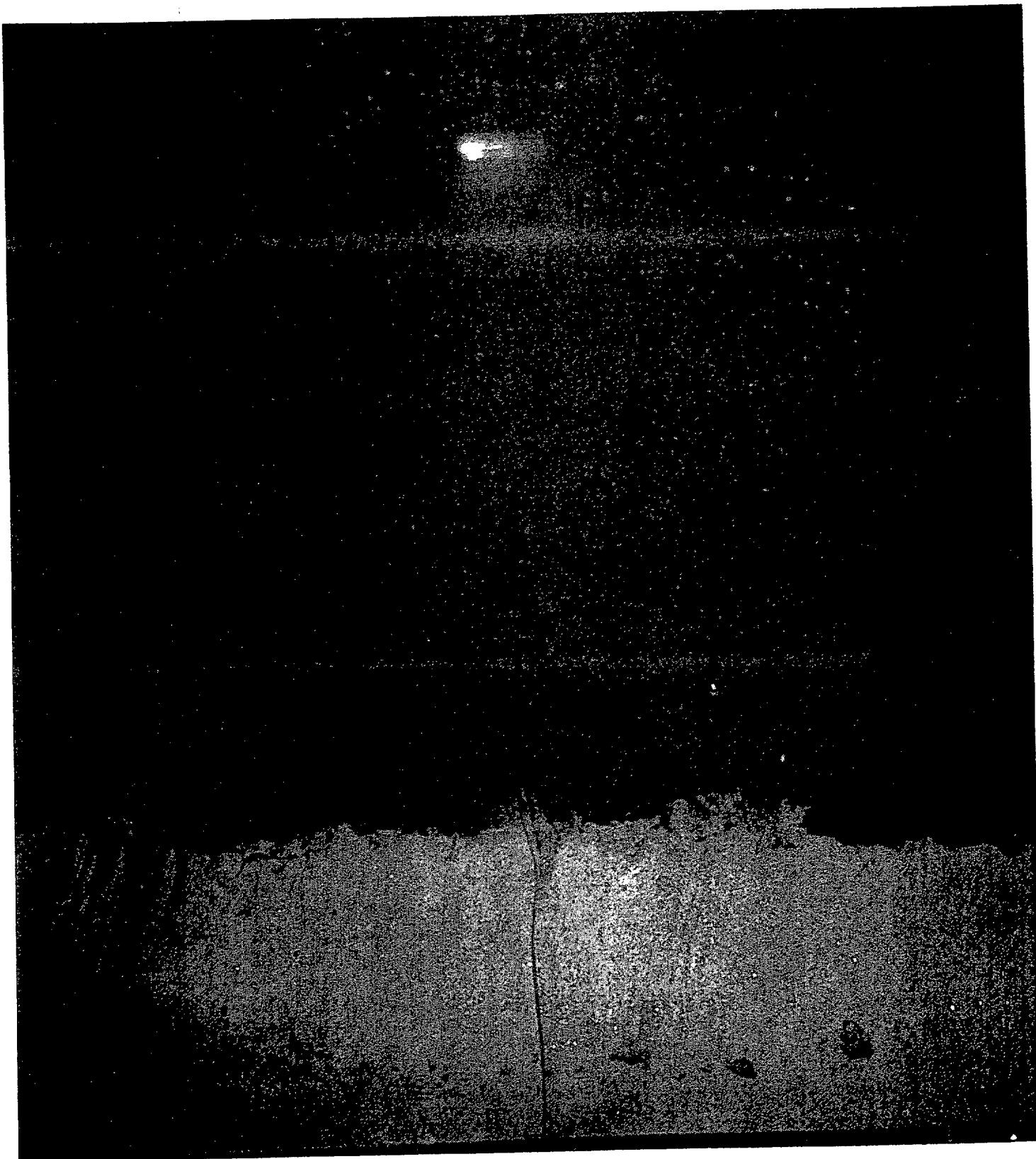
**Figure 4. SPI image of Lower Study Site station LS-09.**



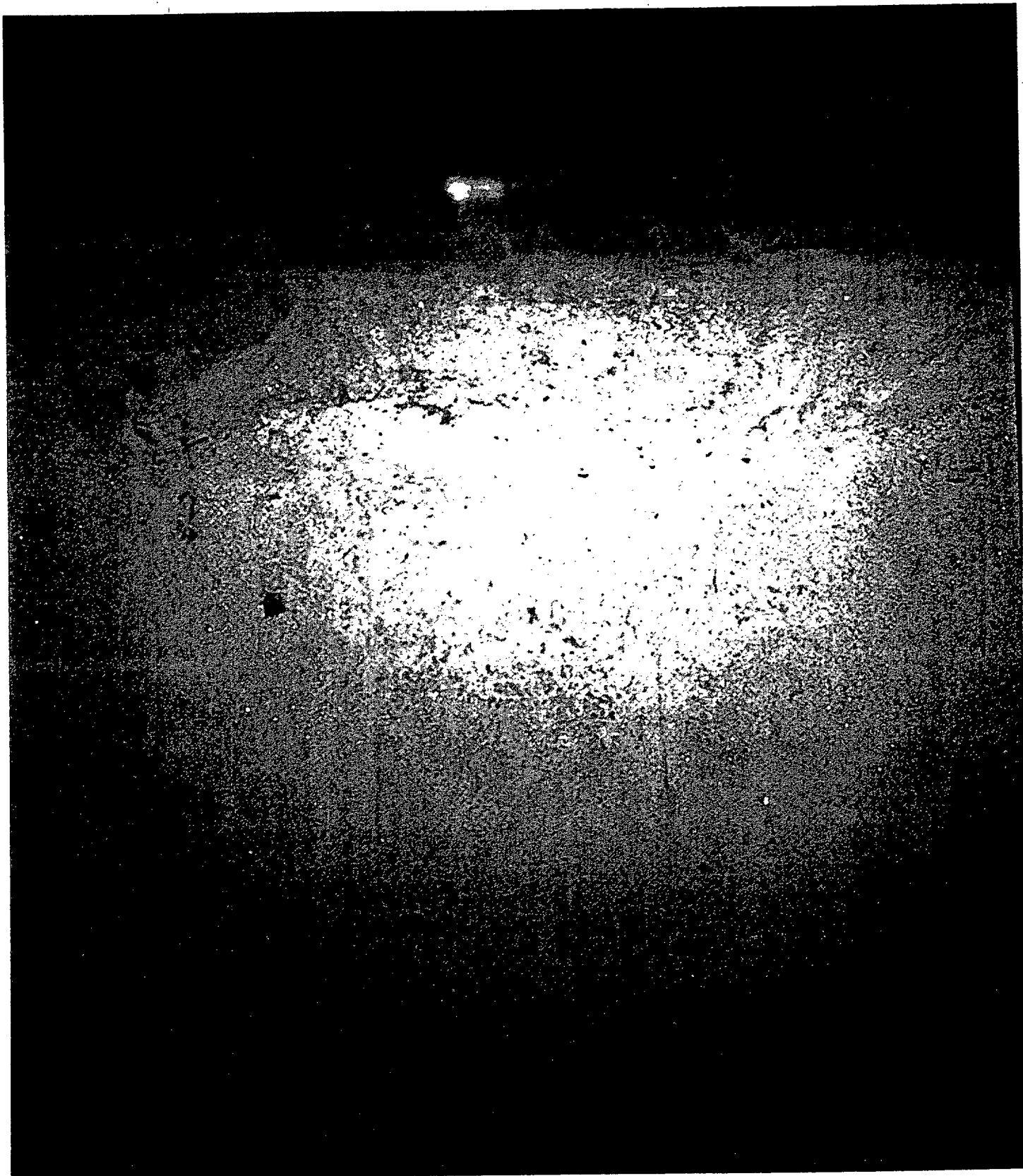
**Figure 5. SPI image of Upper Study Site station US-14.**



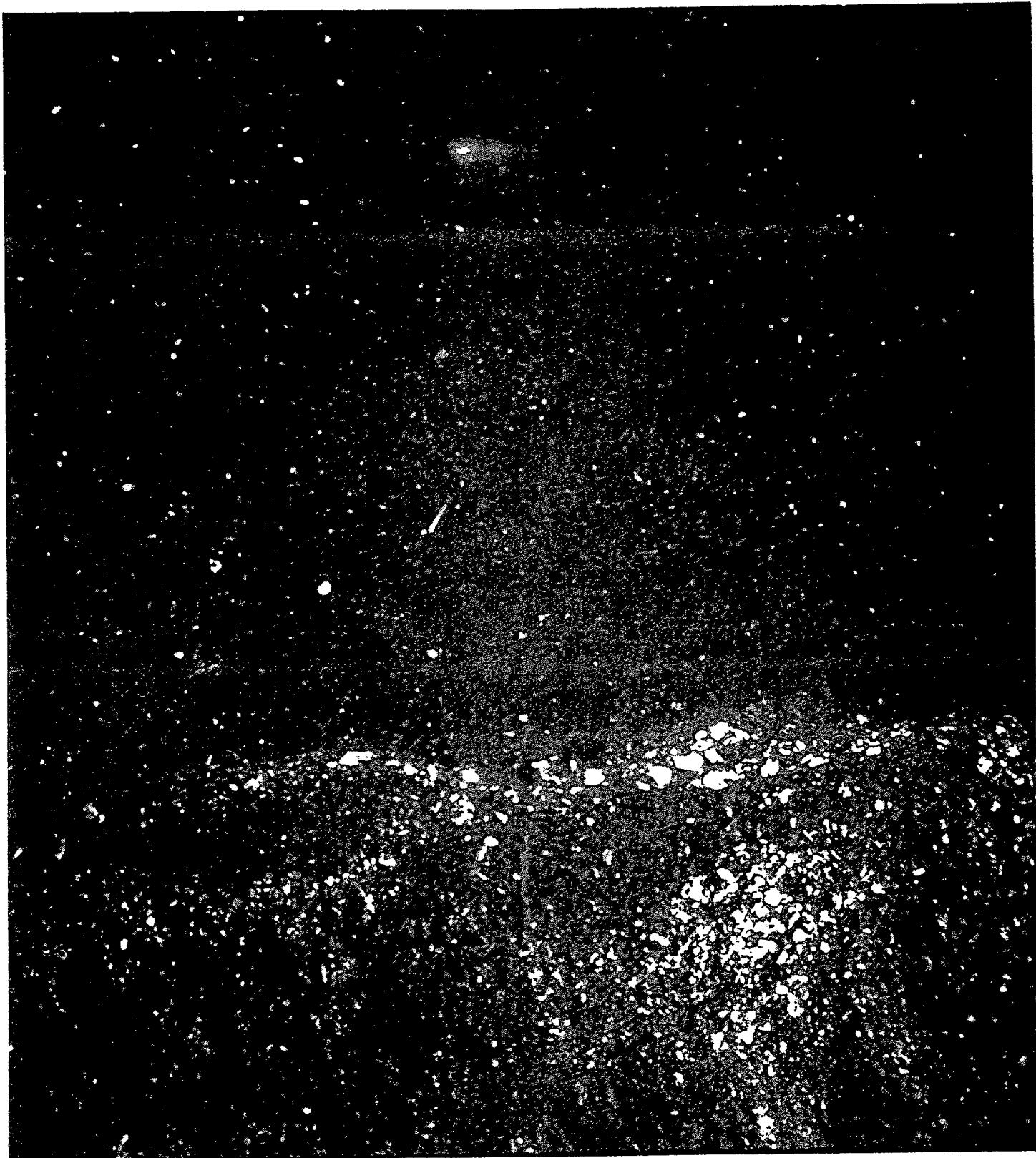
**Figure 6. SPI image of Lower Study site station LS-13.**



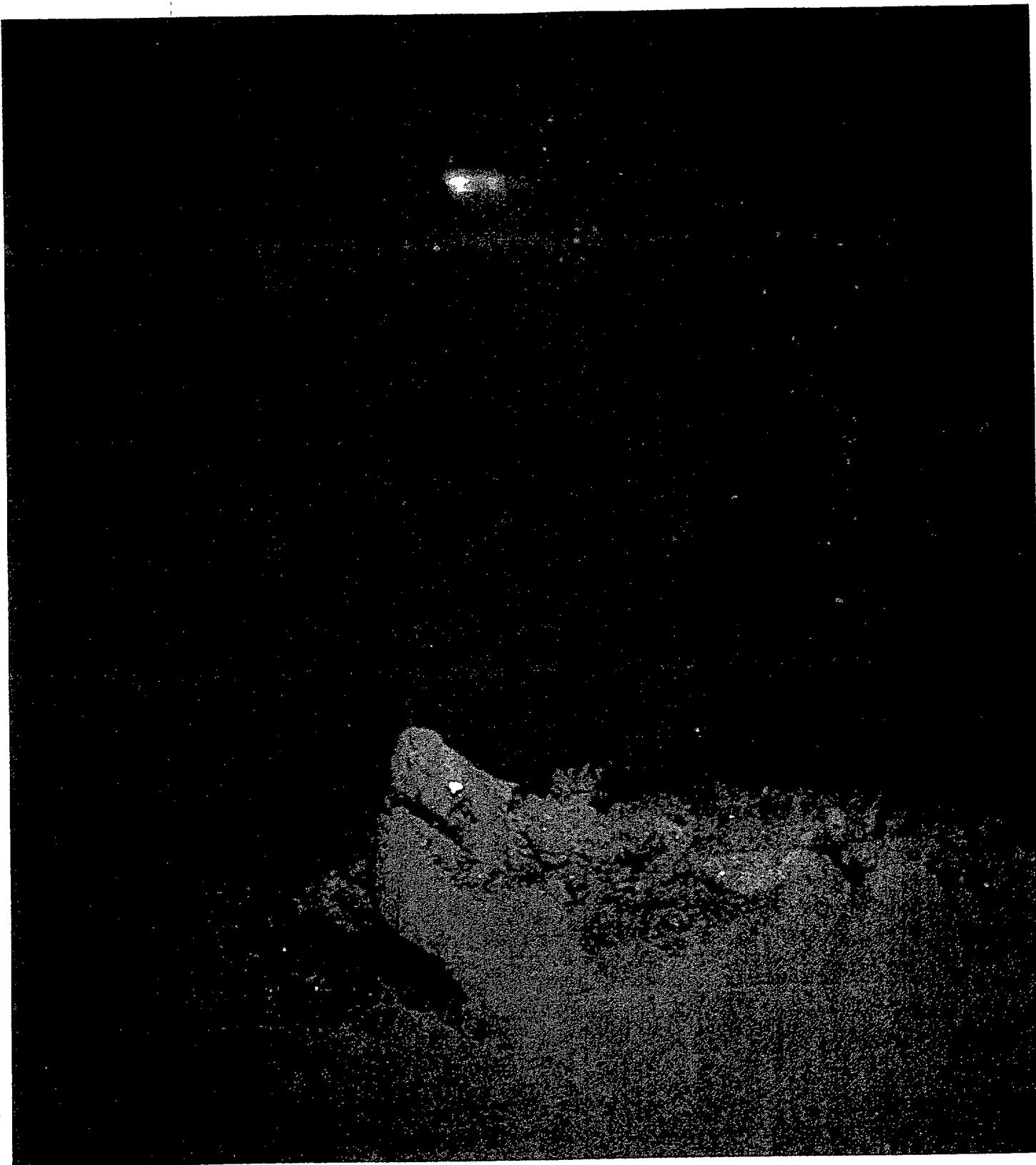
**Figure 7. SPI image of Upper Study site station US-35.**



**Figure 8.** SPI image of Upper Study site station US-11.



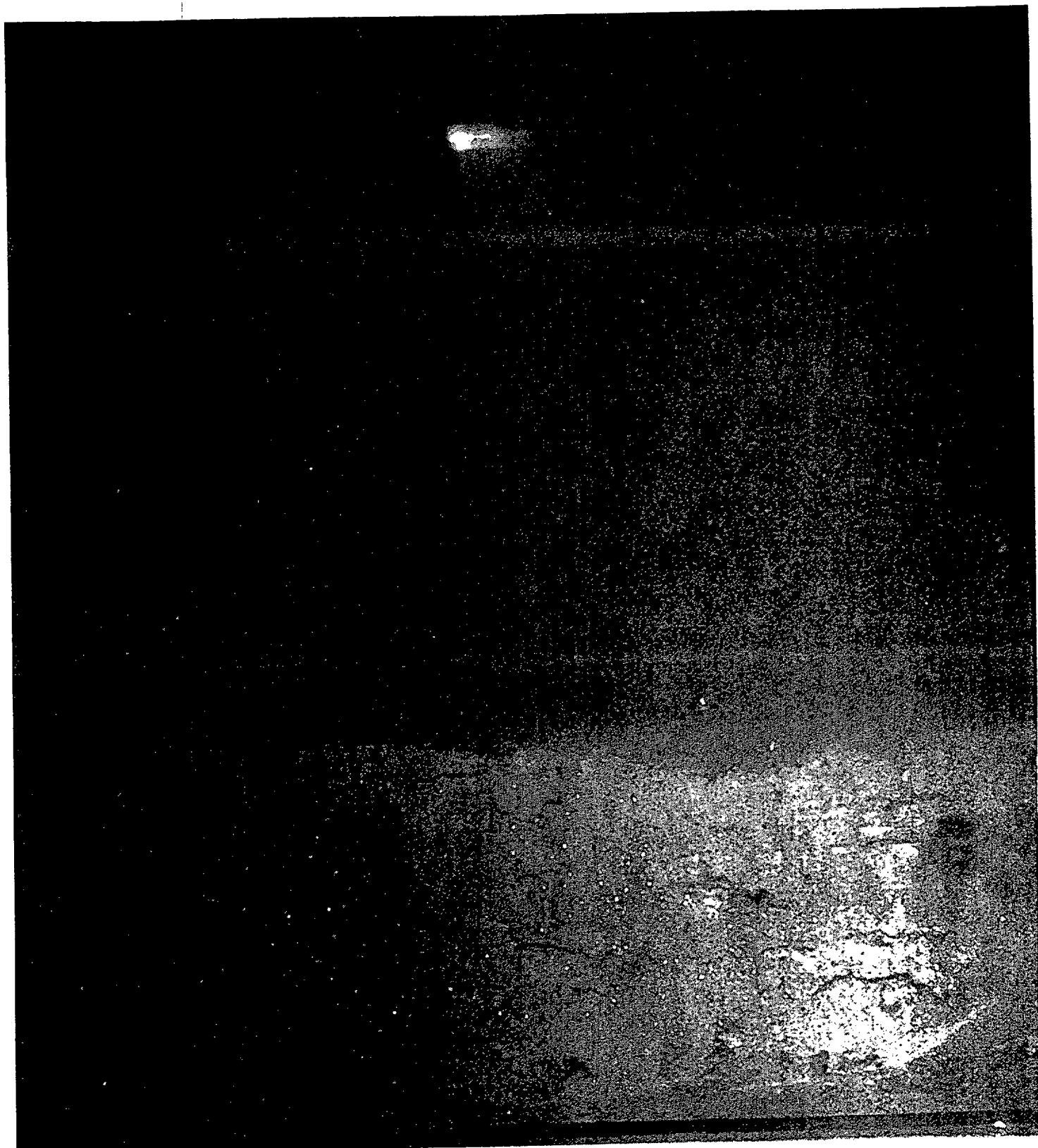
**Figure 9. SPI image of Lower Study site station LS-06.**



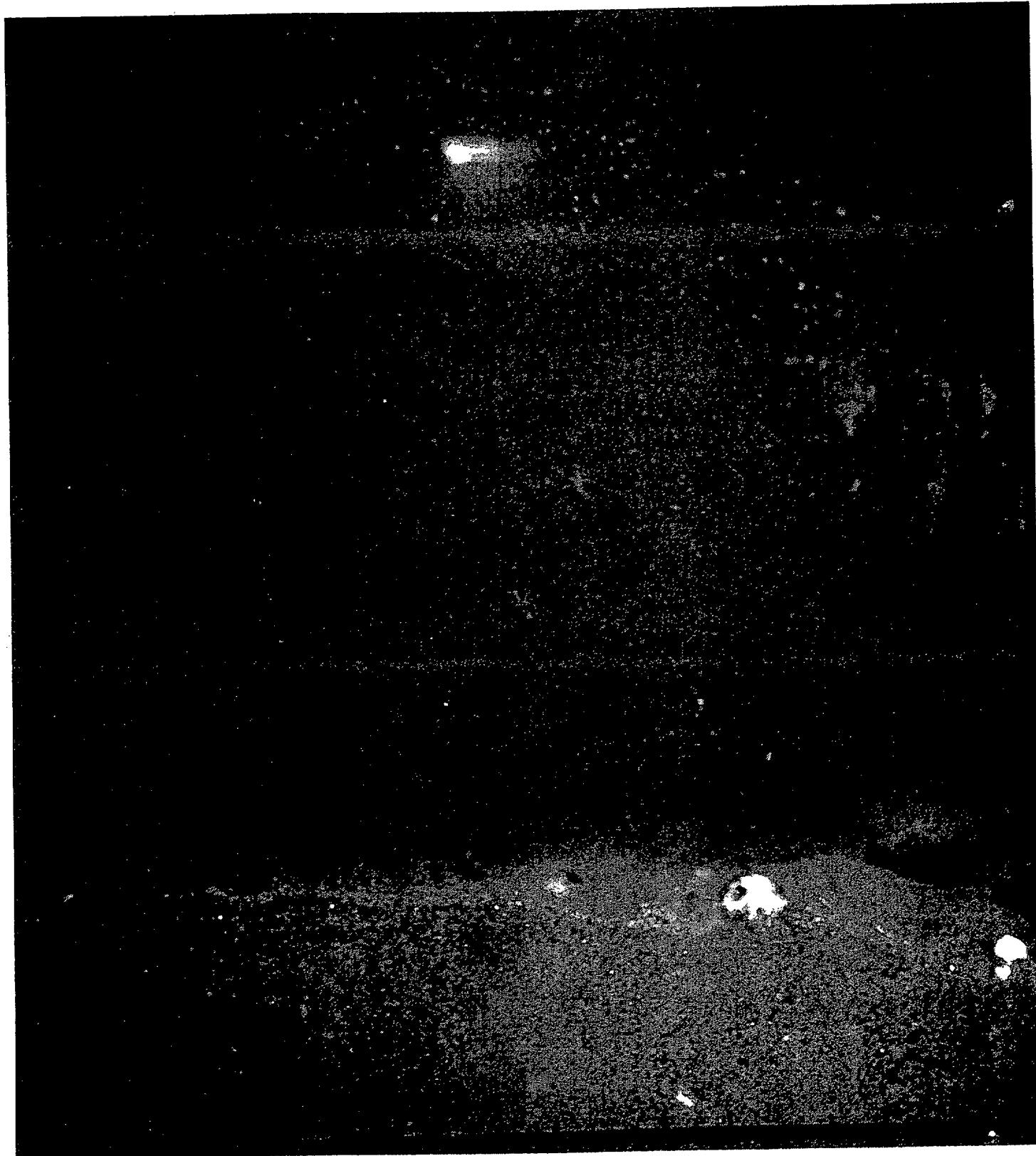
**Figure 10. SPI image of Upper Study Site station US-33.**



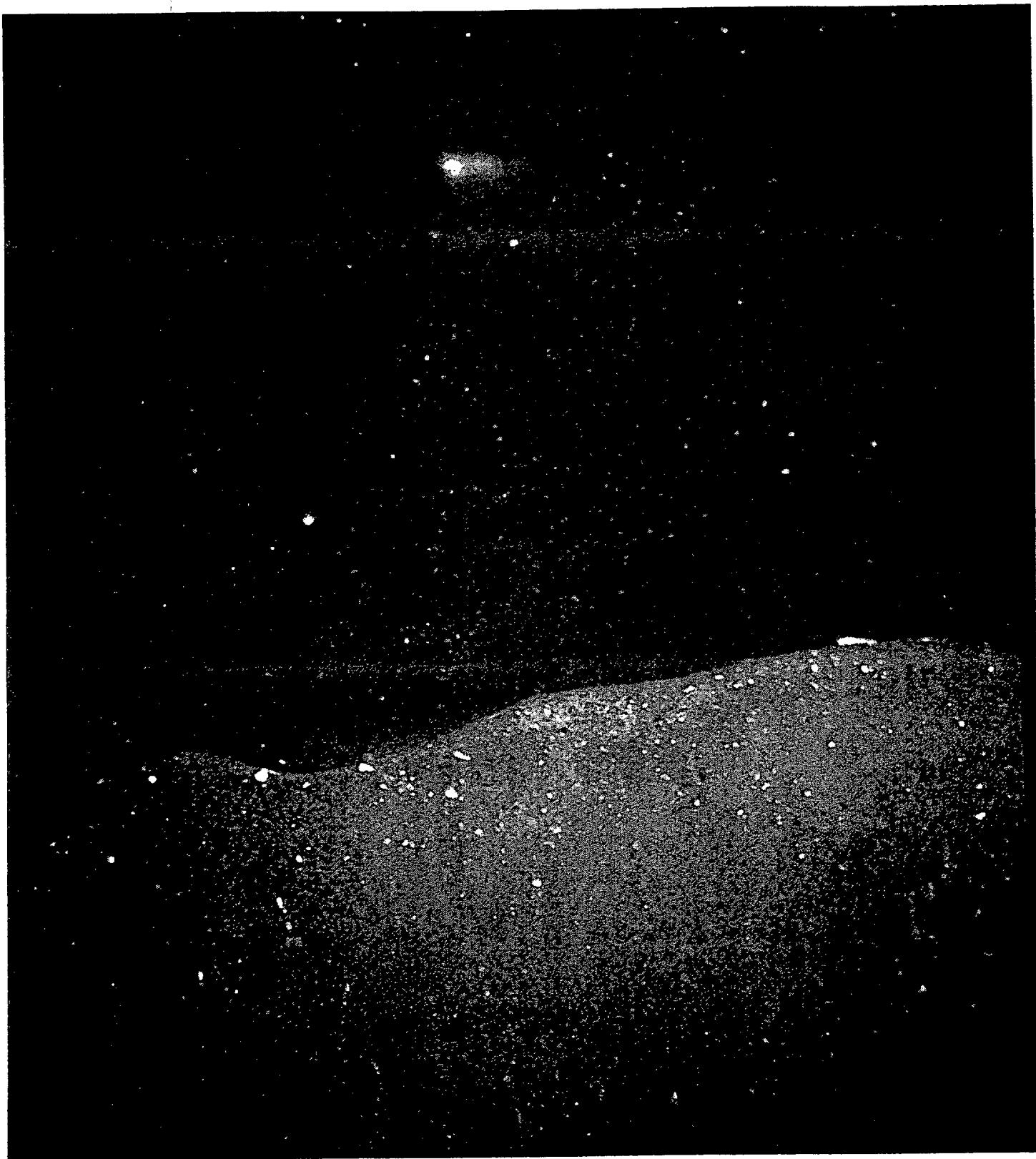
**Figure 11. SPI image of Upper Study site station US-21.**



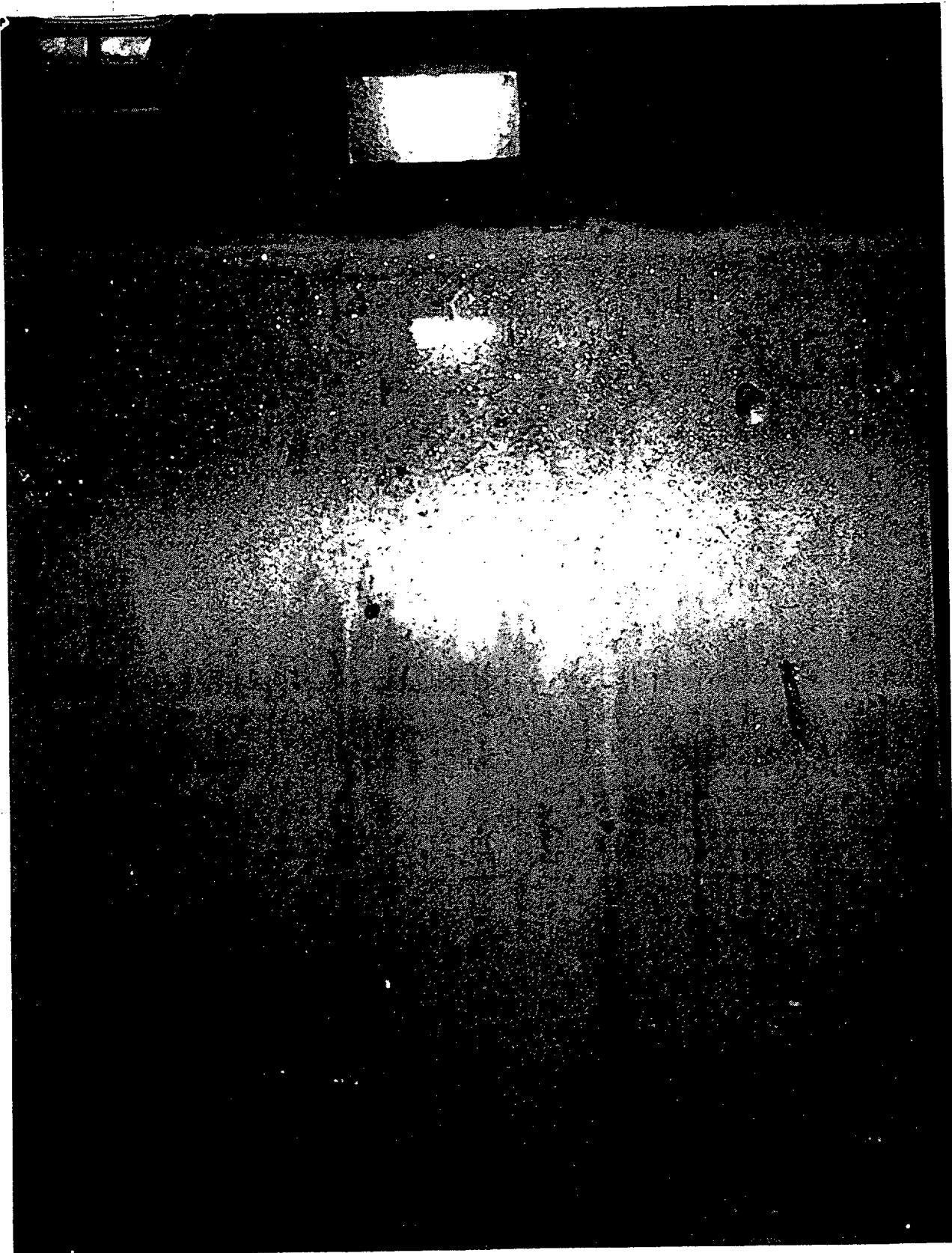
**Figure 12. SPI image of Upper Study site station US-29.**



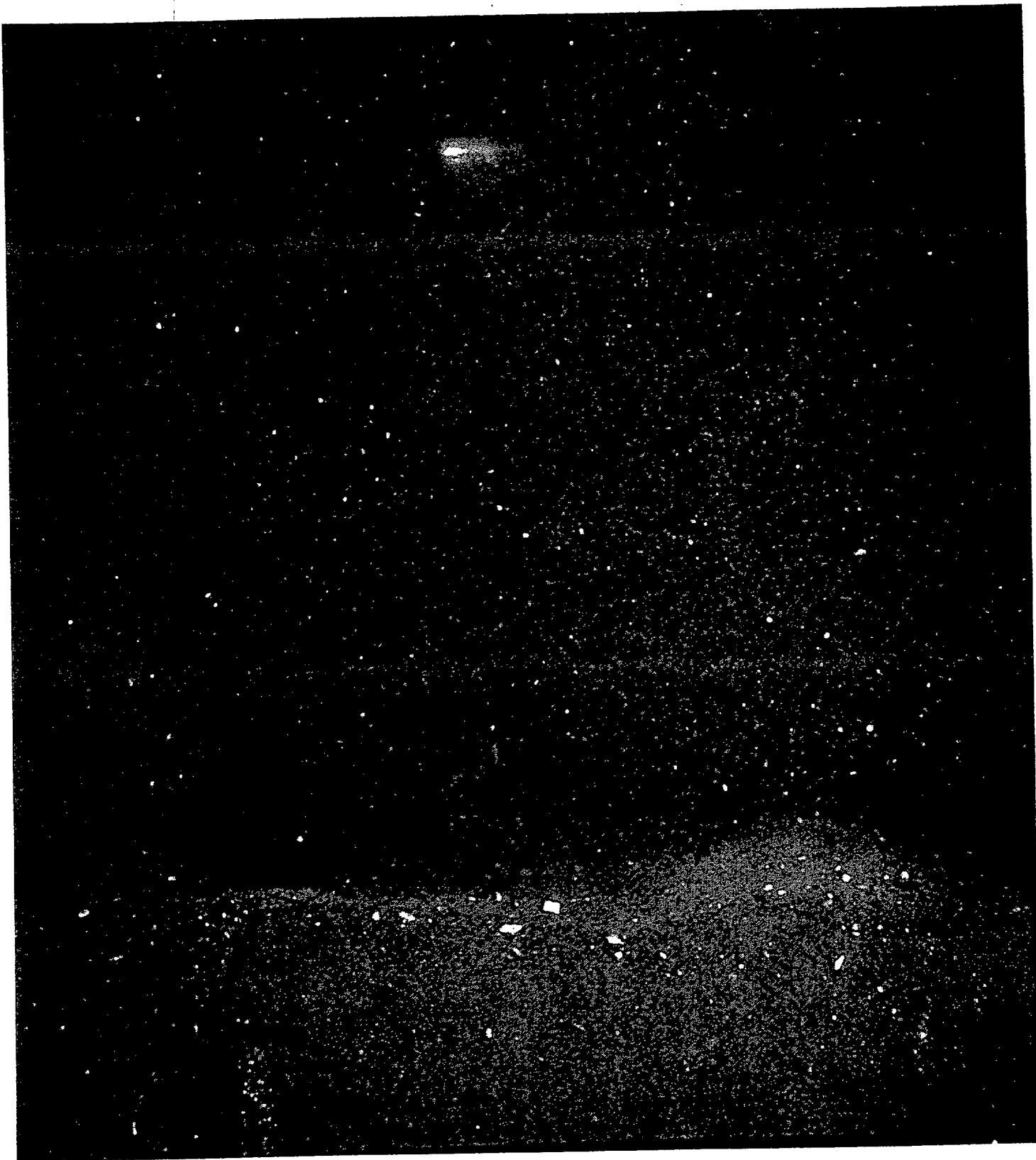
**Figure 13. SPI image of Upper Study Site station US-32.**



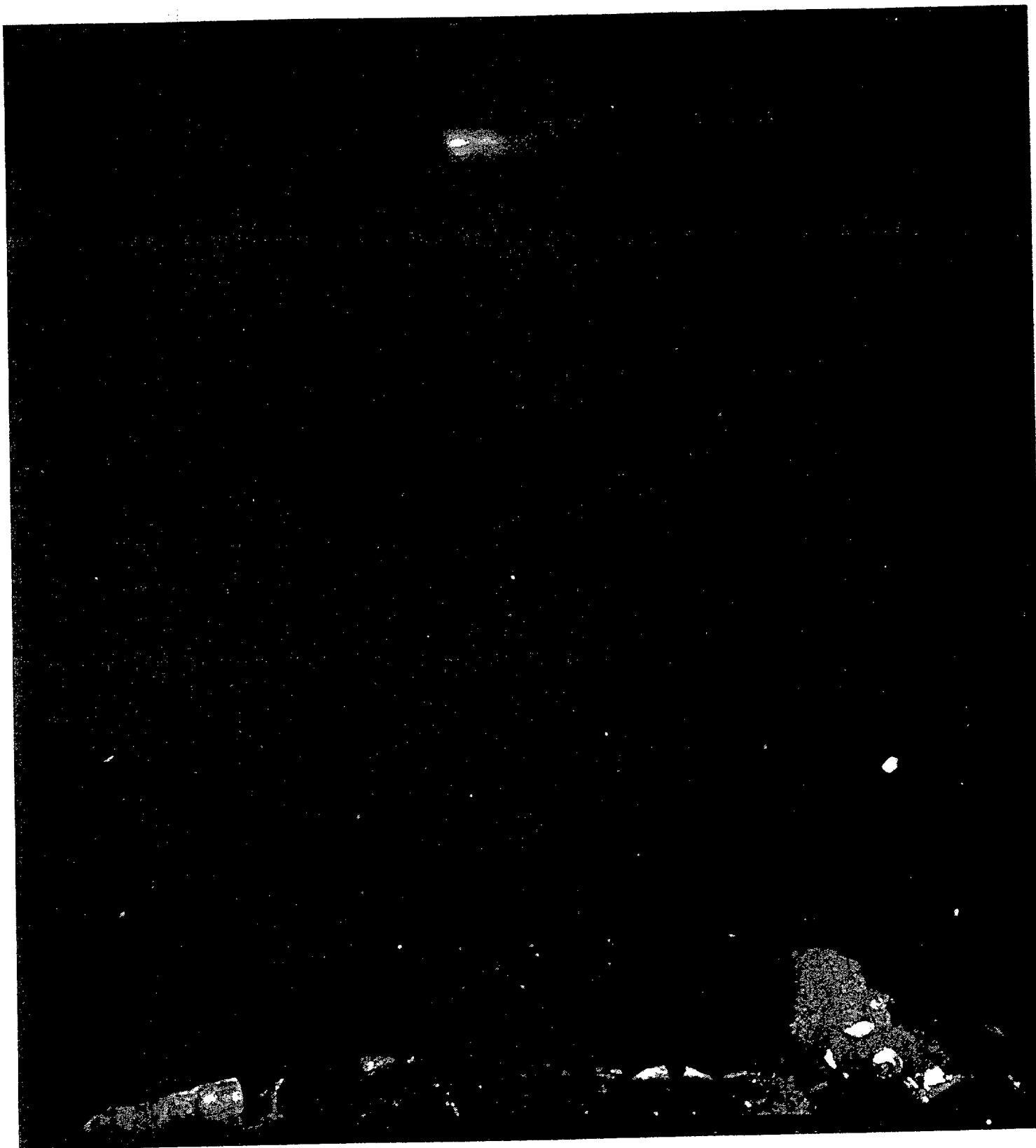
**Figure 14. SPI image of Lower Study Site station LS-03.**



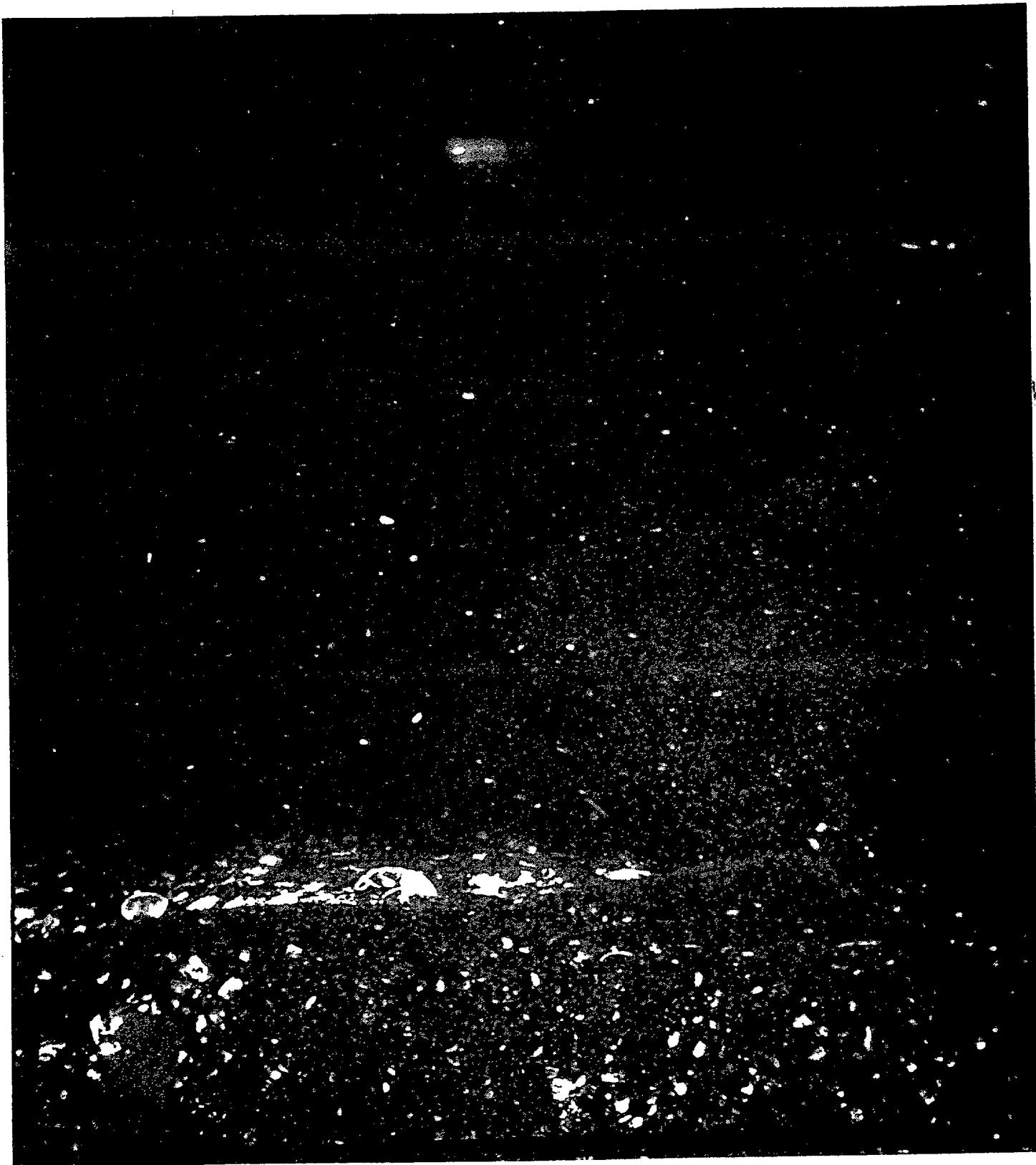
**Figure 15. SPI image of Upper Study site station US-09.**



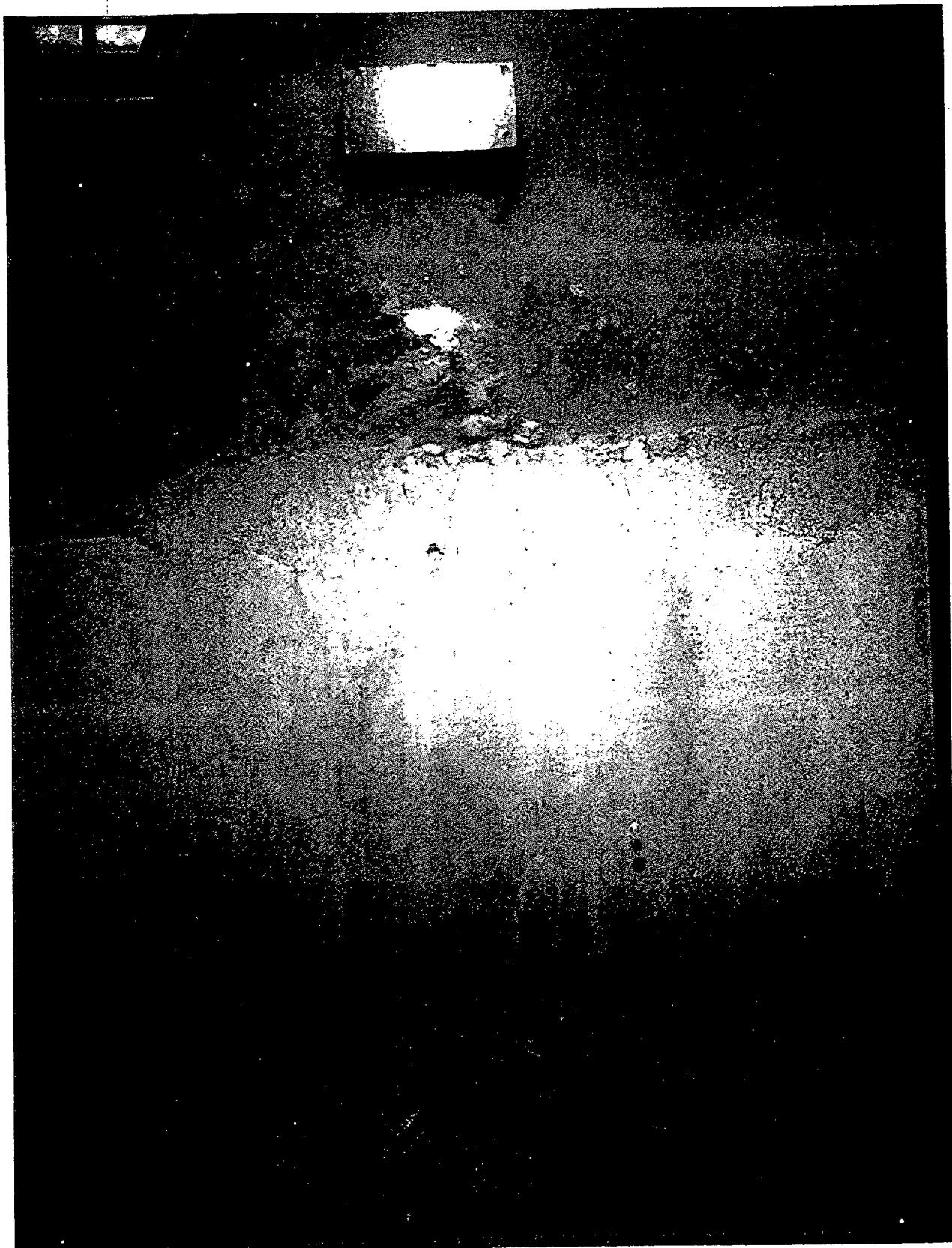
**Figure 16. SPI image of Lower Study site station LS-02.**



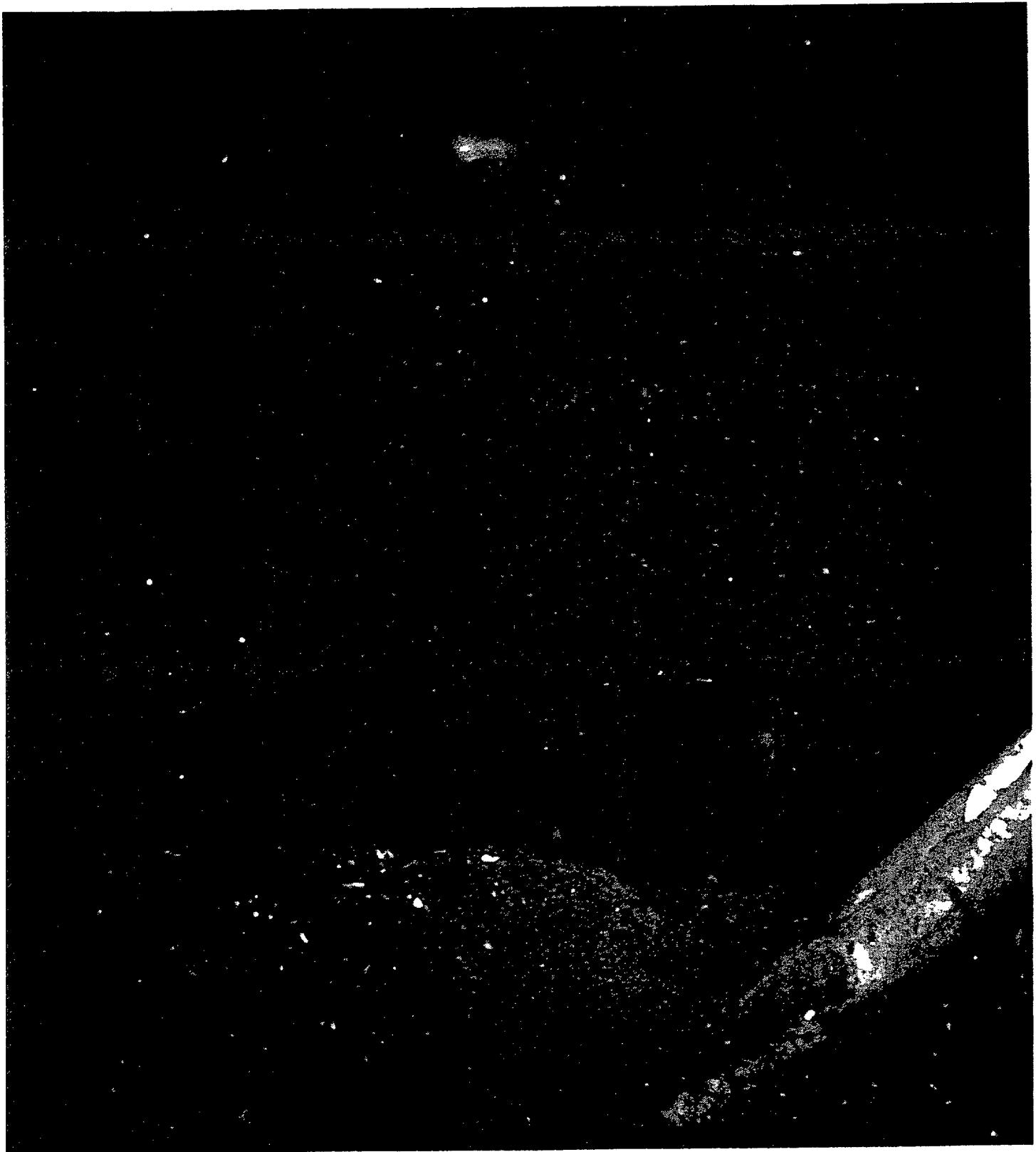
**Figure 17. SPI image of Lower Study site station LS-07.**



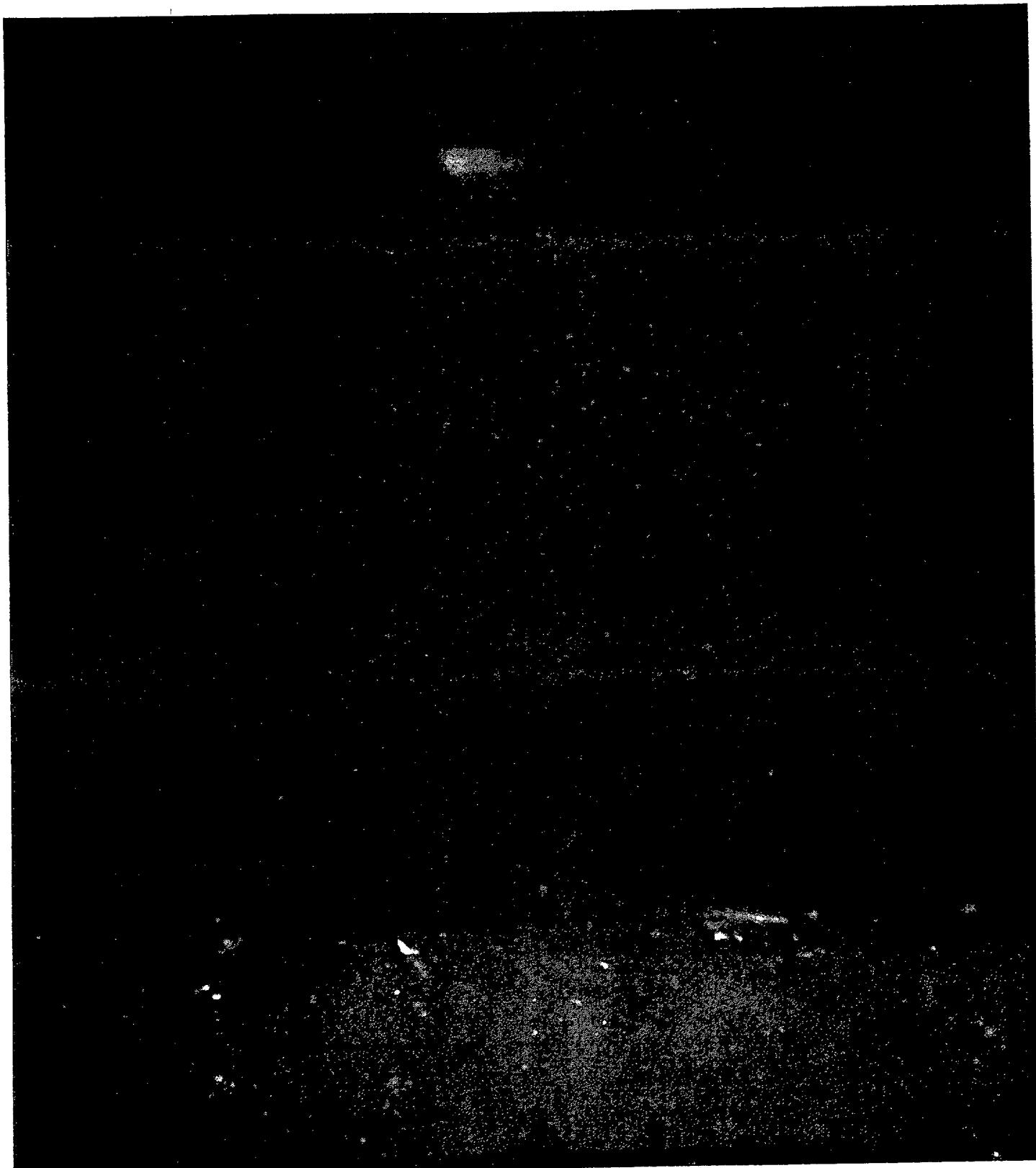
**Figure 18. SPI image of Lower Study Site station LS-12.**



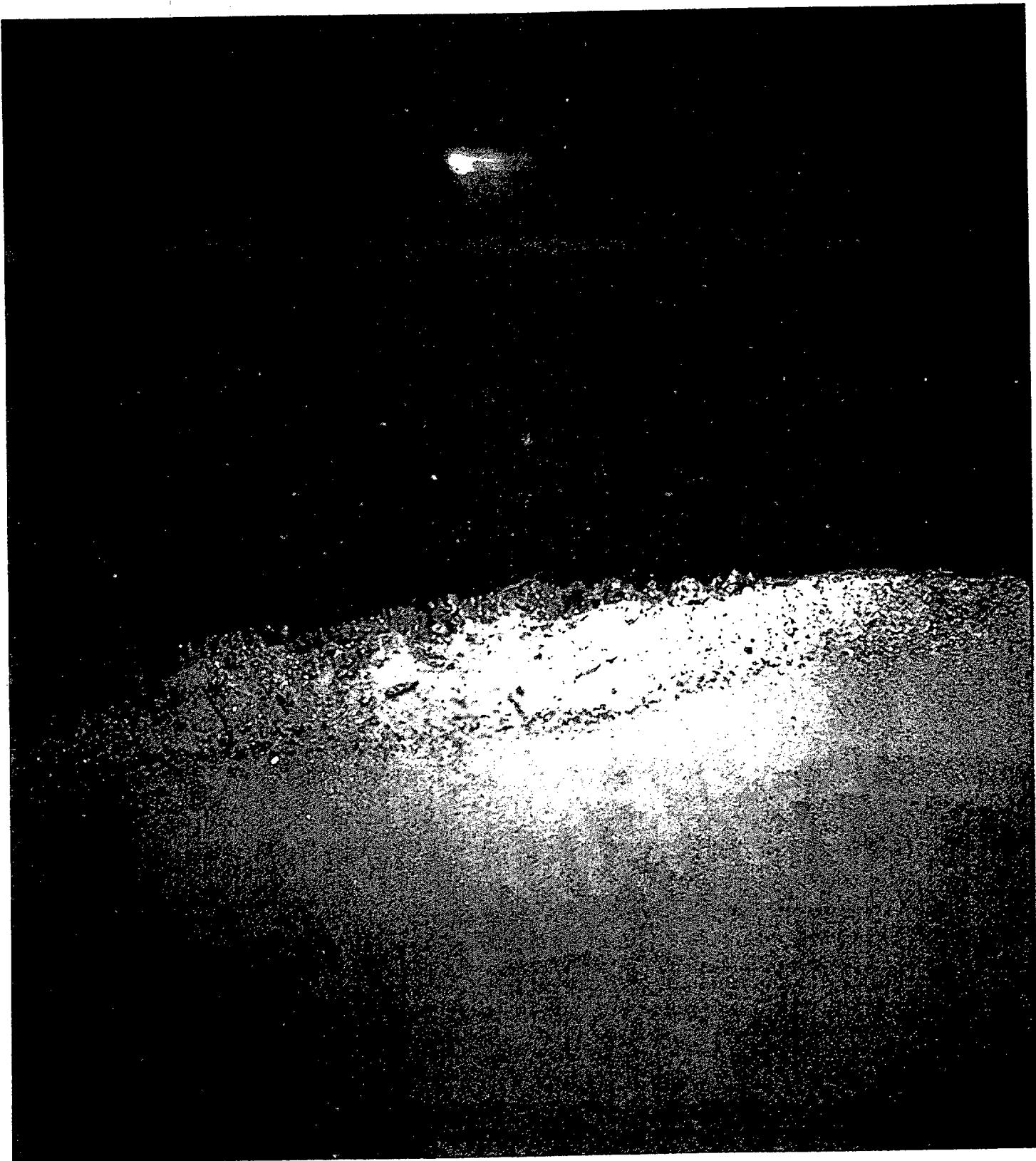
**Figure 19. SPI image of Upper Study site station US-31.**



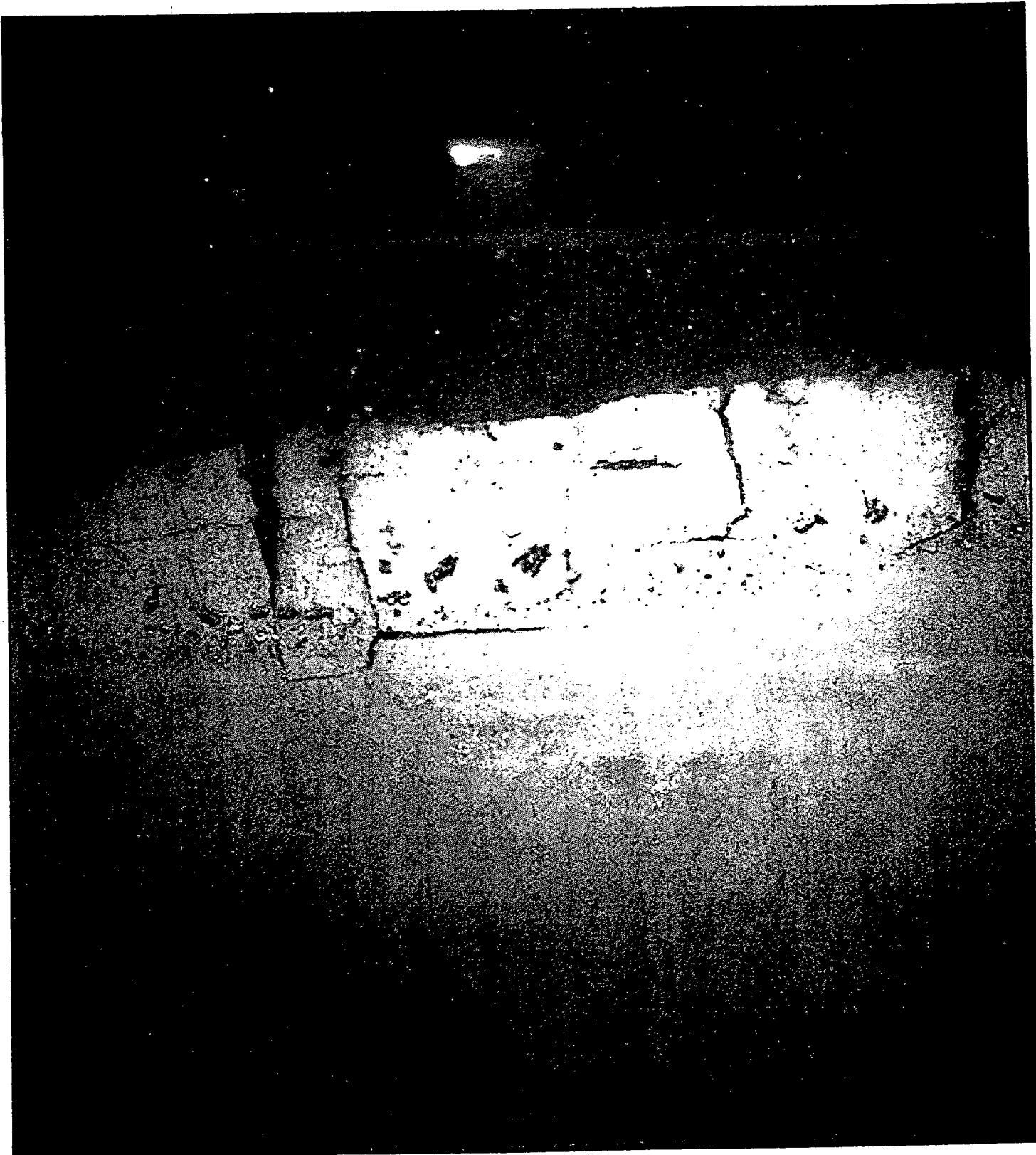
**Figure 20. SPI image of Lower Study Site station LS-11.**



**Figure 21.** SPI image of Lower Study Site station LS-10.



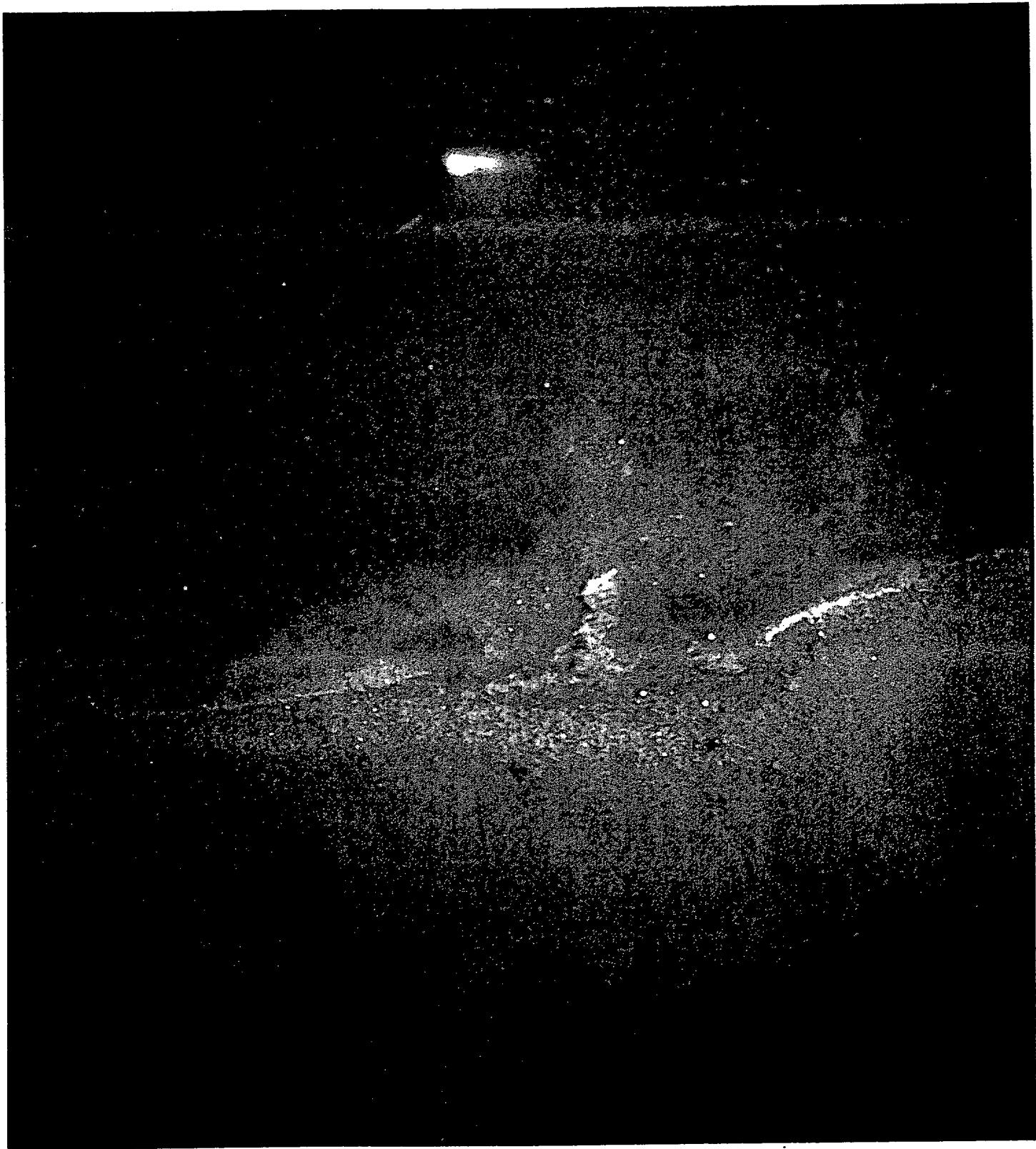
**Figure 22. SPI image of Upper Study site station US-22.**



**Figure 23. SPI image of Upper Study site station US-23.**



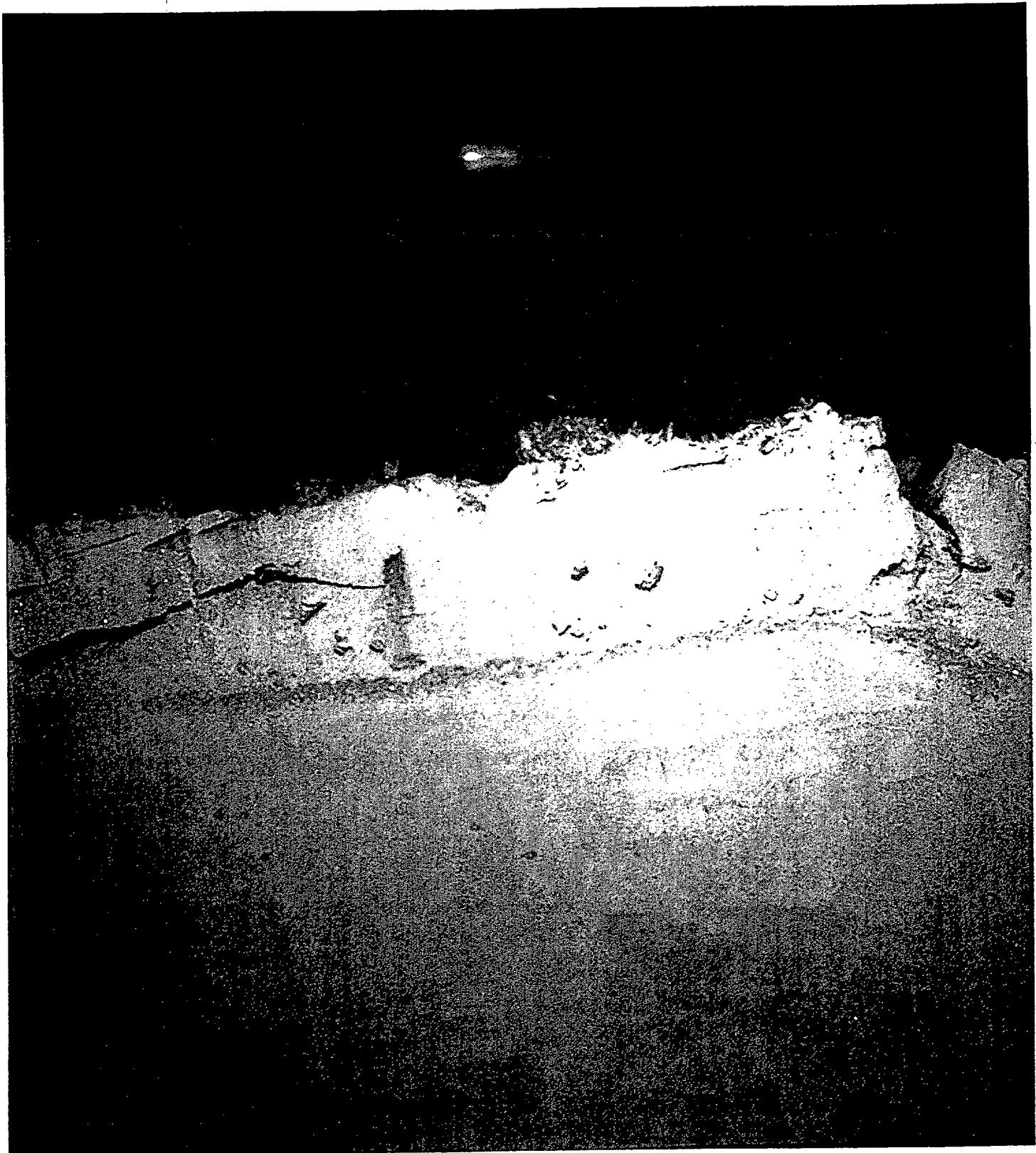
**Figure 24. SPI image of Upper Study Site station US-10.**



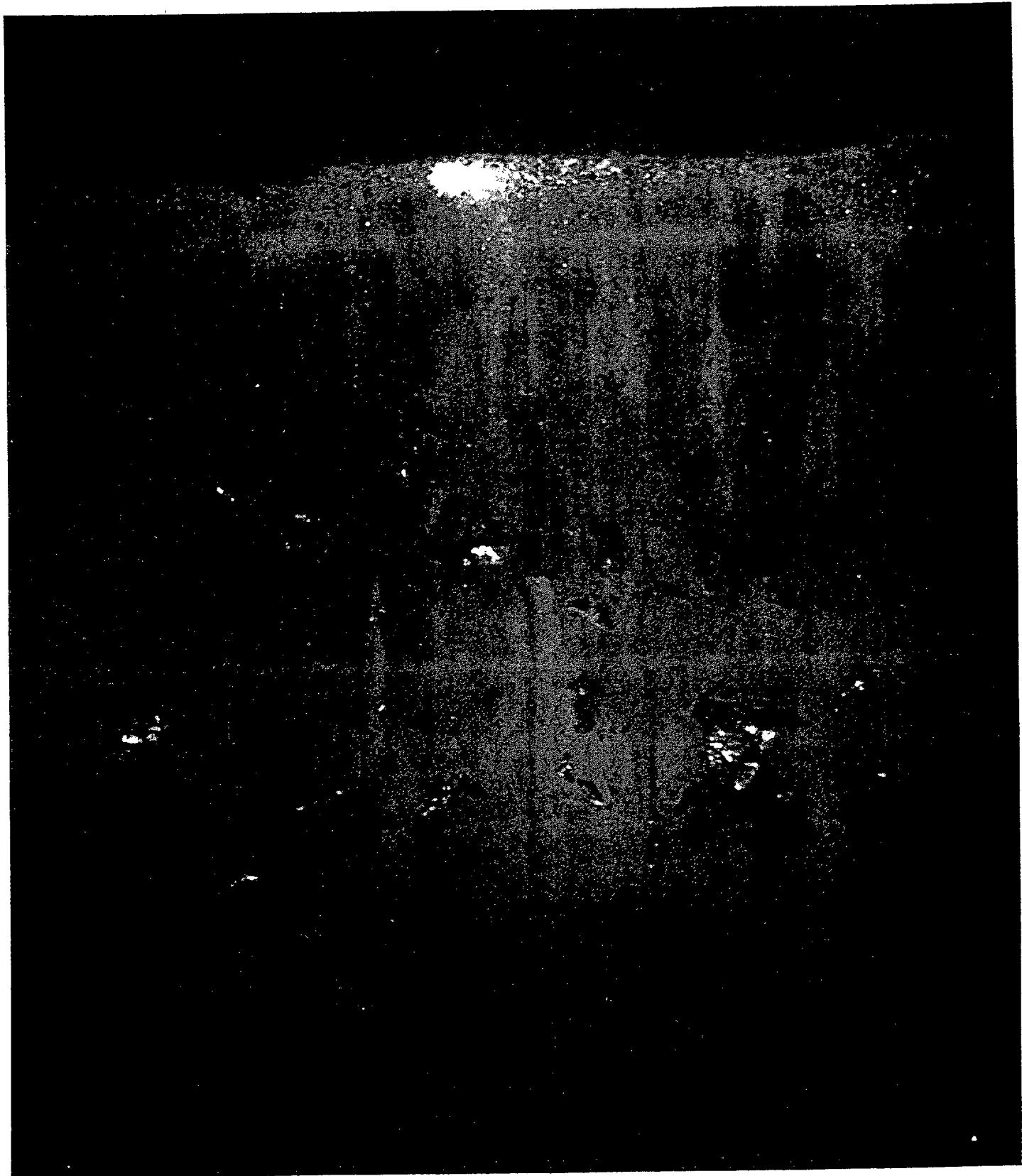
**Figure 25. SPI image of Upper Study Site station US-34.**



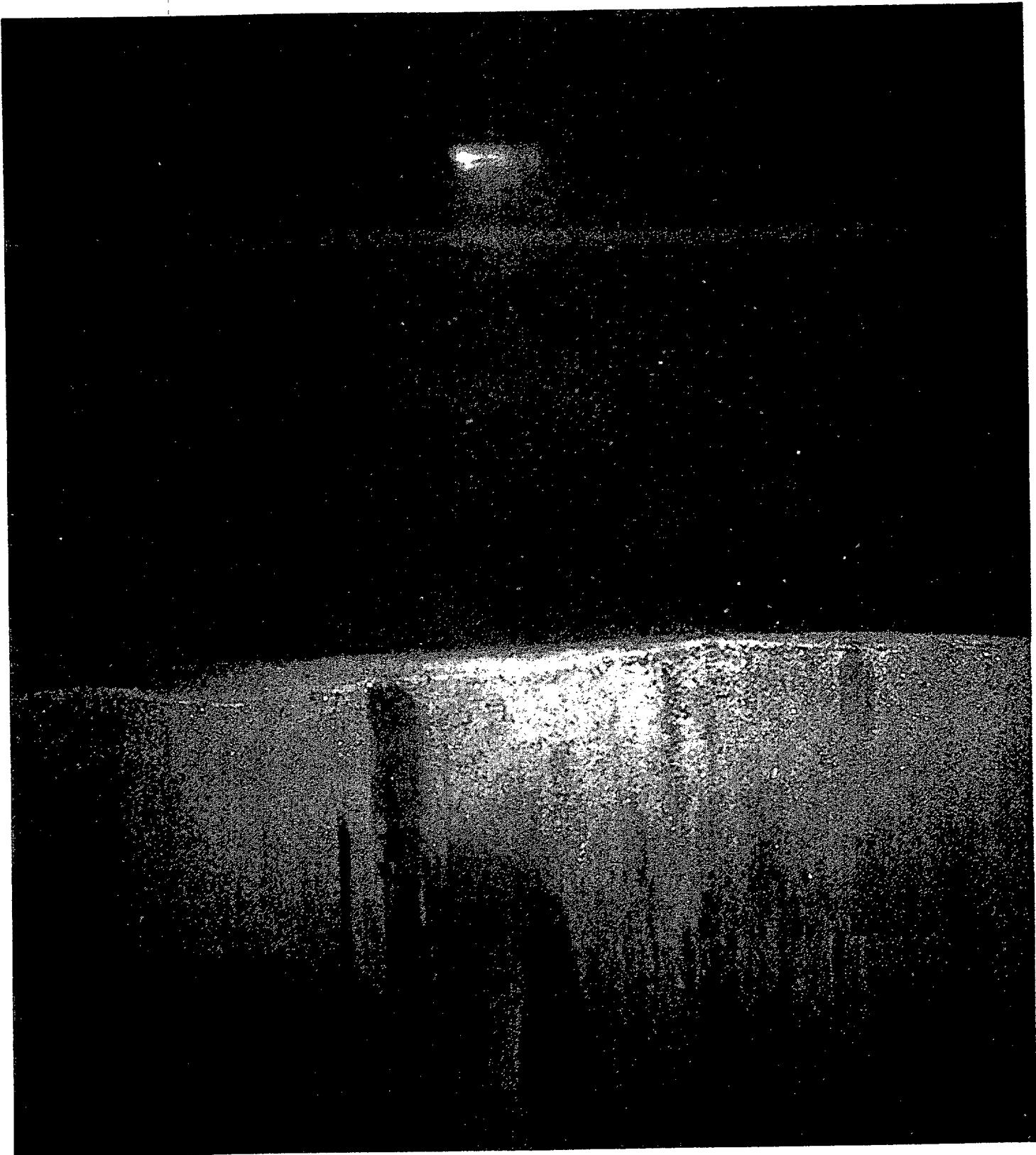
**Figure 27. SPI image of Upper Study site station US-06.**



**Figure 26.** SPI image of Upper Study site station US-05.



**Figure 28. SPI image of Upper Study Site station US-26.**



**Figure 29. SPI image of Upper Study site station US-03.**

## **APPENDIX D**

**Summary of Technical Findings: 96-hr bioassay with *Mysidopsis bahia* and *Menidia beryllina*.**

CEWES-ES-F (70-1r)  
98

17 Nov

MEMORANDUM FOR: Mr. Jerry Miller, (CEWES-EE-A)

Thru:  
Dr. Todd Bridges, (CEWES-ES-F)

SUBJECT: Narrative Summary of Technical Findings of a 96-hr Bioassay with Delaware River Sediment and Water.

1. Please find enclosed a letter report summarizing the results of bioassays conducted with *Mysidopsis bahia* and *Menidia beryllina* exposed to concentrations of filtered elutriate.
2. If you have any questions please call me at (601) 634-4027 or Dr. Todd Bridges at (601) 634-3626.

ALFREDA GIBSON  
Research Biologist  
CEWES-ES-F

## **Summary of Technical Findings: 96-hr bioassay with *Mysidopsis bahia* and *Menidia beryllina*.**

1. **Background:** As part of an effort to determine the possible biological effects of water column exposure to Delaware River sediment Mr. Jerry Miller (EED) requested the Aquatic Biological Effects Team (ABET) conduct acute 96-hr elutriate bioassays on the material with survival being the observed endpoint. The two species used were *Mysidopsis bahia* and *Menidia beryllina*. This report summarizes the results of that study.

2. **Technical Approach:** 96-hr elutriate bioassays using the mysid shrimp *Mysidopsis bahia* and the inland silverside *Menidia beryllina* were conducted according to methods described in the CE/EPA Inland Testing Manual (1998). Four treatments were evaluated: 1) *Mysidopsis bahia* exposed in R1-HO-TOX (coarse-grained material at 30 o/oo); *Mysidopsis bahia* exposed to R2-HO-TOX (fine-grained material at 6 o/oo); *Menidia beryllina* exposed to R1-HO-TOX (coarse-grained material at 30 o/oo); and *Menidia beryllina* exposed to R2-HO-TOX (fine-grained material at 6 o/oo). The filtered elutriate was diluted with our standard laboratory control water - forty fathoms (6 o/oo and 30 o/oo) to yield the following concentrations: 0%; 6.25%; 12.5%; 25%; 50%; and 100% elutriate. Each treatment was replicated five times. The test was conducted using *Mysidopsis bahia* that were 5 days old and *Menidia beryllina* that were 9 days old. *Mysidopsis bahia* were fed newly hatched brine shrimp daily (0.2 mg) and *Menidia beryllina* were fed newly hatched brine shrimp on day 2 of the test (0.2 mg). Each beaker was provided trickle-flow aeration, and covered with a watch glass to minimize evaporation.

3. **Results:** 96-hr survival of *Mysidopsis bahia* in the R1-HO-TOX (30 o/oo, coarse-grained material) exposures survival ranged from 100% to 88% (Table 1). Survival in R2-HO-TOX (6 o/oo fine-grained material) ranged from 90 % to 0 % with 0% survival in the 50% and 100% elutriate treatments (Table 1). 96-hr survival of *Menidia beryllina* in R1-HO-TOX (30 o/oo coarse-grained material) survival ranged from 88% - 68%. Survival in R2-HO-TOX (6 o/oo fine-grained material) with ranged from 98% to 0% with 4% - 0% survival in the 50% and 100% exposures (Table 2). The trimmed spearman-karber method was used to calculate LC<sub>50</sub> values (Hamilton et al. 1978). *Mysidopsis bahia* in R2-HO-TOX (6 o/oo) had an LC<sub>50</sub> value of 30.04 % (23.44 - 38.50 lower - upper confidence limit). *Menidia beryllina* in R2-HO-TOX (6 o/oo) had an LC<sub>50</sub> value of 31.66 % (27.54 - 36.40 lower - upper confidence limits). An LC<sub>50</sub> value could not be calculated for *Mysidopsis bahia* or *Menidia beryllina* in R1-HO-TOX treatments because neither had mortality values greater than 50%.

Survival met or exceeded the test acceptability criterion of 90% in the 6 o/oo and 30 o/oo *Mysidopsis bahia* controls, and also in the 6 o/oo *Menidia beryllina* control. Survival in the 30 o/oo *Menidia beryllina* control was slightly below the criterion at 88%, but is not considered to render the test invalid.

Water quality data are presented in Tables 7 - 10. The pH, dissolved oxygen, and temperature levels were within an acceptable range for conducting toxicity studies with the two test species. Ammonia levels (NH<sub>3</sub>) were exceedingly higher than the LC<sub>50</sub> of 1.00 mg/L for 5-days old *Mysidopsis bahia* or the LC<sub>50</sub> of 1.24 mg/L for 9-days old *Menidia beryllina* (USEPA 1989).

In conclusion, R1-HO-TOX exposures did not adversely affect survival of either test

species, whereas the mortality observed in R2-HO-TOX at 6 o/oo with both species can be attributed to the high level of NH<sub>3</sub>.

4. References:

- Hamilton, M.A., Russo, R.C., and Thurston, R.V. 1978. Trimmed Spearman-Karber Method for Estimating Median Lethal Concentration in Toxicity Bioassays. *Environ. Sci. Tech.* 12(4): 417.
- USEPA, 1989. Ambient Water Quality Criteria for Ammonia (Saltwater)-1989. Office of Water Regulations and Standards, Criteria and Standards Division, EPA 440/S-88-004, Washington, DC.
- USEPA and USACE, 1998. Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. - Testing Manual. EPA-823-B-98-004, Washington, D.C.

Table 1. Summary Survival Data for *Mysidopsis bahia* exposed to Delaware River Elutriates.

Treatment	Elutriate Concentration	Mean Percent Survival (standard deviation)
R1-HO-TOX (30 o/oo)	0	100 (0.00)
	6	88 (0.84)
	12	96 (0.55)
	25	92 (0.84)
	50	90 (1.22)
	100	92 (0.45)
R2-HO-TOX (6 o/oo)	0	90 (0.00)
	6	76 (1.67)
	12	66 (2.30)
	25	82 (1.30)
	50	0 (0.00)
	100	0 (0.00)

Table 2. Summary Survival Data for *Menidia beryllina* exposed to Delaware River Elutriates.

Treatment	Elutriate Concentration	Mean Percent Survival (standard deviation)
R1-HO-TOX (30 o/oo)	0	88 (0.84)
	6	70 (1.58)
	12	68 (1.64)
	25	78 (1.79)
	50	80 (1.22)
	100	74 (1.82)
R2-HO-TOX (6 o/oo)	0	90 (0.71)
	6	68 (0.45)
	12	98 (0.45)
	25	78 (1.64)
	50	4 (0.89)
	100	0 (0.00)

Table 3. 96-hr survival data for *Mysidopsis bahia* exposed to R1-HO-TOX (coarse-grained material) elutriates at 30 o/oo.

Treatment	Replicate	Total number alive
Control	1	10
Control	2	10
Control	3	10
Control	4	10
Control	5	10
6%	1	8
6%	2	10
6%	3	9
6%	4	9
6 %	5	8
12%	1	10
12%	2	9
12%	3	9
12%	4	10
12%	5	10
25%	1	9
25%	2	9
25%	3	8
25%	4	10
25%	5	10
50%	1	9
50%	2	9
50%	3	10
50%	4	7
50%	5	10
100%	1	9
100%	2	10
100%	3	9
100%	4	9
100%	5	9

Table 4. 96-hr survival data for *Mysidopsis bahia* exposed to R2-HO-TOX (fine-grained material) elutriates at 6 o/oo..

Treatment	Replicate	Total number alive
Control	1	9
Control	2	9
Control	3	9
Control	4	9
Control	5	9
6%	1	8
6%	2	9
6%	3	7
6%	4	9
6 %	5	5
12%	1	8
12%	2	6
12%	3	9
12%	4	7
12%	5	3
25%	1	7
25%	2	7
25%	3	9
25%	4	8
25%	5	10
50%	1	0
50%	2	0
50%	3	0
50%	4	0
50%	5	0
100%	1	0
100%	2	0
100%	3	0
100%	4	0
100%	5	0

Table 5. 96-hr survival data for *Menidia beryllina* exposed to R2-HO-TOX (fine-grained material) elutriates at 6 o/oo.

Treatment	Replicate	Total number alive
Control	1	9
Control	2	9
Control	3	9
Control	4	8
Control	5	10
6%	1	7
6%	2	7
6%	3	7
6%	4	6
6 %	5	7
12%	1	10
12%	2	10
12%	3	9
12%	4	10
12%	5	10
25%	1	10
25%	2	7
25%	3	9
25%	4	7
25%	5	6
50%	1	0
50%	2	0
50%	3	0
50%	4	0
50%	5	2
100%	1	0
100%	2	0
100%	3	0
100%	4	0
100%	5	0

Table 6. 96-hr survival data for *Menidia beryllina* exposed to elutriates made from R1-HO-TOX (coarse-grained material) at 30 o/oo.

Treatment	Replicate	Total number alive
Control	1	9
Control	2	8
Control	3	10
Control	4	8
Control	5	9
6%	1	6
6%	2	9
6%	3	8
6%	4	5
6 %	5	7
12%	1	8
12%	2	7
12%	3	8
12%	4	4
12%	5	7
25%	1	9
25%	2	10
25%	3	8
25%	4	6
25%	5	6
50%	1	8
50%	2	10
50%	3	7
50%	4	7
50%	5	8
100%	1	7
100%	2	7
100%	3	10
100%	4	8
100%	5	5

Table 7. Water Quality Parameters for *Mysidopsis bahia* exposed to R1-HO-TOX elutriates at 30 o/oo.

Treatment	Replicate	D.O. mg/L)	pH	Salinity (ppt)	Temp. (°C)	NH <sub>3</sub> (mg/L) (composite)
<b>Control</b> (initial)	1	5.50	7.85	30	21.7	
(final)		5.84	7.83	30	22.8	1.00
(initial)	3	5.98	7.85	30	21.7	
(final)		6.10	7.80	30	22.8	
(initial)	5	6.11	7.85	30	22.1	
(final)		6.20	7.80	30	22.8	
<b>6 %</b> (initial)	1	5.87	7.89	30	22.1	
(final)		6.08	7.88	30	22.8	1.38
(initial)	3	5.86	7.87	30	21.7	
(final)		6.10	7.87	30	22.7	
(initial)	5	5.85	7.86	30	21.5	
(final)		6.10	7.87	30	22.8	
<b>12 %</b> (initial)	1	6.00	7.85	30	23.1	
(final)		6.92	7.86	30	22.8	1.81
(initial)	3	6.15	7.89	30	22.0	
(final)		6.83	7.88	30	22.9	
(initial)	5	6.00	7.87	30	22.0	
(final)		6.22	7.86	30	23.0	
<b>25 %</b> (initial)	1	6.10	7.85	30	21.8	
(final)		6.19	7.85	30	22.7	1.32
(initial)	3	6.00	7.83	30	21.8	
(final)		6.30	7.84	30	22.7	
(initial)	5	5.98	7.80	30	21.8	
(final)		6.10	7.83	30	22.7	

Treatment	Replicate	D.O. mg/L)	pH	Salinity (ppt)	Temp. (°C)	NH <sub>3</sub> (mg/L) (composite)
50 % (initial)	1	6.10	7.80	30	21.7	
		6.20	7.80	30	22.7	0.67
(initial)	3	5.95	7.82	30	21.7	
		5.99	7.81	30	22.0	
(initial)	5	5.97	7.70	30	21.7	
		6.10	7.79	30	22.0	
100 % (initial)	1	5.97	7.65	28	21.7	
		6.10	7.70	28	22.0	1.53
(initial)	3	5.96	7.69	28	22.7	
		6.10	7.70	28	22.8	
(initial)	5	5.94	7.64	28	22.7	
		6.05	7.69	28	22.8	

Table 8. Water Quality Parameters for *Mysidopsis bahia* exposed to R2-HO-TOX elutriates at 6 o/oo.

Treatment	Replicate	D.O. mg/L)	pH	Salinity (ppt)	Temp. (°C)	NH <sub>3</sub> (mg/L) (composite)
<b>Control</b> (initial)	1	6.10	7.34	6	22.0	
(final)		5.98	7.80	6	23.0	1.20
(initial)	3	6.08	7.29	6	22.0	
(final)		6.00	7.70	6	23.1	
(initial)	5	6.06	7.30	6	22.0	
(final)		6.00	7.77	6	23.0	
<b>6 %</b> (initial)	1	6.13	7.50	6	21.7	
(final)		5.35	7.83	6	23.0	3.63
(initial)	3	6.13	7.55	6	21.7	
(final)		5.29	7.84	6	23.0	
(initial)	5	6.19	7.55	6	21.7	
(final)		5.30	7.82	6	23.0	
<b>12 %</b> (initial)	1	6.21	7.53	6	21.6	
(final)		5.20	7.96	6	23.1	5.04
(initial)	3	6.20	7.55	6	21.6	
(final)		5.30	7.97	6	23.0	
(initial)	5	6.21	7.57	6	21.6	
(final)		5.75	7.97	6	23.0	
<b>25 %</b> (initial)	1	6.11	7.62	6	21.6	
(final)		5.30	8.10	6	23.0	7.33
(initial)	3	6.10	7.60	6	21.6	
(final)		5.29	8.09	6	23.0	
(initial)	5	6.10	7.64	6	21.6	
(final)		5.30	8.13	6	23.1	

Treatment	Replicate	D.O. mg/L	pH	Salinity ppt	Temp. (°C)	NH <sub>3</sub> (mg/L) (composite)
50 % (initial)	1	6.00	7.65	5	21.7	
		5.20	8.13	5	23.1	12.4
(initial)	3	6.05	7.66	5	21.7	
		5.40	8.15	5	23.0	
(initial)	5	6.00	7.60	5	21.7	
		5.30	8.16	5	23.0	
100 % (initial)	1	5.35	7.60	6	22.0	
		5.50	8.20	6	23.0	21.2
(initial)	3	5.45	7.67	6	22.0	
		5.39	8.17	6	23.0	
(initial)	5	5.39	7.67	6	21.9	
		5.40	8.17	6	23.1	

Table 9. Water Quality Parameters for *Menidia beryllina* exposed to R1-HO-TOX elutriates at 30 o/oo.

Treatment	Replicate	D.O. mg/L)	pH	Salinity (ppt)	Temp. (°C)	NH <sub>3</sub> (mg/L) (composite)
<b>Control</b> (initial)	1	5.45	7.83	30	21.7	
(final)		7.10	7.73	30	23.1	1.05
(initial)	3	5.98	7.84	30	21.7	
(final)		7.06	7.67	30	23.1	
(initial)	5	6.17	7.85	30	21.7	
(final)		7.08	7.74	30	23.0	
<b>6 %</b> (initial)	1	5.85	7.85	30	21.7	1.22
(final)		7.23	7.86	30	23.1	
(initial)	3	5.88	7.85	30	21.5	
(final)		7.20	7.84	30	23.1	
(initial)	5	5.93	7.86	30	21.6	
(final)		7.23	7.86	30	23.1	
<b>12 %</b> (initial)	1	5.98	7.85	30	22.0	
(final)		7.32	7.87	30	23.1	1.36
(initial)	3	6.13	7.85	30	21.9	
(final)		6.95	7.88	30	23.1	
(initial)	5	5.89	7.85	30	21.9	
(final)		6.65	7.87	30	23.1	
<b>25 %</b> (initial)	1	6.03	7.85	30	21.8	
(final)		6.07	7.91	30	23.1	1.27
(initial)	3	5.95	7.83	30	21.8	
(final)		6.25	7.91	30	23.0	
(initial)	5	6.02	7.80	30	21.8	
(final)		6.03	7.88	30	23.1	

Treatment	Replicate	D.O. mg/L)	pH	Salinity (ppt)	Temp. (°C)	NH <sub>3</sub> (mg/L) (composite)
50 % (initial)	1	5.59	7.70	30	21.8	
		5.88	7.93	30	23.1	1.22
(initial)	3	5.95	7.80	30	21.8	
		6.11	7.92	30	23.1	
(initial)	5	5.85	7.80	30	21.7	
		5.64	7.97	30	23.1	
100 % (initial)	1	5.95	7.64	30	21.7	
		5.58	7.97	30	23.1	1.45
(initial)	3	5.96	7.64	30	21.7	
		5.54	7.96	30	23.1	
(initial)	5	5.93	7.63	30	21.7	
		5.69	7.95	30	23.1	

Table 10. Water Quality Parameters for *Menidia beryllina* exposed to R2-HO-TOX elutriates at 6 o/oo.

Treatment	Replicate	D.O. mg/L)	pH	Salinity (ppt)	Temp. (°C)	NH <sub>3</sub> (mg/L) (composite)
<b>Control</b> (initial)	1	6.10	7.24	6	22.2	
(final)		5.08	7.65	6	23.1	1.81
(initial)	3	6.10	7.26	6	22.2	
(final)		5.38	7.57	6	23.1	
(initial)	5	6.06	7.30	6	22.2	
(final)		5.33	7.66	6	23.1	
<b>6 %</b> (initial)	1	6.13	7.47	6	21.7	
(final)		5.21	7.86	6	23.0	4.62
(initial)	3	6.14	7.54	6	21.7	
(final)		5.30	7.84	6	23.1	
(initial)	5	6.21	7.55	6	21.7	
(final)		5.25	7.86	6	23.1	
<b>12 %</b> (initial)	1	6.20	7.50	6	21.4	
(final)		5.00	7.97	6	23.0	6.20
(initial)	3	6.25	7.55	6	21.4	
(final)		5.00	8.00	6	23.0	
(initial)	5	6.20	7.55	6	21.4	
(final)		5.25	7.95	6	23.0	
<b>25 %</b> (initial)	1	6.10	7.63	6	21.7	
(final)		5.23	8.21	6	23.0	5.95
(initial)	3	6.00	7.63	6	21.7	
(final)		5.00	8.20	6	23.1	
(initial)	5	6.10	7.64	6	21.7	
(final)		5.25	8.16	6	23.1	

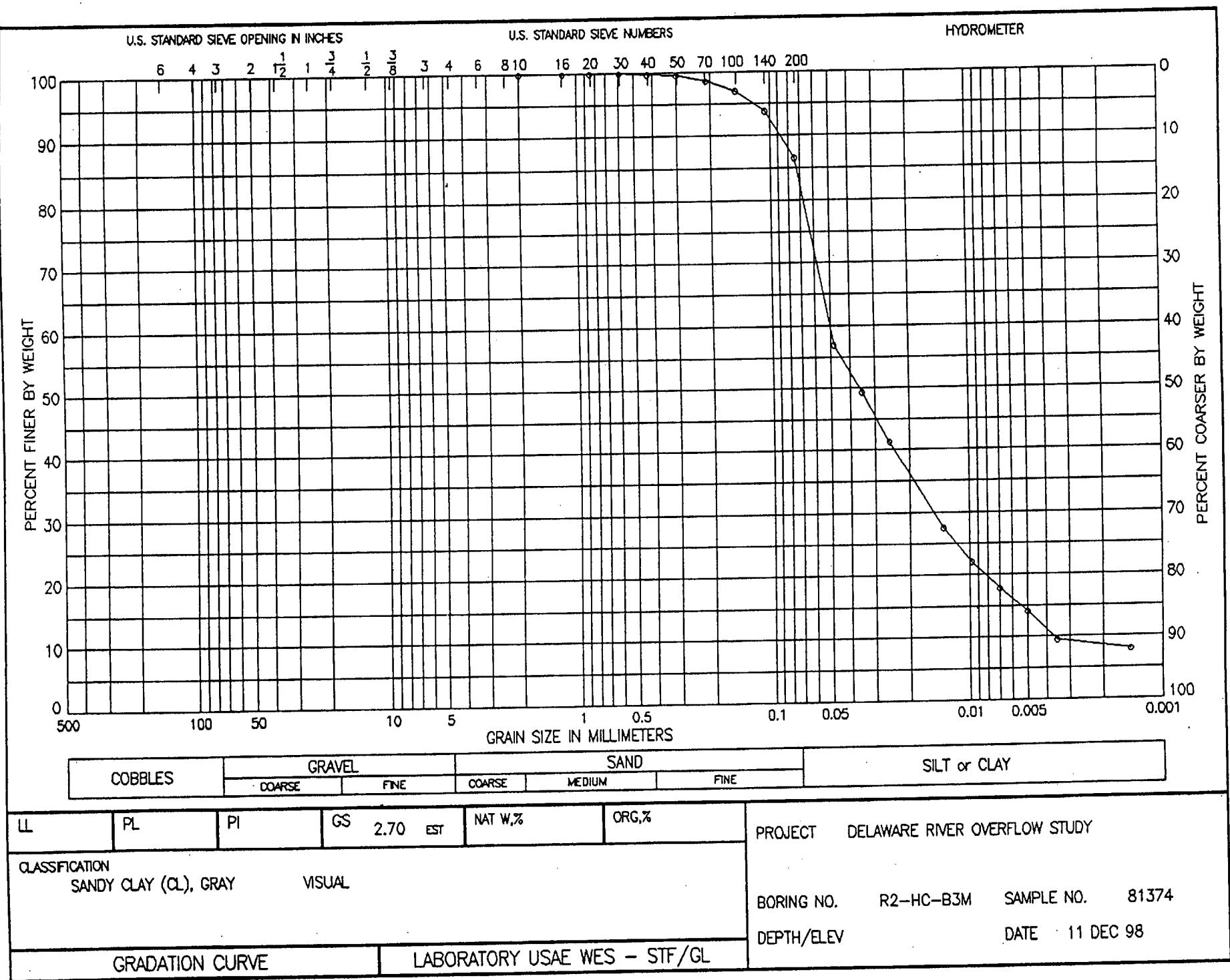
Treatment	Replicate	D.O. mg/L)	pH	Salinity (ppt)	Temp. (°C)	NH <sub>3</sub> (mg/L) (composite)
50 % (initial)	1	6.00	7.65	6	21.4	
		5.10	8.43	6	23.0	12.4
(initial)	3	6.00	7.66	6	21.4	
		5.01	8.44	6	23.0	
(initial)	5	6.00	7.66	6	21.5	
		5.00	8.46	6	23.0	
100 % (initial)	1	5.30	7.66	6	21.5	
		5.00	8.75	6	23.1	22.3
(initial)	3	5.31	7.67	6	21.5	
		5.08	8.75	6	23.0	
(initial)	5	5.23	7.67	6	21.7	
		5.01	8.71	6	23.0	

## **APPENDIX E**

### **Raw Data Sheets for Sieve Analysis and Gradation Curves**

**Key:**

- R1 - Coarse-Grained Site
- R2 - Fine-Grained Site
- HI - Hopper Inflow
- HC - Hopper Contents
- HO - Hopper Overflow
- ISS - In-situ Samples
- C - Composites
- B1 - Hopper Contents Sample Port #1
- B2 - Hopper Contents Sample Port #2
- B3 - Hopper Contents Sample Port #3
- T - Hopper Contents Surface Sample
- M - Hopper Contents Mid-Depth Sample
- B - Hopper Contents Bottom Sample



SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HC-B3M      SAMPLE: 81374      DF: MD0199 .DAT  
 DEPTH:                    DATE: 11 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC: .00  
 CLASSIFICATION: 36  
 SANDY CLAY (CL), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT: 51.9 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.1	No 40	.425	99.8	.2
.2	No 50	.300	99.6	.4
.7	No 70	.212	98.7	1.3
1.5	No 100	.150	97.1	2.9
3.2	No 140	.106	93.8	6.2
7.0	No 200	.075	86.5	13.5

HYDROMETER:

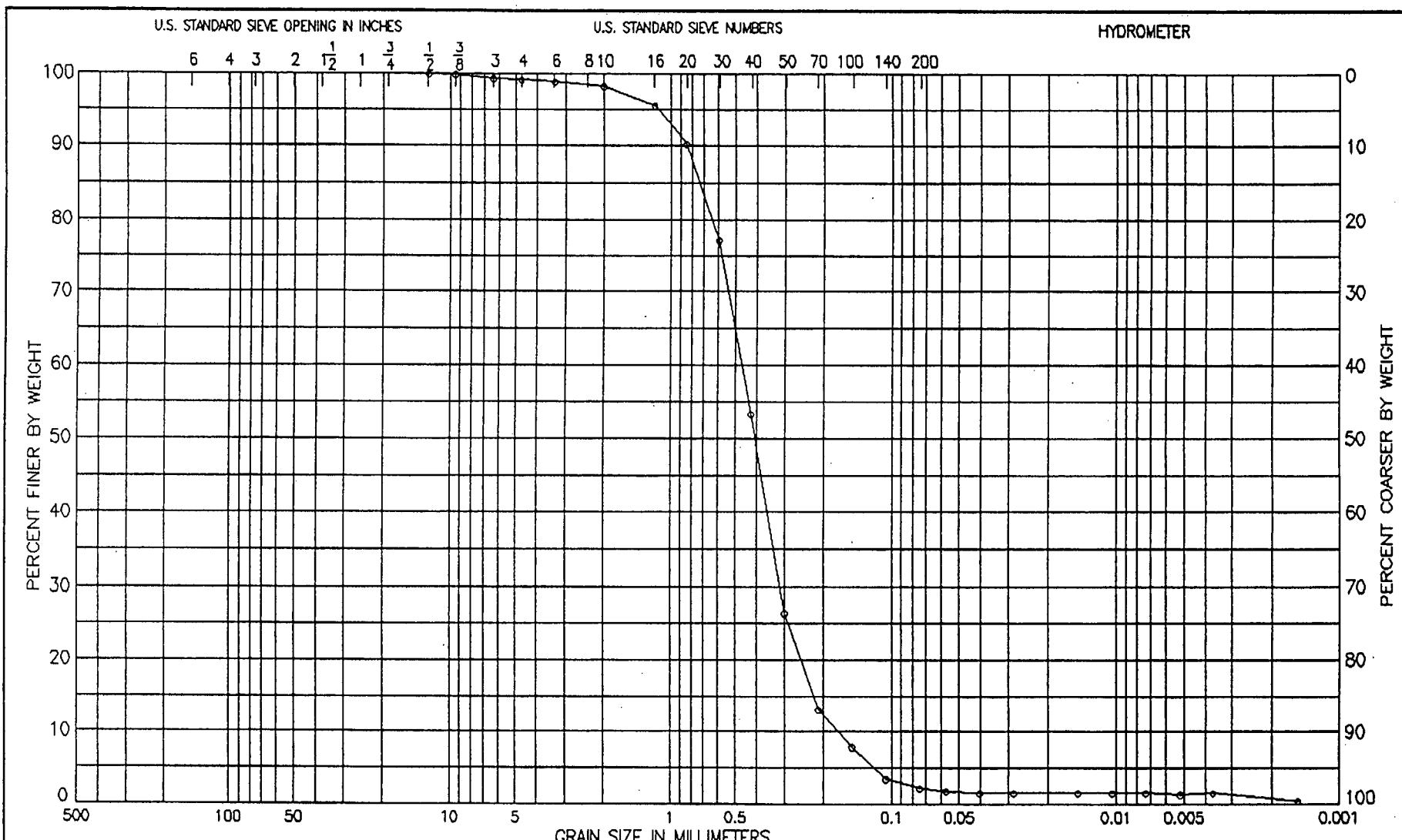
RDGS	TEMP			
18.8	21.5	.0483	56.9	43.1
16.3	21.5	.0350	49.3	50.7
13.7	21.5	.0254	41.3	58.7
9.2	21.5	.0137	27.5	72.5
7.4	21.5	.0098	22.0	78.0
6.0	21.5	.0070	17.7	82.3
4.8	21.5	.0050	14.1	85.9
3.2	22.0	.0035	9.5	90.5
2.9	21.0	.0015	8.0	92.0

PERCENT GRAVEL = .0

PERCENT SAND = 13.5

PERCENT FINES = 86.5

EDE



COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LL	NP	PL	PI	GS	2.65	EST	NAT W, %	ORG, %	PROJECT	DELAWARE RIVER OVERFLOW STUDY		
CLASSIFICATION SAND (SP), GRAY									BORING NO.	R1-ISS-C1-	SAMPLE NO.	81438
GRADATION CURVE							LABORATORY USAE WES - STF/GL		DEPTH/ELEV		DATE	31 DEC 98

# SIEVE ANALYSIS

## PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-ISS-C1-      SAMPLE: 81438      DF: MD0199 .DAT  
 DEPTH:                    DATE: 31 DEC 98

NON-PLASTIC      GS: 2.65 est      WC:      .00  
 CLASSIFICATION: 569  
 SAND (SP), GRAY

TOTAL WEIGHT OF SAMPLE: 691.1 gms.  
 PARTIAL WEIGHT AFTER SPLIT: 69.7 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	1/2 in	12.500	100.0	.0
.4	3/8 in	9.500	99.9	.1
3.9	No 3	6.350	99.4	.6
1.2	No 4	4.750	99.2	.8
1.8	No 6	3.350	98.9	1.1
4.5	No 10	2.000	98.3	1.7
1.9	No 16	1.180	95.6	4.4
5.7	No 20	.850	90.3	9.7
15.0	No 30	.600	77.1	22.9
31.9	No 40	.425	53.3	46.7
51.0	No 50	.300	26.4	73.6
60.4	No 70	.212	13.1	86.9
64.1	No 100	.150	7.9	92.1
67.2	No 140	.106	3.5	96.5
68.1	No 200	.075	2.3	97.7

### HYDROMETER:

RDGS	TEMP			
1.1	21.0	.0573	1.8	98.2
1.0	21.0	.0405	1.6	98.4
1.0	21.0	.0287	1.6	98.4
1.0	21.0	.0148	1.6	98.4
1.0	21.0	.0105	1.6	98.4
1.0	21.0	.0074	1.6	98.4
.9	21.0	.0052	1.4	98.6
.9	21.5	.0037	1.6	98.4
.6	20.5	.0015	.5	99.5

PERCENT GRAVEL = .8

PERCENT SAND = 96.9

PERCENT FINES = 2.3

D60 = .47

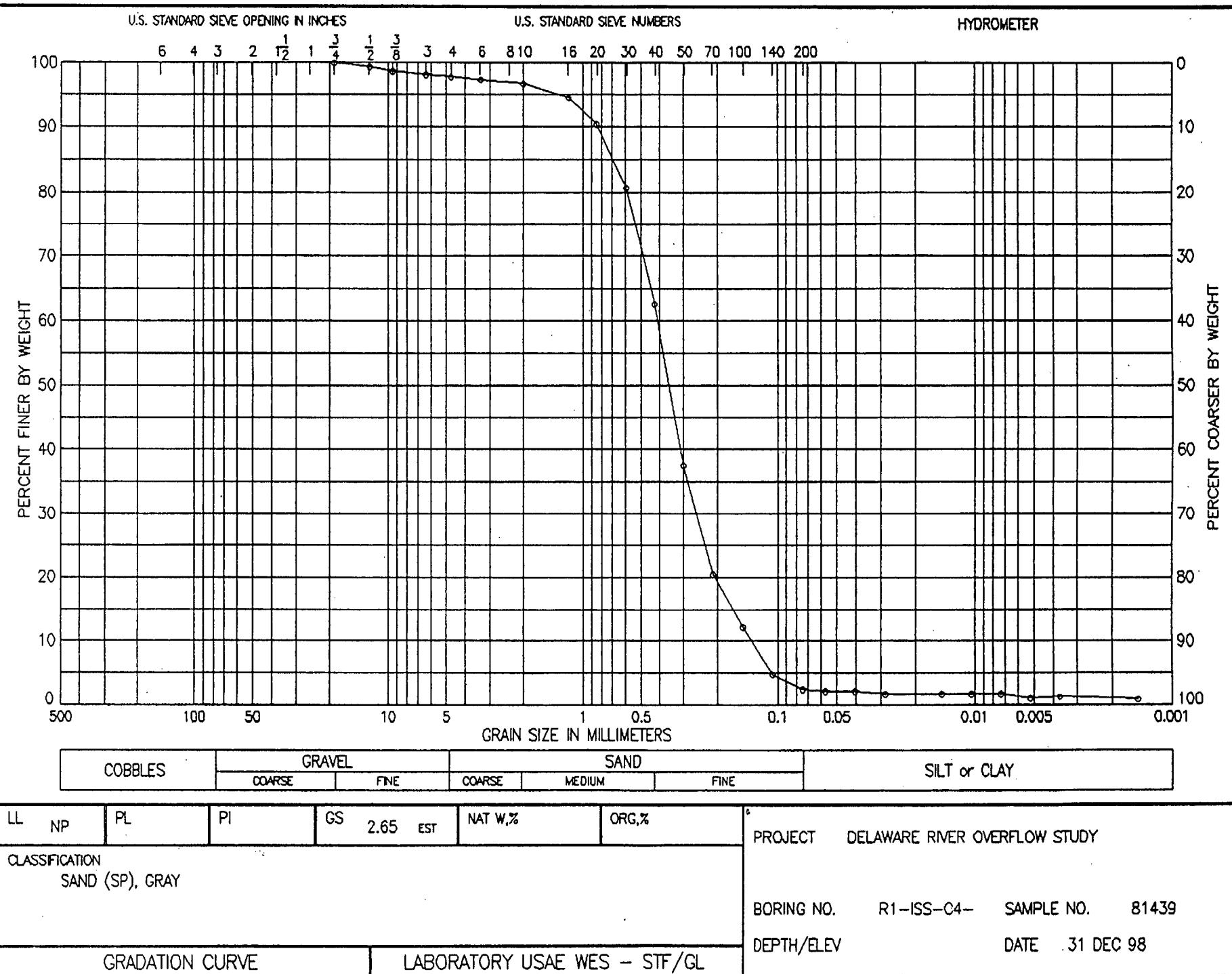
D30 = .32

D10 = .17

CU = 2.71

CC = 1.21

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-ISS-C4-      SAMPLE: 81439      DF: MD0199 .DAT  
 DEPTH:                    DATE: 31 DEC 98

NON-PLASTIC      GS: 2.65 est      WC:      .00  
 CLASSIFICATION: 578  
 SAND (SP), GRAY

TOTAL WEIGHT OF SAMPLE: 697.9 gms.

PARTIAL WEIGHT AFTER SPLIT: 70.4 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	3/4 in	19.100	100.0	.0
4.0	1/2 in	12.500	99.4	.6
5.1	3/8 in	9.500	98.7	1.3
3.5	No 3	6.350	98.2	1.8
2.5	No 4	4.750	97.8	2.2
3.0	No 6	3.350	97.4	2.6
4.5	No 10	2.000	96.8	3.2
1.6	No 16	1.180	94.6	5.4
4.6	No 20	.850	90.4	9.6
11.7	No 30	.600	80.7	19.3
24.8	No 40	.425	62.7	37.3
43.1	No 50	.300	37.5	62.5
55.5	No 70	.212	20.5	79.5
61.5	No 100	.150	12.2	87.8
66.9	No 140	.106	4.8	95.2
68.6	No 200	.075	2.5	97.5

HYDROMETER:

RDGS	TEMP			
1.3	21.0	.0572	2.2	97.8
1.3	21.0	.0404	2.2	97.8
1.1	21.0	.0286	1.8	98.2
1.1	21.0	.0148	1.8	98.2
1.1	21.0	.0105	1.8	98.2
1.1	21.0	.0074	1.8	98.2
.8	21.0	.0052	1.1	98.9
.8	21.5	.0037	1.3	98.7
.5	22.0	.0015	.9	99.1

PERCENT GRAVEL = 2.2

PERCENT SAND = 95.4

PERCENT FINES = 2.5

D60 = .41

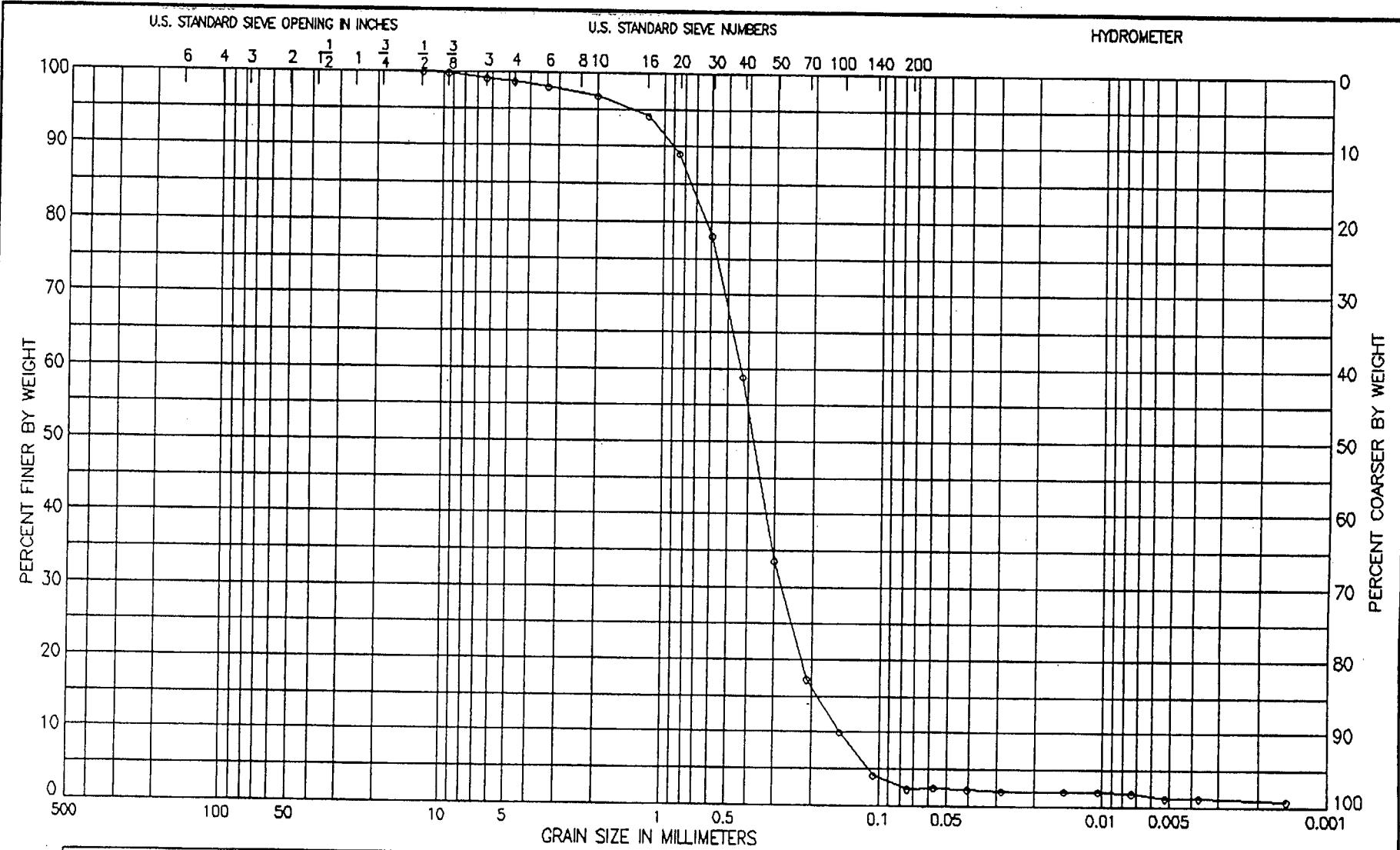
D30 = .26

D10 = .14

CU = 3.01

CC = 1.21

EDE



COBBLES

GRAVEL

COARSE

FINE

SAND

COARSE

MEDIUM

FINE

SILT or CLAY

LL

NP

PL

PI

GS

2.65 EST

NAT W.%

ORG. %

PROJECT DELAWARE RIVER OVERFLOW STUDY

CLASSIFICATION

SAND (SP), GRAY

BORING NO. R1-ISS-C7- SAMPLE NO. 81440

DEPTH/ELEV DATE 31 DEC 98

GRADATION CURVE

LABORATORY USAE WES - STF/GL

# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-ISS-C7-      SAMPLE: 81440      DF: MD0199 .DAT  
 DEPTH:                    DATE: 31 DEC 98

NON-PLASTIC      GS: 2.65 est      WC: .00  
 CLASSIFICATION: 587  
 SAND (SP), GRAY

TOTAL WEIGHT OF SAMPLE: 721.4 gms.  
 PARTIAL WEIGHT AFTER SPLIT: 74.6 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	1/2 in	12.500	100.0	.0
.6	3/8 in	9.500	99.9	.1
4.9	No 3	6.350	99.2	.8
2.9	No 4	4.750	98.8	1.2
5.2	No 6	3.350	98.1	1.9
8.7	No 10	2.000	96.9	3.1
2.1	No 16	1.180	94.2	5.8
6.1	No 20	.850	89.0	11.0
14.5	No 30	.600	78.1	21.9
29.3	No 40	.425	58.8	41.2
48.7	No 50	.300	33.6	66.4
61.3	No 70	.212	17.3	82.7
66.9	No 100	.150	10.0	90.0
71.4	No 140	.106	4.2	95.8
72.8	No 200	.075	2.3	97.7

## HYDROMETER:

RDGS	TEMP			
1.4	21.5	.0571	2.5	97.5
1.3	21.5	.0404	2.3	97.7
1.2	21.5	.0286	2.1	97.9
1.2	21.5	.0148	2.1	97.9
1.2	21.5	.0104	2.1	97.9
1.1	21.5	.0074	1.9	98.1
.8	21.5	.0052	1.3	98.7
.8	21.5	.0037	1.3	98.7
.7	21.0	.0015	.8	99.2

PERCENT GRAVEL = 1.2

PERCENT SAND = 96.5

PERCENT FINES = 2.3

D60 = .44

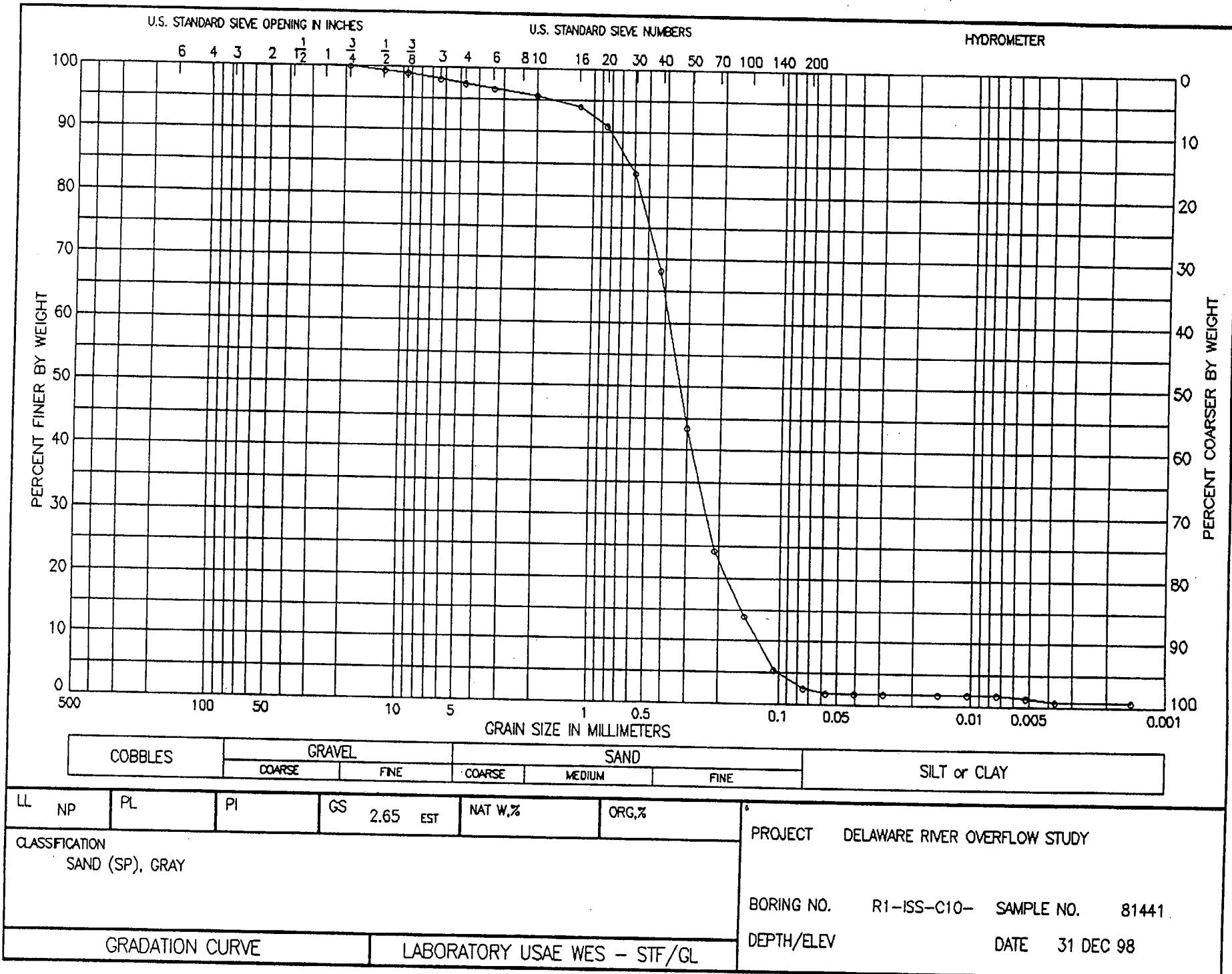
D30 = .28

D10 = .15

CU = 2.90

CC = 1.20

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-ISS-C10- SAMPLE: 81441 DF: MD0199 .DAT  
 DEPTH: DATE: 31 DEC 98

NON-PLASTIC GS: 2.65 est WC: .00  
 CLASSIFICATION: 596  
 SAND (SP), GRAY

TOTAL WEIGHT OF SAMPLE: 737.5 gms.  
 PARTIAL WEIGHT AFTER SPLIT: 77.8 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	3/4 in	19.100	100.0	.0
4.4	1/2 in	12.500	99.4	.6
3.1	3/8 in	9.500	99.0	1.0
6.5	No 3	6.350	98.1	1.9
4.6	No 4	4.750	97.5	2.5
5.4	No 6	3.350	96.7	3.3
7.4	No 10	2.000	95.7	4.3
1.4	No 16	1.180	94.0	6.0
3.9	No 20	.850	90.9	9.1
9.9	No 30	.600	83.6	16.4
22.4	No 40	.425	68.2	31.8
42.5	No 50	.300	43.4	56.6
58.1	No 70	.212	24.2	75.8
66.5	No 100	.150	13.9	86.1
73.4	No 140	.106	5.4	94.6
75.7	No 200	.075	2.6	97.4

HYDROMETER:

RDGS	TEMP			
1.2	21.0	.0572	1.8	98.2
1.2	21.0	.0405	1.8	98.2
1.2	21.0	.0286	1.8	98.2
1.2	21.0	.0148	1.8	98.2
1.2	21.0	.0104	1.8	98.2
1.2	21.0	.0074	1.8	98.2
1.0	21.0	.0052	1.4	98.6
.7	21.0	.0037	.8	99.2
.7	21.0	.0015	.8	99.2

PERCENT GRAVEL = 2.5

PERCENT SAND = 94.9

PERCENT FINES = 2.6

D60 = .38

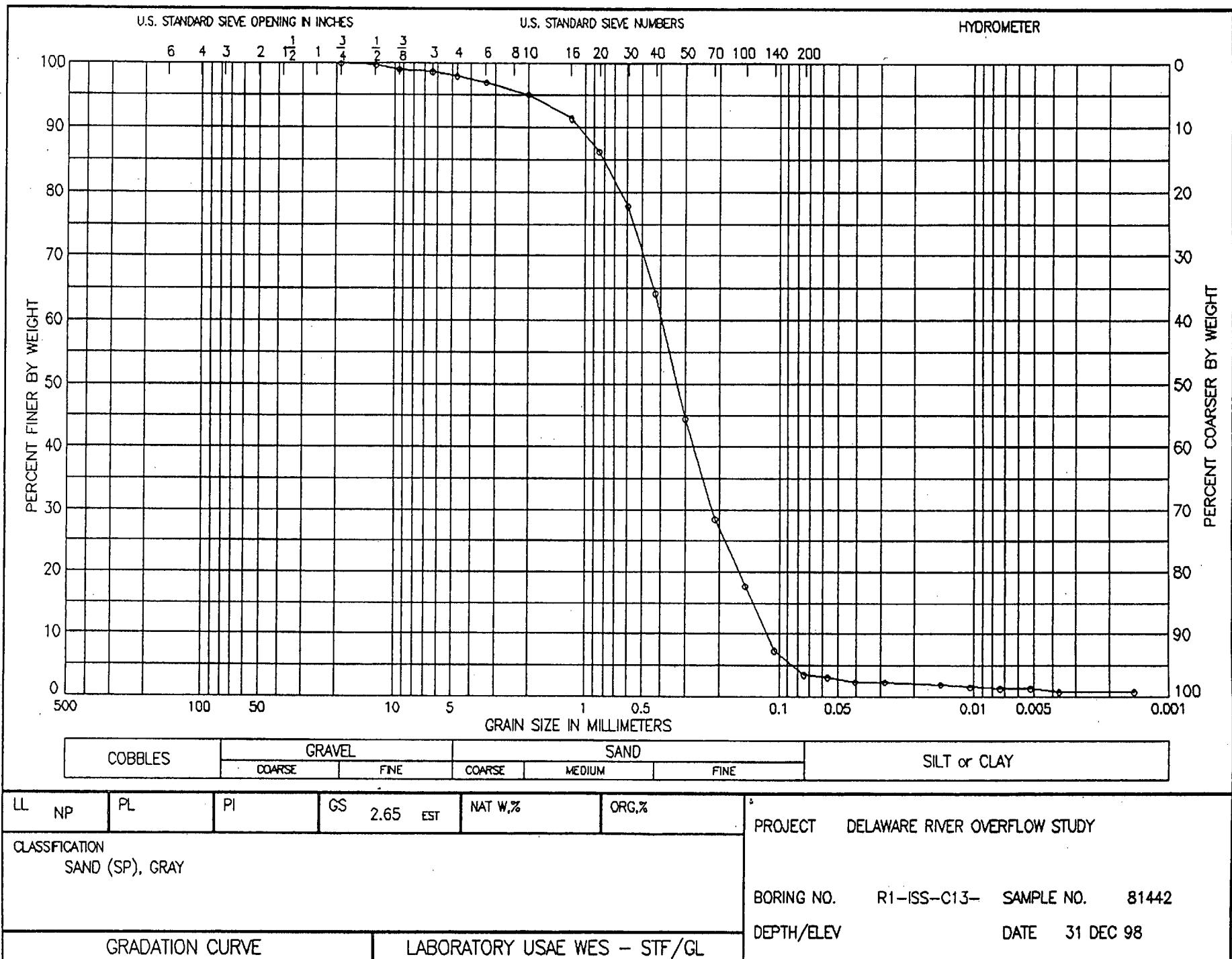
D30 = .24

D10 = .13

CU = 2.96

CC = 1.14

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-ISS-C13- SAMPLE: 81442 DF: MD0199 .DAT  
 DEPTH: DATE: 31 DEC 98

NON-PLASTIC GS: 2.65 est WC: .00  
 CLASSIFICATION: 605  
 SAND (SP), GRAY

TOTAL WEIGHT OF SAMPLE: 773.6 gms.  
 PARTIAL WEIGHT AFTER SPLIT: 77.7 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	3/4 in	19.100	100.0	.0
1.5	1/2 in	12.500	99.8	.2
6.0	3/8 in	9.500	99.0	1.0
2.5	No 3	6.350	98.7	1.3
5.1	No 4	4.750	98.0	2.0
8.1	No 6	3.350	97.0	3.0
14.8	No 10	2.000	95.1	4.9
3.0	No 16	1.180	91.4	8.6
7.2	No 20	.850	86.3	13.7
14.1	No 30	.600	77.8	22.2
25.2	No 40	.425	64.2	35.8
41.4	No 50	.300	44.4	55.6
54.4	No 70	.212	28.5	71.5
63.2	No 100	.150	17.7	82.3
71.7	No 140	.106	7.3	92.7
74.8	No 200	.075	3.5	96.5

HYDROMETER:

RDGS	TEMP			
1.9	21.0	.0569	3.1	96.9
1.5	21.0	.0404	2.4	97.6
1.5	21.0	.0285	2.4	97.6
1.3	21.0	.0148	2.0	98.0
1.1	21.0	.0105	1.6	98.4
1.0	21.0	.0074	1.4	98.6
1.0	21.0	.0052	1.4	98.6
.7	21.0	.0037	.8	99.2
.7	21.0	.0015	.8	99.2

PERCENT GRAVEL = 2.0

PERCENT SAND = 94.5

PERCENT FINES = 3.5

D60 = .40

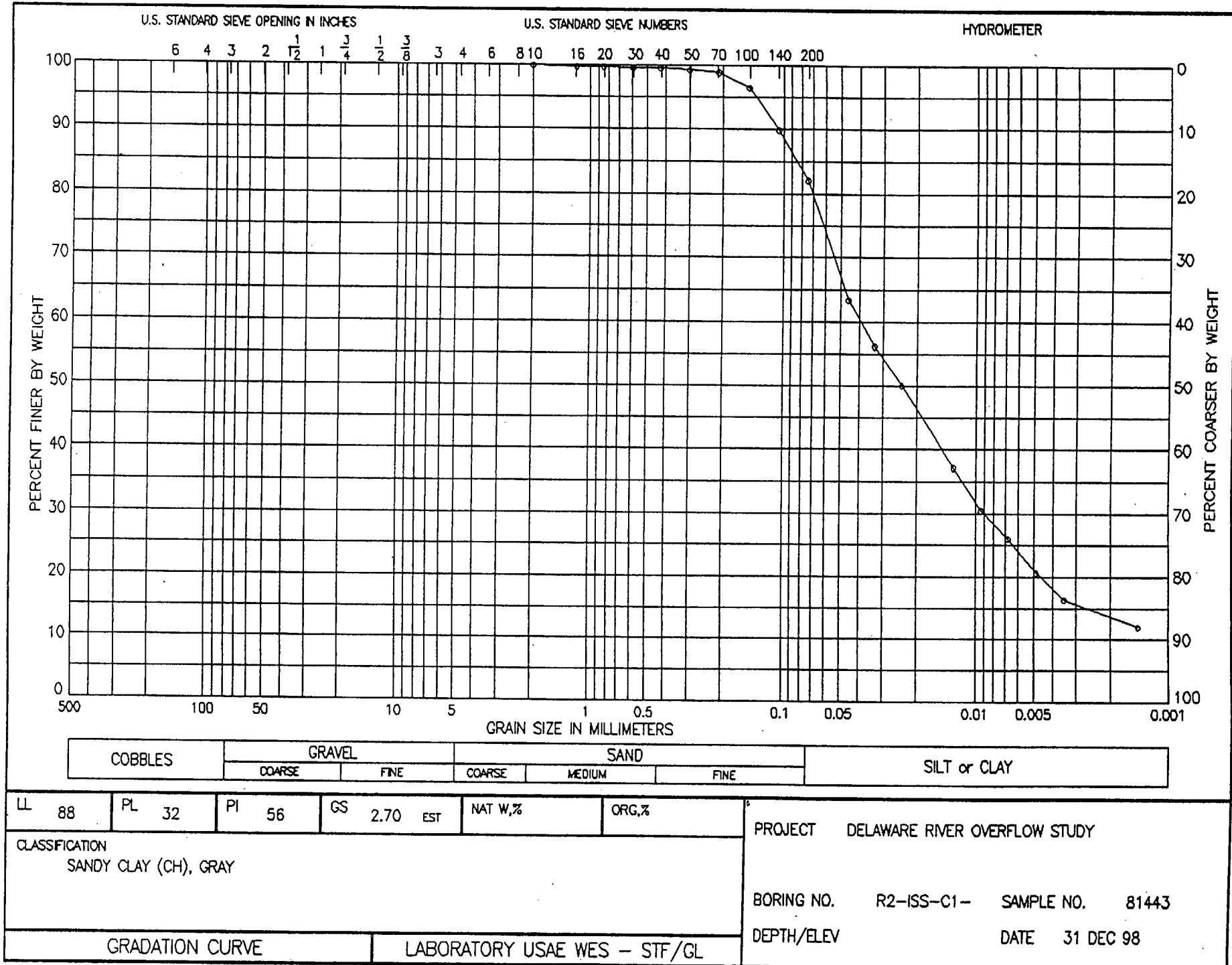
D30 = .22

D10 = .12

CU = 3.40

CC = 1.04

EDE



## SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-ISS-C1-      SAMPLE: 81443      DF: MD0199 .DAT  
 DEPTH:                    DATE: 31 DEC 98

LL: 88   PL: 32   PI: 56   GS: 2.70 est   WC: .00

CLASSIFICATION: 614

SANDY CLAY (CH), GRAY

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 59.3 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER No	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	10	2.000	100.0	.0
.1	16	1.180	99.8	.2
.1	20	.850	99.8	.2
.2	30	.600	99.7	.3
.2	40	.425	99.7	.3
.4	50	.300	99.3	.7
.6	70	.212	99.0	1.0
2.0	100	.150	96.6	3.4
6.0	140	.106	89.9	10.1
10.6	200	.075	82.1	17.9

HYDROMETER:

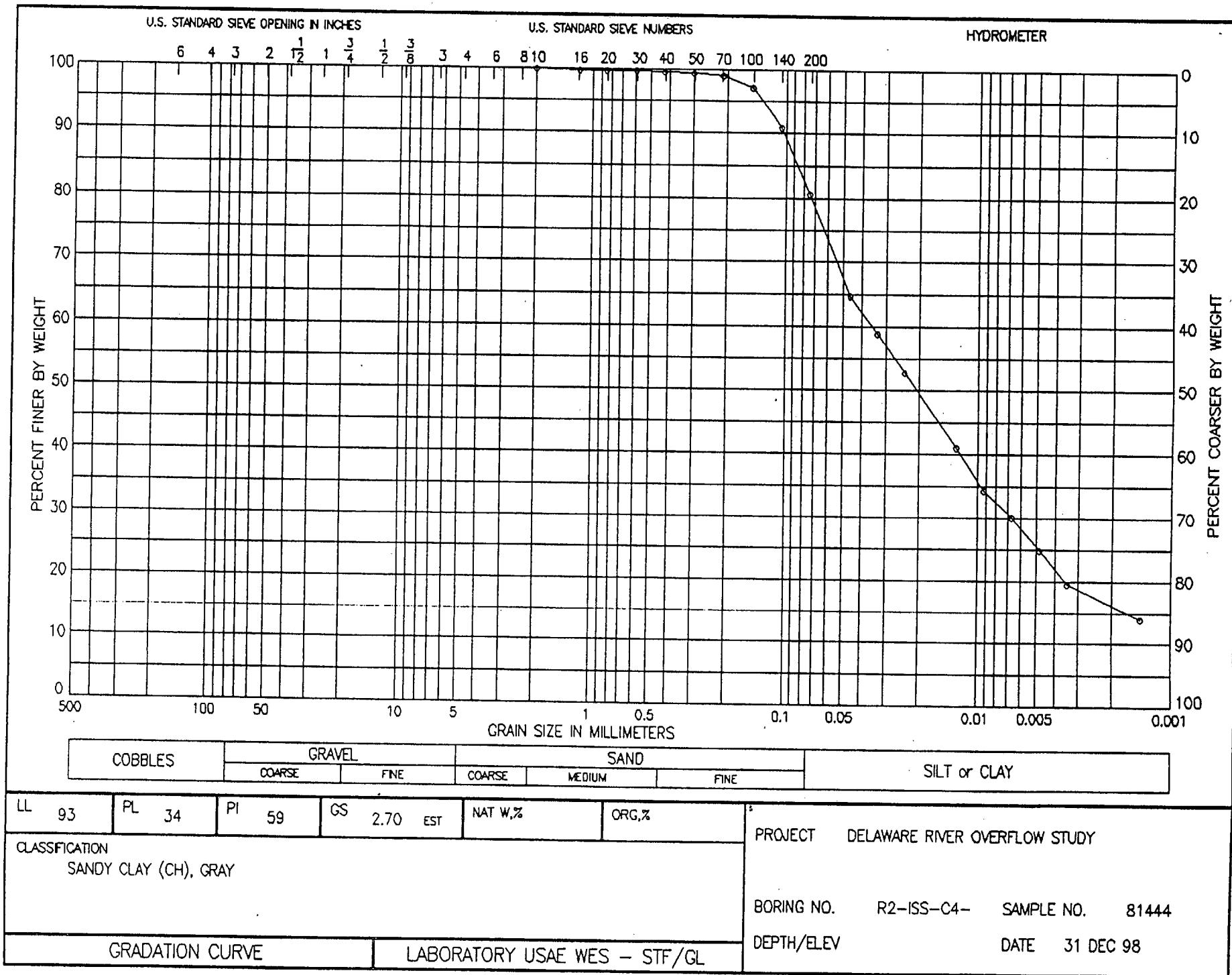
RDGS	TEMP			
24.0	21.0	.0457	63.5	36.5
21.3	21.0	.0333	56.2	43.8
19.0	21.0	.0241	50.1	49.9
14.2	21.0	.0131	37.2	62.8
11.7	21.0	.0094	30.5	69.5
9.9	21.5	.0068	26.0	74.0
7.9	21.5	.0049	20.6	79.4
6.3	21.5	.0035	16.3	83.7
4.8	21.0	.0014	12.1	87.9

PERCENT GRAVEL = .0

PERCENT SAND = 17.9

PERCENT FINES = 82.1

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-ISS-C4-      SAMPLE: 81444      DF: MD0199 .DAT  
 DEPTH:                    DATE: 31 DEC 98

LL: 93    PL: 34    PI: 59    GS: 2.70 est    WC:    .00  
 CLASSIFICATION: 622  
 SANDY CLAY (CH), GRAY

TOTAL WEIGHT OF SAMPLE:    .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT:    56.9 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.1	No 16	1.180	99.8	.2
.1	No 20	.850	99.8	.2
.1	No 30	.600	99.8	.2
.2	No 40	.425	99.6	.4
.3	No 50	.300	99.5	.5
.5	No 70	.212	99.1	.9
1.6	No 100	.150	97.2	2.8
5.2	No 140	.106	90.9	9.1
11.0	No 200	.075	80.7	19.3

HYDROMETER:

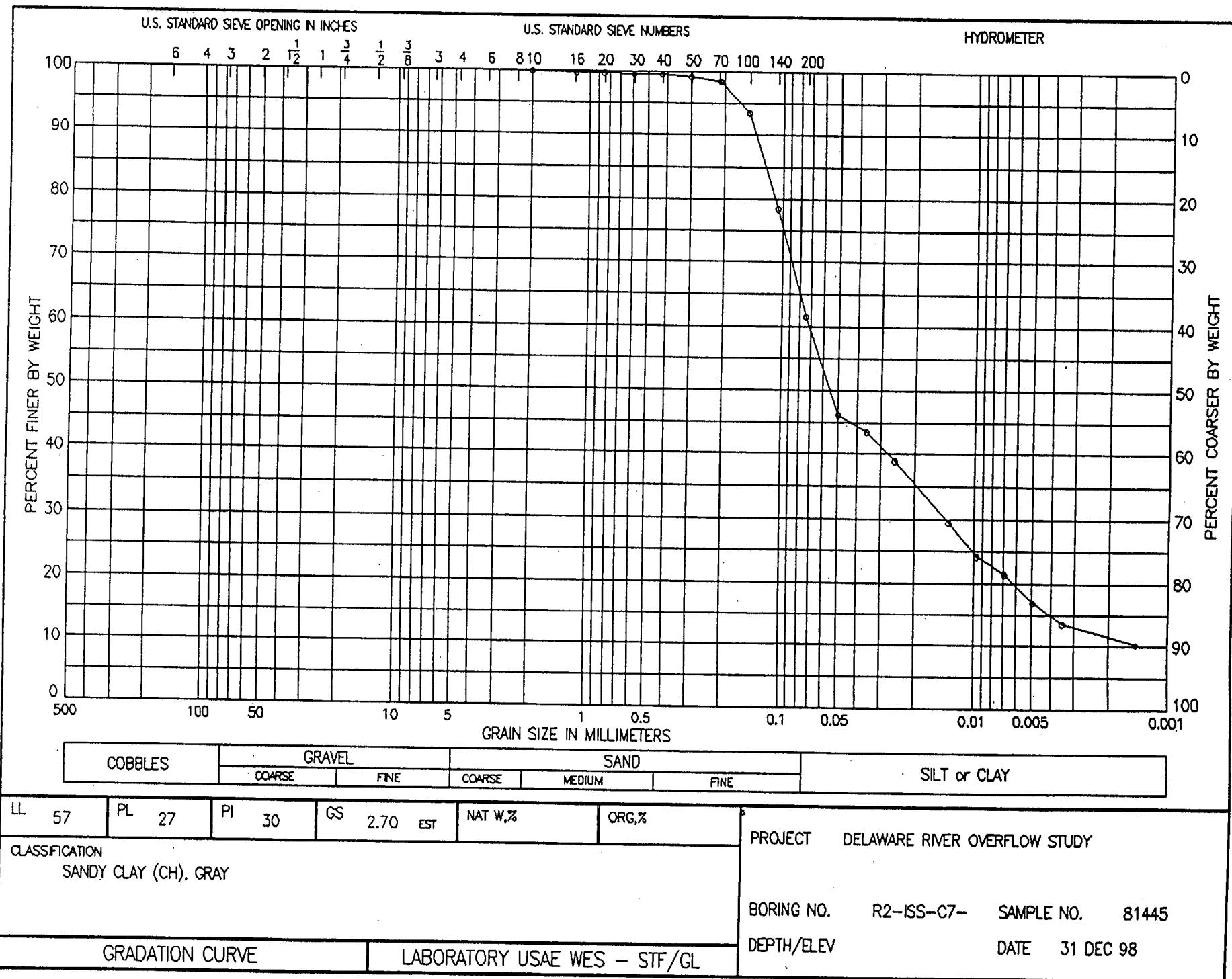
RDGS	TEMP			
23.4	21.5	.0460	64.8	35.2
21.3	21.5	.0333	58.9	41.1
19.1	21.5	.0241	52.8	47.2
14.9	21.5	.0130	41.0	59.0
12.5	21.5	.0094	34.3	65.7
11.0	21.5	.0067	30.1	69.9
9.1	21.5	.0048	24.8	75.2
7.2	21.5	.0035	19.5	80.5
5.3	21.0	.0014	14.0	86.0

PERCENT GRAVEL = .0

PERCENT SAND = 19.3

PERCENT FINES = 80.7

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-ISS-C7-      SAMPLE: 81445      DF: MD0199 .DAT  
 DEPTH:                    DATE: 31 DEC 98

LL: 57    PL: 27    PI: 30    GS: 2.70 est    WC:    .00  
 CLASSIFICATION: 630  
 SANDY CLAY (CH), GRAY

TOTAL WEIGHT OF SAMPLE:        .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT:    52.6 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.1	No 16	1.180	99.8	.2
.1	No 20	.850	99.8	.2
.2	No 30	.600	99.6	.4
.2	No 40	.425	99.6	.4
.4	No 50	.300	99.2	.8
.8	No 70	.212	98.5	1.5
3.4	No 100	.150	93.5	6.5
11.3	No 140	.106	78.5	21.5
20.2	No 200	.075	61.6	38.4

HYDROMETER:

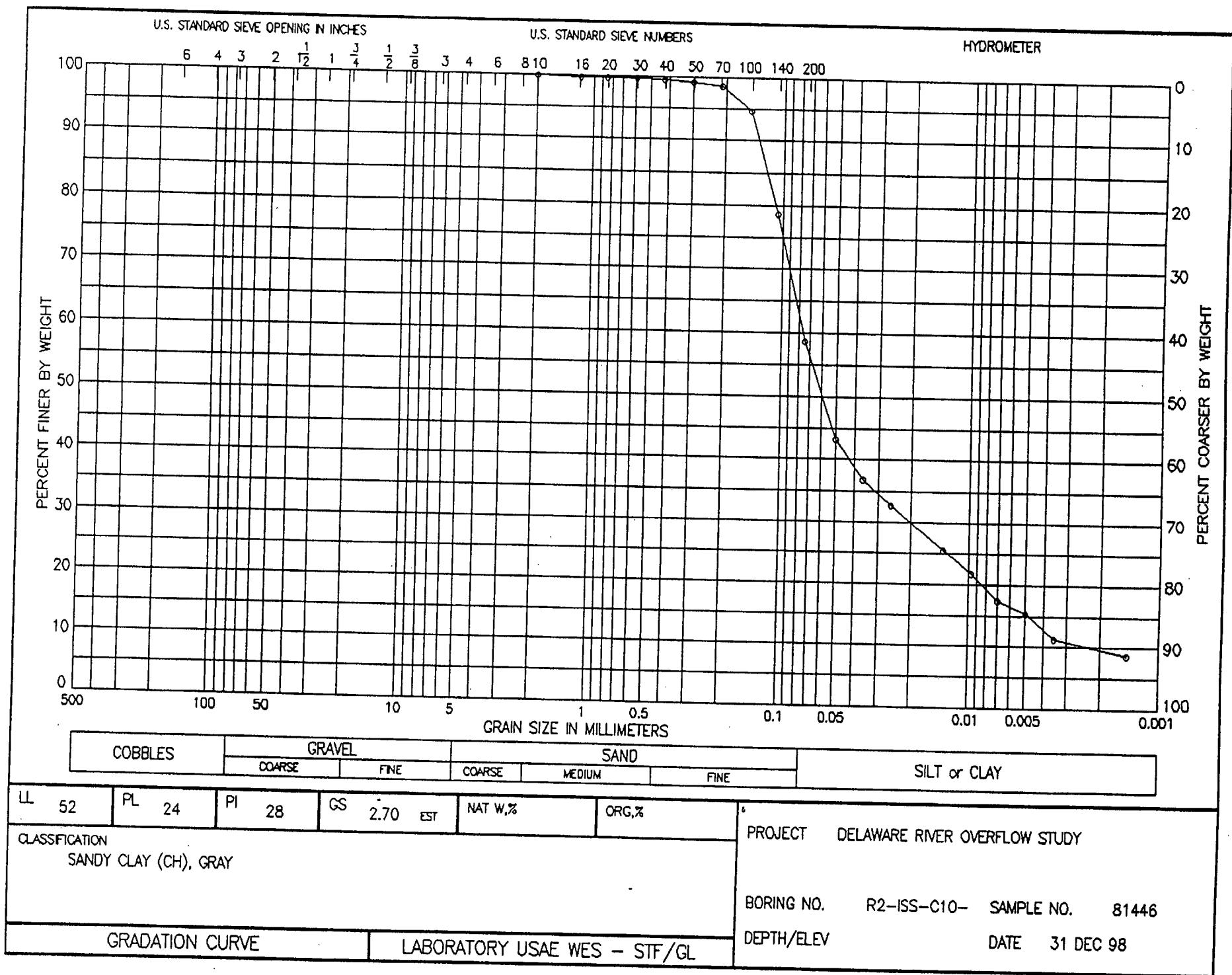
RDGS	TEMP			
15.5	21.5	.0499	46.2	53.8
14.6	21.5	.0356	43.5	56.5
13.1	21.5	.0255	39.0	61.0
10.0	21.5	.0136	29.6	70.4
8.2	21.5	.0097	24.2	75.8
7.3	21.5	.0069	21.4	78.6
5.8	21.5	.0050	16.9	83.1
4.6	22.0	.0035	13.6	86.4
3.7	21.0	.0015	10.3	89.7

PERCENT GRAVEL =    .0

PERCENT SAND    = 38.4

PERCENT FINES   = 61.6

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-ISS-C10- SAMPLE: 81446 DF: MD0199 .DAT  
 DEPTH: DATE: 31 DEC 98

LL: 52 PL: 24 PI: 28 GS: 2.70 est WC: .00

CLASSIFICATION: 638

SANDY CLAY (CH), GRAY

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 54.8 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER		OPENING mm	PERCENT FINER	PERCENT COARSER
	No	10			
.0			2.000	100.0	.0
.1	No	16	1.180	99.8	.2
.1	No	20	.850	99.8	.2
.1	No	30	.600	99.8	.2
.2	No	40	.425	99.6	.4
.4	No	50	.300	99.3	.7
.7	No	70	.212	98.7	1.3
2.9	No	100	.150	94.7	5.3
11.7	No	140	.106	78.6	21.4
22.6	No	200	.075	58.8	41.2

HYDROMETER:

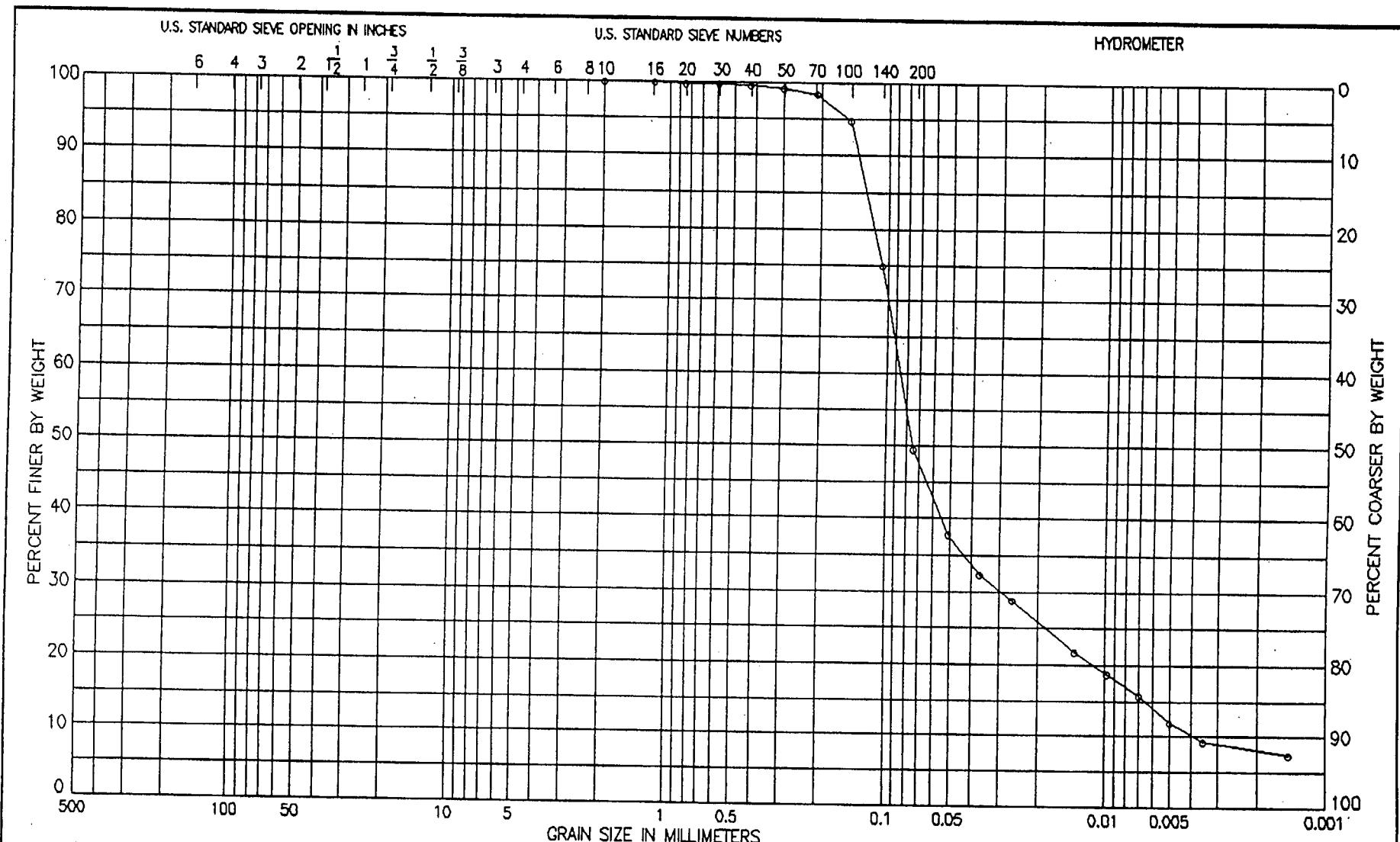
RDGS	TEMP			
15.1	21.5	.0501	43.2	56.8
12.9	21.5	.0362	36.8	63.2
11.5	21.5	.0259	32.8	67.2
9.0	21.5	.0137	25.5	74.5
7.7	21.5	.0098	21.7	78.3
6.2	21.5	.0070	17.4	82.6
5.5	21.5	.0050	15.4	84.6
4.0	22.0	.0035	11.3	88.7
3.3	21.0	.0015	8.7	91.3

PERCENT GRAVEL = .0

PERCENT SAND = 41.2

PERCENT FINES = 58.8

EDE



COBBLES		GRAVEL			SAND			SILT or CLAY
COARSE	FINE	COARSE		MEDIUM		FINE		
LL 44	PL 24	PI 20	GS 2.70 EST	NAT W. %	ORG. %			

CLASSIFICATION SILTY CLAYEY SAND (SC), GRAY	PROJECT DELAWARE RIVER OVERFLOW STUDY
	BORING NO. R2-ISS-C13- SAMPLE NO. 82447
GRADATION CURVE	DEPTH/ELEV DATE 31 DEC 98
LABORATORY USAE WES - STF/GL	

# SIEVE ANALYSIS

**PROJECT: DELAWARE RIVER OVERFLOW STUDY**

**BORING: R2-ISS-C13- SAMPLE: 82447 DF: MD0199 .DAT  
DEPTH: DATE: 31 DEC 98**

**LL: 44 PL: 24 PI: 20 GS: 2.70 est WC: .00**

**CLASSIFICATION: 646**

**SILTY CLAYEY SAND (SC), GRAY**

**TOTAL WEIGHT OF SAMPLE: .0 gms.**

**PARTIAL WEIGHT AFTER SPLIT: 53.4 gms.**

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.1	No 20	.850	99.8	.2
.1	No 30	.600	99.8	.2
.2	No 40	.425	99.6	.4
.4	No 50	.300	99.3	.7
.8	No 70	.212	98.5	1.5
2.8	No 100	.150	94.8	5.2
13.4	No 140	.106	74.9	25.1
27.0	No 200	.075	49.4	50.6

**HYDROMETER:**

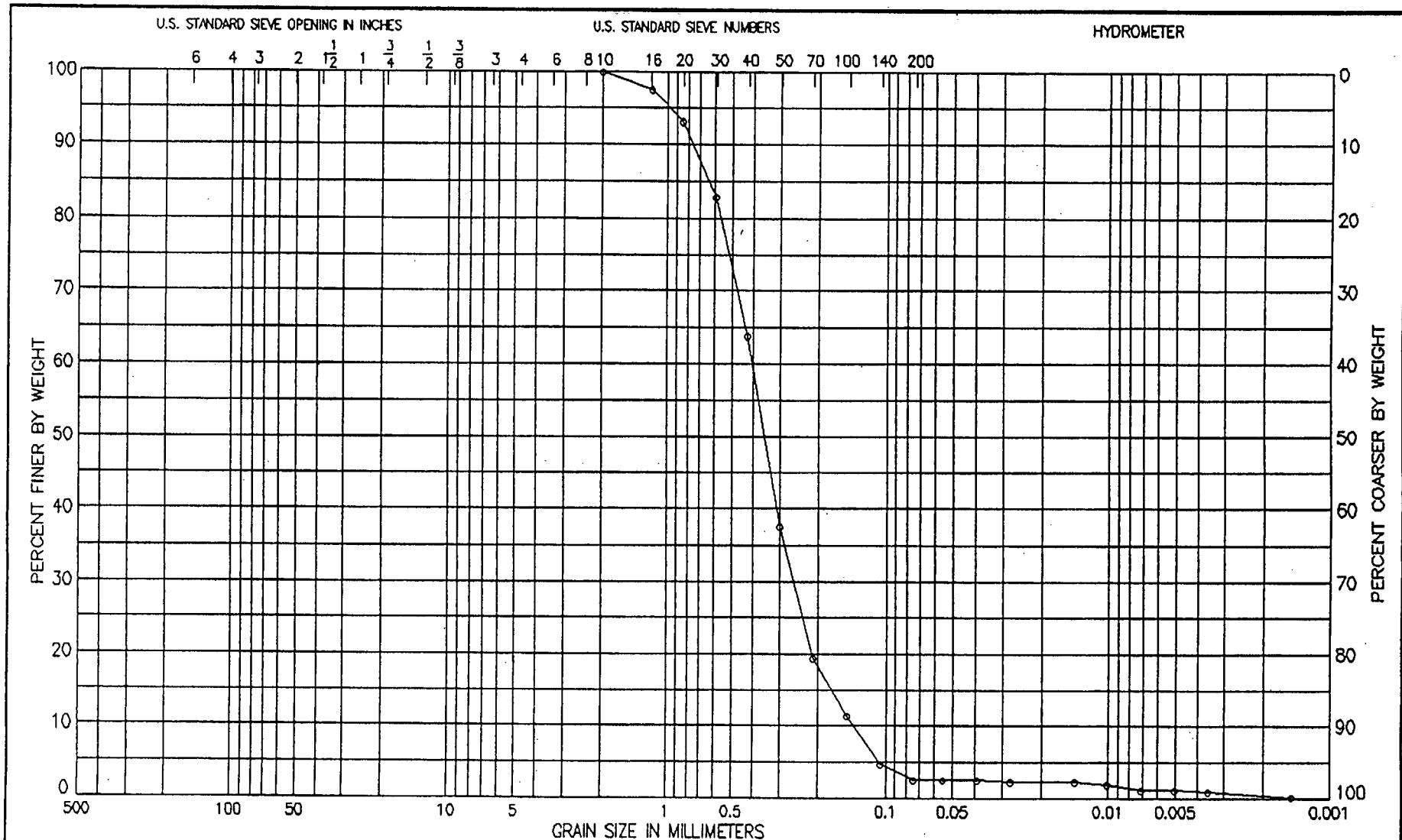
RDGS	TEMP			
12.9	21.5	.0512	37.8	62.2
11.1	21.5	.0368	32.4	67.6
9.9	21.5	.0263	28.8	71.2
7.5	21.5	.0138	21.7	78.3
6.5	21.5	.0099	18.7	81.3
5.5	21.5	.0070	15.8	84.2
4.2	21.5	.0050	11.9	88.1
3.2	22.0	.0035	9.2	90.8
2.8	21.0	.0015	7.4	92.6

**PERCENT GRAVEL = .0**

**PERCENT SAND = 50.6**

**PERCENT FINES = 49.4**

**EDE**



LL	PL	PI	GS	2.65 EST	NAT W. %	ORG. %	PROJECT DELAWARE RIVER OVERFLOW STUDY
CLASSIFICATION	SAND (SP), GRAY						
GRADATION CURVE	LABORATORY USAE WES - STF/GL			BORING NO.	R1-HI-3-6	SAMPLE NO.	81428
DEPTH/ELEV	DATE 31 DEC 98			DEPTH/ELEV	DATE 31 DEC 98		

# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HI-3-6      SAMPLE: 81428      DF: MD0199 .DAT  
 DEPTH:                    DATE: 31 DEC 98

NO-LIMITS-RAN      GS: 2.65 est      WC:      .00  
 CLASSIFICATION: 487  
 SAND (SP), GRAY

TOTAL WEIGHT OF SAMPLE:      .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT:      83.0 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
2.0	No 16	1.180	97.6	2.4
5.7	No 20	.850	93.1	6.9
14.2	No 30	.600	82.9	17.1
30.0	No 40	.425	63.9	36.1
51.8	No 50	.300	37.6	62.4
66.9	No 70	.212	19.4	80.6
73.6	No 100	.150	11.3	88.7
79.1	No 140	.106	4.7	95.3
80.9	No 200	.075	2.5	97.5

HYDROMETER:

RDGS	TEMP			
1.0	24.0	.0553	2.5	97.5
1.0	24.0	.0391	2.5	97.5
.9	24.0	.0277	2.3	97.7
.9	24.0	.0143	2.3	97.7
.7	24.0	.0101	1.9	98.1
.3	24.0	.0072	1.2	98.8
.3	24.0	.0051	1.2	98.8
.2	24.0	.0036	1.0	99.0
.2	22.0	.0015	.2	99.8

PERCENT GRAVEL = .0

PERCENT SAND = 97.5

PERCENT FINES = 2.5

D60 = .41

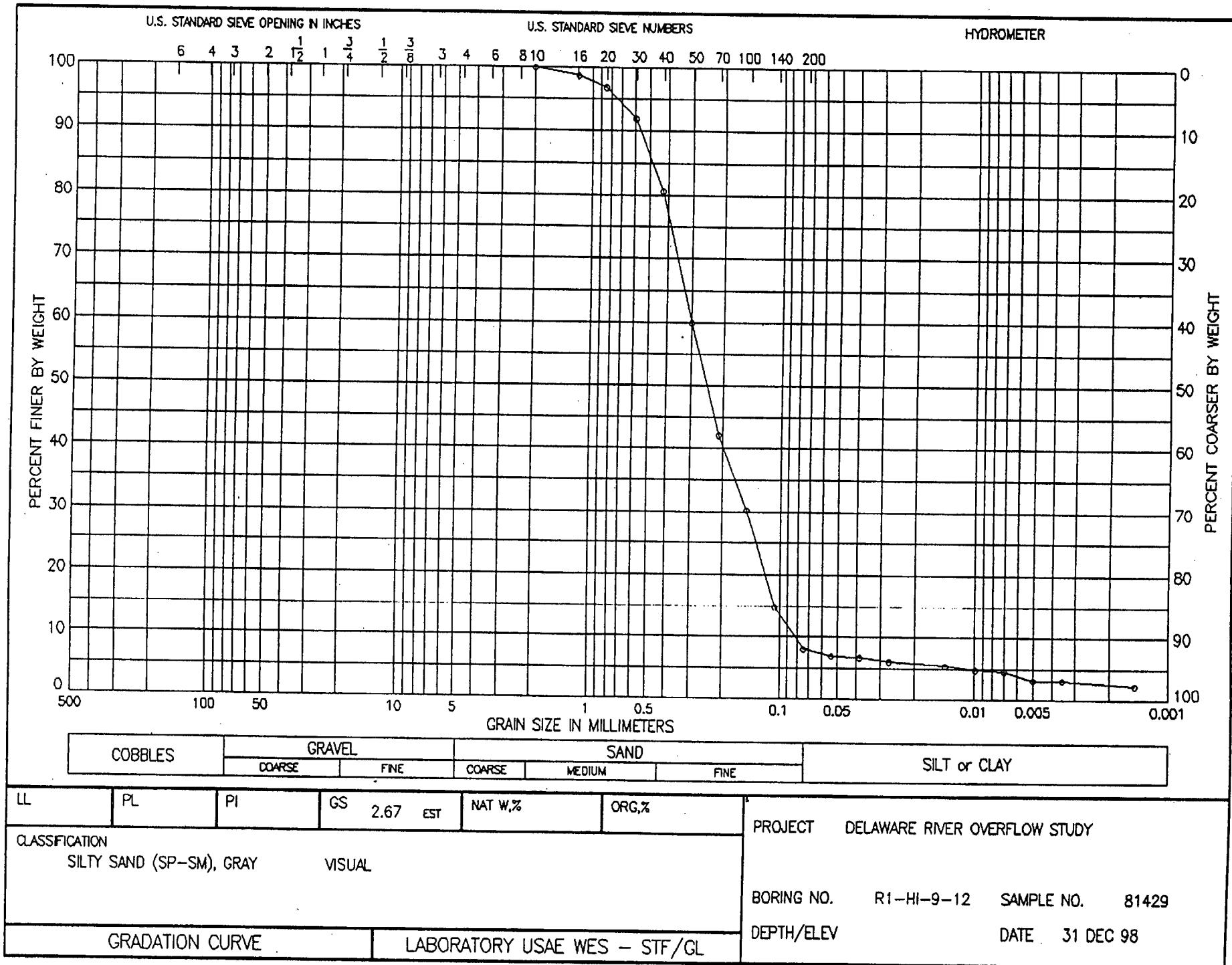
D30 = .26

D10 = .14

CU = 2.88

CC = 1.21

EDE



## SIEVE ANALYSIS

## PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HI-9-12 SAMPLE: 81429 DF: MD0199 .DAT  
DEPTH: DATE: 31 DEC 98

NO-LIMITS-RAN GS: 2.67 est WC: .00  
CLASSIFICATION: 495  
SILTY SAND (SP-SM), GRAY VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
PARTIAL WEIGHT AFTER SPLIT: 75.5 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.9	No 16	1.180	98.8	1.2
2.3	No 20	.850	97.0	3.0
6.1	No 30	.600	91.9	8.1
14.6	No 40	.425	80.7	19.3
30.2	No 50	.300	60.0	40.0
43.7	No 70	.212	42.1	57.9
52.6	No 100	.150	30.3	69.7
64.3	No 140	.106	14.8	85.2
69.4	No 200	.075	8.1	91.9

## HYDROMETER:

RDGS	TEMP			
3.0	24.0	.0541	7.0	93.0
2.9	24.0	.0383	6.8	93.2
2.6	24.0	.0271	6.1	93.9
2.3	24.0	.0140	5.5	94.5
2.0	24.0	.0100	4.9	95.1
1.9	24.0	.0070	4.7	95.3
1.2	24.0	.0050	3.2	96.8
1.2	24.0	.0035	3.2	96.8
1.2	22.0	.0015	2.3	97.7

PERCENT GRAVEL = .0

**PERCENT SAND = 91.9**

PERCENT FINES = 8.1

D60 = .30

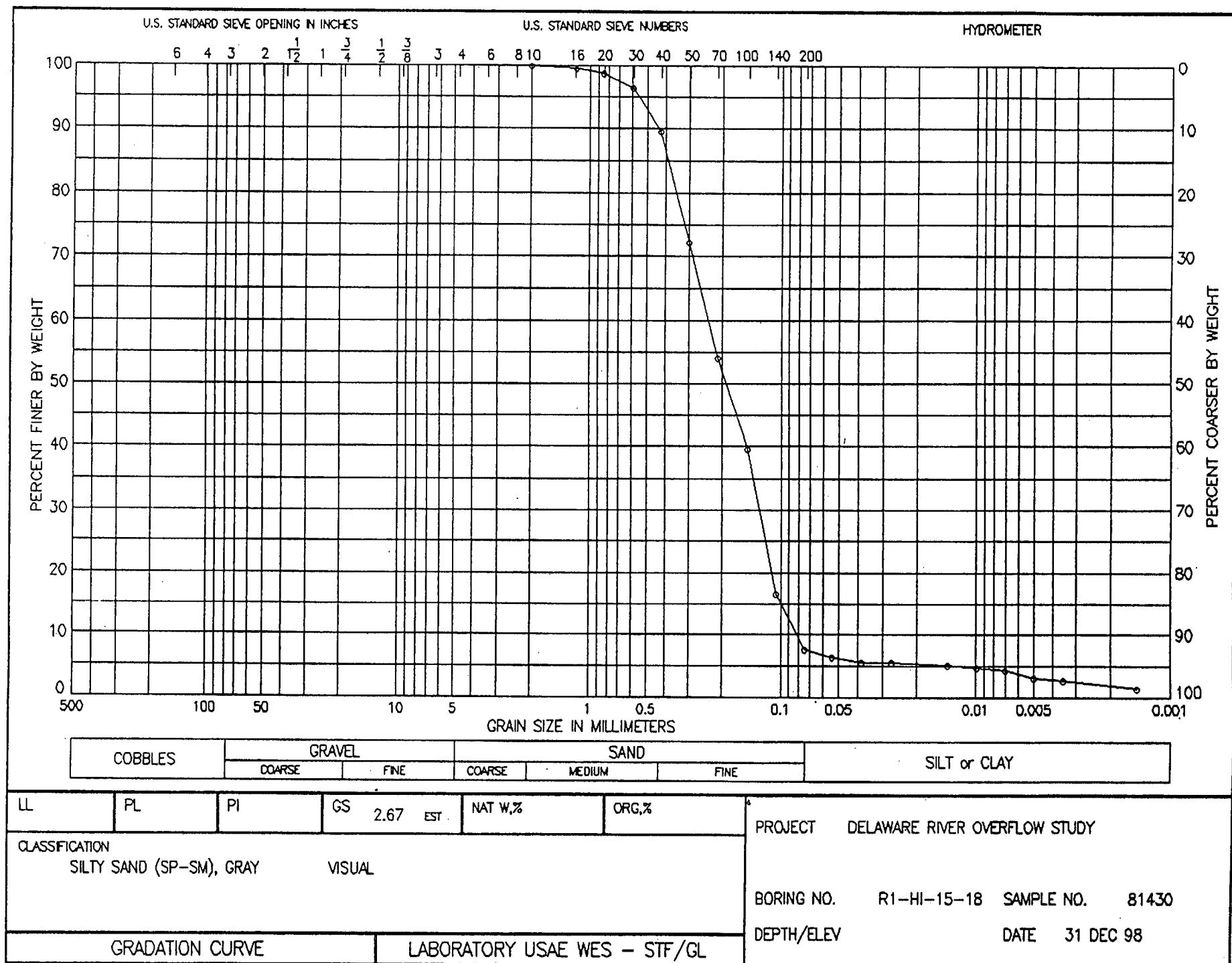
D30 = .15

D10 = .08

GU = 3.58

CC = .88

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HI-15-18 SAMPLE: 81430 DF: MD0199 .DAT  
DEPTH: DATE: 31 DEC 98

NO-LIMITS-RAN GS: 2.67 est WC: .00  
CLASSIFICATION: 503  
SILTY SAND (SP-SM), GRAY VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
PARTIAL WEIGHT AFTER SPLIT: 77.3 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.3	No 16	1.180	99.6	.4
.9	No 20	.850	98.8	1.2
2.7	No 30	.600	96.5	3.5
8.1	No 40	.425	89.5	10.5
21.5	No 50	.300	72.2	27.8
35.5	No 70	.212	54.1	45.9
46.7	No 100	.150	39.6	60.4
64.5	No 140	.106	16.6	83.4
71.4	No 200	.075	7.6	92.4

## HYDROMETER:

RDGS	TEMP			
2.8	24.0	.0542	6.4	93.6
2.4	24.0	.0384	5.6	94.4
2.4	24.0	.0272	5.6	94.4
2.2	24.0	.0141	5.2	94.8
2.0	24.0	.0100	4.8	95.2
1.8	24.0	.0071	4.3	95.7
1.2	24.0	.0050	3.1	96.9
1.0	24.0	.0035	2.7	97.3
.8	22.0	.0015	1.4	98.6

PERCENT GRAVEL = .0

PERCENT SAND = 92.4

PERCENT FINES = 7.6

D60 = .24

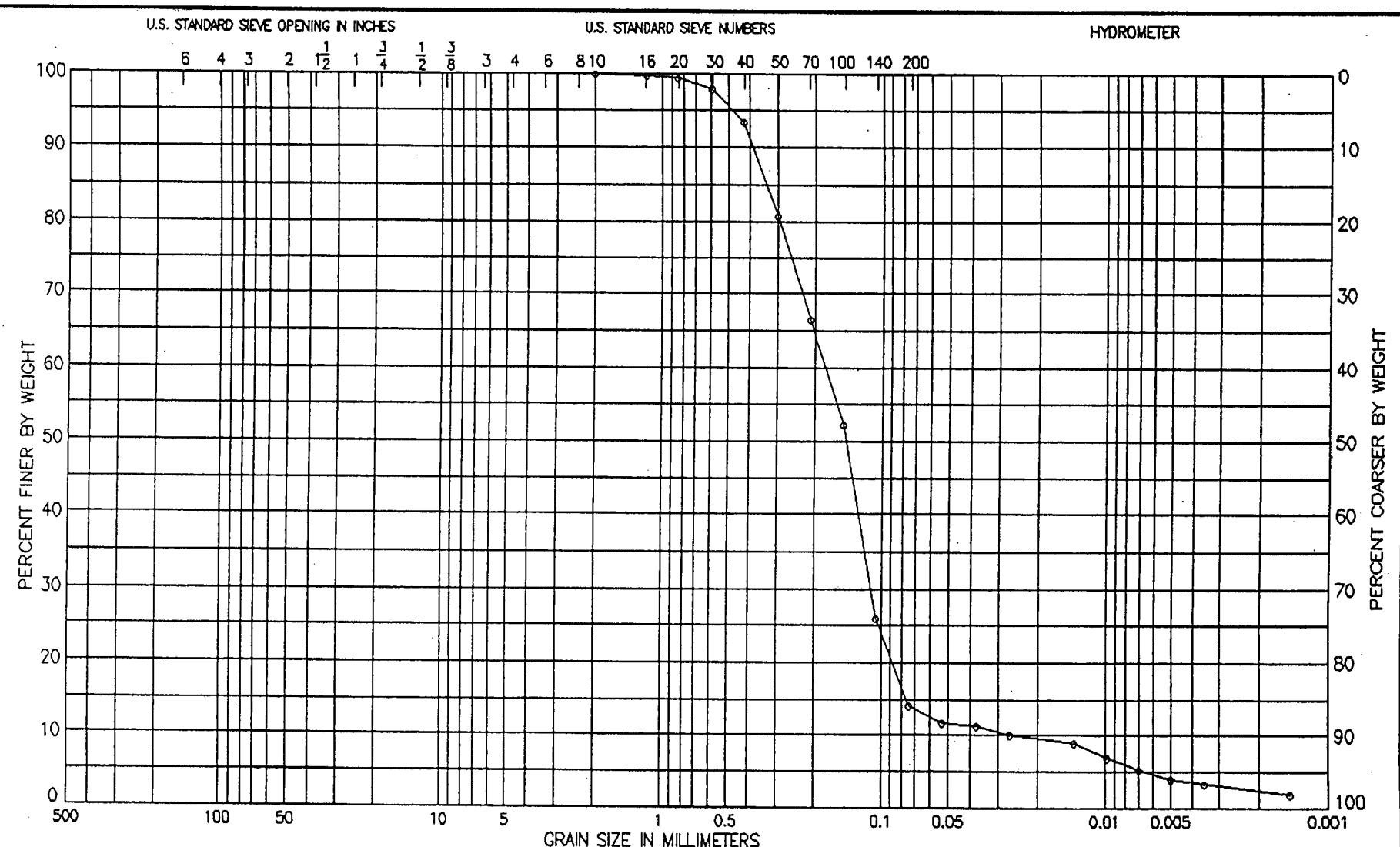
D30 = .13

D10 = .08

CU = 2.89

CC = .87

EDE



COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LL	PL	PI	GS	2.67 EST	NAT W. %	ORG. %	PROJECT	DELAWARE RIVER OVERFLOW STUDY	
CLASSIFICATION	SILTY SAND (SM), GRAY		VISUAL					BORING NO.	R1-HI-21-24
								SAMPLE NO.	81431
GRADATION CURVE			LABORATORY USAE WES - STF/GL				DEPTH/ELEV	DATE	31 DEC 98

# SIEVE ANALYSIS

## PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HI-21-24 SAMPLE: 81431 DF: MD0199 .DAT  
DEPTH: DATE: 31 DEC 98

NO-LIMITS-RAN GS: 2.67 est WC: .00  
CLASSIFICATION: 511  
SILTY SAND (SM), GRAY VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
PARTIAL WEIGHT AFTER SPLIT: 76.4 gms.

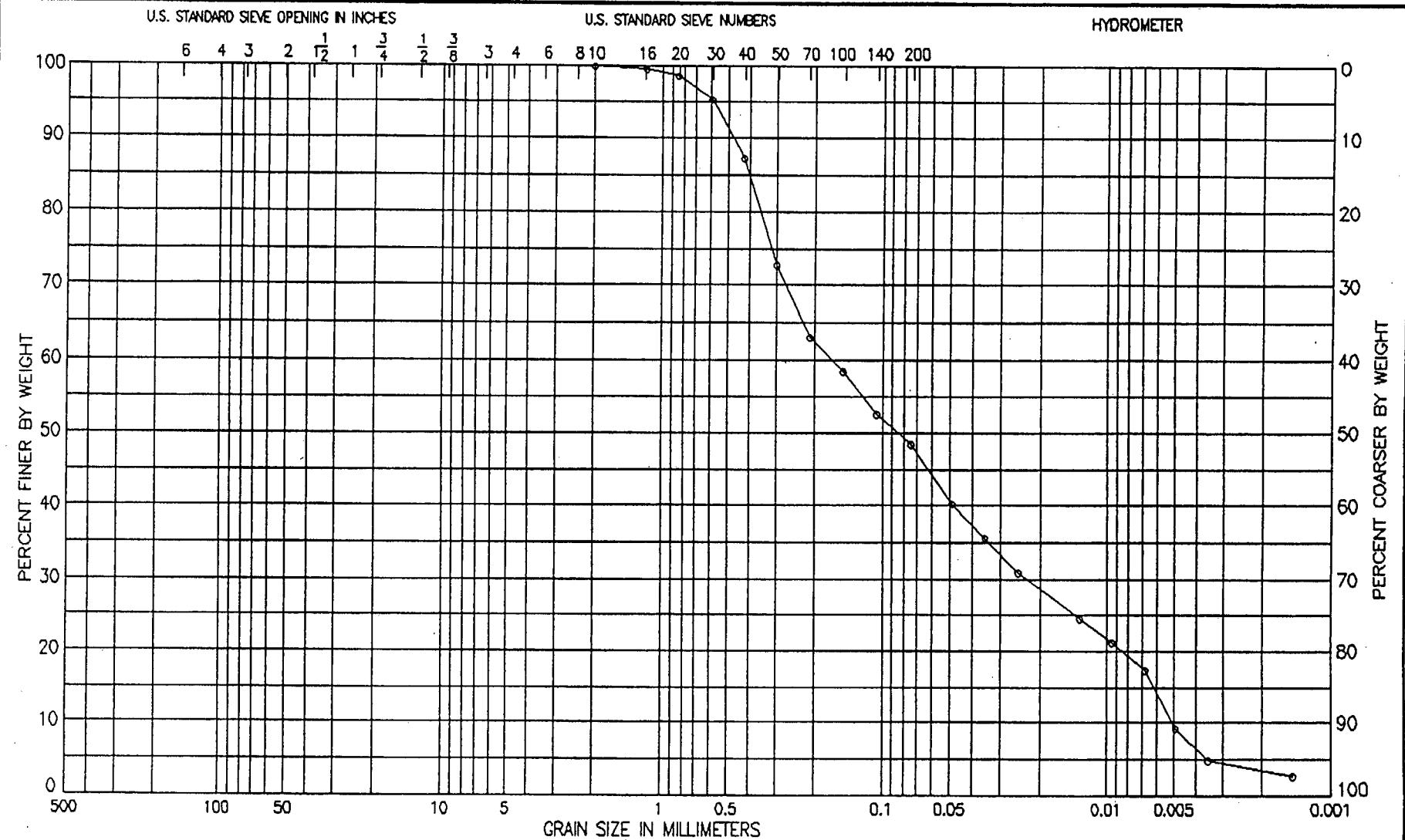
WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.2	No 16	1.180	99.7	.3
.4	No 20	.850	99.5	.5
1.5	No 30	.600	98.0	2.0
5.0	No 40	.425	93.5	6.5
14.7	No 50	.300	80.8	19.2
25.6	No 70	.212	66.5	33.5
36.5	No 100	.150	52.2	47.8
56.6	No 140	.106	25.9	74.1
65.6	No 200	.075	14.1	85.9

### HYDROMETER:

RDGS	TEMP			
5.3	24.0	.0531	11.7	88.3
5.1	24.0	.0376	11.3	88.7
4.5	24.0	.0267	10.0	90.0
4.0	24.0	.0139	9.0	91.0
3.0	24.0	.0099	6.9	93.1
2.2	24.0	.0070	5.2	94.8
1.6	24.0	.0050	4.0	96.0
1.3	24.0	.0035	3.3	96.7
1.0	22.0	.0015	1.9	98.1

PERCENT GRAVEL = .0  
PERCENT SAND = 85.9  
PERCENT FINES = 14.1

EDE



COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LL	PL	PI	GS	2.67 EST	NAT W. %	ORG. %	PROJECT	DELAWARE RIVER OVERFLOW STUDY
CLASSIFICATION	SILTY SAND (SM), GRAY				BORING NO.	R1-HI-27-30	SAMPLE NO.	81432
	VISUAL				DEPTH/ELEV		DATE	31 DEC 98
GRADATION CURVE			LABORATORY USAE WES - STF/GL					

# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HI-27-30 SAMPLE: 81432 DF: MD0199 .DAT  
DEPTH: DATE: 31 DEC 98

NO-LIMITS-RAN GS: 2.67 est WC: .00  
CLASSIFICATION: 519  
SILTY SAND (SM), GRAY VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
PARTIAL WEIGHT AFTER SPLIT: 58.8 gms.

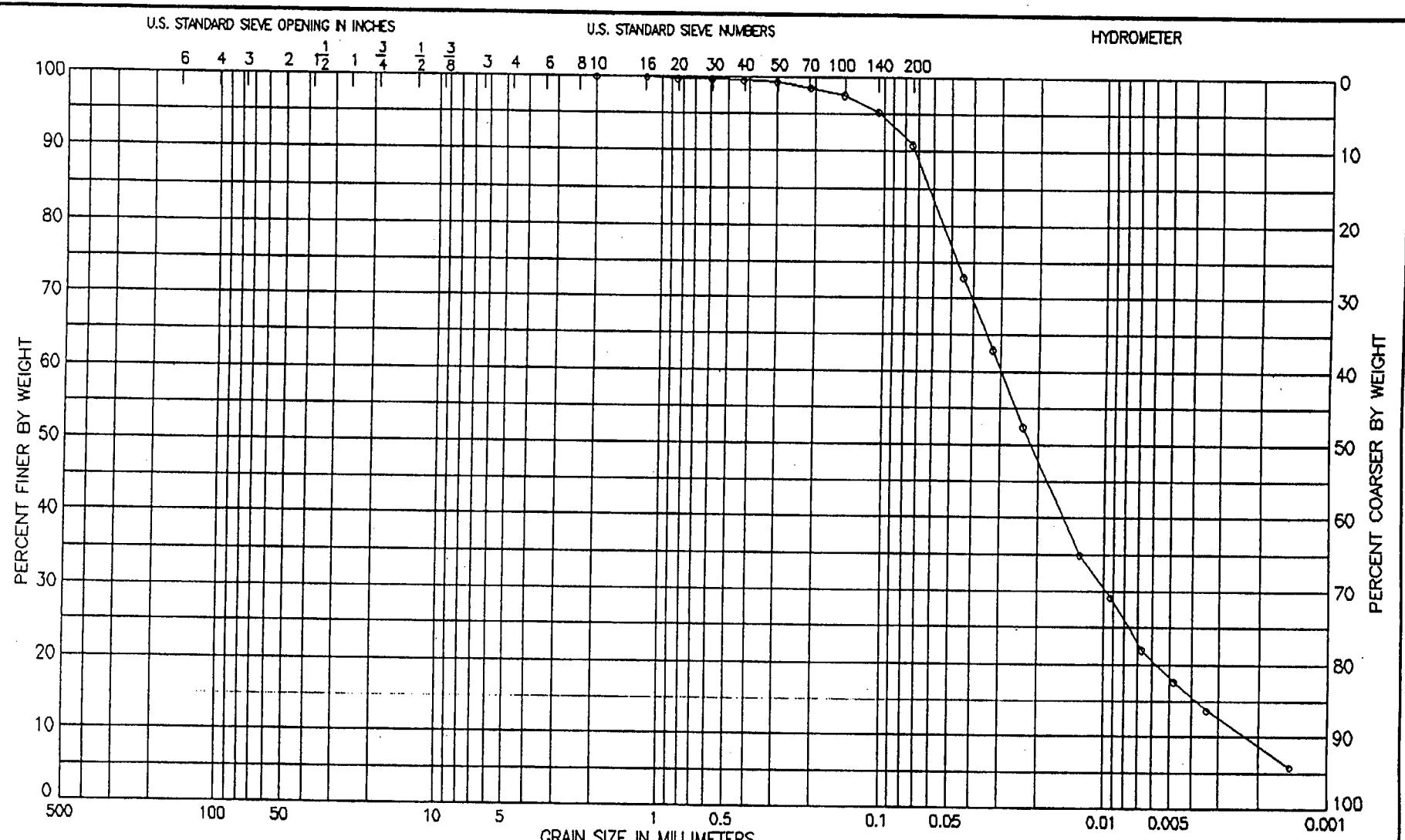
WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.2	No 16	1.180	99.7	.3
.8	No 20	.850	98.6	1.4
2.7	No 30	.600	95.4	4.6
7.5	No 40	.425	87.2	12.8
16.0	No 50	.300	72.8	27.2
21.7	No 70	.212	63.1	36.9
24.4	No 100	.150	58.5	41.5
27.9	No 140	.106	52.6	47.4
30.3	No 200	.075	48.5	51.5

HYDROMETER:

RDGS	TEMP			
14.5	24.0	.0491	40.2	59.8
12.8	24.0	.0352	35.6	64.4
11.1	24.0	.0253	31.0	69.0
8.7	24.0	.0133	24.5	75.5
7.5	24.0	.0095	21.2	78.8
6.1	24.0	.0068	17.4	82.6
3.1	24.0	.0049	9.2	90.8
1.5	24.0	.0035	4.9	95.1
1.1	22.0	.0015	2.7	97.3

PERCENT GRAVEL = .0  
PERCENT SAND = 51.5  
PERCENT FINES = 48.5

EDE



LL	PL	PI	GS	2.70 EST	NAT W. %	ORG. %	PROJECT	DELAWARE RIVER OVERFLOW STUDY	
CLASSIFICATION	CLAY (CL), GRAY; WITH SAND						BORING NO.	R2-HI-3-6	SAMPLE NO. 81433
GRADATION CURVE	VISUAL						DEPTH/ELEV	DATE 31 DEC 98	
LABORATORY USAE WES - STF/GL									

# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HI-3-6      SAMPLE: 81433      DF: MD0199 .DAT  
DEPTH:                    DATE: 31 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00

CLASSIFICATION: 527

CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:    51.2 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.1	No 20	.850	99.8	.2
.1	No 30	.600	99.8	.2
.2	No 40	.425	99.6	.4
.3	No 50	.300	99.4	.6
.7	No 70	.212	98.6	1.4
1.2	No 100	.150	97.7	2.3
2.4	No 140	.106	95.3	4.7
4.7	No 200	.075	90.8	9.2

## HYDROMETER:

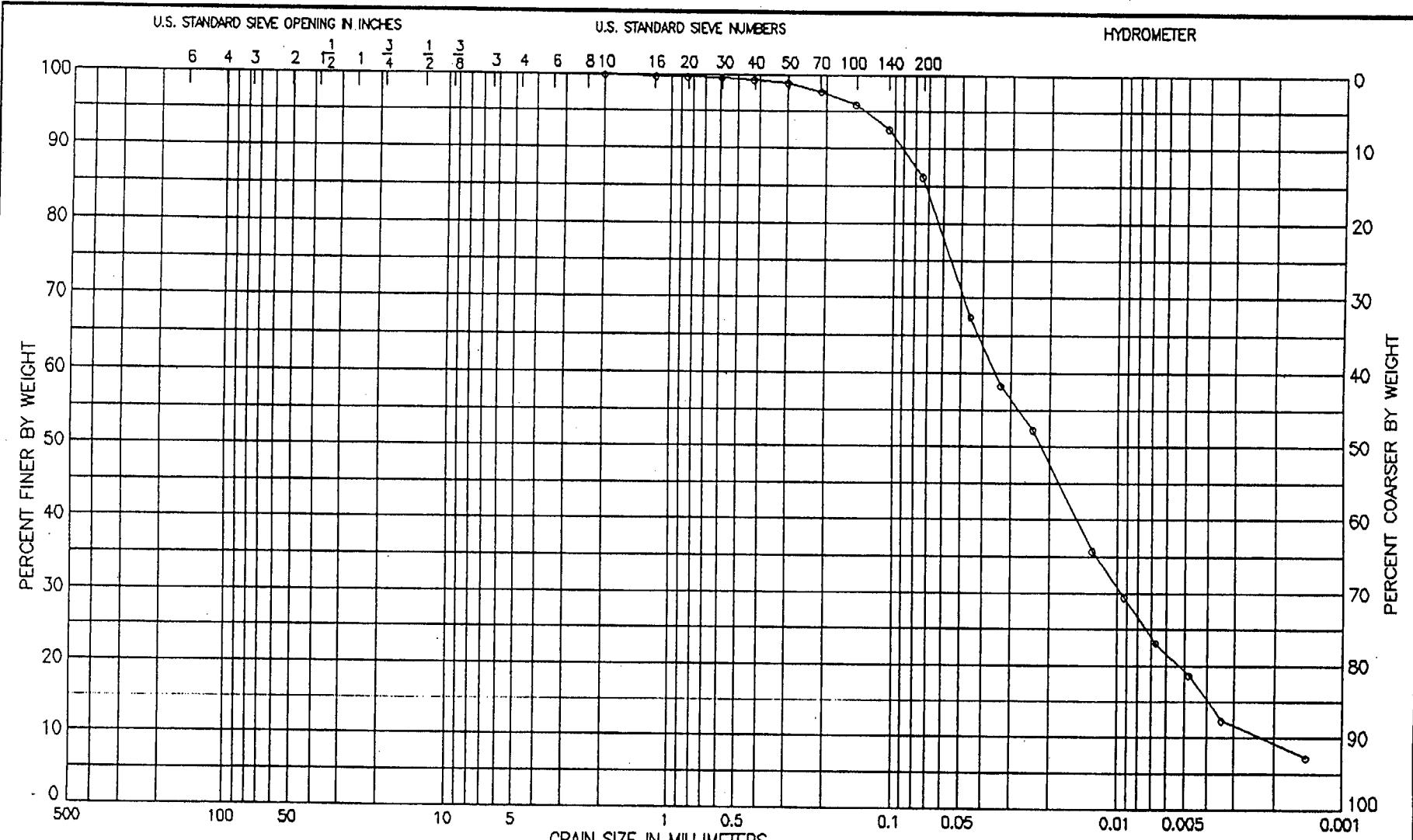
RDGS	TEMP			
23.2	24.0	.0445	72.9	27.1
20.0	24.0	.0326	63.0	37.0
16.6	24.0	.0238	52.4	47.6
11.0	24.0	.0130	35.1	64.9
9.1	24.0	.0093	29.2	70.8
6.8	24.0	.0067	22.0	78.0
5.4	24.0	.0048	17.7	82.3
4.1	24.0	.0034	13.6	86.4
2.0	22.0	.0015	5.9	94.1

PERCENT GRAVEL =      .0

PERCENT SAND      = 9.2

PERCENT FINES      = 90.8

EDE



COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LL	PL	PI	GS	2.70 EST	NAT W. %	ORG. %	PROJECT	DELAWARE RIVER OVERFLOW STUDY	
CLASSIFICATION	SANDY CLAY (CL), GRAY		VISUAL				BORING NO.	R2-HI-9-12	SAMPLE NO. 81434
							DEPTH/ELEV		DATE 31 DEC 98
GRADATION CURVE			LABORATORY USAE WES - STF/GL						

# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HI-9-12      SAMPLE: 81434      DF: MD0199 .DAT  
 DEPTH:                    DATE: 31 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00  
 CLASSIFICATION: 535  
 SANDY CLAY (CL), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:      50.1 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.1	No 16	1.180	99.8	.2
.1	No 20	.850	99.8	.2
.2	No 30	.600	99.6	.4
.3	No 40	.425	99.4	.6
.5	No 50	.300	99.0	1.0
1.1	No 70	.212	97.8	2.2
2.0	No 100	.150	96.0	4.0
3.7	No 140	.106	92.6	7.4
6.9	No 200	.075	86.2	13.8

HYDROMETER:

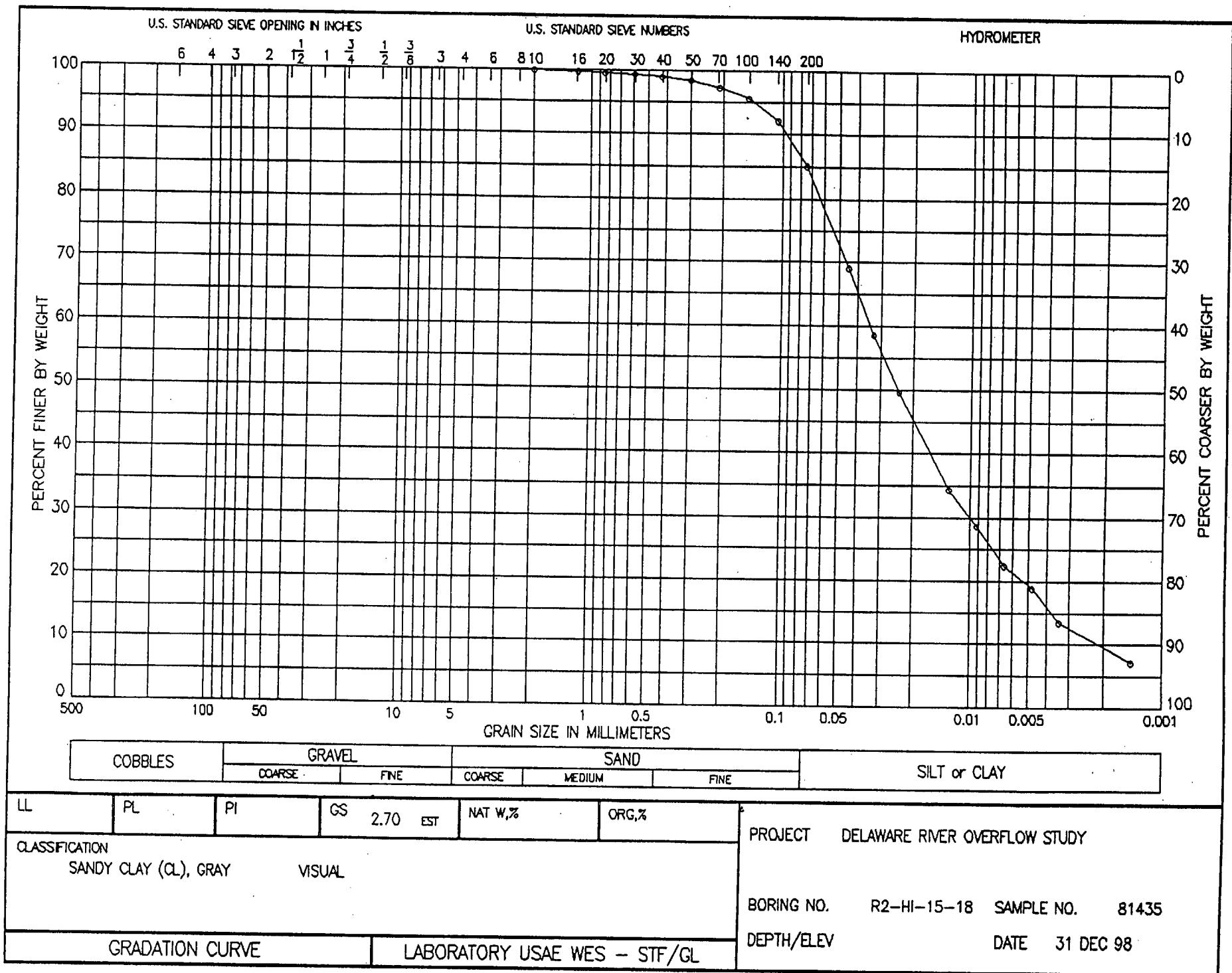
RDGS	TEMP			
21.0	24.0	.0456	67.5	32.5
18.1	24.0	.0332	58.3	41.7
16.2	24.0	.0239	52.3	47.7
11.0	24.0	.0130	35.8	64.2
9.0	24.0	.0093	29.5	70.5
7.0	24.0	.0067	23.1	76.9
5.6	24.0	.0048	18.7	81.3
3.6	24.0	.0034	12.4	87.6
2.4	22.0	.0015	7.3	92.7

PERCENT GRAVEL =      .0

PERCENT SAND      = 13.8

PERCENT FINES      = 86.2

EDE



## SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HI-15-18 SAMPLE: 81435 DF: MD0199 .DAT  
DEPTH: DATE: 31 DEC 98

NO-LIMITS-RAN GS: 2.70 est WC: .00  
CLASSIFICATION: 543  
SANDY CLAY (CL), GRAY VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
PARTIAL WEIGHT AFTER SPLIT: 53.1 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.1	No 16	1.180	99.8	.2
.2	No 20	.850	99.6	.4
.3	No 30	.600	99.4	.6
.5	No 40	.425	99.1	.9
.8	No 50	.300	98.5	1.5
1.4	No 70	.212	97.4	2.6
2.3	No 100	.150	95.7	4.3
4.2	No 140	.106	92.1	7.9
7.9	No 200	.075	85.1	14.9

### HYDROMETER:

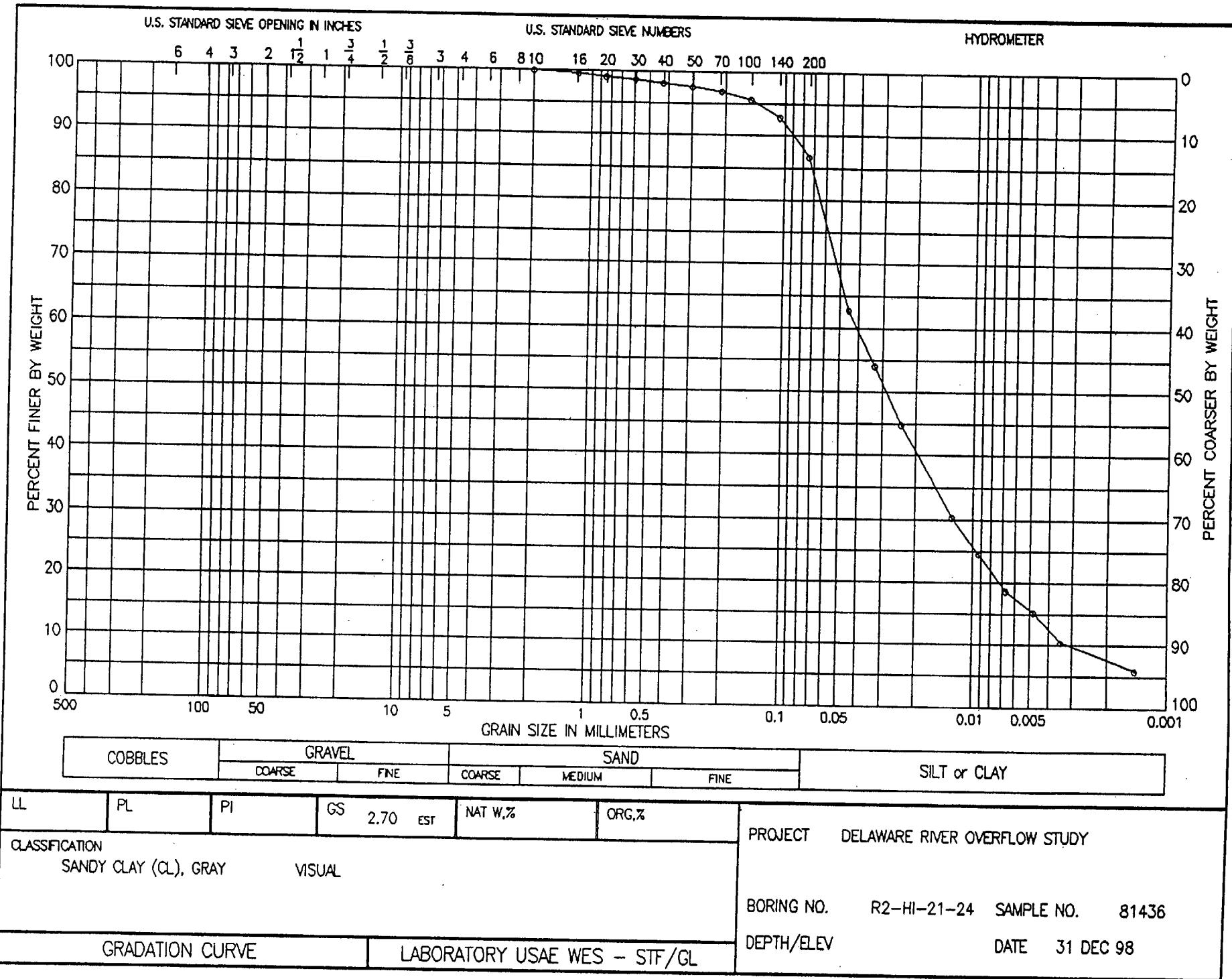
RDGS	TEMP			
22.8	24.0	.0447	69.1	30.9
19.3	24.0	.0328	58.6	41.4
16.3	24.0	.0239	49.7	50.3
11.2	24.0	.0129	34.4	65.6
9.3	24.0	.0093	28.7	71.3
7.2	24.0	.0067	22.4	77.6
6.0	24.0	.0048	18.8	81.2
4.2	24.0	.0034	13.5	86.5
2.5	22.0	.0015	7.2	92.8

PERCENT GRAVEL = .0

PERCENT SAND = 14.9

PERCENT FINES = 85.1

EDE



SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HI-21-24 SAMPLE: 81436 DF: MD0199 .DAT  
 DEPTH: DATE: 31 DEC 98

NO-LIMITS-RAN GS: 2.70 est WC: .00  
 CLASSIFICATION: 551  
 SANDY CLAY (CL), GRAY VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT: 56.4 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.2	No 16	1.180	99.6	.4
.5	No 20	.850	99.1	.9
.7	No 30	.600	98.8	1.2
1.0	No 40	.425	98.2	1.8
1.3	No 50	.300	97.7	2.3
1.7	No 70	.212	97.0	3.0
2.4	No 100	.150	95.7	4.3
4.0	No 140	.106	92.9	7.1
7.5	No 200	.075	86.7	13.3

HYDROMETER:

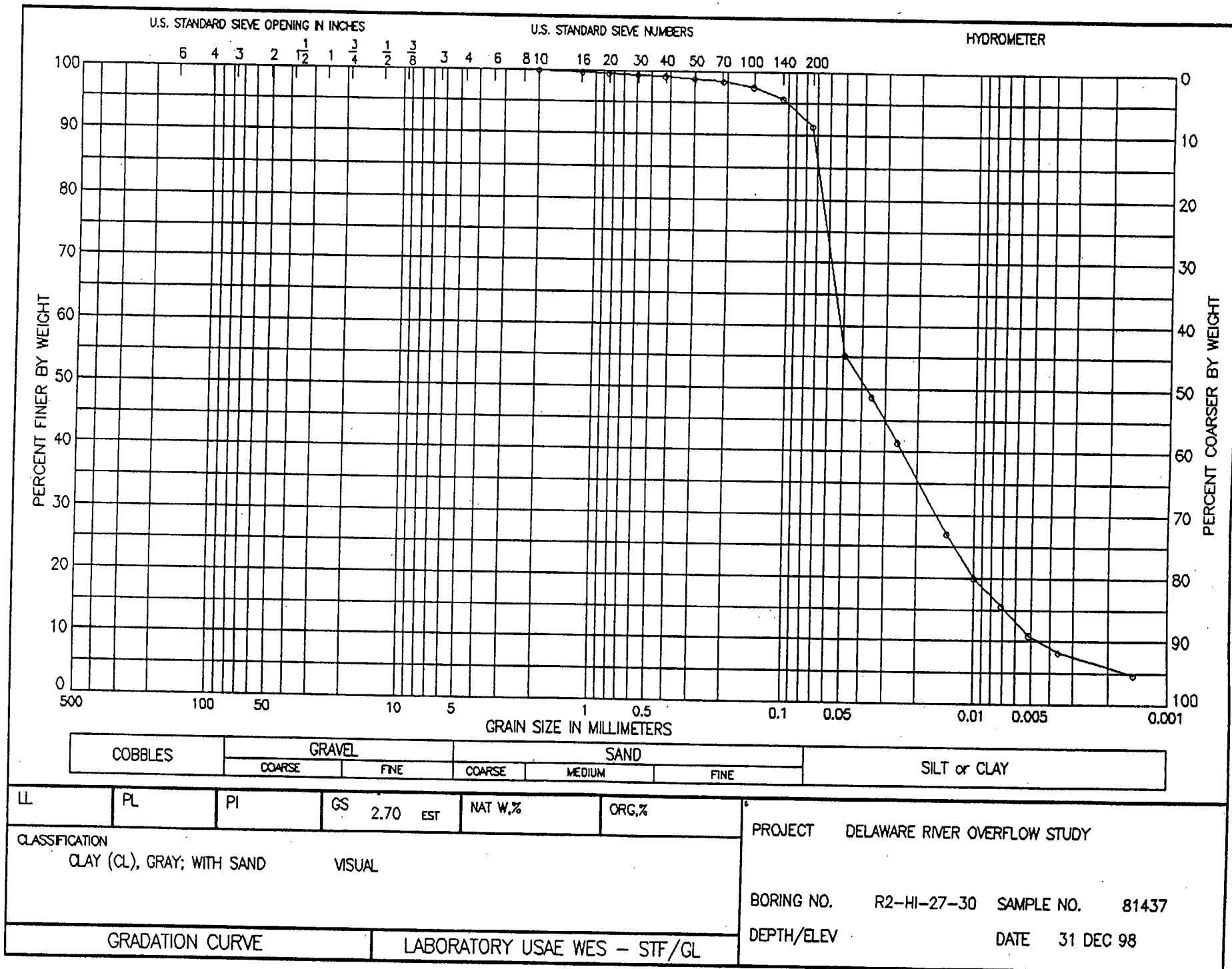
RDGS	TEMP			
22.0	24.0	.0451	62.8	37.2
18.9	24.0	.0329	54.1	45.9
15.6	24.0	.0241	44.8	55.2
10.5	24.0	.0130	30.4	69.6
8.4	24.0	.0094	24.5	75.5
6.3	24.0	.0067	18.6	81.4
5.1	24.0	.0048	15.2	84.8
3.4	24.0	.0035	10.4	89.6
2.2	22.0	.0015	5.9	94.1

PERCENT GRAVEL = .0

PERCENT SAND = 13.3

PERCENT FINES = 86.7

EDE



SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HI-27-30 SAMPLE: 81437 DF: MD0199 .DAT  
DEPTH: DATE: 31 DEC 98

NO-LIMITS-RAN GS: 2.70 est WC: .00

CLASSIFICATION: 559

CLAY (CL), GRAY; WITH SAND VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 54.1 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.1	No 16	1.180	99.8	.2
.2	No 20	.850	99.6	.4
.3	No 30	.600	99.4	.6
.4	No 40	.425	99.3	.7
.6	No 50	.300	98.9	1.1
.8	No 70	.212	98.5	1.5
1.3	No 100	.150	97.6	2.4
2.3	No 140	.106	95.7	4.3
4.7	No 200	.075	91.3	8.7

HYDROMETER:

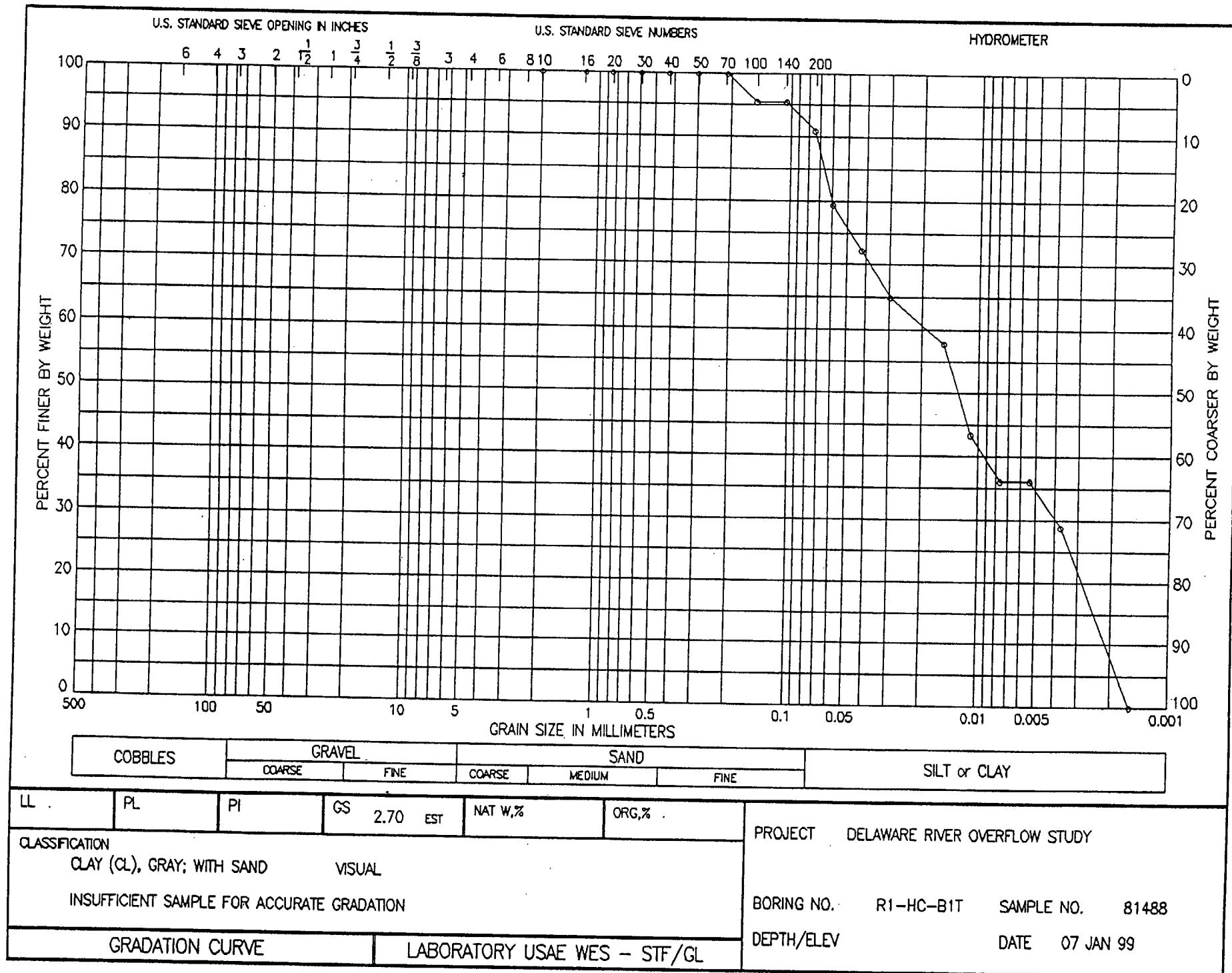
RDGS	TEMP			
19.5	19.0	.0492	55.2	44.8
17.3	19.0	.0356	48.7	51.3
14.8	19.0	.0258	41.4	58.6
9.9	19.0	.0139	27.0	73.0
7.5	19.0	.0100	20.0	80.0
6.0	19.0	.0072	15.6	84.4
4.3	19.5	.0052	10.9	89.1
3.3	20.0	.0036	8.2	91.8
2.1	20.0	.0015	4.7	95.3

PERCENT GRAVEL = .0

PERCENT SAND = 8.7

PERCENT FINES = 91.3

EDE



## SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HC-B1T      SAMPLE: 81488      DF: MD0199 .DAT  
 DEPTH:                    DATE: 07 JAN 99

NO-LIMITS-RAN GS: 2.70 est WC: .00

CLASSIFICATION: 838

CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 2.2 gms.

INSUFFICIENT SAMPLE FOR ACCURATE GRADATION

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.0	No 40	.425	100.0	.0
.0	No 50	.300	100.0	.0
.0	No 70	.212	100.0	.0
.1	No 100	.150	95.5	4.5
.1	No 140	.106	95.5	4.5
.2	No 200	.075	90.9	9.1

## HYDROMETER:

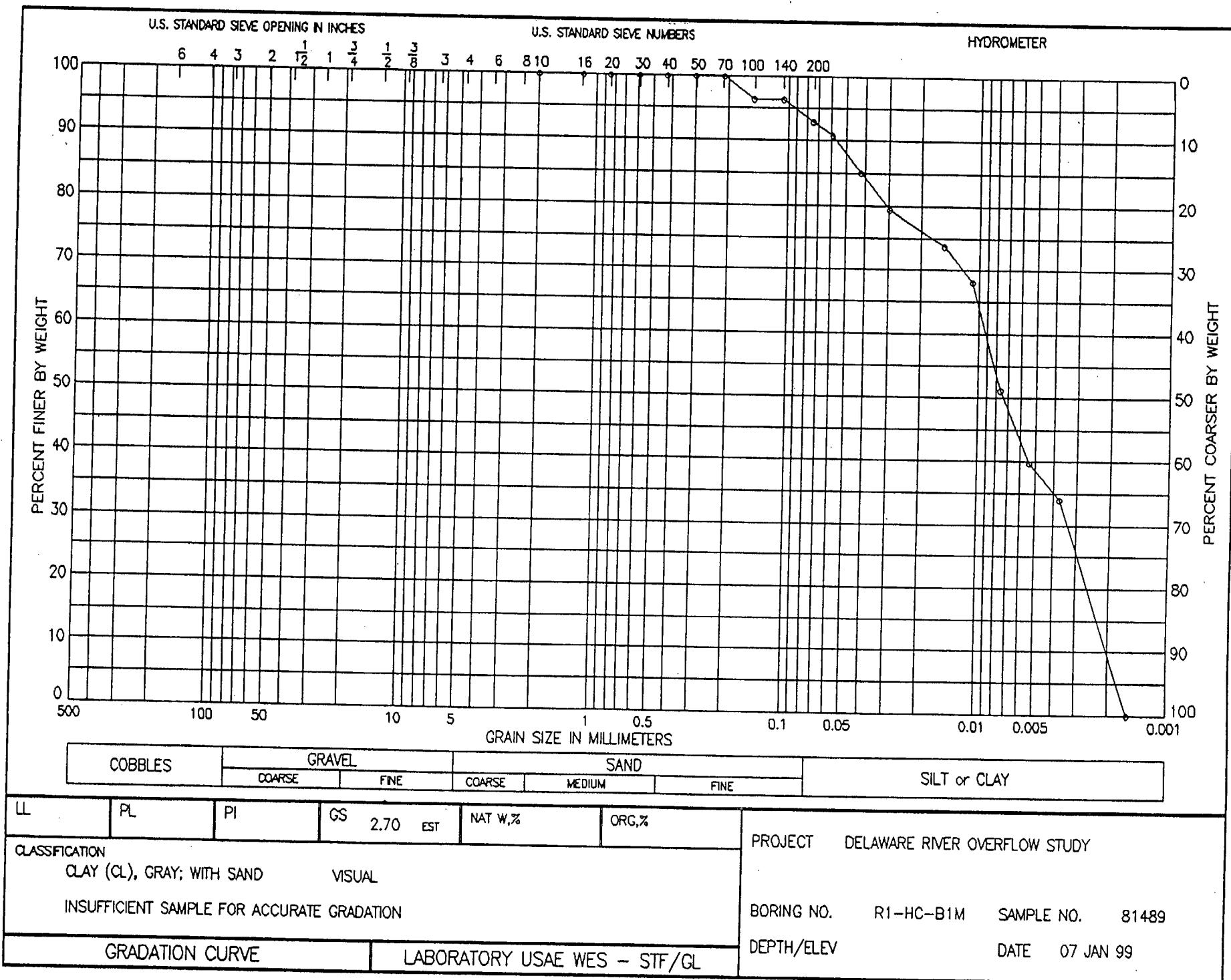
RDGS	TEMP			
2.2	16.0	.0596	79.4	20.6
2.1	16.0	.0422	72.2	27.8
2.0	16.0	.0298	65.0	35.0
1.9	16.0	.0154	57.8	42.2
1.8	15.5	.0111	43.3	56.7
1.6	16.0	.0077	36.1	63.9
1.5	17.0	.0054	36.1	63.9
1.1	19.0	.0037	28.9	71.1
1.1	16.0	.0016	.0	100.0

PERCENT GRAVEL = .0

PERCENT SAND = 9.1

PERCENT FINES = 90.9

EDE



## SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HC-B1M      SAMPLE: 81489      DF: MD0199 .DAT  
 DEPTH:                    DATE: 07 JAN 99

NO-LIMITS-RAN      GS: 2.70 est      WC: .00

CLASSIFICATION: 846

CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 2.8 gms.

INSUFFICIENT SAMPLE FOR ACCURATE GRADATION

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.0	No 40	.425	100.0	.0
.0	No 50	.300	100.0	.0
.0	No 70	.212	100.0	.0
.1	No 100	.150	96.4	3.6
.1	No 140	.106	96.4	3.6
.2	No 200	.075	92.9	7.1

## HYDROMETER:

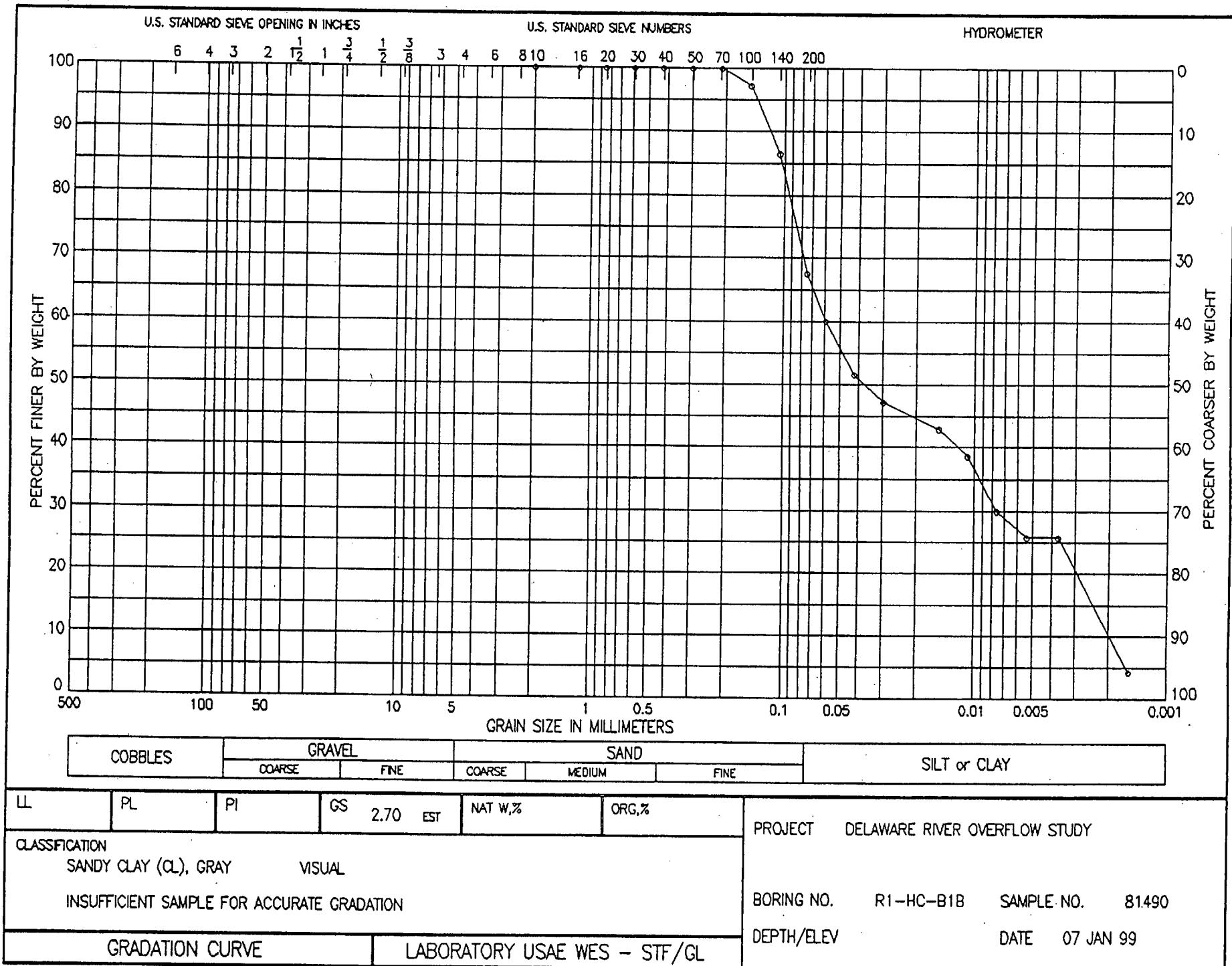
RDGS	TEMP			
2.7	16.0	.0594	90.8	9.2
2.6	16.0	.0420	85.1	14.9
2.5	16.0	.0297	79.4	20.6
2.4	16.0	.0154	73.7	26.3
2.3	16.0	.0109	68.1	31.9
2.0	16.0	.0077	51.1	48.9
1.7	17.0	.0054	39.7	60.3
1.3	19.0	.0037	34.0	66.0
1.1	16.0	.0016	.0	100.0

PERCENT GRAVEL = .0

PERCENT SAND = 7.1

PERCENT FINES = 92.9

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HC-B1B      SAMPLE: 81490      DF: MD0199 .DAT  
 DEPTH:                    DATE: 07 JAN 99

NO-LIMITS-RAN      GS: 2.70 est      WC: .00  
 CLASSIFICATION: 854  
 SANDY CLAY (CL), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT: 3.7 gms.  
 INSUFFICIENT SAMPLE FOR ACCURATE GRADATION

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.0	No 40	.425	100.0	.0
.0	No 50	.300	100.0	.0
.0	No 70	.212	100.0	.0
.1	No 100	.150	97.3	2.7
.5	No 140	.106	86.5	13.5
1.2	No 200	.075	67.6	32.4

HYDROMETER:

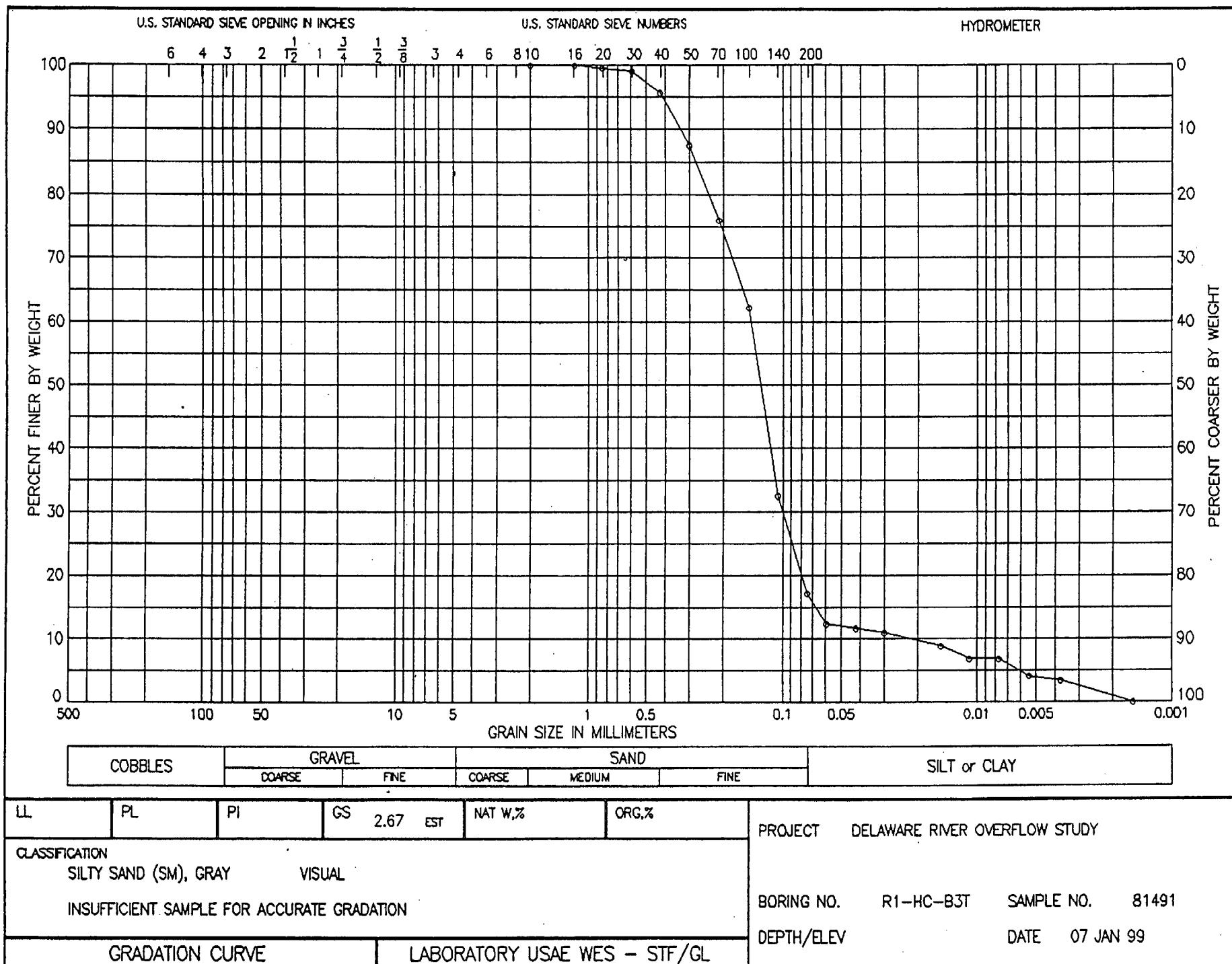
RDGS	TEMP			
2.5	16.0	.0595	60.1	39.9
2.3	16.0	.0421	51.5	48.5
2.2	16.0	.0298	47.2	52.8
2.1	16.0	.0154	42.9	57.1
2.0	16.0	.0109	38.6	61.4
1.8	16.0	.0077	30.0	70.0
1.5	17.5	.0054	25.8	74.2
1.3	19.0	.0037	25.8	74.2
1.2	16.0	.0016	4.3	95.7

PERCENT GRAVEL = .0

PERCENT SAND = 32.4

PERCENT FINES = 67.6

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HC-B3T      SAMPLE: 81491      DF: MD0199 .DAT  
 DEPTH:                    DATE: 07 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC:      .00  
 CLASSIFICATION: 862  
 SILTY SAND (SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:      23.3 gms.  
 INSUFFICIENT SAMPLE FOR ACCURATE GRADATION

WEIGHTS gm.	SIEVE SIZE or NUMBER No	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	10	2.000	100.0	.0
.0	16	1.180	100.0	.0
.1	20	.850	99.6	.4
.2	30	.600	99.1	.9
1.0	40	.425	95.7	4.3
2.9	50	.300	87.6	12.4
5.6	70	.212	76.0	24.0
8.8	100	.150	62.2	37.8
15.7	140	.106	32.6	67.4
19.3	200	.075	17.2	82.8

## HYDROMETER:

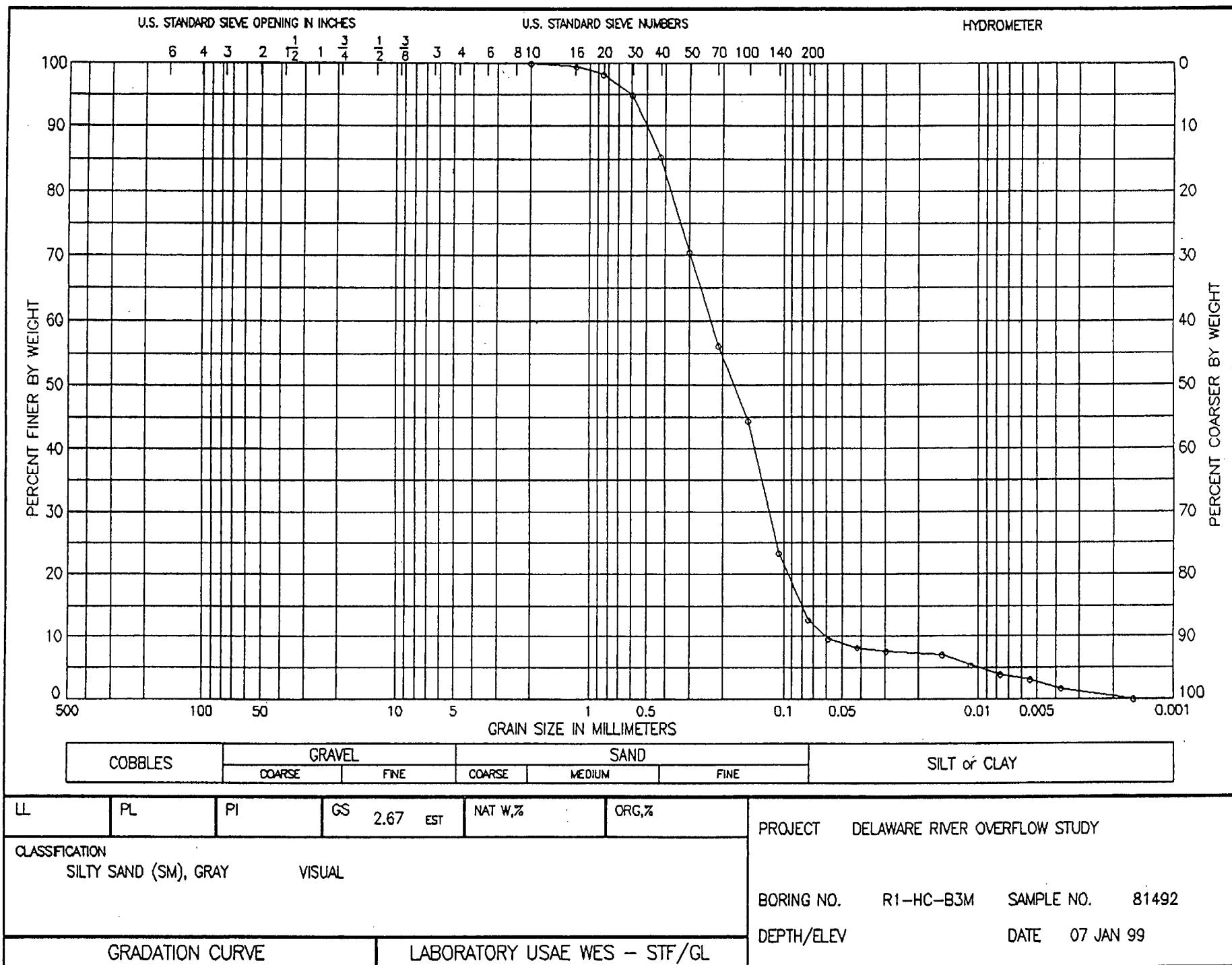
RDGS	TEMP			
2.9	16.0	.0598	12.4	87.6
2.8	16.5	.0423	11.7	88.3
2.7	16.5	.0300	11.0	89.0
2.4	16.5	.0155	8.9	91.1
2.1	16.5	.0110	6.9	93.1
2.1	16.5	.0078	6.9	93.1
1.5	17.5	.0054	4.1	95.9
1.2	19.0	.0038	3.4	96.6
1.1	16.0	.0016	.0	100.0

PERCENT GRAVEL =      .0

PERCENT SAND      = 82.8

PERCENT FINES      = 17.2

EDE



## SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HC-B3M      SAMPLE: 81492      DF: MD0199 .DAT  
 DEPTH:                    DATE: 07 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC: .00  
 CLASSIFICATION: 870  
 SILTY SAND (SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT: 56.6 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.3	No 16	1.180	99.5	.5
1.0	No 20	.850	98.2	1.8
2.9	No 30	.600	94.9	5.1
8.3	No 40	.425	85.3	14.7
16.7	No 50	.300	70.5	29.5
24.8	No 70	.212	56.2	43.8
31.5	No 100	.150	44.3	55.7
43.4	No 140	.106	23.3	76.7
49.4	No 200	.075	12.7	87.3

## HYDROMETER:

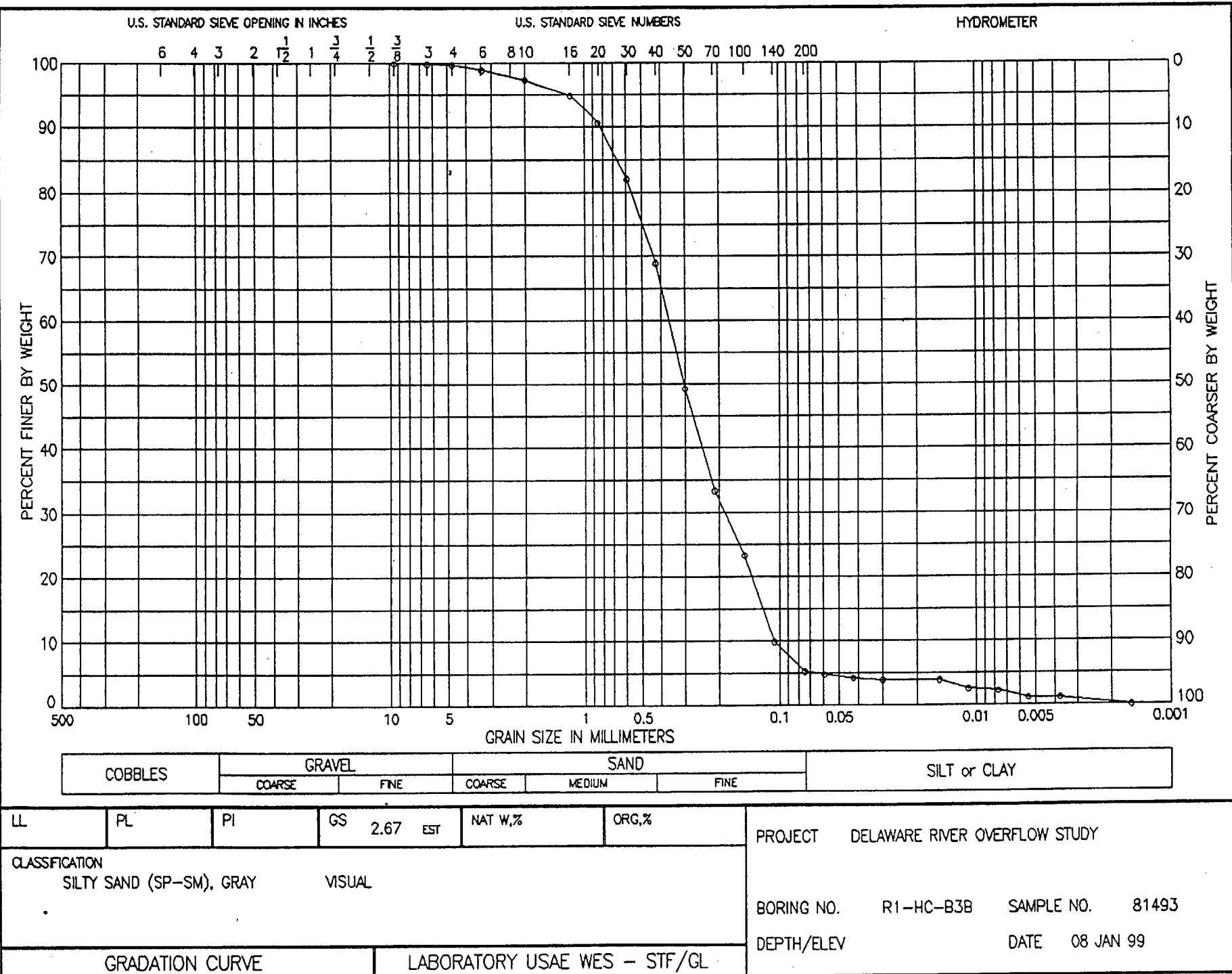
RDGS	TEMP			
4.5	16.5	.0591	9.6	90.4
4.0	16.5	.0419	8.2	91.8
3.8	16.5	.0297	7.6	92.4
3.6	16.5	.0154	7.1	92.9
3.0	16.5	.0109	5.4	94.6
2.5	16.5	.0077	4.0	96.0
2.0	17.5	.0054	3.1	96.9
1.3	19.0	.0038	1.7	98.3
1.1	16.0	.0016	.0	100.0

PERCENT GRAVEL = .0

PERCENT SAND = 87.3

PERCENT FINES = 12.7

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HC-B3B      SAMPLE: 81493      DF: MD0199 .DAT  
 DEPTH:                    DATE: 08 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC:      .00  
 CLASSIFICATION: 878  
 SILTY SAND (SP-SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: 127.1 gms.  
 PARTIAL WEIGHT AFTER SPLIT: 54.8 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	3/8 in	9.500	100.0	.0
.1	No 3	6.350	99.9	.1
.2	No 4	4.750	99.8	.2
1.0	No 6	3.350	99.0	1.0
2.0	No 10	2.000	97.4	2.6
1.4	No 16	1.180	94.9	5.1
3.8	No 20	.850	90.6	9.4
8.6	No 30	.600	82.1	17.9
16.0	No 40	.425	69.0	31.0
27.1	No 50	.300	49.2	50.8
36.0	No 70	.212	33.4	66.6
41.7	No 100	.150	23.3	76.7
49.2	No 140	.106	10.0	90.0
51.8	No 200	.075	5.3	94.7

## HYDROMETER:

RDGS	TEMP			
2.8	16.5	.0599	4.8	95.2
2.6	16.5	.0424	4.3	95.7
2.5	16.5	.0300	4.0	96.0
2.5	16.5	.0155	4.0	96.0
2.0	16.5	.0110	2.6	97.4
1.9	16.5	.0078	2.3	97.7
1.3	17.5	.0055	1.1	98.9
1.1	19.0	.0038	1.1	98.9
1.1	16.0	.0016	.0	100.0

PERCENT GRAVEL = .2

PERCENT SAND = 94.4

PERCENT FINES = 5.3

D60 = .37

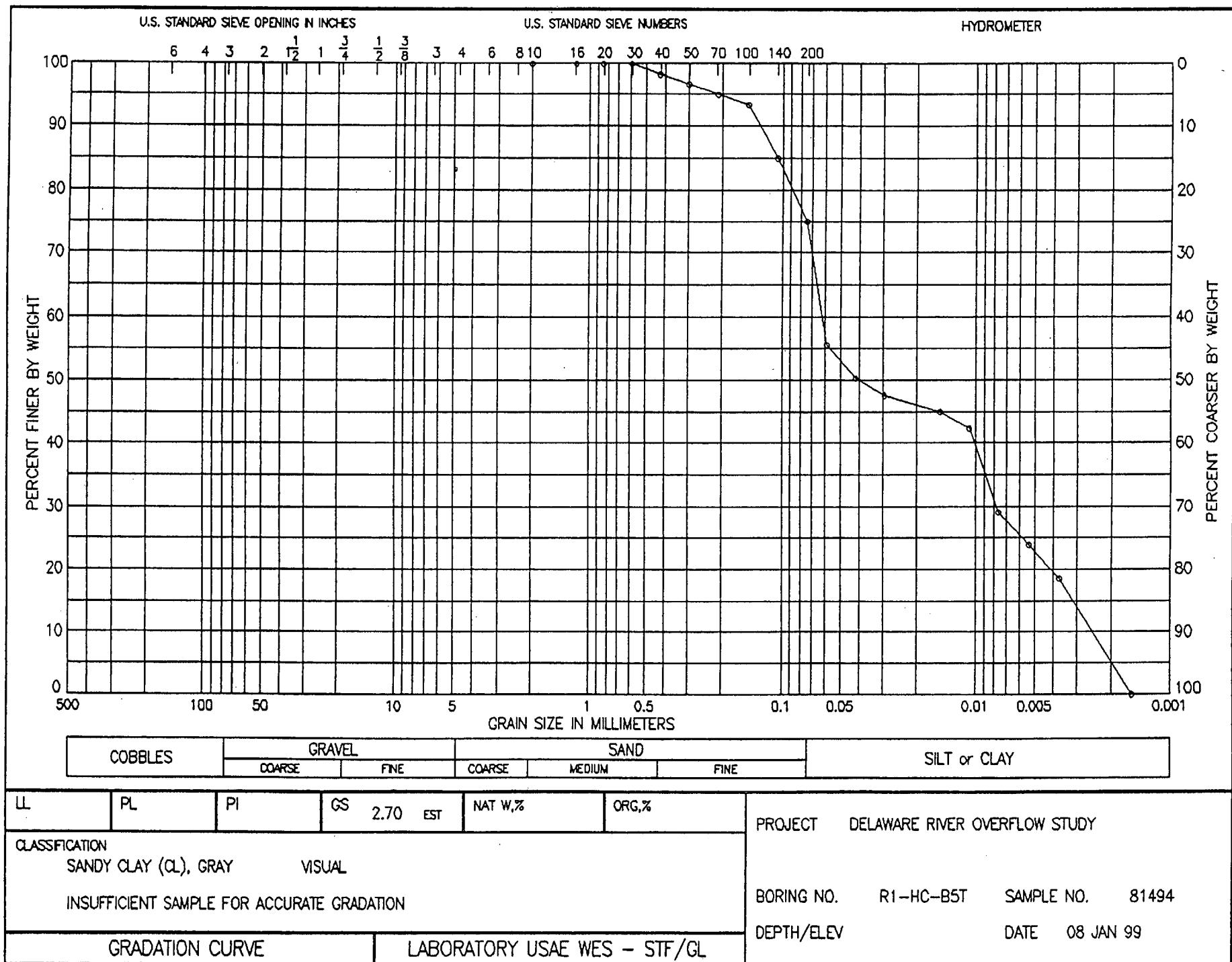
D30 = .19

D10 = .11

CU = 3.47

CC = .93

EDE



## SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HC-B5T      SAMPLE: 81494      DF: MD0199 .DAT  
 DEPTH:                    DATE: 08 JAN 99

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00  
 CLASSIFICATION: 887  
 SANDY CLAY (CL), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT:      6.0 gms.  
 INSUFFICIENT SAMPLE FOR ACCURATE GRADATION

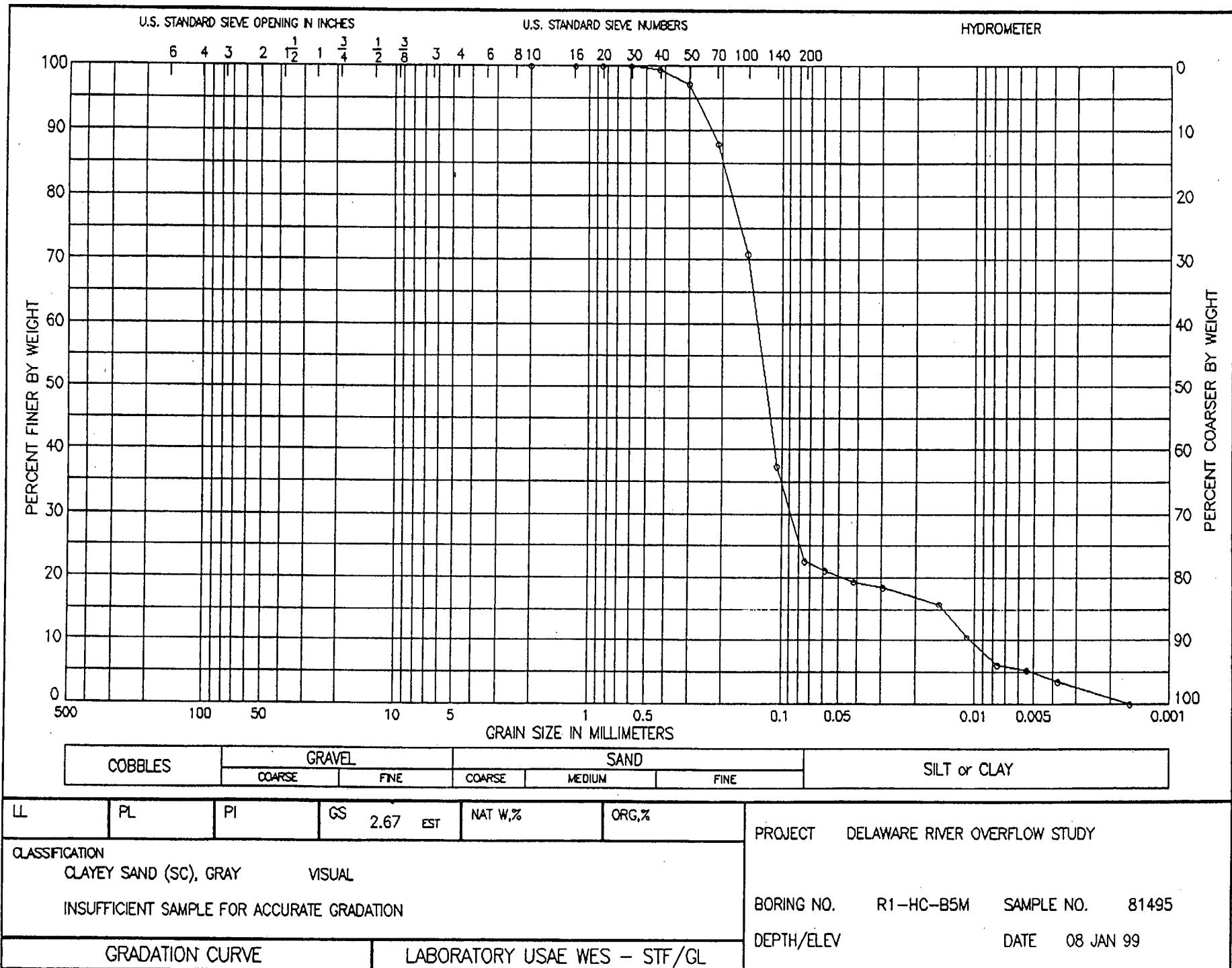
WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.1	No 40	.425	98.3	1.7
.2	No 50	.300	96.7	3.3
.3	No 70	.212	95.0	5.0
.4	No 100	.150	93.3	6.7
.9	No 140	.106	85.0	15.0
1.5	No 200	.075	75.0	25.0

## HYDROMETER:

RDGS	TEMP			
3.2	16.5	.0591	55.6	44.4
3.0	16.5	.0419	50.3	49.7
2.9	16.5	.0296	47.6	52.4
2.8	16.5	.0153	45.0	55.0
2.7	16.5	.0108	42.4	57.6
2.2	16.5	.0077	29.1	70.9
1.8	17.5	.0054	23.8	76.2
1.4	19.0	.0037	18.5	81.5
1.1	16.0	.0016	.0	100.0

PERCENT GRAVEL =      .0  
 PERCENT SAND    = 25.0  
 PERCENT FINES   = 75.0

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HC-B5M      SAMPLE: 81495      DF: MD0199 .DAT  
 DEPTH:                    DATE: 08 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC:      .00  
 CLASSIFICATION: 895  
 CLAYEY SAND (SC), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT:      18.2 gms.  
 INSUFFICIENT SAMPLE FOR ACCURATE GRADATION

WEIGHTS gm.	SIEVE SIZE or NUMBER No	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	10	2.000	100.0	.0
.0	16	1.180	100.0	.0
.0	20	.850	100.0	.0
.0	30	.600	100.0	.0
.1	40	.425	99.5	.5
.5	50	.300	97.3	2.7
2.2	70	.212	87.9	12.1
5.3	100	.150	70.9	29.1
11.4	140	.106	37.4	62.6
14.1	200	.075	22.5	77.5

HYDROMETER:

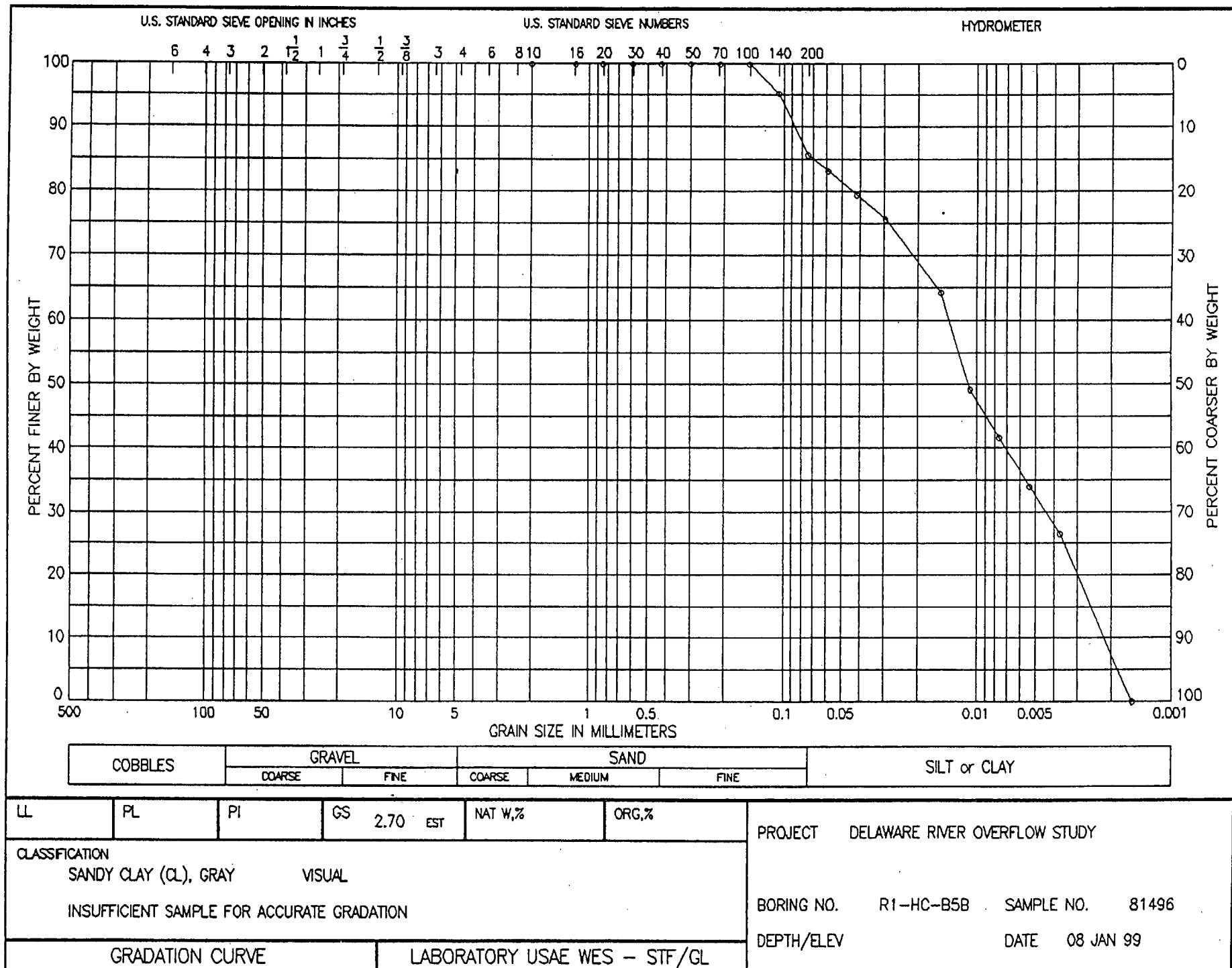
RDGS	TEMP			
3.4	17.0	.0588	21.1	78.9
3.2	17.0	.0417	19.3	80.7
3.1	17.0	.0295	18.4	81.6
2.8	17.0	.0153	15.8	84.2
2.3	16.5	.0110	10.5	89.5
1.7	17.0	.0077	6.1	93.9
1.5	17.5	.0054	5.3	94.7
1.1	19.0	.0038	3.5	96.5
1.1	16.0	.0016	.0	100.0

PERCENT GRAVEL = .0

PERCENT SAND = 77.5

PERCENT FINES = 22.5

EDE



SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HC-B5B      SAMPLE: 81496      DF: MD0199 .DAT  
DEPTH:                    DATE: 08 JAN 99

NO-LIMITS-RAN      GS: 2.70 est      WC: .00  
CLASSIFICATION: 903  
SANDY CLAY (CL), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
PARTIAL WEIGHT AFTER SPLIT: 4.2 gms.  
INSUFFICIENT SAMPLE FOR ACCURATE GRADATION

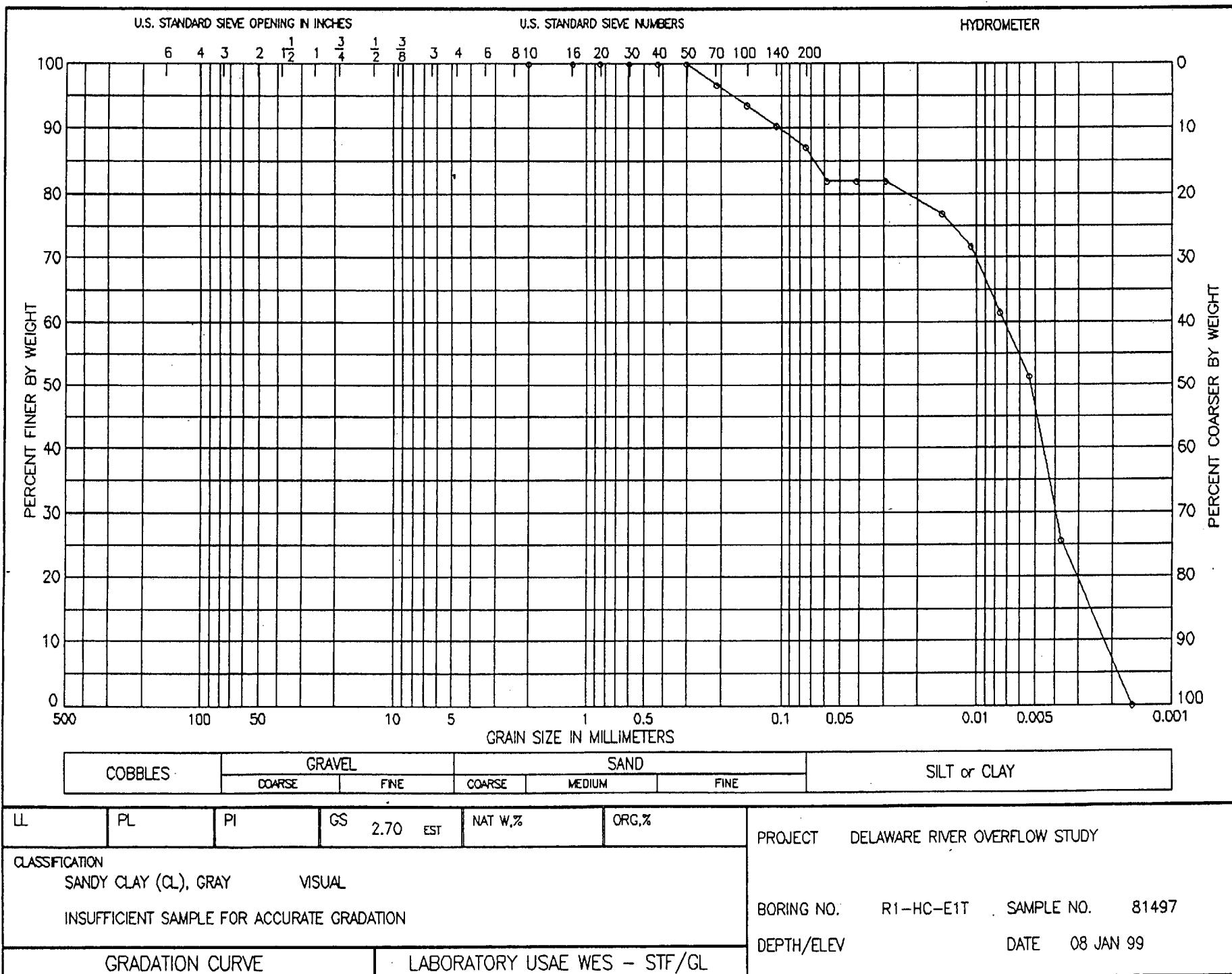
WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.0	No 40	.425	100.0	.0
.0	No 50	.300	100.0	.0
.0	No 70	.212	100.0	.0
.0	No 100	.150	100.0	.0
.2	No 140	.106	95.2	4.8
.6	No 200	.075	85.7	14.3

HYDROMETER:

RDGS	TEMP			
3.3	16.5	.0591	83.2	16.8
3.2	16.5	.0418	79.4	20.6
3.1	16.5	.0296	75.6	24.4
2.8	16.5	.0153	64.3	35.7
2.4	16.5	.0109	49.2	50.8
2.2	16.5	.0077	41.6	58.4
1.8	17.5	.0054	34.0	66.0
1.4	19.0	.0037	26.5	73.5
1.1	16.0	.0016	.0	100.0

PERCENT GRAVEL = .0  
PERCENT SAND = 14.3  
PERCENT FINES = 85.7

EDE



# SIEVE ANALYSIS

## PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HC-E1T      SAMPLE: 81497      DF: MD0199 .DAT  
DEPTH:                    DATE: 08 JAN 99

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00

CLASSIFICATION: 911

SANDY CLAY (CL), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:      3.1 gms.

INSUFFICIENT SAMPLE FOR ACCURATE GRADATION

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.0	No 40	.425	100.0	.0
.0	No 50	.300	100.0	.0
.1	No 70	.212	96.8	3.2
.2	No 100	.150	93.5	6.5
.3	No 140	.106	90.3	9.7
.4	No 200	.075	87.1	12.9

### HYDROMETER:

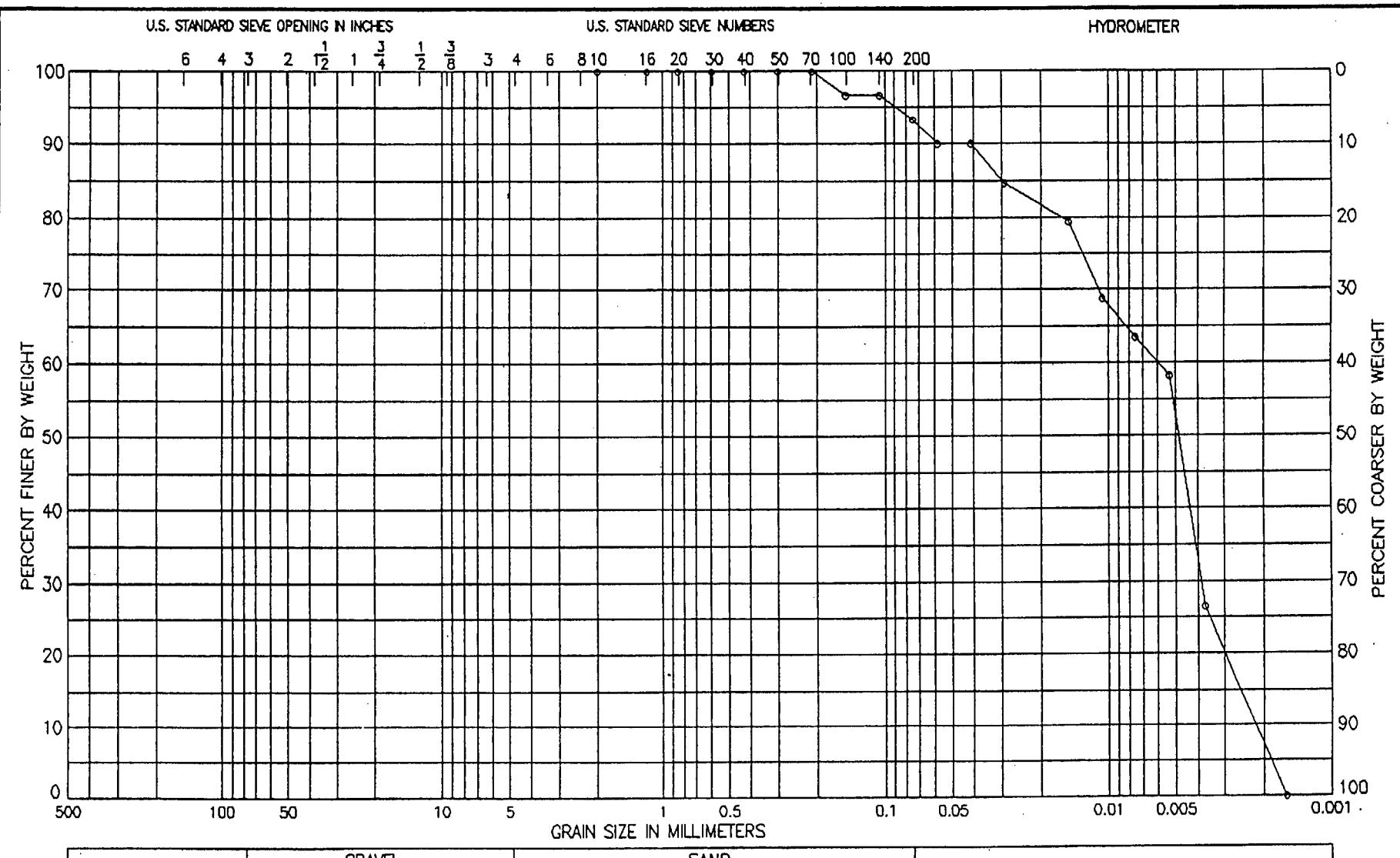
RDGS	TEMP			
2.6	17.0	.0587	82.0	18.0
2.6	17.0	.0415	82.0	18.0
2.6	17.0	.0293	82.0	18.0
2.5	17.0	.0152	76.9	23.1
2.4	17.0	.0107	71.7	28.3
2.2	17.0	.0076	61.5	38.5
1.9	17.5	.0054	51.2	48.8
1.2	19.0	.0037	25.6	74.4
1.1	16.0	.0016	.0	100.0

PERCENT GRAVEL = .0

PERCENT SAND = 12.9

PERCENT FINES = 87.1

EDE



COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

IL	PL	PI	GS	2.70	EST	NAT W.%	ORG.%	PROJECT : DELAWARE RIVER OVERFLOW STUDY			
CLASSIFICATION CLAY (CL), GRAY; WITH SAND      VISUAL INSUFFICIENT SAMPLE FOR ACCURATE GRADATION											
GRADATION CURVE				LABORATORY USAE WES - STF/GL				BORING NO.	R1-HC-E1M	SAMPLE NO.	81498
								DEPTH/ELEV	DATE 08 JAN 99		

# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HC-E1M      SAMPLE: 81498      DF: MD0199 .DAT  
DEPTH:                    DATE: 08 JAN 99

NO-LIMITS-RAN      GS: 2.70 est      WC: .00

CLASSIFICATION: 919

CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 3.0 gms.

INSUFFICIENT SAMPLE FOR ACCURATE GRADATION

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.0	No 40	.425	100.0	.0
.0	No 50	.300	100.0	.0
.0	No 70	.212	100.0	.0
.1	No 100	.150	96.7	3.3
.1	No 140	.106	96.7	3.3
.2	No 200	.075	93.3	6.7

## HYDROMETER:

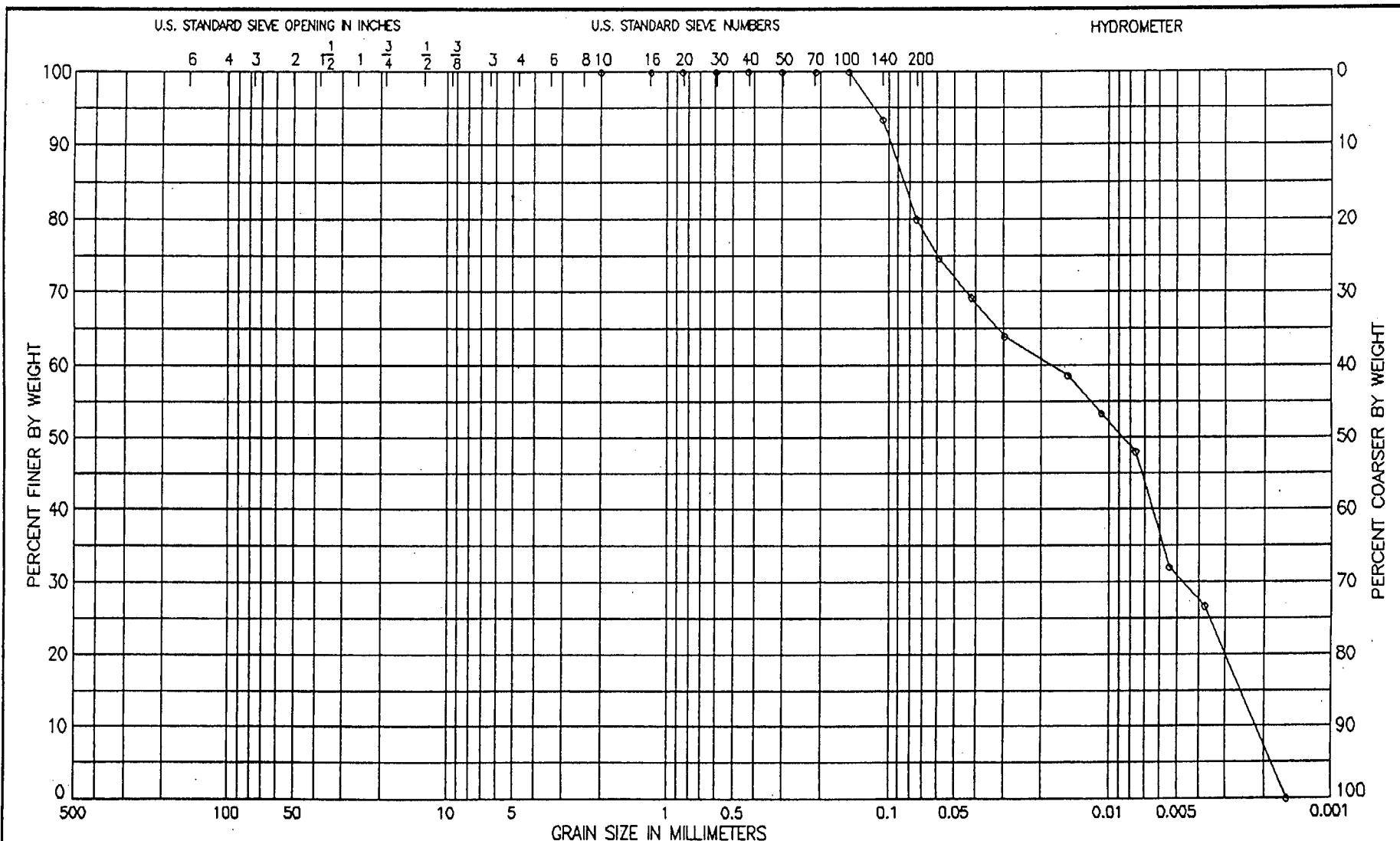
RDGS	TEMP			
2.7	17.0	.0586	90.0	10.0
2.7	17.0	.0414	90.0	10.0
2.6	17.0	.0293	84.7	15.3
2.5	17.0	.0152	79.4	20.6
2.3	17.0	.0107	68.8	31.2
2.2	17.0	.0076	63.5	36.5
2.0	18.0	.0053	58.2	41.8
1.2	19.0	.0037	26.5	73.5
1.1	16.0	.0016	.0	100.0

PERCENT GRAVEL = .0

PERCENT SAND = 6.7

PERCENT FINES = 93.3

EDE



COBBLES		GRAVEL			SAND					SILT or CLAY	
		COARSE		FINE	COARSE		MEDIUM	FINE			
LL	PL	PI	GS	2.67	EST	NAT W, %	ORG, %			PROJECT	DELAWARE RIVER OVERFLOW STUDY
CLASSIFICATION	SANDY SILT (ML), GRAY	VISUAL								BORING NO.	R1-HC-E1B
GRADATION CURVE	LABORATORY USAE WES - STF/GL									SAMPLE NO.	81499
								DEPTH/ELEV		DATE	08 JAN 99

# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HC-E1B      SAMPLE: 81499      DF: MD0199 .DAT  
 DEPTH:                    DATE: 08 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC: .00  
 CLASSIFICATION: 927  
 SANDY SILT (ML), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT: 3.0 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.0	No 40	.425	100.0	.0
.0	No 50	.300	100.0	.0
.0	No 70	.212	100.0	.0
.0	No 100	.150	100.0	.0
.2	No 140	.106	93.3	6.7
.6	No 200	.075	80.0	20.0

HYDROMETER:

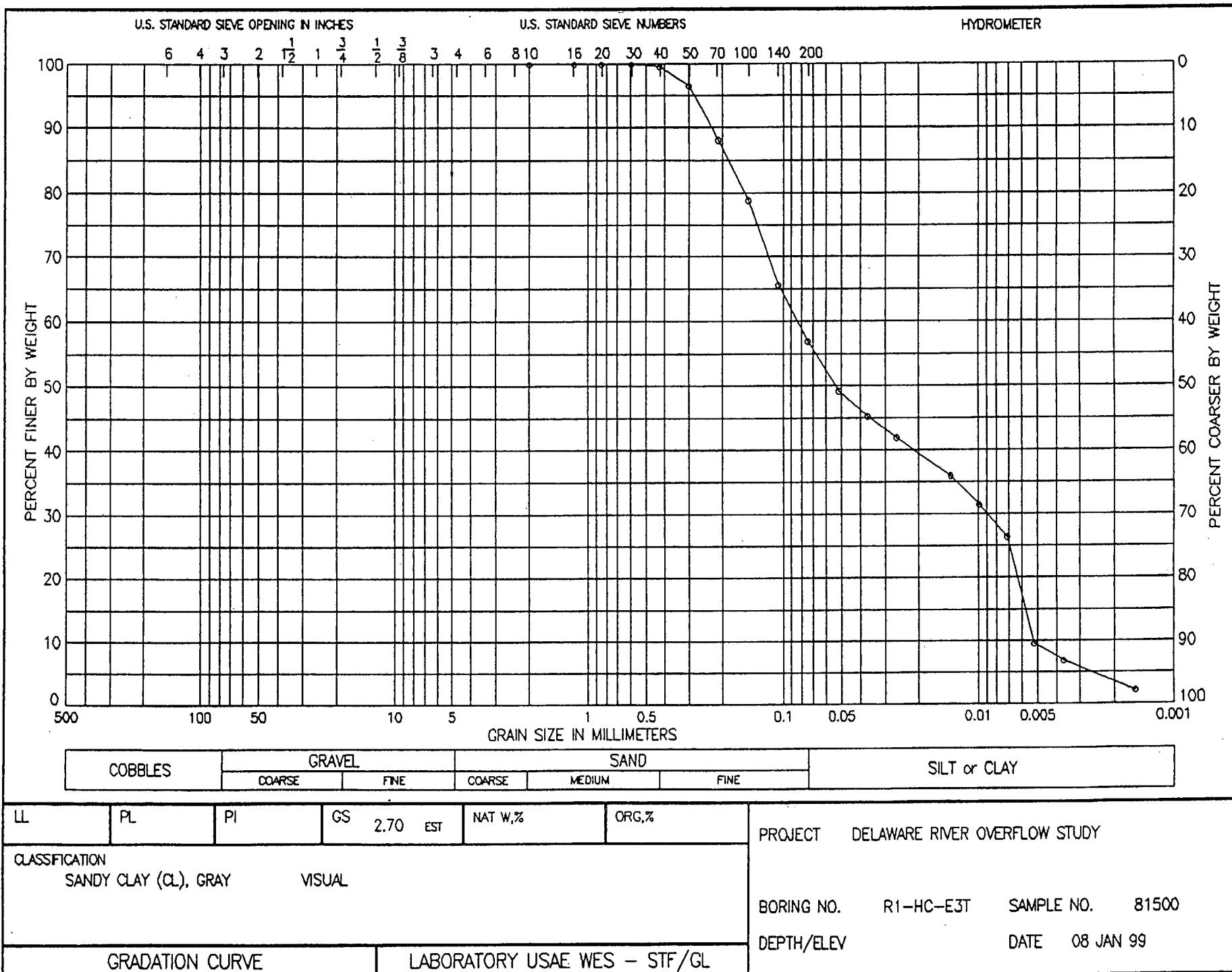
RDGS	TEMP			
2.4	17.0	.0593	74.6	25.4
2.3	17.0	.0419	69.3	30.7
2.2	17.0	.0297	64.0	36.0
2.1	17.0	.0153	58.6	41.4
2.0	17.0	.0109	53.3	46.7
1.9	17.0	.0077	48.0	52.0
1.5	17.5	.0054	32.0	68.0
1.2	19.0	.0038	26.6	73.4
1.1	16.0	.0016	.0	100.0

PERCENT GRAVEL = .0

PERCENT SAND = 20.0

PERCENT FINES = 80.0

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HC-E3T      SAMPLE: 81500      DF: MD0199 .DAT  
 DEPTH:                    DATE: 08 JAN 99

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00  
 CLASSIFICATION: 935  
 SANDY CLAY (CL), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT:    53.0 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.2	No 40	.425	99.6	.4
1.8	No 50	.300	96.6	3.4
6.3	No 70	.212	88.1	11.9
11.2	No 100	.150	78.9	21.1
18.2	No 140	.106	65.7	34.3
22.8	No 200	.075	57.0	43.0

## HYDROMETER:

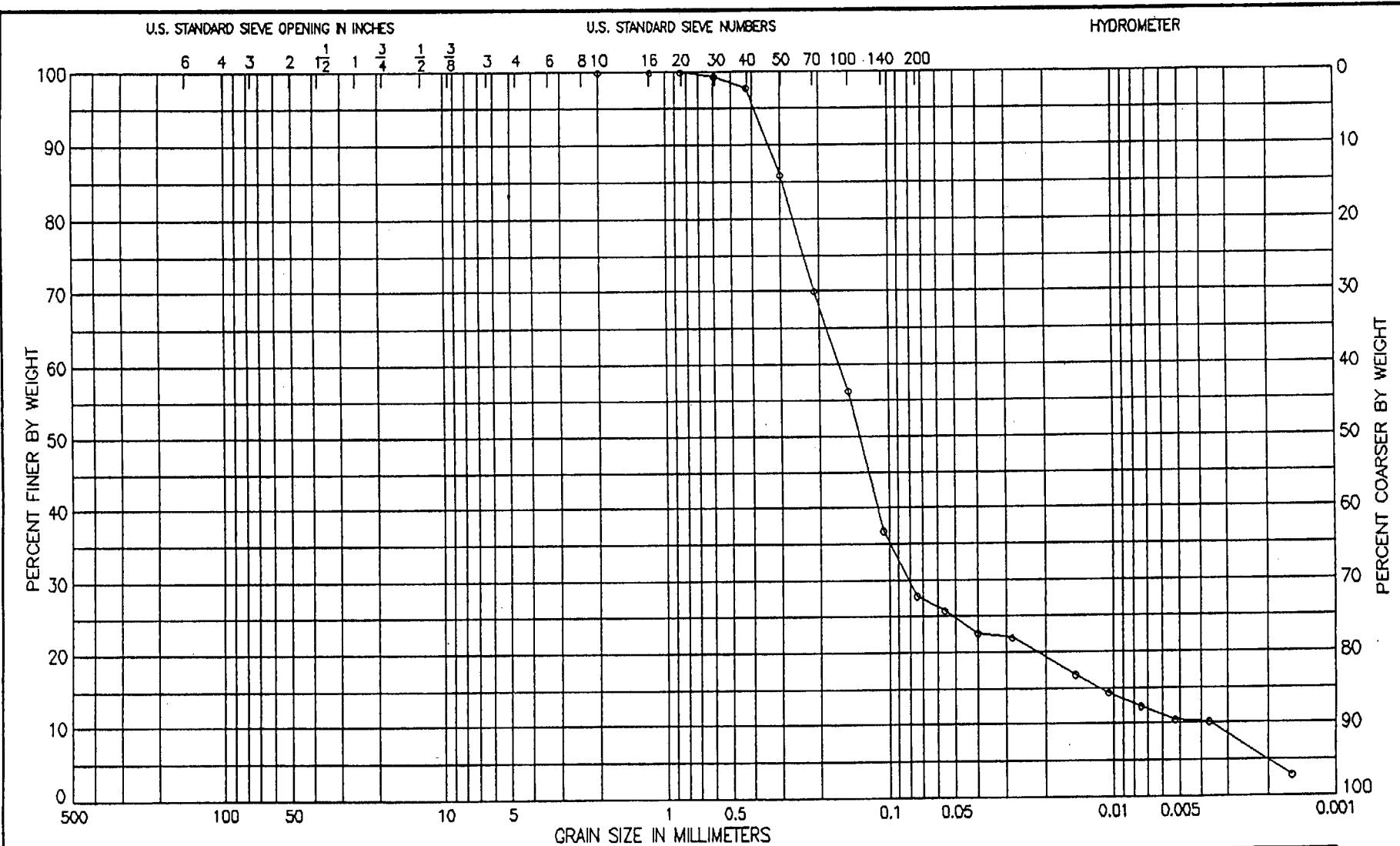
RDGS	TEMP			
17.4	17.0	.0516	49.1	50.9
16.1	17.0	.0369	45.2	54.8
15.0	17.0	.0264	42.0	58.0
13.0	17.0	.0139	36.0	64.0
11.5	17.0	.0100	31.5	68.5
9.8	17.0	.0071	26.4	73.6
4.1	18.0	.0052	9.6	90.4
3.0	19.0	.0037	6.9	93.1
1.8	16.0	.0016	2.1	97.9

PERCENT GRAVEL = .0

PERCENT SAND = 43.0

PERCENT FINES = 57.0

EDE



COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LL	PL	PI	GS	2.67 EST	NAT W, %	ORG, %	PROJECT	DELAWARE RIVER OVERFLOW STUDY
CLASSIFICATION	CLAYEY SAND (SC), GRAY				VISUAL		BORING NO.	R1-HC-E3M
							SAMPLE NO.	81501
GRADATION CURVE				LABORATORY USAE WES - STF/GL				DEPTH/ELEV
								DATE 08 JAN 99

# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HC-E3M      SAMPLE: 81501      DF: MD0199 .DAT  
 DEPTH:                    DATE: 08 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC:      .00

CLASSIFICATION: 943

CLAYEY SAND (SC), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:      50.3 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.3	No 30	.600	99.4	.6
1.1	No 40	.425	97.8	2.2
7.1	No 50	.300	85.9	14.1
15.1	No 70	.212	70.0	30.0
22.0	No 100	.150	56.3	43.7
31.8	No 140	.106	36.8	63.2
36.3	No 200	.075	27.8	72.2

## HYDROMETER:

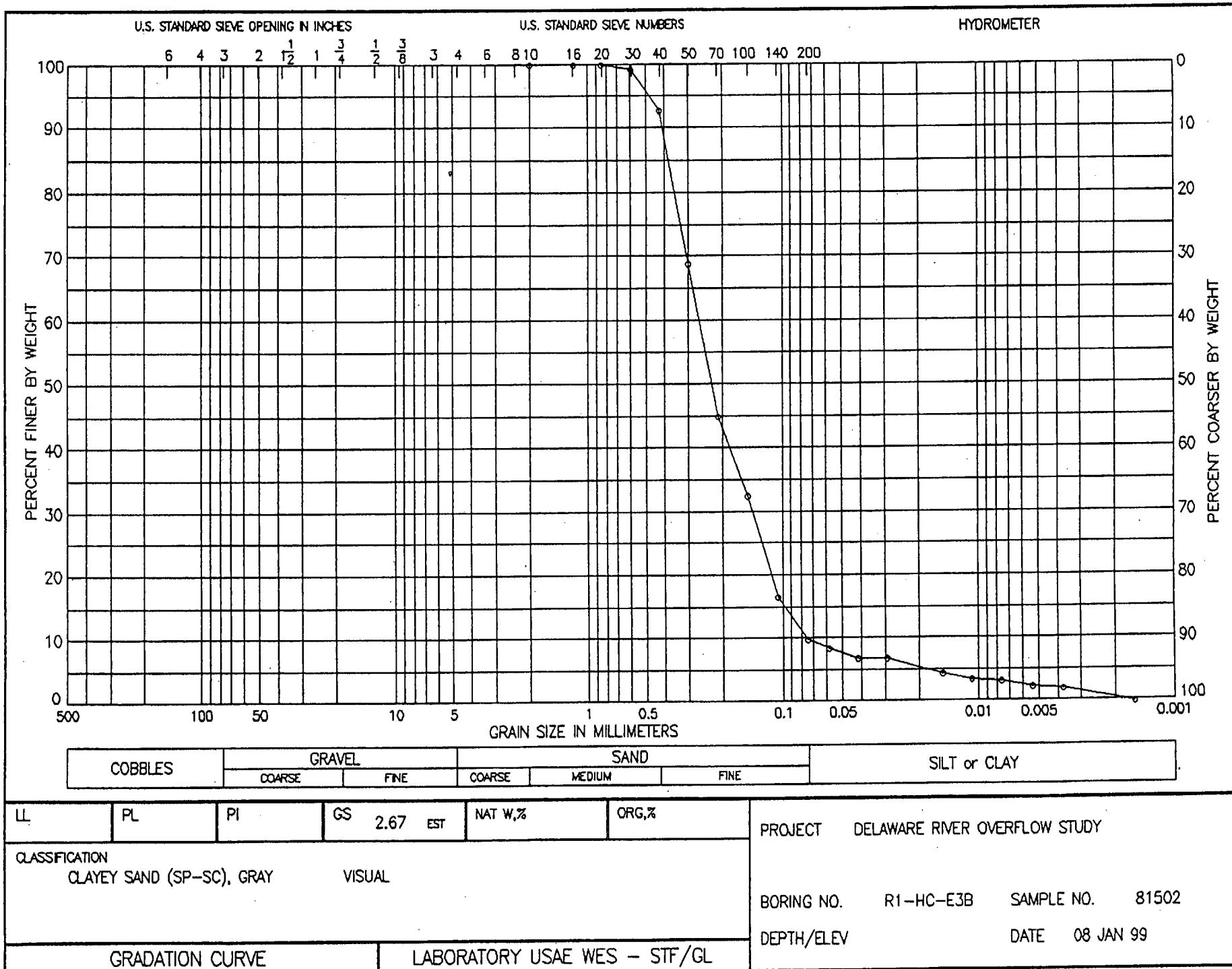
RDGS	TEMP			
9.0	17.5	.0562	25.7	74.3
8.0	17.5	.0401	22.6	77.4
7.8	17.5	.0284	21.9	78.1
6.2	17.5	.0149	16.8	83.2
5.5	17.0	.0106	14.3	85.7
4.8	17.5	.0075	12.4	87.6
4.2	18.0	.0053	10.5	89.5
3.9	19.0	.0037	10.2	89.8
2.0	16.0	.0016	2.9	97.1

PERCENT GRAVEL = .0

PERCENT SAND = 72.2

PERCENT FINES = 27.8

EDE



SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HC-E3B      SAMPLE: 81502      DF: MD0199 .DAT  
 DEPTH:                    DATE: 08 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC:      .00

CLASSIFICATION: 951

CLAYEY SAND (SP-SC), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:      51.5 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.4	No 30	.600	99.2	.8
3.8	No 40	.425	92.6	7.4
16.1	No 50	.300	68.7	31.3
28.4	No 70	.212	44.9	55.1
34.8	No 100	.150	32.4	67.6
43.0	No 140	.106	16.5	83.5
46.5	No 200	.075	9.7	90.3

HYDROMETER:

RDGS	TEMP			
3.7	17.0	.0587	8.4	91.6
3.2	17.0	.0417	6.8	93.2
3.2	17.0	.0295	6.8	93.2
2.4	17.0	.0153	4.3	95.7
2.1	17.0	.0108	3.4	96.6
1.9	17.5	.0077	3.1	96.9
1.6	18.0	.0054	2.2	97.8
1.3	19.0	.0038	1.9	98.1
1.0	16.0	.0016	-.3	100.3

PERCENT GRAVEL =      .0

PERCENT SAND      = 90.3

PERCENT FINES      = 9.7

D60 =      .27

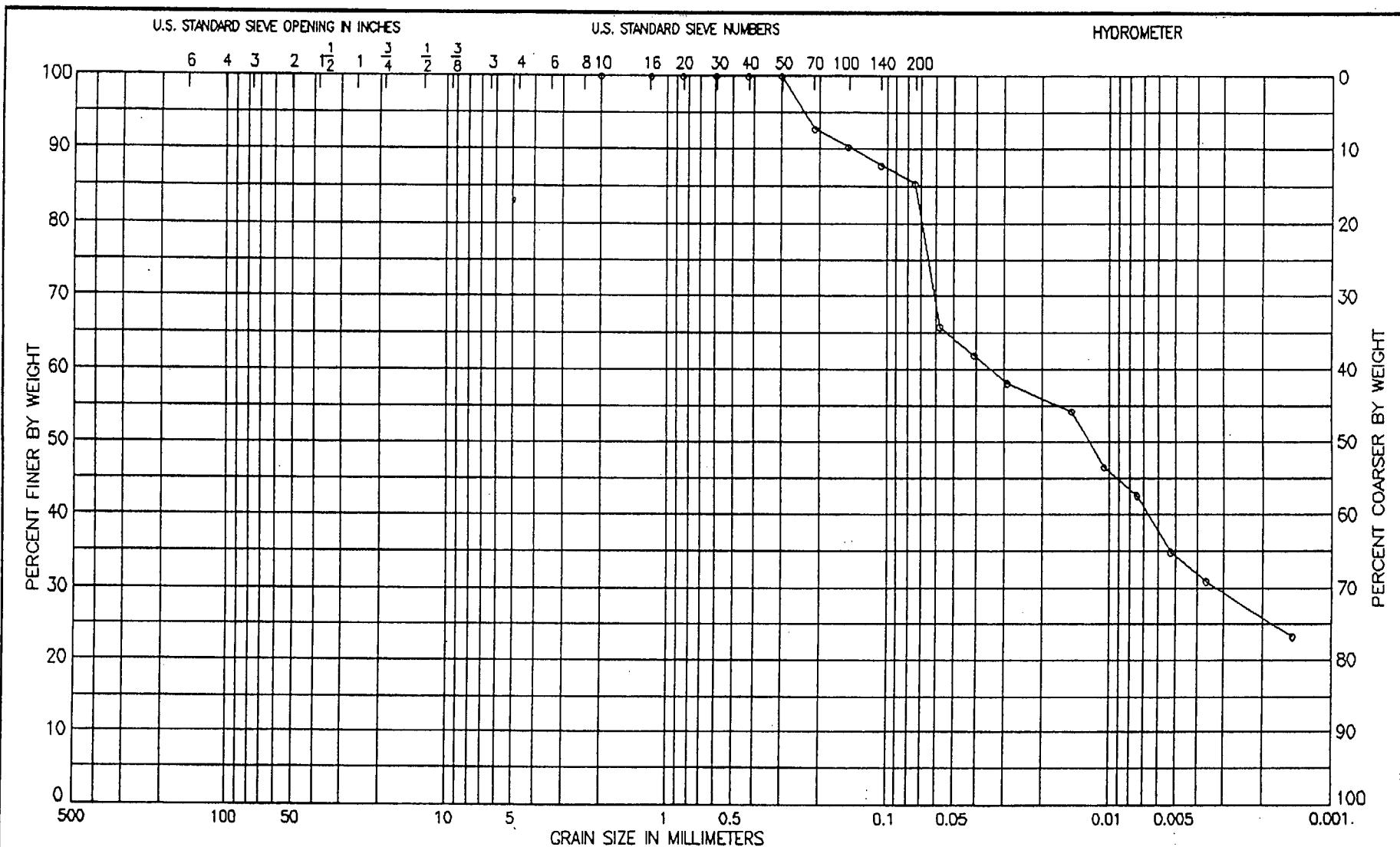
D30 =      .14

D10 =      .08

CU =      3.51

CC =      1.00

EDE



COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LL	PL	PI	GS	2.70 EST	NAT W. %	ORG. %	PROJECT	DELAWARE RIVER OVERFLOW STUDY	
CLASSIFICATION									
SANDY CLAY (CL), GRAY	VISUAL								
INSUFFICIENT SAMPLE FOR ACCURATE GRADATION					BORING NO.	R1-HC-EST	SAMPLE NO.	81503	
GRADATION CURVE			LABORATORY USAE WES - STF/GL			DEPTH/ELEV	DATE 08 JAN 99		

SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HC-E5T      SAMPLE: 81503      DF: MD0199 .DAT  
DEPTH:                    DATE: 08 JAN 99

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00  
CLASSIFICATION: 959  
SANDY CLAY (CL), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.  
PARTIAL WEIGHT AFTER SPLIT:      4.1 gms.  
INSUFFICIENT SAMPLE FOR ACCURATE GRADATION

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.0	No 40	.425	100.0	.0
.0	No 50	.300	100.0	.0
.3	No 70	.212	92.7	7.3
.4	No 100	.150	90.2	9.8
.5	No 140	.106	87.8	12.2
.6	No 200	.075	85.4	14.6

HYDROMETER:

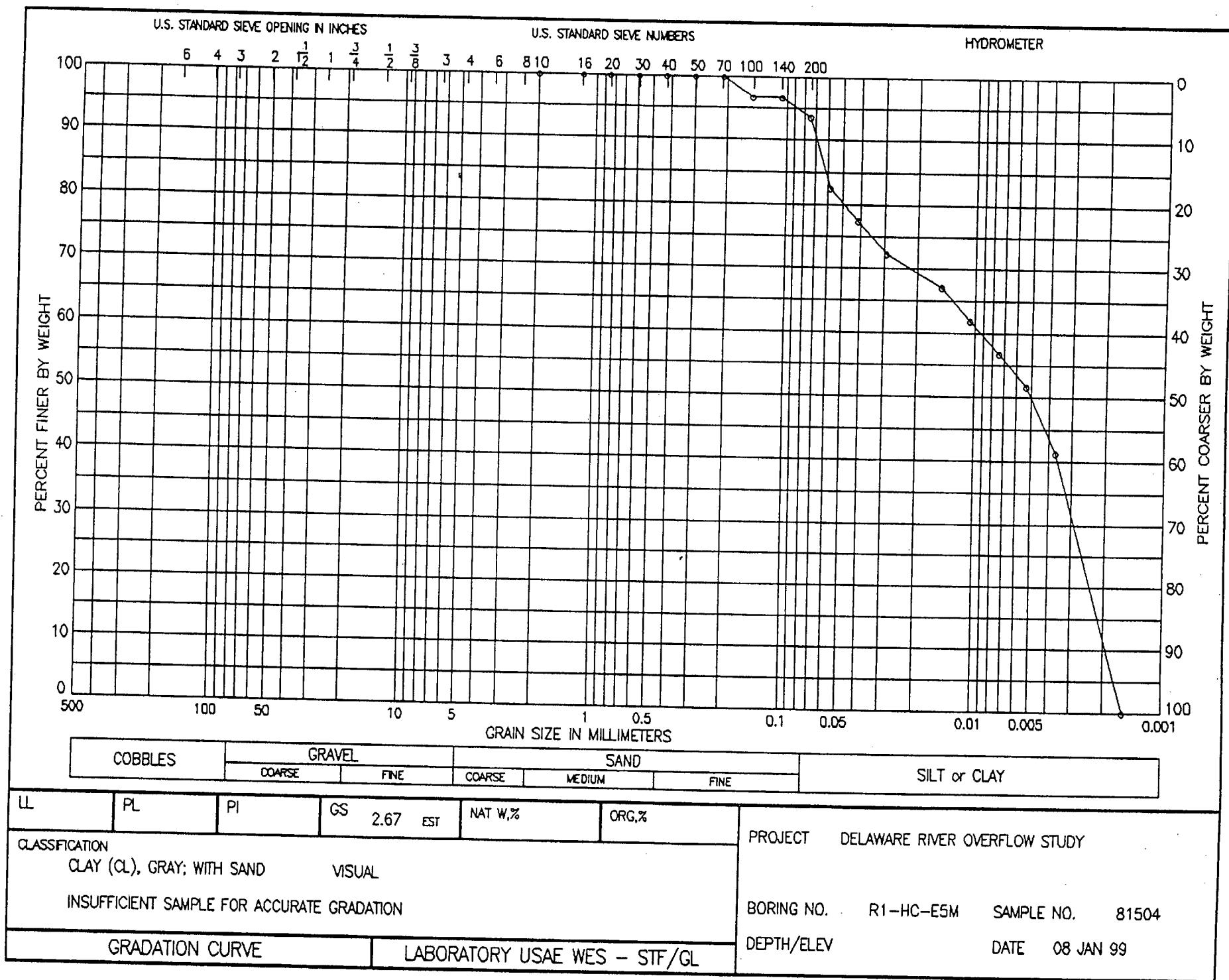
RDGS	TEMP			
2.5	18.5	.0579	65.9	34.1
2.4	18.5	.0410	62.0	38.0
2.3	18.5	.0290	58.1	41.9
2.2	18.5	.0150	54.2	45.8
2.0	18.5	.0106	46.5	53.5
1.9	18.5	.0075	42.6	57.4
1.5	19.5	.0053	34.9	65.1
1.1	21.0	.0036	31.0	69.0
.9	21.3	.0015	23.2	76.8

PERCENT GRAVEL = .0

PERCENT SAND = 14.6

PERCENT FINES = 85.4

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HC-E5M      SAMPLE: 81504      DF: MD0199 .DAT  
 DEPTH:                    DATE: 08 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC: .00

CLASSIFICATION: 967

CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 3.1 gms.

INSUFFICIENT SAMPLE FOR ACCURATE GRADATION

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.0	No 40	.425	100.0	.0
.0	No 50	.300	100.0	.0
.0	No 70	.212	100.0	.0
.1	No 100	.150	96.8	3.2
.1	No 140	.106	96.8	3.2
.2	No 200	.075	93.5	6.5

HYDROMETER:

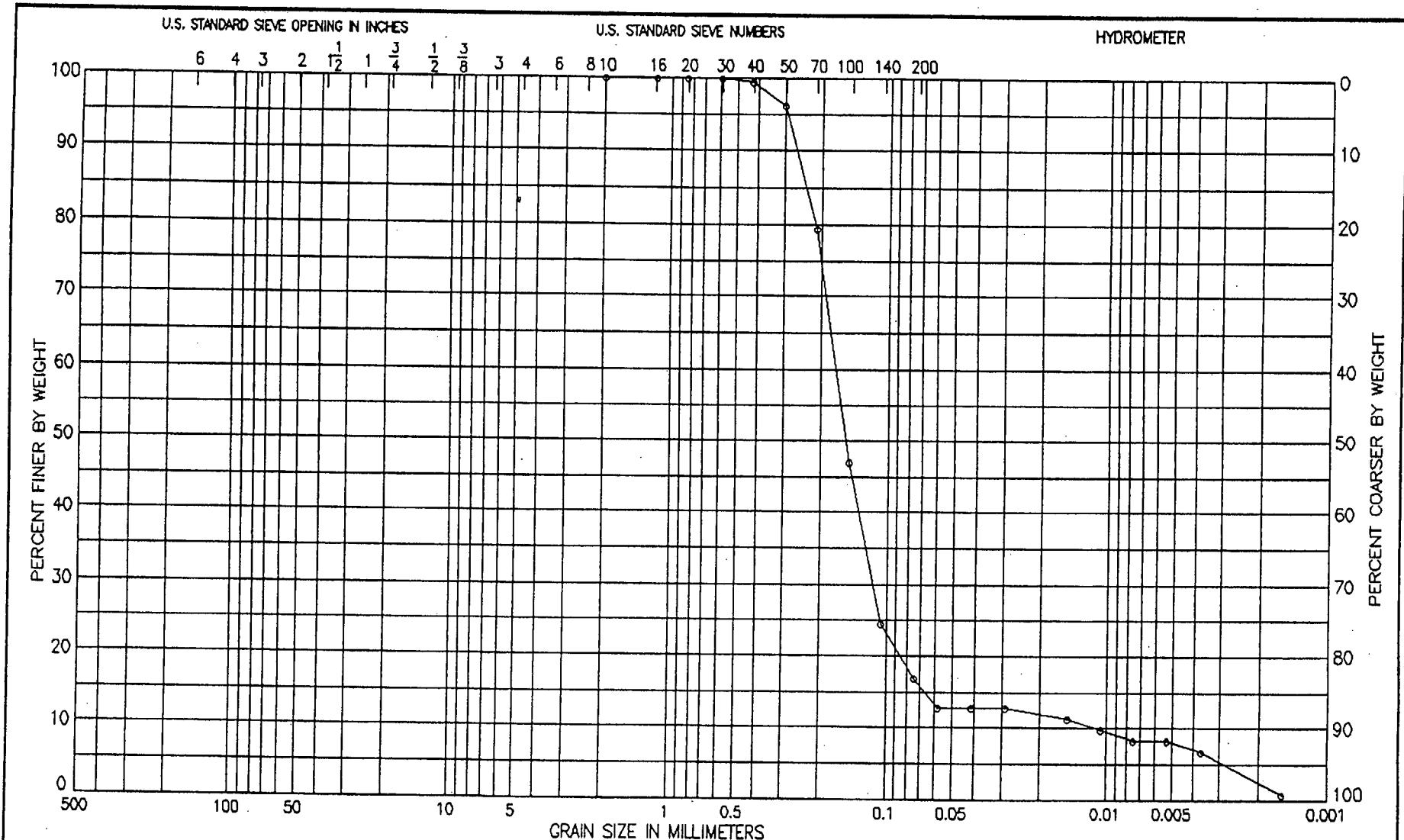
RDGS	TEMP			
2.4	18.5	.0585	82.5	17.5
2.3	18.5	.0414	77.4	22.6
2.2	18.5	.0293	72.2	27.8
2.1	18.5	.0151	67.0	33.0
2.0	18.5	.0107	61.9	38.1
1.8	19.0	.0075	56.7	43.3
1.6	19.5	.0053	51.6	48.4
1.1	21.0	.0037	41.3	58.7
1.1	16.0	.0016	.0	100.0

PERCENT GRAVEL = .0

PERCENT SAND = 6.5

PERCENT FINES = 93.5

EDE



COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LL	PL	PI	GS 2.67 EST	NAT W.%	ORG, %	PROJECT DELaware River OVERflow STUDY
CLASSIFICATION	CLAYEY SAND (SC), GRAY VISUAL					
INSUFFICIENT SAMPLE FOR ACCURATE GRADATION						BORING NO. R1-HC-E5B SAMPLE NO. 81505
GRADATION CURVE	LABORATORY USAE WES - STF/GL					DEPTH/ELEV DATE 08 JAN 99

## SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HC-E5B      SAMPLE: 81505      DF: MD0199 .DAT  
 DEPTH:                    DATE: 08 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC: .00  
 CLASSIFICATION: 975  
 CLAYEY SAND (SC), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT: 21.3 gms.  
 INSUFFICIENT SAMPLE FOR ACCURATE GRADATION

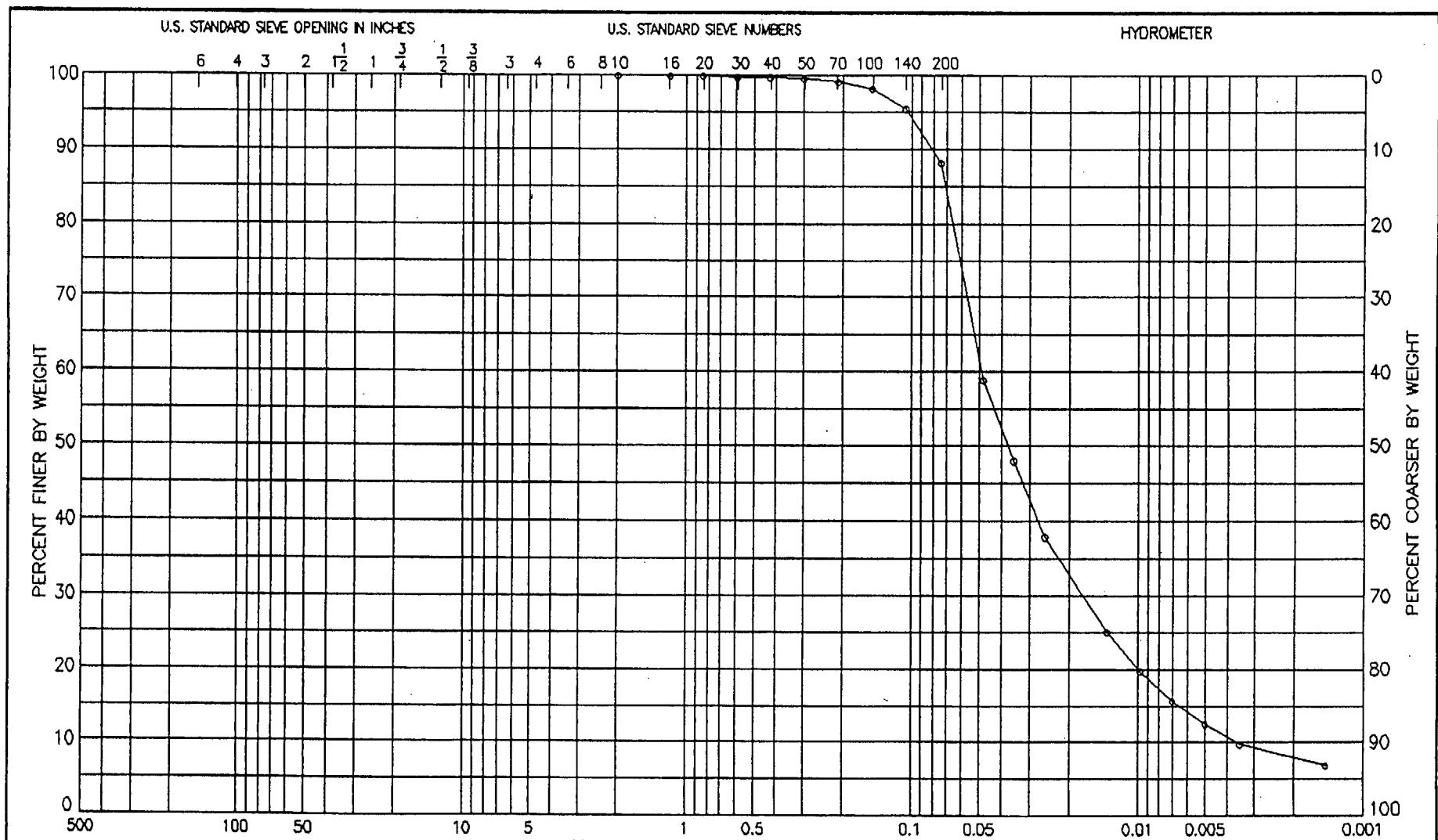
WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.1	No 40	.425	99.5	.5
.8	No 50	.300	96.2	3.8
4.4	No 70	.212	79.3	20.7
11.3	No 100	.150	46.9	53.1
16.1	No 140	.106	24.4	75.6
17.7	No 200	.075	16.9	83.1

HYDROMETER:

RDGS	TEMP			
2.5	18.5	.0585	12.8	87.2
2.5	18.5	.0413	12.8	87.2
2.5	18.5	.0292	12.8	87.2
2.3	18.5	.0151	11.3	88.7
2.1	18.5	.0107	9.8	90.2
1.9	18.5	.0076	8.3	91.7
1.7	19.5	.0053	8.3	91.7
1.2	21.0	.0037	6.8	93.2
1.2	16.0	.0016	.8	99.2

PERCENT GRAVEL = .0  
 PERCENT SAND = 83.1  
 PERCENT FINES = 16.9

EDE



GRAIN SIZE IN MILLIMETERS						SILT or CLAY	
COBBLES	GRAVEL		SAND				
	COARSE	FINE	COARSE	MEDIUM	FINE		

LL PL PI GS 270 NAT W.% ORG.%

### **CLASSIFICATION**

CLAY (CL), GRAY; WITH SAND

VISUAL

**PROJECT DELAWARE RIVER OVERFLOW STUDY**

BORING NO. R2-HC-B1T SAMPLE NO. 81370

DEPTH/ELEV

DATE 18 DEC 98

GRADATION CURVE      LABORATORY USAE WES – STF/GL      DEPTH/ELEV      DATE 18 DEC 98

## SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HC-B1T      SAMPLE: 81370      DF: MD0199 .DAT  
 DEPTH:                    DATE: 18 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC: .00  
 CLASSIFICATION: 4  
 CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT: 50.7 gms.

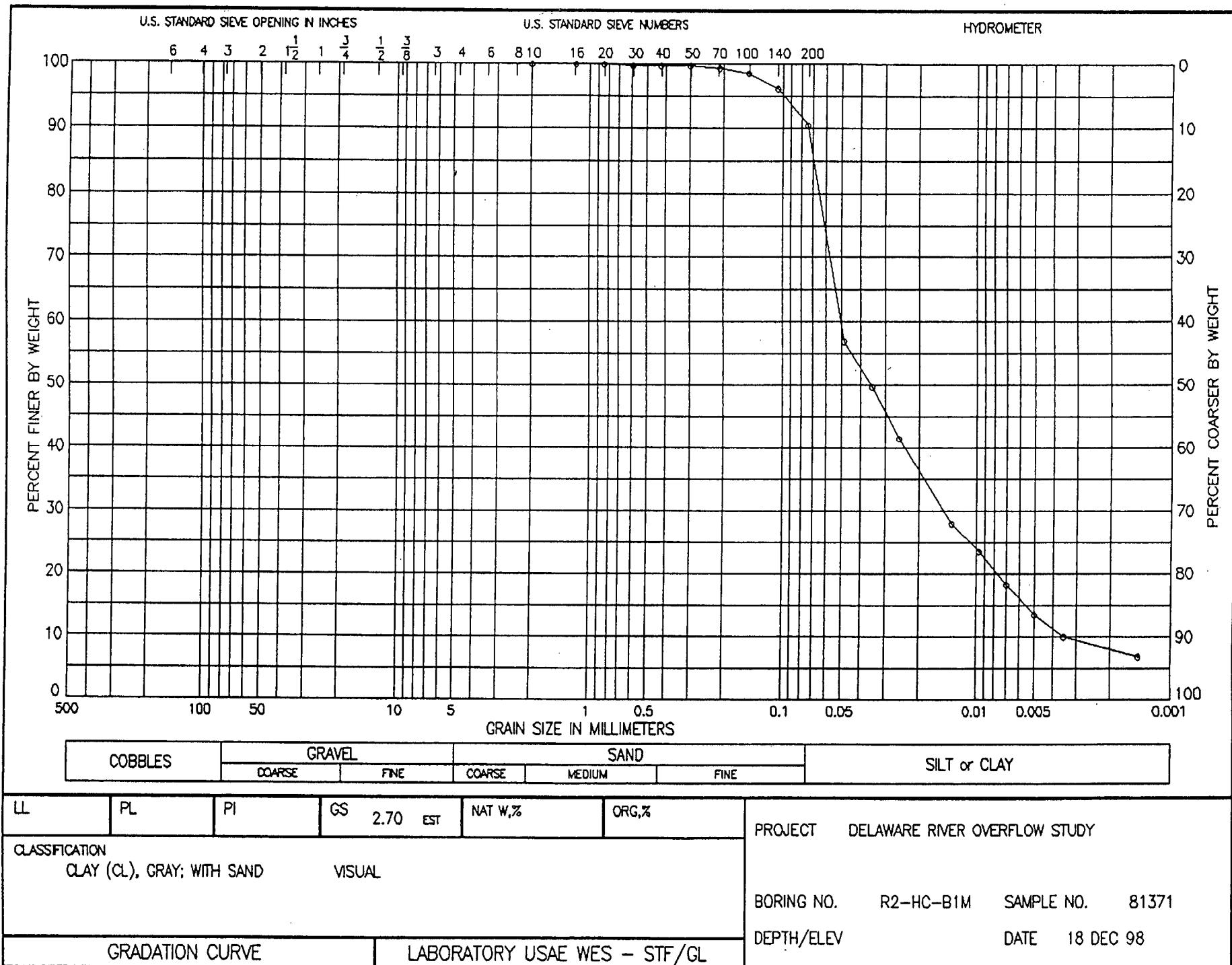
WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.8	.2
.1	No 40	.425	99.8	.2
.2	No 50	.300	99.6	.4
.4	No 70	.212	99.2	.8
.9	No 100	.150	98.2	1.8
2.3	No 140	.106	95.5	4.5
6.0	No 200	.075	88.2	11.8

## HYDROMETER:

RDGS	TEMP			
19.0	21.5	.0482	58.9	41.1
15.5	21.5	.0353	47.9	52.1
12.3	21.5	.0257	37.9	62.1
8.2	21.5	.0138	25.1	74.9
6.5	21.5	.0099	19.7	80.3
5.2	21.5	.0071	15.7	84.3
4.2	21.5	.0050	12.5	87.5
3.2	22.0	.0035	9.7	90.3
2.5	21.0	.0015	6.9	93.1

PERCENT GRAVEL = .0  
 PERCENT SAND = 11.8  
 PERCENT FINES = 88.2

EDE



## SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HC-B1M      SAMPLE: 81371      DF: MD0199 .DAT  
 DEPTH:                    DATE: 18 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00

CLASSIFICATION: 12  
 CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:      50.5 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.8	.2
.1	No 40	.425	99.8	.2
.1	No 50	.300	99.8	.2
.3	No 70	.212	99.4	.6
.7	No 100	.150	98.6	1.4
1.9	No 140	.106	96.2	3.8
4.8	No 200	.075	90.5	9.5

## HYDROMETER:

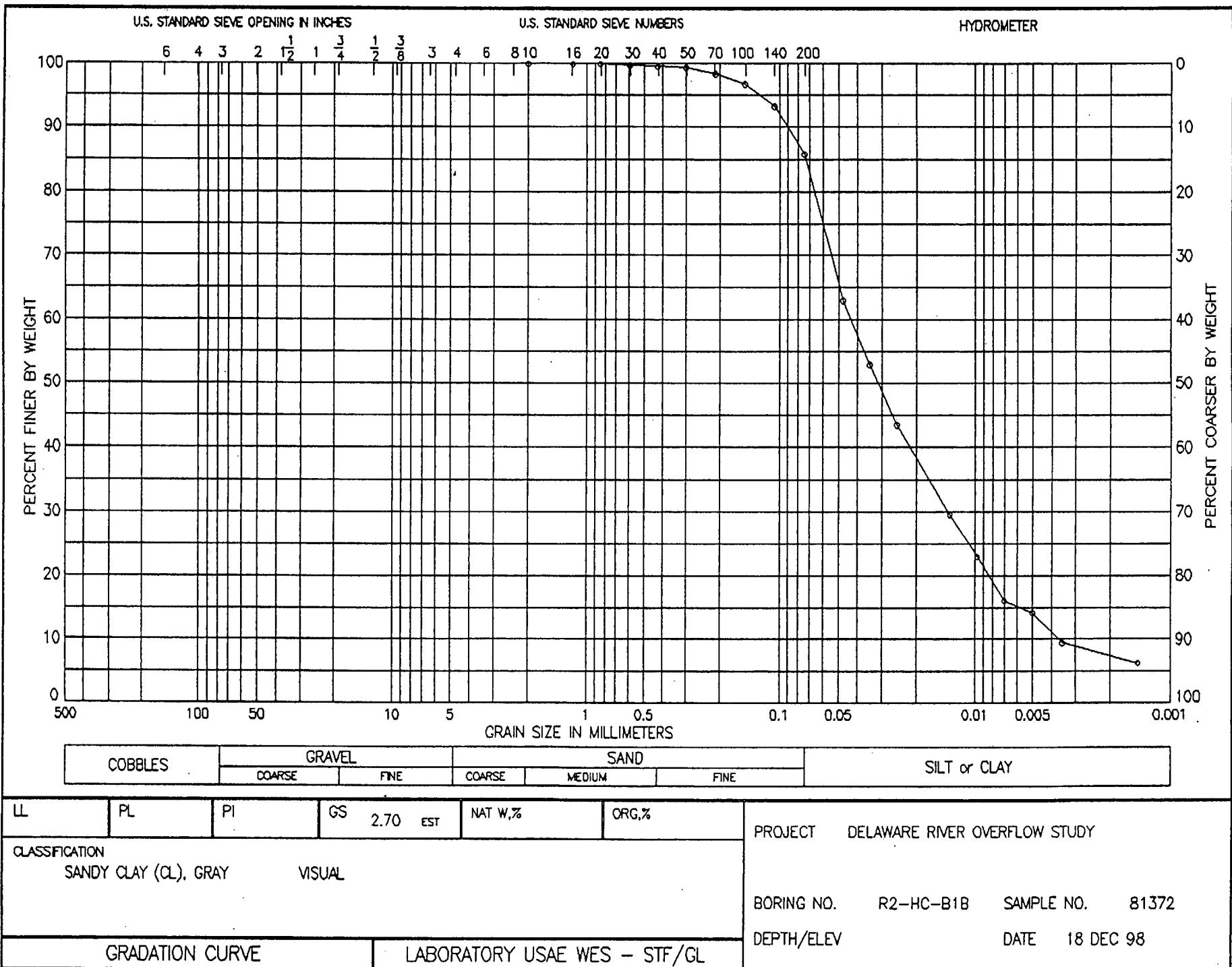
RDGS	TEMP			
18.3	21.5	.0486	56.9	43.1
16.0	21.5	.0351	49.7	50.3
13.4	21.5	.0255	41.5	58.5
9.1	21.5	.0137	28.0	72.0
7.7	21.5	.0098	23.6	76.4
6.0	21.5	.0070	18.2	81.8
4.5	21.5	.0050	13.5	86.5
3.3	22.0	.0035	10.1	89.9
2.5	21.0	.0015	6.9	93.1

PERCENT GRAVEL =      .0

PERCENT SAND      =      9.5

PERCENT FINES      =      90.5

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HC-B1B      SAMPLE: 81372      DF: MD0199 .DAT  
 DEPTH:                    DATE: 18 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00  
 CLASSIFICATION: 20  
 SANDY CLAY (CL), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT: 50.4 gms.

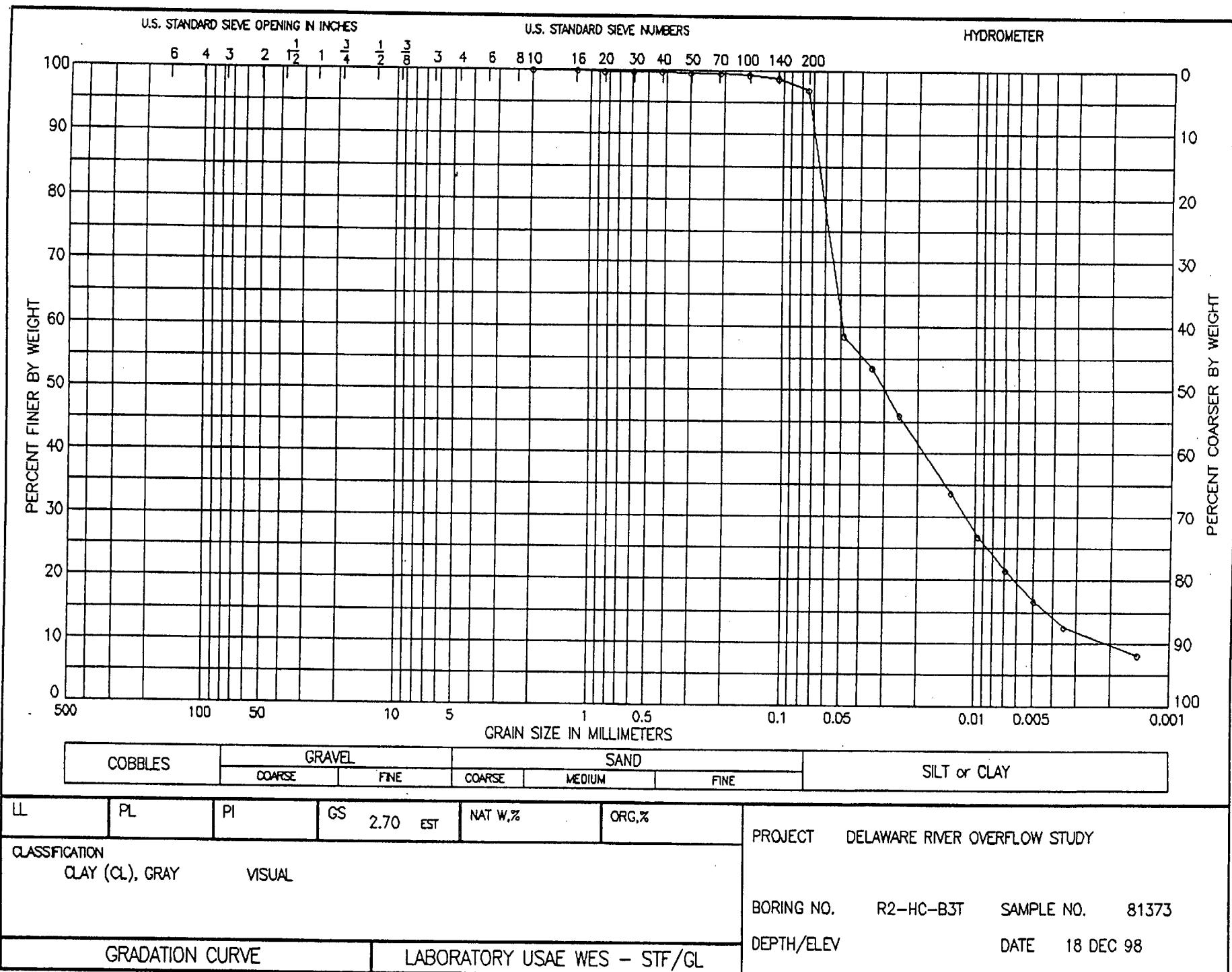
WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.8	.2
.2	No 40	.425	99.6	.4
.3	No 50	.300	99.4	.6
.8	No 70	.212	98.4	1.6
1.6	No 100	.150	96.8	3.2
3.4	No 140	.106	93.3	6.7
7.1	No 200	.075	85.9	14.1

HYDROMETER:

RDGS	TEMP			
20.2	21.5	.0476	63.0	37.0
17.0	21.5	.0348	52.9	47.1
14.0	21.5	.0253	43.5	56.5
9.6	21.5	.0136	29.6	70.4
7.5	21.5	.0098	23.0	77.0
5.3	21.5	.0070	16.1	83.9
4.7	21.5	.0050	14.2	85.8
3.1	22.0	.0035	9.5	90.5
2.3	21.0	.0015	6.3	93.7

PERCENT GRAVEL = .0  
 PERCENT SAND = 14.1  
 PERCENT FINES = 85.9

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HC-B3T      SAMPLE: 81373      DF: MD0199 .DAT  
 DEPTH:                    DATE: 18 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00  
 CLASSIFICATION: 28  
 CLAY (CL), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT:      50.5 gms.

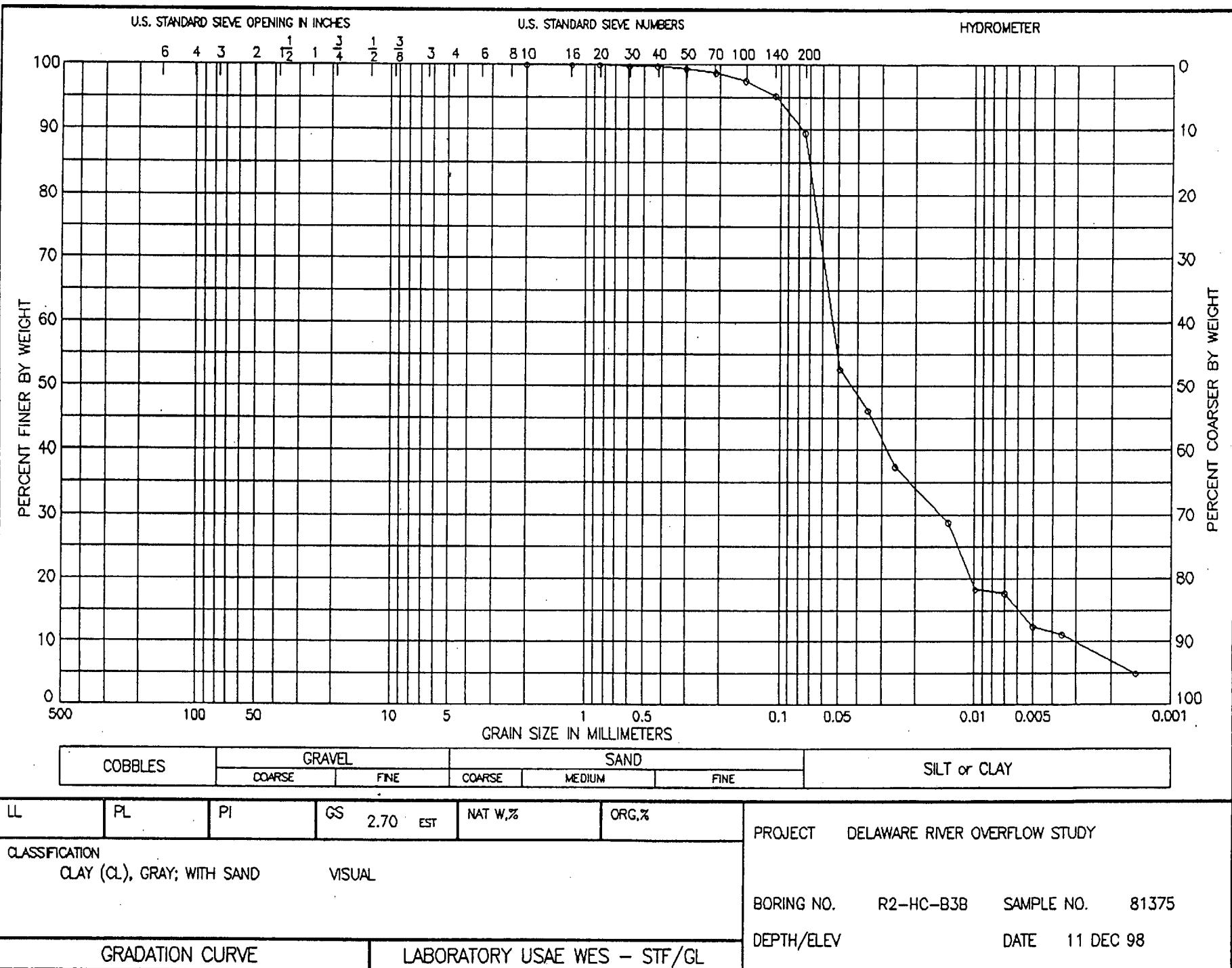
WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.1	No 20	.850	99.8	.2
.1	No 30	.600	99.8	.2
.1	No 40	.425	99.8	.2
.2	No 50	.300	99.6	.4
.2	No 70	.212	99.6	.4
.3	No 100	.150	99.4	.6
.6	No 140	.106	98.8	1.2
1.5	No 200	.075	97.0	3.0

HYDROMETER:

RDGS	TEMP			
18.8	21.5	.0483	58.5	41.5
17.2	21.5	.0347	53.5	46.5
14.8	21.5	.0251	45.9	54.1
10.9	21.5	.0135	33.7	66.3
8.7	21.5	.0097	26.7	73.3
7.0	21.5	.0070	21.4	78.6
5.5	21.5	.0050	16.7	83.3
4.1	22.0	.0035	12.6	87.4
2.9	21.0	.0015	8.2	91.8

PERCENT GRAVEL =      .0  
 PERCENT SAND      =      3.0  
 PERCENT FINES      = 97.0

EDE



SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HC-B3B      SAMPLE: 81375      DF: MD0199 .DAT  
 DEPTH:                    DATE: 11 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC: .00  
 CLASSIFICATION: 44  
 CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 51.3 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.8	.2
.1	No 40	.425	99.8	.2
.3	No 50	.300	99.4	.6
.6	No 70	.212	98.8	1.2
1.2	No 100	.150	97.7	2.3
2.4	No 140	.106	95.3	4.7
5.4	No 200	.075	89.5	10.5

HYDROMETER:

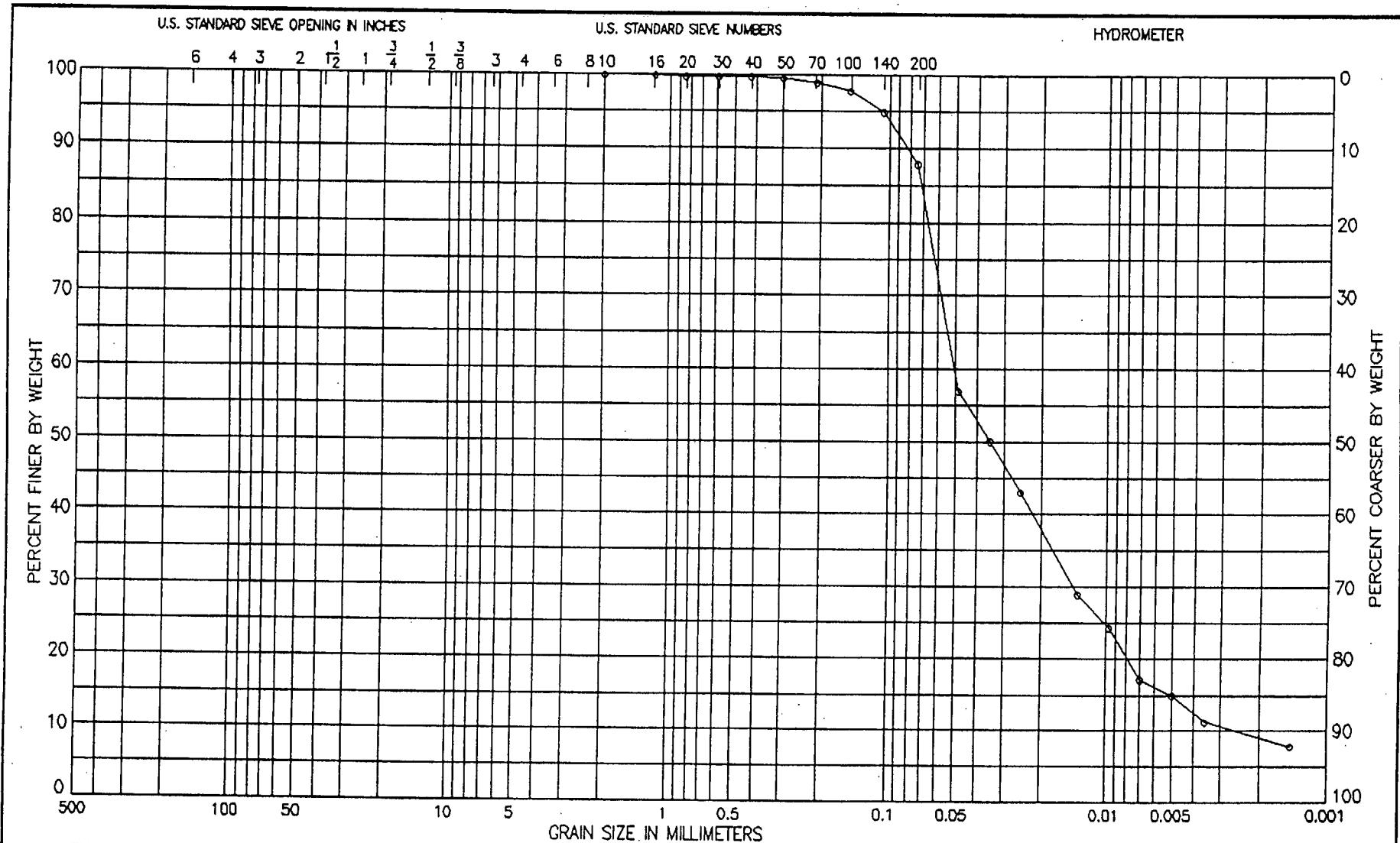
RDGS	TEMP			
17.2	21.5	.0491	52.6	47.4
15.1	21.5	.0354	46.1	53.9
12.3	21.5	.0257	37.5	62.5
9.5	21.5	.0136	28.8	71.2
6.1	21.5	.0099	18.3	81.7
5.9	21.5	.0070	17.6	82.4
4.3	21.0	.0050	12.4	87.6
3.9	21.0	.0036	11.1	88.9
2.2	19.5	.0015	5.0	95.0

PERCENT GRAVEL = .0

PERCENT SAND = 10.5

PERCENT FINES = 89.5

EDE



COBBLES

GRAVEL

COARSE

FINE

COARSE

MEDIUM

FINE

SILT or CLAY

LL

PL

PI

GS

2.70 EST

NAT W.%

ORG.%

PROJECT DELAWARE RIVER OVERFLOW STUDY

CLASSIFICATION

SANDY CLAY (CL), GRAY

VISUAL

BORING NO. R2-HC-B5T SAMPLE NO. 81376  
 DEPTH/ELEV DATE 11 DEC 98

GRADATION CURVE

LABORATORY USAE WES - STF/GL

# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HC-B5T      SAMPLE: 81376      DF: MD0199 .DAT  
 DEPTH:                    DATE: 11 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00  
 CLASSIFICATION: 52  
 SANDY CLAY (CL), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT: 51.0 gms.

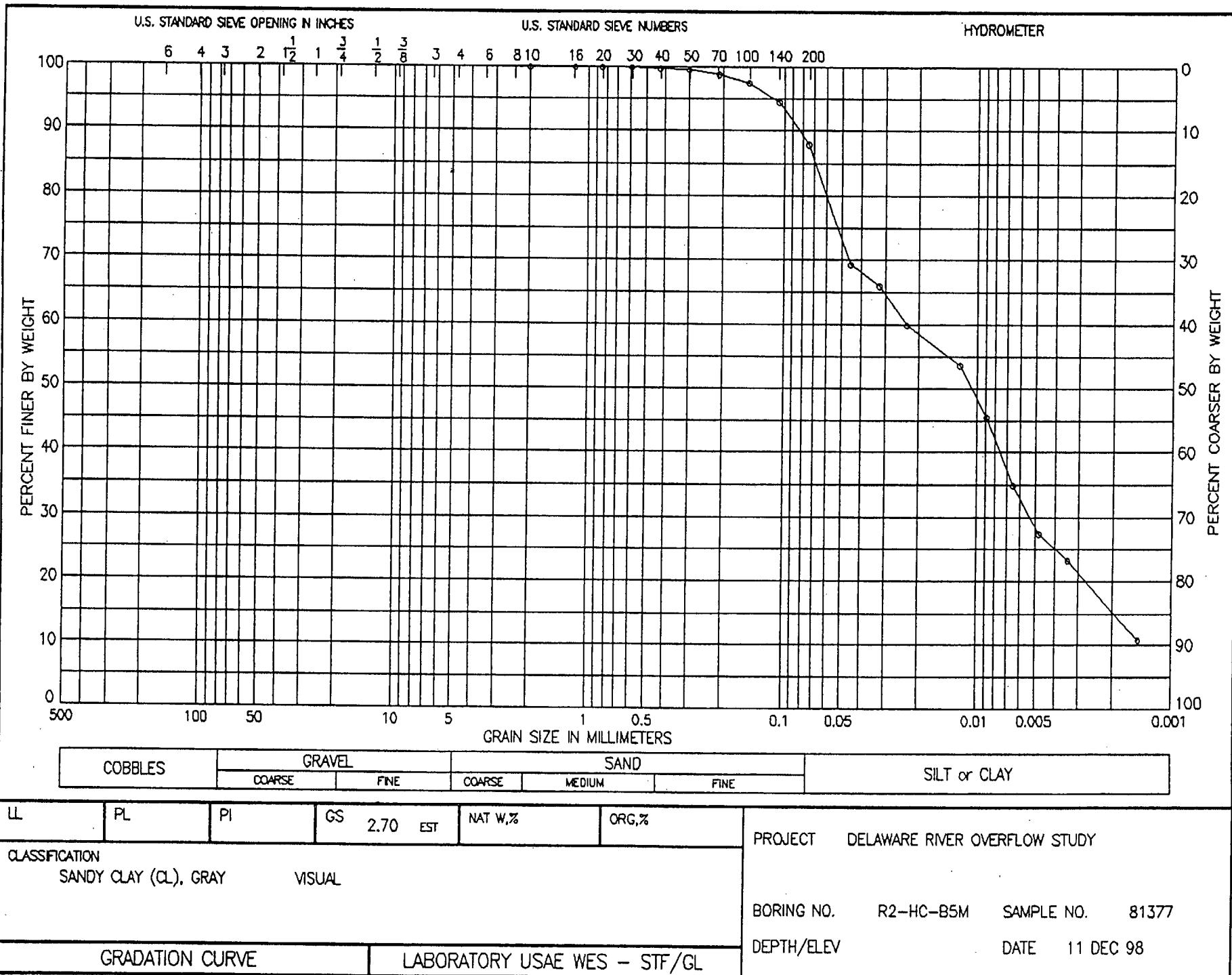
WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.1	No 20	.850	99.8	.2
.1	No 30	.600	99.8	.2
.1	No 40	.425	99.8	.2
.2	No 50	.300	99.6	.4
.5	No 70	.212	99.0	1.0
1.1	No 100	.150	97.8	2.2
2.6	No 140	.106	94.9	5.1
6.2	No 200	.075	87.8	12.2

HYDROMETER:

RDGS	TEMP			
18.5	21.5	.0485	57.0	43.0
16.3	21.5	.0350	50.1	49.9
14.0	21.5	.0253	43.0	57.0
9.5	21.5	.0136	29.0	71.0
8.0	21.5	.0098	24.3	75.7
5.7	21.5	.0070	17.1	82.9
5.0	21.5	.0050	14.9	85.1
3.9	21.0	.0036	11.2	88.8
2.8	21.0	.0015	7.8	92.2

PERCENT GRAVEL = .0  
 PERCENT SAND = 12.2  
 PERCENT FINES = 87.8

EDE



# SIEVE ANALYSIS

## PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HC-B5M      SAMPLE: 81377      DF: MD0199 .DAT  
 DEPTH:                    DATE: 11 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00  
 CLASSIFICATION: 60  
 SANDY CLAY (CL), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT:      52.7 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.1	No 40	.425	99.8	.2
.2	No 50	.300	99.6	.4
.6	No 70	.212	98.9	1.1
1.3	No 100	.150	97.5	2.5
2.9	No 140	.106	94.5	5.5
6.4	No 200	.075	87.9	12.1

### HYDROMETER:

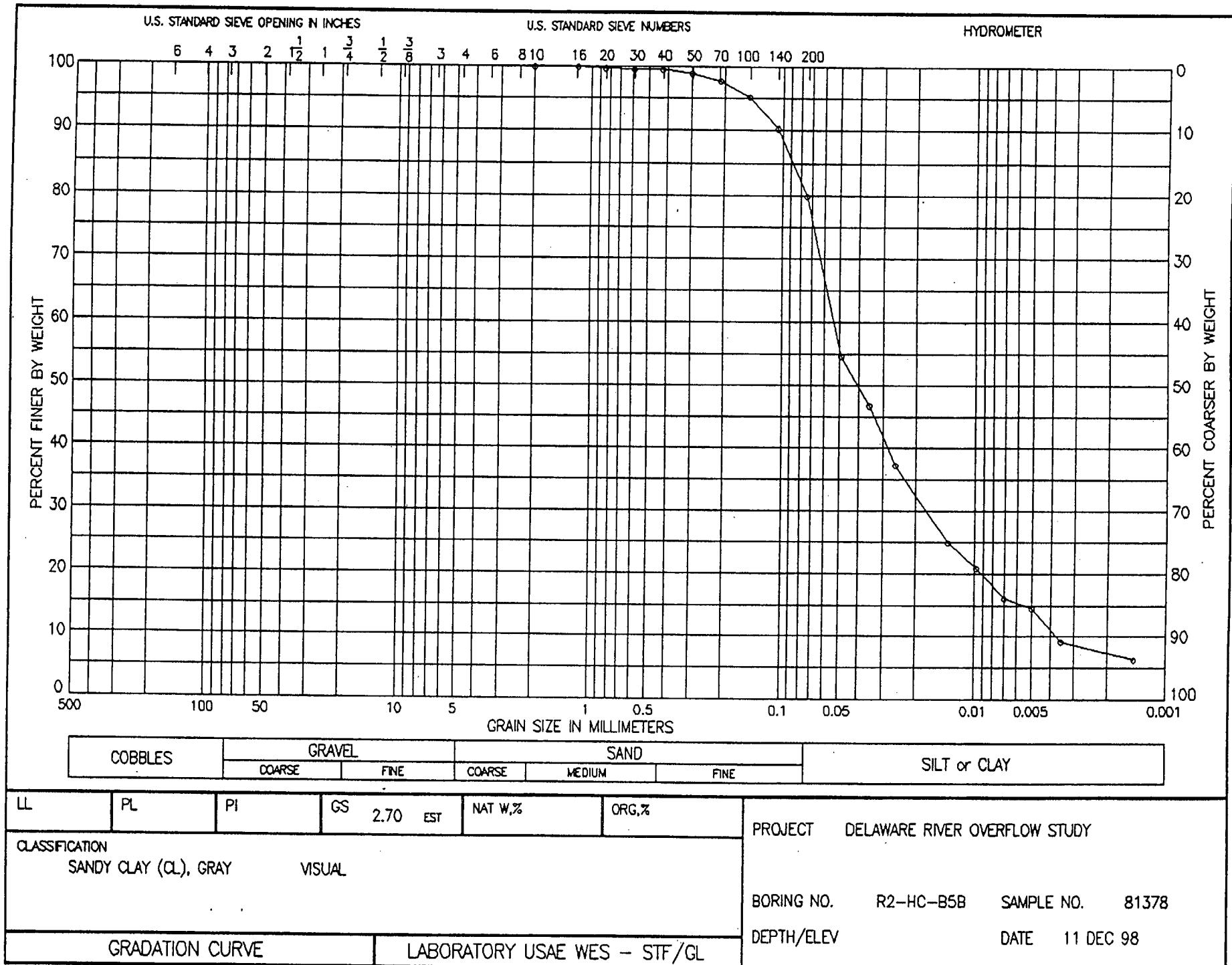
RDGS	TEMP			
22.9	23.0	.0452	69.3	30.7
21.7	23.5	.0324	66.0	34.0
19.7	23.5	.0234	60.0	40.0
17.6	23.5	.0123	53.6	46.4
14.9	23.5	.0090	45.5	54.5
11.4	23.5	.0065	35.0	65.0
9.3	21.5	.0048	27.4	72.6
7.9	21.5	.0035	23.2	76.8
4.2	19.5	.0015	10.8	89.2

PERCENT GRAVEL = .0

PERCENT SAND = 12.1

PERCENT FINES = 87.9

EDE



SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HC-B5B      SAMPLE: 81378      DF: MD0199 .DAT  
 DEPTH:                    DATE: 11 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00  
 CLASSIFICATION: 68  
 SANDY CLAY (CL), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT: 50.3 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.1	No 20	.850	99.8	.2
.2	No 30	.600	99.6	.4
.2	No 40	.425	99.6	.4
.5	No 50	.300	99.0	1.0
1.1	No 70	.212	97.8	2.2
2.4	No 100	.150	95.2	4.8
4.9	No 140	.106	90.3	9.7
10.1	No 200	.075	79.9	20.1

HYDROMETER:

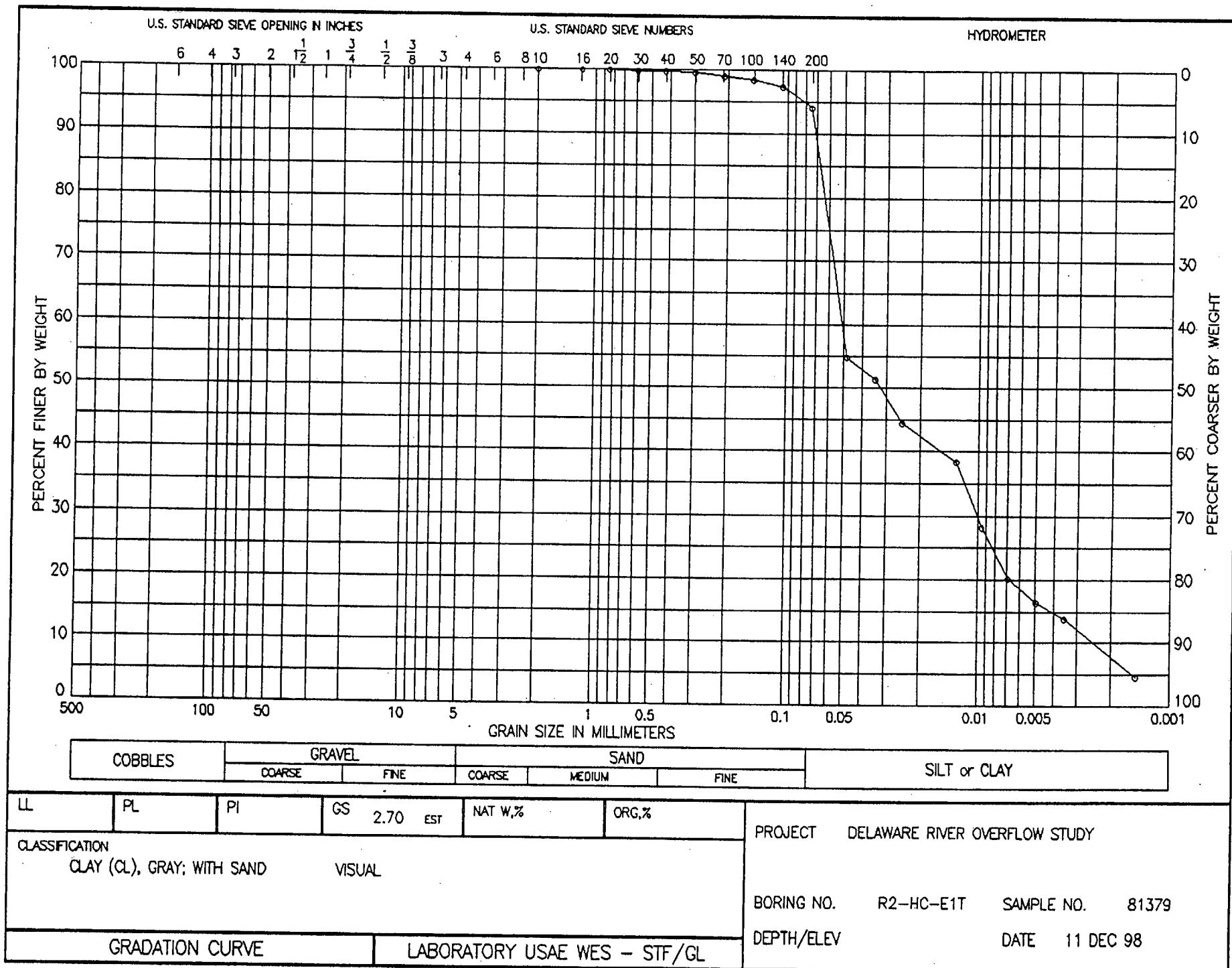
RDGS	TEMP			
17.5	21.5	.0490	54.6	45.4
15.0	21.5	.0355	46.7	53.3
12.0	21.5	.0258	37.3	62.7
8.1	21.5	.0138	24.9	75.1
6.8	21.5	.0098	20.8	79.2
5.3	21.5	.0070	16.1	83.9
4.8	21.5	.0050	14.5	85.5
3.0	22.0	.0035	9.2	90.8
2.3	21.0	.0015	6.3	93.7

PERCENT GRAVEL = .0

PERCENT SAND = 20.1

PERCENT FINES = 79.9

EDE



## SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HC-E1T      SAMPLE: 81379      DF: MD0199 .DAT  
 DEPTH:                    DATE: 11 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC: .00

CLASSIFICATION: 76

CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 55.1 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.8	.2
.1	No 40	.425	99.8	.2
.2	No 50	.300	99.6	.4
.5	No 70	.212	99.1	.9
.8	No 100	.150	98.5	1.5
1.4	No 140	.106	97.5	2.5
3.2	No 200	.075	94.2	5.8

## HYDROMETER:

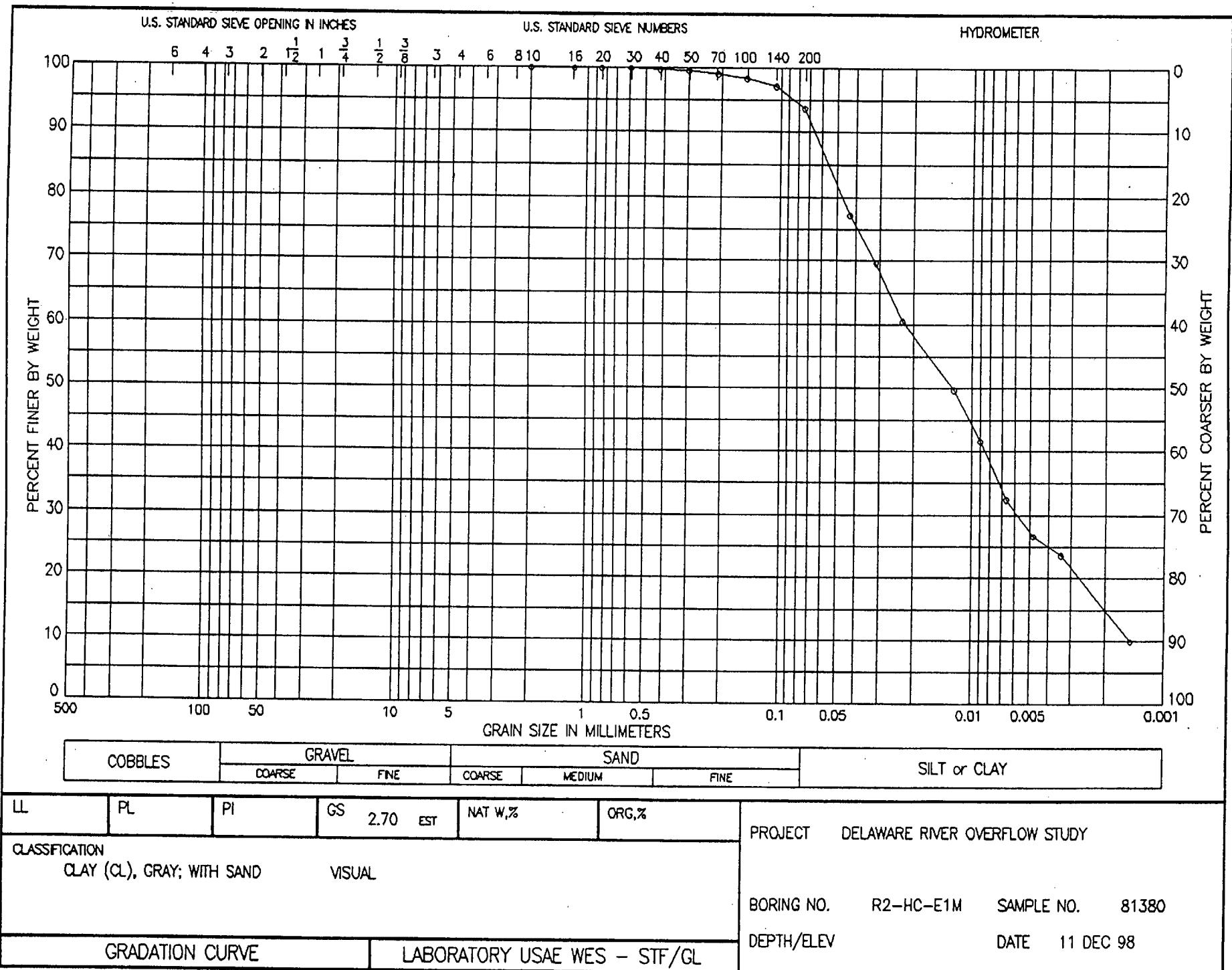
RDGS	TEMP			
19.2	21.5	.0481	54.8	45.2
18.0	21.5	.0345	51.3	48.7
15.6	21.5	.0249	44.4	55.6
13.5	21.5	.0131	38.3	61.7
10.0	21.5	.0096	28.2	71.8
7.2	21.5	.0069	20.2	79.8
5.9	21.5	.0050	16.4	83.6
5.0	21.5	.0035	13.8	86.2
2.2	19.5	.0015	4.6	95.4

PERCENT GRAVEL = .0

PERCENT SAND = 5.8

PERCENT FINES = 94.2

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HC-E1M      SAMPLE: 81380      DF: MD0199 .DAT  
DEPTH:                    DATE: 11 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC: .00

CLASSIFICATION: 84

CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 57.2 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.1	No 40	.425	99.8	.2
.2	No 50	.300	99.7	.3
.5	No 70	.212	99.1	.9
.9	No 100	.150	98.4	1.6
1.6	No 140	.106	97.2	2.8
3.6	No 200	.075	93.7	6.3

HYDROMETER:

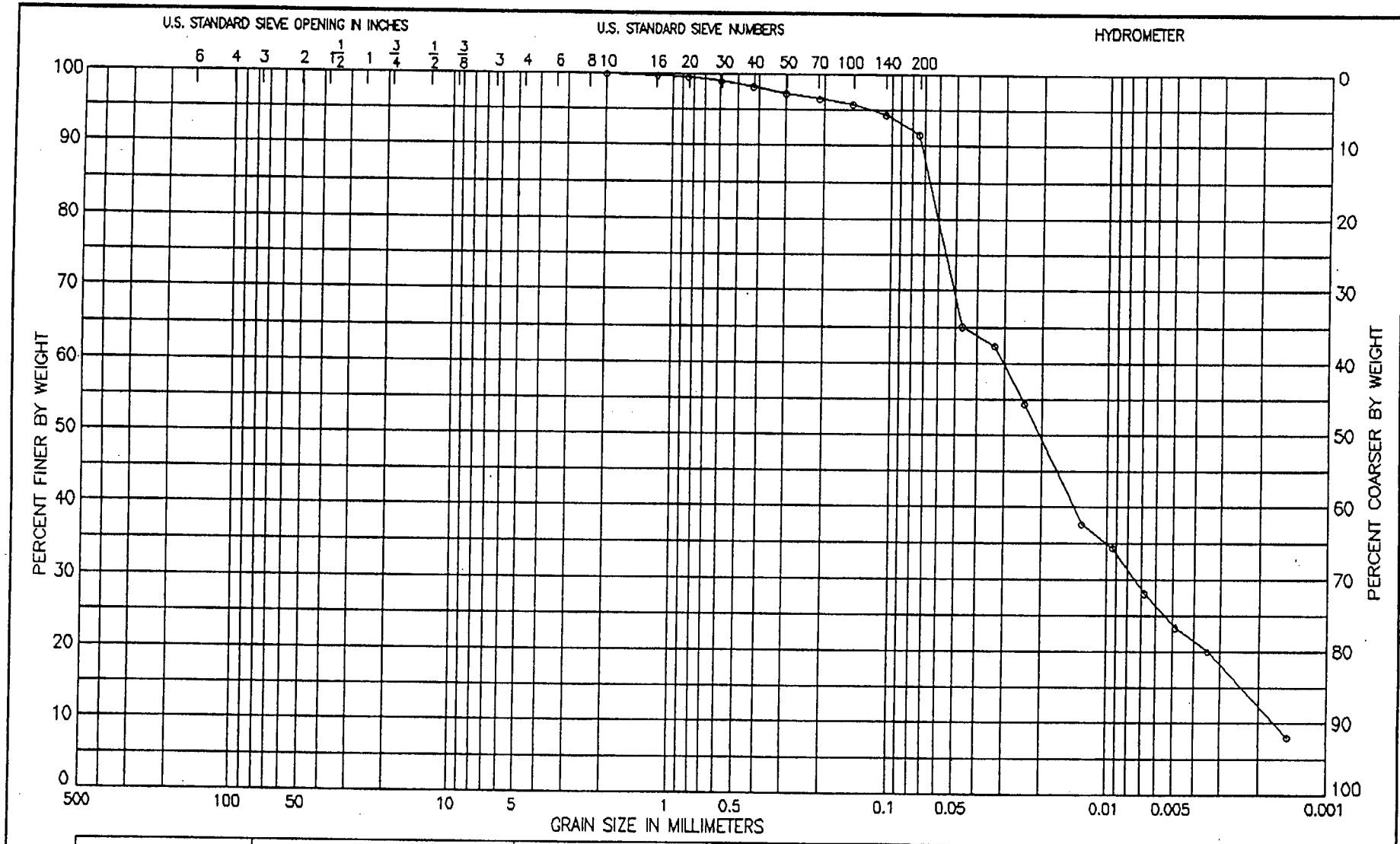
RDGS	TEMP			
27.9	22.0	.0431	77.2	22.8
25.2	22.0	.0315	69.7	30.3
21.9	22.0	.0231	60.5	39.5
18.0	22.0	.0124	49.7	50.3
15.1	22.0	.0090	41.6	58.4
11.9	21.5	.0067	32.5	67.5
9.8	21.5	.0048	26.7	73.3
8.7	21.5	.0034	23.6	76.4
4.2	19.5	.0015	10.0	90.0

PERCENT GRAVEL = .0

PERCENT SAND = 6.3

PERCENT FINES = 93.7

EDE



COBBLES	GRAVEL			SAND			SILT or CLAY
	COARSE	FINE	COARSE		FINE		

LL	PL	PI	GS	2.70 EST	NAT W. %	ORG. %	PROJECT	DELAWARE RIVER OVERFLOW STUDY
CLASSIFICATION	CLAY (CL), GRAY; WITH SAND						BORING NO.	R2-HC-E1B
	VISUAL						SAMPLE NO.	81381
GRADATION CURVE			LABORATORY USAE WES - STF/GL				DEPTH/ELEV	DATE 11 DEC 98

## SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HC-E1B      SAMPLE: 81381      DF: MD0199 .DAT  
 DEPTH:                    DATE: 11 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC: .00

CLASSIFICATION: 100

CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 53.1 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.1	No 16	1.180	99.8	.2
.2	No 20	.850	99.6	.4
.5	No 30	.600	99.1	.9
.9	No 40	.425	98.3	1.7
1.4	No 50	.300	97.4	2.6
1.8	No 70	.212	96.6	3.4
2.2	No 100	.150	95.9	4.1
3.0	No 140	.106	94.4	5.6
4.5	No 200	.075	91.5	8.5

## HYDROMETER:

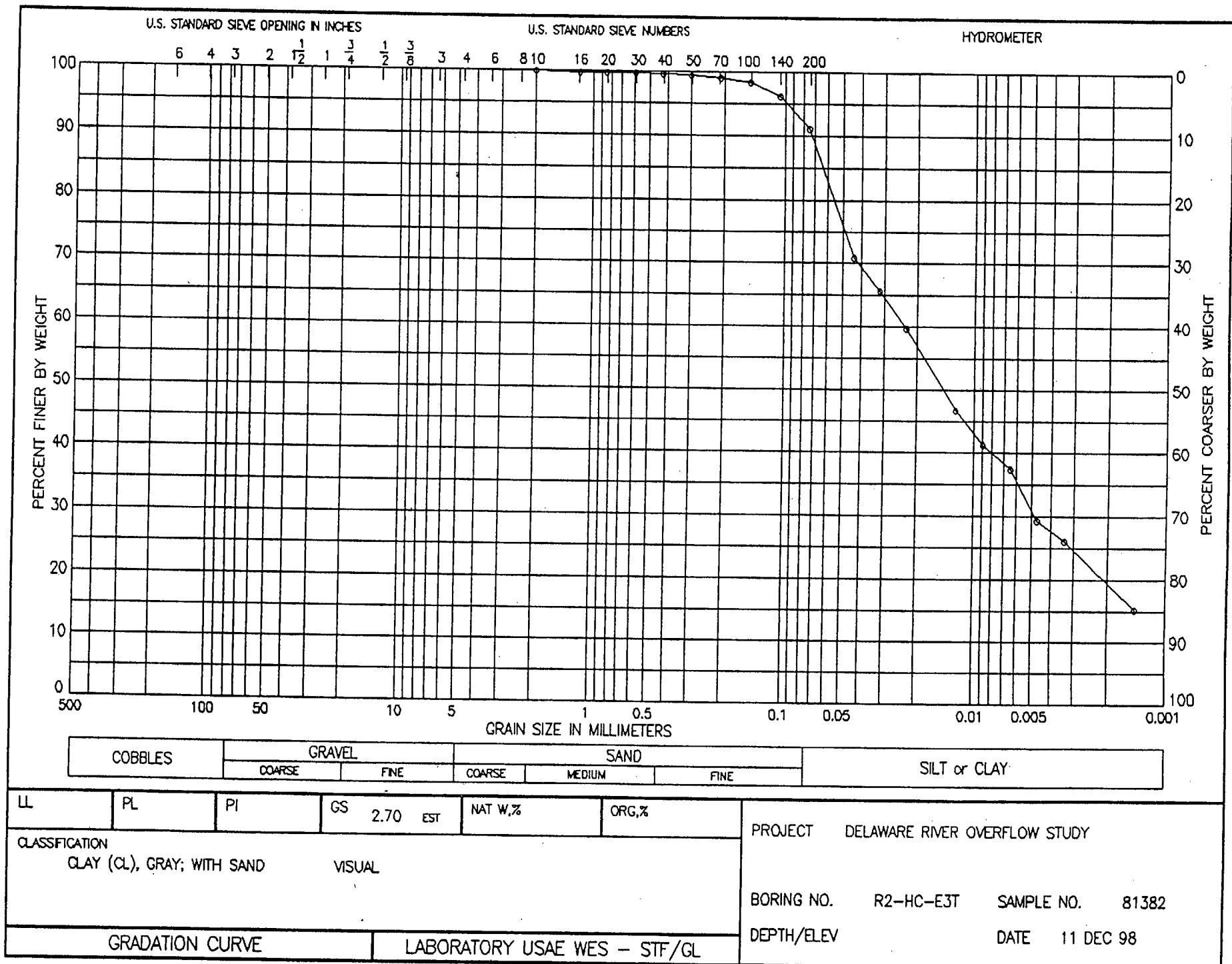
RDGS	TEMP			
22.0	21.5	.0467	65.2	34.8
21.1	21.5	.0334	62.5	37.5
18.4	21.5	.0243	54.4	45.6
12.8	21.5	.0132	37.7	62.3
11.7	21.5	.0094	34.4	65.6
9.6	21.5	.0068	28.1	71.9
8.0	21.5	.0049	23.3	76.7
6.9	21.5	.0035	20.0	80.0
3.3	19.5	.0015	8.1	91.9

PERCENT GRAVEL = .0

PERCENT SAND = 8.5

PERCENT FINES = 91.5

EDE



SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HC-E3T      SAMPLE: 81382      DF: MD0199 .DAT  
 DEPTH:                    DATE: 11 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC: .00

CLASSIFICATION: 108

CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 58.5 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER No	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	10	2.000	100.0	.0
.1	16	1.180	99.8	.2
.1	20	.850	99.8	.2
.1	30	.600	99.8	.2
.2	40	.425	99.7	.3
.3	50	.300	99.5	.5
.5	70	.212	99.1	.9
.9	100	.150	98.5	1.5
2.2	140	.106	96.2	3.8
5.2	200	.075	91.1	8.9

HYDROMETER:

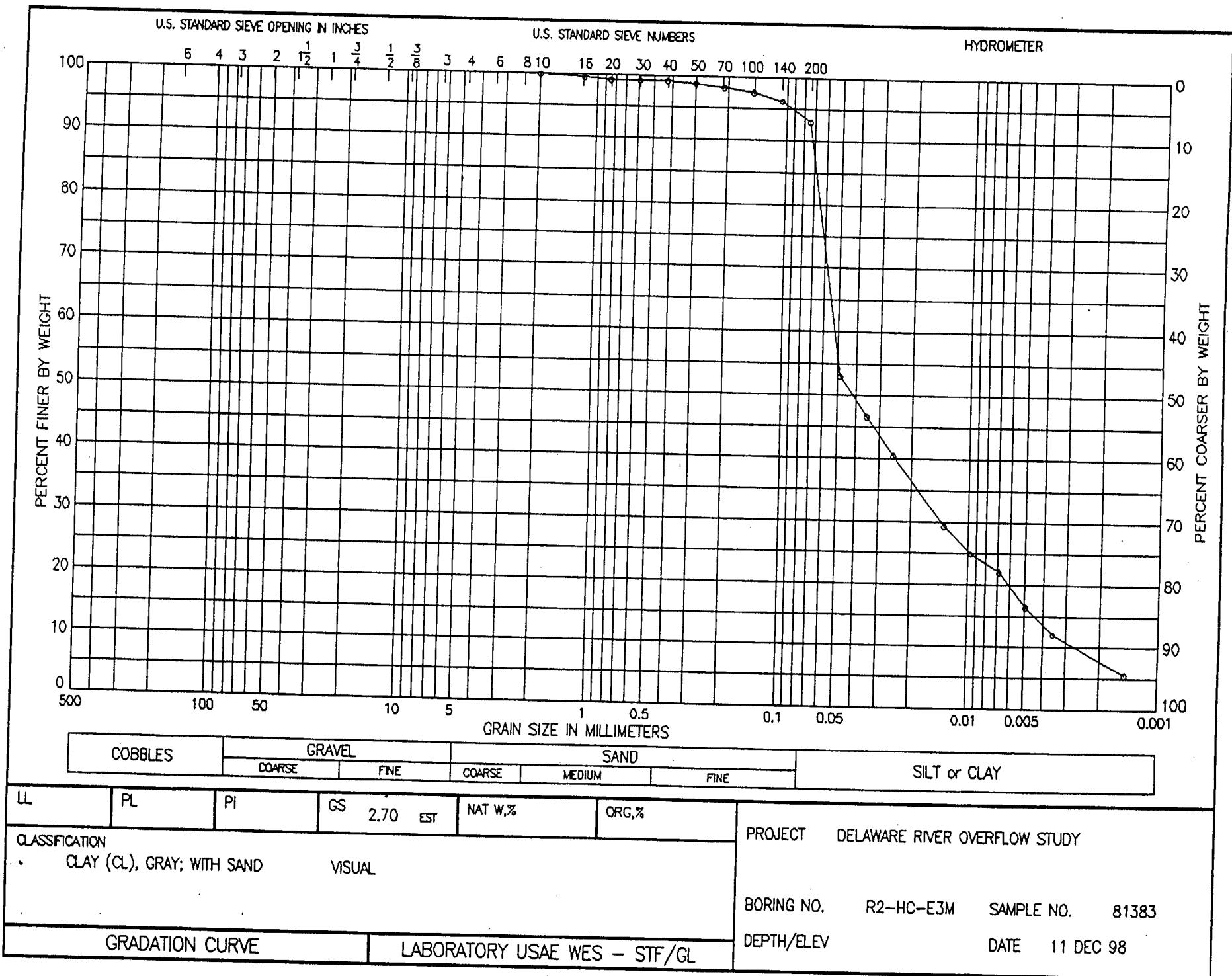
RDGS	TEMP			
26.2	22.0	.0440	70.9	29.1
24.3	22.0	.0318	65.7	34.3
22.1	22.0	.0231	59.7	40.3
17.3	22.0	.0125	46.7	53.3
15.3	22.0	.0090	41.3	58.7
13.9	22.0	.0065	37.5	62.5
10.9	22.0	.0047	29.3	70.7
9.8	21.5	.0034	26.1	73.9
6.1	20.0	.0014	15.2	84.8

PERCENT GRAVEL = .0

PERCENT SAND = 8.9

PERCENT FINES = 91.1

EDE



## SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HC-E3M      SAMPLE: 81383      DF: MD0199 .DAT  
 DEPTH:                    DATE: 11 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00

CLASSIFICATION: 117

CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:      54.2 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.2	No 16	1.180	99.6	.4
.4	No 20	.850	99.3	.7
.4	No 30	.600	99.3	.7
.4	No 40	.425	99.3	.7
.6	No 50	.300	98.9	1.1
.9	No 70	.212	98.3	1.7
1.3	No 100	.150	97.6	2.4
2.0	No 140	.106	96.3	3.7
3.8	No 200	.075	93.0	7.0

## HYDROMETER:

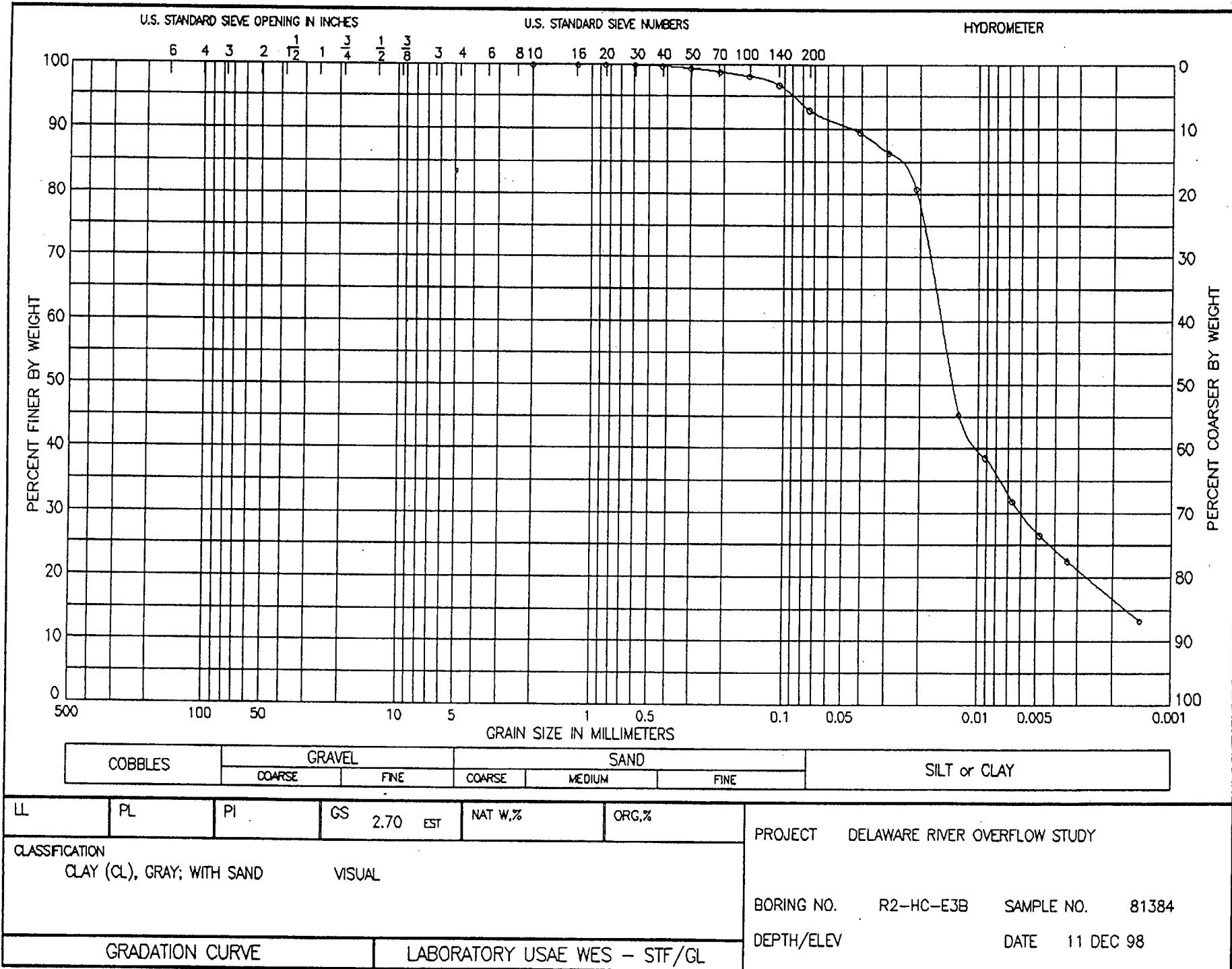
RDGS	TEMP			
18.3	21.5	.0486	53.0	47.0
16.1	21.5	.0351	46.6	53.4
14.0	21.5	.0253	40.4	59.6
10.2	21.5	.0135	29.3	70.7
8.7	21.5	.0097	24.9	75.1
7.7	21.5	.0069	22.0	78.0
5.8	21.5	.0050	16.4	83.6
4.3	21.5	.0036	12.0	88.0
2.4	20.0	.0015	5.6	94.4

PERCENT GRAVEL = .0

PERCENT SAND = 7.0

PERCENT FINES = 93.0

EDE



## SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HC-E3B      SAMPLE: 81384      DF: MD0199 .DAT  
 DEPTH:                    DATE: 11 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC: .00

CLASSIFICATION: 125  
 CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 56.4 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.1	No 40	.425	99.8	.2
.3	No 50	.300	99.5	.5
.6	No 70	.212	98.9	1.1
1.0	No 100	.150	98.2	1.8
1.8	No 140	.106	96.8	3.2
4.0	No 200	.075	92.9	7.1

## HYDROMETER:

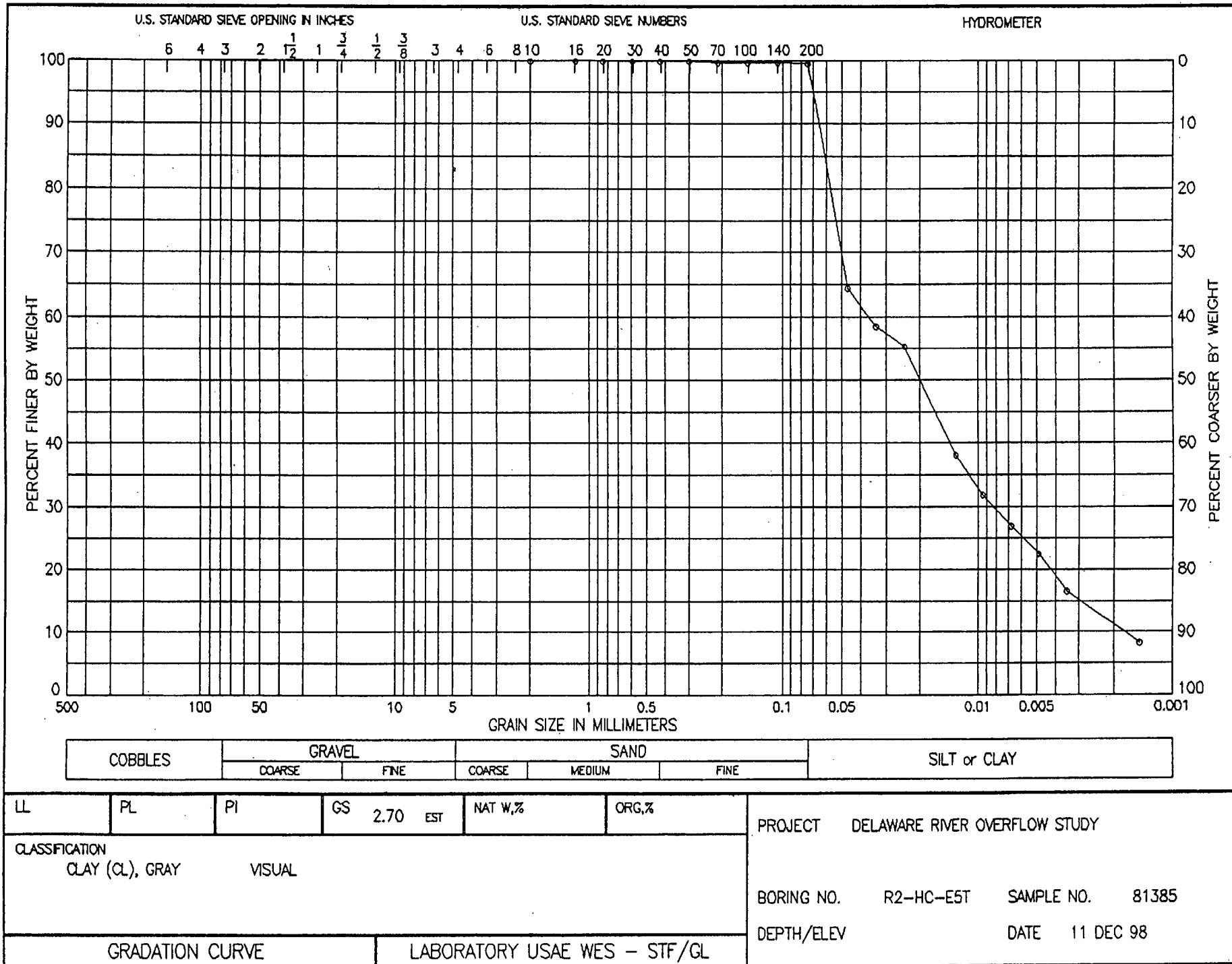
RDGS	TEMP			
31.9	22.0	.0409	89.5	10.5
30.8	22.0	.0293	86.5	13.5
28.8	22.0	.0213	80.8	19.2
16.2	22.0	.0127	45.3	54.7
13.9	21.5	.0093	38.6	61.4
11.5	21.5	.0067	31.8	68.2
9.6	21.5	.0048	26.5	73.5
8.2	21.5	.0034	22.5	77.5
5.2	20.0	.0015	13.2	86.8

PERCENT GRAVEL = .0

PERCENT SAND = 7.1

PERCENT FINES = 92.9

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HC-E5T      SAMPLE: 81385      DF: MD0199 .DAT  
DEPTH:                    DATE: 11 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC: .00  
CLASSIFICATION: 133  
CLAY (CL), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
PARTIAL WEIGHT AFTER SPLIT: 53.7 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER No	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	10	2.000	100.0	.0
.0	16	1.180	100.0	.0
.0	20	.850	100.0	.0
.0	30	.600	100.0	.0
.0	40	.425	100.0	.0
.0	50	.300	100.0	.0
.1	70	.212	99.8	.0
.1	100	.150	99.8	.2
.1	140	.106	99.8	.2
.2	200	.075	99.6	.4

HYDROMETER:

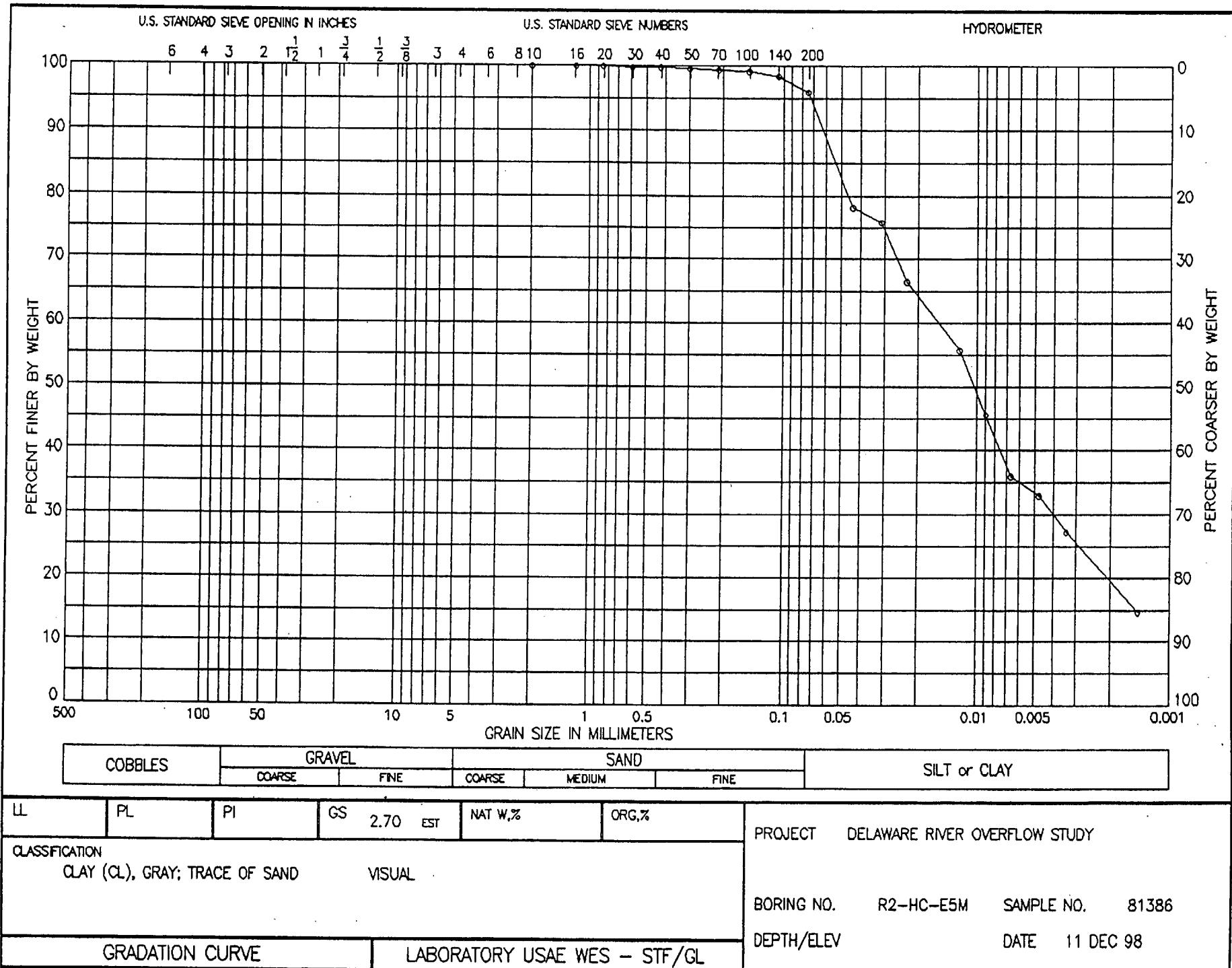
RDGS	TEMP			
22.0	21.5	.0467	64.5	35.5
20.0	21.5	.0338	58.6	41.4
18.9	21.5	.0241	55.3	44.7
13.1	21.5	.0132	38.2	61.8
11.0	21.5	.0095	31.9	68.1
9.3	21.5	.0068	26.9	73.1
7.8	21.5	.0049	22.5	77.5
5.8	21.5	.0035	16.6	83.4
3.3	20.0	.0015	8.3	91.7

PERCENT GRAVEL = .0

PERCENT SAND = .4

PERCENT FINES = 99.6

EDE



SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HC-E5M      SAMPLE: 81386      DF: MD0199 .DAT  
 DEPTH:                    DATE: 11 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC: .00

CLASSIFICATION: 141

CLAY (CL), GRAY; TRACE OF SAND      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 53.0 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.8	.2
.1	No 40	.425	99.8	.2
.2	No 50	.300	99.6	.4
.3	No 70	.212	99.4	.6
.4	No 100	.150	99.2	.8
.8	No 140	.106	98.5	1.5
2.1	No 200	.075	96.0	4.0

HYDROMETER:

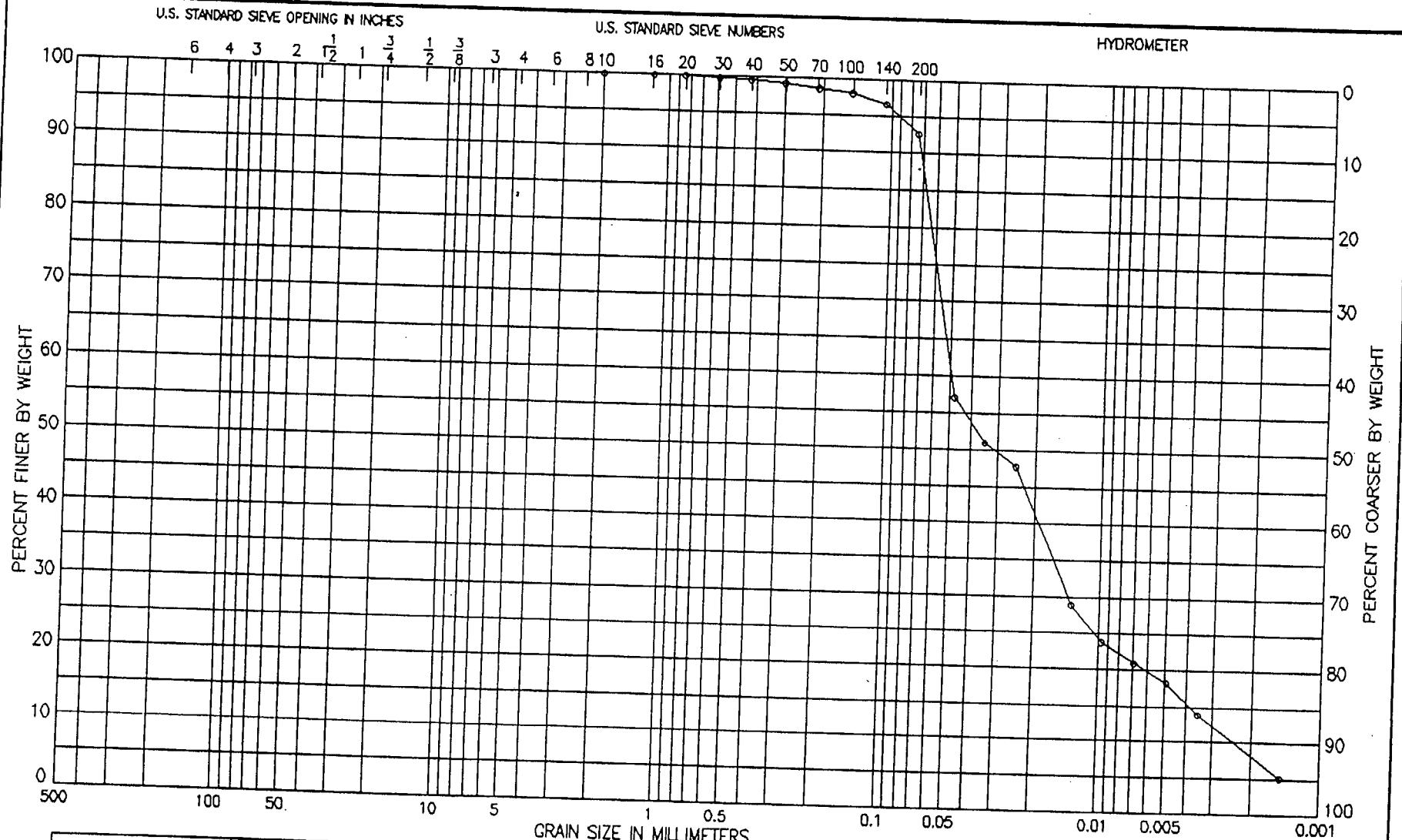
RDGS	TEMP			
26.2	22.0	.0440	78.2	21.8
25.4	22.0	.0314	75.8	24.2
22.3	22.0	.0230	66.5	33.5
18.7	22.0	.0123	55.7	44.3
15.3	22.0	.0090	45.5	54.5
12.2	21.5	.0066	36.0	64.0
11.2	21.5	.0047	33.0	67.0
9.3	21.5	.0034	27.3	72.7
5.4	20.0	.0015	14.7	85.3

PERCENT GRAVEL = .0

PERCENT SAND = 4.0

PERCENT FINES = 96.0

EDE



COBBLES	GRAVEL			SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE		
LL	PL	PI	GS 2.70 EST	NAT W. %	ORG. %		

CLASSIFICATION CLAY (CL), GRAY; WITH SAND	VISUAL	PROJECT DELAWARE RIVER OVERFLOW STUDY
		BORING NO. R2-HC-E5B SAMPLE NO. 81387
GRADATION CURVE	LABORATORY USAE WES - STF/GL	DEPTH/ELEV DATE 11 DEC 98

SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HC-E5B      SAMPLE: 81387      DF: MD0199 .DAT  
 DEPTH:                    DATE: 11 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00

CLASSIFICATION: 149  
 CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:      54.8 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.8	.2
.2	No 40	.425	99.6	.4
.4	No 50	.300	99.3	.7
.7	No 70	.212	98.7	1.3
1.0	No 100	.150	98.2	1.8
1.8	No 140	.106	96.7	3.3
4.0	No 200	.075	92.7	7.3

HYDROMETER:

RDGS	TEMP			
19.9	21.5	.0478	57.1	42.9
17.8	21.5	.0345	51.0	49.0
16.7	21.5	.0247	47.8	52.2
10.2	21.5	.0135	29.0	71.0
8.4	21.5	.0097	23.8	76.2
7.4	21.5	.0069	20.9	79.1
6.5	21.5	.0049	18.3	81.7
5.0	21.5	.0035	13.9	86.1
2.3	20.0	.0015	5.2	94.8

PERCENT GRAVEL =      .0

PERCENT SAND      =      7.3

PERCENT FINES      =      92.7

EDE

# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-C2      SAMPLE: 81738      DF: MD0199 .DAT  
DEPTH:                    DATE: 08 JAN 99

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00

CLASSIFICATION: 316

CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:    54.4 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.8	.2
.1	No 40	.425	99.8	.2
.3	No 50	.300	99.4	.6
.6	No 70	.212	98.9	1.1
1.2	No 100	.150	97.8	2.2
2.8	No 140	.106	94.9	5.1
6.1	No 200	.075	88.8	11.2

## HYDROMETER:

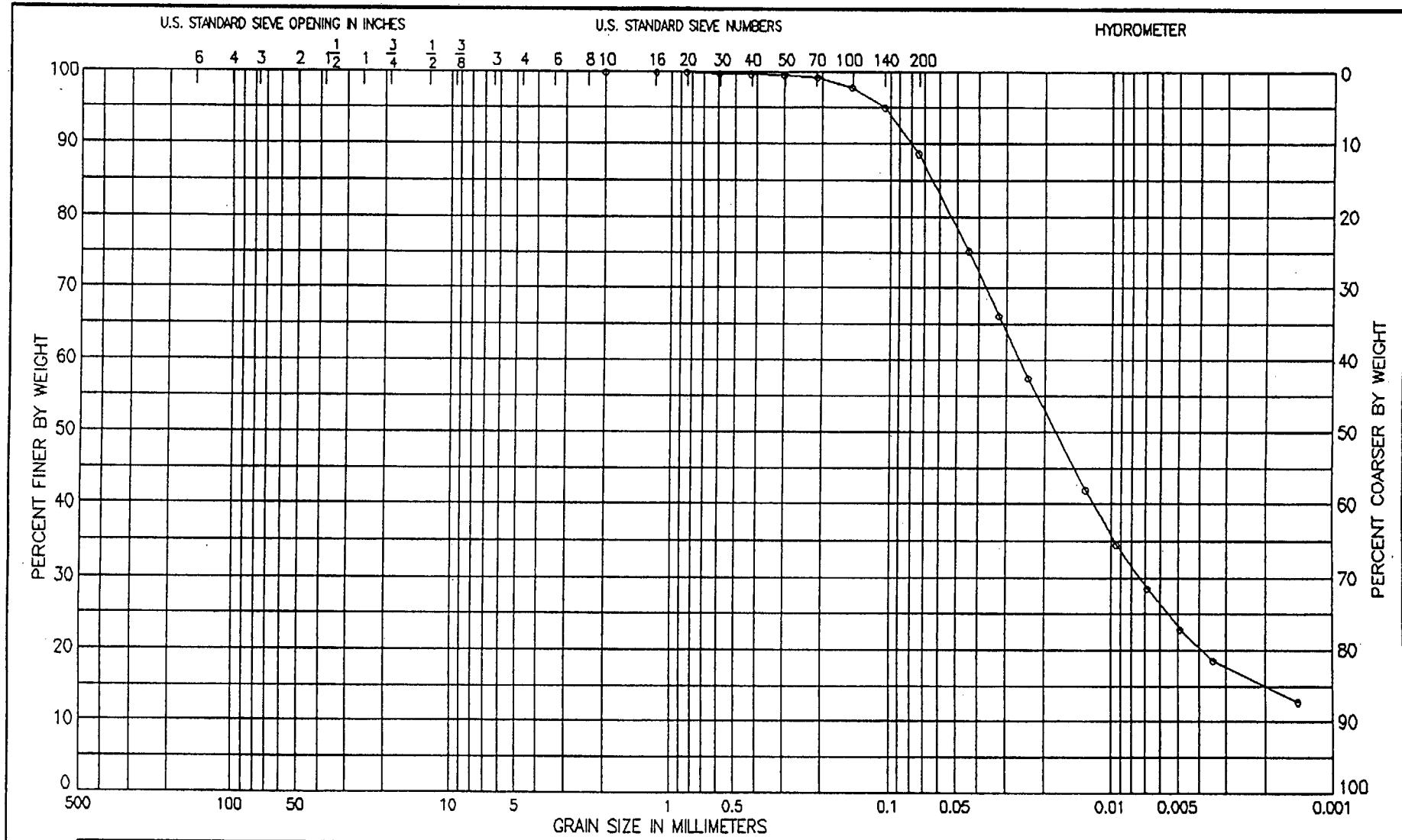
RDGS	TEMP			
25.3	19.0	.0461	71.8	28.2
22.9	19.0	.0335	64.8	35.2
20.2	19.0	.0244	56.9	43.1
14.8	19.0	.0133	41.2	58.8
12.2	19.0	.0096	33.6	66.4
10.5	19.0	.0069	28.6	71.4
8.3	20.0	.0049	22.8	77.2
6.5	21.5	.0035	18.4	81.6
4.0	21.0	.0015	10.8	89.2

PERCENT GRAVEL = .0

PERCENT SAND = 11.2

PERCENT FINES = 88.8

EDE



COBBLES		GRAVEL		SAND			SILT or CLAY
COARSE	FINE	COARSE	MEEDIUM	FINE			

LL	PL	PI	GS 2.70 EST	NAT W, %	ORG, %	PROJECT	DELAWARE RIVER OVERFLOW STUDY	
CLASSIFICATION	CLAY (CL), GRAY; WITH SAND		VISUAL			BORING NO.	R2-HO-C3	SAMPLE NO. 81739
						DEPTH/ELEV	08 JAN 99	
GRADATION CURVE			LABORATORY USAE WES - STF/GL					

# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-C3      SAMPLE: 81739      DF: MD0199 .DAT  
DEPTH:                    DATE: 08 JAN 99

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00

CLASSIFICATION: 332

CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:    58.3 gms.

WEIGHTS gm.	SIEVE SIZE OR NUMBER No	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	10	2.000	100.0	.0
.0	16	1.180	100.0	.0
.0	20	.850	100.0	.0
.1	30	.600	99.8	.2
.1	40	.425	99.8	.2
.2	50	.300	99.7	.3
.4	70	.212	99.3	.7
1.2	100	.150	97.9	2.1
2.9	140	.106	95.0	5.0
6.6	200	.075	88.7	11.3

HYDROMETER:

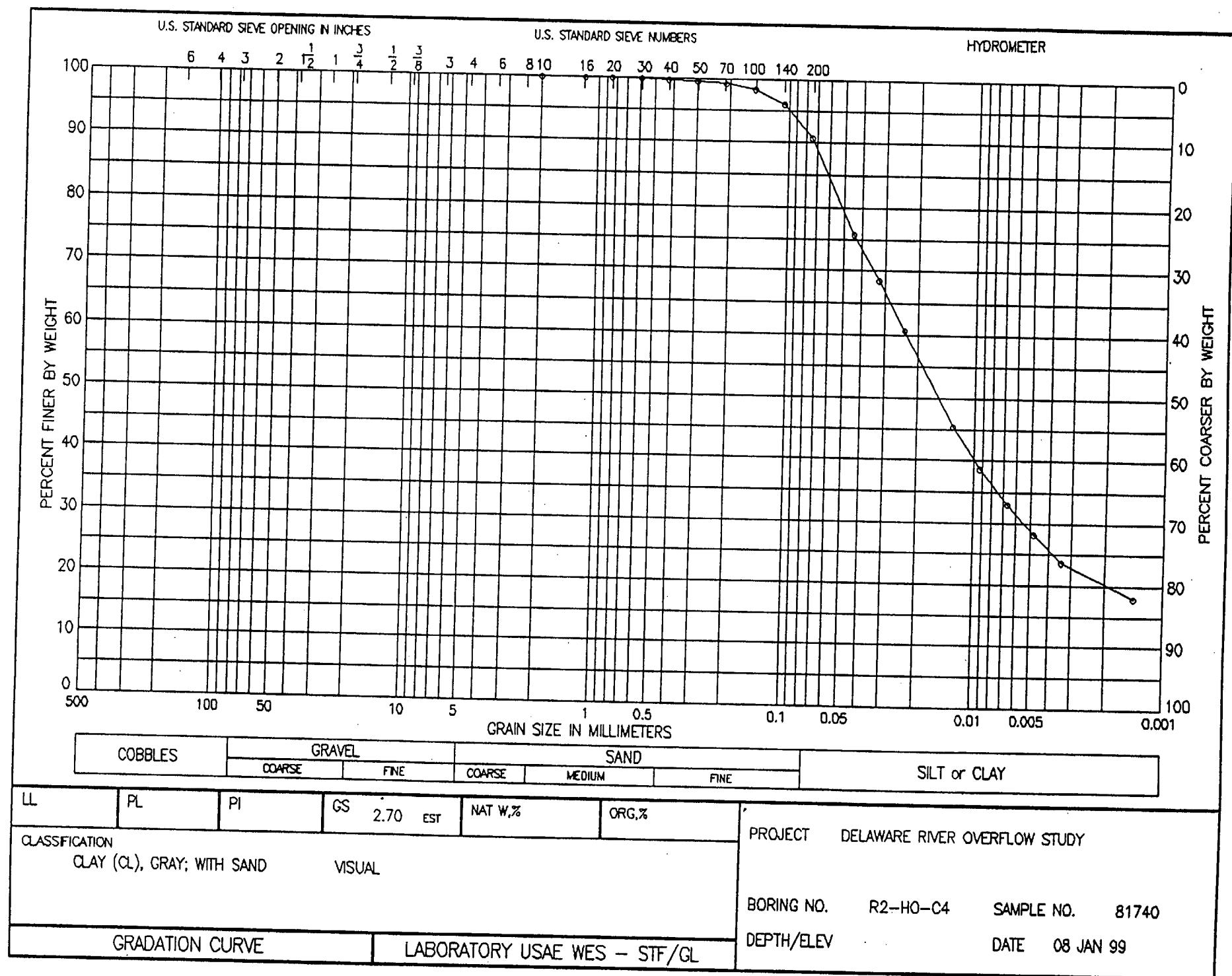
RDGS	TEMP			
28.3	19.0	.0445	75.2	24.8
25.0	19.0	.0327	66.2	33.8
21.8	19.0	.0240	57.5	42.5
16.1	19.0	.0131	42.0	58.0
13.4	19.0	.0095	34.6	65.4
11.2	19.0	.0069	28.6	71.4
8.8	20.5	.0049	22.9	77.1
7.0	21.5	.0035	18.5	81.5
5.0	21.0	.0014	12.8	87.2

PERCENT GRAVEL = .0

PERCENT SAND = 11.3

PERCENT FINES = 88.7

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-C4      SAMPLE: 81740      DF: MD0199 .DAT  
DEPTH:                    DATE: 08 JAN 99

NO-LIMITS-RAN      GS: 2.70 est      WC: .00

CLASSIFICATION: 348

CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 59.1 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.1	No 40	.425	99.8	.2
.2	No 50	.300	99.7	.3
.4	No 70	.212	99.3	.7
.9	No 100	.150	98.5	1.5
2.3	No 140	.106	96.1	3.9
5.5	No 200	.075	90.7	9.3

## HYDROMETER:

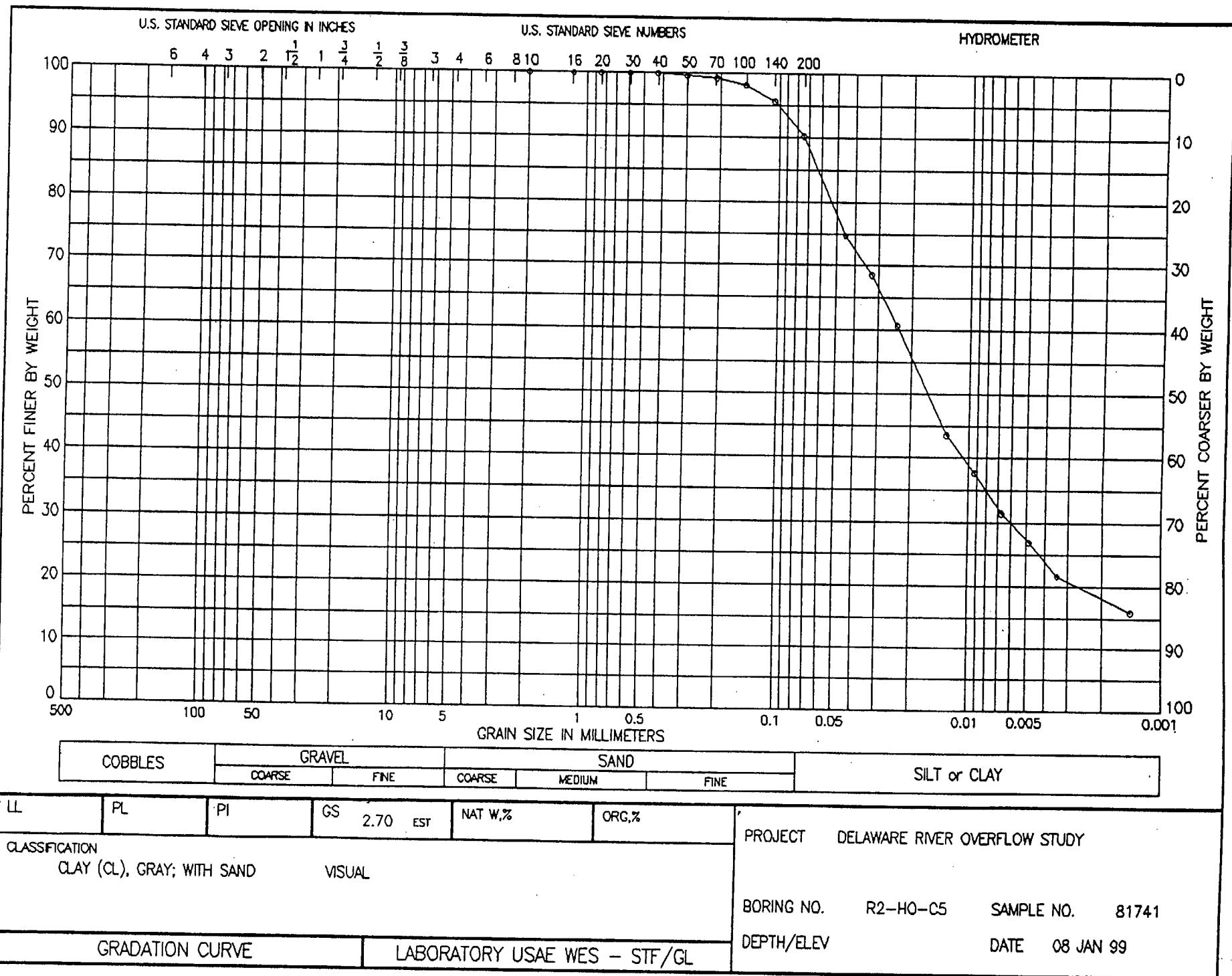
RDGS	TEMP			
28.8	19.5	.0442	75.8	24.2
26.1	19.5	.0323	68.5	31.5
23.2	19.5	.0236	60.7	39.3
17.5	19.5	.0130	45.4	54.6
15.0	19.5	.0094	38.7	61.3
12.8	20.0	.0067	33.1	66.9
10.9	20.5	.0048	28.2	71.8
9.0	21.5	.0034	23.6	76.4
7.0	21.0	.0014	18.0	82.0

PERCENT GRAVEL = .0

PERCENT SAND = 9.3

PERCENT FINES = 90.7

EDE



# SIEVE ANALYSIS

## PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-C5      SAMPLE: 81741      DF: MD0199 .DAT  
DEPTH:                    DATE: 08 JAN 99

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00  
CLASSIFICATION: 364  
CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:      56.5 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.0	No 40	.425	100.0	.0
.2	No 50	.300	99.6	.4
.4	No 70	.212	99.3	.7
1.0	No 100	.150	98.2	1.8
2.4	No 140	.106	95.8	4.2
5.5	No 200	.075	90.3	9.7

## HYDROMETER:

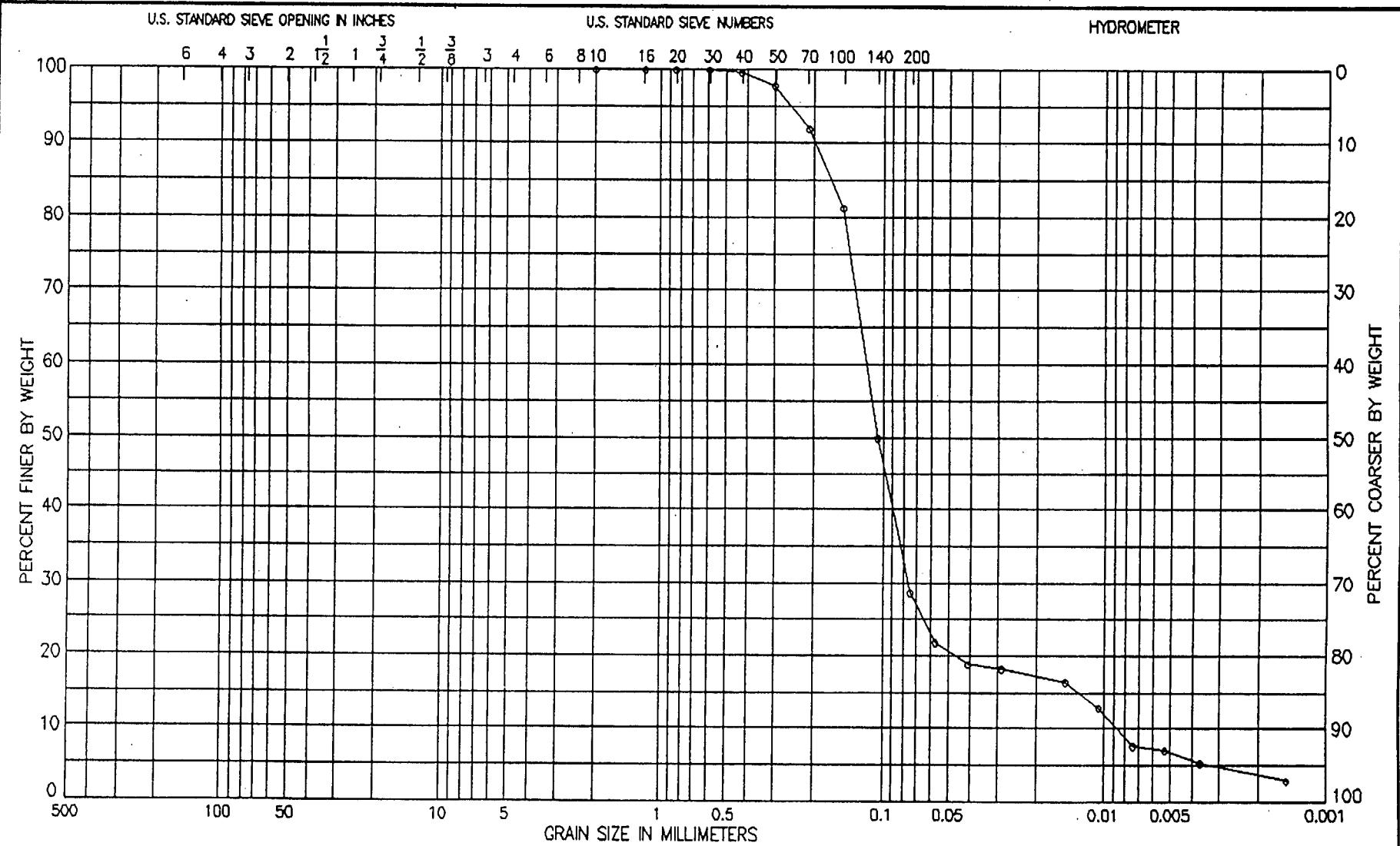
RDGS	TEMP			
27.2	19.5	.0451	74.8	25.2
25.0	19.5	.0327	68.6	31.4
22.2	19.5	.0239	60.7	39.3
16.1	19.5	.0131	43.6	56.4
13.9	20.0	.0094	37.7	62.3
11.7	20.0	.0068	31.5	68.5
10.0	20.5	.0049	27.0	73.0
8.0	21.0	.0034	21.6	78.4
6.0	21.0	.0014	16.0	84.0

PERCENT GRAVEL = .0

PERCENT SAND = 9.7

PERCENT FINES = 90.3

EDE



COBBLES	GRAVEL			SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE		

LL	PL	PI	GS	2.67 EST	NAT W, %	ORG, %	PROJECT	DELAWARE RIVER OVERFLOW STUDY	
CLASSIFICATION									
CLAYEY SAND (SC), GRAY	VISUAL						BORING NO.	R1-HO-C1	SAMPLE NO. 81732
INSUFFICIENT SAMPLE FOR ACCURATE GRADATION							DEPTH/ELEV		DATE 08 JAN 99
GRADATION CURVE			LABORATORY USAE WES - STF/GL						

## SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-C1      SAMPLE: 81732      DF: MD0199 .DAT  
DEPTH:                    DATE: 08 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC: .00  
CLASSIFICATION: 983  
CLAYEY SAND (SC), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
PARTIAL WEIGHT AFTER SPLIT: 27.2 gms.  
INSUFFICIENT SAMPLE FOR ACCURATE GRADATION

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.1	No 40	.425	99.6	.4
.6	No 50	.300	97.8	2.2
2.2	No 70	.212	91.9	8.1
5.1	No 100	.150	81.3	18.8
13.6	No 140	.106	50.0	50.0
19.4	No 200	.075	28.7	71.3

### HYDROMETER:

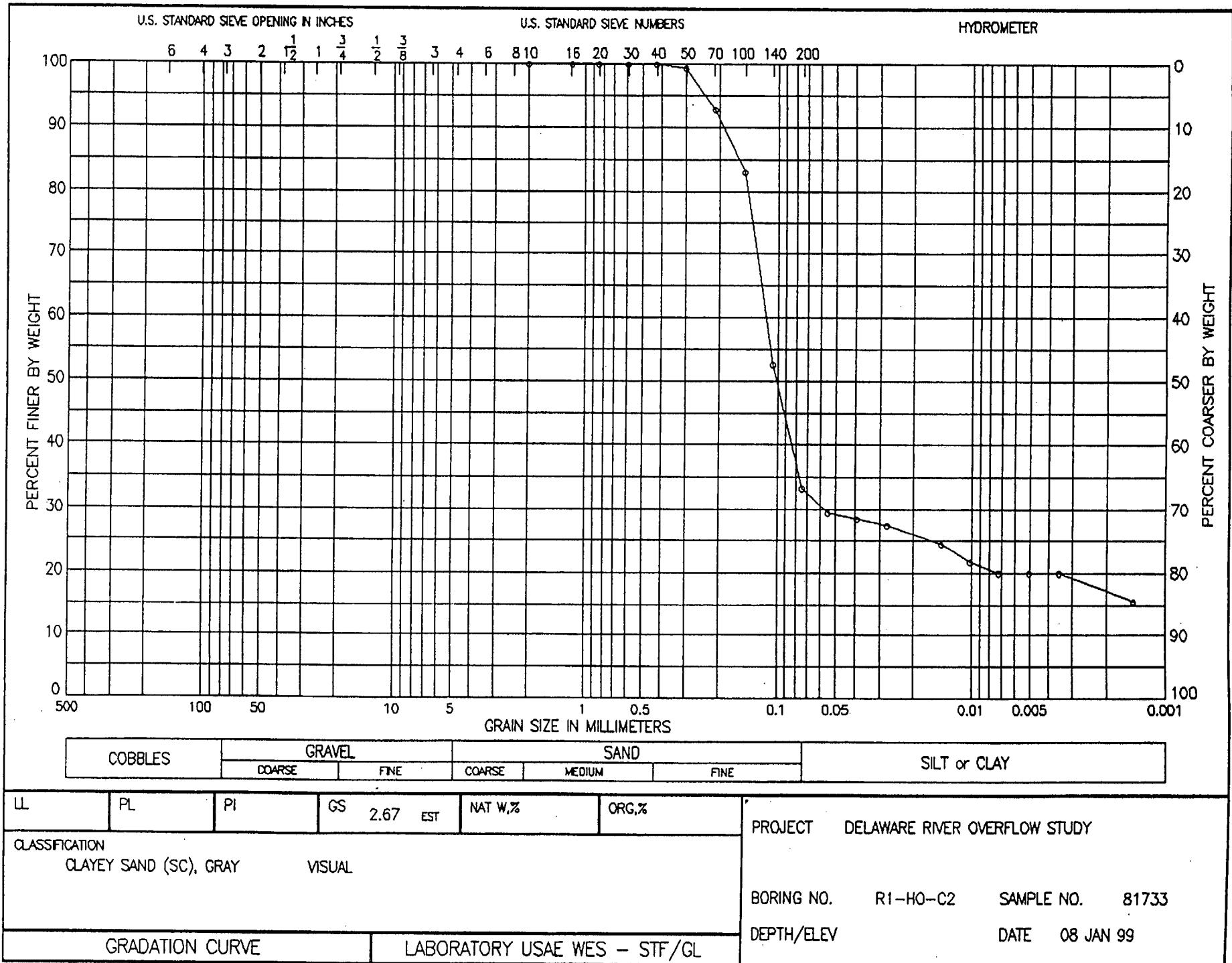
RDGS	TEMP			
4.5	18.5	.0576	21.7	78.3
4.0	18.5	.0409	18.8	81.2
3.9	18.5	.0289	18.2	81.8
3.6	18.5	.0150	16.5	83.5
3.0	18.5	.0106	12.9	87.1
2.0	19.0	.0075	7.6	92.4
1.8	19.5	.0053	7.1	92.9
1.2	21.0	.0037	5.3	94.7
.8	21.0	.0015	2.9	97.1

PERCENT GRAVEL = .0

PERCENT SAND = 71.3

PERCENT FINES = 28.7

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-C2      SAMPLE: 81733      DF: MD0199 .DAT  
DEPTH:                    DATE: 08 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC: .00  
CLASSIFICATION: 991  
CLAYEY SAND (SC), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
PARTIAL WEIGHT AFTER SPLIT: 47.2 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.0	No 40	.425	100.0	.0
.3	No 50	.300	99.4	.6
3.4	No 70	.212	92.8	7.2
8.0	No 100	.150	83.1	16.9
22.4	No 140	.106	52.5	47.5
31.5	No 200	.075	33.3	66.7

## HYDROMETER:

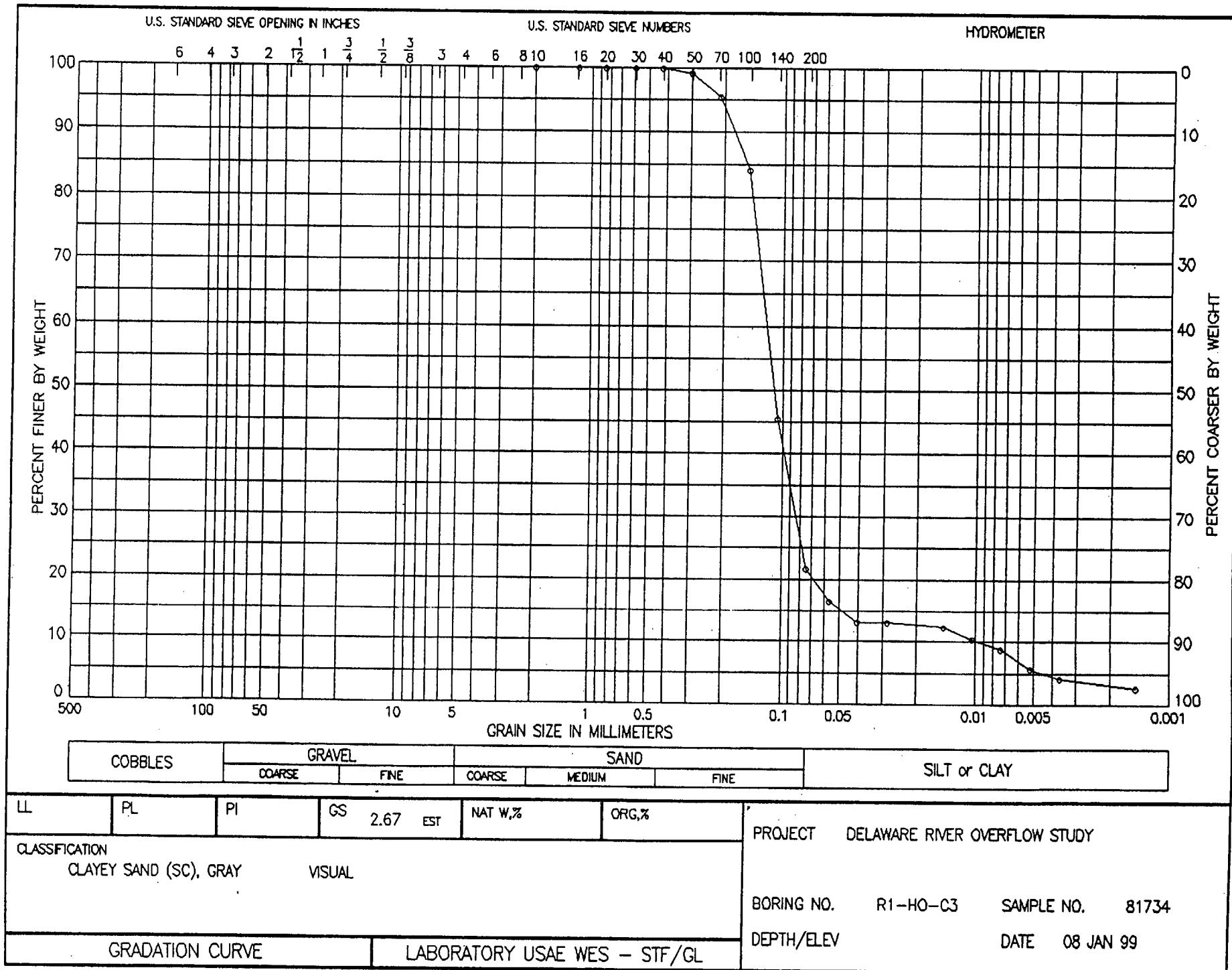
RDGS	TEMP			
9.5	18.5	.0552	29.5	70.5
9.2	18.5	.0392	28.5	71.5
8.9	18.5	.0278	27.4	72.6
8.0	18.5	.0144	24.4	75.6
7.2	18.5	.0103	21.7	78.3
6.7	18.5	.0073	20.0	80.0
6.4	20.0	.0050	20.0	80.0
6.2	21.0	.0035	20.0	80.0
4.9	21.0	.0015	15.6	84.4

PERCENT GRAVEL = .0

PERCENT SAND = 66.7

PERCENT FINES = 33.3

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-C3      SAMPLE: 81734      DF: MD0199 .DAT  
DEPTH:                    DATE: 08 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC:      .00

CLASSIFICATION: 252

CLAYEY SAND (SC), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:      41.6 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.0	No 40	.425	100.0	.0
.3	No 50	.300	99.3	.7
1.9	No 70	.212	95.4	4.6
6.6	No 100	.150	84.1	15.9
22.7	No 140	.106	45.4	54.6
32.6	No 200	.075	21.6	78.4

HYDROMETER:

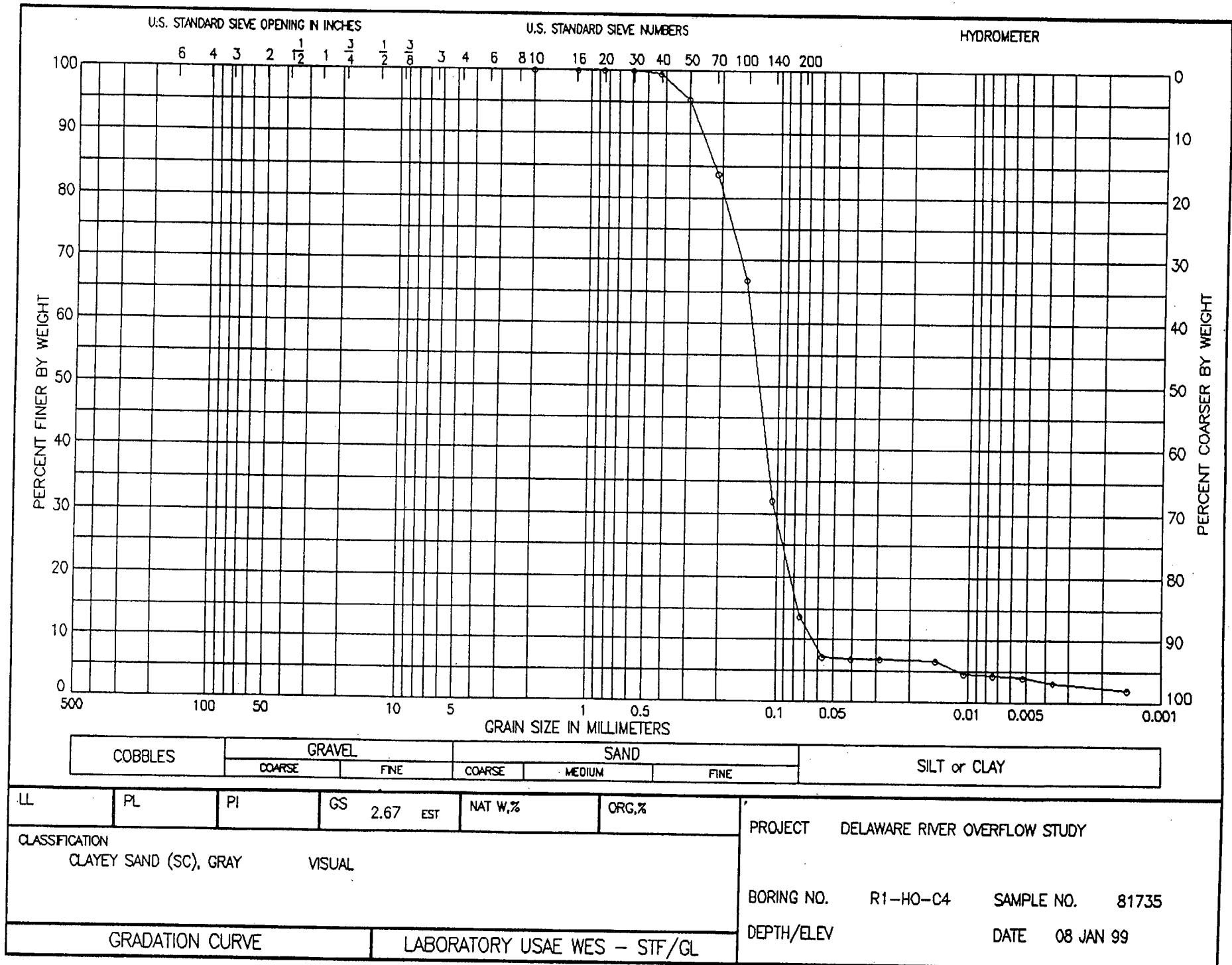
RDGS	TEMP			
5.0	19.0	.0566	16.5	83.5
4.1	19.0	.0403	13.1	86.9
4.1	19.0	.0285	13.1	86.9
3.9	19.0	.0147	12.3	87.7
3.4	19.0	.0105	10.4	89.6
3.0	19.0	.0074	8.8	91.2
2.0	20.0	.0052	5.8	94.2
1.4	21.0	.0037	4.2	95.8
1.0	21.0	.0015	2.7	97.3

PERCENT GRAVEL = .0

PERCENT SAND = 78.4

PERCENT FINES = 21.6

EDE



# SIEVE ANALYSIS

## PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-C4      SAMPLE: 81735      DF: MD0199 .DAT  
DEPTH:                    DATE: 08 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC:      .00  
CLASSIFICATION: 268

CLAYEY SAND (SC), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:      55.5 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.3	No 40	.425	99.5	.5
2.5	No 50	.300	95.5	4.5
9.0	No 70	.212	83.8	16.2
18.4	No 100	.150	66.8	33.2
37.7	No 140	.106	32.1	67.9
47.9	No 200	.075	13.7	86.3

### HYDROMETER:

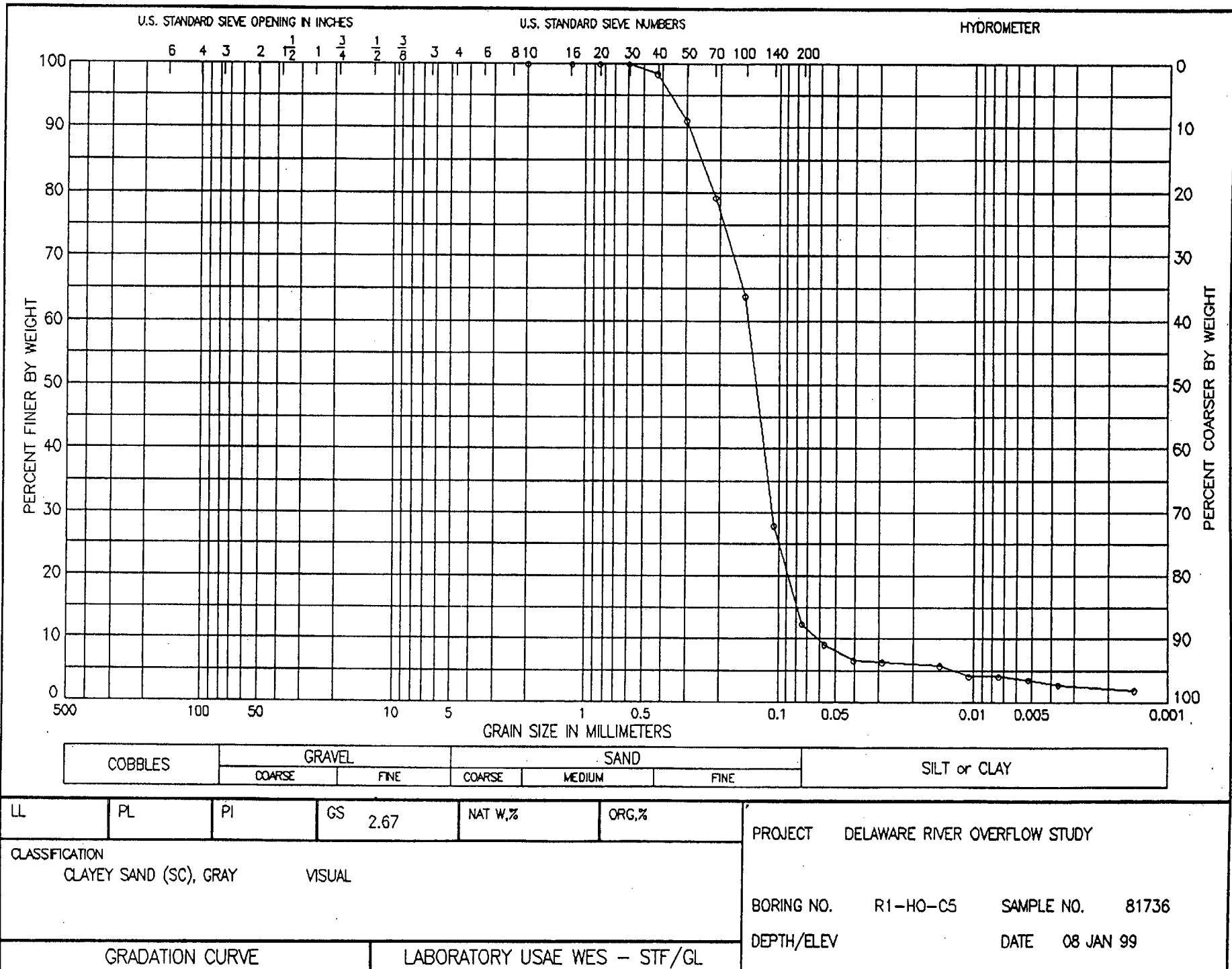
RDGS	TEMP			
3.2	19.0	.0574	7.2	92.8
3.1	19.0	.0406	6.9	93.1
3.1	19.0	.0287	6.9	93.1
3.0	19.0	.0149	6.6	93.4
2.3	19.0	.0106	4.6	95.4
2.2	19.0	.0075	4.3	95.7
1.9	20.0	.0052	4.0	96.0
1.4	21.0	.0037	3.2	96.8
1.0	21.0	.0015	2.0	98.0

PERCENT GRAVEL = .0

PERCENT SAND = 86.3

PERCENT FINES = 13.7

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-C5      SAMPLE: 81736      DF: MD0199 .DAT  
DEPTH:                    DATE: 08 JAN 99

NO-LIMITS-RAN GS: 2.67      WC: .00

CLASSIFICATION: 284

CLAYEY SAND (SC), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 57.8 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.9	No 40	.425	98.4	1.6
5.2	No 50	.300	91.0	9.0
12.0	No 70	.212	79.2	20.8
20.9	No 100	.150	63.8	36.2
41.7	No 140	.106	27.9	72.1
50.7	No 200	.075	12.3	87.7

## HYDROMETER:

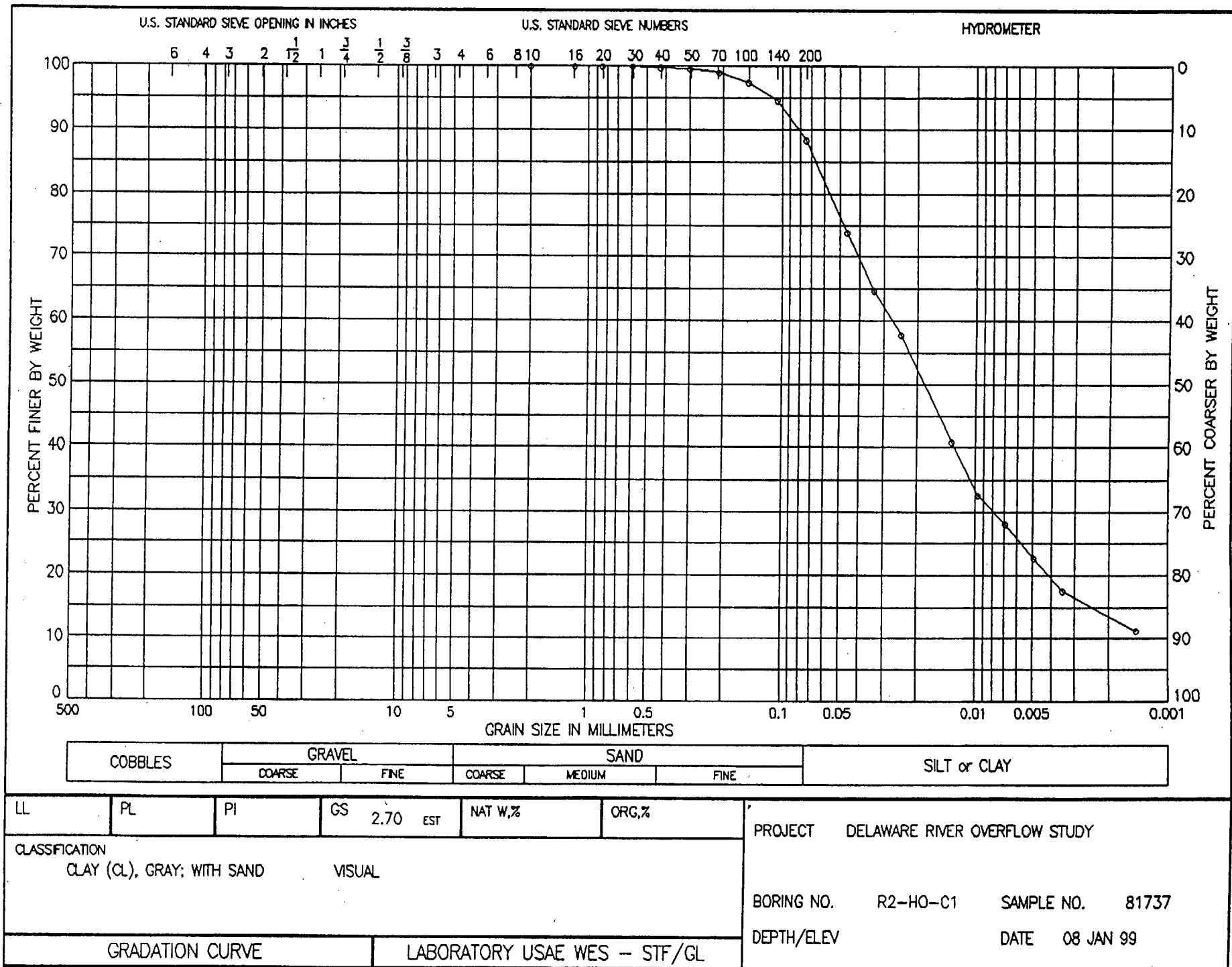
RDGS	TEMP			
4.0	19.0	.0571	9.1	90.9
3.1	19.0	.0406	6.6	93.4
3.0	19.0	.0288	6.4	93.6
2.8	19.0	.0149	5.8	94.2
2.2	19.0	.0106	4.1	95.9
2.2	19.0	.0075	4.1	95.9
1.8	20.0	.0052	3.6	96.4
1.3	21.0	.0037	2.8	97.2
1.0	21.0	.0015	1.9	98.1

PERCENT GRAVEL = .0

PERCENT SAND = 87.7

PERCENT FINES = 12.3

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-C1      SAMPLE: 81737      DF: MD0199 .DAT  
 DEPTH:                    DATE: 08 JAN 99

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00

CLASSIFICATION: 300  
 CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:      52.5 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.1	No 40	.425	99.8	.2
.2	No 50	.300	99.6	.4
.5	No 70	.212	99.0	1.0
1.3	No 100	.150	97.5	2.5
2.8	No 140	.106	94.7	5.3
6.1	No 200	.075	88.4	11.6

HYDROMETER:

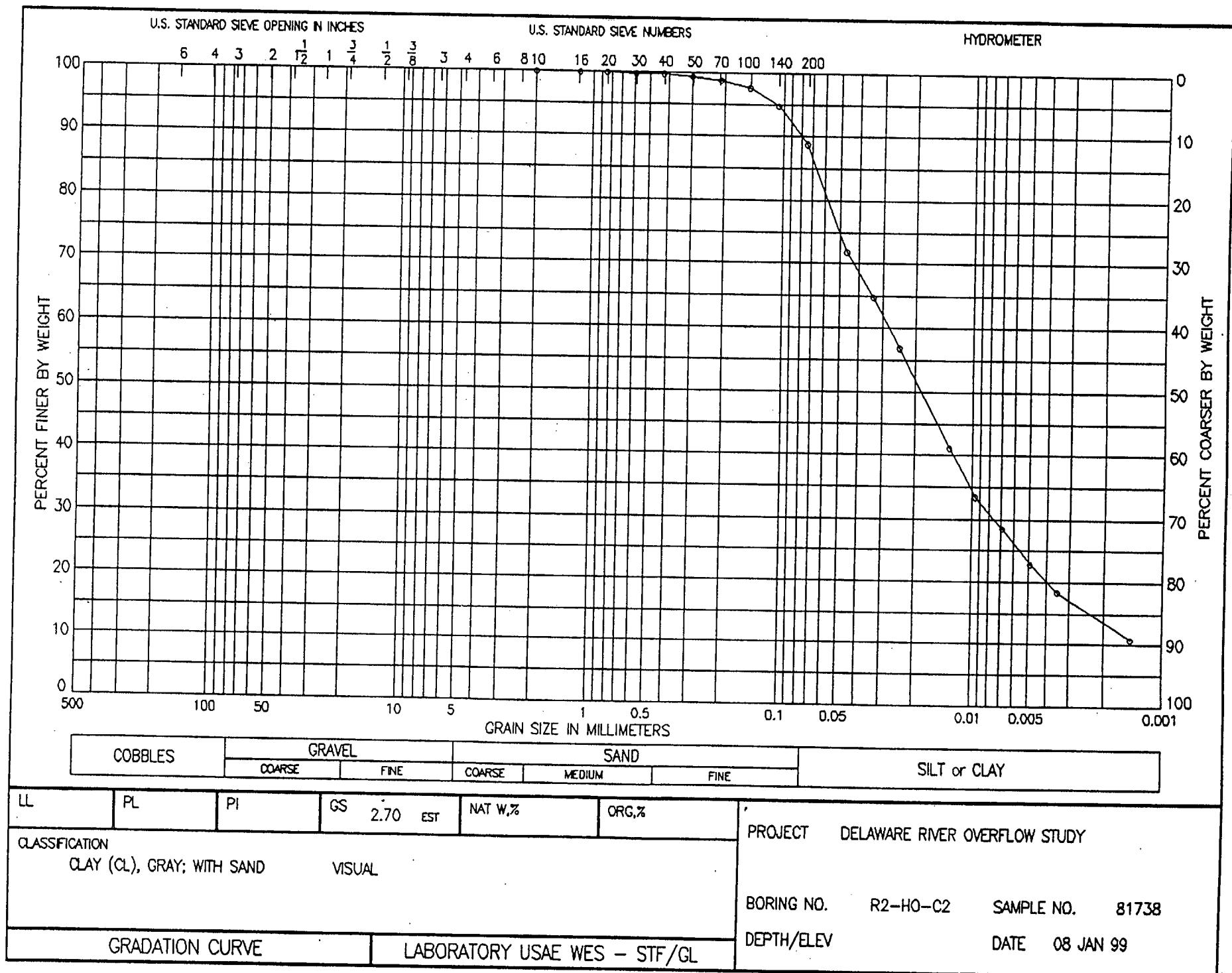
RDGS	TEMP			
25.1	19.0	.0462	73.8	26.2
22.1	19.0	.0338	64.7	35.3
19.8	19.0	.0245	57.8	42.2
14.2	19.0	.0134	40.8	59.2
11.5	19.0	.0097	32.7	67.3
10.0	19.0	.0069	28.1	71.9
8.0	20.0	.0049	22.7	77.3
6.0	21.5	.0035	17.5	82.5
4.0	21.0	.0015	11.2	88.8

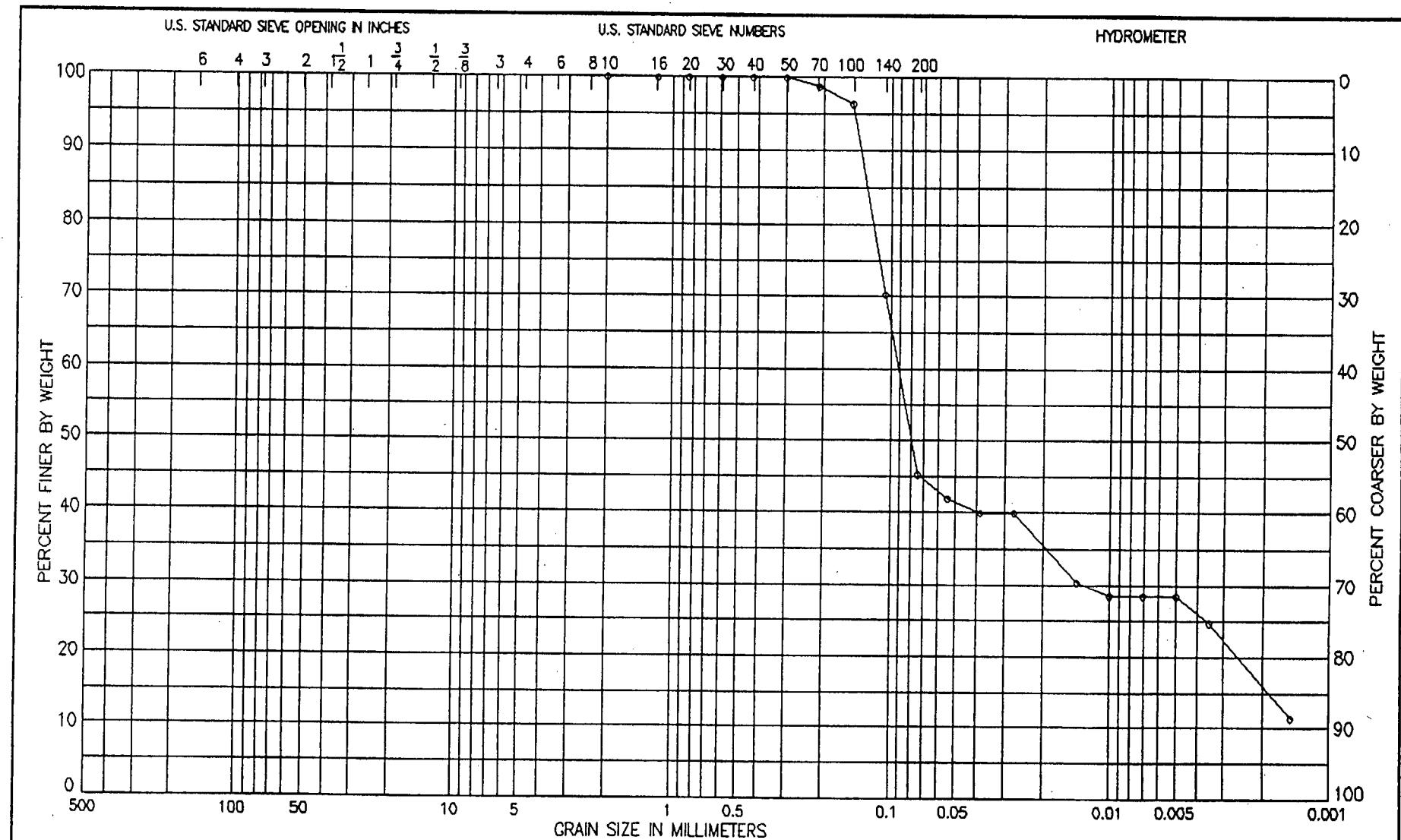
PERCENT GRAVEL = .0

PERCENT SAND = 11.6

PERCENT FINES = 88.4

EDE





COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-1                    SAMPLE: 81448    DF: MD0199 .DAT  
 DEPTH:                              DATE: 31 DEC 98

NO-LIMITS-RAN    GS: 2.67 est    WC:     .00

CLASSIFICATION: 654

CLAYEY SAND (SC), GRAY                VISUAL

TOTAL WEIGHT OF SAMPLE:     .0 gms.

PARTIAL WEIGHT AFTER SPLIT:    8.4 gms.

INSUFFICIENT SAMPLE FOR ACCURATE GRADATION

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.0	No 40	.425	100.0	.0
.0	No 50	.300	100.0	.0
.1	No 70	.212	98.8	1.2
.3	No 100	.150	96.4	3.6
2.5	No 140	.106	70.2	29.8
4.6	No 200	.075	45.2	54.8

HYDROMETER:

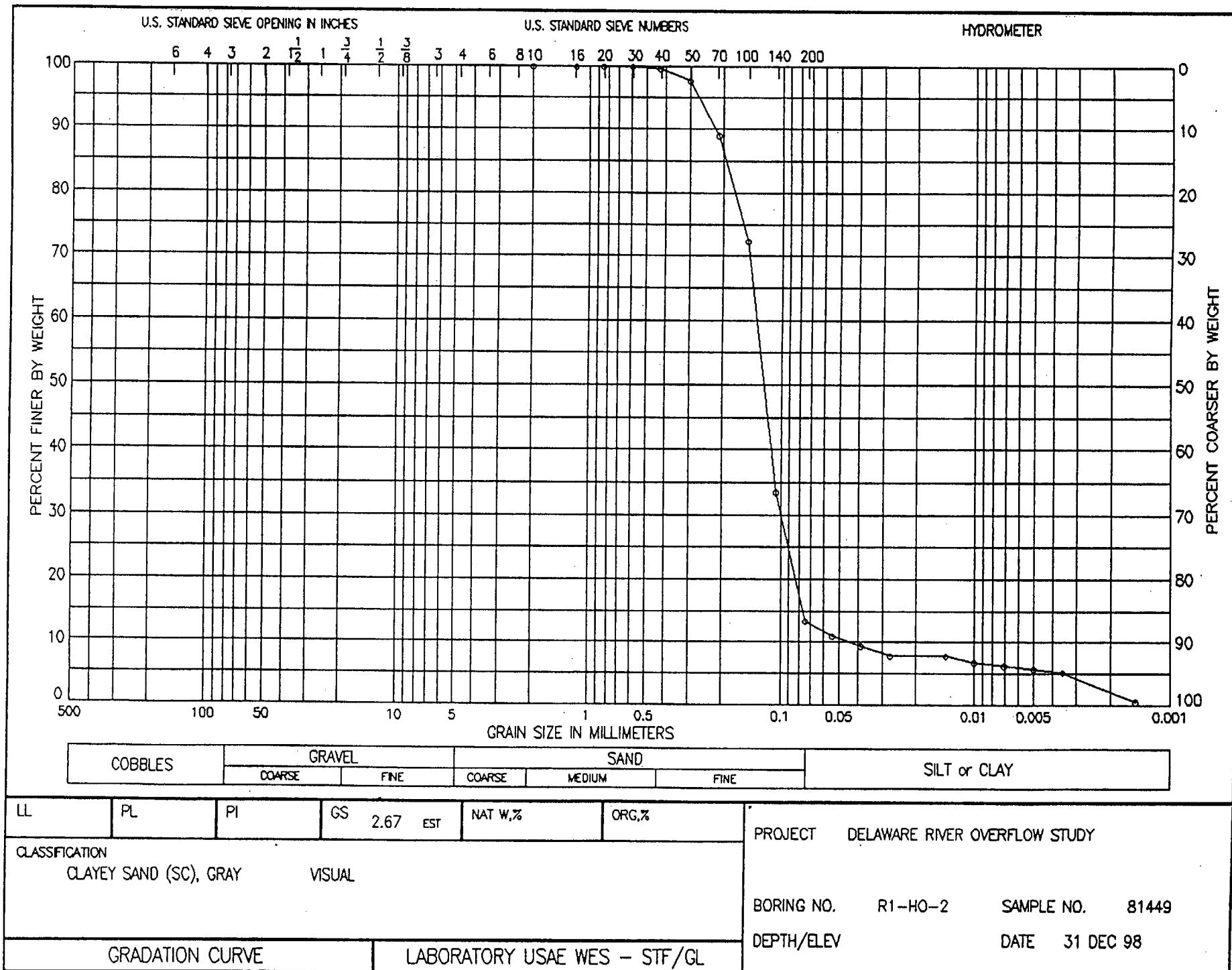
RDGS	TEMP			
1.9	24.0	.0546	41.9	58.1
1.8	24.0	.0386	40.0	60.0
1.8	24.0	.0273	40.0	60.0
1.3	24.0	.0142	30.5	69.5
1.2	24.0	.0100	28.6	71.4
1.2	24.0	.0071	28.6	71.4
1.2	24.0	.0050	28.6	71.4
1.0	24.0	.0035	24.7	75.3
.8	21.5	.0015	11.4	88.6

PERCENT GRAVEL = .0

PERCENT SAND = 54.8

PERCENT FINES = 45.2

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-2      SAMPLE: 81449      DF: MD0199 .DAT  
DEPTH:                  DATE: 31 DEC 98

NO-LIMITS-RAN      GS: 2.67 est      WC: .00

CLASSIFICATION: 662

CLAYEY SAND (SC), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 30.7 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.1	No 40	.425	99.7	.3
.7	No 50	.300	97.7	2.3
3.4	No 70	.212	88.9	11.1
8.5	No 100	.150	72.3	27.7
20.4	No 140	.106	33.6	66.4
26.6	No 200	.075	13.4	86.6

HYDROMETER:

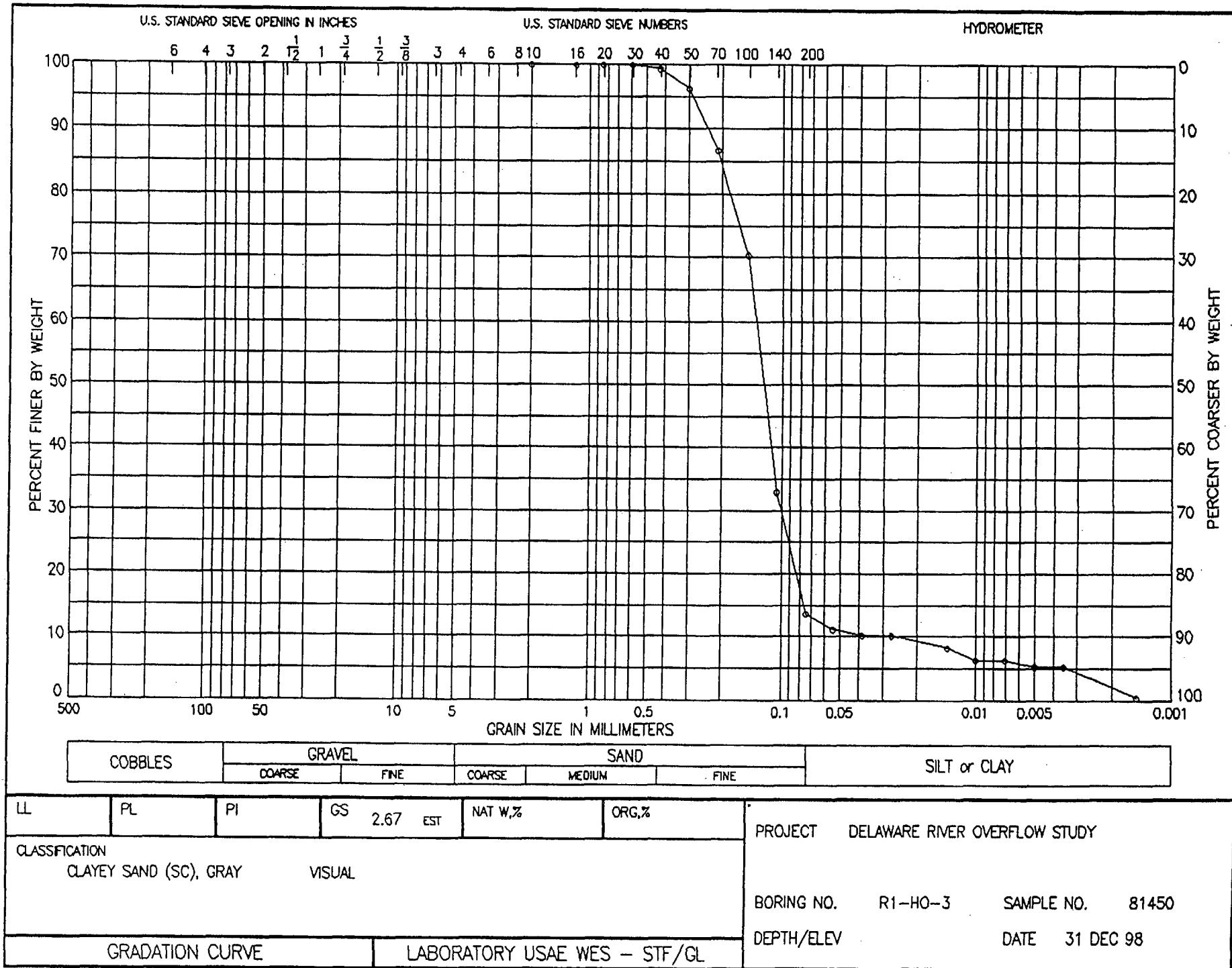
RDGS	TEMP			
1.8	24.0	.0546	10.9	89.1
1.5	24.0	.0387	9.4	90.6
1.2	24.0	.0274	7.8	92.2
1.2	24.0	.0142	7.8	92.2
1.0	24.0	.0100	6.8	93.2
.9	24.0	.0071	6.2	93.8
.8	24.0	.0050	5.7	94.3
.7	24.0	.0036	5.2	94.8
.3	21.5	.0015	.5	99.5

PERCENT GRAVEL = .0

PERCENT SAND = 86.6

PERCENT FINES = 13.4

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-3            SAMPLE: 81450    DF: MD0199 .DAT  
DEPTH:                    DATE: 31 DEC 98

NO-LIMITS-RAN    GS: 2.67 est    WC: .00

CLASSIFICATION: 670

CLAYEY SAND (SC), GRAY                    VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 33.0 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.2	No 40	.425	99.4	.6
1.2	No 50	.300	96.4	3.6
4.4	No 70	.212	86.7	13.3
9.8	No 100	.150	70.3	29.7
22.1	No 140	.106	33.0	67.0
28.5	No 200	.075	13.6	86.4

HYDROMETER:

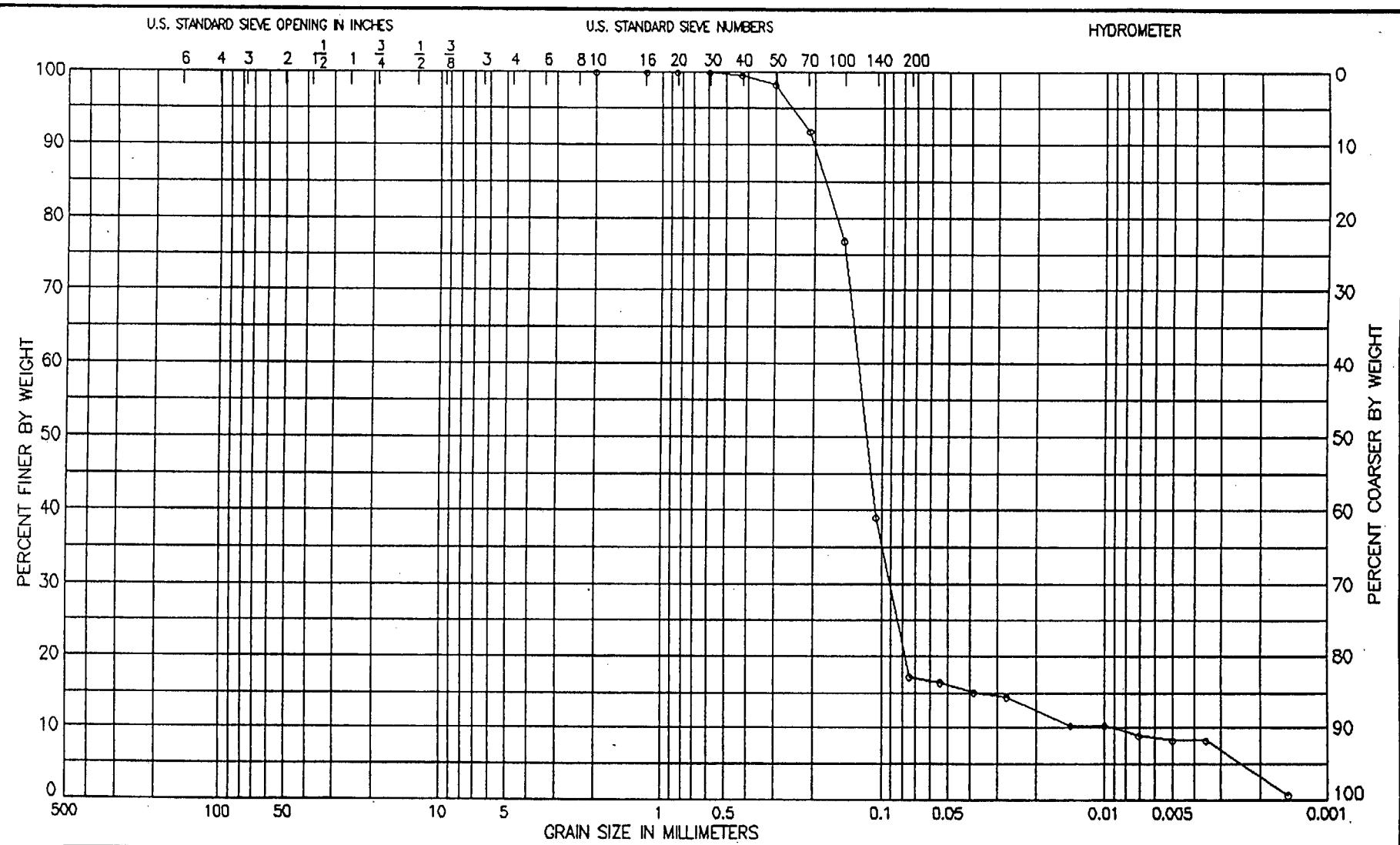
RDGS	TEMP			
2.0	24.0	.0545	11.1	88.9
1.8	24.0	.0386	10.2	89.8
1.8	24.0	.0273	10.2	89.8
1.4	24.0	.0141	8.2	91.8
1.0	24.0	.0100	6.3	93.7
1.0	24.0	.0071	6.3	93.7
.8	24.0	.0050	5.3	94.7
.8	24.0	.0036	5.3	94.7
.3	21.5	.0015	.5	99.5

PERCENT GRAVEL = .0

PERCENT SAND = 86.4

PERCENT FINES = 13.6

EDE



COBBLES	GRAVEL			SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE		

LL	PL	PI	GS	2.67	EST	NAT W. %	ORG. %	PROJECT	DELAWARE RIVER OVERFLOW STUDY
CLASSIFICATION	CLAYEY SAND (SC), GRAY						BORING NO.	R1-HO-4	SAMPLE NO. 81451
VISUAL							DEPTH/ELEV	DATE 31 DEC 98	
GRADATION CURVE			LABORATORY USAE WES - STF/GL						

SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-4                    SAMPLE: 81451    DF: MD0199 .DAT  
 DEPTH:                              DATE: 31 DEC 98

NO-LIMITS-RAN       GS: 2.67 est    WC:       .00

CLASSIFICATION: 678

CLAYEY SAND (SC), GRAY            VISUAL

TOTAL WEIGHT OF SAMPLE:         .0 gms.

PARTIAL WEIGHT AFTER SPLIT:    23.3 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.1	No 40	.425	99.6	.4
.4	No 50	.300	98.3	1.7
1.9	No 70	.212	91.8	8.2
5.4	No 100	.150	76.8	23.2
14.2	No 140	.106	39.1	60.9
19.3	No 200	.075	17.2	82.8

HYDROMETER:

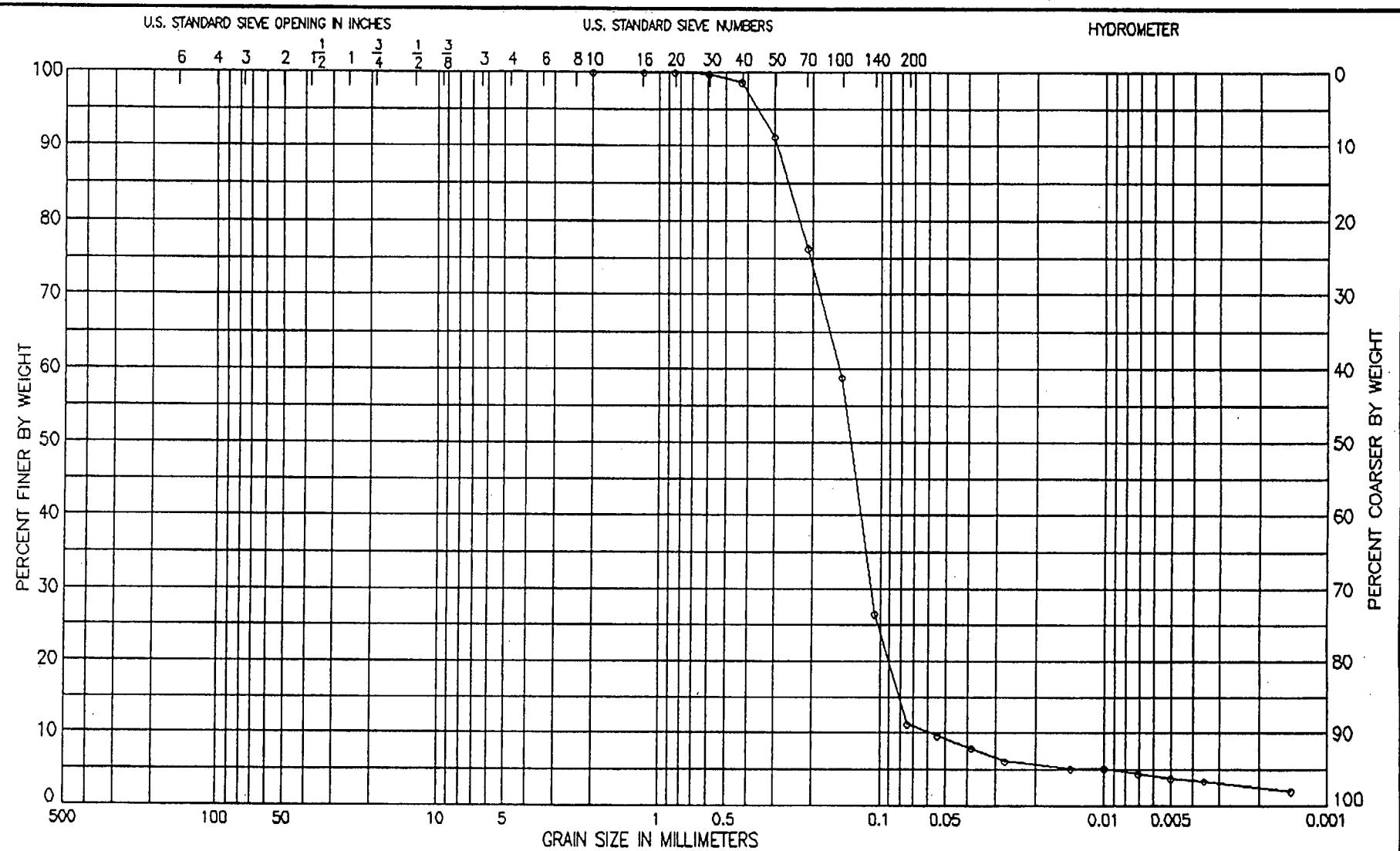
RDGS	TEMP			
2.1	24.0	.0545	16.5	83.5
1.9	24.0	.0386	15.1	84.9
1.8	24.0	.0273	14.4	85.6
1.2	24.0	.0142	10.3	89.7
1.2	24.0	.0100	10.3	89.7
1.0	24.0	.0071	8.9	91.1
.9	24.0	.0050	8.2	91.8
.9	24.0	.0035	8.2	91.8
.3	21.5	.0015	.7	99.3

PERCENT GRAVEL = .0

PERCENT SAND = 82.8

PERCENT FINES = 17.2

EDE



COBBLES	GRAVEL			SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE		

LL	PL	PI	GS	2.67 EST	NAT W.%	ORG. %	PROJECT	DELAWARE RIVER OVERFLOW STUDY
CLASSIFICATION	CLAYEY SAND (SC), GRAY				VISUAL		BORING NO.	R1-HO-5
							SAMPLE NO.	81452
GRADATION CURVE				LABORATORY USAE WES - STF/GL				DEPTH/ELEV
				DATE 31 DEC 98				

## SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-5                    SAMPLE: 81452    DF: MD0199 .DAT  
 DEPTH:                              DATE: 31 DEC 98

NO-LIMITS-RAN       GS: 2.67 est    WC: .00  
 CLASSIFICATION: 686  
 CLAYEY SAND (SC), GRAY                    VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT: 46.4 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.8	.2
.6	No 40	.425	98.7	1.3
4.1	No 50	.300	91.2	8.8
11.0	No 70	.212	76.3	23.7
19.1	No 100	.150	58.8	41.2
34.1	No 140	.106	26.5	73.5
41.2	No 200	.075	11.2	88.8

HYDROMETER:

RDGS	TEMP			
2.5	24.0	.0543	9.6	90.4
2.0	24.0	.0386	7.9	92.1
1.5	24.0	.0274	6.2	93.8
1.2	24.0	.0142	5.2	94.8
1.2	24.0	.0100	5.2	94.8
1.0	24.0	.0071	4.5	95.5
.8	24.0	.0050	3.8	96.2
.7	24.0	.0036	3.4	96.6
.3	24.0	.0015	2.1	97.9

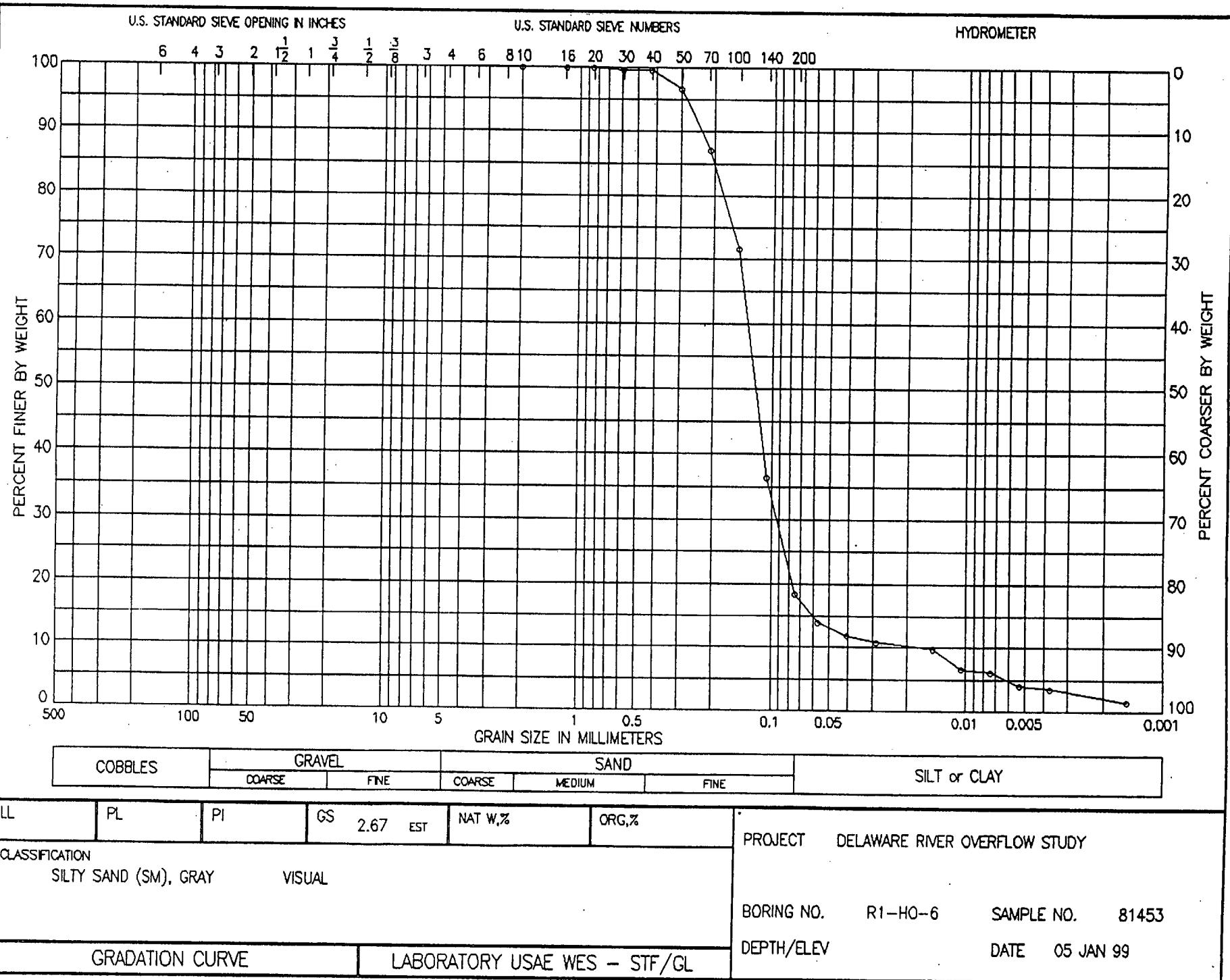
PERCENT GRAVEL = .0

PERCENT SAND = 88.8

PERCENT FINES = 11.2

D60 = .15  
 D30 = .11  
 D10 = .07  
 CU = 2.12  
 CC = 1.10

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-6      SAMPLE: 81453      DF: MD0199 .DAT  
DEPTH:                    DATE: 05 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC: .00  
CLASSIFICATION: 694  
SILTY SAND (SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
PARTIAL WEIGHT AFTER SPLIT: 31.0 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.7	.3
.1	No 40	.425	99.7	.3
1.0	No 50	.300	96.8	3.2
4.0	No 70	.212	87.1	12.9
8.8	No 100	.150	71.6	28.4
19.7	No 140	.106	36.5	63.5
25.3	No 200	.075	18.4	81.6

HYDROMETER:

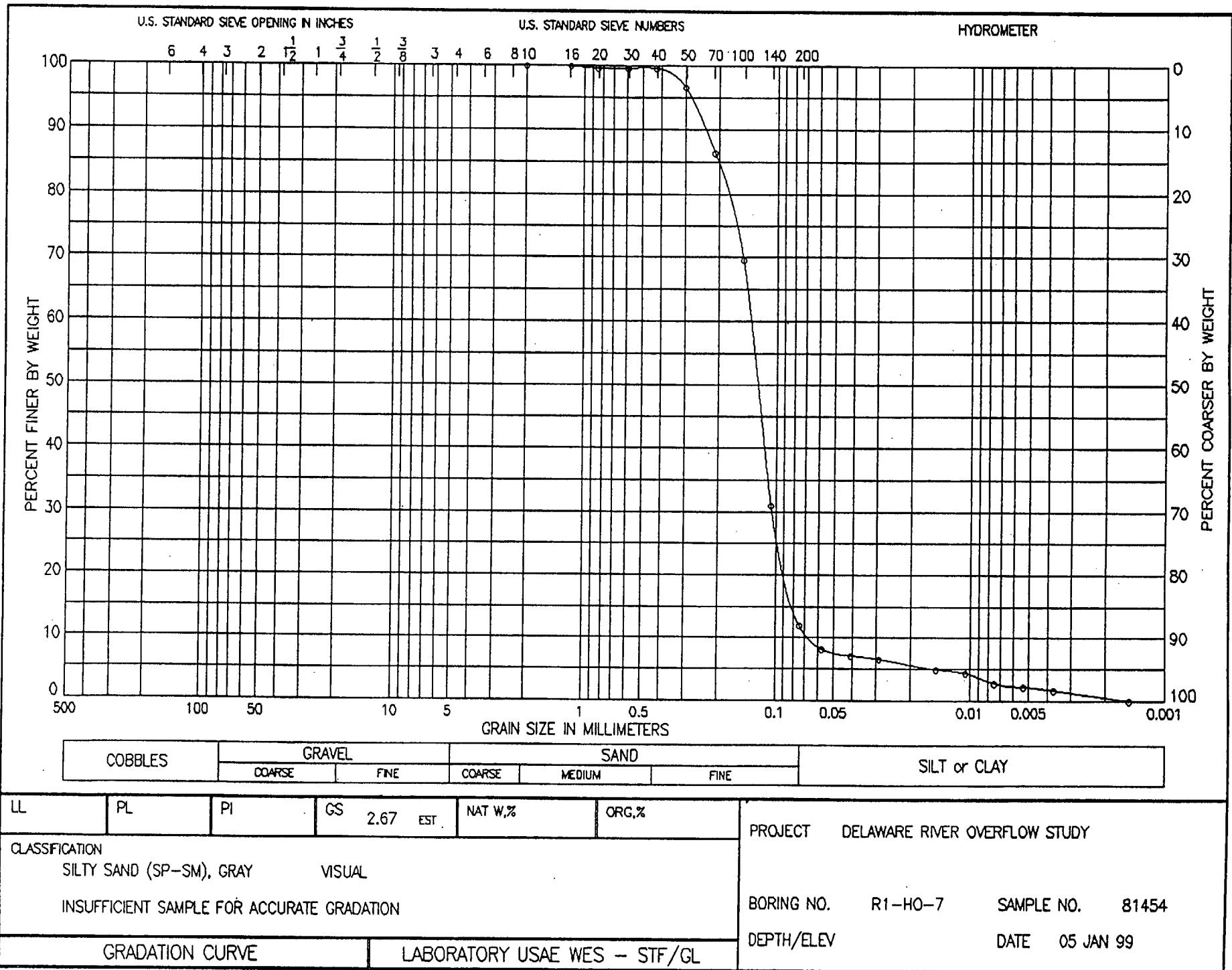
RDGS	TEMP			
3.4	19.0	.0573	13.9	86.1
3.0	19.0	.0407	11.9	88.1
2.8	19.0	.0288	10.8	89.2
2.6	19.0	.0149	9.8	90.2
2.0	19.0	.0106	6.7	93.3
1.9	19.0	.0075	6.2	93.8
1.5	19.0	.0053	4.1	95.9
1.2	20.0	.0037	3.6	96.4
.8	20.0	.0015	1.5	98.5

PERCENT GRAVEL = .0

PERCENT SAND = 81.6

PERCENT FINES = 18.4

EDE



## SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-7      SAMPLE: 81454      DF: MD0199Z .DAT  
 DEPTH:                  DATE: 05 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC: .00  
 CLASSIFICATION: 702  
 SILTY SAND (SP-SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT: 29.3 gms.  
 INSUFFICIENT SAMPLE FOR ACCURATE GRADATION

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.1	No 20	.850	99.7	.3
.1	No 30	.600	99.7	.3
.1	No 40	.425	99.7	.3
1.0	No 50	.300	96.6	3.4
4.0	No 70	.212	86.3	13.7
8.9	No 100	.150	69.6	30.4
20.2	No 140	.106	31.1	68.9
25.8	No 200	.075	11.9	88.1

## HYDROMETER:

RDGS	TEMP			
2.2	19.0	.0579	8.2	91.8
2.0	19.0	.0410	7.1	92.9
1.9	19.0	.0290	6.5	93.5
1.6	19.0	.0150	4.9	95.1
1.5	19.0	.0106	4.4	95.6
1.2	19.0	.0075	2.7	97.3
1.1	19.0	.0053	2.2	97.8
.8	20.0	.0037	1.6	98.4
.5	20.0	.0015	.0	100.0

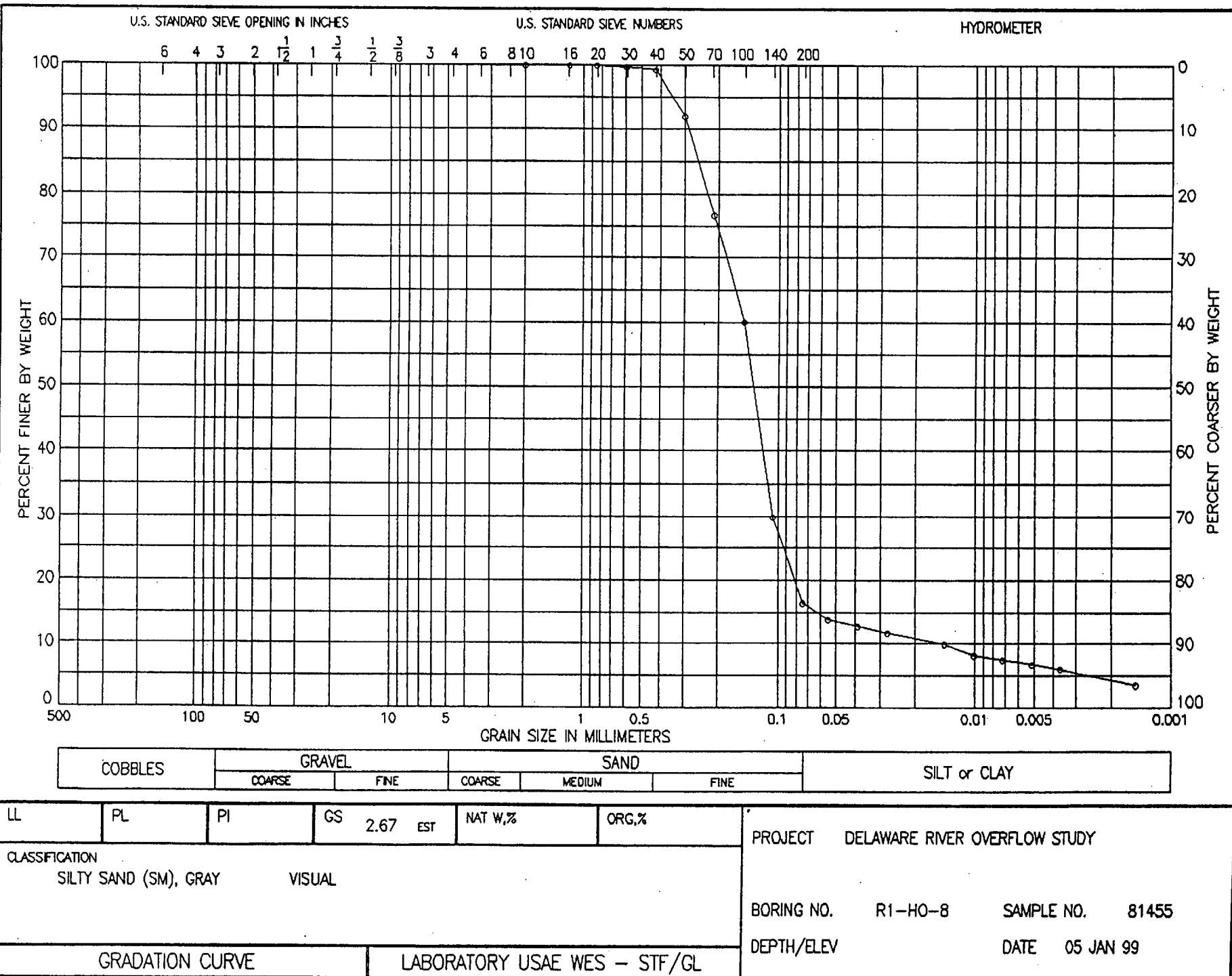
PERCENT GRAVEL = .0

PERCENT SAND = 88.1

PERCENT FINES = 11.9

D60 = .14  
 D30 = .10  
 D10 = .07  
 CU = 1.94  
 CC = 1.09

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-8                    SAMPLE: 81455    DF: MD0199 .DAT  
DEPTH:                            DATE: 05 JAN 99

NO-LIMITS-RAN    GS: 2.67 est    WC:     .00

CLASSIFICATION: 710

SILTY SAND (SM), GRAY                    VISUAL

TOTAL WEIGHT OF SAMPLE:     .0 gms.

PARTIAL WEIGHT AFTER SPLIT:    45.1 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.8	.2
.3	No 40	.425	99.3	.7
3.6	No 50	.300	92.0	8.0
10.5	No 70	.212	76.7	23.3
18.0	No 100	.150	60.1	39.9
31.6	No 140	.106	29.9	70.1
37.7	No 200	.075	16.4	83.6

HYDROMETER:

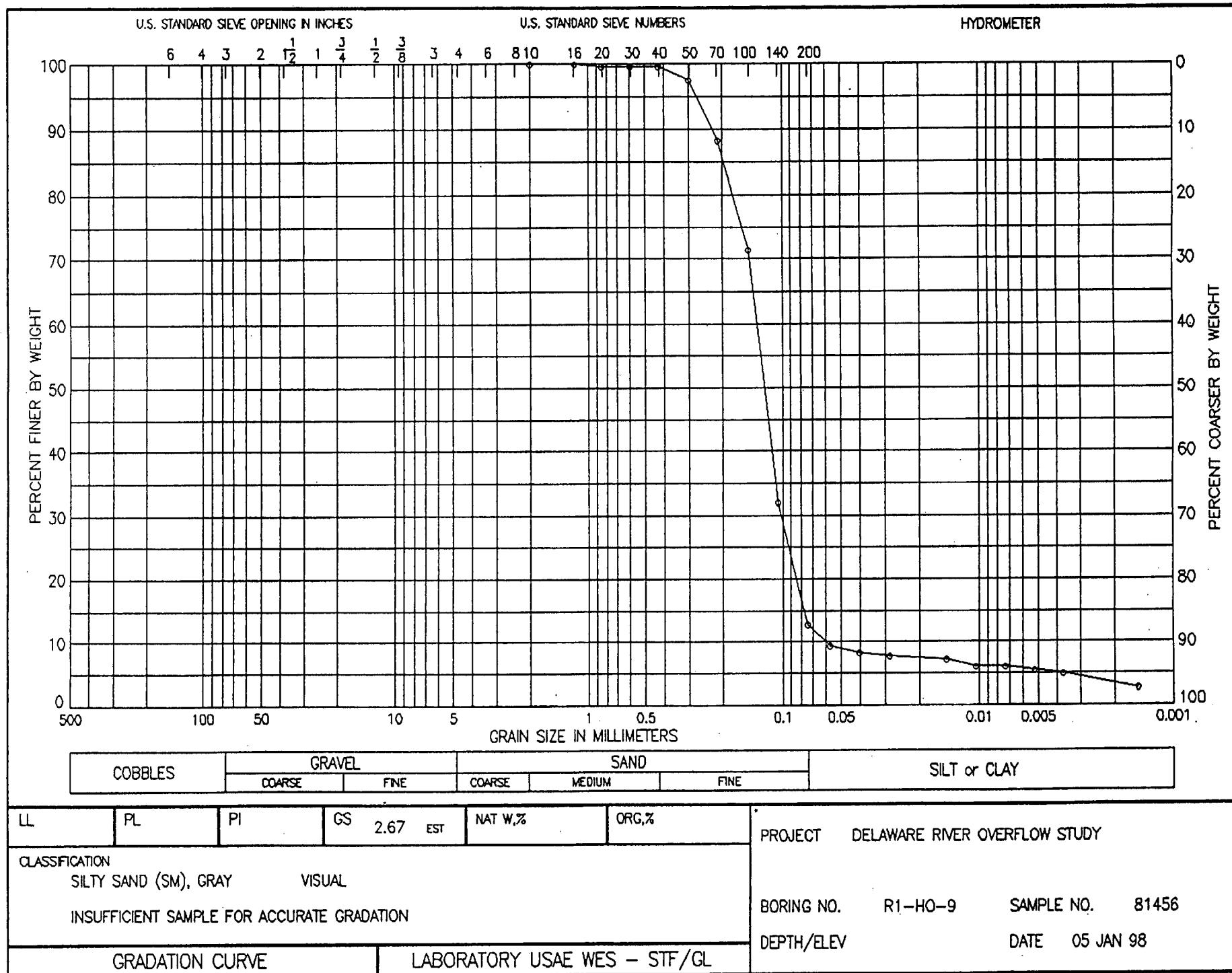
RDGS	TEMP			
4.0	22.0	.0550	13.8	86.2
3.7	22.0	.0390	12.8	87.2
3.4	22.0	.0276	11.7	88.3
2.9	22.0	.0143	9.9	90.1
2.4	22.0	.0102	8.2	91.8
2.4	21.0	.0073	7.4	92.6
2.2	21.0	.0052	6.7	93.3
2.2	20.0	.0037	6.0	94.0
1.5	20.0	.0015	3.5	96.5

PERCENT GRAVEL = .0

PERCENT SAND = 83.6

PERCENT FINES = 16.4

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-9      SAMPLE: 81456      DF: MD0199 .DAT  
DEPTH:                  DATE: 05 JAN 98

NO-LIMITS-RAN      GS: 2.67 est      WC:      .00

CLASSIFICATION: 718

SILTY SAND (SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:      29.0 gms.

INSUFFICIENT SAMPLE FOR ACCURATE GRADATION

WEIGHTS gm.	SIEVE SIZE or NUMBER No	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	10	2.000	100.0	.0
.0	16	1.180	100.0	.0
.1	20	.850	99.7	.3
.1	30	.600	99.7	.3
.1	40	.425	99.7	.3
.7	50	.300	97.6	2.4
3.4	70	.212	88.3	11.7
8.3	100	.150	71.4	28.6
19.7	140	.106	32.1	67.9
25.3	200	.075	12.8	87.2

HYDROMETER:

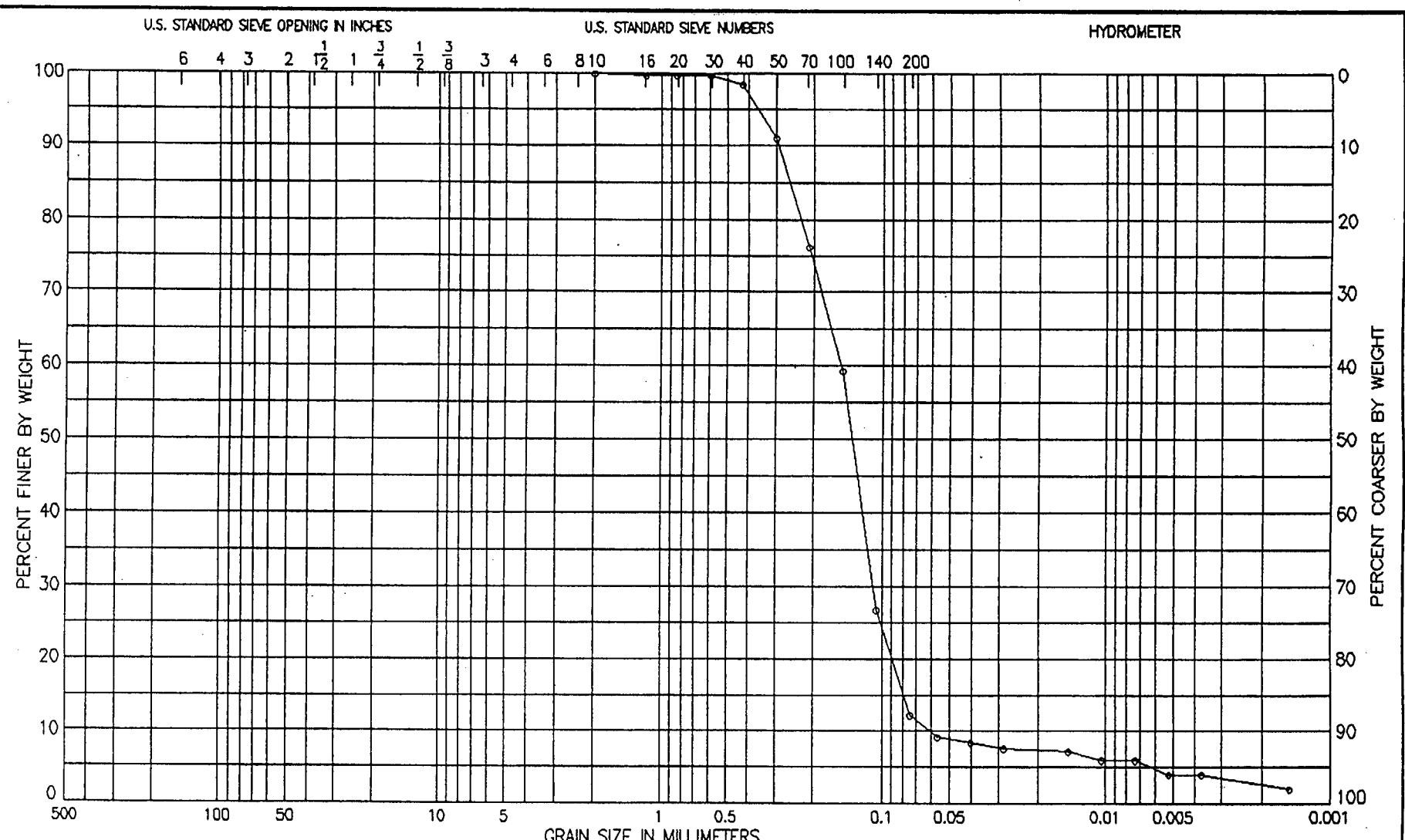
RDGS	TEMP			
2.1	20.5	.0572	9.4	90.6
1.9	20.5	.0405	8.3	91.7
1.8	20.5	.0287	7.7	92.3
1.7	20.5	.0148	7.2	92.8
1.6	20.0	.0105	6.1	93.9
1.6	20.0	.0074	6.1	93.9
1.5	20.0	.0052	5.5	94.5
1.4	20.0	.0037	5.0	95.0
1.0	20.0	.0015	2.8	97.2

PERCENT GRAVEL =      .0

PERCENT SAND      = 87.2

PERCENT FINES      = 12.8

EDE



COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LL	PL	PI	GS	2.67 EST	NAT W, %	ORG, %	PROJECT	DELAWARE RIVER OVERFLOW STUDY	
CLASSIFICATION	SILTY SAND (SM), GRAY		VISUAL						
BORING NO.	R1-HO-10		SAMPLE NO.	81457		DEPTH/ELEV	DATE 05 JAN 99		
GRADATION CURVE			LABORATORY USAE WES - STF/GL						

# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-10      SAMPLE: 81457      DF: MD0199 .DAT  
 DEPTH:                    DATE: 05 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC: .00

CLASSIFICATION: 726

SILTY SAND (SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 40.0 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.1	No 16	1.180	99.8	.3
.1	No 20	.850	99.8	.3
.1	No 30	.600	99.8	.3
.6	No 40	.425	98.5	1.5
3.6	No 50	.300	91.0	9.0
9.5	No 70	.212	76.3	23.8
16.3	No 100	.150	59.3	40.8
29.3	No 140	.106	26.8	73.3
35.1	No 200	.075	12.3	87.8

HYDROMETER:

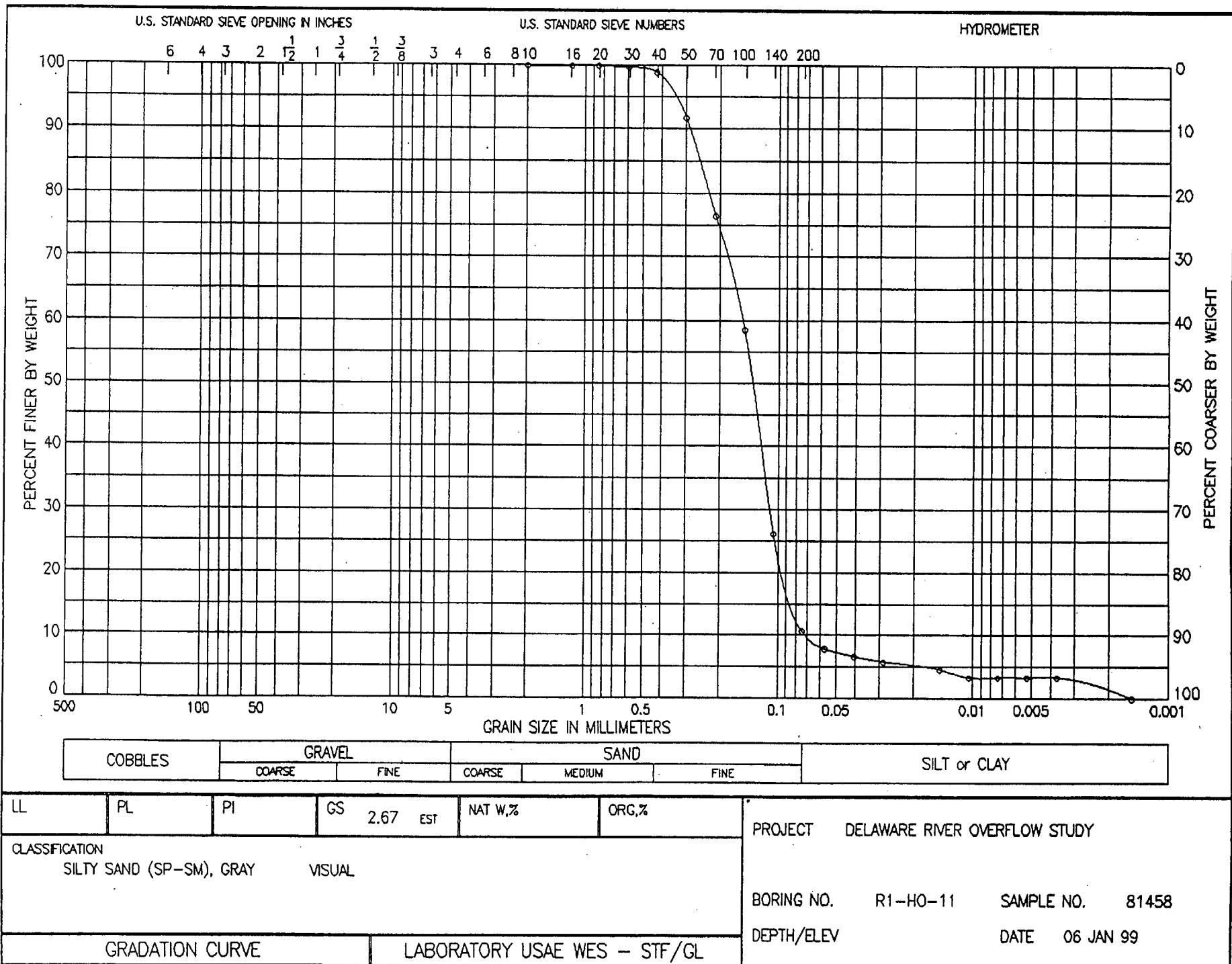
RDGS	TEMP			
2.8	20.0	.0569	9.2	90.8
2.6	20.0	.0403	8.4	91.6
2.4	20.0	.0285	7.6	92.4
2.3	20.0	.0147	7.2	92.8
2.0	20.0	.0105	6.0	94.0
2.0	20.0	.0074	6.0	94.0
1.5	20.0	.0052	4.0	96.0
1.5	20.0	.0037	4.0	96.0
1.0	20.0	.0015	2.0	98.0

PERCENT GRAVEL = .0

PERCENT SAND = 87.8

PERCENT FINES = 12.3

EDE



## SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-11      SAMPLE: 81458      DF: MD0199 .DAT  
 DEPTH:                    DATE: 06 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC: .00  
 CLASSIFICATION: 108  
 SILTY SAND (SP-SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 38.6 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.7	.3
.4	No 40	.425	99.0	1.0
3.2	No 50	.300	91.7	8.3
9.1	No 70	.212	76.4	23.6
16.0	No 100	.150	58.5	41.5
28.5	No 140	.106	26.2	73.8
34.5	No 200	.075	10.6	89.4

## HYDROMETER:

RDGS	TEMP			
2.3	20.5	.0571	7.9	92.1
2.0	20.5	.0405	6.6	93.4
1.8	20.5	.0287	5.8	94.2
1.5	20.5	.0148	4.6	95.4
1.3	20.0	.0105	3.3	96.7
1.3	20.0	.0074	3.3	96.7
1.3	20.0	.0053	3.3	96.7
1.3	20.0	.0037	3.3	96.7
.5	20.0	.0015	.0	100.0

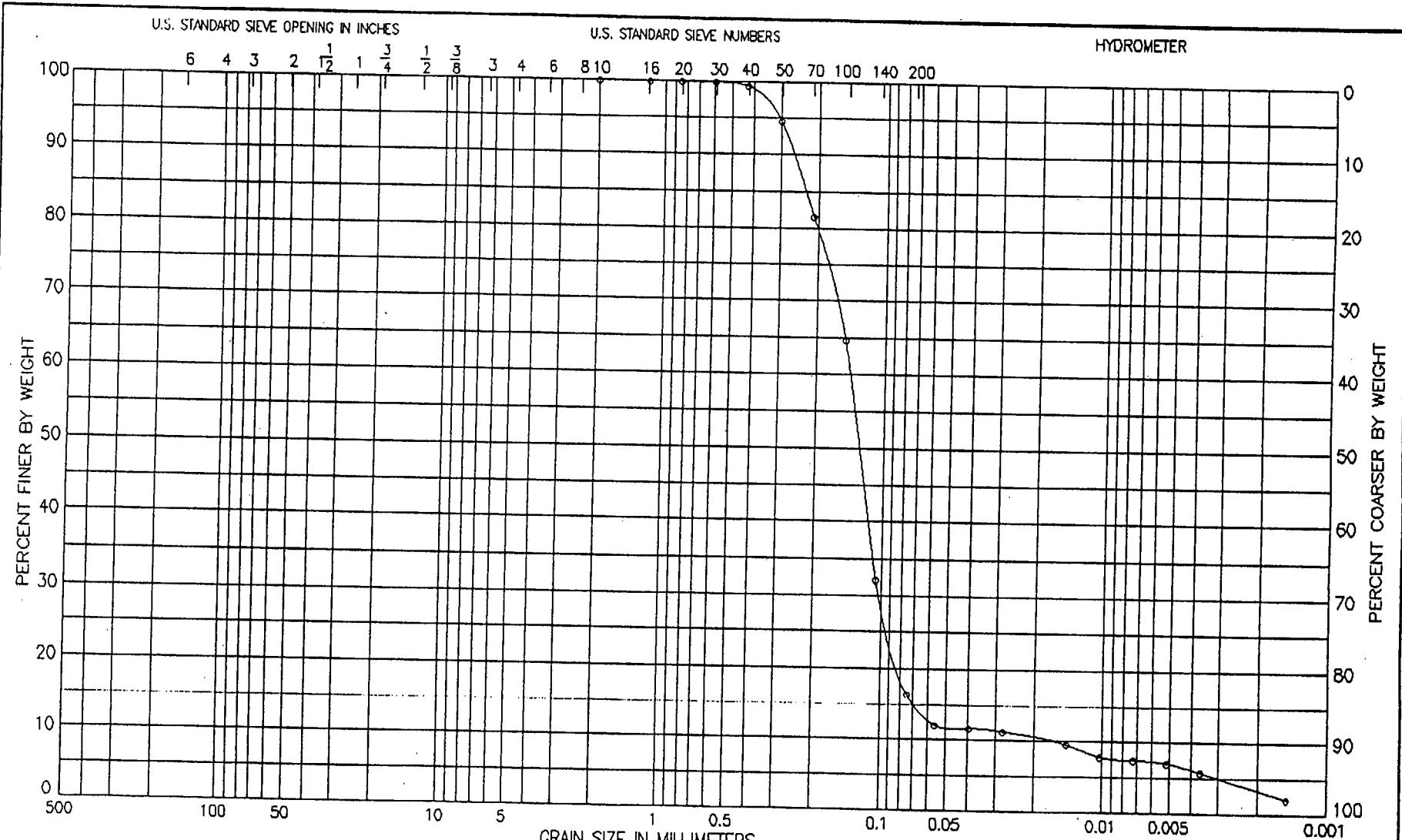
PERCENT GRAVEL = .0

PERCENT SAND = 89.4

PERCENT FINES = 10.6

D60 = .16  
 D30 = .11  
 D10 = .07  
 CU = 2.10  
 CC = 1.08

EDE



COBBLES	GRAVEL			SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE		

LL	PL	PI	GS	2.67 EST	NAT W, %	ORG, %	PROJECT	DELAWARE RIVER OVERFLOW STUDY
CLASSIFICATION	SILTY SAND (SM), GRAY				BORING NO.	R1-HO-12	SAMPLE NO.	81459
	VISUAL				DEPTH/ELEV	DATE 06 JAN 99		
GRADATION CURVE			LABORATORY USAE WES - STF/GL					

# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-12      SAMPLE: 81459      DF: MD0199 .DAT  
 DEPTH:                    DATE: 06 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC: .00

CLASSIFICATION: 124

SILTY SAND (SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 38.5 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.2	No 40	.425	99.5	.5
2.1	No 50	.300	94.5	5.5
7.1	No 70	.212	81.6	18.4
13.6	No 100	.150	64.7	35.3
26.1	No 140	.106	32.2	67.8
32.2	No 200	.075	16.4	83.6

## HYDROMETER:

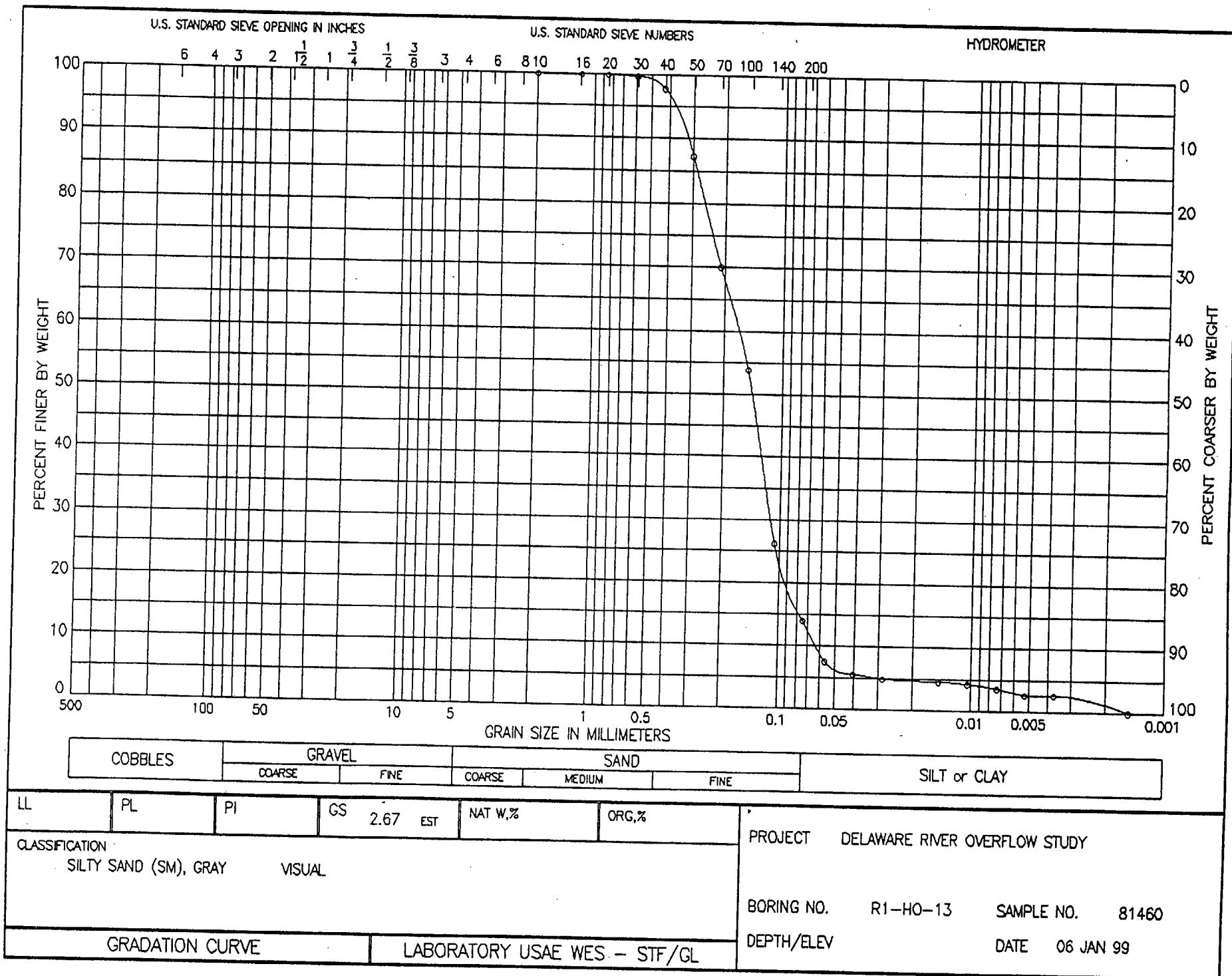
RDGS	TEMP			
3.2	21.0	.0560	12.0	88.0
3.1	21.0	.0396	11.6	88.4
3.0	21.0	.0281	11.2	88.8
2.6	21.0	.0145	9.6	90.4
2.2	21.0	.0103	7.9	92.1
2.1	21.0	.0073	7.5	92.5
2.0	21.0	.0052	7.1	92.9
1.7	21.0	.0037	5.8	94.2
.8	21.0	.0015	2.1	97.9

PERCENT GRAVEL = .0

PERCENT SAND = 83.6

PERCENT FINES = 16.4

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-13      SAMPLE: 81460      DF: MD0199 .DAT  
DEPTH:                    DATE: 06 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC:      .00  
CLASSIFICATION: 140  
SILTY SAND (SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:      48.1 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.8	.2
1.0	No 40	.425	97.9	2.1
6.1	No 50	.300	87.3	12.7
14.4	No 70	.212	70.1	29.9
22.2	No 100	.150	53.8	46.2
35.5	No 140	.106	26.2	73.8
41.4	No 200	.075	13.9	86.1

HYDROMETER:

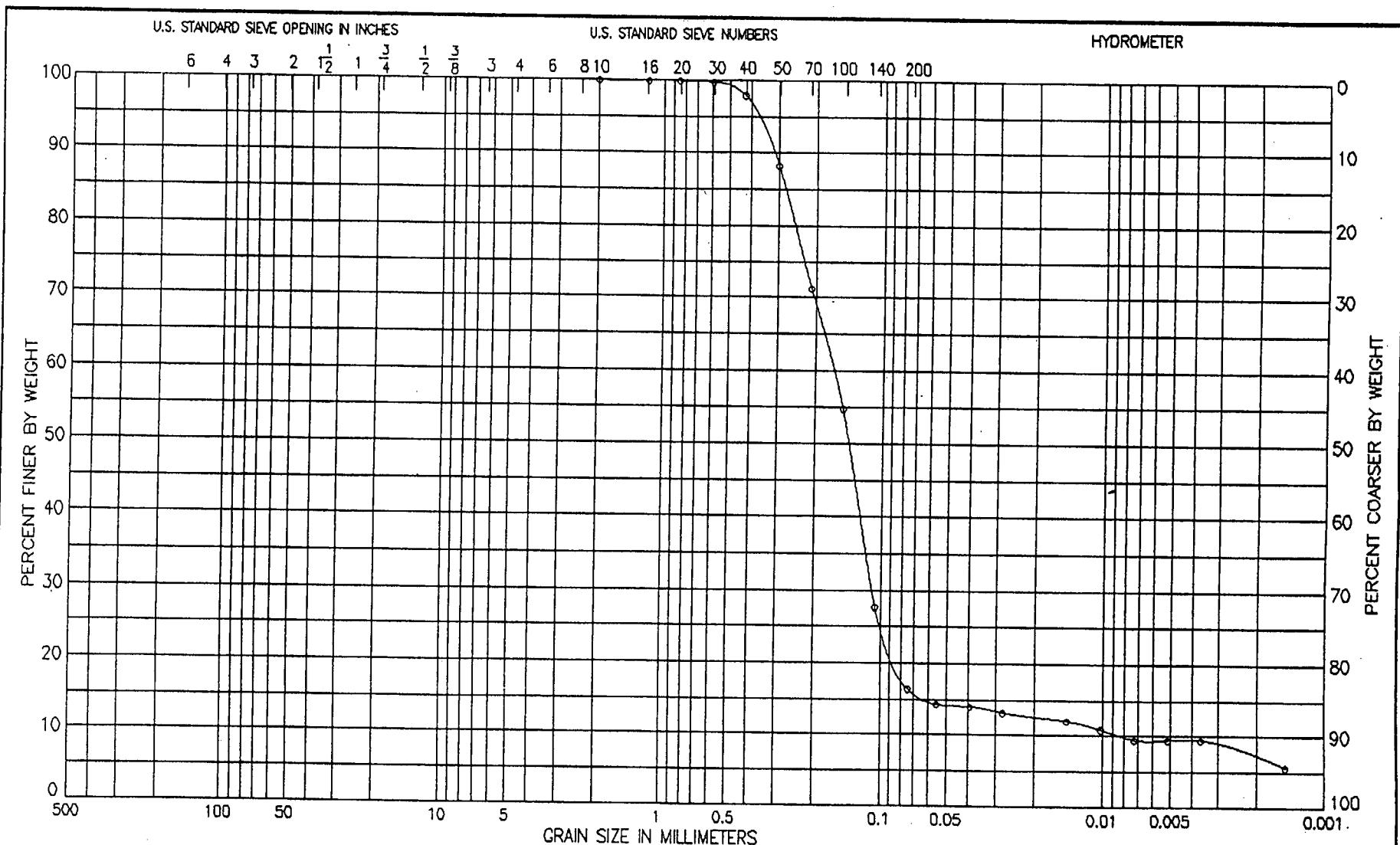
RDGS	TEMP			
2.8	20.0	.0569	7.6	92.4
2.2	20.0	.0404	5.7	94.3
2.0	20.0	.0286	5.0	95.0
1.9	20.0	.0148	4.7	95.3
1.8	20.0	.0105	4.3	95.7
1.6	20.0	.0074	3.7	96.3
1.3	20.0	.0053	2.7	97.3
1.3	20.0	.0037	2.7	97.3
.5	20.0	.0015	.0	100.0

PERCENT GRAVEL = .0

PERCENT SAND = 86.1

PERCENT FINES = 13.9

EDE



COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LL	PL	PI	GS	2.67	EST	NAT W. %	ORG. %	PROJECT	DELAWARE RIVER OVERFLOW STUDY
CLASSIFICATION	SILTY SAND (SM), GRAY					VISUAL		BORING NO.	R1-HO-14
								SAMPLE NO.	81461
GRADATION CURVE			LABORATORY USAE WES - STF/GL					DEPTH/ELEV	DATE 06 JAN 99

# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-14      SAMPLE: 81461      DF: MD0199 .DAT  
DEPTH:                    DATE: 06 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC: .00

CLASSIFICATION: 156

SILTY SAND (SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 55.9 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.8	.2
1.1	No 40	.425	98.0	2.0
6.6	No 50	.300	88.2	11.8
16.1	No 70	.212	71.2	28.8
25.3	No 100	.150	54.7	45.3
40.4	No 140	.106	27.7	72.3
46.7	No 200	.075	16.5	83.5

HYDROMETER:

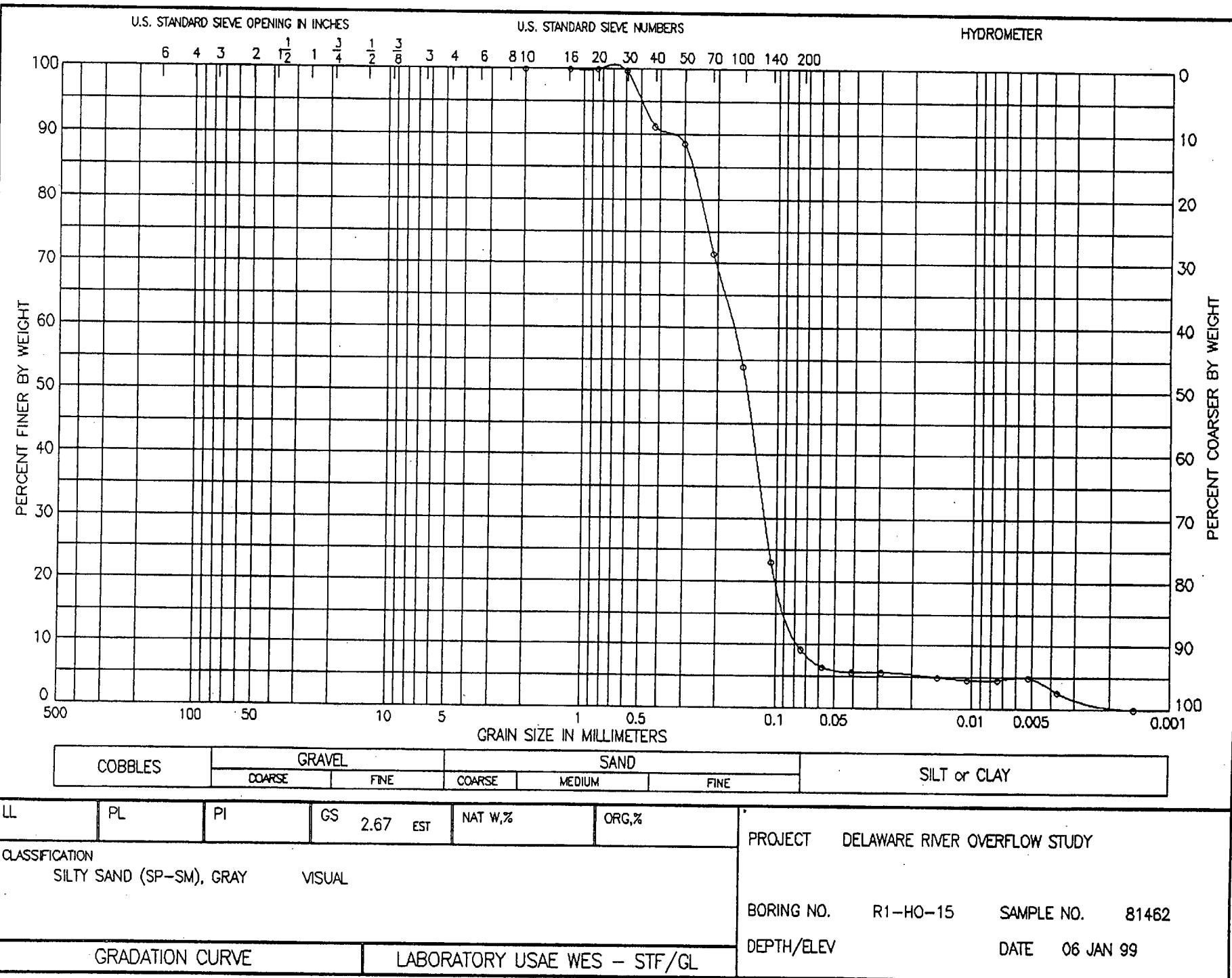
RDGS	TEMP			
5.5	20.0	.0557	14.3	85.7
5.4	20.0	.0394	14.0	86.0
5.1	20.0	.0279	13.2	86.8
4.7	20.0	.0145	12.0	88.0
4.3	20.0	.0103	10.9	89.1
3.8	20.0	.0073	9.4	90.6
3.8	20.0	.0052	9.4	90.6
3.8	20.0	.0036	9.4	90.6
2.5	20.0	.0015	5.7	94.3

PERCENT GRAVEL = .0

PERCENT SAND = 83.5

PERCENT FINES = 16.5

EDE



# SIEVE ANALYSIS

## PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-15      SAMPLE: 81462      DF: MD0199 .DAT  
 DEPTH:                    DATE: 06 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC:      .00  
 CLASSIFICATION: 172  
 SILTY SAND (SP-SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:      42.1 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.8	.2
3.7	No 40	.425	91.2	8.8
4.8	No 50	.300	88.6	11.4
12.0	No 70	.212	71.5	28.5
19.4	No 100	.150	53.9	46.1
32.4	No 140	.106	23.0	77.0
38.2	No 200	.075	9.3	90.7

### HYDROMETER:

RDGS	TEMP			
2.3	19.5	.0578	6.5	93.5
2.1	19.5	.0410	5.7	94.3
2.1	19.5	.0290	5.7	94.3
1.9	19.5	.0150	4.9	95.1
1.8	19.5	.0106	4.6	95.4
1.8	19.5	.0075	4.6	95.4
1.8	20.0	.0052	4.9	95.1
1.2	20.0	.0037	2.7	97.3
.5	20.0	.0015	.0	100.0

PERCENT GRAVEL = .0

PERCENT SAND = 90.7

PERCENT FINES = 9.3

D60 = .17

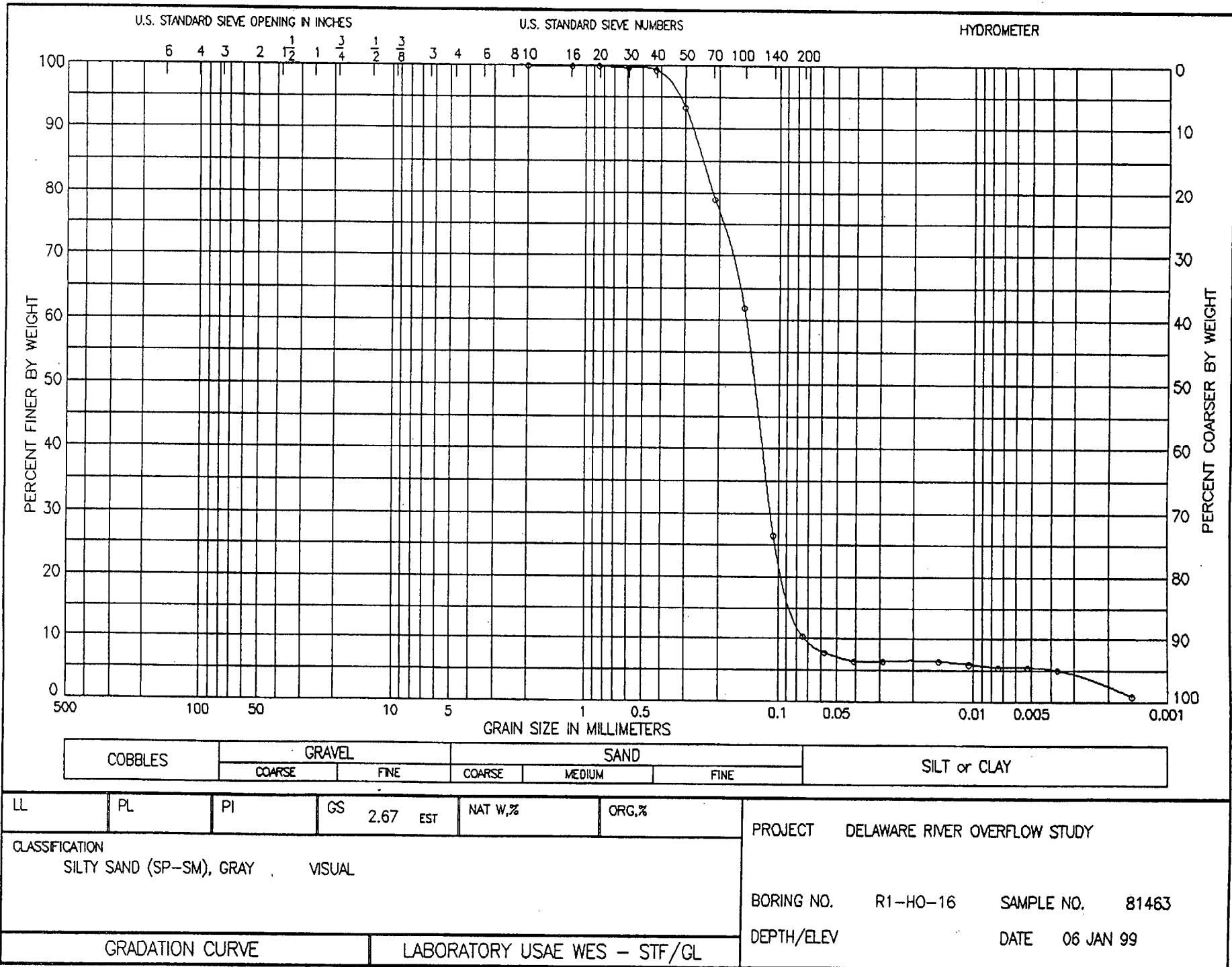
D30 = .12

D10 = .08

CU = 2.24

CC = 1.02

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-16      SAMPLE: 81463      DF: MD0199 .DAT  
DEPTH:                    DATE: 06 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC: .00  
CLASSIFICATION: 188  
SILTY SAND (SP-SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 34.7 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.7	.3
.2	No 40	.425	99.4	.6
2.3	No 50	.300	93.4	6.6
7.3	No 70	.212	79.0	21.0
13.2	No 100	.150	62.0	38.0
25.5	No 140	.106	26.5	73.5
31.1	No 200	.075	10.4	89.6

## HYDROMETER:

RDGS	TEMP			
2.3	19.5	.0578	7.8	92.2
2.0	19.5	.0410	6.5	93.5
2.0	19.5	.0290	6.5	93.5
2.0	19.5	.0150	6.5	93.5
1.9	19.5	.0106	6.0	94.0
1.8	19.5	.0075	5.5	94.5
1.7	20.0	.0052	5.5	94.5
1.6	20.0	.0037	5.1	94.9
.7	20.0	.0015	.9	99.1

PERCENT GRAVEL = .0

PERCENT SAND = 89.6

PERCENT FINES = 10.4

D60 = .15

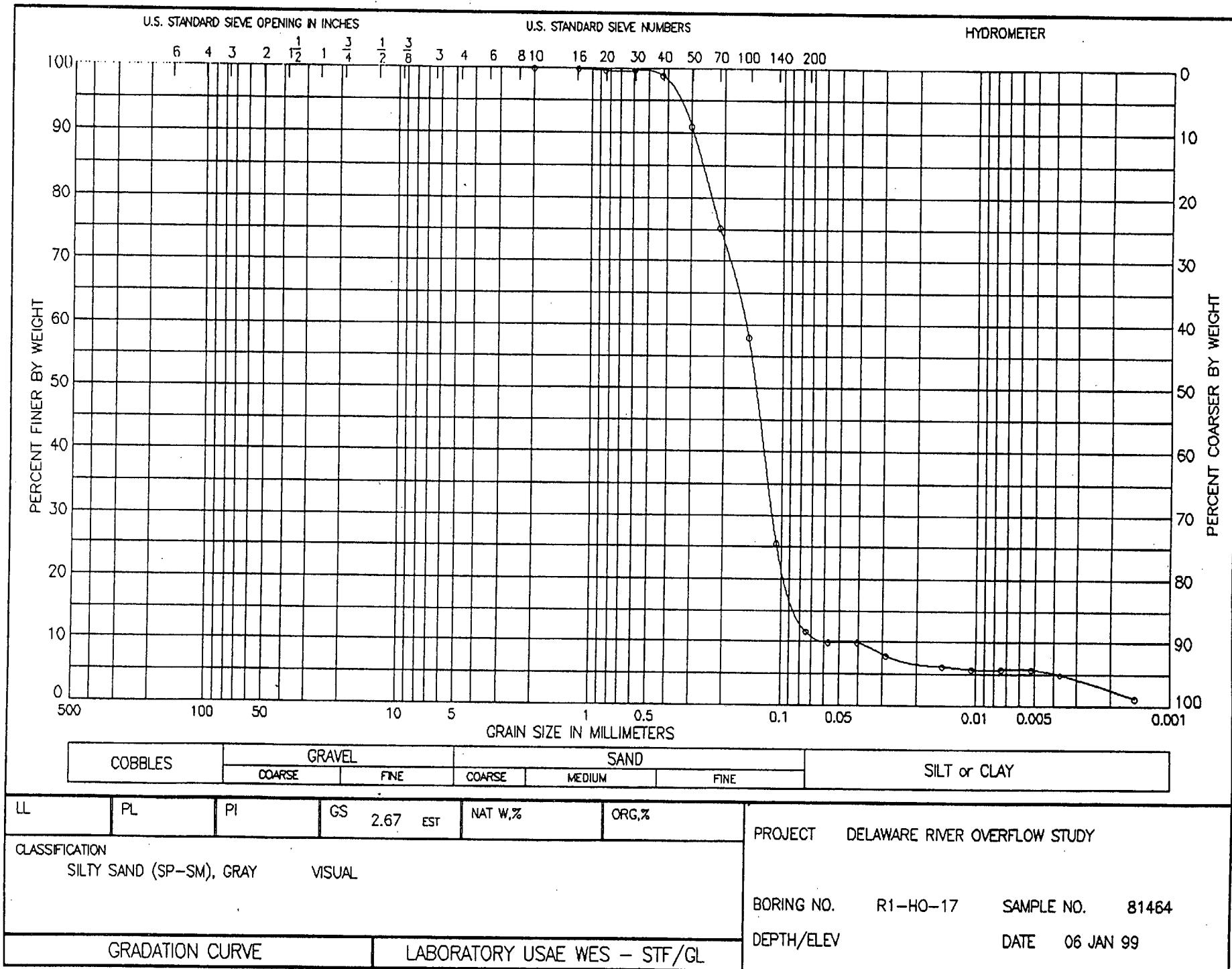
D30 = .11

D10 = .07

CU = 1.99

CC = 1.11

EDE



# SIEVE ANALYSIS

## PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-17      SAMPLE: 81464      DF: MD0199 .DAT  
DEPTH:                    DATE: 06 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC: .00  
CLASSIFICATION: 204  
SILTY SAND (SP-SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 38.8 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER No	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	10	2.000	100.0	.0
.0	16	1.180	100.0	.0
.1	20	.850	99.7	.3
.1	30	.600	99.7	.3
.4	40	.425	99.0	1.0
3.5	50	.300	91.0	9.0
9.6	70	.212	75.3	24.7
16.3	100	.150	58.0	42.0
28.9	140	.106	25.5	74.5
34.3	200	.075	11.6	88.4

### HYDROMETER:

RDGS	TEMP			
3.0	19.5	.0575	9.9	90.1
3.0	19.5	.0407	9.9	90.1
2.5	19.5	.0289	7.8	92.2
2.1	19.5	.0150	6.2	93.8
2.0	19.5	.0106	5.8	94.2
2.0	19.5	.0075	5.8	94.2
1.9	20.0	.0052	5.8	94.2
1.7	20.0	.0037	4.9	95.1
.8	20.0	.0015	1.2	98.8

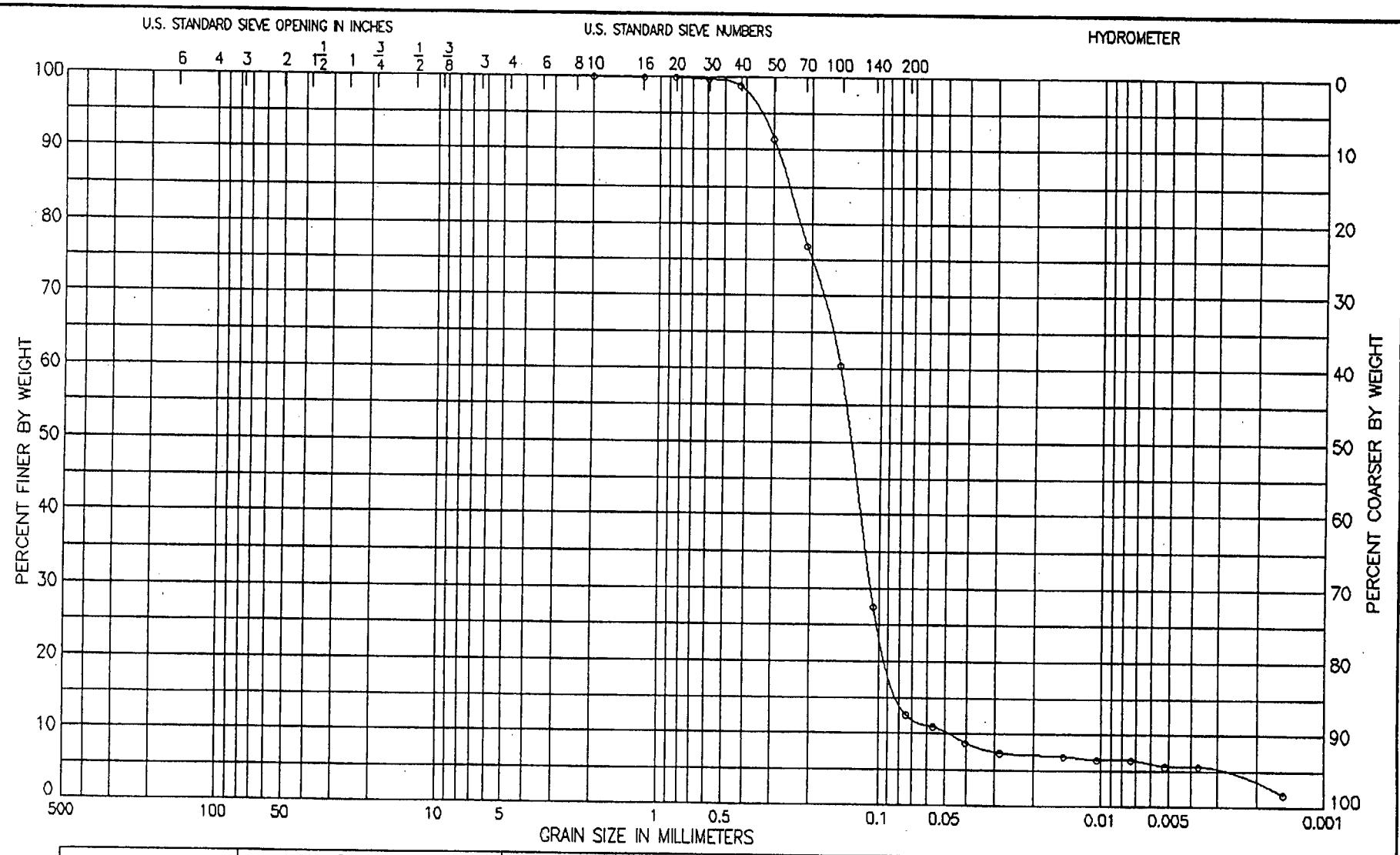
PERCENT GRAVEL = .0

PERCENT SAND = 88.4

PERCENT FINES = 11.6

D60 = .16  
D30 = .11  
D10 = .07  
CU = 2.20  
CC = 1.12

EDE



COBBLES

GRAVEL

COARSE

FINE

SAND

COARSE

MEDIUM

FINE

SILT or CLAY

LL

PL

PI

GS

2.67 EST

NAT W, %

ORG, %

PROJECT DELAWARE RIVER OVERFLOW STUDY

CLASSIFICATION

SILTY SAND (SM), GRAY

VISUAL

BORING NO. R1-HO-18 SAMPLE NO. 81465  
 DEPTH/ELEV DATE 06 JAN 99

GRADATION CURVE

LABORATORY USAE WES - STF/GL

## SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-18      SAMPLE: 81465      DF: MD0199 .DAT  
 DEPTH:                    DATE: 06 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC: .00

CLASSIFICATION: 204

SILTY SAND (SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 36.4 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.7	.3
.4	No 40	.425	98.9	1.1
3.1	No 50	.300	91.5	8.5
8.4	No 70	.212	76.9	23.1
14.4	No 100	.150	60.4	39.6
26.4	No 140	.106	27.5	72.5
31.8	No 200	.075	12.6	87.4

## HYDROMETER:

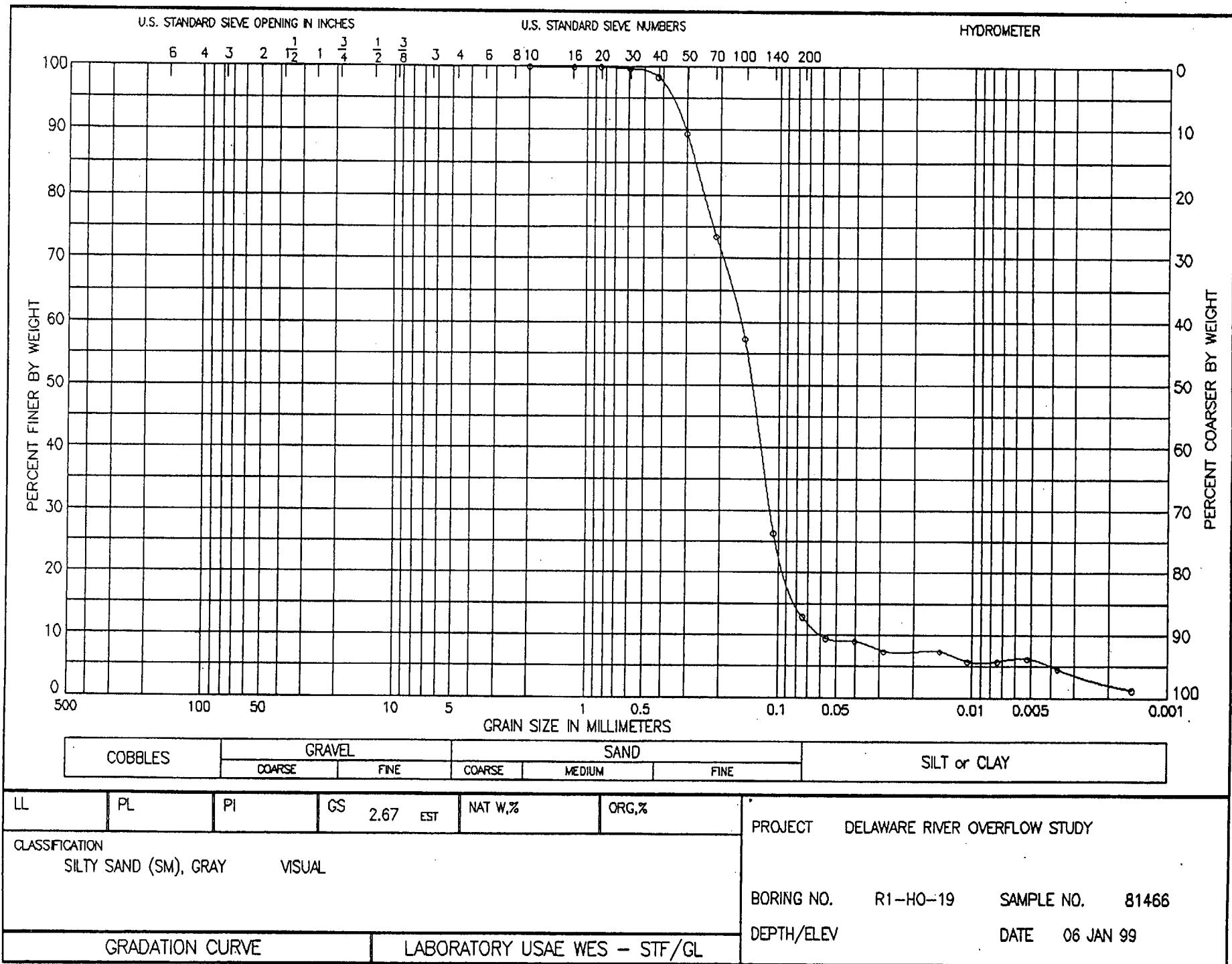
RDGS	TEMP			
3.0	20.0	.0568	11.0	89.0
2.5	20.0	.0403	8.8	91.2
2.2	20.0	.0286	7.5	92.5
2.1	20.0	.0148	7.0	93.0
2.0	20.0	.0105	6.6	93.4
2.0	20.0	.0074	6.6	93.4
1.8	20.0	.0052	5.7	94.3
1.8	20.0	.0037	5.7	94.3
.9	20.0	.0015	1.8	98.2

PERCENT GRAVEL = .0

PERCENT SAND = 87.4

PERCENT FINES = 12.6

EDE



# SIEVE ANALYSIS

## PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-19      SAMPLE: 81466      DF: MD0199 .DAT  
DEPTH:                    DATE: 06 JAN 99

10-LIMITS-RAN      GS: 2.67 est      WC: .00

CLASSIFICATION: 204

SILTY SAND (SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 38.7 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.7	.3
.6	No 40	.425	98.4	1.6
4.1	No 50	.300	89.4	10.6
10.3	No 70	.212	73.4	26.6
16.5	No 100	.150	57.4	42.6
28.5	No 140	.106	26.4	73.6
33.7	No 200	.075	12.9	87.1

### HYDROMETER:

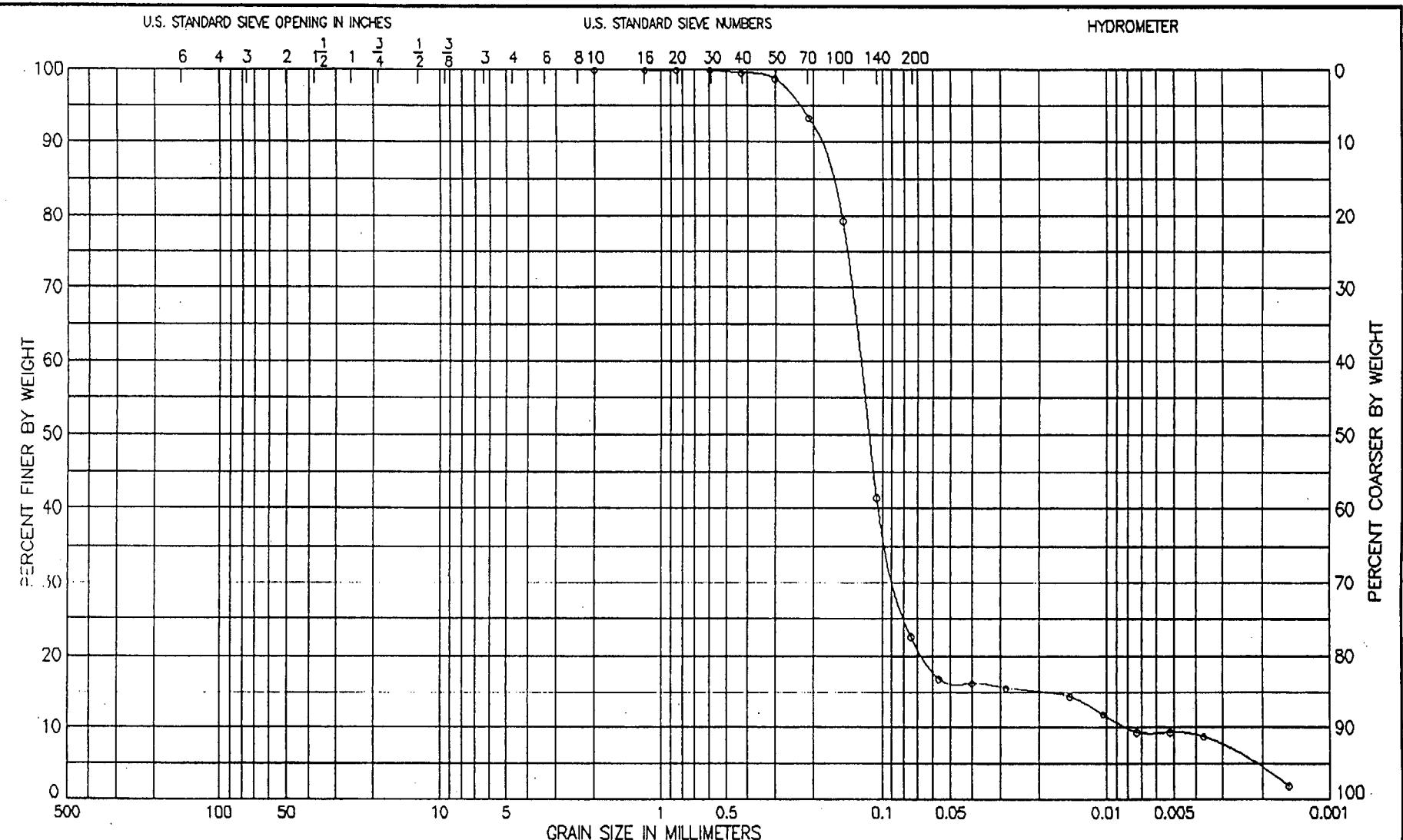
RDGS	TEMP			
2.8	20.0	.0569	9.5	90.5
2.7	20.0	.0403	9.1	90.9
2.3	20.0	.0286	7.4	92.6
2.3	20.0	.0147	7.4	92.6
2.0	19.5	.0106	5.8	94.2
2.0	19.5	.0075	5.8	94.2
2.0	20.0	.0052	6.2	93.8
1.6	20.0	.0037	4.5	95.5
.8	20.0	.0015	1.2	98.8

PERCENT GRAVEL = .0

PERCENT SAND = 87.1

PERCENT FINES = 12.9

EDE



COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LL	PL	PI	GS	2.67 EST	NAT W, %	ORG, %	PROJECT	DELAWARE RIVER OVERFLOW STUDY
CLASSIFICATION	SILTY SAND (SM), GRAY	VISUAL					BORING NO.	R1-HO-20
							SAMPLE NO.	81467
GRADATION CURVE			LABORATORY USAE WES - STF/GL					
							DEPTH/ELEV	DATE 06 JAN 99

# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-20      SAMPLE: 81467      DF: MD0199 .DAT  
DEPTH:                    DATE: 06 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC: .00

CLASSIFICATION: 204

SILTY SAND (SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 25.6 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.1	No 40	.425	99.6	.4
.3	No 50	.300	98.8	1.2
1.7	No 70	.212	93.4	6.6
5.3	No 100	.150	79.3	20.7
15.0	No 140	.106	41.4	58.6
19.8	No 200	.075	22.7	77.3

HYDROMETER:

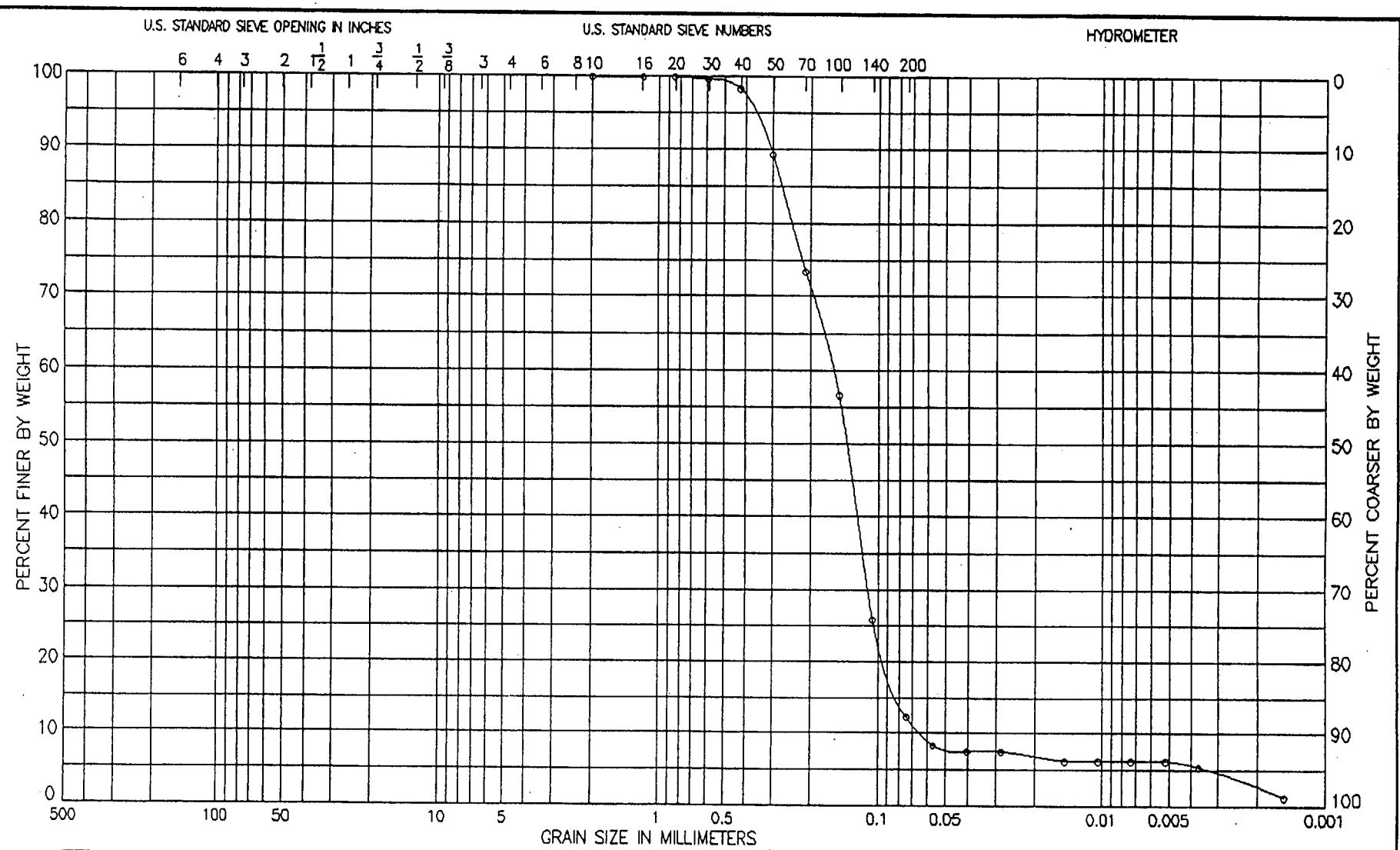
RDGS	TEMP			
3.2	20.0	.0567	16.9	83.1
3.1	20.0	.0401	16.2	83.8
3.0	20.0	.0284	15.6	84.4
2.8	20.0	.0147	14.4	85.6
2.4	20.0	.0104	11.9	88.1
2.0	20.0	.0074	9.4	90.6
2.0	20.0	.0052	9.4	90.6
1.9	20.0	.0037	8.7	91.3
.8	20.0	.0015	1.9	98.1

PERCENT GRAVEL = .0

PERCENT SAND = 77.3

PERCENT FINES = 22.7

EDE



COBBLES	GRAVEL			SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE		

LL	PL	PI	GS	2.67 EST	NAT W. %	ORG. %	PROJECT	DELAWARE RIVER OVERFLOW STUDY
CLASSIFICATION	SILTY SAND (SM), GRAY			VISUAL			BORING NO.	R1-HO-21
							SAMPLE NO.	81468
GRADATION CURVE			LABORATORY USAE WES - STF/GL			DEPTH/ELEV	DATE	06 JAN 99

# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-21      SAMPLE: 81468      DF: MD0199 .DAT  
DEPTH:                    DATE: 06 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC: .00  
CLASSIFICATION: 204  
SILTY SAND (SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
PARTIAL WEIGHT AFTER SPLIT: 38.3 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.7	.3
.6	No 40	.425	98.4	1.6
4.1	No 50	.300	89.3	10.7
10.2	No 70	.212	73.4	26.6
16.6	No 100	.150	56.7	43.3
28.4	No 140	.106	25.8	74.2
33.6	No 200	.075	12.3	87.7

HYDROMETER:

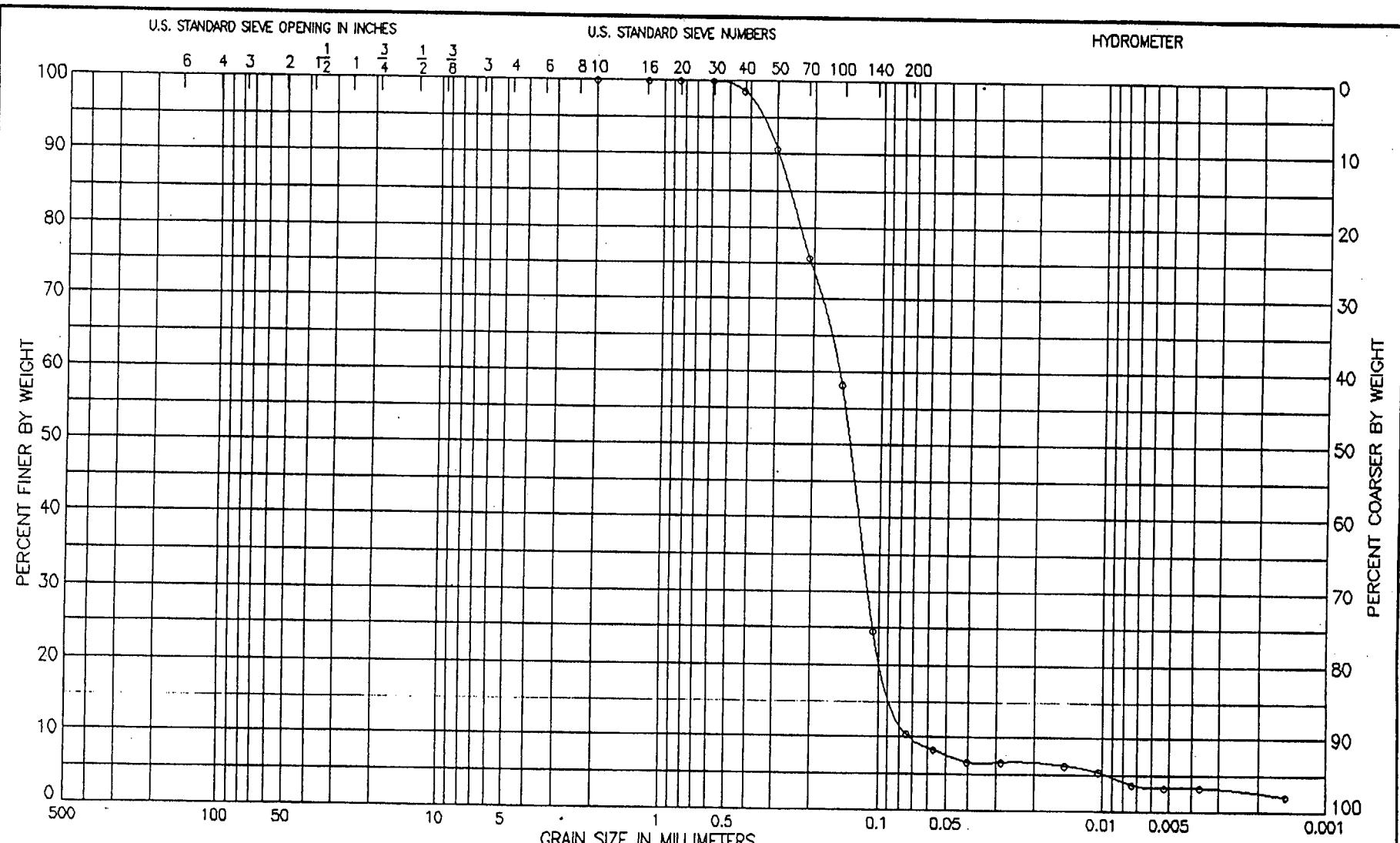
RDGS	TEMP.			
2.5	20.0	.0570	8.3	91.7
2.3	20.0	.0404	7.5	92.5
2.3	20.0	.0286	7.5	92.5
2.0	20.0	.0148	6.3	93.7
2.0	20.0	.0105	6.3	93.7
2.0	20.0	.0074	6.3	93.7
2.0	20.0	.0052	6.3	93.7
1.8	20.0	.0037	5.4	94.6
.8	20.0	.0015	1.3	98.7

PERCENT GRAVEL = .0

PERCENT SAND = 87.7

PERCENT FINES = 12.3

EDE



COBBLES

GRAVEL

SAND

COARSE

FINE

COARSE

MEDIUM

FINE

SILT or CLAY

LL

PL

PI

GS

2.67 EST

NAT W, %

ORG, %

PROJECT DELAWARE RIVER OVERFLOW STUDY

CLASSIFICATION

SILTY SAND (SP-SM), GRAY

VISUAL

BORING NO. R1-HO-22 SAMPLE NO. 81469

DEPTH/ELEV DATE 06 JAN 99'

GRADATION CURVE

LABORATORY USAE WES - STF/GL

# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-22      SAMPLE: 81469      DF: MD0199 .DAT  
 DEPTH:                    DATE: 06 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC:      .00  
 CLASSIFICATION: 204  
 SILTY SAND (SP-SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT:    38.3 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.5	No 40	.425	98.7	1.3
3.6	No 50	.300	90.6	9.4
9.3	No 70	.212	75.7	24.3
16.0	No 100	.150	58.2	41.8
28.9	No 140	.106	24.5	75.5
34.3	No 200	.075	10.4	89.6

## HYDROMETER:

RDGS	TEMP			
2.5	20.0	.0570	8.3	91.7
2.1	20.0	.0405	6.7	93.3
2.1	20.0	.0286	6.7	93.3
2.0	20.0	.0148	6.3	93.7
1.8	20.0	.0105	5.4	94.6
1.4	20.0	.0074	3.8	96.2
1.2	20.5	.0053	3.3	96.7
1.0	21.5	.0037	3.3	96.7
1.0	20.0	.0015	2.1	97.9

PERCENT GRAVEL = .0

PERCENT SAND = 89.6

PERCENT FINES = 10.4

D60 = .16

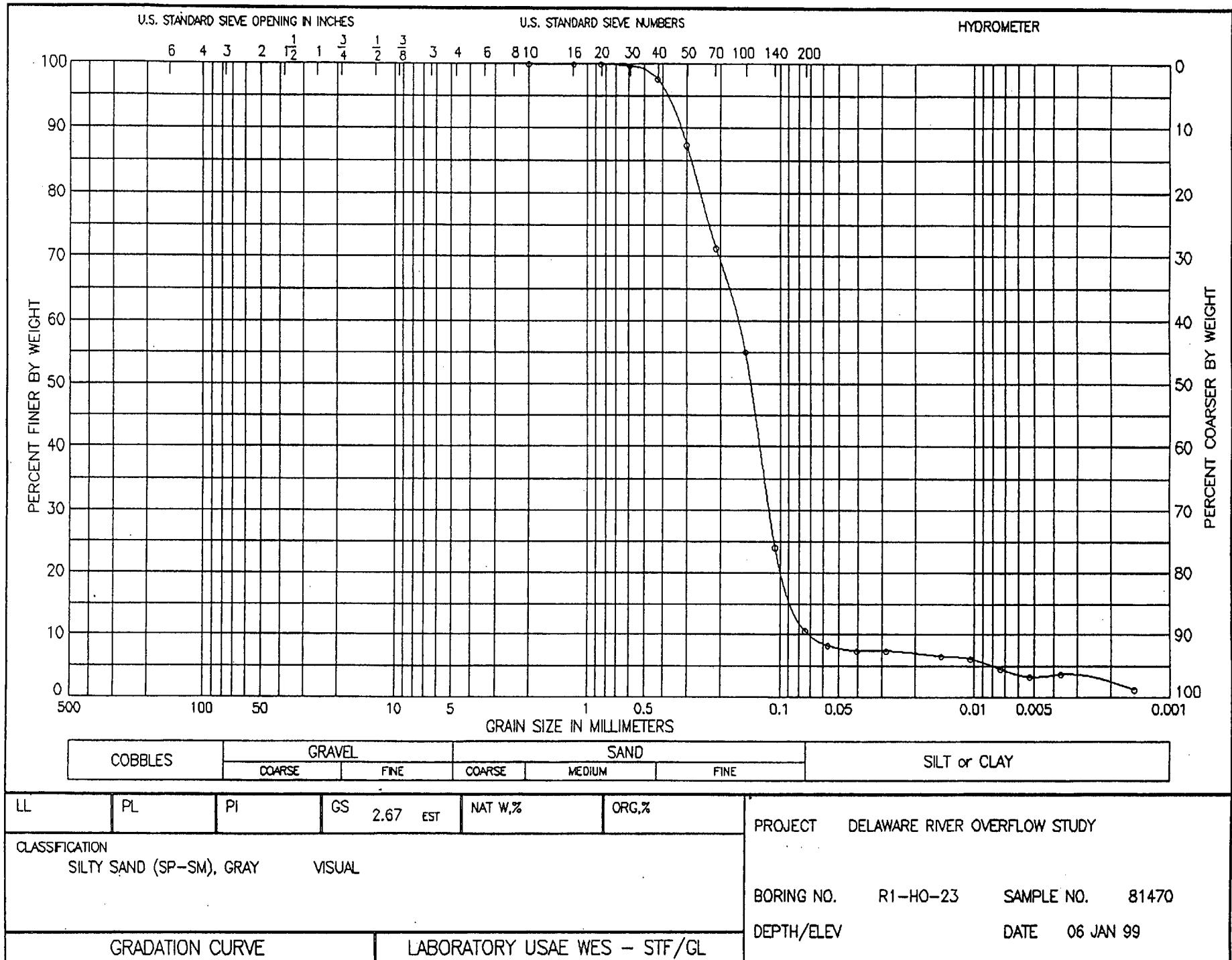
D30 = .11

D10 = .07

CU = 2.11

CC = 1.11

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-23      SAMPLE: 81470      DF: MD0199 .DAT  
DEPTH:                    DATE: 06 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC: .00

CLASSIFICATION: 204

SILTY SAND (SP-SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 38.7 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.7	.3
.9	No 40	.425	97.7	2.3
4.9	No 50	.300	87.3	12.7
11.1	No 70	.212	71.3	28.7
17.4	No 100	.150	55.0	45.0
29.4	No 140	.106	24.0	76.0
34.6	No 200	.075	10.6	89.4

## HYDROMETER:

RDGS	TEMP			
2.5	20.0	.0570	8.3	91.7
2.3	20.0	.0404	7.4	92.6
2.3	20.0	.0286	7.4	92.6
2.1	20.0	.0148	6.6	93.4
2.0	20.0	.0105	6.2	93.8
1.6	20.0	.0074	4.5	95.5
1.2	20.5	.0053	3.3	96.7
1.2	21.0	.0037	3.7	96.3
.8	20.0	.0015	1.2	98.8

PERCENT GRAVEL = .0

PERCENT SAND = 89.4

PERCENT FINES = 10.6

D60 = .17

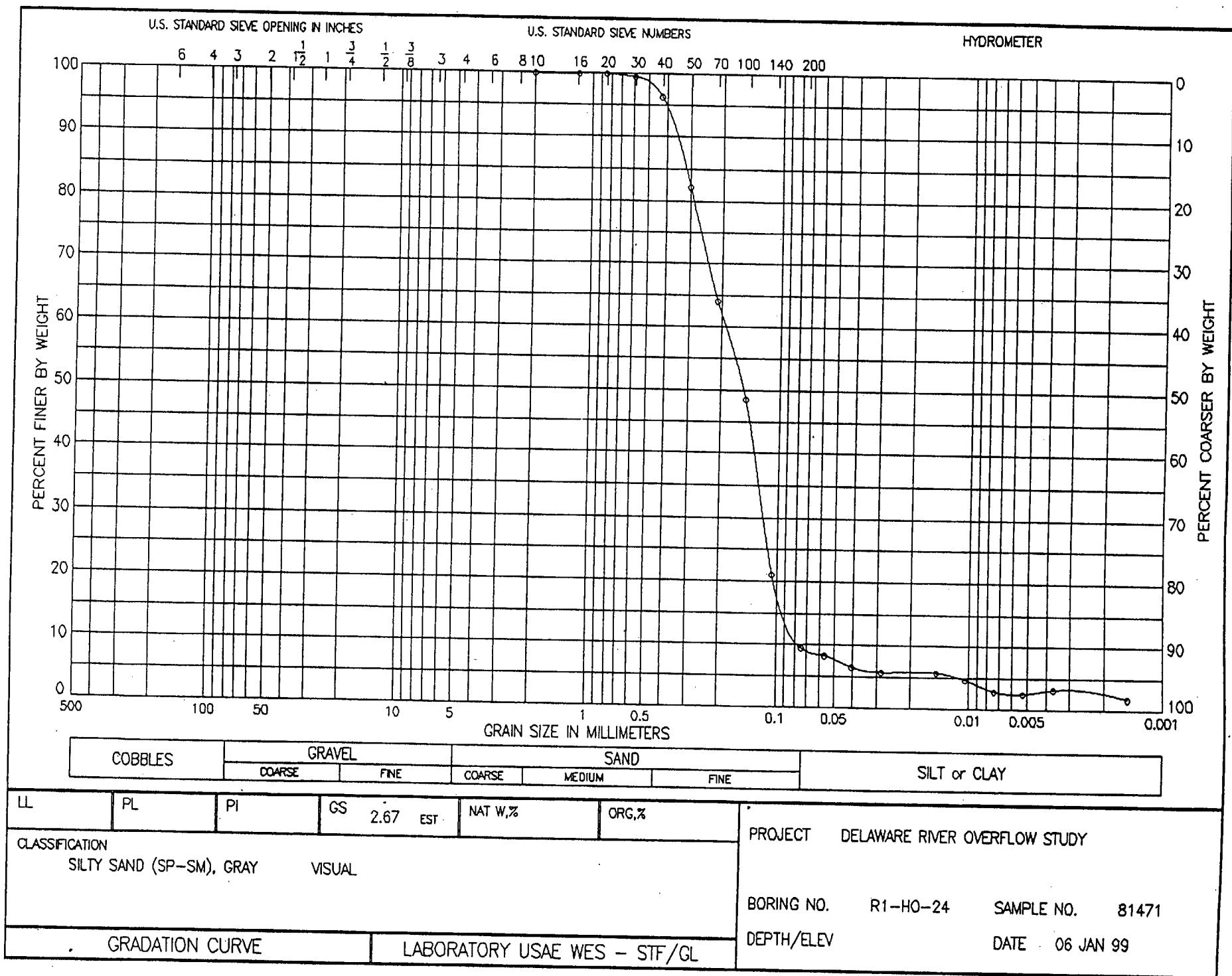
D30 = .11

D10 = .07

CU = 2.29

CC = 1.05

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-24      SAMPLE: 81471      DF: MD0199 .DAT  
 DEPTH:                    DATE: 06 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC: .00  
 CLASSIFICATION: 204  
 SILTY SAND (SP-SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT: 44.3 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER No	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	10	2.000	100.0	.0
.0	16	1.180	100.0	.0
.0	20	.850	100.0	.0
.2	30	.600	99.5	.5
1.6	40	.425	96.4	3.6
7.9	50	.300	82.2	17.8
15.9	70	.212	64.1	35.9
22.8	100	.150	48.5	51.5
35.0	140	.106	21.0	79.0
40.1	200	.075	9.5	90.5

## HYDROMETER:

RDGS	TEMP			
2.8	20.0	.0569	8.3	91.7
2.3	20.0	.0404	6.5	93.5
2.1	20.0	.0286	5.8	94.2
2.1	20.0	.0148	5.8	94.2
1.8	20.0	.0105	4.7	95.3
1.3	20.0	.0074	2.9	97.1
1.1	20.5	.0053	2.5	97.5
1.2	21.0	.0037	3.2	96.8
1.0	20.0	.0015	1.8	98.2

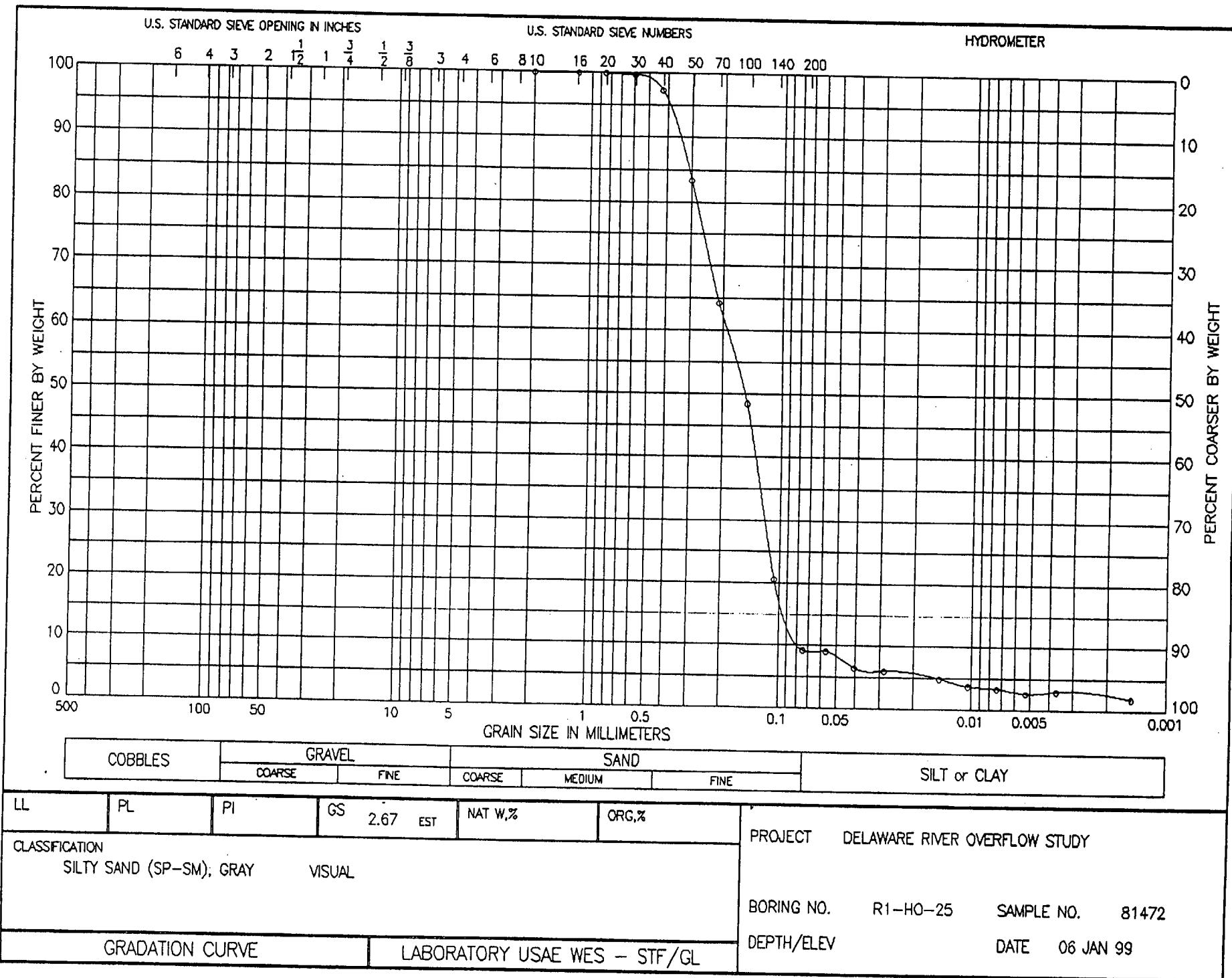
PERCENT GRAVEL = .0

PERCENT SAND = 90.5

PERCENT FINES = 9.5

D60 = .20  
 D30 = .12  
 D10 = .08  
 CU = 2.56  
 CC = .97

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-25      SAMPLE: 81472      DF: MD0199 .DAT  
DEPTH:                    DATE: 06 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC:      .00  
CLASSIFICATION: 204

SILTY SAND (SP-SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:      42.3 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.8	.2
1.1	No 40	.425	97.4	2.6
7.0	No 50	.300	83.5	16.5
15.1	No 70	.212	64.3	35.7
21.8	No 100	.150	48.5	51.5
33.6	No 140	.106	20.6	79.4
38.4	No 200	.075	9.2	90.8

## HYDROMETER:

RDGS	TEMP			
2.9	20.0	.0569	9.1	90.9
2.2	20.0	.0404	6.4	93.6
2.1	20.0	.0286	6.0	94.0
1.8	20.0	.0148	4.9	95.1
1.5	20.0	.0105	3.8	96.2
1.3	20.5	.0074	3.4	96.6
1.1	20.5	.0053	2.6	97.4
1.1	21.0	.0037	3.0	97.0
1.0	20.0	.0015	1.9	98.1

PERCENT GRAVEL = .0

PERCENT SAND = 90.8

PERCENT FINES = 9.2

D60 = .20

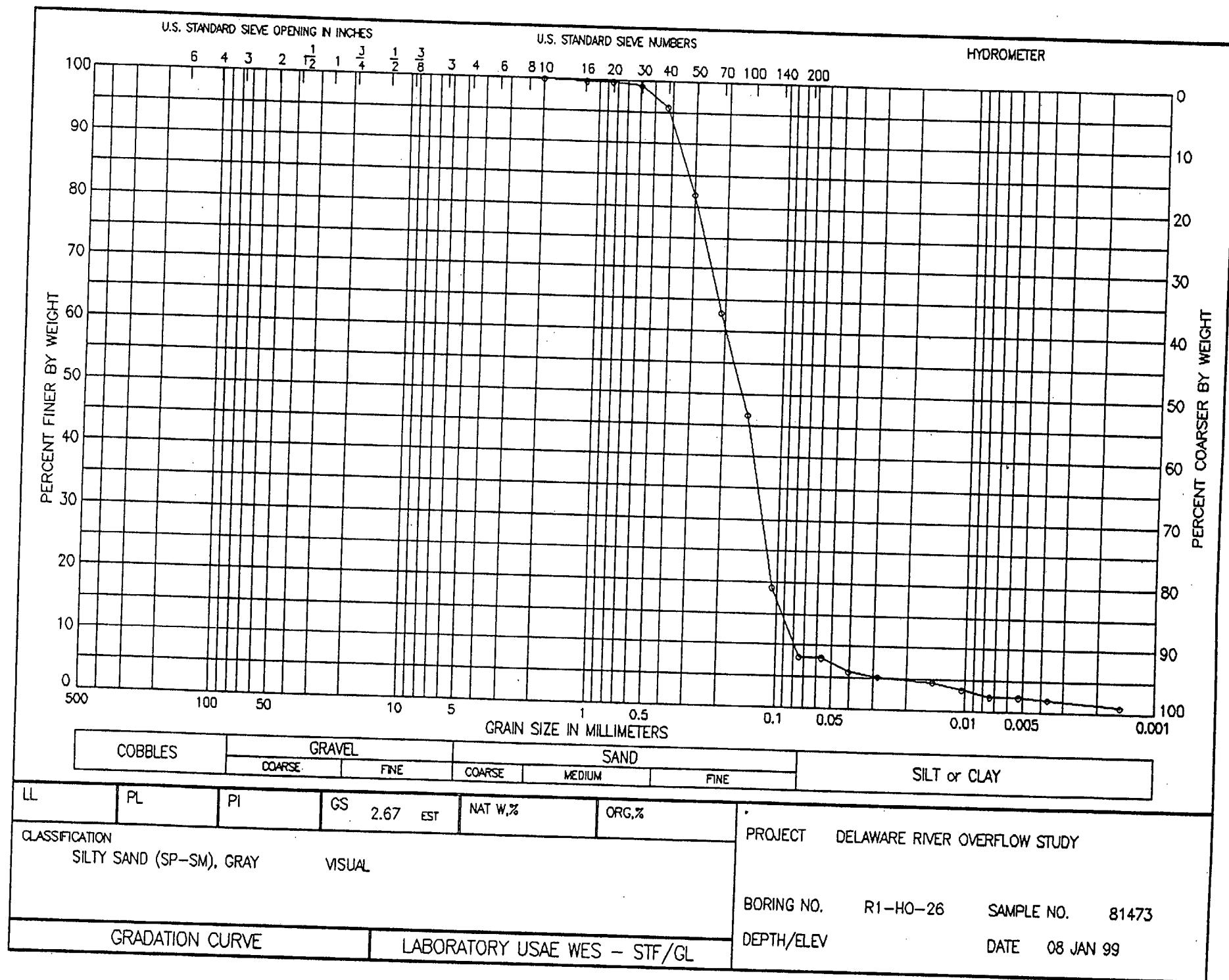
D30 = .12

D10 = .08

CU = 2.53

CC = .97

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-26      SAMPLE: 81473      DF: MD0199C .DAT  
 DEPTH:                    DATE: 08 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC:      .00

CLASSIFICATION: 108  
 SILTY SAND (SP-SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:      45.9 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER No	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	10	2.000	100.0	.0
.1	No 16	1.180	99.8	.2
.1	No 20	.850	99.8	.2
.3	No 30	.600	99.3	.7
1.9	No 40	.425	95.9	4.1
8.3	No 50	.300	81.9	18.1
17.0	No 70	.212	63.0	37.0
24.5	No 100	.150	46.6	53.4
37.1	No 140	.106	19.2	80.8
42.2	No 200	.075	8.1	91.9

HYDROMETER:

RDGS	TEMP			
2.8	20.0	.0569	8.0	92.0
2.2	20.0	.0404	5.9	94.1
2.0	20.0	.0286	5.2	94.8
1.8	20.0	.0148	4.5	95.5
1.5	20.0	.0105	3.5	96.5
1.2	20.0	.0074	2.4	97.6
1.1	20.5	.0053	2.4	97.6
.8	21.5	.0037	2.1	97.9
.8	20.0	.0015	1.0	99.0

PERCENT GRAVEL =      .0

PERCENT SAND      = 91.9

PERCENT FINES      = 8.1

D60 =      .20

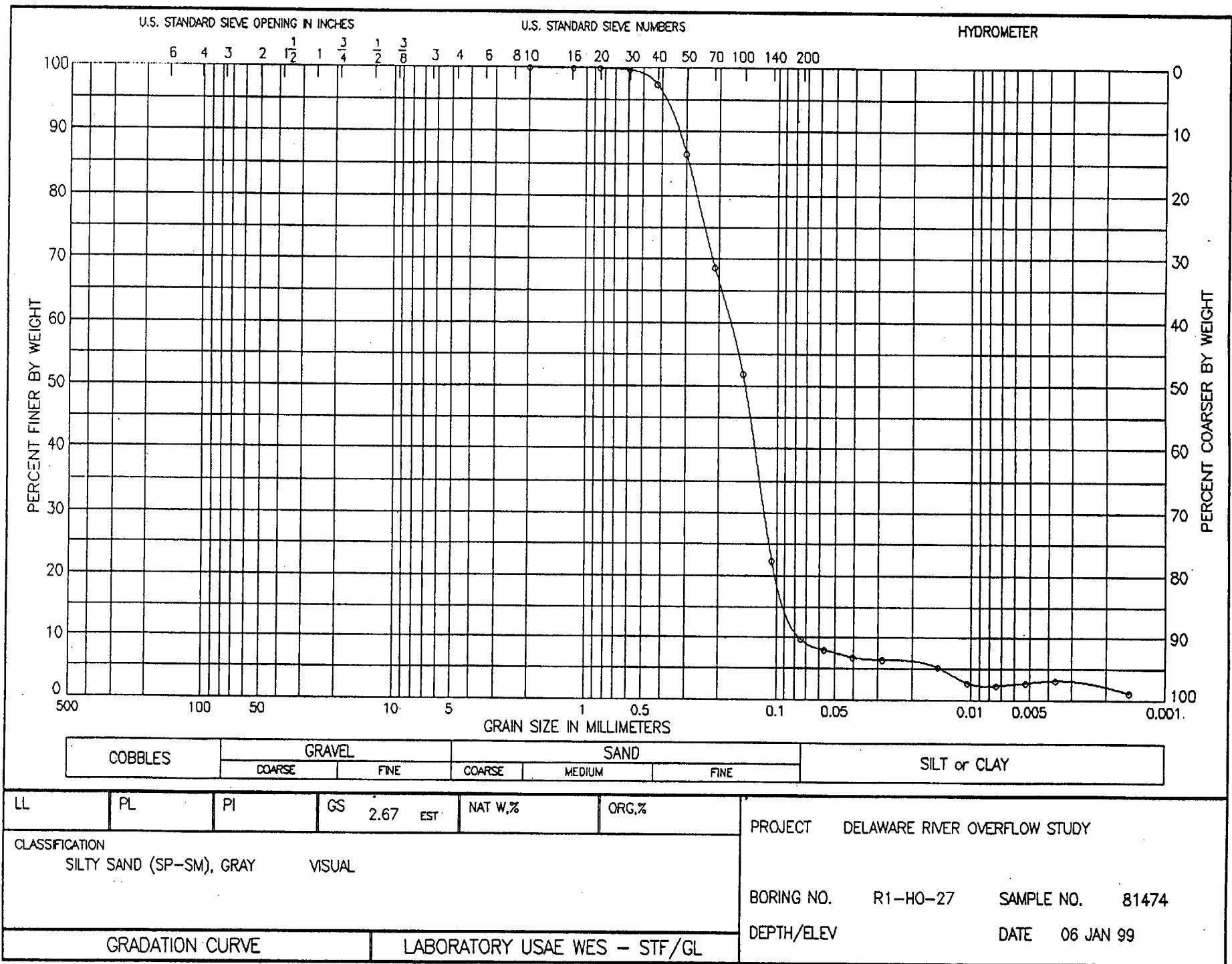
D30 =      .12

D10 =      .08

CU =      2.50

CC =      .94

EDE



# SIEVE ANALYSIS

## PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-27      SAMPLE: 81474      DF: MD0199 .DAT  
 DEPTH:                    DATE: 06 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC: .00

CLASSIFICATION: 204

SILTY SAND (SP-SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 39.9 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.7	.3
1.0	No 40	.425	97.5	2.5
5.4	No 50	.300	86.5	13.5
12.5	No 70	.212	68.7	31.3
19.2	No 100	.150	51.9	48.1
31.0	No 140	.106	22.3	77.7
36.0	No 200	.075	9.8	90.2

### HYDROMETER:

RDGS	TEMP			
2.5	20.0	.0570	8.0	92.0
2.2	20.0	.0404	6.8	93.2
2.1	20.0	.0286	6.4	93.6
1.8	20.0	.0148	5.2	94.8
1.2	20.0	.0105	2.8	97.2
1.1	20.0	.0074	2.4	97.6
1.1	20.5	.0053	2.8	97.2
1.1	21.0	.0037	3.2	96.8
.8	20.0	.0015	1.2	98.8

PERCENT GRAVEL = .0

PERCENT SAND = 90.2

PERCENT FINES = 9.8

D60 = .18

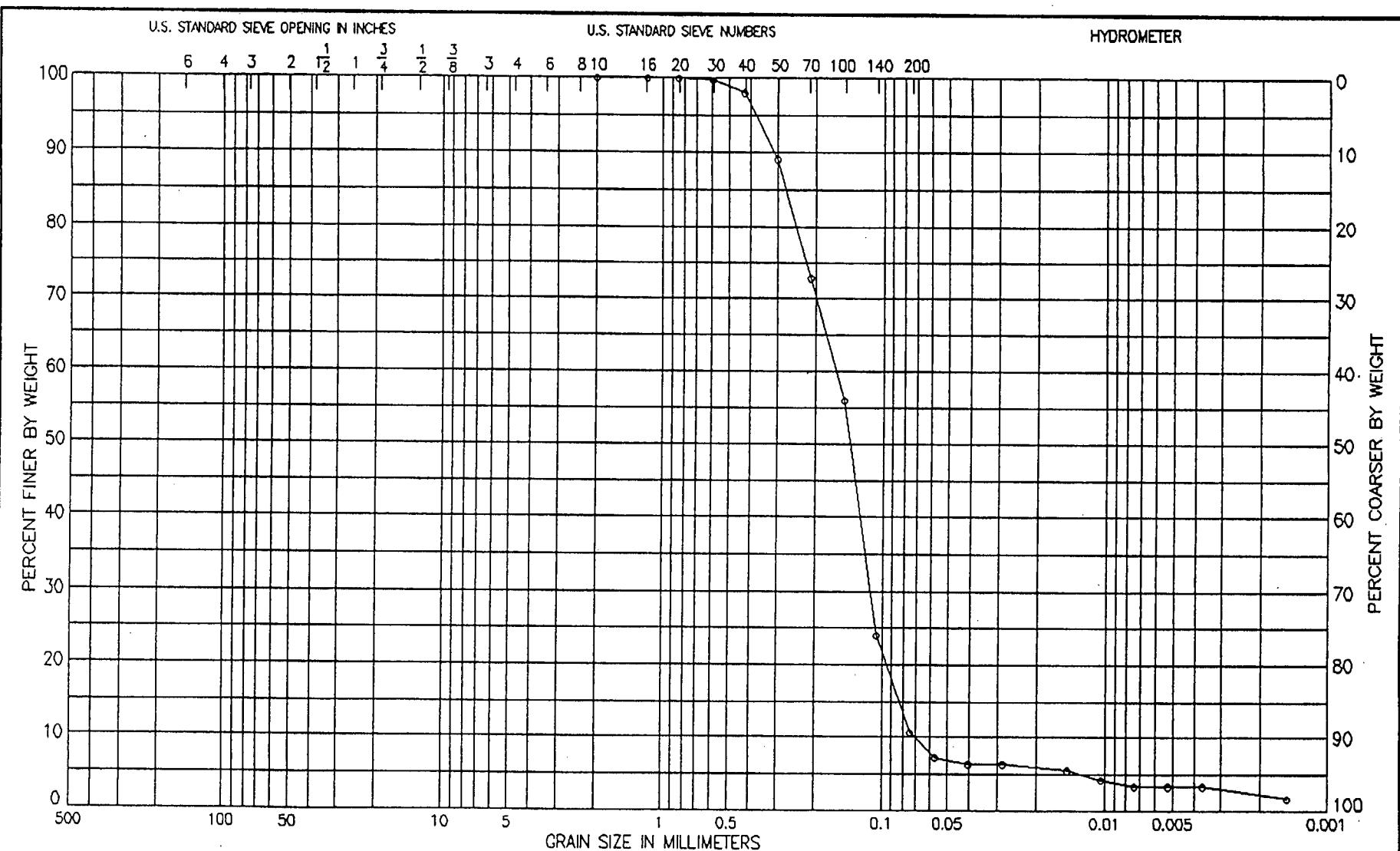
D30 = .12

D10 = .08

CU = 2.38

CC = 1.01

EDE



COBBLES

GRAVEL

SAND

SILT or CLAY

COARSE

FINE

COARSE

MEDIUM

FINE

LL

PL

PI

GS

2.67

EST

NAT W.%

ORG.%

PROJECT

DELAWARE RIVER OVERFLOW STUDY

CLASSIFICATION

SILTY SAND (SP-SM), GRAY

VISUAL

BORING NO.

R1-HO-28

SAMPLE NO. 81475

DEPTH/ELEV

DATE 07 JAN 99

GRADATION CURVE

LABORATORY USAE WES - STF/GL

# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-28      SAMPLE: 81475      DF: MD0199 .DAT  
 DEPTH:                    DATE: 07 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC: .00

CLASSIFICATION: 734

SILTY SAND (SP-SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 37.5 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.7	.3
.7	No 40	.425	98.1	1.9
4.1	No 50	.300	89.1	10.9
10.2	No 70	.212	72.8	27.2
16.5	No 100	.150	56.0	44.0
28.5	No 140	.106	24.0	76.0
33.5	No 200	.075	10.7	89.3

HYDROMETER:

RDGS	TEMP			
2.2	20.0	.0572	7.2	92.8
2.0	20.0	.0405	6.4	93.6
2.0	20.0	.0286	6.4	93.6
1.8	20.0	.0148	5.5	94.5
1.5	20.0	.0105	4.3	95.7
1.3	20.0	.0074	3.4	96.6
1.2	20.5	.0053	3.4	96.6
1.0	21.5	.0037	3.4	96.6
.9	20.0	.0015	1.7	98.3

PERCENT GRAVEL = .0

PERCENT SAND = 89.3

PERCENT FINES = 10.7

D60 = .16

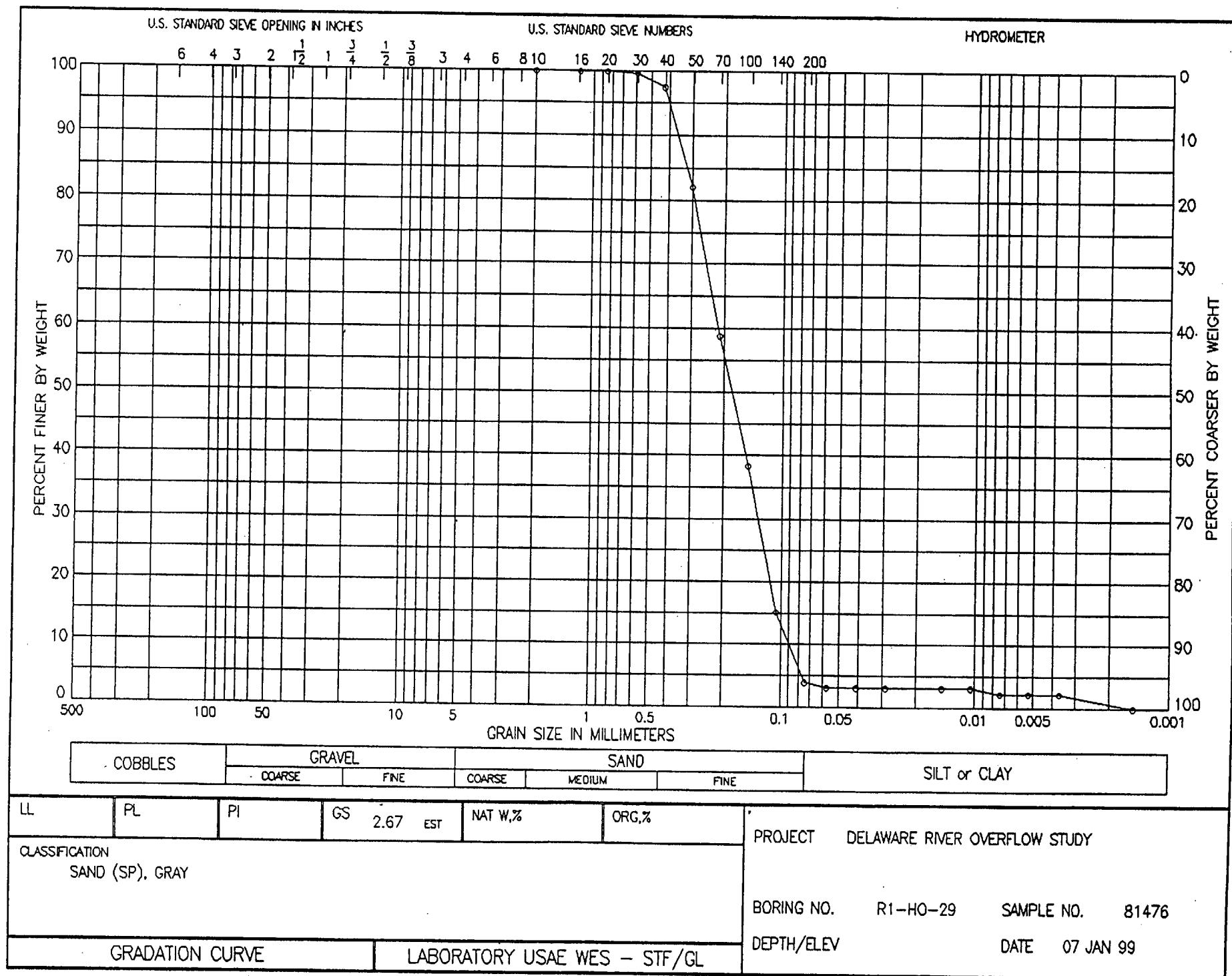
D30 = .11

D10 = .07

CU = 2.24

CC = 1.08

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-29      SAMPLE: 81476      DF: MD0199 .DAT  
 DEPTH:                    DATE: 07 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC: .00  
 CLASSIFICATION: 742  
 SAND (SP), GRAY

TOTAL WEIGHT OF SAMPLE: .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT: 35.7 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.7	.3
.9	No 40	.425	97.5	2.5
6.4	No 50	.300	82.1	17.9
14.7	No 70	.212	58.8	41.2
22.0	No 100	.150	38.4	61.6
30.3	No 140	.106	15.1	84.9
34.3	No 200	.075	3.9	96.1

HYDROMETER:

RDGS	TEMP			
1.2	20.0	.0576	3.1	96.9
1.2	20.0	.0407	3.1	96.9
1.2	20.0	.0288	3.1	96.9
1.2	20.0	.0149	3.1	96.9
1.2	20.0	.0105	3.1	96.9
1.0	20.0	.0074	2.2	97.8
.9	20.5	.0053	2.2	97.8
.7	21.5	.0037	2.2	97.8
.5	20.0	.0015	.0	100.0

PERCENT GRAVEL = .0

PERCENT SAND = 96.1

PERCENT FINES = 3.9

D60 = .22

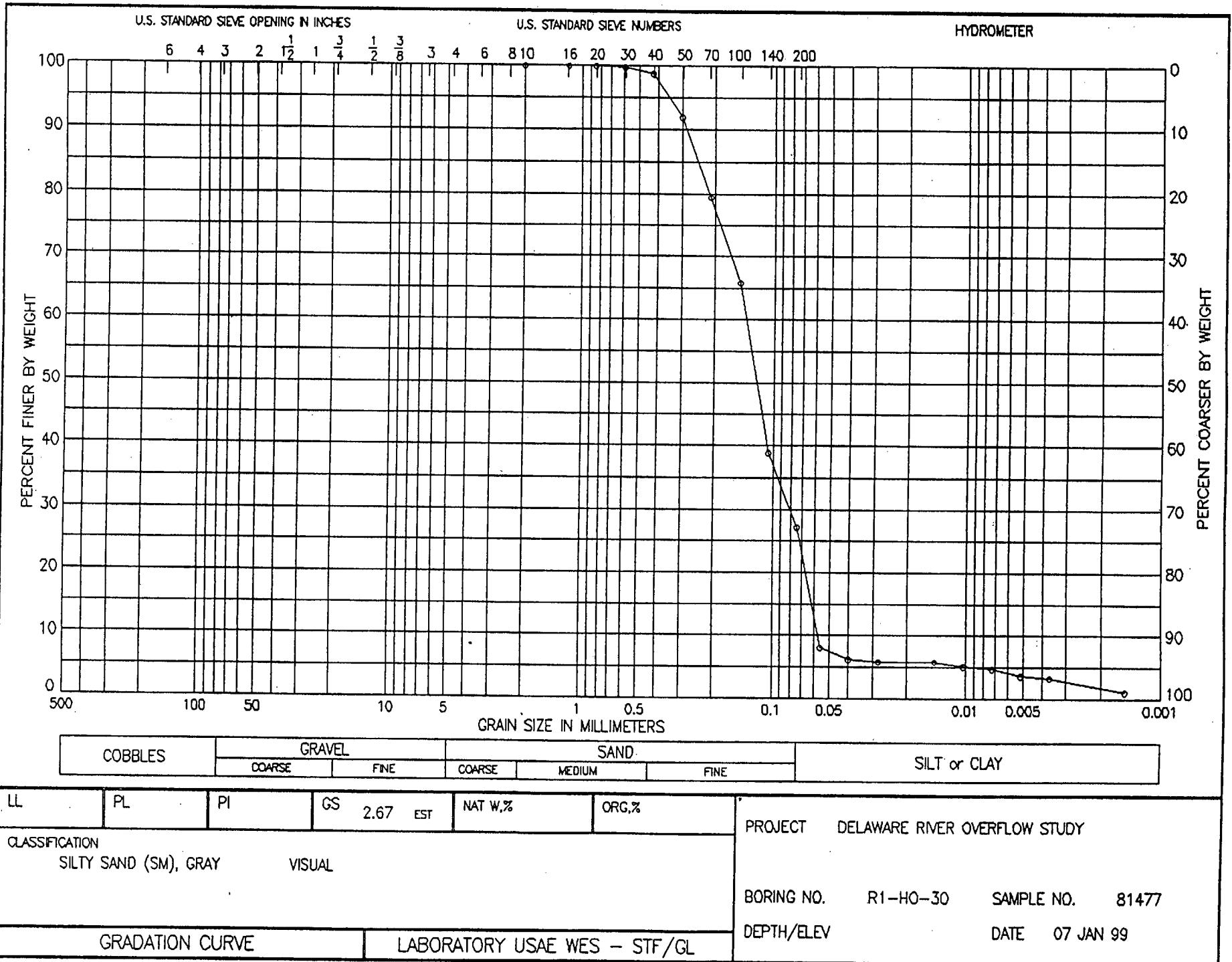
D30 = .13

D10 = .09

CU = 2.36

CC = .91

EDE



# SIEVE ANALYSIS

## PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-30      SAMPLE: 81477      DF: MD0199 .DAT  
 DEPTH:                    DATE: 07 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC: .00

CLASSIFICATION: 750

SILTY SAND (SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 43.4 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.8	.2
.5	No 40	.425	98.8	1.2
3.5	No 50	.300	91.9	8.1
8.9	No 70	.212	79.5	20.5
14.8	No 100	.150	65.9	34.1
26.5	No 140	.106	38.9	61.1
31.6	No 200	.075	27.2	72.8

### HYDROMETER:

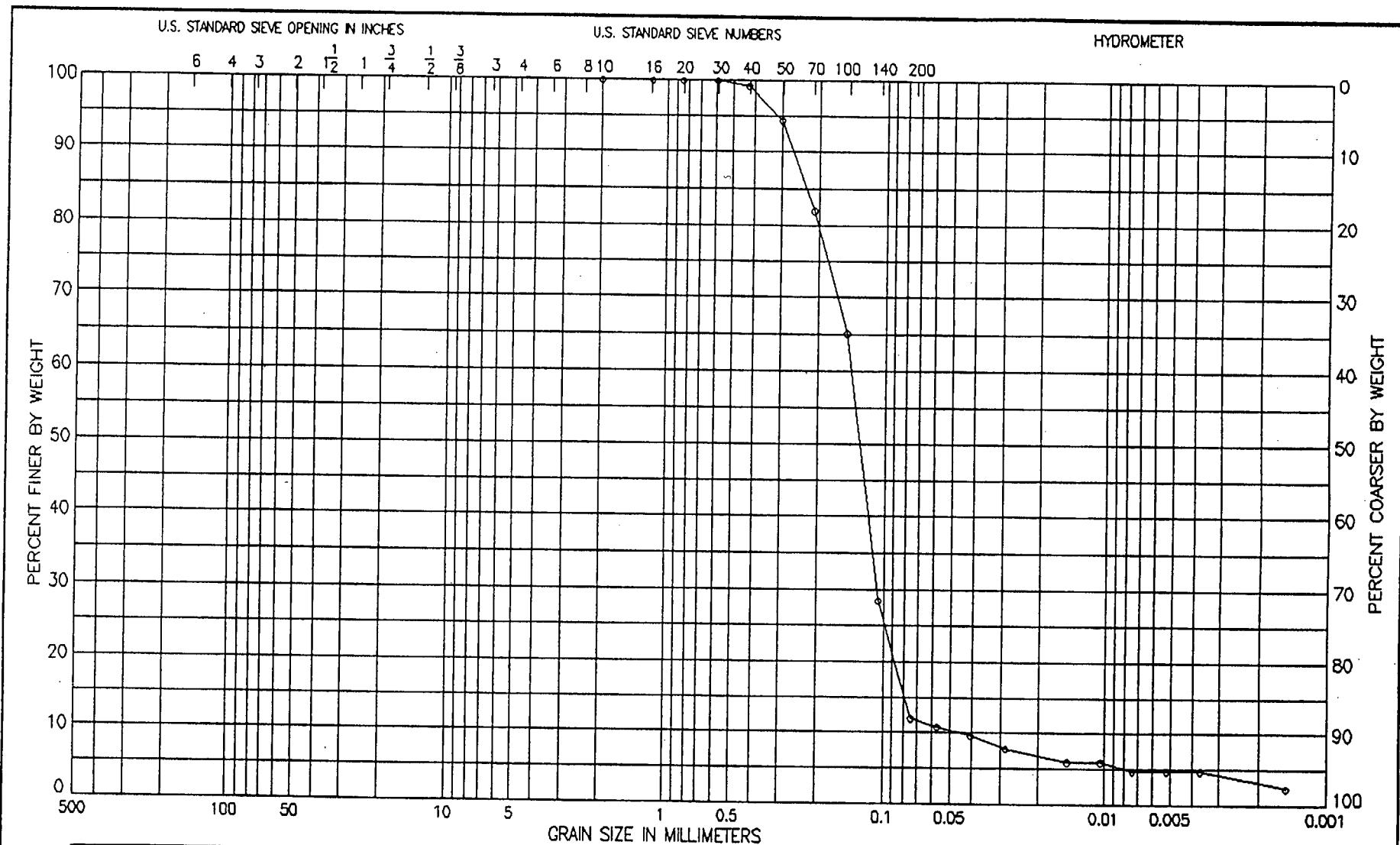
RDGS	TEMP			
2.5	21.0	.0563	8.1	91.9
2.0	21.0	.0400	6.3	93.7
1.9	21.0	.0283	5.9	94.1
1.9	21.0	.0146	5.9	94.1
1.7	21.0	.0103	5.2	94.8
1.6	21.0	.0073	4.8	95.2
1.3	21.0	.0052	3.7	96.3
1.1	21.5	.0037	3.3	96.7
.8	20.0	.0015	1.1	98.9

PERCENT GRAVEL = .0

PERCENT SAND = 72.8

PERCENT FINES = 27.2

EDE



COBBLES	GRAVEL			SAND			SILT or CLAY
	DOORSE	FINE	COARSE	MEDIUM	FINE		

LL	PL	PI	GS	2.67 EST	NAT W, %	ORG, %	PROJECT	DELAWARE RIVER OVERFLOW STUDY
CLASSIFICATION								
SILTY SAND (SP-SM), GRAY	VISUAL						BORING NO.	R1-H0-31
INSUFFICIENT SAMPLE FOR ACCURATE GRADATION							SAMPLE NO.	81478
GRADATION CURVE			LABORATORY USAE WES - STF/GL					
DEPTH/ELEV						DATE 07 JAN 99		

# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-31      SAMPLE: 81478      DF: MD0199 .DAT  
 DEPTH:                    DATE: 07 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC:      .00  
 CLASSIFICATION: 758  
 SILTY SAND (SP-SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT:      26.7 gms.  
 INSUFFICIENT SAMPLE FOR ACCURATE GRADATION

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.2	No 40	.425	99.3	.7
1.5	No 50	.300	94.4	5.6
4.8	No 70	.212	82.0	18.0
9.3	No 100	.150	65.2	34.8
19.1	No 140	.106	28.5	71.5
23.5	No 200	.075	12.0	88.0

HYDROMETER:

RDGS	TEMP			
2.3	20.0	.0571	10.8	89.2
2.1	20.0	.0405	9.6	90.4
1.8	20.0	.0287	7.8	92.2
1.5	20.0	.0148	6.0	94.0
1.5	20.0	.0105	6.0	94.0
1.3	20.0	.0074	4.8	95.2
1.1	21.0	.0052	4.8	95.2
1.0	21.5	.0037	4.8	95.2
.9	20.0	.0015	2.4	97.6

PERCENT GRAVEL =      .0

PERCENT SAND      = 88.0

PERCENT FINES      = 12.0

D60 =      .14

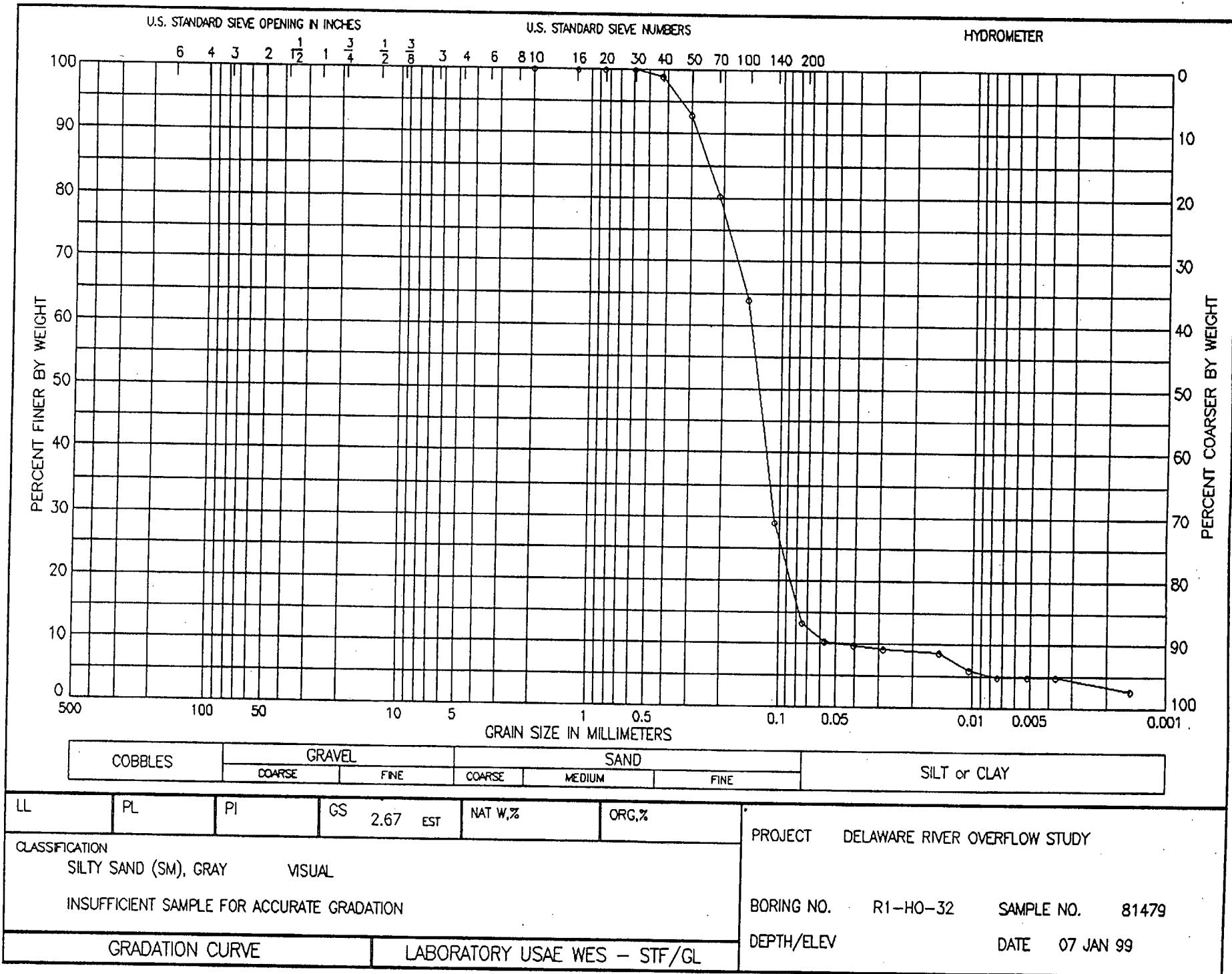
D30 =      .11

D10 =      .07

CU =      2.02

CC =      1.13

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-32      SAMPLE: 81479      DF: MD0199 .DAT  
DEPTH:                    DATE: 07 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC: .00  
CLASSIFICATION: 766  
SILTY SAND (SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
PARTIAL WEIGHT AFTER SPLIT: 29.5 gms.  
INSUFFICIENT SAMPLE FOR ACCURATE GRADATION

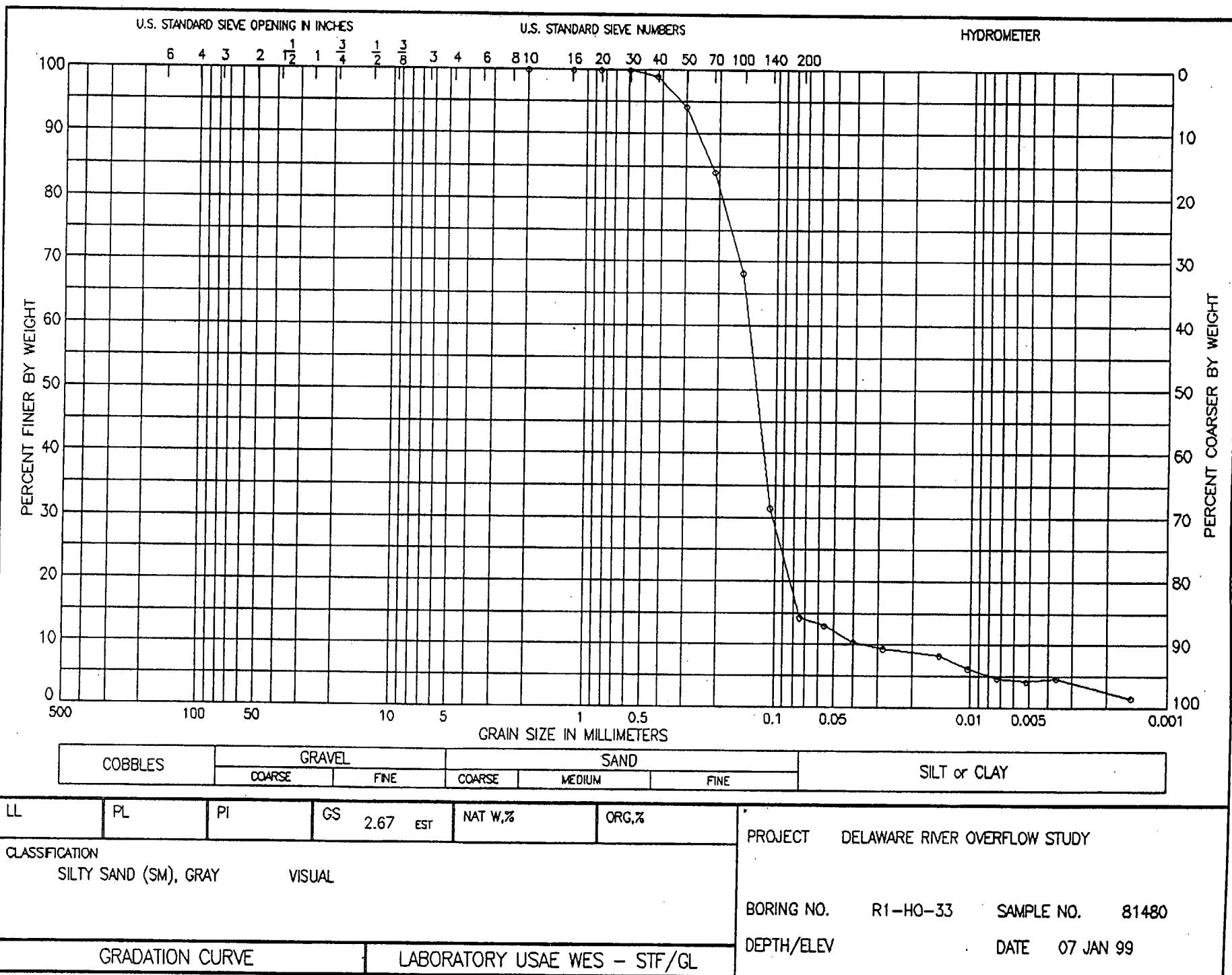
WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.3	No 40	.425	99.0	1.0
2.1	No 50	.300	92.9	7.1
5.8	No 70	.212	80.3	19.7
10.6	No 100	.150	64.1	35.9
20.9	No 140	.106	29.2	70.8
25.6	No 200	.075	13.2	86.8

## HYDROMETER:

RDGS	TEMP			
2.3	20.5	.0571	10.3	89.7
2.2	20.5	.0404	9.8	90.2
2.1	20.5	.0286	9.2	90.8
2.0	20.5	.0148	8.7	91.3
1.5	20.5	.0105	6.0	94.0
1.3	20.5	.0074	4.9	95.1
1.2	21.0	.0052	4.9	95.1
1.1	21.5	.0037	4.9	95.1
1.0	20.0	.0015	2.7	97.3

PERCENT GRAVEL = .0  
PERCENT SAND = 86.8  
PERCENT FINES = 13.2

EDE



# SIEVE ANALYSIS

## PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-33      SAMPLE: 81480      DF: MD0199 .DAT  
DEPTH:                    DATE: 07 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC:      .00

CLASSIFICATION: 774

SILTY SAND (SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:      30.8 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.3	No 40	.425	99.0	1.0
1.8	No 50	.300	94.2	5.8
4.9	No 70	.212	84.1	15.9
9.8	No 100	.150	68.2	31.8
21.1	No 140	.106	31.5	68.5
26.4	No 200	.075	14.3	85.7

### HYDROMETER:

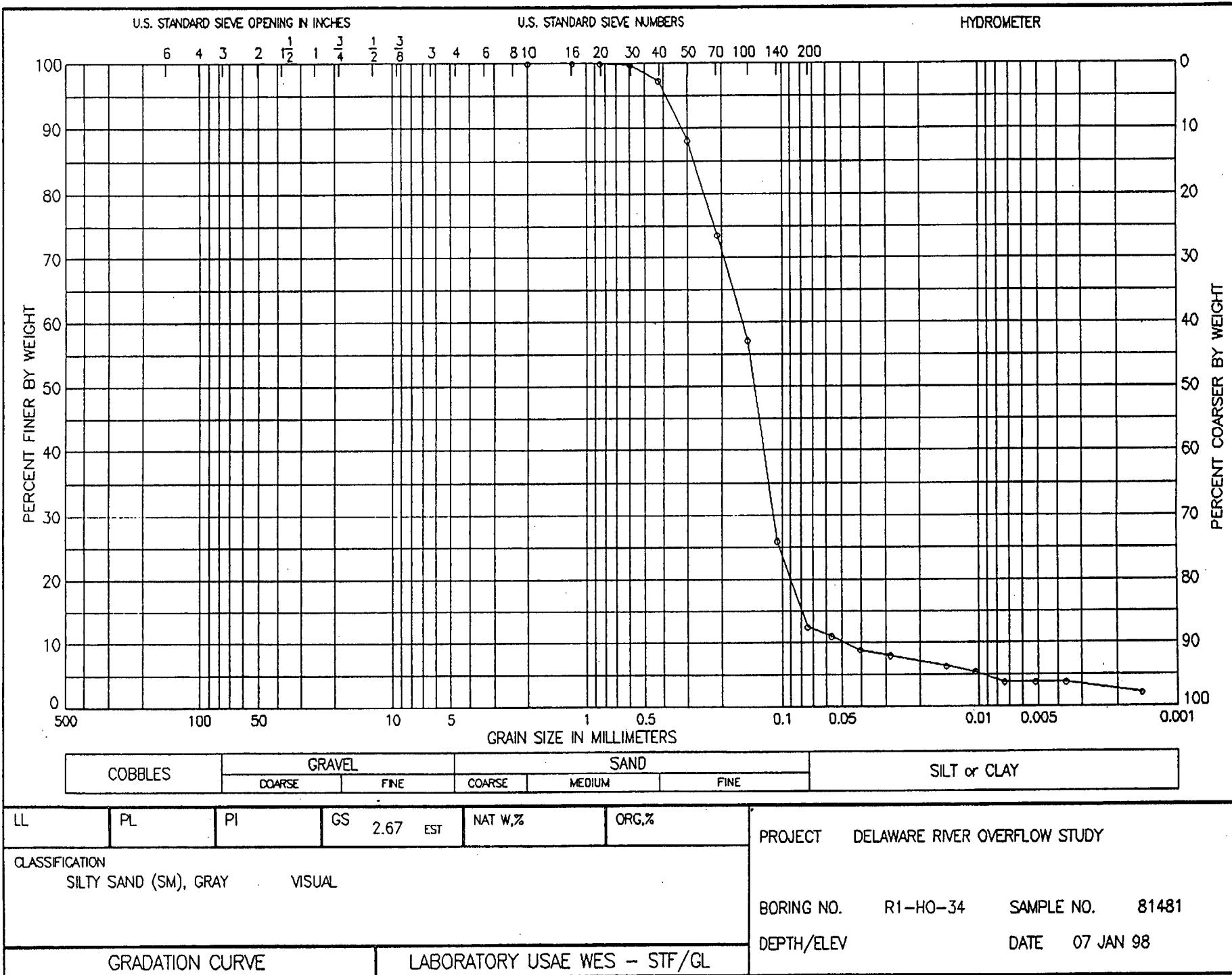
RDGS	TEMP			
2.7	21.5	.0562	13.0	87.0
2.2	21.5	.0399	10.4	89.6
2.0	21.5	.0283	9.3	90.7
1.8	21.5	.0146	8.3	91.7
1.4	21.5	.0104	6.2	93.8
1.1	21.5	.0073	4.7	95.3
1.1	21.0	.0052	4.2	95.8
1.0	22.0	.0036	4.7	95.3
.8	20.0	.0015	1.6	98.4

PERCENT GRAVEL = .0

PERCENT SAND = 85.7

PERCENT FINES = 14.3

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-34      SAMPLE: 81481      DF: MD0199 .DAT  
DEPTH:                    DATE: 07 JAN 98

NO-LIMITS-RAN      GS: 2.67 est      WC:      .00  
CLASSIFICATION: 782  
SILTY SAND (SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.  
PARTIAL WEIGHT AFTER SPLIT:      37.8 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.7	.3
1.0	No 40	.425	97.4	2.6
4.5	No 50	.300	88.1	11.9
10.0	No 70	.212	73.5	26.5
16.2	No 100	.150	57.1	42.9
28.0	No 140	.106	25.9	74.1
33.1	No 200	.075	12.4	87.6

HYDROMETER:

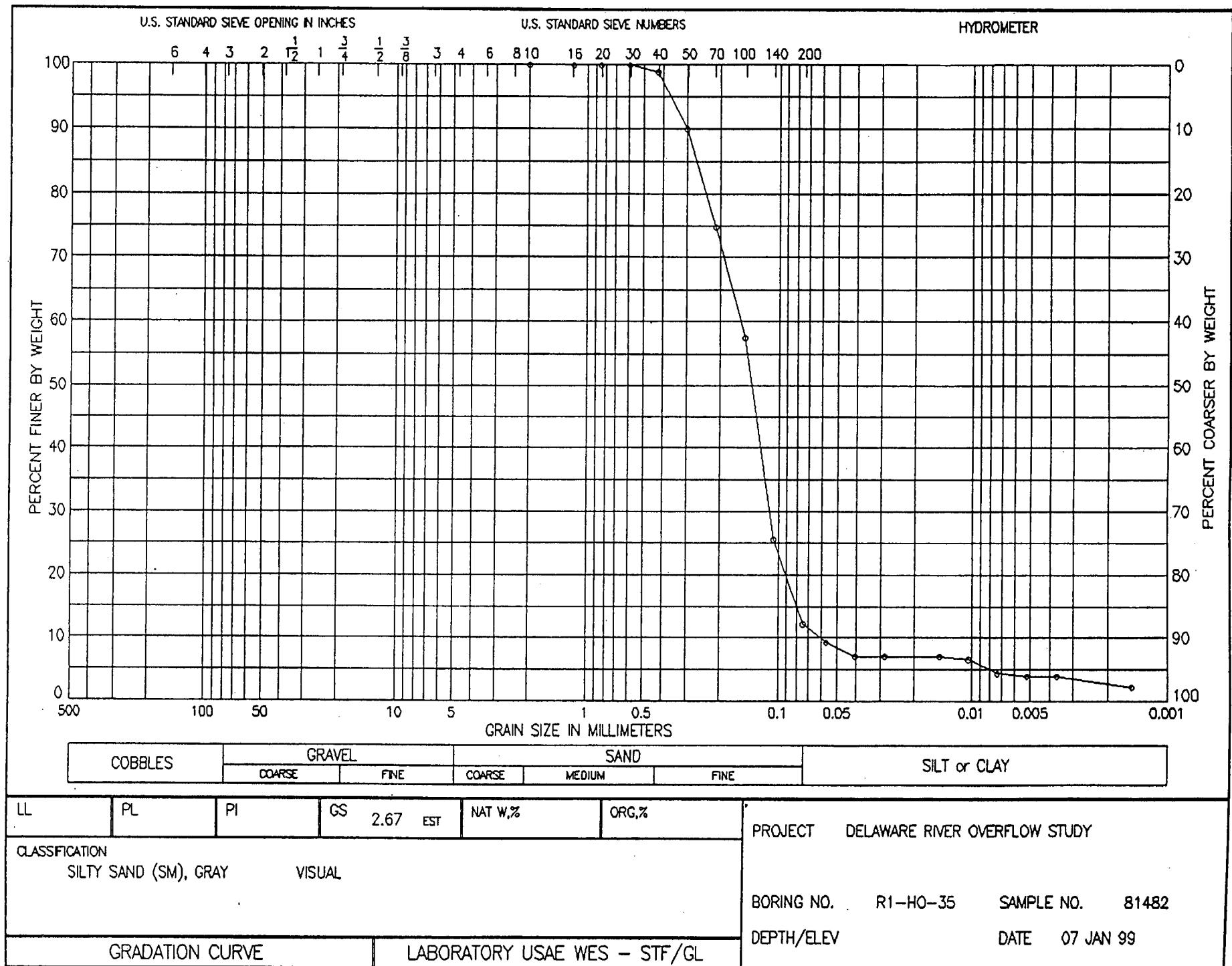
RDGS	TEMP			
3.0	20.5	.0568	11.0	89.0
2.5	20.5	.0403	8.9	91.1
2.3	20.5	.0286	8.0	92.0
1.9	20.5	.0148	6.3	93.7
1.7	20.5	.0105	5.5	94.5
1.3	20.5	.0074	3.8	96.2
1.2	21.0	.0052	3.8	96.2
1.0	22.0	.0036	3.8	96.2
1.0	20.0	.0015	2.1	97.9

PERCENT GRAVEL = .0

PERCENT SAND = 87.6

PERCENT FINES = 12.4

EDE



# SIEVE ANALYSIS

## PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-35      SAMPLE: 81482      DF: MD0199 .DAT  
DEPTH:                    DATE: 07 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC: .00

CLASSIFICATION: 790

SILTY SAND (SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 36.0 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.4	No 40	.425	98.9	1.1
3.6	No 50	.300	90.0	10.0
9.1	No 70	.212	74.7	25.3
15.3	No 100	.150	57.5	42.5
26.8	No 140	.106	25.6	74.4
31.6	No 200	.075	12.2	87.8

### HYDROMETER:

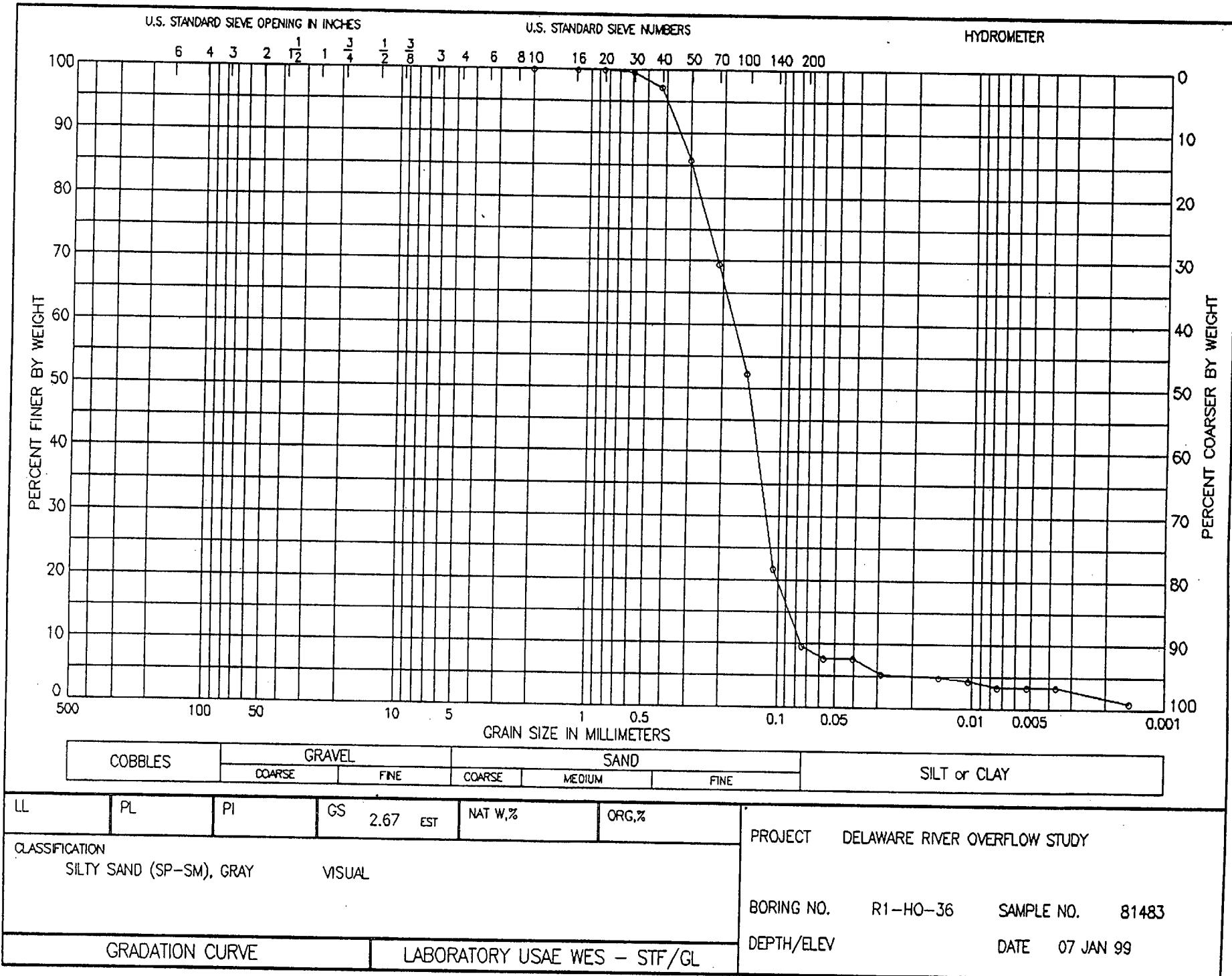
RDGS	TEMP			
2.5	20.5	.0570	9.3	90.7
2.0	20.5	.0405	7.1	92.9
2.0	20.5	.0286	7.1	92.9
2.0	20.5	.0148	7.1	92.9
1.9	20.5	.0105	6.7	93.3
1.4	20.5	.0074	4.4	95.6
1.2	21.0	.0052	4.0	96.0
1.1	21.5	.0037	4.0	96.0
1.0	20.0	.0015	2.2	97.8

PERCENT GRAVEL = .0

PERCENT SAND = 87.8

PERCENT FINES = 12.2

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-36      SAMPLE: 81483      DF: MD0199 .DAT  
 DEPTH:                    DATE: 07 JAN 99

NO-LIMITS-RAN      GS: 2.67 est      WC: .00  
 CLASSIFICATION: 798

SILTY SAND (SP-SM), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT: 33.1 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.7	.3
.9	No 40	.425	97.3	2.7
4.7	No 50	.300	85.8	14.2
10.1	No 70	.212	69.5	30.5
15.8	No 100	.150	52.3	47.7
25.9	No 140	.106	21.8	78.2
29.9	No 200	.075	9.7	90.3

## HYDROMETER:

RDGS	TEMP			
2.0	20.5	.0573	7.7	92.3
2.0	20.5	.0405	7.7	92.3
1.5	20.5	.0287	5.3	94.7
1.4	20.5	.0148	4.8	95.2
1.3	20.5	.0105	4.3	95.7
1.1	20.5	.0074	3.4	96.6
1.0	21.0	.0052	3.4	96.6
.9	21.5	.0037	3.4	96.6
.7	20.0	.0015	1.0	99.0

PERCENT GRAVEL = .0

PERCENT SAND = 90.3

PERCENT FINES = 9.7

D60 = .18

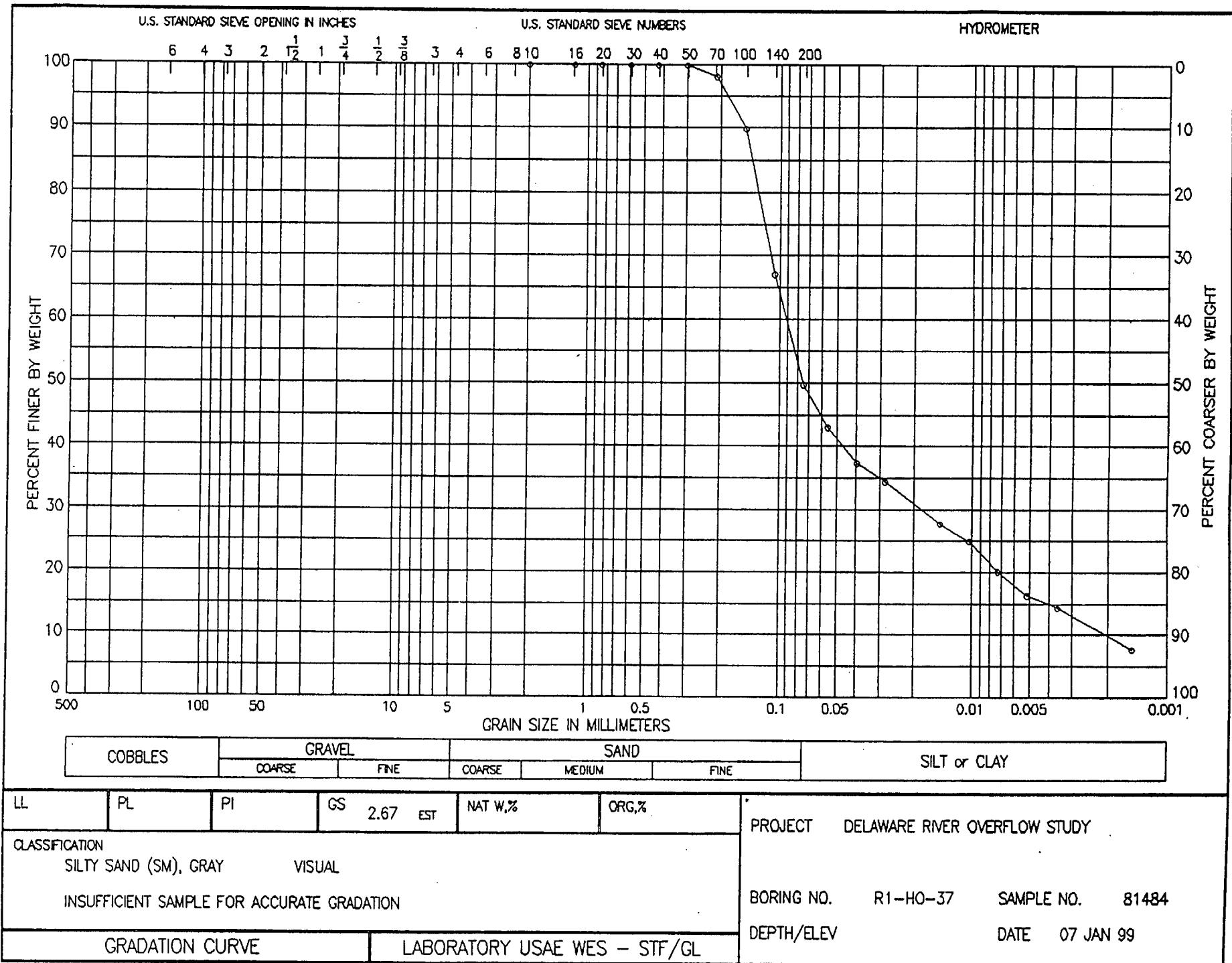
D30 = .12

D10 = .08

CU = 2.34

CC = 1.03

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-37      SAMPLE: 81484    DF: MD0199 .DAT  
 DEPTH:                    DATE: 07 JAN 99

NO-LIMITS-RAN    GS: 2.67 est    WC: .00  
 CLASSIFICATION: 806  
 SILTY SAND (SM), GRAY                    VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT: 16.7 gms.  
 INSUFFICIENT SAMPLE FOR ACCURATE GRADATION

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.0	No 40	.425	100.0	.0
.0	No 50	.300	100.0	.0
.3	No 70	.212	98.2	1.8
1.7	No 100	.150	89.8	10.2
5.5	No 140	.106	67.1	32.9
8.4	No 200	.075	49.7	50.3

## HYDROMETER:

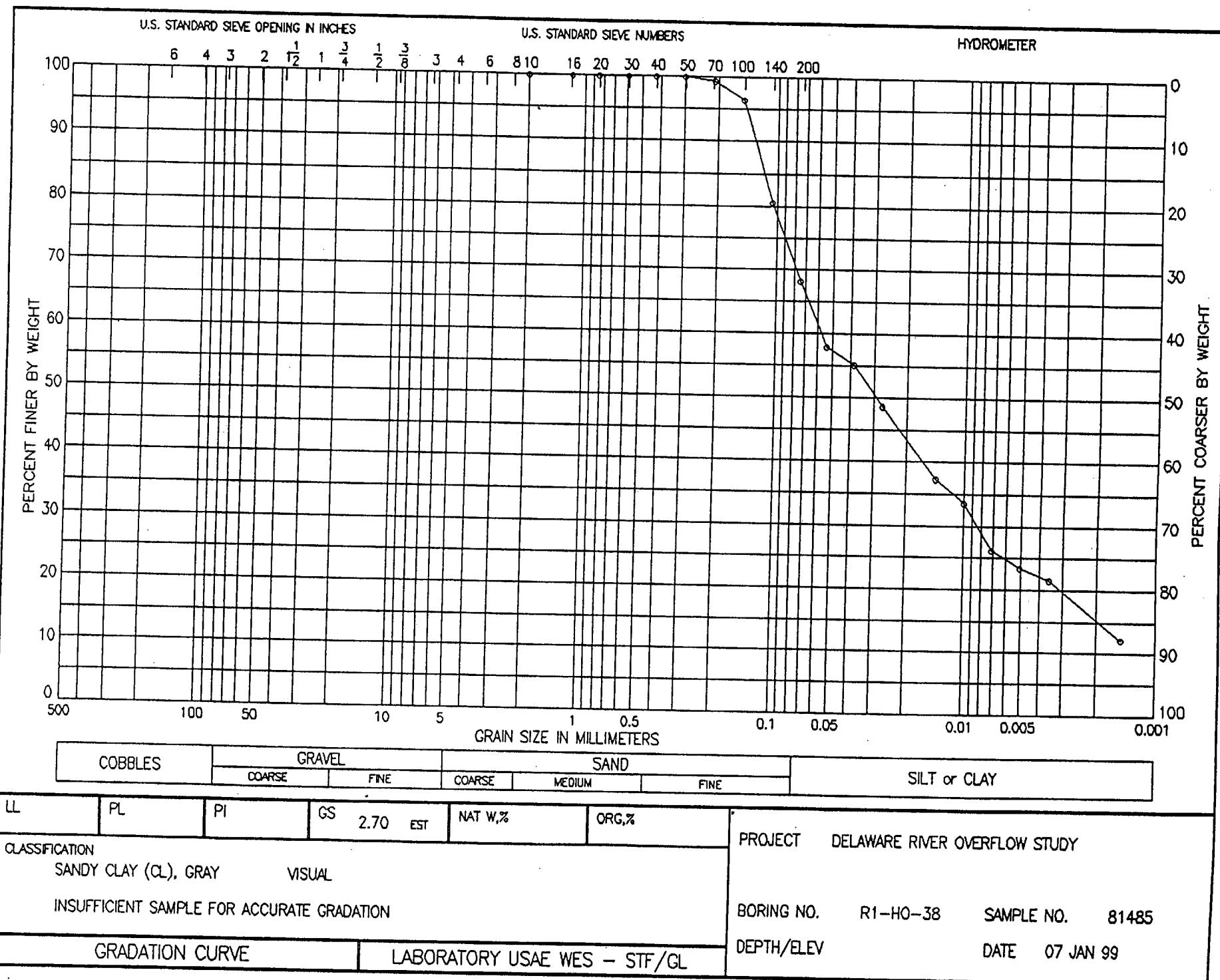
RDGS	TEMP			
4.9	20.5	.0560	43.1	56.9
4.3	20.5	.0398	37.3	62.7
4.0	20.5	.0282	34.5	65.5
3.3	20.5	.0146	27.8	72.2
3.0	20.5	.0104	24.9	75.1
2.5	20.5	.0074	20.1	79.9
2.0	21.0	.0052	16.3	83.7
1.6	22.0	.0036	14.4	85.6
1.3	20.0	.0015	7.7	92.3

PERCENT GRAVEL = .0

PERCENT SAND = 50.3

PERCENT FINES = 49.7

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-38      SAMPLE: 81485      DF: MD0199 .DAT  
DEPTH:                    DATE: 07 JAN 99

NO-LIMITS-RAN      GS: 2.70 est      WC: .00  
CLASSIFICATION: 814  
SANDY CLAY (CL), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
PARTIAL WEIGHT AFTER SPLIT: 17.0 gms.  
INSUFFICIENT SAMPLE FOR ACCURATE GRADATION

WEIGHTS gm.	SIEVE SIZE OR NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.0	No 40	.425	100.0	.0
.0	No 50	.300	100.0	.0
.1	No 70	.212	99.4	.6
.6	No 100	.150	96.5	3.5
3.3	No 140	.106	80.6	19.4
5.4	No 200	.075	68.2	31.8

HYDROMETER:

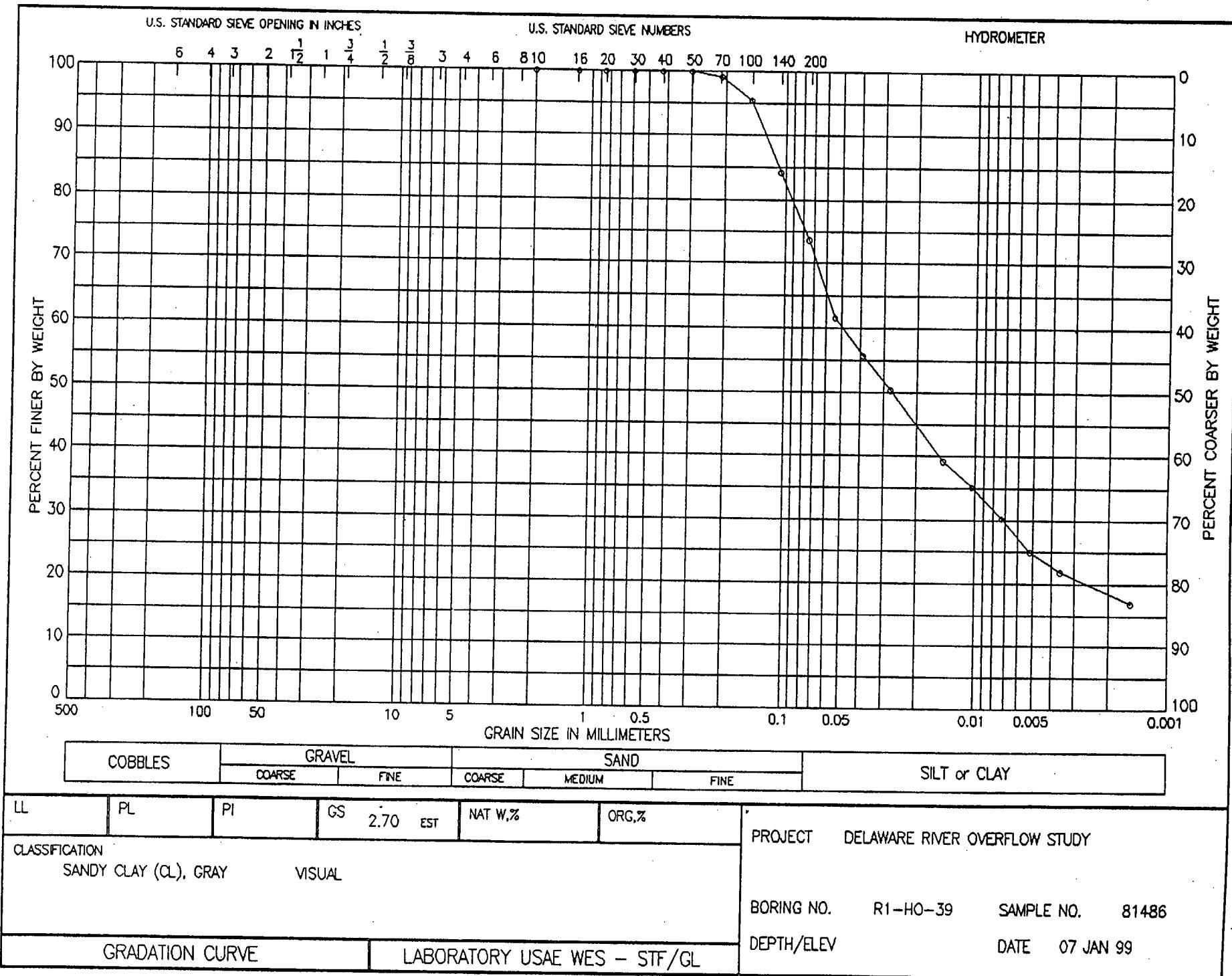
RDGS	TEMP			
6.5	21.0	.0541	57.9	42.1
6.2	21.0	.0383	55.1	44.9
5.5	21.0	.0273	48.6	51.4
4.3	21.0	.0142	37.4	62.6
3.9	21.0	.0101	33.6	66.4
3.1	21.0	.0072	26.2	73.8
2.8	21.0	.0051	23.4	76.6
2.4	22.0	.0036	21.5	78.5
1.8	20.0	.0015	12.1	87.9

PERCENT GRAVEL = .0

PERCENT SAND = 31.8

PERCENT FINES = 68.2

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-39      SAMPLE: 81486      DF: MD0199 .DAT  
DEPTH:                    DATE: 07 JAN 99

NO-LIMITS-RAN      GS: 2.70 est      WC: .00

CLASSIFICATION: 822

SANDY CLAY (CL), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 35.6 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.0	No 40	.425	100.0	.0
.0	No 50	.300	100.0	.0
.3	No 70	.212	99.2	.8
1.6	No 100	.150	95.5	4.5
5.6	No 140	.106	84.3	15.7
9.4	No 200	.075	73.6	26.4

HYDROMETER:

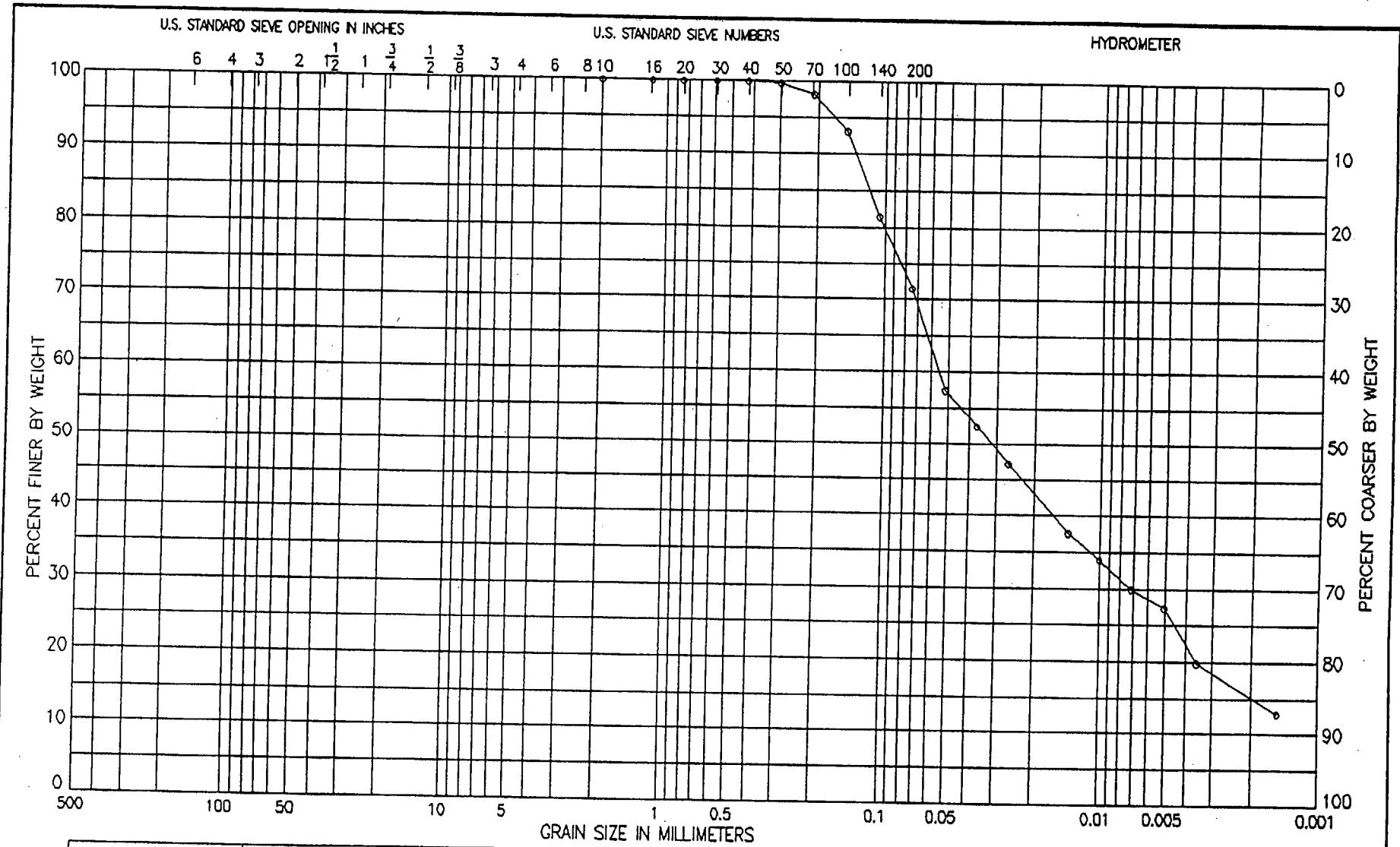
RDGS	TEMP			
15.0	15.5	.0541	61.6	38.4
13.7	15.5	.0388	55.8	44.2
12.5	15.5	.0277	50.4	49.6
10.0	15.5	.0146	39.3	60.7
9.1	15.5	.0104	35.2	64.8
7.9	16.0	.0074	30.3	69.7
6.5	17.5	.0052	25.0	75.0
5.6	19.0	.0036	21.9	78.1
4.9	16.0	.0015	17.0	83.0

PERCENT GRAVEL = .0

PERCENT SAND = 26.4

PERCENT FINES = 73.6

EDE



COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LL	PL	PI	GS	2.70 EST	NAT W.%	ORG.%	PROJECT	DELAWARE RIVER OVERFLOW STUDY
CLASSIFICATION	SANDY CLAY (CL), GRAY	VISUAL					BORING NO.	R1-HO-40
GRADATION CURVE	LABORATORY USAE WES - STF/GL						SAMPLE NO.	81487
						DEPTH/ELEV	DATE	07 JAN 99

## SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R1-HO-40      SAMPLE: 81487      DF: MD0199 .DAT  
 DEPTH:                    DATE: 07 JAN 99

NO-LIMITS-RAN      GS: 2.70 est      WC: .00  
 CLASSIFICATION: 830  
 SANDY CLAY (CL), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 48.1 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.0	No 40	.425	100.0	.0
.1	No 50	.300	99.8	.2
.8	No 70	.212	98.3	1.7
3.3	No 100	.150	93.1	6.9
8.9	No 140	.106	81.5	18.5
13.7	No 200	.075	71.5	28.5

## HYDROMETER:

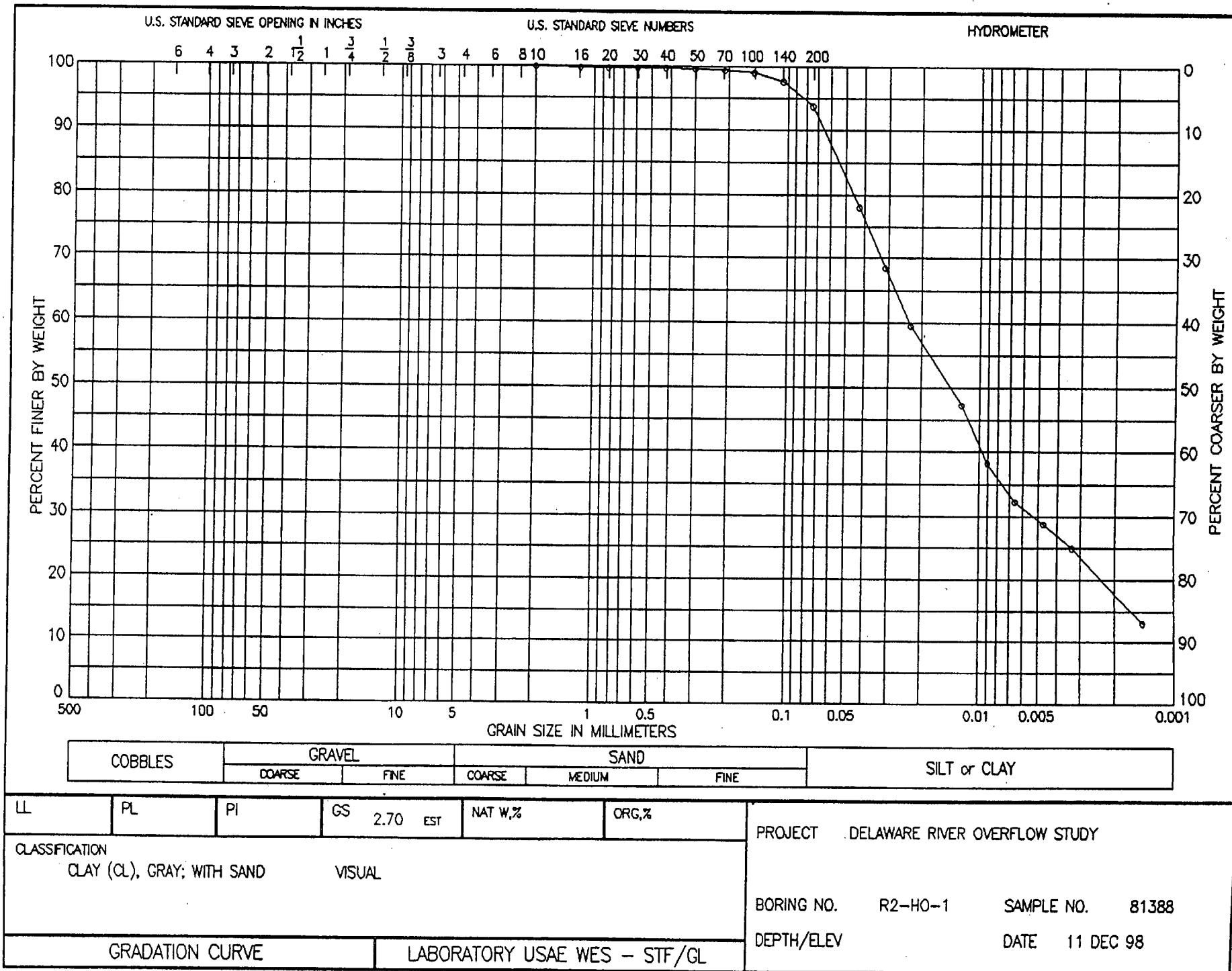
RDGS	TEMP			
18.5	16.5	.0516	57.5	42.5
17.0	16.5	.0371	52.5	47.5
15.4	16.5	.0266	47.2	52.8
12.5	16.5	.0141	37.6	62.4
11.4	16.0	.0101	34.0	66.0
10.2	16.0	.0072	30.0	70.0
9.2	17.5	.0051	27.4	72.6
6.7	19.0	.0036	19.8	80.2
5.0	16.0	.0015	12.9	87.1

PERCENT GRAVEL = .0

PERCENT SAND = 28.5

PERCENT FINES = 71.5

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-1            SAMPLE: 81388    DF: MD0199 .DAT  
DEPTH:                    DATE: 11 DEC 98

NO-LIMITS-RAN    GS: 2.70 est    WC: .00

CLASSIFICATION: 157

CLAY (CL), GRAY; WITH SAND                    VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 58.4 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.1	No 16	1.180	99.8	.2
.1	No 20	.850	99.8	.2
.1	No 30	.600	99.8	.2
.1	No 40	.425	99.8	.2
.2	No 50	.300	99.7	.3
.3	No 70	.212	99.5	.5
.5	No 100	.150	99.1	.9
1.3	No 140	.106	97.8	2.2
3.6	No 200	.075	93.8	6.2

## HYDROMETER:

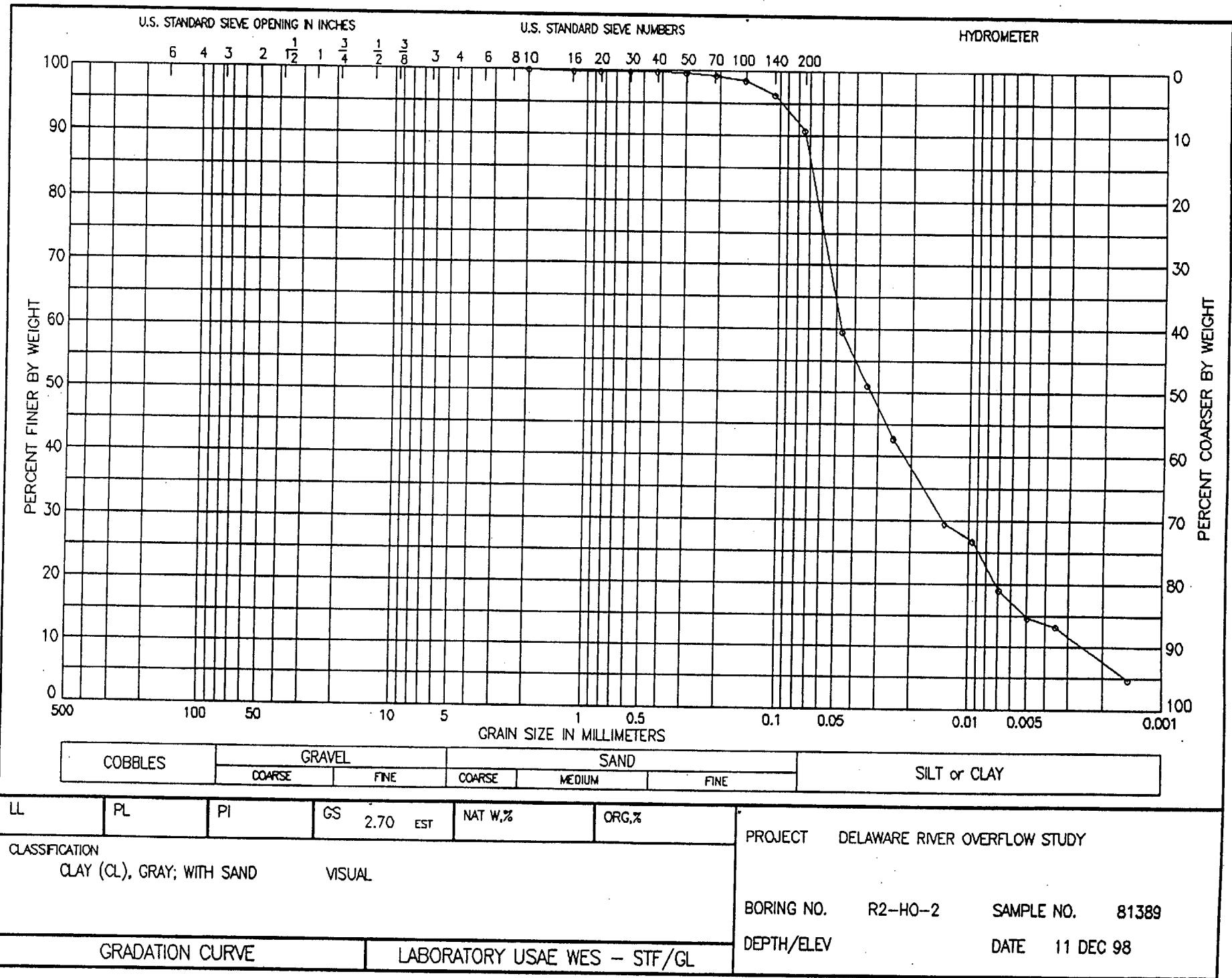
RDGS	TEMP			
28.8	22.0	.0426	78.1	21.9
25.3	22.0	.0314	68.5	31.5
22.0	22.0	.0231	59.6	40.4
17.5	22.0	.0125	47.3	52.7
14.2	22.0	.0091	38.3	61.7
12.0	22.0	.0066	32.4	67.6
10.7	22.0	.0047	28.8	71.2
9.3	22.0	.0034	25.0	75.0
5.3	20.0	.0015	13.1	86.9

PERCENT GRAVEL = .0

PERCENT SAND = 6.2

PERCENT FINES = 93.8

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-2                    SAMPLE: 81389    DF: MD0199 .DAT  
 DEPTH:                              DATE: 11 DEC 98

NO-LIMITS-RAN    GS: 2.70 est    WC:     .00

CLASSIFICATION: 165

CLAY (CL), GRAY; WITH SAND                    VISUAL

TOTAL WEIGHT OF SAMPLE:     .0 gms.

PARTIAL WEIGHT AFTER SPLIT:    57.6 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.1	No 16	1.180	99.8	.2
.1	No 20	.850	99.8	.2
.1	No 30	.600	99.8	.2
.1	No 40	.425	99.8	.2
.2	No 50	.300	99.7	.3
.4	No 70	.212	99.3	.7
.8	No 100	.150	98.6	1.4
2.1	No 140	.106	96.4	3.6
5.3	No 200	.075	90.8	9.2

HYDROMETER:

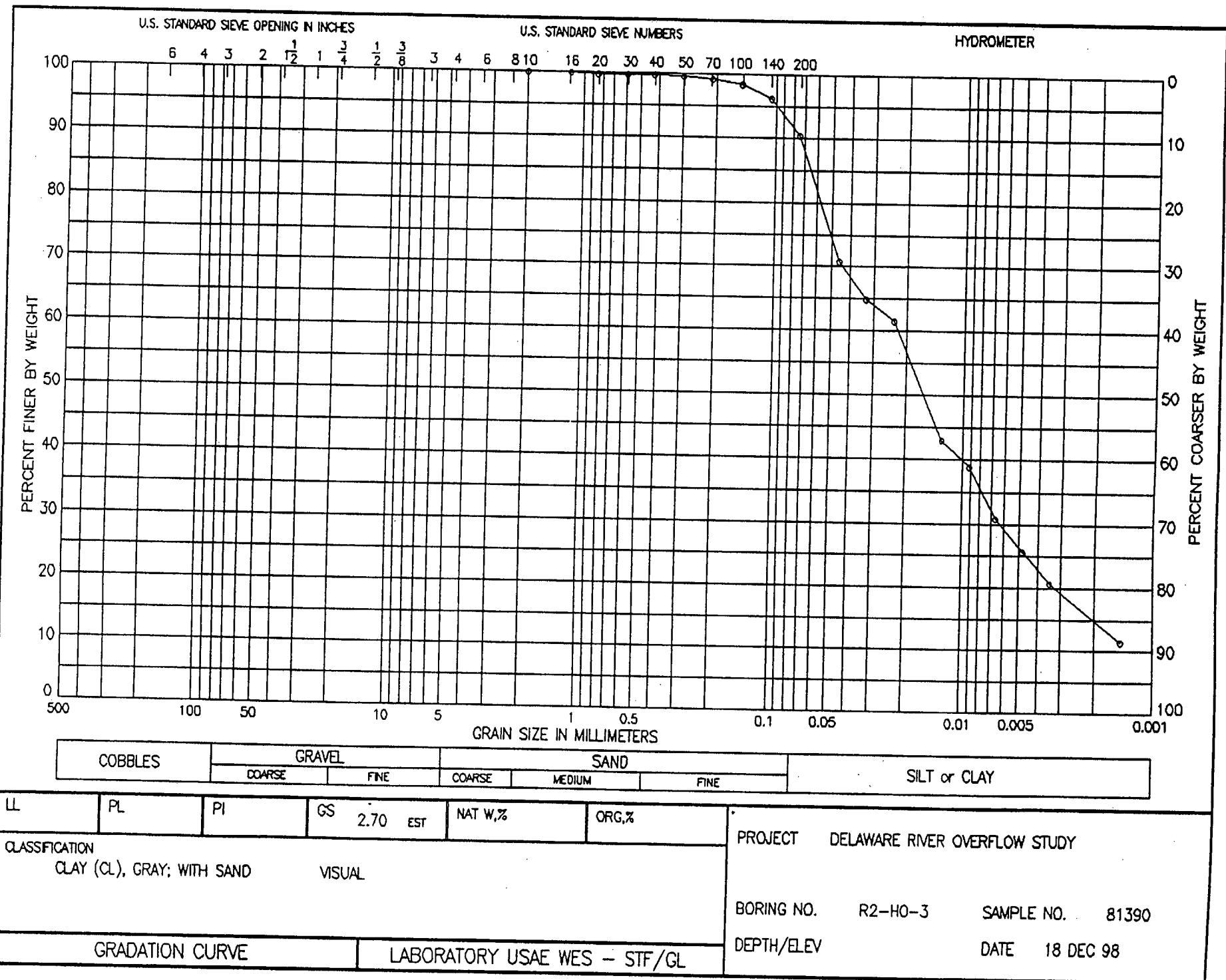
RDGS	TEMP			
21.8	21.5	.0468	59.6	40.4
18.7	21.5	.0342	51.0	49.0
15.7	21.5	.0249	42.7	57.3
10.9	21.5	.0135	29.5	70.5
9.9	21.5	.0096	26.7	73.3
7.1	21.5	.0069	19.0	81.0
5.5	21.5	.0050	14.6	85.4
5.0	21.5	.0035	13.2	86.8
2.2	20.0	.0015	4.7	95.3

PERCENT GRAVEL = .0

PERCENT SAND = 9.2

PERCENT FINES = 90.8

EDE



## SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-H0-3      SAMPLE: 81390      DF: MD0199 .DAT  
 DEPTH:                DATE: 18 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC: .00

CLASSIFICATION: 173

CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 51.4 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER No	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	10	2.000	100.0	.0
.0	16	1.180	100.0	.0
.1	20	.850	99.8	.2
.1	30	.600	99.8	.2
.1	40	.425	99.8	.2
.2	50	.300	99.6	.4
.4	70	.212	99.2	.8
.8	100	.150	98.4	1.6
1.9	140	.106	96.3	3.7
4.9	200	.075	90.5	9.5

## HYDROMETER:

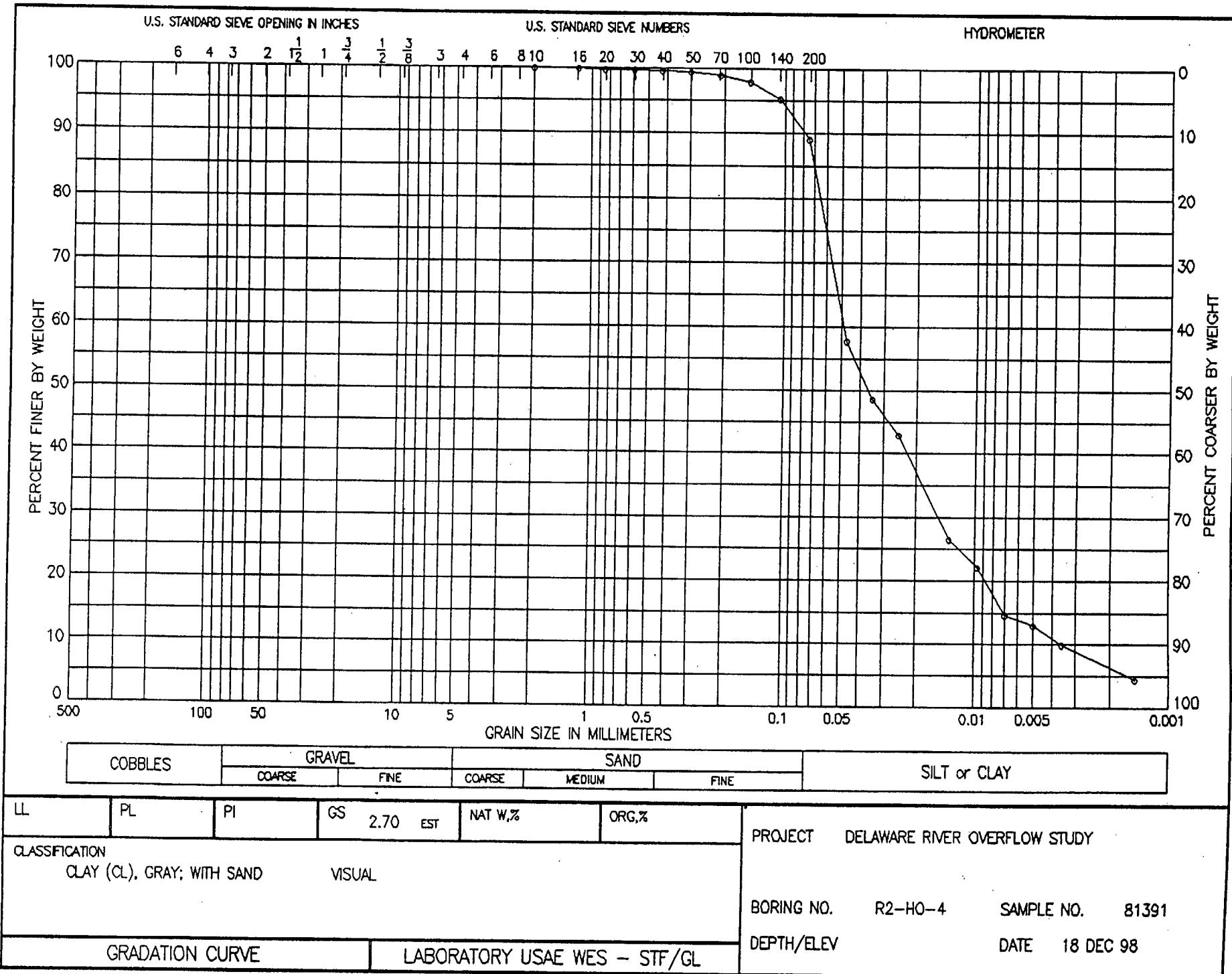
RDGS	TEMP			
23.0	22.0	.0457	70.8	29.2
21.1	22.0	.0330	64.9	35.1
20.0	22.0	.0236	61.5	38.5
14.0	22.0	.0129	43.0	57.0
12.7	22.0	.0092	38.9	61.1
10.1	22.0	.0067	30.9	69.1
8.4	22.0	.0048	25.6	74.4
6.9	21.5	.0035	20.7	79.3
4.2	20.0	.0015	11.4	88.6

PERCENT GRAVEL = .0

PERCENT SAND = 9.5

PERCENT FINES = 90.5

EDE



# SIEVE ANALYSIS

## PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-4      SAMPLE: 81391      DF: MD0199 .DAT  
 DEPTH:                  DATE: 18 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00

CLASSIFICATION: 181  
 CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:      57.5 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.1	No 20	.850	99.8	.2
.1	No 30	.600	99.8	.2
.2	No 40	.425	99.7	.3
.3	No 50	.300	99.5	.5
.6	No 70	.212	99.0	1.0
1.2	No 100	.150	97.9	2.1
2.7	No 140	.106	95.3	4.7
6.3	No 200	.075	89.0	11.0

### HYDROMETER:

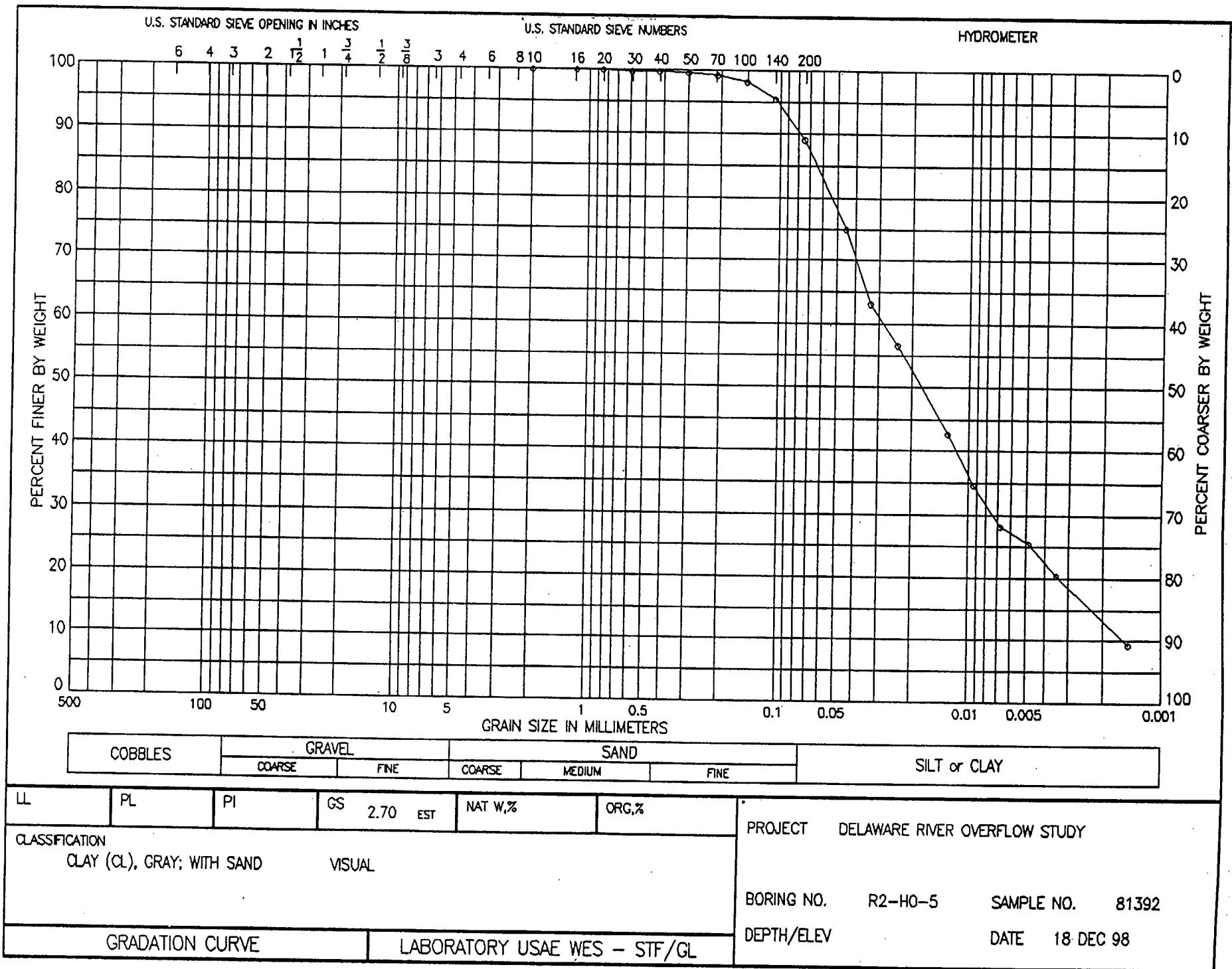
RDGS	TEMP			
21.1	21.5	.0472	57.7	42.3
17.8	21.5	.0345	48.6	51.4
15.7	21.5	.0249	42.8	57.2
9.8	21.5	.0136	26.5	73.5
8.2	21.5	.0097	22.1	77.9
5.5	21.5	.0070	14.6	85.4
4.9	21.5	.0050	13.0	87.0
3.8	21.5	.0036	9.9	90.1
2.1	20.0	.0015	4.4	95.6

PERCENT GRAVEL = .0

PERCENT SAND = 11.0

PERCENT FINES = 89.0

EDE



# SIEVE ANALYSIS

## PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-H0-5      SAMPLE: 81392      DF: MD0199 .DAT  
DEPTH:                    DATE: 18 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00

CLASSIFICATION: 189

CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:    51.3 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.8	.2
.1	No 40	.425	99.8	.2
.2	No 50	.300	99.6	.4
.4	No 70	.212	99.2	.8
.9	No 100	.150	98.2	1.8
2.3	No 140	.106	95.5	4.5
5.6	No 200	.075	89.1	10.9

### HYDROMETER:

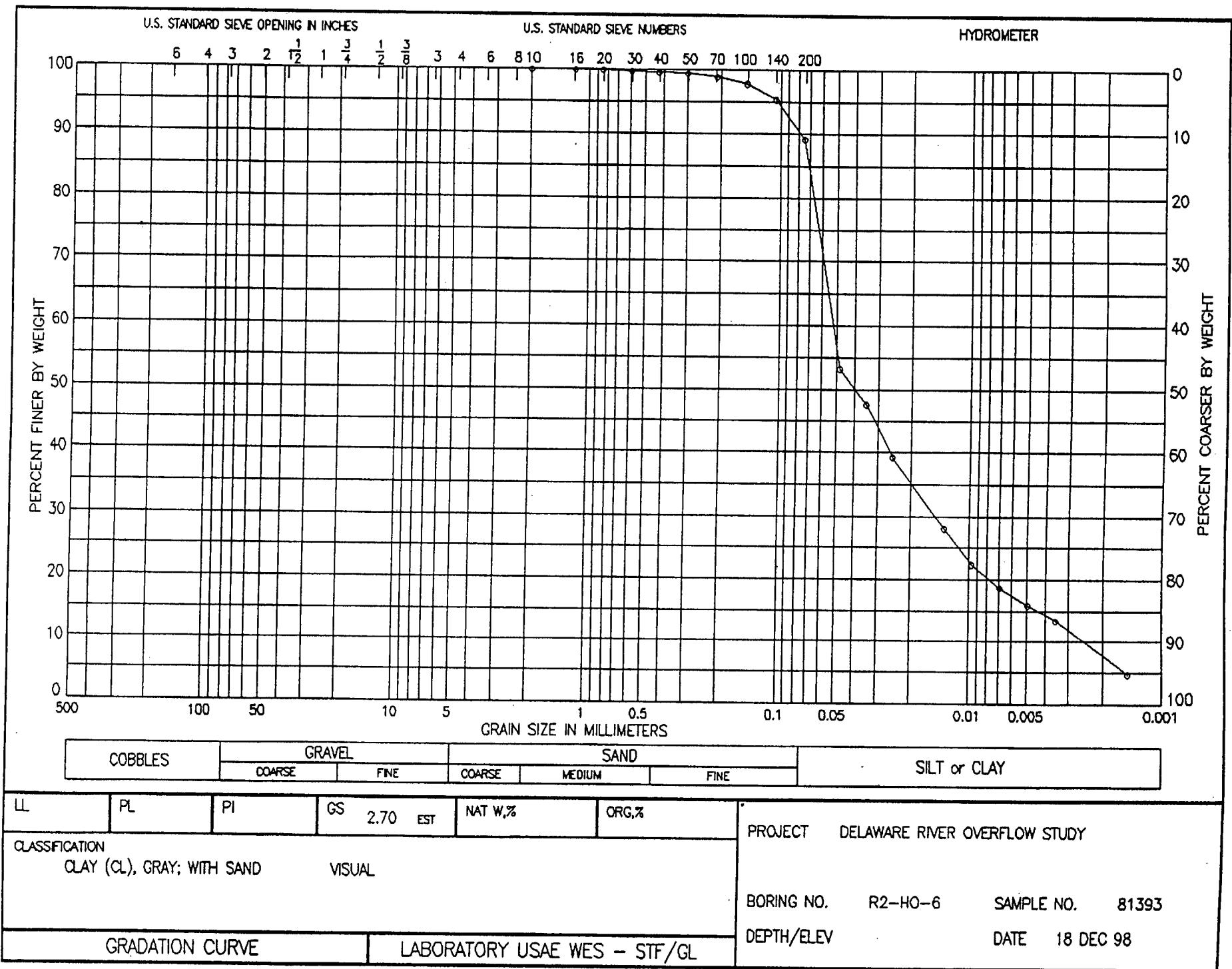
RDGS	TEMP			
24.3	22.0	.0450	74.9	25.1
20.5	22.0	.0332	63.2	36.8
18.4	22.0	.0240	56.7	43.3
13.9	22.0	.0129	42.7	57.3
11.4	21.5	.0095	34.7	65.3
9.3	21.5	.0068	28.2	71.8
8.4	21.5	.0049	25.4	74.6
6.8	21.5	.0035	20.4	79.6
3.5	20.0	.0015	9.3	90.7

PERCENT GRAVEL =      .0

PERCENT SAND    = 10.9

PERCENT FINES   = 89.1

EDE



## SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-6      SAMPLE: 81393      DF: MD0199 .DAT  
 DEPTH:                DATE: 18 DEC 98

10-LIMITS-RAN      GS: 2.70 est      WC: .00

CLASSIFICATION: 197

CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 57.0 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER No	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	10	2.000	100.0	.0
.0	16	1.180	100.0	.0
.0	20	.850	100.0	.0
.1	30	.600	99.8	.2
.2	40	.425	99.6	.4
.3	50	.300	99.5	.5
.6	70	.212	98.9	1.1
1.2	100	.150	97.9	2.1
2.6	140	.106	95.4	4.6
6.2	200	.075	89.1	10.9

HYDROMETER:

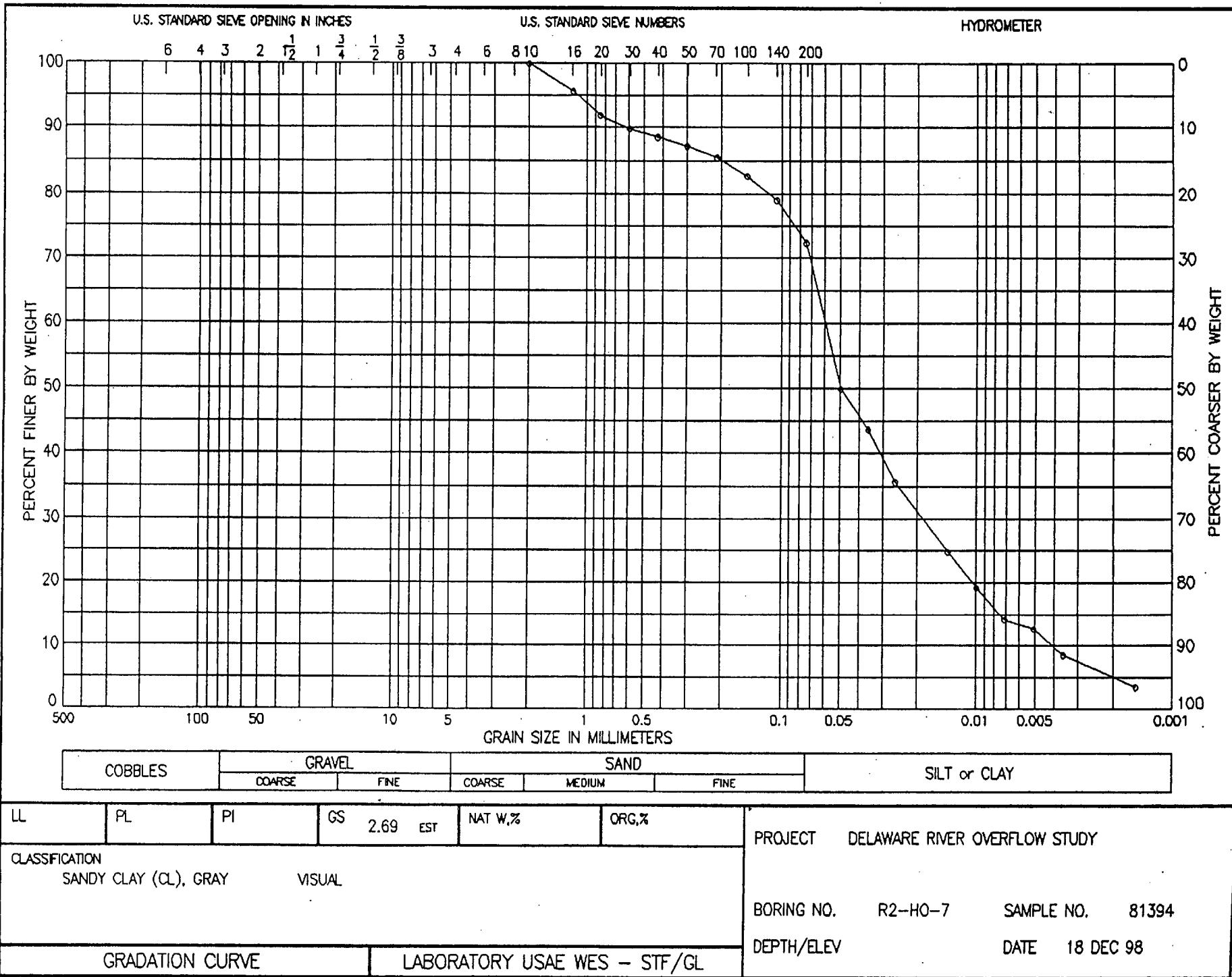
RDGS	TEMP			
19.3	21.5	.0481	53.2	46.8
17.3	21.5	.0347	47.6	52.4
14.3	21.5	.0253	39.3	60.7
10.3	21.5	.0135	28.1	71.9
8.2	21.5	.0097	22.3	77.7
6.9	21.5	.0070	18.7	81.3
5.9	21.5	.0050	15.9	84.1
5.0	21.5	.0035	13.4	86.6
2.2	20.0	.0015	4.7	95.3

PERCENT GRAVEL = .0

PERCENT SAND = 10.9

PERCENT FINES = 89.1

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-7                    SAMPLE: 81394    DF: MD0199 .DAT  
DEPTH:                              DATE: 18 DEC 98

NO-LIMITS-RAN    GS: 2.69 est    WC:     .00  
CLASSIFICATION: 205  
SANDY CLAY (CL), GRAY                VISUAL

TOTAL WEIGHT OF SAMPLE:     .0 gms.  
PARTIAL WEIGHT AFTER SPLIT:    53.9 gms.

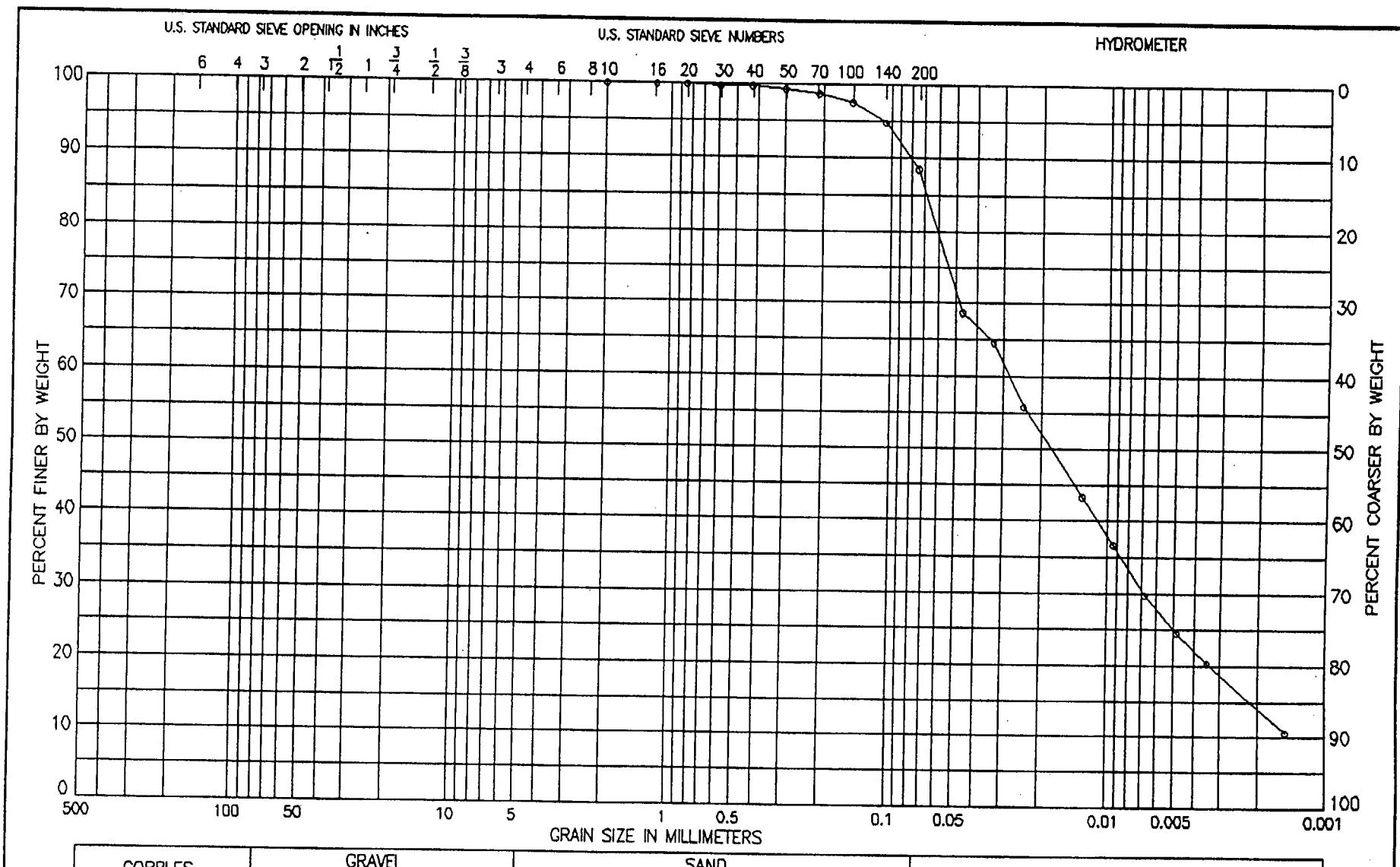
WEIGHTS gm.	SIEVE SIZE or NUMBER No	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	10	2.000	100.0	.0
2.3	No 16	1.180	95.7	4.3
4.4	No 20	.850	91.8	8.2
5.5	No 30	.600	89.8	10.2
6.2	No 40	.425	88.5	11.5
6.9	No 50	.300	87.2	12.8
7.8	No 70	.212	85.5	14.5
9.3	No 100	.150	82.7	17.3
11.3	No 140	.106	79.0	21.0
14.9	No 200	.075	72.4	27.6

HYDROMETER:

RDGS	TEMP			
17.3	20.5	.0498	49.9	50.1
15.2	20.5	.0360	43.7	56.3
12.5	20.5	.0261	35.7	64.3
8.8	20.5	.0139	24.8	75.2
6.9	20.5	.0100	19.2	80.8
5.2	20.5	.0072	14.2	85.8
4.7	20.5	.0051	12.7	87.3
3.2	21.0	.0036	8.6	91.4
2.1	18.0	.0015	3.5	96.5

PERCENT GRAVEL = .0  
PERCENT SAND = 27.6  
PERCENT FINES = 72.4

EDE



COBBLES	GRAVEL			SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE		

LL	PL	PI	GS 2.70 EST	NAT W.%	ORG. %	PROJECT DELAWARE RIVER OVERFLOW STUDY  CLASSIFICATION CLAY (CL), GRAY; WITH SAND VISUAL	
GRADATION CURVE			LABORATORY USAE WES - STF/GL			DEPTH/ELEV DATE 18 DEC 98	

# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-H0-8            SAMPLE: 81395    DF: MD0199 .DAT  
DEPTH:                    DATE: 18 DEC 98

NO-LIMITS-RAN    GS: 2.70 est    WC: .00  
CLASSIFICATION: 213  
CLAY (CL), GRAY; WITH SAND                    VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
PARTIAL WEIGHT AFTER SPLIT: 50.6 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.8	.2
.1	No 40	.425	99.8	.2
.3	No 50	.300	99.4	.6
.6	No 70	.212	98.8	1.2
1.2	No 100	.150	97.6	2.4
2.6	No 140	.106	94.9	5.1
5.8	No 200	.075	88.5	11.5

HYDROMETER:

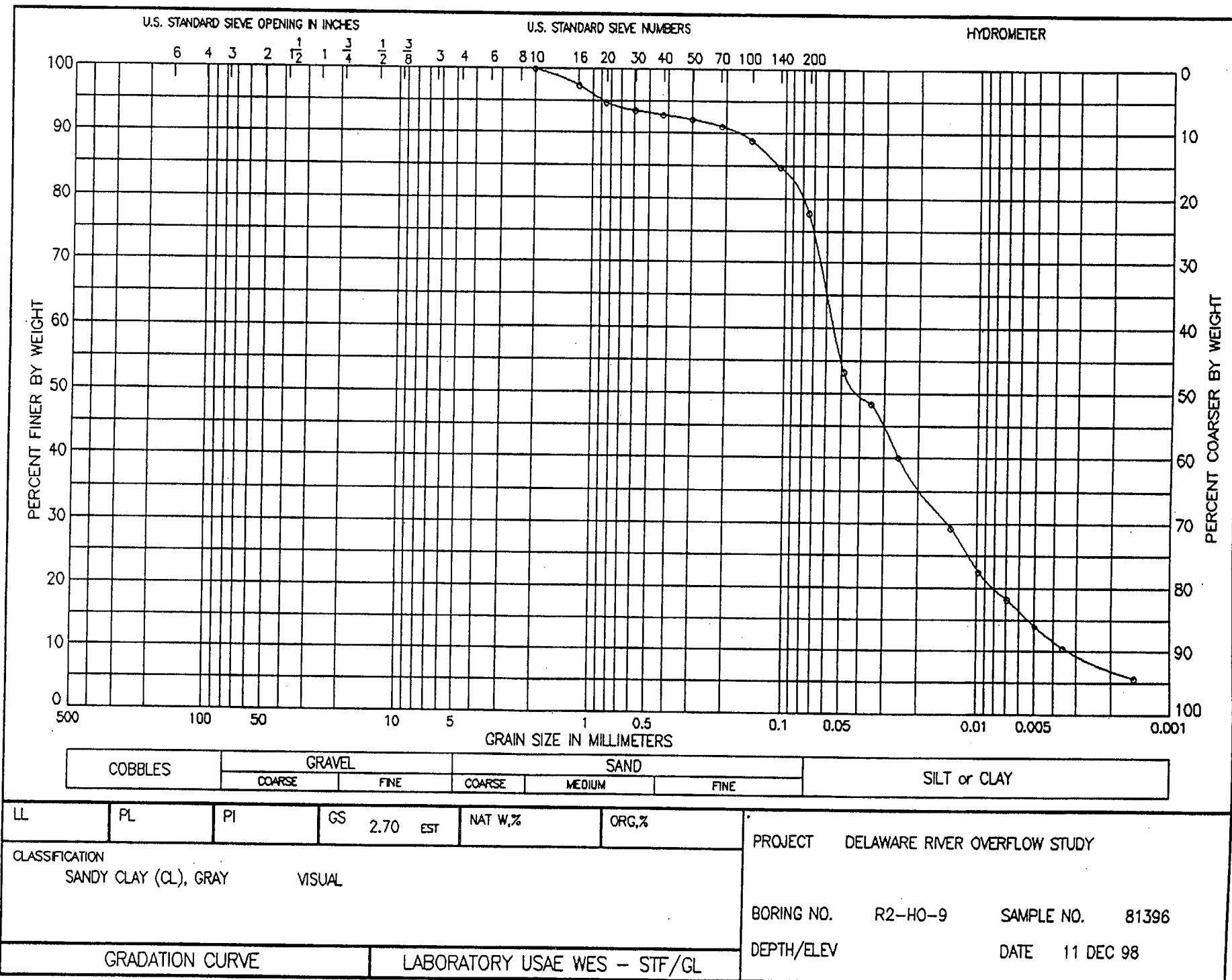
RDGS	TEMP			
22.2	21.0	.0466	68.7	31.3
20.9	21.0	.0334	64.7	35.3
18.1	21.0	.0243	55.9	44.1
14.1	21.0	.0131	43.3	56.7
12.0	21.0	.0094	36.7	63.3
9.8	21.0	.0068	29.8	70.2
8.1	21.0	.0049	24.5	75.5
6.8	21.0	.0035	20.4	79.6
4.3	18.0	.0015	10.7	89.3

PERCENT GRAVEL = .0

PERCENT SAND = 11.5

PERCENT FINES = 88.5

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-9                    SAMPLE: 81396    DF: MD0199 .DAT  
DEPTH:                              DATE: 11 DEC 98

NO-LIMITS-RAN       GS: 2.70 est    WC: .00

CLASSIFICATION: 221

SANDY CLAY (CL), GRAY              VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 55.8 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER No	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	10	2.000	100.0	.0
1.4	No 16	1.180	97.5	2.5
2.9	No 20	.850	94.8	5.2
3.6	No 30	.600	93.5	6.5
4.0	No 40	.425	92.8	7.2
4.4	No 50	.300	92.1	7.9
5.0	No 70	.212	91.0	9.0
6.2	No 100	.150	88.9	11.1
8.5	No 140	.106	84.8	15.2
12.4	No 200	.075	77.8	22.2

## HYDROMETER:

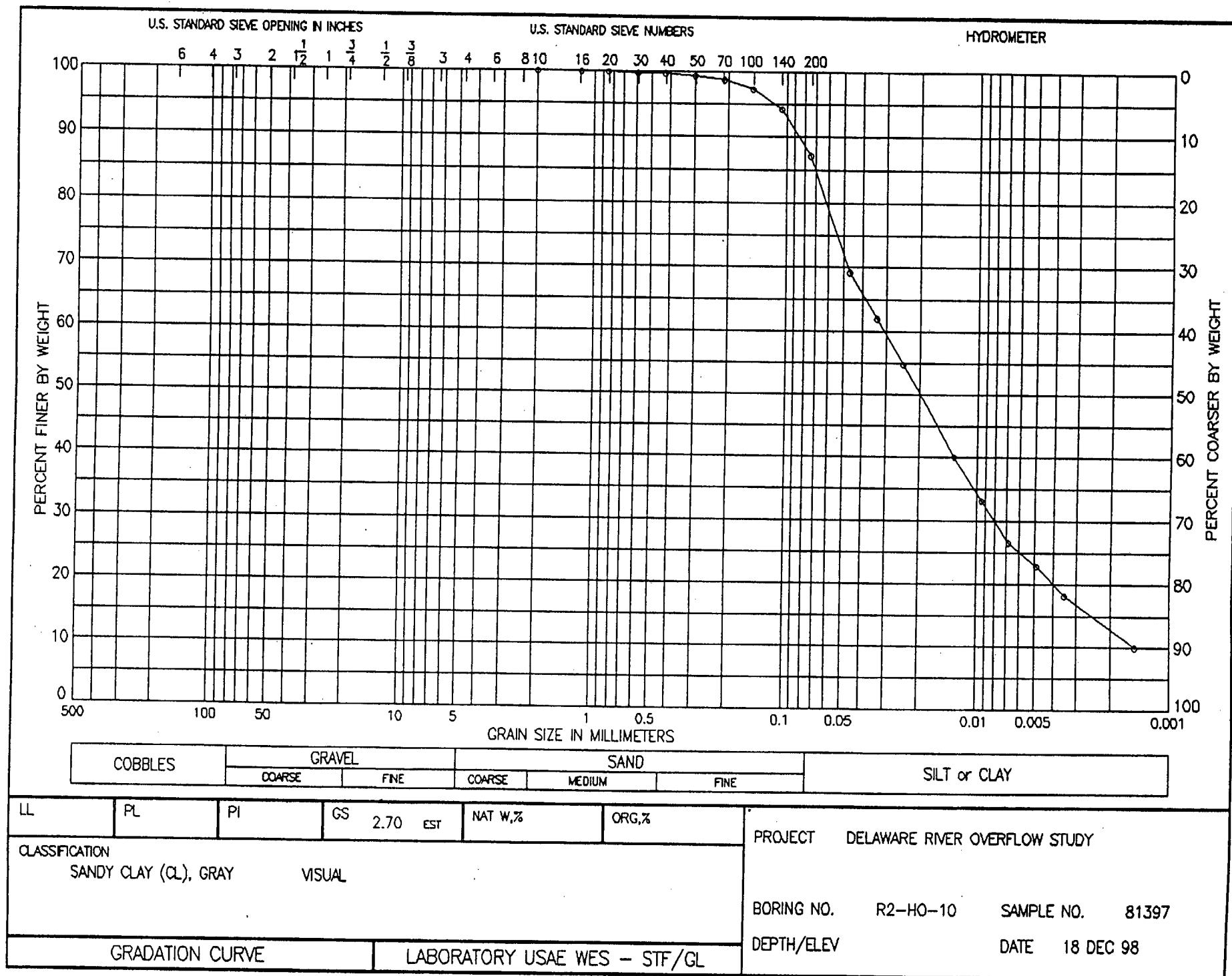
RDGS	TEMP			
19.1	20.5	.0488	53.2	46.8
17.4	20.5	.0351	48.4	51.6
14.5	20.5	.0255	40.1	59.9
10.7	20.5	.0136	29.3	70.7
8.3	20.5	.0099	22.5	77.5
6.7	21.0	.0070	18.2	81.8
5.2	21.0	.0050	13.9	86.1
4.0	21.0	.0036	10.5	89.5
2.9	18.0	.0015	5.7	94.3

PERCENT GRAVEL = .0

PERCENT SAND = 22.2

PERCENT FINES = 77.8

EDE



## SIEVE ANALYSIS

## PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-10      SAMPLE: 81397      DF: MD0199 .DAT  
 DEPTH:                    DATE: 18 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00  
 CLASSIFICATION: 229  
 SANDY CLAY (CL), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT:      50.7 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.8	.2
.1	No 40	.425	99.8	.2
.3	No 50	.300	99.4	.6
.6	No 70	.212	98.8	1.2
1.3	No 100	.150	97.4	2.6
2.9	No 140	.106	94.3	5.7
6.5	No 200	.075	87.2	12.8

## HYDROMETER:

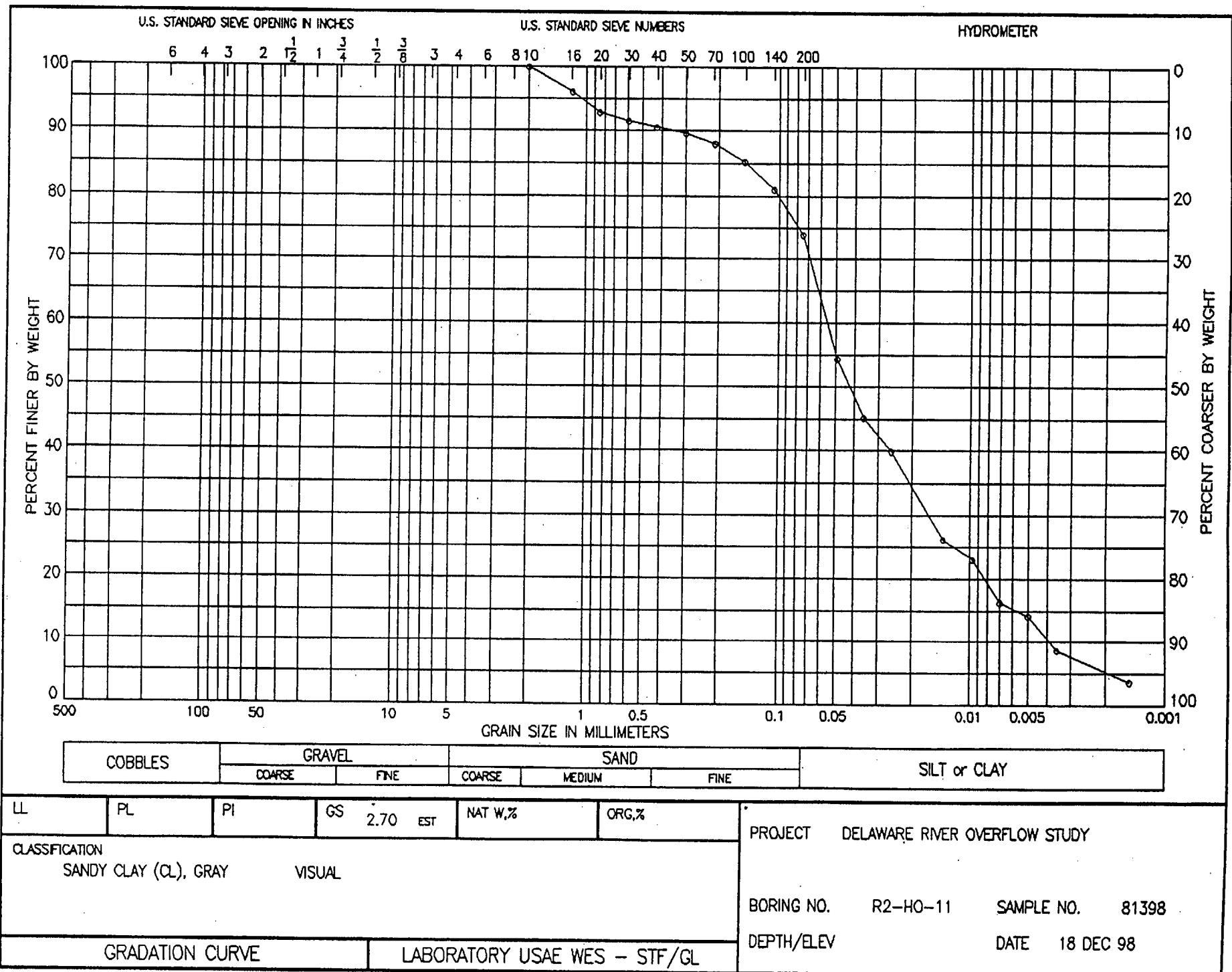
RDGS	TEMP			
22.4	21.0	.0465	69.2	30.8
20.1	21.0	.0337	62.0	38.0
17.8	21.0	.0244	54.8	45.2
13.1	21.0	.0132	40.1	59.9
10.9	21.0	.0095	33.2	66.8
8.8	21.0	.0068	26.6	73.4
7.6	21.0	.0049	22.9	77.1
6.1	21.0	.0035	18.2	81.8
4.1	18.0	.0015	10.0	90.0

PERCENT GRAVEL = .0

PERCENT SAND = 12.8

PERCENT FINES = 87.2

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-11      SAMPLE: 81398      DF: MD0199 .DAT  
DEPTH:                    DATE: 18 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC: .00  
CLASSIFICATION: 237  
SANDY CLAY (CL), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
PARTIAL WEIGHT AFTER SPLIT: 51.7 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
2.0	No 16	1.180	96.1	3.9
3.7	No 20	.850	92.8	7.2
4.4	No 30	.600	91.5	8.5
4.9	No 40	.425	90.5	9.5
5.4	No 50	.300	89.6	10.4
6.2	No 70	.212	88.0	12.0
7.6	No 100	.150	85.3	14.7
9.8	No 140	.106	81.0	19.0
13.5	No 200	.075	73.9	26.1

## HYDROMETER:

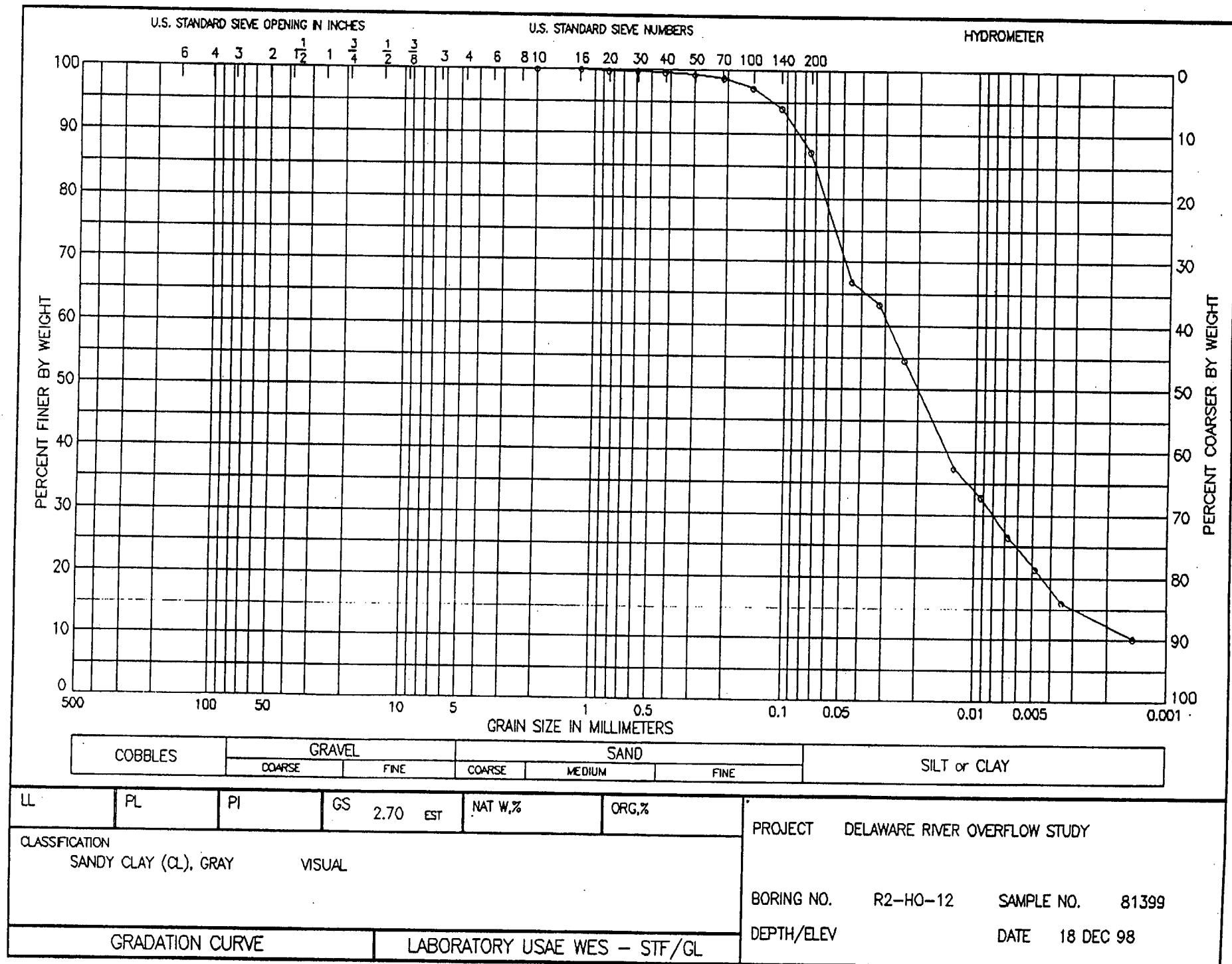
RDGS	TEMP			
18.1	20.5	.0493	54.4	45.6
15.1	20.5	.0359	45.2	54.8
13.4	20.5	.0258	39.9	60.1
8.9	20.5	.0139	26.1	73.9
7.8	21.0	.0098	23.0	77.0
5.6	21.0	.0070	16.3	83.7
4.9	21.0	.0050	14.1	85.9
3.1	21.0	.0036	8.6	91.4
2.1	18.0	.0015	3.7	96.3

PERCENT GRAVEL = .0

PERCENT SAND = 26.1

PERCENT FINES = 73.9

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-12      SAMPLE: 81399      DF: MD0199 .DAT  
DEPTH:                    DATE: 18 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC: .00

CLASSIFICATION: 245

SANDY CLAY (CL), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 59.4 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER No	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.1	No 20	.850	99.8	.2
.1	No 30	.600	99.8	.2
.2	No 40	.425	99.7	.3
.4	No 50	.300	99.3	.7
.7	No 70	.212	98.8	1.2
1.6	No 100	.150	97.3	2.7
3.5	No 140	.106	94.1	5.9
7.6	No 200	.075	87.2	12.8

## HYDROMETER:

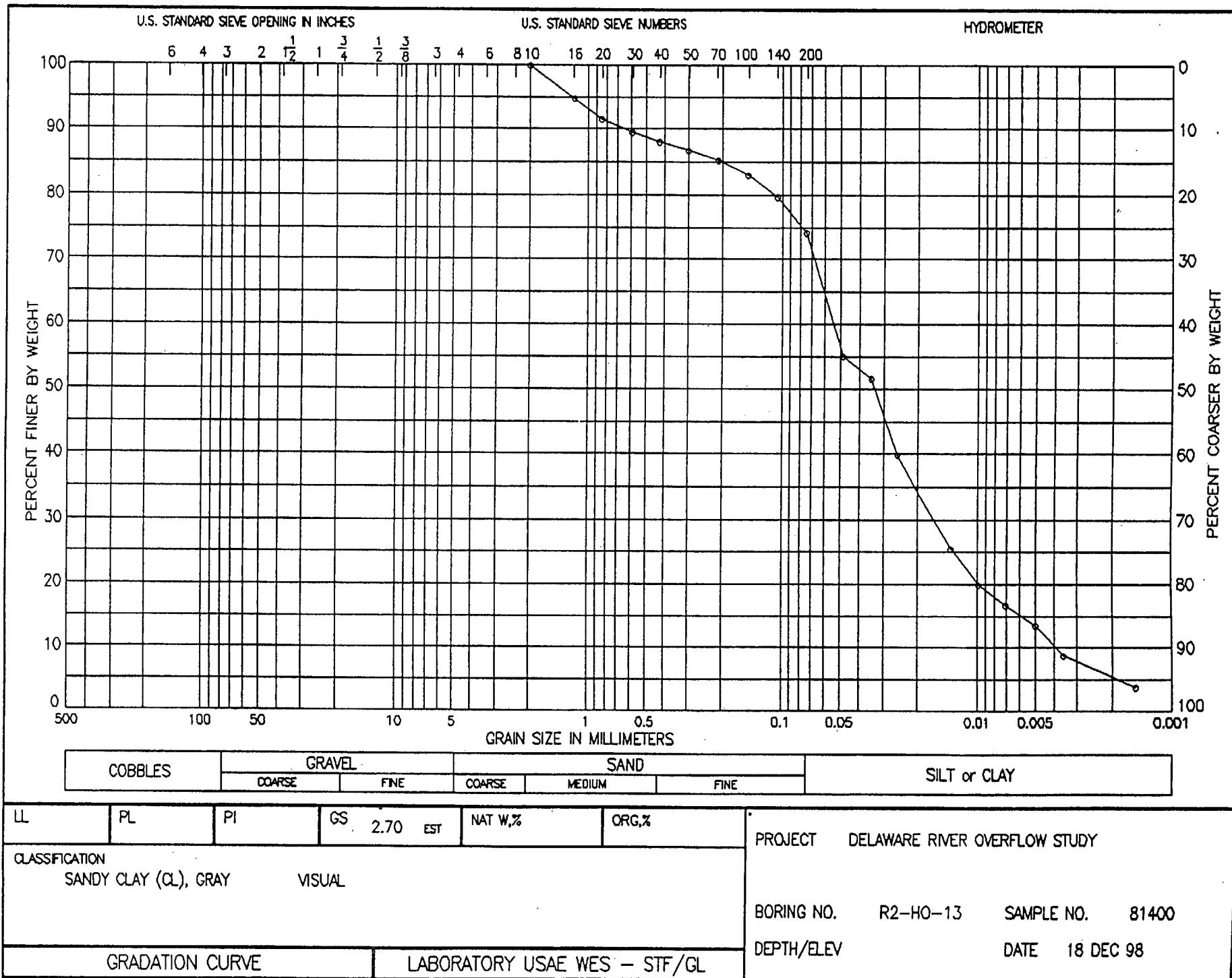
RDGS	TEMP			
25.3	21.0	.0450	66.8	33.2
24.0	21.0	.0323	63.4	36.6
20.7	21.0	.0237	54.5	45.5
14.3	21.0	.0130	37.4	62.6
12.6	21.0	.0094	32.9	67.1
10.2	21.0	.0068	26.5	73.5
8.3	21.0	.0049	21.4	78.6
6.3	21.0	.0035	16.0	84.0
4.7	18.0	.0015	10.2	89.8

PERCENT GRAVEL = .0

PERCENT SAND = 12.8

PERCENT FINES = 87.2

EDE



## SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-13      SAMPLE: 81400      DF: MD0199 .DAT  
DEPTH:                    DATE: 18 DEC 98

LO-LIMITS-RAN      GS: 2.70 est      WC: .00  
CLASSIFICATION: 253  
SANDY CLAY (CL), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
PARTIAL WEIGHT AFTER SPLIT: 54.2 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
2.8	No 16	1.180	94.8	5.2
4.6	No 20	.850	91.5	8.5
5.7	No 30	.600	89.5	10.5
6.5	No 40	.425	88.0	12.0
7.2	No 50	.300	86.7	13.3
8.0	No 70	.212	85.2	14.8
9.2	No 100	.150	83.0	17.0
11.0	No 140	.106	79.7	20.3
14.0	No 200	.075	74.2	25.8

HYDROMETER:

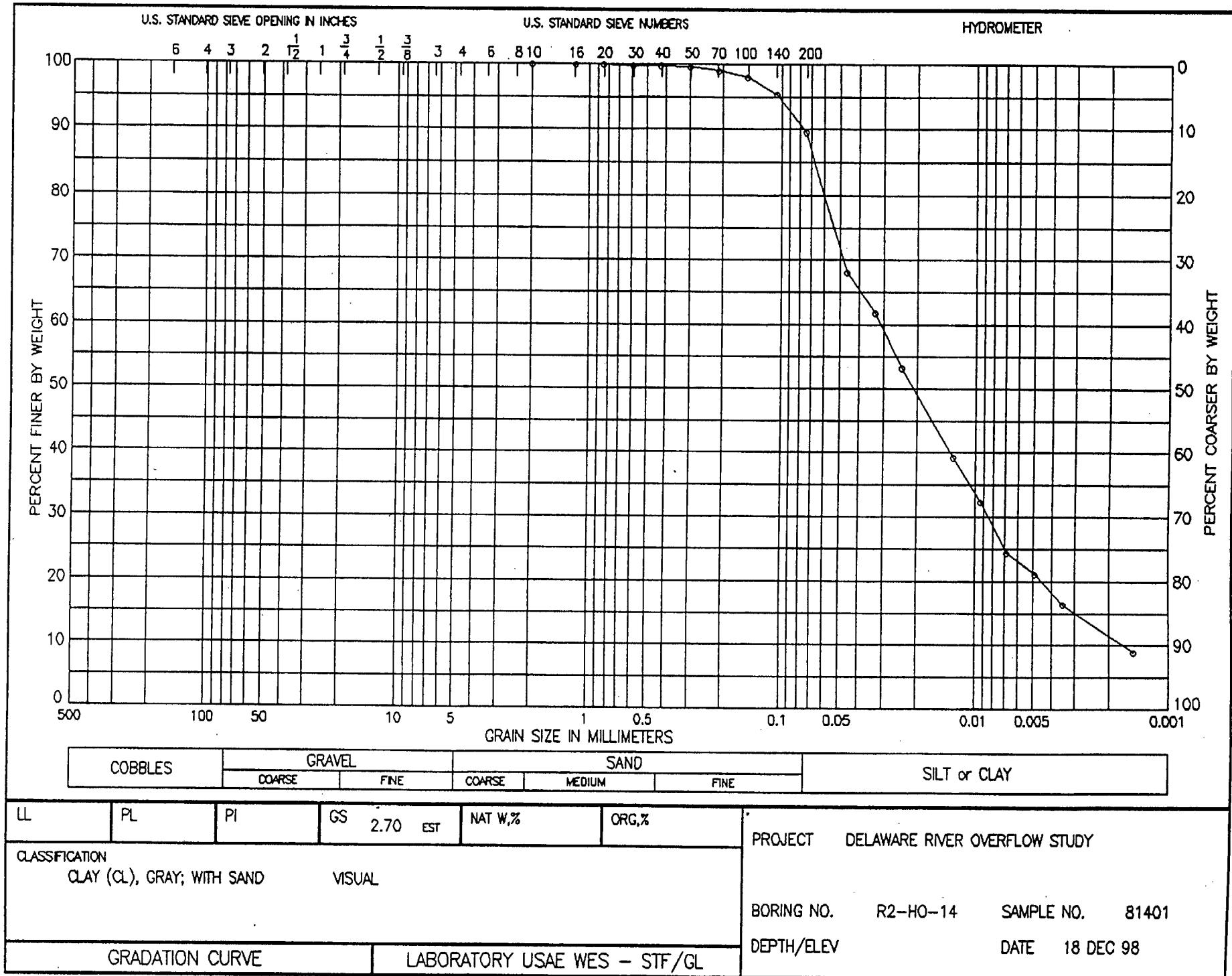
RDGS	TEMP			
19.2	20.5	.0487	55.1	44.9
18.0	20.5	.0349	51.6	48.4
14.0	20.5	.0256	39.9	60.1
9.1	20.5	.0138	25.5	74.5
7.2	20.5	.0099	19.9	80.1
6.1	20.5	.0071	16.7	83.3
4.9	21.0	.0050	13.5	86.5
3.3	21.0	.0036	8.8	91.2
2.2	18.0	.0015	3.8	96.2

PERCENT GRAVEL = .0

PERCENT SAND = 25.8

PERCENT FINES = 74.2

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-14      SAMPLE: 81401      DF: MD0199 .DAT  
DEPTH:                    DATE: 18 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00

CLASSIFICATION: 261

CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:    53.4 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.8	.2
.1	No 40	.425	99.8	.2
.2	No 50	.300	99.6	.4
.5	No 70	.212	99.1	.9
1.0	No 100	.150	98.1	1.9
2.4	No 140	.106	95.5	4.5
5.6	No 200	.075	89.5	10.5

HYDROMETER:

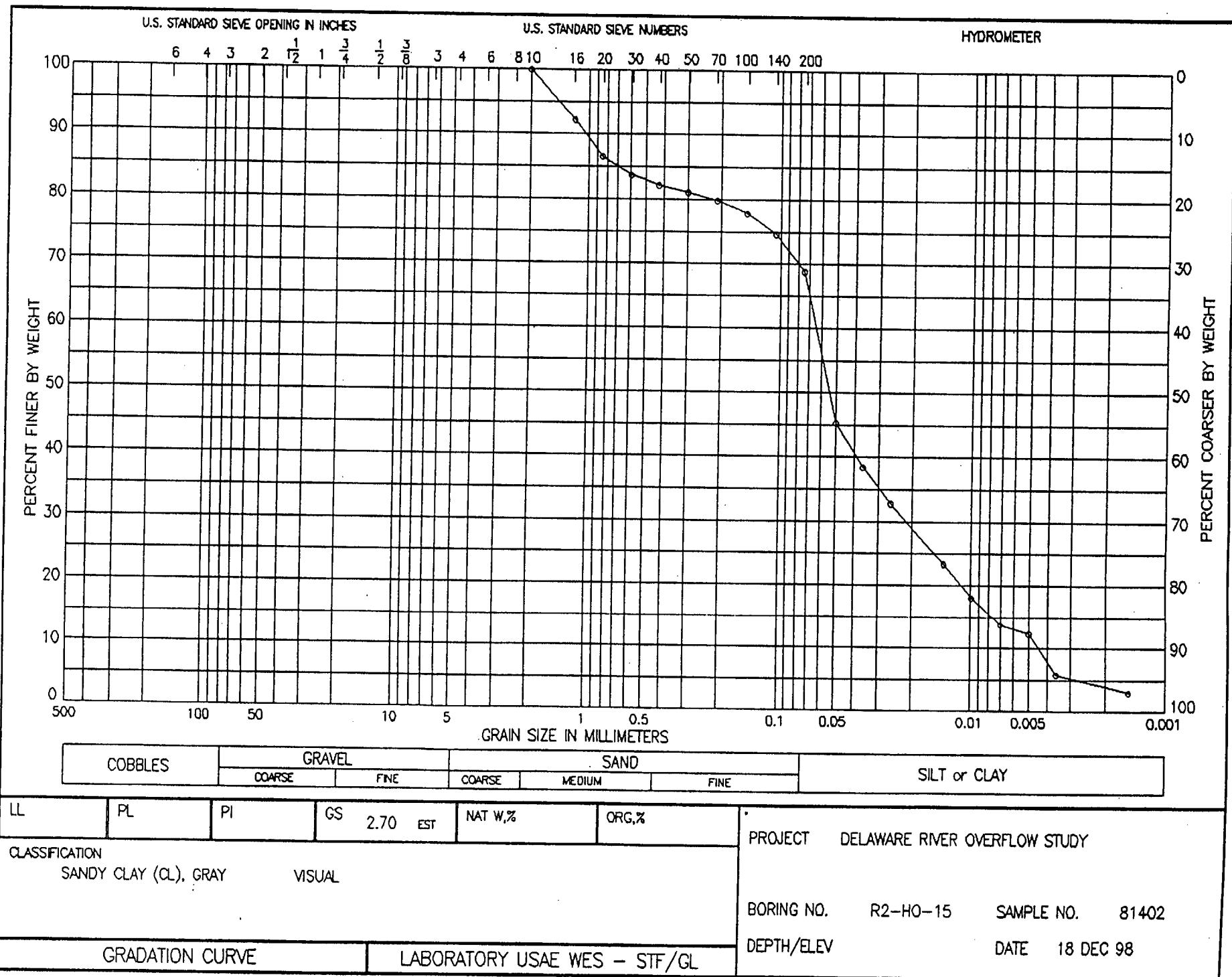
RDGS	TEMP			
23.2	21.0	.0461	68.1	31.9
21.1	21.0	.0334	61.9	38.1
18.2	21.0	.0243	53.2	46.8
13.5	21.0	.0131	39.3	60.7
11.2	21.0	.0095	32.4	67.6
8.5	21.0	.0069	24.4	75.6
7.4	21.0	.0049	21.1	78.9
5.8	21.0	.0035	16.4	83.6
3.9	18.0	.0015	8.9	91.1

PERCENT GRAVEL = .0

PERCENT SAND = 10.5

PERCENT FINES = 89.5

EDE



## SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-15      SAMPLE: 81402      DF: MD0199 .DAT  
 DEPTH:                    DATE: 18 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC: .00  
 CLASSIFICATION: 269  
 SANDY CLAY (CL), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT: 56.5 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER No	OPENING mm	PERCENT	PERCENT
			FINER	COARSER
.0	10	2.000	100.0	.0
4.4	No 16	1.180	92.2	7.8
7.6	No 20	.850	86.5	13.5
9.2	No 30	.600	83.7	16.3
10.1	No 40	.425	82.1	17.9
10.7	No 50	.300	81.1	18.9
11.4	No 70	.212	79.8	20.2
12.5	No 100	.150	77.9	22.1
14.3	No 140	.106	74.7	25.3
17.6	No 200	.075	68.8	31.2

HYDROMETER:

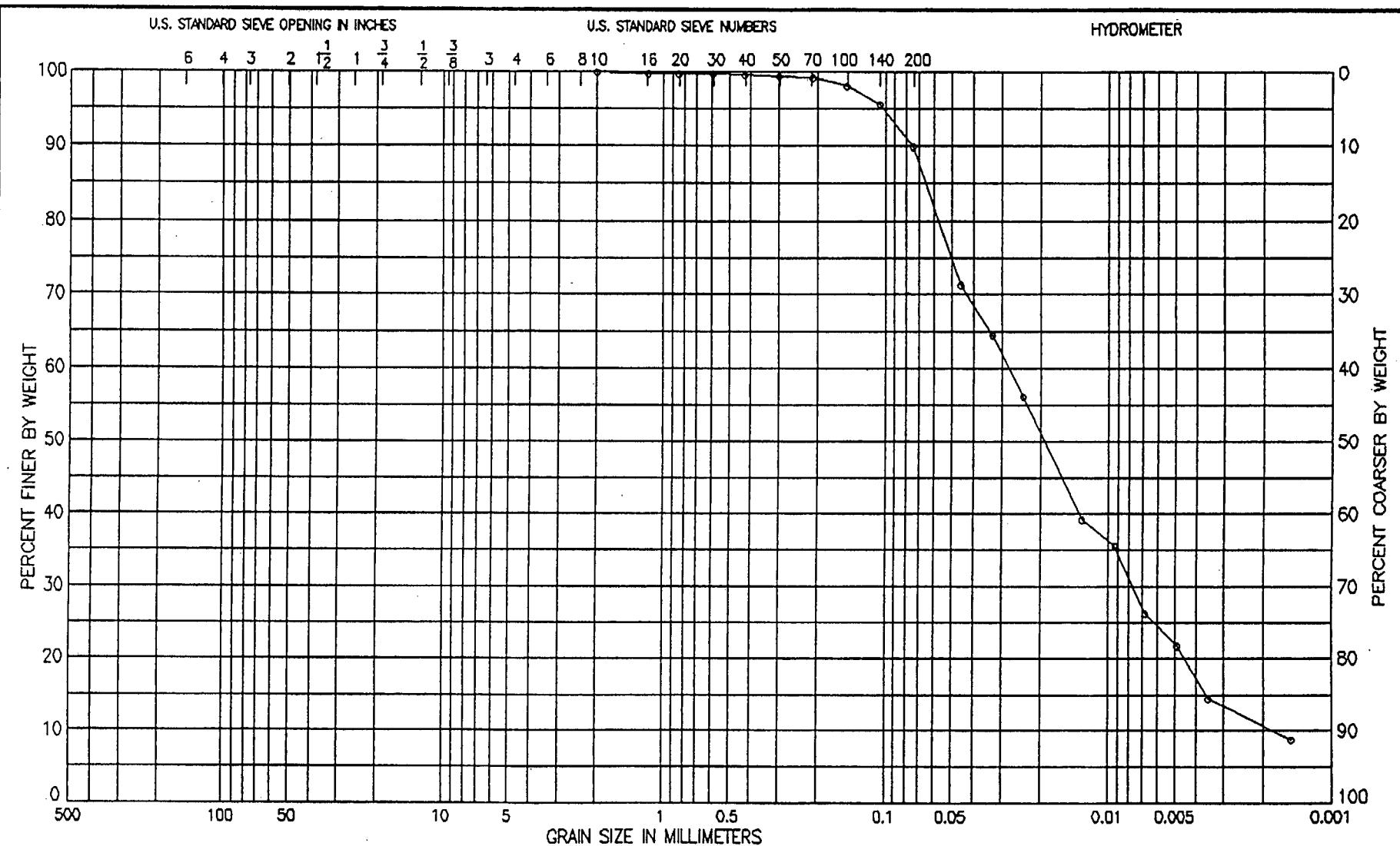
RDGS	TEMP			
16.5	20.5	.0501	45.3	54.7
14.1	20.5	.0362	38.5	61.5
12.1	20.5	.0261	32.9	67.1
8.7	20.5	.0139	23.3	76.7
6.8	20.5	.0100	18.0	82.0
5.2	21.0	.0071	13.8	86.2
4.7	21.0	.0050	12.4	87.6
2.4	21.0	.0036	5.9	94.1
2.0	18.0	.0015	3.1	96.9

PERCENT GRAVEL = .0

PERCENT SAND = 31.2

PERCENT FINES = 68.8

EDE



COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LL	PL	PI	GS	2.70	EST	NAT W. %	ORG. %	PROJECT	DELAWARE RIVER OVERFLOW STUDY
CLASSIFICATION	CLAY (CL), GRAY; WITH SAND					VISUAL		BORING NO.	R2-HO-16
								SAMPLE NO.	81403
GRADATION CURVE			LABORATORY USAE WES - STF/GL					DEPTH/ELEV	DATE 18 DEC 98

# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-16      SAMPLE: 81403      DF: MD0199 .DAT  
 DEPTH:                    DATE: 18 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00  
 CLASSIFICATION: 277  
 CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:      52.6 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.1	No 16	1.180	99.8	.2
.1	No 20	.850	99.8	.2
.1	No 30	.600	99.8	.2
.2	No 40	.425	99.6	.4
.3	No 50	.300	99.4	.6
.4	No 70	.212	99.2	.8
1.0	No 100	.150	98.1	1.9
2.3	No 140	.106	95.6	4.4
5.3	No 200	.075	89.9	10.1

HYDROMETER:

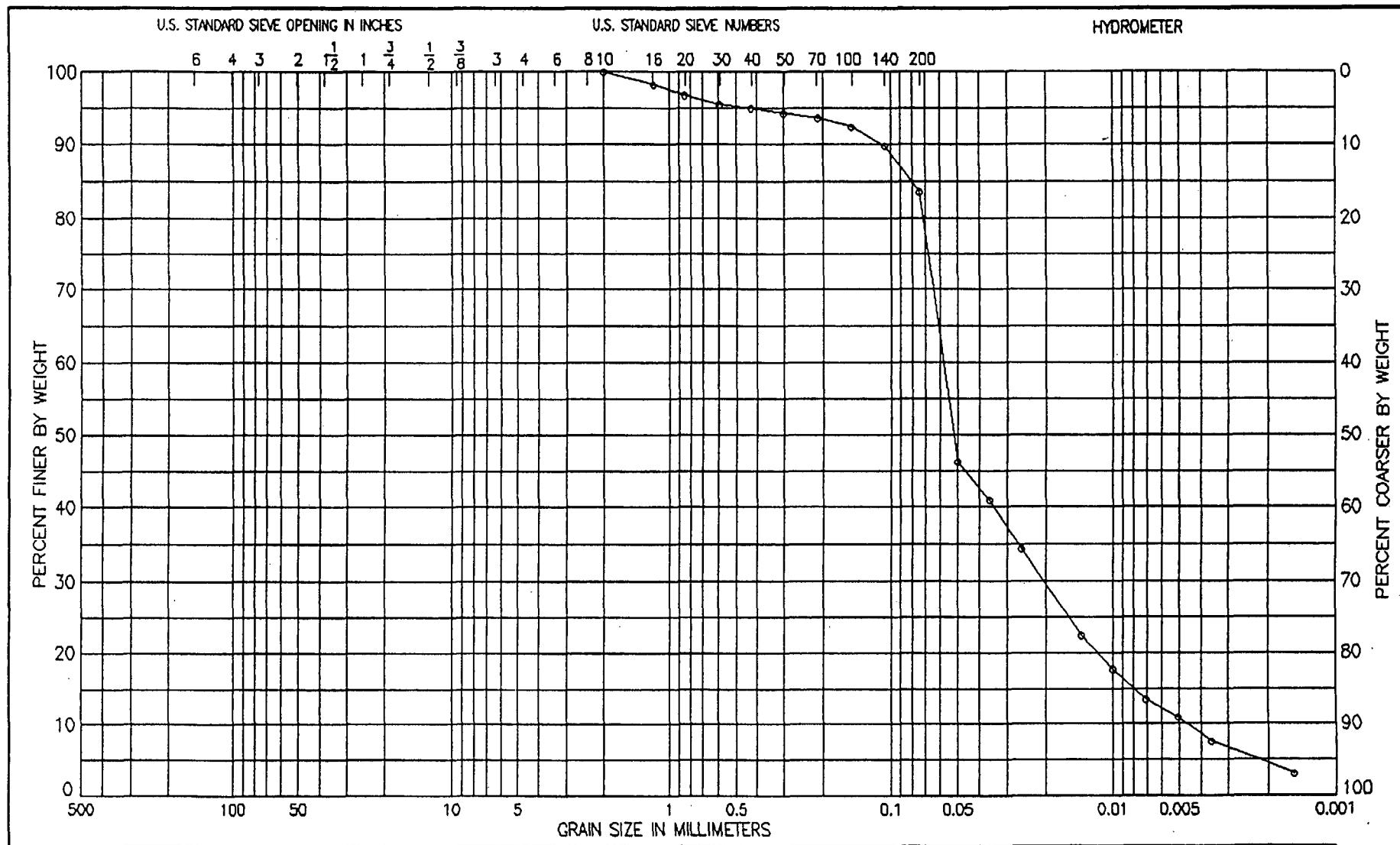
RDGS	TEMP			
23.9	21.0	.0457	71.3	28.7
21.7	21.0	.0331	64.6	35.4
18.9	21.0	.0241	56.2	43.8
13.3	21.0	.0132	39.3	60.7
12.1	21.0	.0094	35.6	64.4
9.0	21.0	.0068	26.3	73.7
7.5	21.0	.0049	21.7	78.3
5.1	21.0	.0035	14.5	85.5
3.8	18.0	.0015	8.8	91.2

PERCENT GRAVEL = .0

PERCENT SAND = 10.1

PERCENT FINES = 89.9

EDE



COBBLES			GRAVEL			SAND			SILT or CLAY		
LL	PL	PI	GS DOARSE	FINE	COARSE	MEDIUM	FINE	PROJECT DELAWARE RIVER OVERFLOW STUDY			
CLASSIFICATION SANDY CLAY (CL), GRAY	VISUAL							BORING NO.	R2-HO-17	SAMPLE NO.	81404
GRADATION CURVE			LABORATORY USAE WES - STF/GL			DEPTH/ELEV			DATE 18 DEC 98		

# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-17      SAMPLE: 81404      DF: MD0199 .DAT  
DEPTH:                    DATE: 18 DEC 98

NO-LIMITS-RAN      GS: 2.69 est      WC: .00

CLASSIFICATION: 285

SANDY CLAY (CL), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 56.8 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
1.0	No 16	1.180	98.2	1.8
1.8	No 20	.850	96.8	3.2
2.5	No 30	.600	95.6	4.4
2.8	No 40	.425	95.1	4.9
3.2	No 50	.300	94.4	5.6
3.6	No 70	.212	93.7	6.3
4.3	No 100	.150	92.4	7.6
5.8	No 140	.106	89.8	10.2
9.3	No 200	.075	83.6	16.4

HYDROMETER:

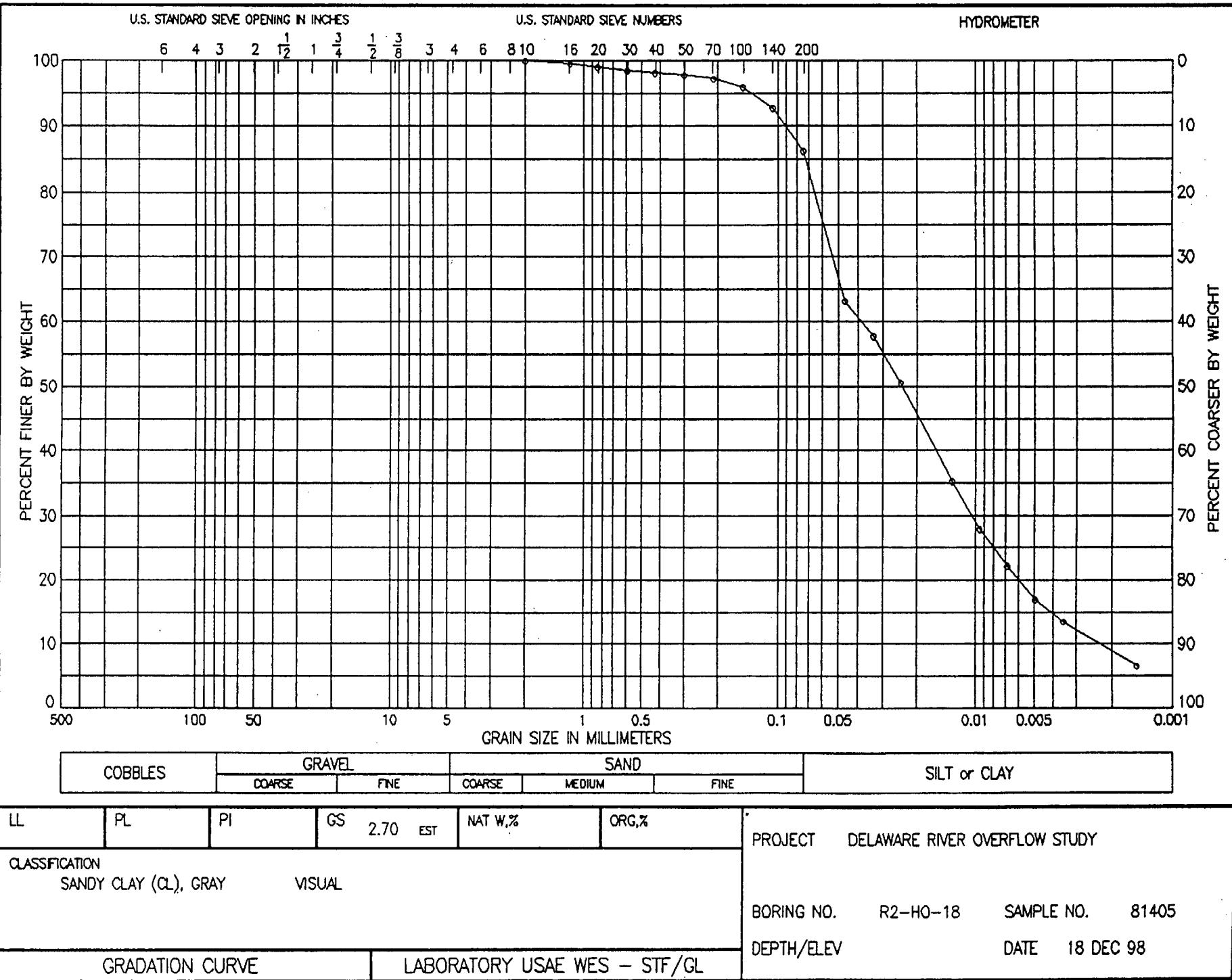
RDGS	TEMP			
16.9	20.5	.0500	46.2	53.8
15.0	20.5	.0360	40.9	59.1
12.7	20.5	.0260	34.5	65.5
8.4	20.5	.0140	22.4	77.6
6.7	20.5	.0100	17.7	82.3
5.1	21.0	.0071	13.5	86.5
4.2	21.0	.0050	10.9	89.1
3.0	21.0	.0036	7.6	92.4
2.0	18.0	.0015	3.1	96.9

PERCENT GRAVEL = .0

PERCENT SAND = 16.4

PERCENT FINES = 83.6

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-18      SAMPLE: 81405      DF: MD0199 .DAT  
 DEPTH:                    DATE: 18 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00

CLASSIFICATION: 298

SANDY CLAY (CL), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:      55.3 gms.

WEIGHTS gm.	SIEVE SIZE OR NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.2	No 16	1.180	99.6	.4
.5	No 20	.850	99.1	.9
.8	No 30	.600	98.6	1.4
1.0	No 40	.425	98.2	1.8
1.2	No 50	.300	97.8	2.2
1.5	No 70	.212	97.3	2.7
2.2	No 100	.150	96.0	4.0
4.0	No 140	.106	92.8	7.2
7.6	No 200	.075	86.3	13.7

## HYDROMETER:

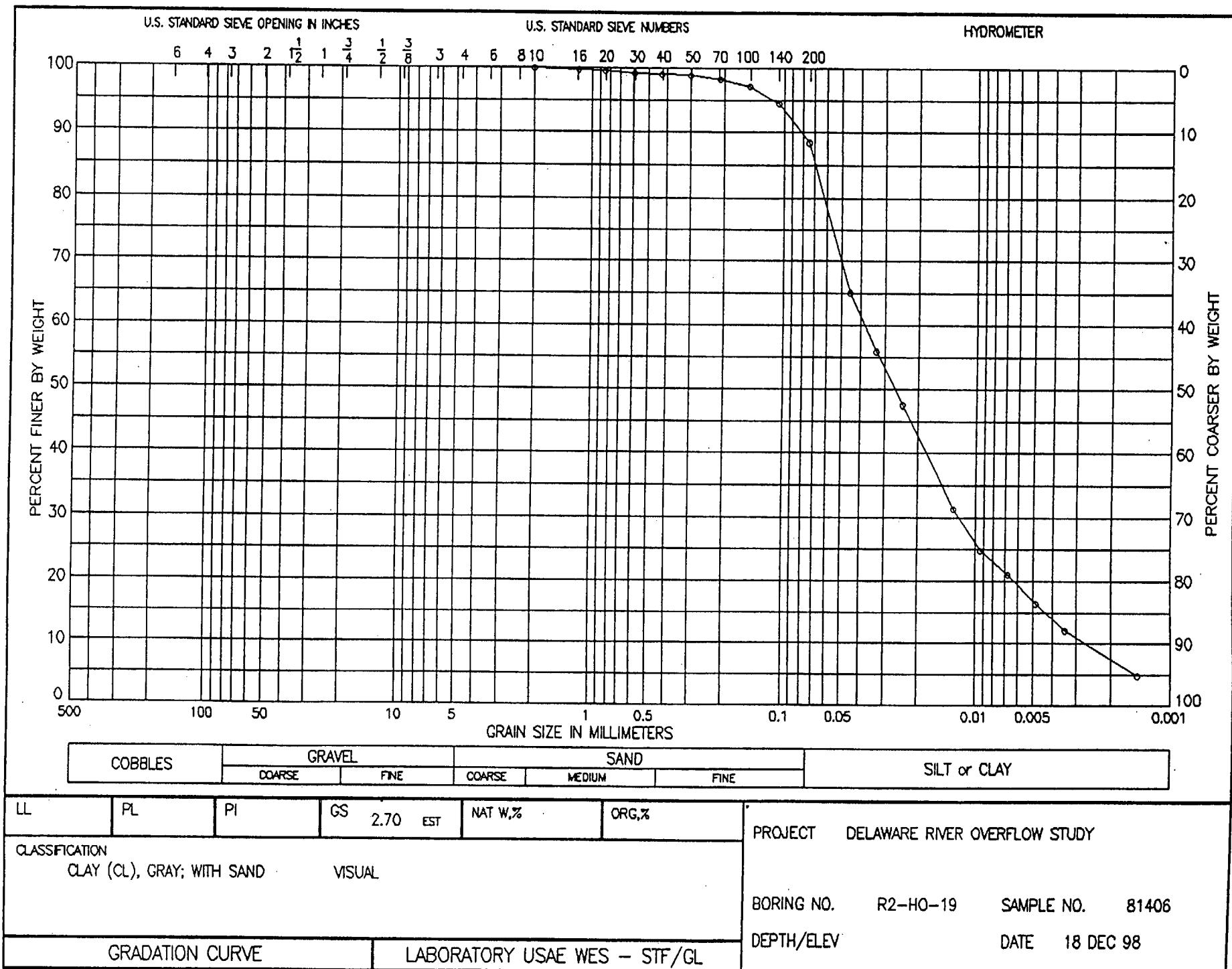
RDGS	TEMP			
22.3	21.0	.0466	63.2	36.8
20.4	21.0	.0336	57.7	42.3
17.9	21.0	.0244	50.5	49.5
12.6	21.0	.0132	35.3	64.7
10.0	21.0	.0096	27.9	72.1
8.0	21.0	.0069	22.1	77.9
6.2	21.0	.0049	16.9	83.1
5.0	21.0	.0035	13.5	86.5
3.2	18.0	.0015	6.6	93.4

PERCENT GRAVEL = .0

PERCENT SAND = 13.7

PERCENT FINES = 86.3

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-19      SAMPLE: 81406      DF: MD0199 .DAT  
DEPTH:                    DATE: 18 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00

CLASSIFICATION: 307

CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:    55.1 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.1	No 16	1.180	99.8	.2
.2	No 20	.850	99.6	.4
.4	No 30	.600	99.3	.7
.5	No 40	.425	99.1	.9
.6	No 50	.300	98.9	1.1
.9	No 70	.212	98.4	1.6
1.5	No 100	.150	97.3	2.7
3.0	No 140	.106	94.6	5.4
6.4	No 200	.075	88.4	11.6

HYDROMETER:

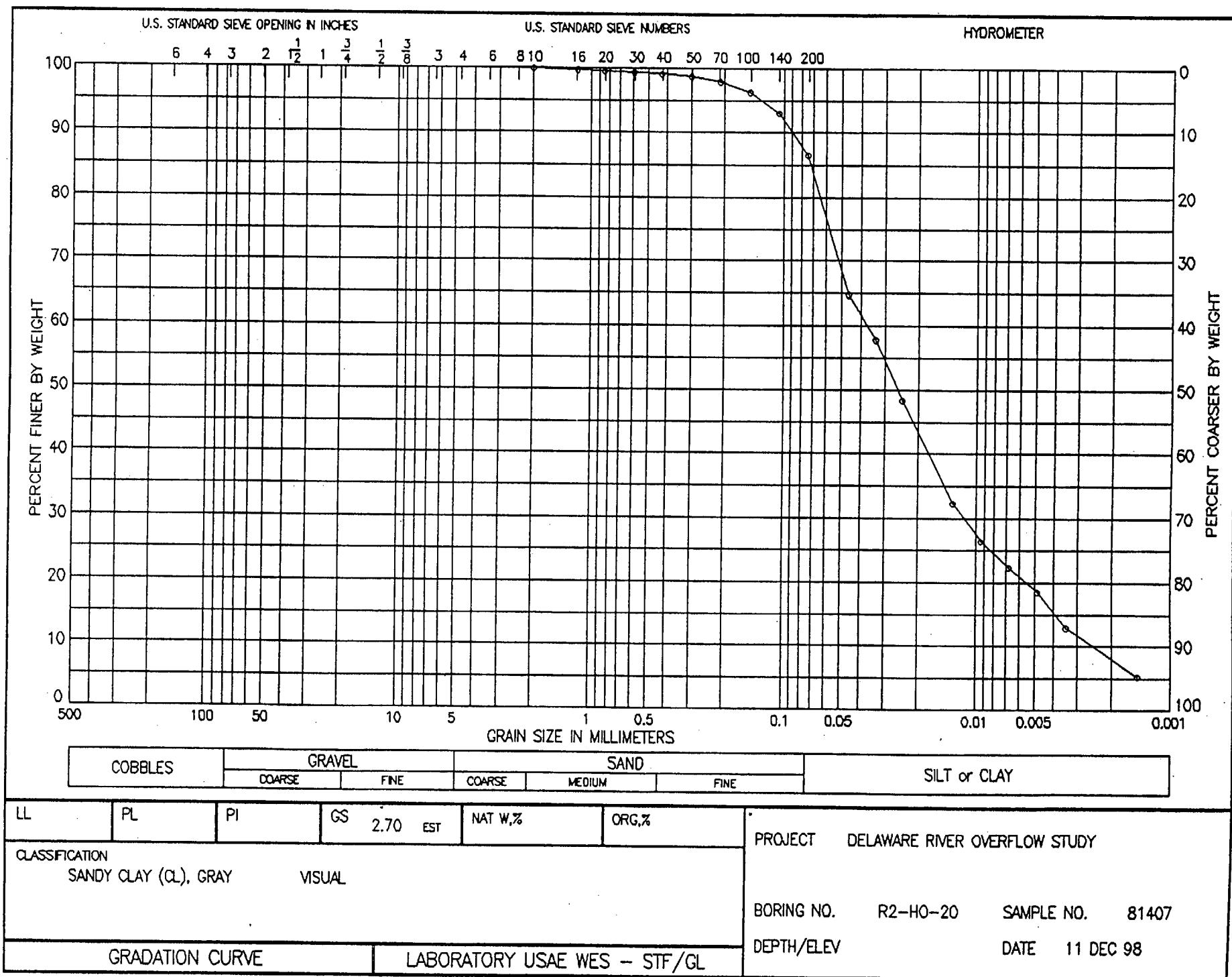
RDGS	TEMP			
22.5	23.0	.0454	65.1	34.9
19.3	23.0	.0332	55.9	44.1
16.4	23.0	.0242	47.6	52.4
10.8	23.0	.0131	31.4	68.6
8.5	23.0	.0095	24.8	75.2
7.2	23.0	.0068	21.0	79.0
5.6	23.0	.0049	16.4	83.6
4.1	23.0	.0035	12.1	87.9
2.0	21.0	.0015	4.9	95.1

PERCENT GRAVEL = .0

PERCENT SAND = 11.6

PERCENT FINES = 88.4

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-20      SAMPLE: 81407      DF: MD0199 .DAT  
 DEPTH:                    DATE: 11 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC: .00  
 CLASSIFICATION: 315  
 SANDY CLAY (CL), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT: 50.5 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.1	No 16	1.180	99.8	.2
.2	No 20	.850	99.6	.4
.3	No 30	.600	99.4	.6
.4	No 40	.425	99.2	.8
.6	No 50	.300	98.8	1.2
1.0	No 70	.212	98.0	2.0
1.8	No 100	.150	96.4	3.6
3.5	No 140	.106	93.1	6.9
6.8	No 200	.075	86.5	13.5

HYDROMETER:

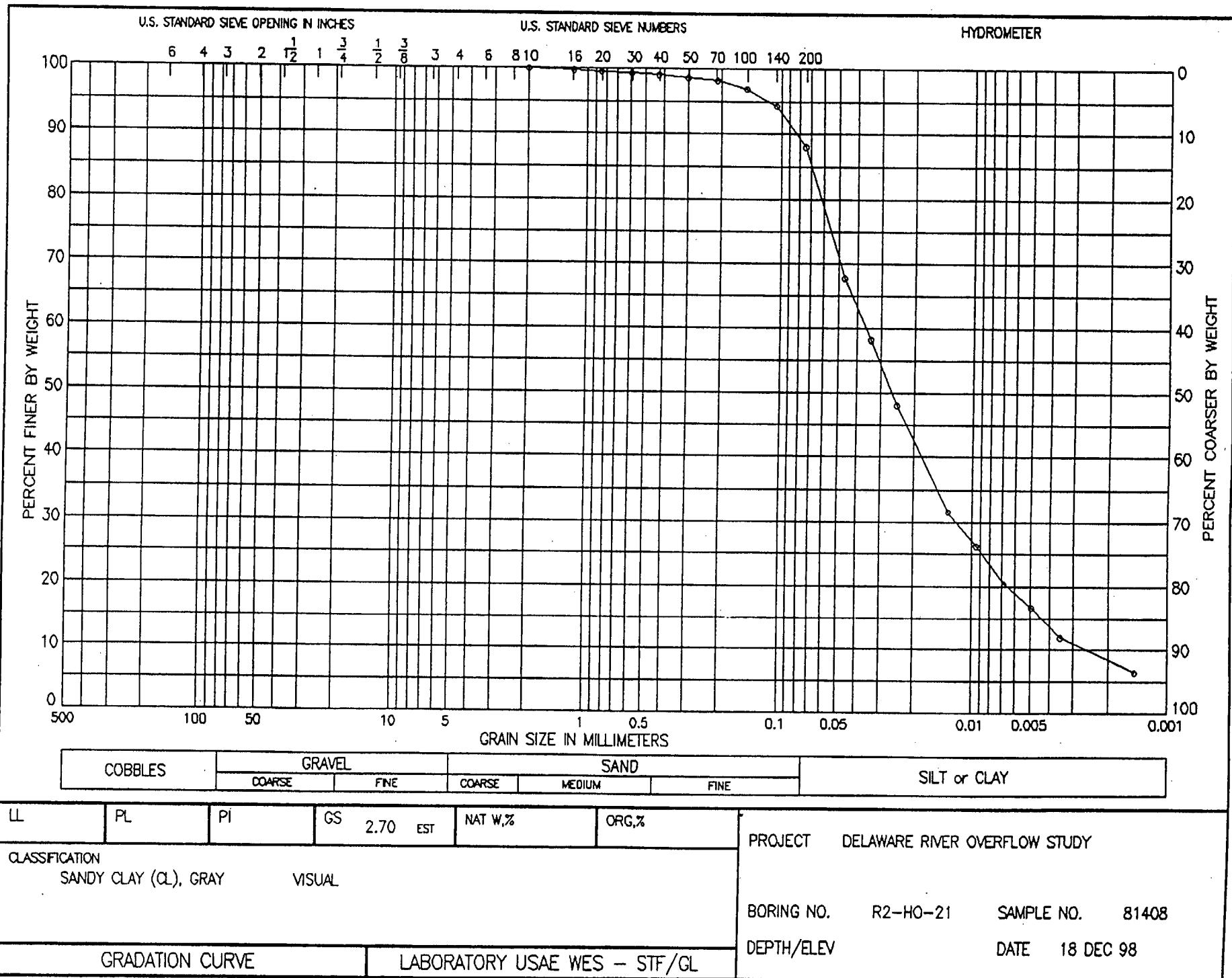
RDGS	TEMP			
20.5	23.0	.0464	64.8	35.2
18.3	23.0	.0335	57.9	42.1
15.3	23.0	.0244	48.4	51.6
10.2	23.0	.0132	32.4	67.6
8.3	23.0	.0095	26.4	73.6
7.0	23.0	.0068	22.3	77.7
5.8	23.0	.0048	18.6	81.4
4.0	23.0	.0035	12.9	87.1
2.0	21.0	.0015	5.3	94.7

PERCENT GRAVEL = .0

PERCENT SAND = 13.5

PERCENT FINES = 86.5

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-21      SAMPLE: 81408      DF: MD0199 .DAT  
 DEPTH:                    DATE: 18 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00  
 CLASSIFICATION: 323  
 SANDY CLAY (CL), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT:      46.6 gms.

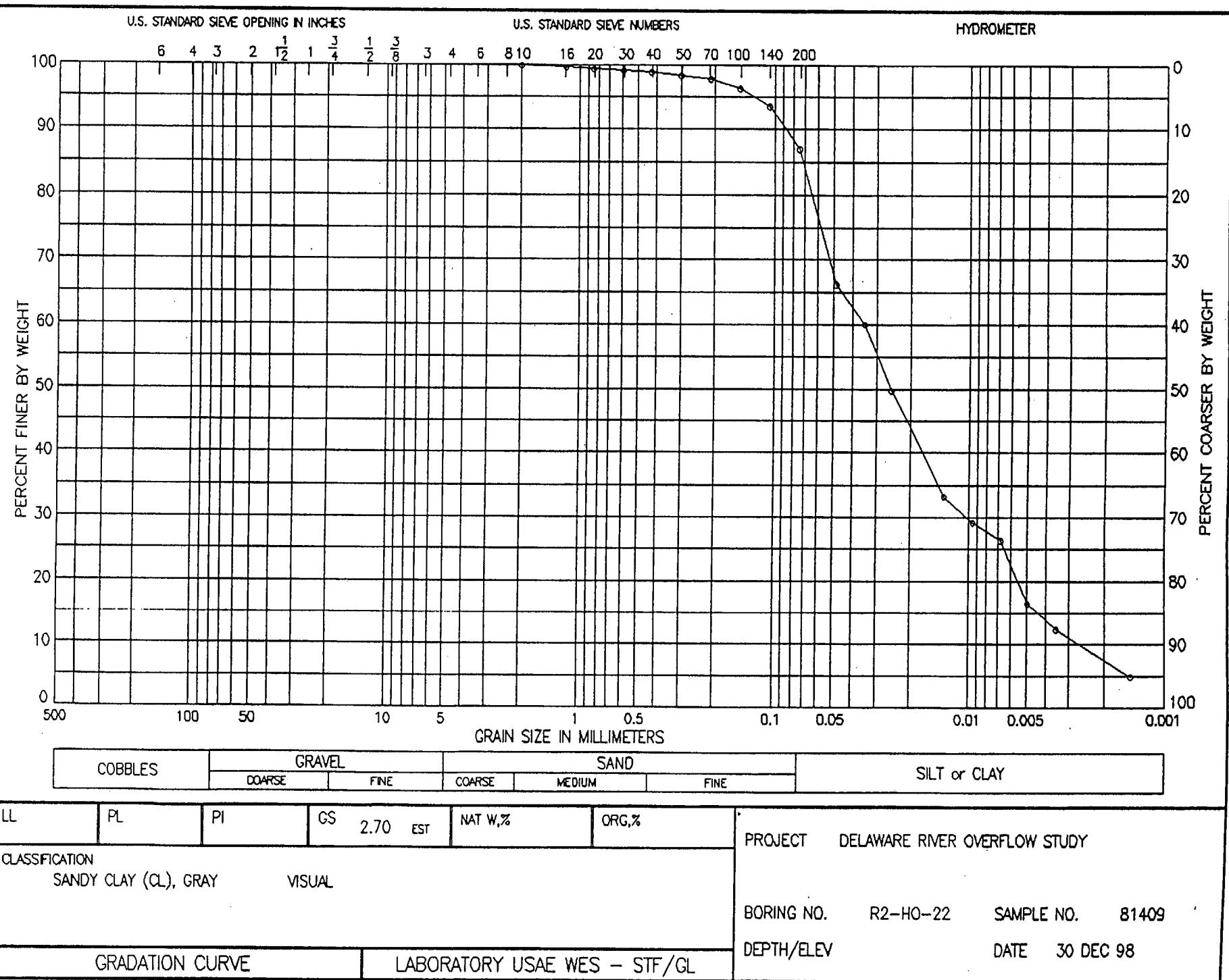
WEIGHTS gm.	SIEVE SIZE OR NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.1	No 16	1.180	99.8	.2
.2	No 20	.850	99.6	.4
.3	No 30	.600	99.4	.6
.4	No 40	.425	99.1	.9
.6	No 50	.300	98.7	1.3
.8	No 70	.212	98.3	1.7
1.4	No 100	.150	97.0	3.0
2.6	No 140	.106	94.4	5.6
5.6	No 200	.075	88.0	12.0

HYDROMETER:

RDGS	TEMP			
19.8	23.0	.0467	67.8	32.2
17.0	23.0	.0340	58.3	41.7
14.0	23.0	.0247	48.1	51.9
9.2	23.0	.0133	31.7	68.3
7.6	23.0	.0096	26.2	73.8
5.9	23.0	.0068	20.4	79.6
4.9	22.5	.0049	16.7	83.3
3.5	22.5	.0035	11.9	88.1
2.2	21.0	.0015	6.5	93.5

PERCENT GRAVEL =      .0  
 PERCENT SAND      = 12.0  
 PERCENT FINES      = 88.0

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-22      SAMPLE: 81409      DF: MD0199 .DAT  
DEPTH:                    DATE: 30 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC: .00  
CLASSIFICATION: 108  
SANDY CLAY (CL), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
PARTIAL WEIGHT AFTER SPLIT: 38.6 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.1	No 16	1.180	99.7	.3
.2	No 20	.850	99.5	.5
.3	No 30	.600	99.2	.8
.4	No 40	.425	99.0	1.0
.6	No 50	.300	98.4	1.6
.8	No 70	.212	97.9	2.1
1.4	No 100	.150	96.4	3.6
2.5	No 140	.106	93.5	6.5
5.0	No 200	.075	87.0	13.0

## HYDROMETER:

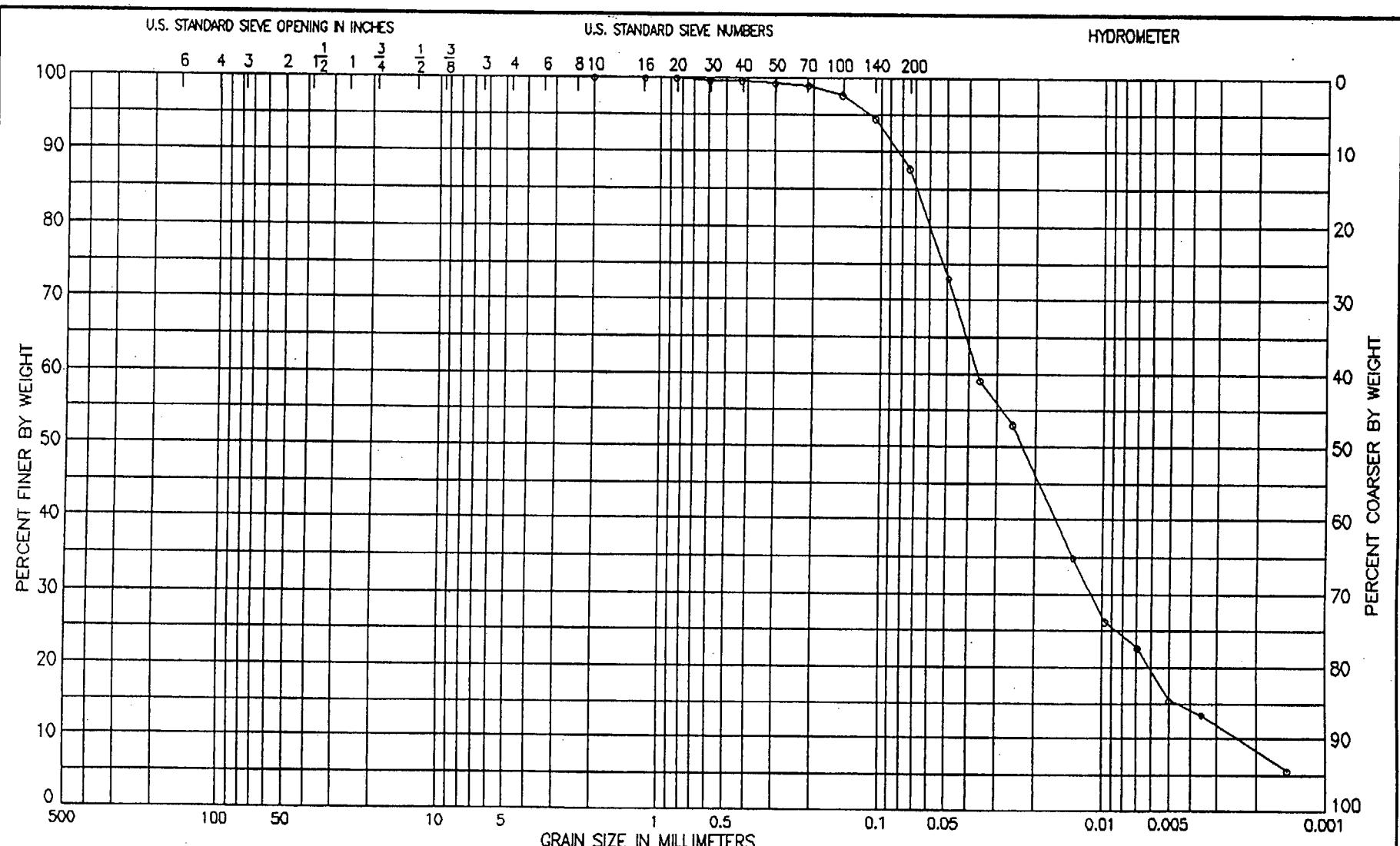
RDGS	TEMP			
16.0	23.0	.0485	66.2	33.8
14.5	23.0	.0348	60.1	39.9
12.0	23.0	.0252	49.8	50.2
8.0	23.0	.0135	33.3	66.7
7.0	23.0	.0096	29.2	70.8
6.3	23.0	.0068	26.3	73.7
4.0	22.5	.0050	16.5	83.5
3.0	22.5	.0035	12.3	87.7
1.5	21.0	.0015	4.9	95.1

PERCENT GRAVEL = .0

PERCENT SAND = 13.0

PERCENT FINES = 87.0

EDE



COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LL	PL	PI	GS	2.70	EST	NAT W.%	ORG, %	PROJECT	DELAWARE RIVER OVERFLOW STUDY
CLASSIFICATION	SANDY CLAY (CL), GRAY	VISUAL						BORING NO.	R2-HO-23
GRADATION CURVE	LABORATORY USAE WES - STF/GL							SAMPLE NO.	81410
							DEPTH/ELEV	DATE	30 DEC 98

# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-23      SAMPLE: 81410      DF: MD0199 .DAT  
DEPTH:                    DATE: 30 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC: .00  
CLASSIFICATION: 338  
SANDY CLAY (CL), GRAY      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
PARTIAL WEIGHT AFTER SPLIT: 30.9 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.7	.3
.1	No 40	.425	99.7	.3
.2	No 50	.300	99.4	.6
.3	No 70	.212	99.0	1.0
.7	No 100	.150	97.7	2.3
1.7	No 140	.106	94.5	5.5
3.8	No 200	.075	87.7	12.3

## HYDROMETER:

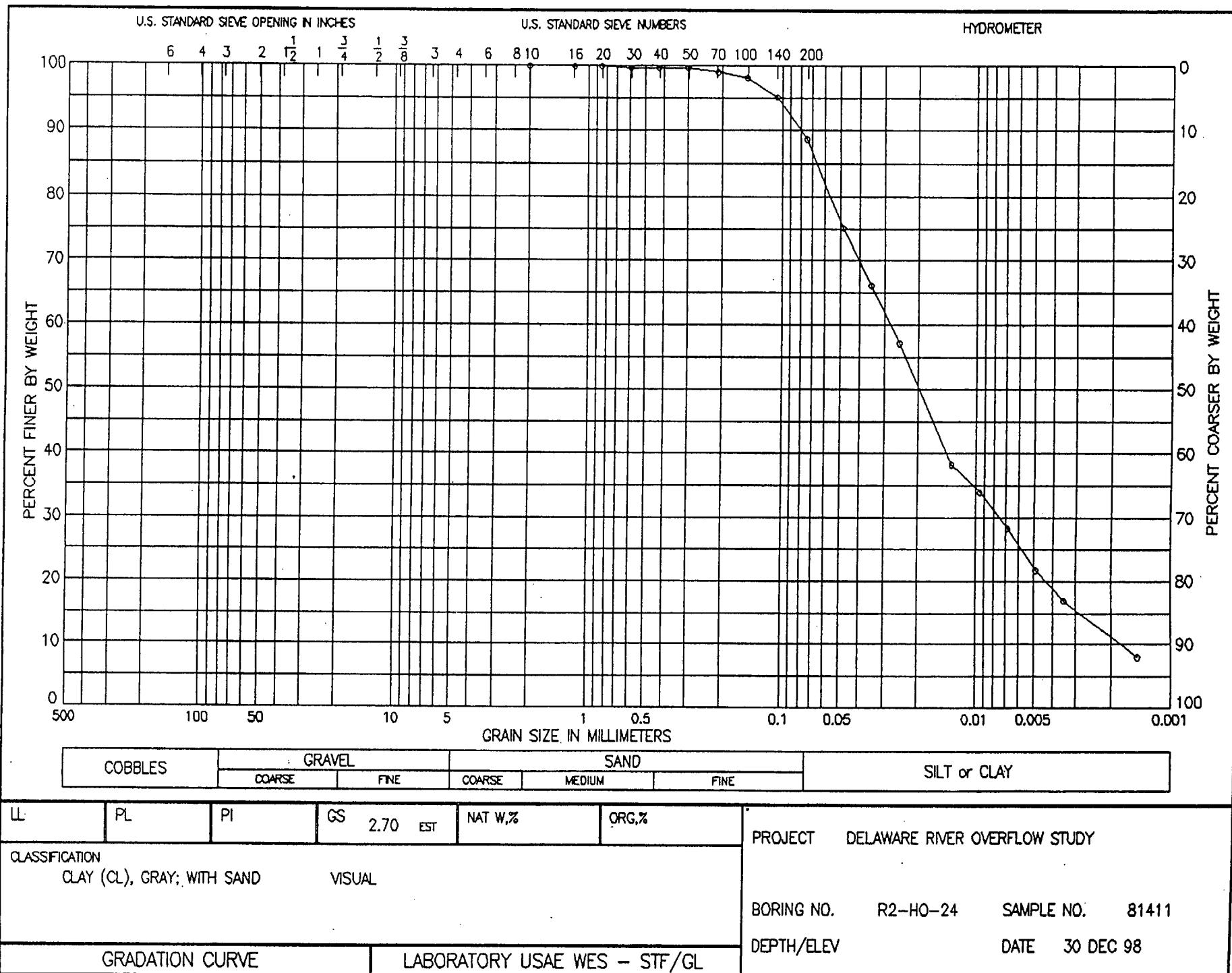
RDGS	TEMP			
14.1	23.0	.0494	73.0	27.0
11.4	23.0	.0358	59.1	40.9
10.2	23.0	.0256	52.9	47.1
6.7	23.0	.0136	35.0	65.0
5.0	23.0	.0098	26.2	73.8
4.3	23.0	.0069	22.6	77.4
3.0	22.5	.0050	15.4	84.6
2.6	22.5	.0036	13.4	86.6
1.4	21.0	.0015	5.7	94.3

PERCENT GRAVEL = .0

PERCENT SAND = 12.3

PERCENT FINES = 87.7

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-24      SAMPLE: 81411      DF: MD0199 .DAT  
DEPTH:                    DATE: 30 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00

CLASSIFICATION: 346

CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:      33.6 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.7	.3
.1	No 40	.425	99.7	.3
.1	No 50	.300	99.7	.3
.3	No 70	.212	99.1	.9
.6	No 100	.150	98.2	1.8
1.6	No 140	.106	95.2	4.8
3.8	No 200	.075	88.7	11.3

## HYDROMETER:

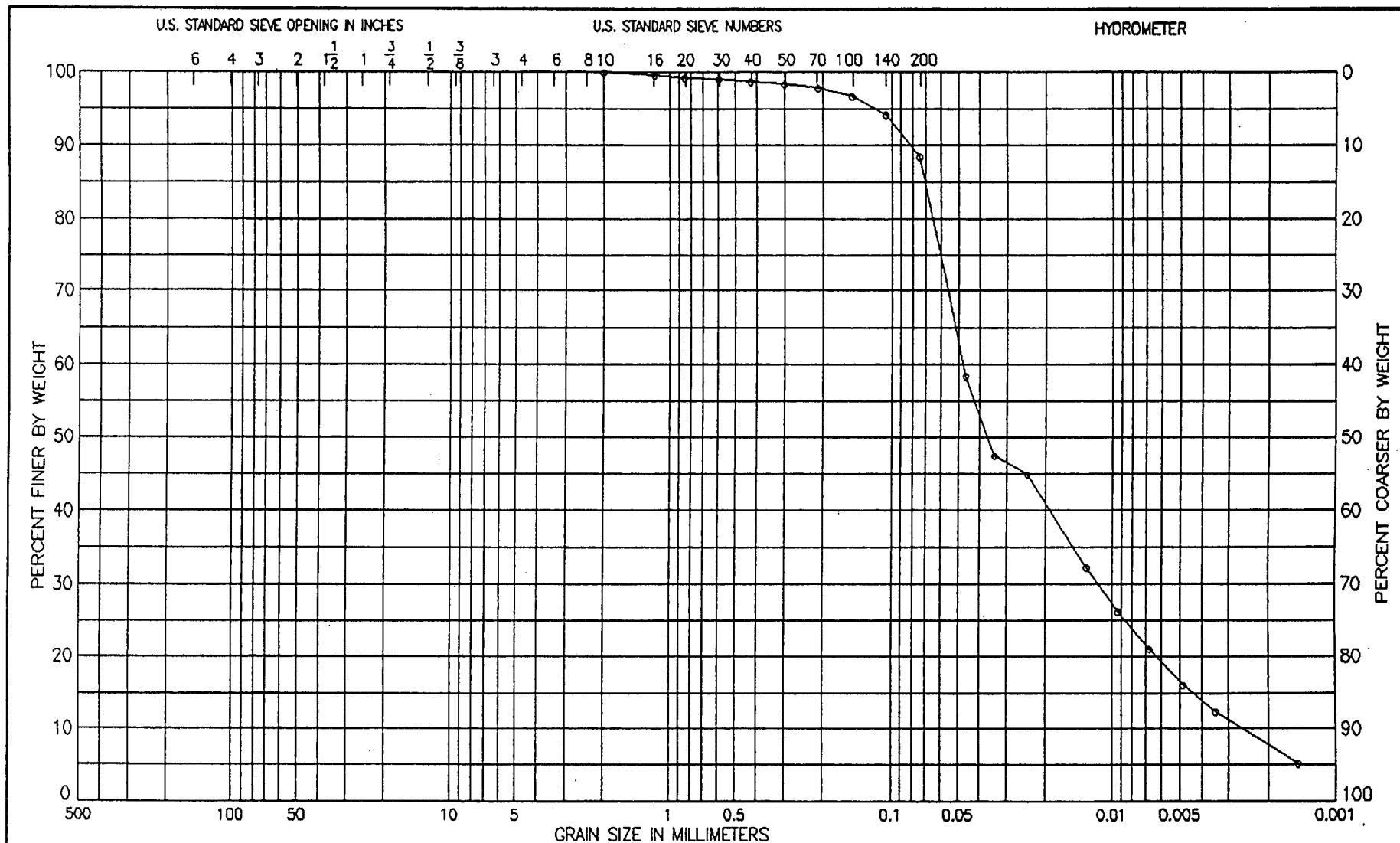
RDGS	TEMP			
15.8	23.0	.0486	75.2	24.8
13.9	23.0	.0350	66.2	33.8
12.0	23.0	.0252	57.2	42.8
8.0	23.0	.0135	38.3	61.7
7.1	23.0	.0096	34.0	66.0
5.9	23.0	.0068	28.4	71.6
4.5	23.0	.0049	21.7	78.3
3.5	23.0	.0035	17.0	83.0
2.0	21.0	.0015	8.0	92.0

PERCENT GRAVEL = .0

PERCENT SAND = 11.3

PERCENT FINES = 88.7

EDE



COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LL	PL	PI	GS	2.70 EST	NAT W, %	ORG, %	PROJECT	DELaware river overflow study
CLASSIFICATION	CLAY (CL), GRAY; WITH SAND			VISUAL			BORING NO.	R2-HO-25
							SAMPLE NO.	81412
GRADATION CURVE			LABORATORY USAE WES - STF/GL					
DEPTH/ELEV						DATE	30 DEC 98	

# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-25      SAMPLE: 81412      DF: MD0199 .DAT  
DEPTH:                    DATE: 30 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00

CLASSIFICATION: 356

CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:      55.2 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.2	No 16	1.180	99.6	.4
.4	No 20	.850	99.3	.7
.5	No 30	.600	99.1	.9
.7	No 40	.425	98.7	1.3
.9	No 50	.300	98.4	1.6
1.2	No 70	.212	97.8	2.2
1.8	No 100	.150	96.7	3.3
3.2	No 140	.106	94.2	5.8
6.4	No 200	.075	88.4	11.6

HYDROMETER:

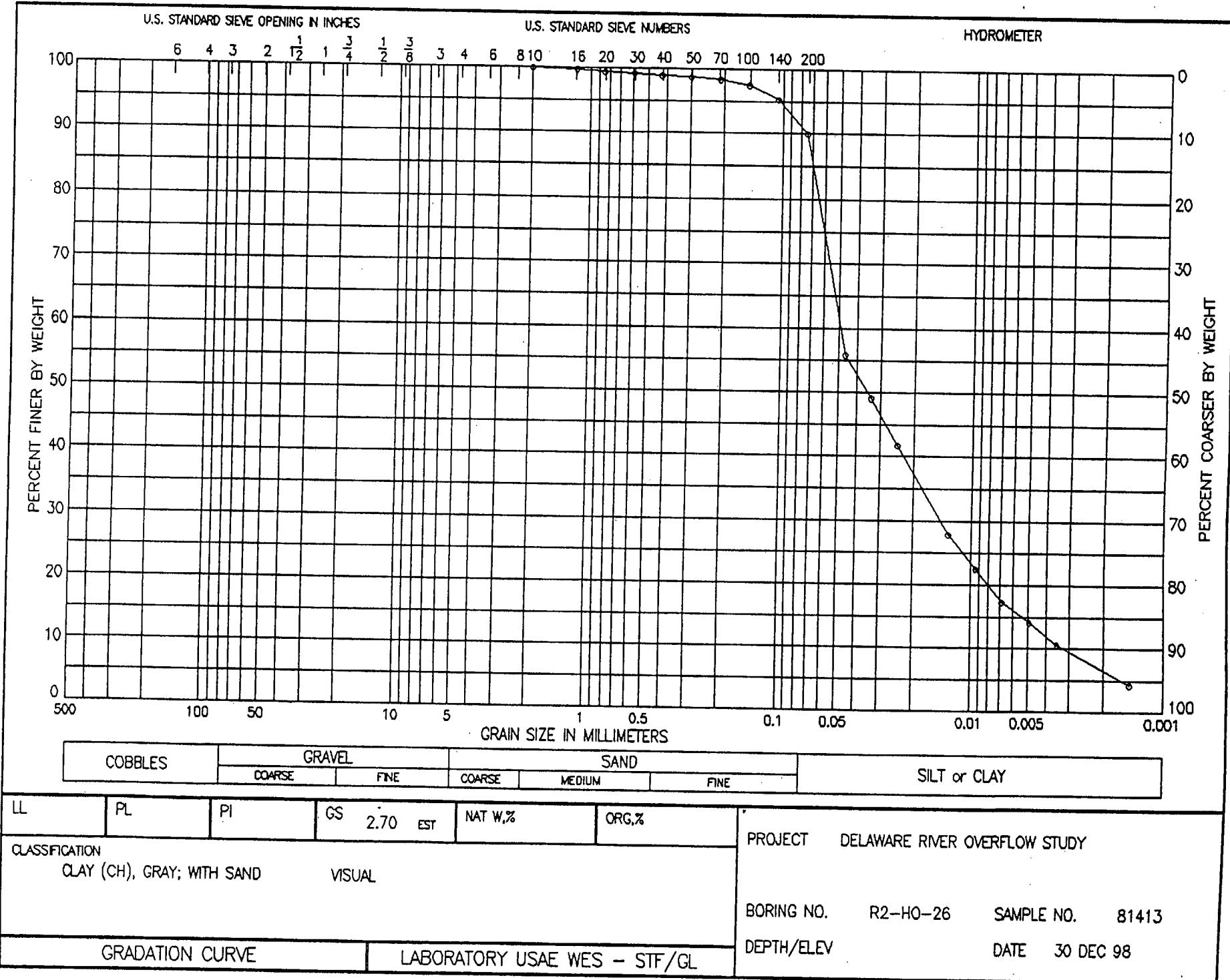
RDGS	TEMP			
20.2	23.0	.0465	58.4	41.6
16.4	23.0	.0342	47.5	52.5
15.5	23.0	.0244	44.9	55.1
11.1	23.0	.0131	32.2	67.8
9.0	23.0	.0094	26.2	73.8
7.2	23.0	.0068	21.0	79.0
5.5	23.0	.0049	16.1	83.9
4.2	23.0	.0035	12.4	87.6
2.1	21.0	.0015	5.2	94.8

PERCENT GRAVEL =      .0

PERCENT SAND      = 11.6

PERCENT FINES      = 88.4

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-26      SAMPLE: 81413      DF: MD0199 .DAT  
DEPTH:                    DATE: 30 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00

CLASSIFICATION: 364

CLAY (CH), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:      58.6 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.1	No 16	1.180	99.8	.2
.3	No 20	.850	99.5	.5
.4	No 30	.600	99.3	.7
.6	No 40	.425	99.0	1.0
.7	No 50	.300	98.8	1.2
.9	No 70	.212	98.5	1.5
1.4	No 100	.150	97.6	2.4
2.7	No 140	.106	95.4	4.6
5.9	No 200	.075	89.9	10.1

HYDROMETER:

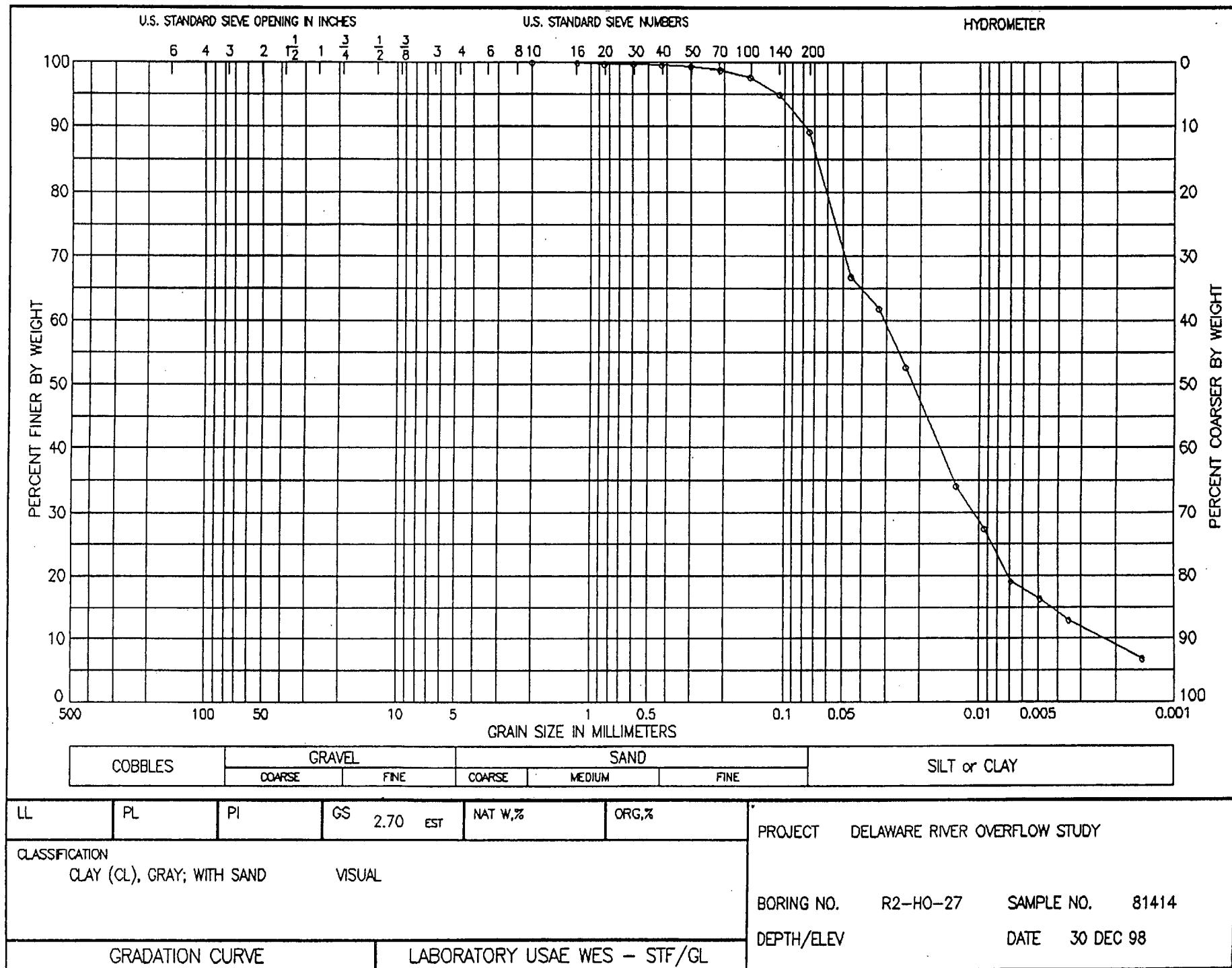
RDGS	TEMP			
20.5	23.0	.0464	55.8	44.2
18.0	23.0	.0336	49.1	50.9
15.3	23.0	.0244	41.7	58.3
10.2	23.0	.0132	27.9	72.1
8.2	23.0	.0095	22.5	77.5
6.4	22.5	.0069	17.3	82.7
5.2	22.5	.0049	14.1	85.9
3.9	22.5	.0035	10.6	89.4
1.9	21.0	.0015	4.3	95.7

PERCENT GRAVEL = .0

PERCENT SAND = 10.1

PERCENT FINES = 89.9

EDE



# SIEVE ANALYSIS

## PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-27      SAMPLE: 81414      DF: MD0199 .DAT  
DEPTH:                    DATE: 30 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00

CLASSIFICATION: 372  
CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:      51.6 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.1	No 20	.850	99.8	.2
.1	No 30	.600	99.8	.2
.2	No 40	.425	99.6	.4
.3	No 50	.300	99.4	.6
.6	No 70	.212	98.8	1.2
1.2	No 100	.150	97.7	2.3
2.6	No 140	.106	95.0	5.0
5.6	No 200	.075	89.1	10.9

### HYDROMETER:

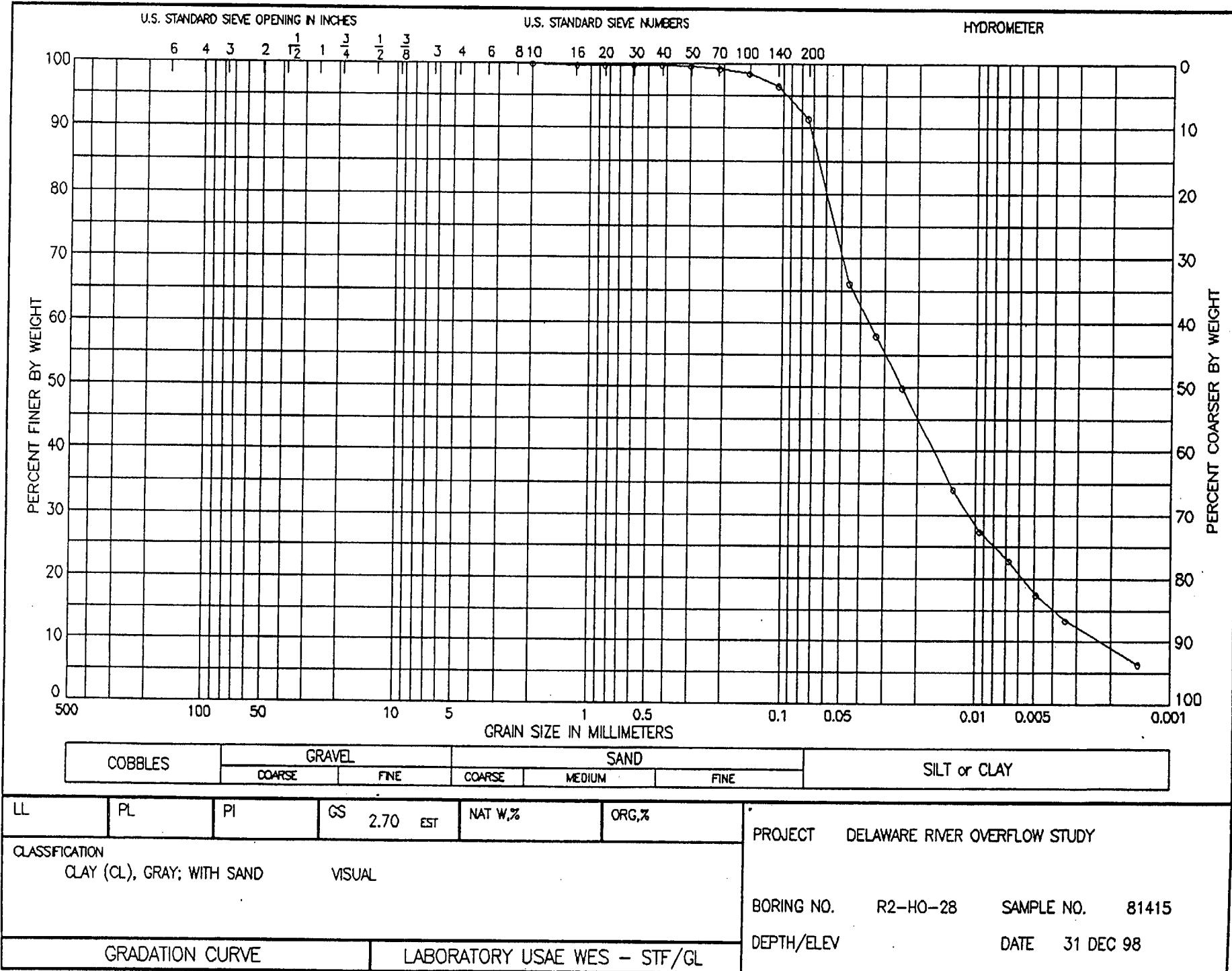
RDGS	TEMP			
21.6	23.0	.0458	66.8	33.2
20.0	23.0	.0330	61.9	38.1
17.0	23.0	.0240	52.6	47.4
11.0	23.0	.0131	34.2	65.8
8.8	23.0	.0095	27.4	72.6
6.2	22.5	.0069	19.1	80.9
5.3	22.5	.0049	16.3	83.7
4.2	22.5	.0035	12.9	87.1
2.5	21.0	.0015	6.8	93.2

PERCENT GRAVEL = .0

PERCENT SAND = 10.9

PERCENT FINES = 89.1

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-28      SAMPLE: 81415      DF: MD0199 .DAT  
DEPTH:                    DATE: 31 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC: .00

CLASSIFICATION: 383

CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 54.5 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.1	No 16	1.180	99.8	.2
.1	No 20	.850	99.8	.2
.1	No 30	.600	99.8	.2
.1	No 40	.425	99.8	.2
.2	No 50	.300	99.6	.4
.4	No 70	.212	99.3	.7
.8	No 100	.150	98.5	1.5
1.9	No 140	.106	96.5	3.5
4.7	No 200	.075	91.4	8.6

HYDROMETER:

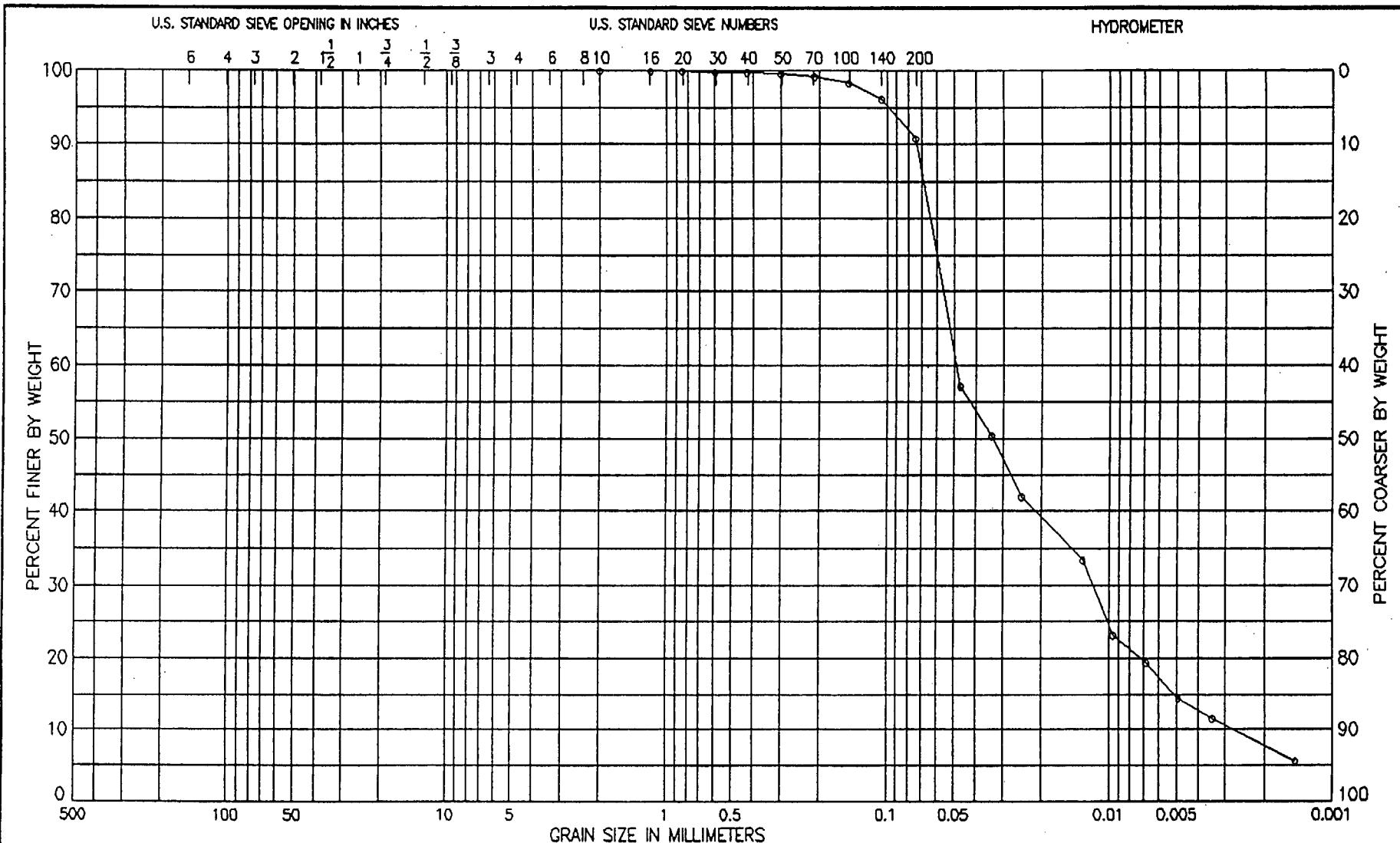
RDGS	TEMP			
22.8	22.0	.0458	66.2	33.8
20.0	22.0	.0334	58.0	42.0
17.2	22.0	.0243	49.8	50.2
11.8	22.0	.0132	34.1	65.9
9.5	22.0	.0095	27.4	72.6
7.9	22.0	.0068	22.7	77.3
6.1	22.0	.0049	17.5	82.5
4.5	23.0	.0035	13.4	86.6
2.5	21.0	.0015	6.4	93.6

PERCENT GRAVEL = .0

PERCENT SAND = 8.6

PERCENT FINES = 91.4

EDE



COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LL	PL	PI	GS	2.70	EST	NAT W, %	ORG, %	PROJECT	DELAWARE RIVER OVERFLOW STUDY
CLASSIFICATION	CLAY (CL), GRAY; WITH SAND			VISUAL				BORING NO.	R2-HO-29
								SAMPLE NO.	81416
GRADATION CURVE	LABORATORY USAE WES - STF/GL			DEPTH/ELEV				DATE	31 DEC 98

# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-29      SAMPLE: 81416      DF: MD0199 .DAT  
 DEPTH:                    DATE: 31 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00

CLASSIFICATION: 391

CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:      56.4 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.8	.2
.1	No 40	.425	99.8	.2
.2	No 50	.300	99.6	.4
.4	No 70	.212	99.3	.7
.9	No 100	.150	98.4	1.6
2.1	No 140	.106	96.3	3.7
5.2	No 200	.075	90.8	9.2

HYDROMETER:

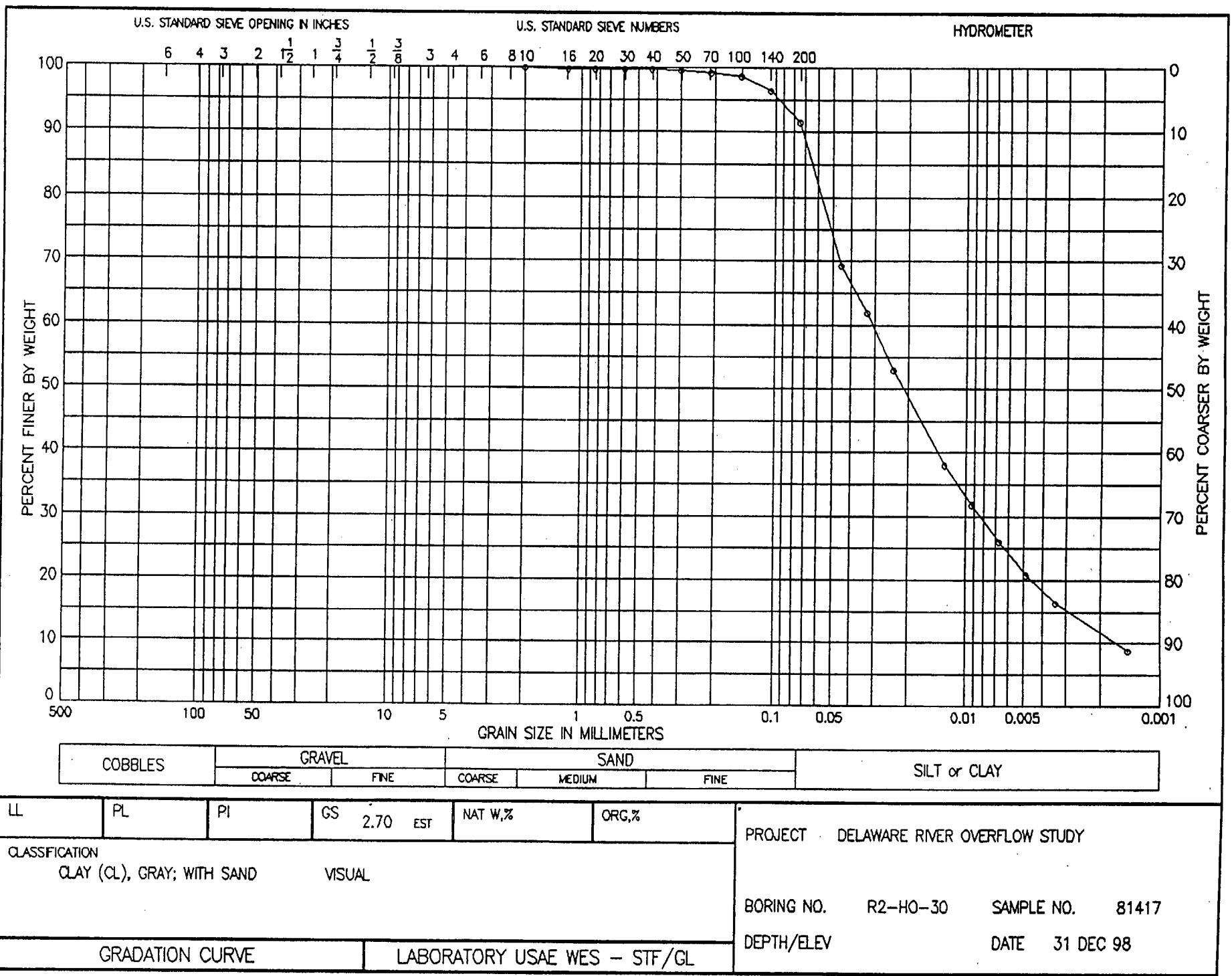
RDGS	TEMP			
20.4	22.0	.0470	57.2	42.8
18.0	22.0	.0340	50.4	49.6
15.0	22.0	.0248	42.0	58.0
12.0	22.0	.0132	33.5	66.5
8.3	22.0	.0096	23.1	76.9
7.0	22.0	.0069	19.4	80.6
5.1	22.5	.0049	14.4	85.6
4.0	23.0	.0035	11.5	88.5
2.3	21.0	.0015	5.6	94.4

PERCENT GRAVEL =      .0

PERCENT SAND      = 9.2

PERCENT FINES      = 90.8

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-30      SAMPLE: 81417      DF: MD0199 .DAT  
DEPTH:                    DATE: 31 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00

CLASSIFICATION: 399  
CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:      54.3 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.1	No 16	1.180	99.8	.2
.1	No 20	.850	99.8	.2
.1	No 30	.600	99.8	.2
.1	No 40	.425	99.8	.2
.2	No 50	.300	99.6	.4
.4	No 70	.212	99.3	.7
.7	No 100	.150	98.7	1.3
1.9	No 140	.106	96.5	3.5
4.6	No 200	.075	91.5	8.5

## HYDROMETER:

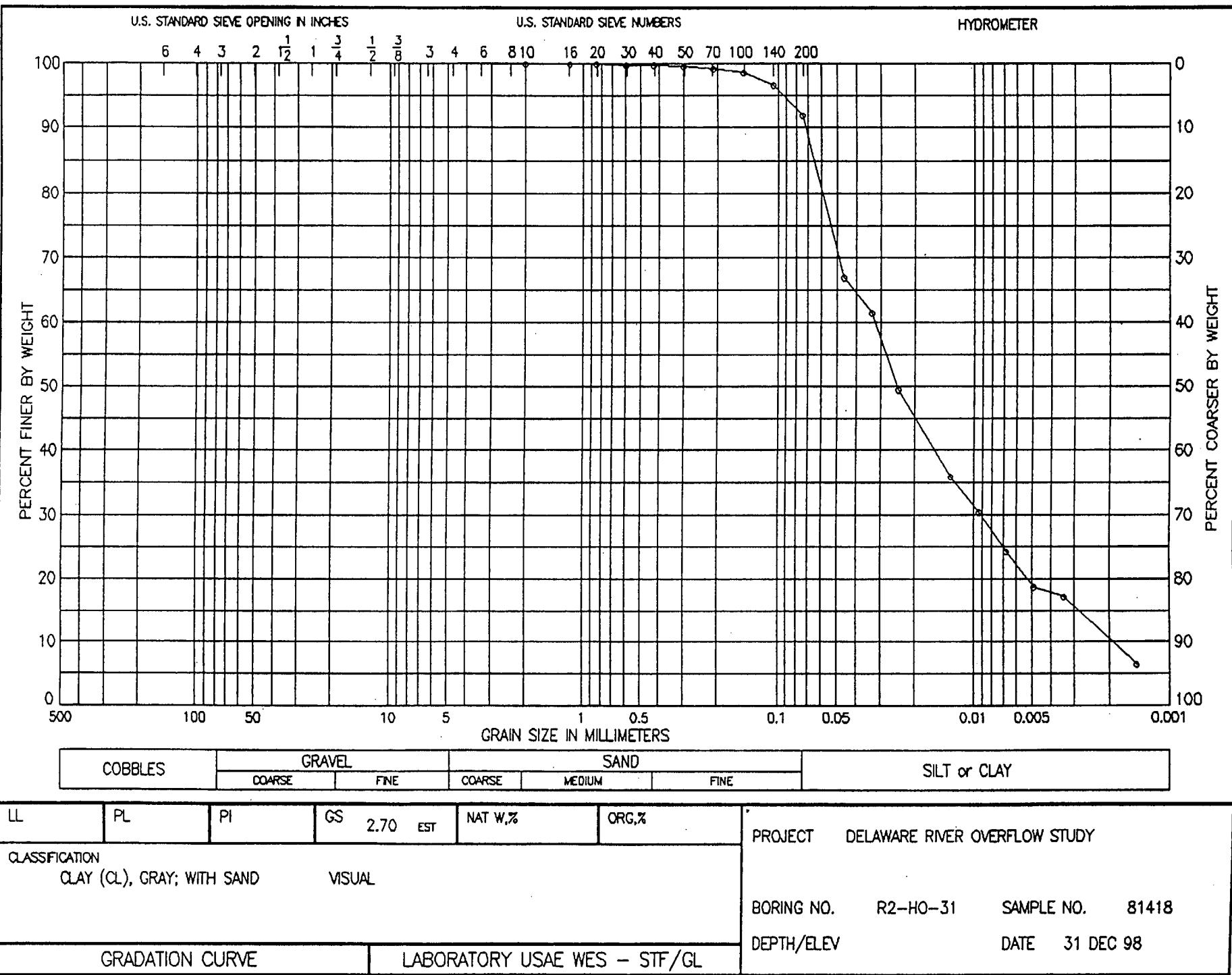
RDGS	TEMP			
23.8	22.0	.0453	69.3	30.7
21.3	22.0	.0329	62.0	38.0
18.2	22.0	.0240	52.9	47.1
13.1	22.0	.0130	38.0	62.0
11.0	22.0	.0094	31.9	68.1
9.0	22.0	.0068	26.0	74.0
7.1	22.5	.0049	20.8	79.2
5.5	23.0	.0034	16.4	83.6
3.3	21.0	.0015	8.8	91.2

PERCENT GRAVEL = .0

PERCENT SAND = 8.5

PERCENT FINES = 91.5

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-31      SAMPLE: 81418      DF: MD0199 .DAT  
 DEPTH:                    DATE: 31 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC:      .00

CLASSIFICATION: 407

CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE:      .0 gms.

PARTIAL WEIGHT AFTER SPLIT:      51.7 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.8	.2
.1	No 40	.425	99.8	.2
.2	No 50	.300	99.6	.4
.4	No 70	.212	99.2	.8
.7	No 100	.150	98.6	1.4
1.7	No 140	.106	96.7	3.3
4.2	No 200	.075	91.9	8.1

HYDROMETER:

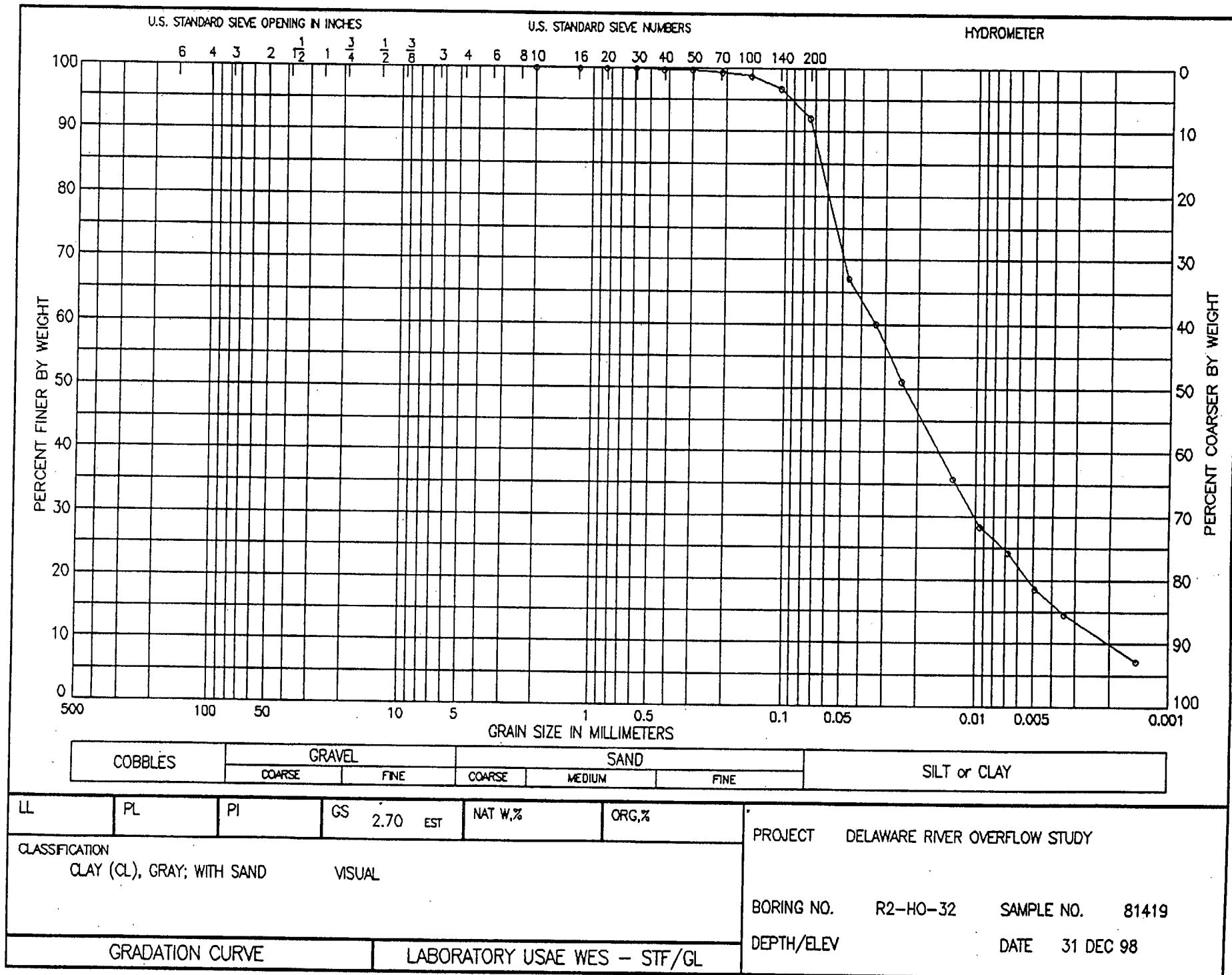
RDGS	TEMP			
21.9	22.0	.0462	67.0	33.0
20.1	22.0	.0333	61.4	38.6
16.2	22.0	.0245	49.5	50.5
11.8	22.0	.0132	35.9	64.1
10.0	22.0	.0095	30.4	69.6
8.0	22.0	.0068	24.3	75.7
6.1	22.5	.0049	18.7	81.3
5.5	23.0	.0034	17.2	82.8
2.4	21.0	.0015	6.5	93.5

PERCENT GRAVEL =      .0

PERCENT SAND      =      8.1

PERCENT FINES      = 91.9

EDE



## SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-32      SAMPLE: 81419      DF: MD0199 .DAT  
DEPTH:                    DATE: 31 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC: .00

CLASSIFICATION: 415

CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 50.4 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER No	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	10	2.000	100.0	.0
.0	16	1.180	100.0	.0
.0	20	.850	100.0	.0
.0	30	.600	100.0	.0
.1	40	.425	99.8	.2
.1	50	.300	99.8	.2
.3	70	.212	99.4	.6
.6	100	.150	98.8	1.2
1.6	140	.106	96.8	3.2
4.0	200	.075	92.1	7.9

### HYDROMETER:

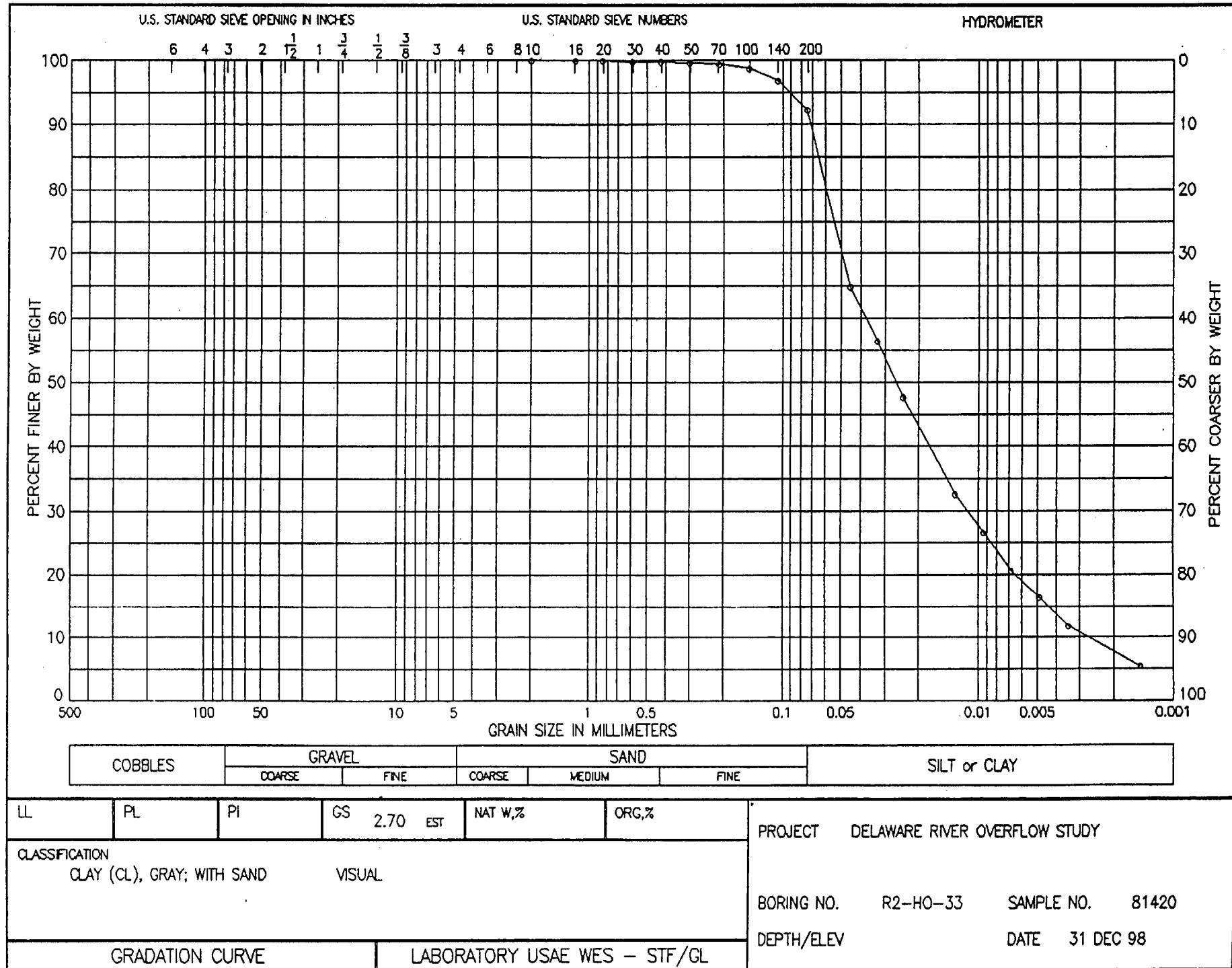
RDGS	TEMP			
21.4	22.0	.0465	67.1	32.9
19.2	22.0	.0336	60.2	39.8
16.3	22.0	.0245	51.1	48.9
11.5	22.0	.0132	35.9	64.1
9.1	22.0	.0095	28.4	71.6
7.8	22.0	.0068	24.3	75.7
5.9	22.5	.0049	18.6	81.4
4.5	23.0	.0035	14.5	85.5
2.6	21.0	.0015	7.2	92.8

PERCENT GRAVEL = .0

PERCENT SAND = 7.9

PERCENT FINES = 92.1

EDE



## SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-33      SAMPLE: 81420      DF: MD0199 .DAT  
DEPTH:                    DATE: 31 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC: .00

CLASSIFICATION: 423

CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 58.0 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.8	.2
.1	No 40	.425	99.8	.2
.2	No 50	.300	99.7	.3
.3	No 70	.212	99.5	.5
.7	No 100	.150	98.8	1.2
1.8	No 140	.106	96.9	3.1
4.5	No 200	.075	92.2	7.8

### HYDROMETER:

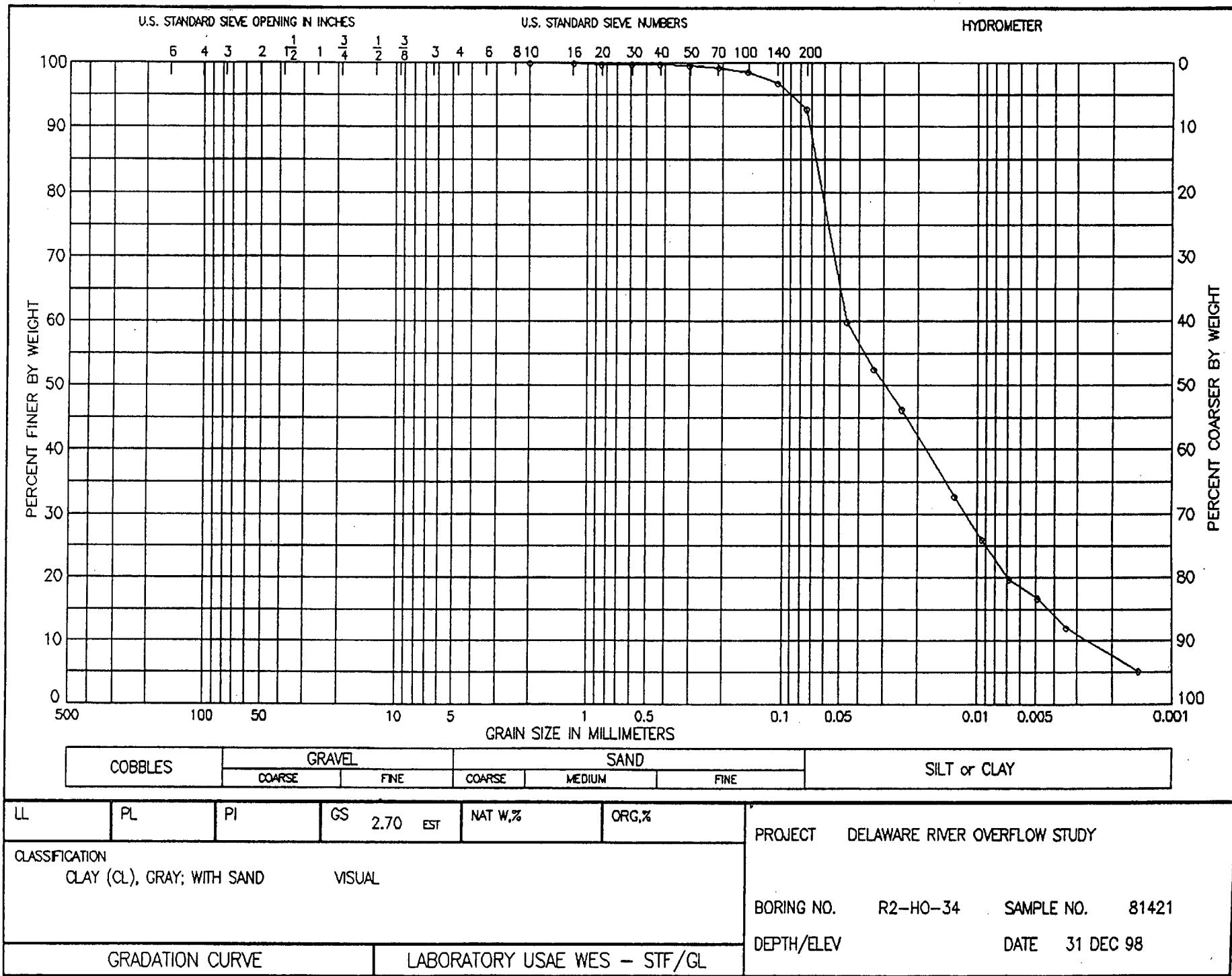
RDGS	TEMP			
23.8	22.0	.0453	64.9	35.1
20.7	22.0	.0331	56.4	43.6
17.5	22.0	.0242	47.6	52.4
12.0	22.0	.0132	32.6	67.4
9.8	22.0	.0095	26.6	73.4
7.6	22.0	.0068	20.5	79.5
6.0	22.5	.0049	16.4	83.6
4.2	23.0	.0035	11.8	88.2
2.3	21.0	.0015	5.5	94.5

PERCENT GRAVEL = .0

PERCENT SAND = 7.8

PERCENT FINES = 92.2

EDE



## SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-34      SAMPLE: 81421      DF: MD0199 .DAT  
DEPTH:                    DATE: 31 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC: .00

CLASSIFICATION: 431

CLAY (CL), GRAY; WITH SAND

VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 58.1 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.1	No 20	.850	99.8	.2
.1	No 30	.600	99.8	.2
.1	No 40	.425	99.8	.2
.2	No 50	.300	99.7	.3
.4	No 70	.212	99.3	.7
.8	No 100	.150	98.6	1.4
1.8	No 140	.106	96.9	3.1
4.2	No 200	.075	92.8	7.2

### HYDROMETER:

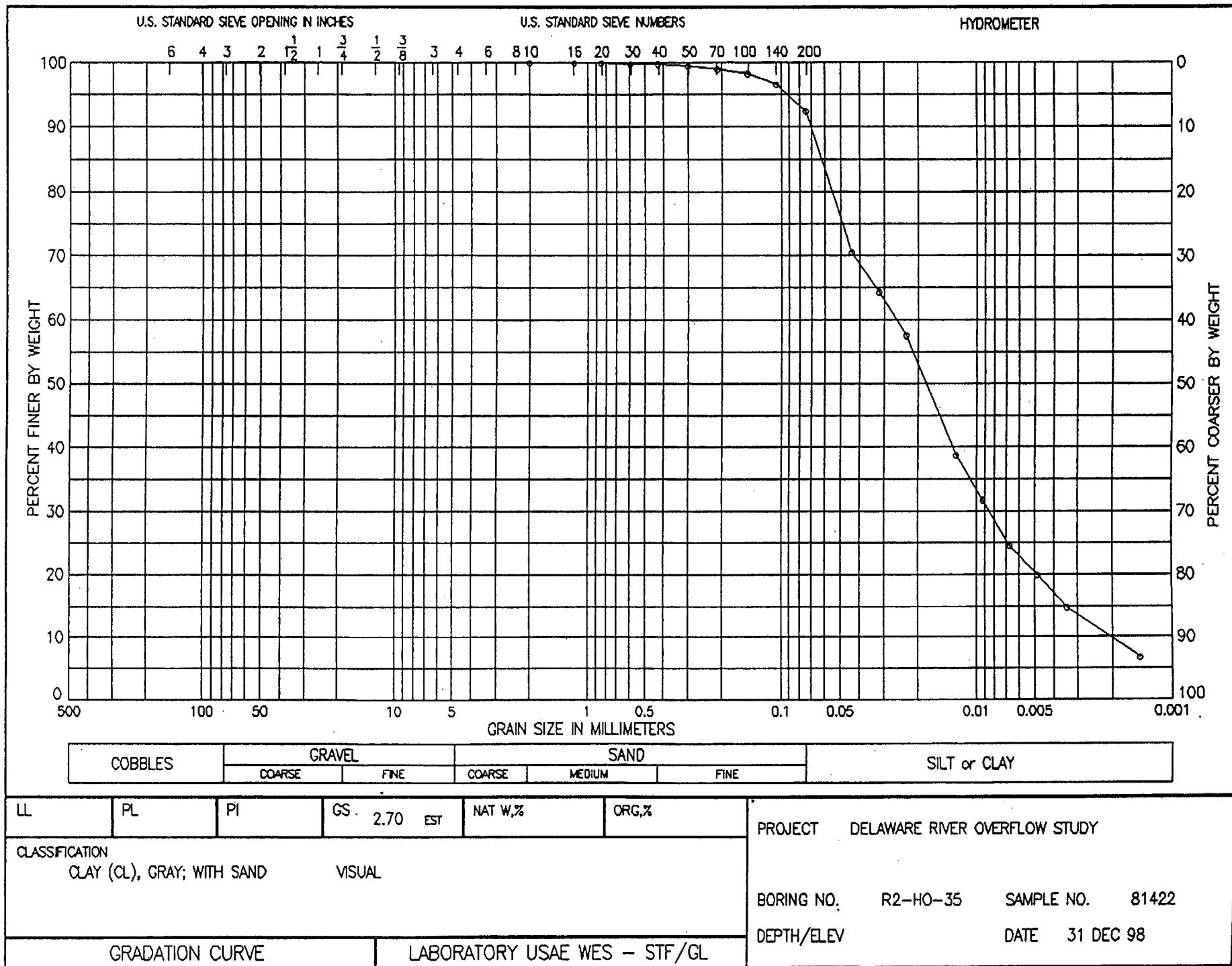
RDGS	TEMP			
22.0	22.0	.0462	59.9	40.1
19.3	22.0	.0336	52.5	47.5
17.0	22.0	.0243	46.2	53.8
12.1	22.0	.0132	32.8	67.2
9.6	22.0	.0095	26.0	74.0
7.3	22.0	.0069	19.7	80.3
6.1	22.5	.0049	16.7	83.3
4.3	23.0	.0035	12.0	88.0
2.2	21.0	.0015	5.2	94.8

PERCENT GRAVEL = .0

PERCENT SAND = 7.2

PERCENT FINES = 92.8

EDE



# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-35      SAMPLE: 81422      DF: MD0199 .DAT  
 DEPTH:                    DATE: 31 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC: .00

CLASSIFICATION: 439

CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 59.0 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.8	.2
.1	No 40	.425	99.8	.2
.3	No 50	.300	99.5	.5
.6	No 70	.212	99.0	1.0
1.0	No 100	.150	98.3	1.7
2.0	No 140	.106	96.6	3.4
4.5	No 200	.075	92.4	7.6

HYDROMETER:

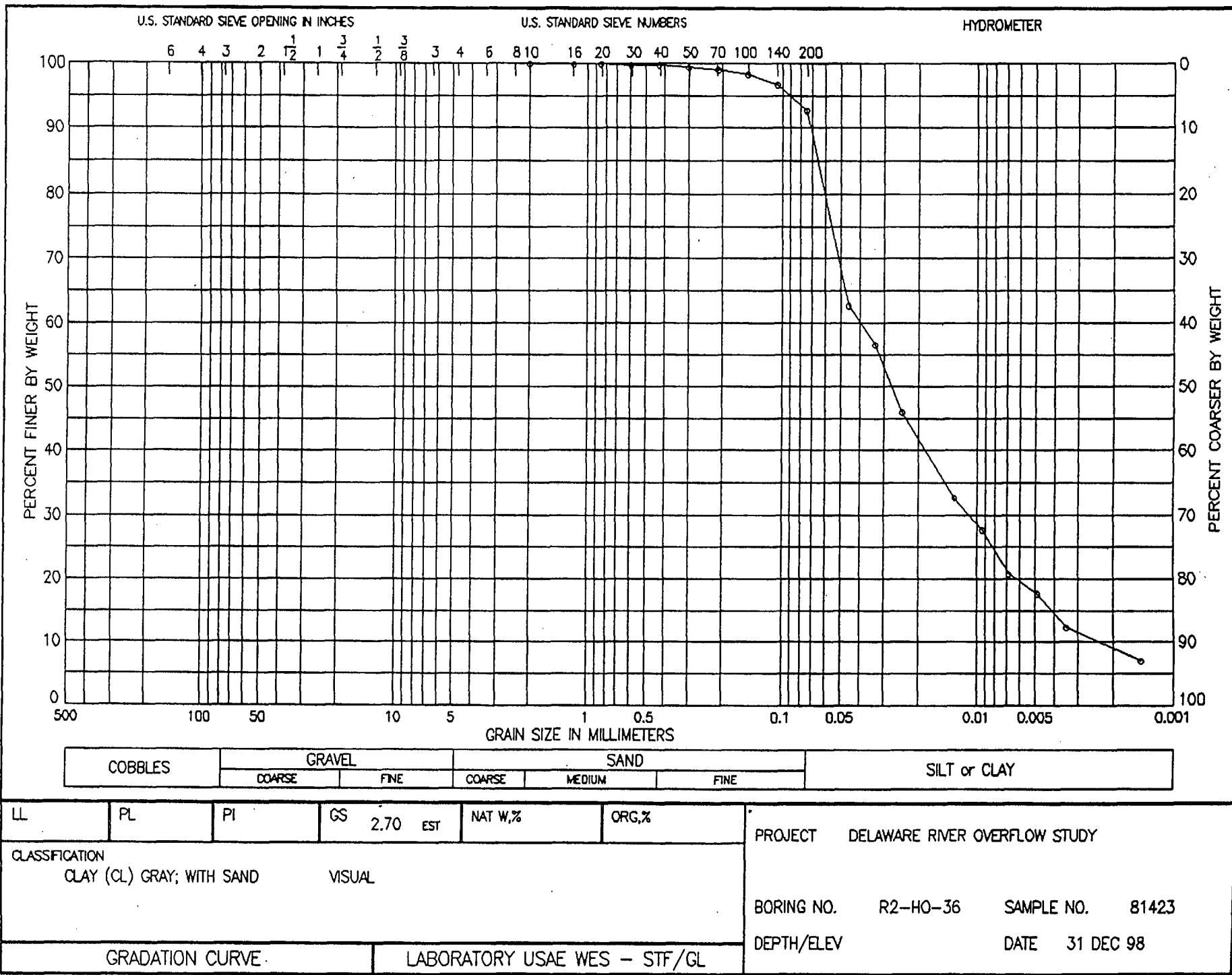
RDGS	TEMP			
26.3	22.0	.0439	70.5	29.5
24.0	22.0	.0319	64.3	35.7
21.5	22.0	.0232	57.6	42.4
14.5	22.0	.0129	38.8	61.2
11.9	22.0	.0093	31.8	68.2
9.2	22.0	.0067	24.5	75.5
7.4	22.5	.0048	19.9	80.1
5.4	23.0	.0034	14.8	85.2
2.8	21.0	.0015	6.7	93.3

PERCENT GRAVEL = .0

PERCENT SAND = 7.6

PERCENT FINES = 92.4

EDE



## SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-36      SAMPLE: 81423      DF: MD0199 .DAT  
DEPTH:                    DATE: 31 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC: .00

CLASSIFICATION: 447

CLAY (CL) GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 56.7 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.8	.2
.1	No 40	.425	99.8	.2
.3	No 50	.300	99.5	.5
.5	No 70	.212	99.1	.9
.9	No 100	.150	98.4	1.6
1.8	No 140	.106	96.8	3.2
4.1	No 200	.075	92.8	7.2

### HYDROMETER:

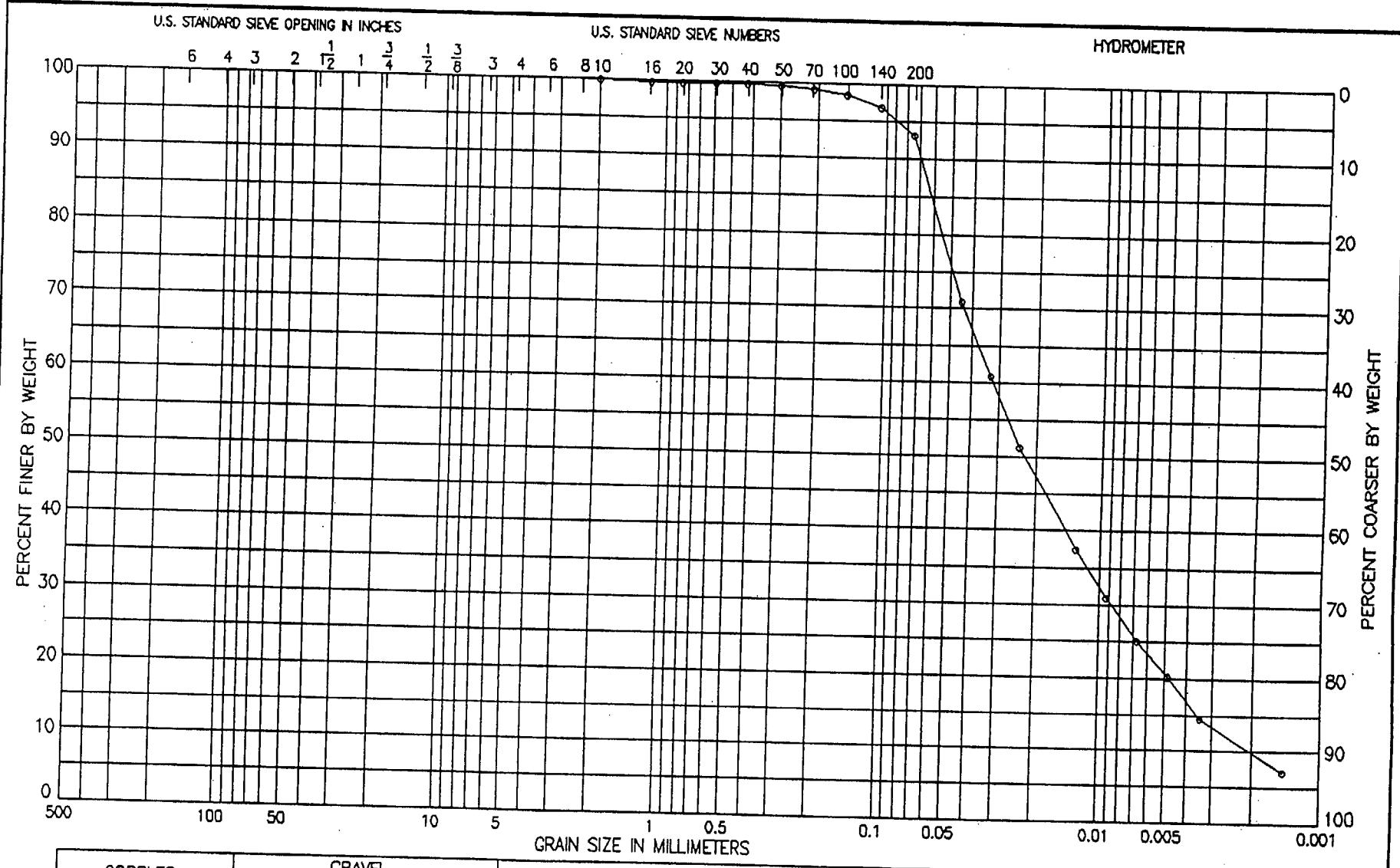
RDGS	TEMP			
22.5	22.0	.0459	62.7	37.3
20.3	22.0	.0333	56.6	43.4
16.5	22.0	.0244	45.9	54.1
11.8	22.0	.0132	32.8	67.2
10.0	22.0	.0095	27.7	72.3
7.5	22.0	.0068	20.7	79.3
6.3	22.5	.0049	17.6	82.4
4.3	23.0	.0035	12.3	87.7
2.8	21.0	.0015	7.0	93.0

PERCENT GRAVEL = .0

PERCENT SAND = 7.2

PERCENT FINES = 92.8

EDE



COBBLES

GRAVEL

COARSE

FINE

COARSE

MEDIUM

FINE

SILT or CLAY

LL

PL

PI

GS

2.70 EST

NAT W. %

ORG. %

CLASSIFICATION

CLAY (CL) GRAY; WITH SAND

VISUAL

PROJECT DELAWARE RIVER OVERFLOW STUDY

BORING NO.

R2-HO-37

SAMPLE NO.

81424

DEPTH/ELEV

DATE 31 DEC 98

GRADATION CURVE

LABORATORY USAE WES - STF/GL

# SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-37      SAMPLE: 81424      DF: MD0199 .DAT  
 DEPTH:                    DATE: 31 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC: .00  
 CLASSIFICATION: 455

CLAY (CL) GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT: 55.8 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.1	No 16	1.180	99.8	.2
.1	No 20	.850	99.8	.2
.1	No 30	.600	99.8	.2
.1	No 40	.425	99.8	.2
.2	No 50	.300	99.6	.4
.4	No 70	.212	99.3	.7
.8	No 100	.150	98.6	1.4
1.7	No 140	.106	97.0	3.0
3.8	No 200	.075	93.2	6.8

HYDROMETER:

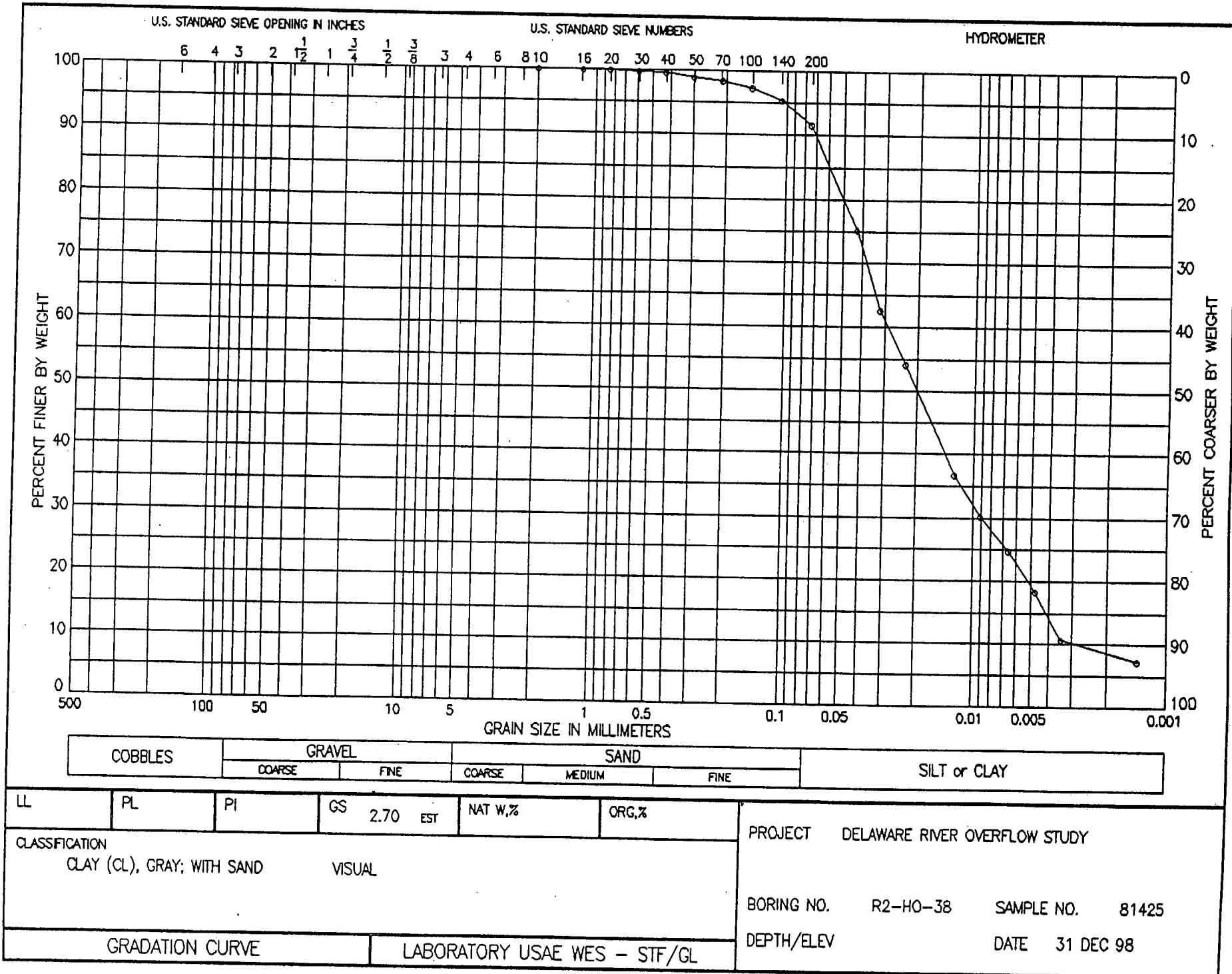
RDGS	TEMP			
25.0	22.0	.0446	70.9	29.1
21.5	22.0	.0328	60.9	39.1
18.1	22.0	.0241	51.2	48.8
13.3	22.0	.0130	37.6	62.4
11.0	22.0	.0094	31.0	69.0
8.9	22.0	.0068	25.0	75.0
7.1	22.5	.0049	20.2	79.8
5.0	23.0	.0034	14.5	85.5
2.8	21.0	.0015	7.1	92.9

PERCENT GRAVEL = .0

PERCENT SAND = 6.8

PERCENT FINES = 93.2

EDE



## SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-38      SAMPLE: 81425      DF: MD0199 .DAT  
DEPTH:                    DATE: 31 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC: .00

CLASSIFICATION: 463

CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.

PARTIAL WEIGHT AFTER SPLIT: 56.6 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.1	No 30	.600	99.8	.2
.2	No 40	.425	99.6	.4
.6	No 50	.300	98.9	1.1
.9	No 70	.212	98.4	1.6
1.5	No 100	.150	97.3	2.7
2.6	No 140	.106	95.4	4.6
4.8	No 200	.075	91.5	8.5

### HYDROMETER:

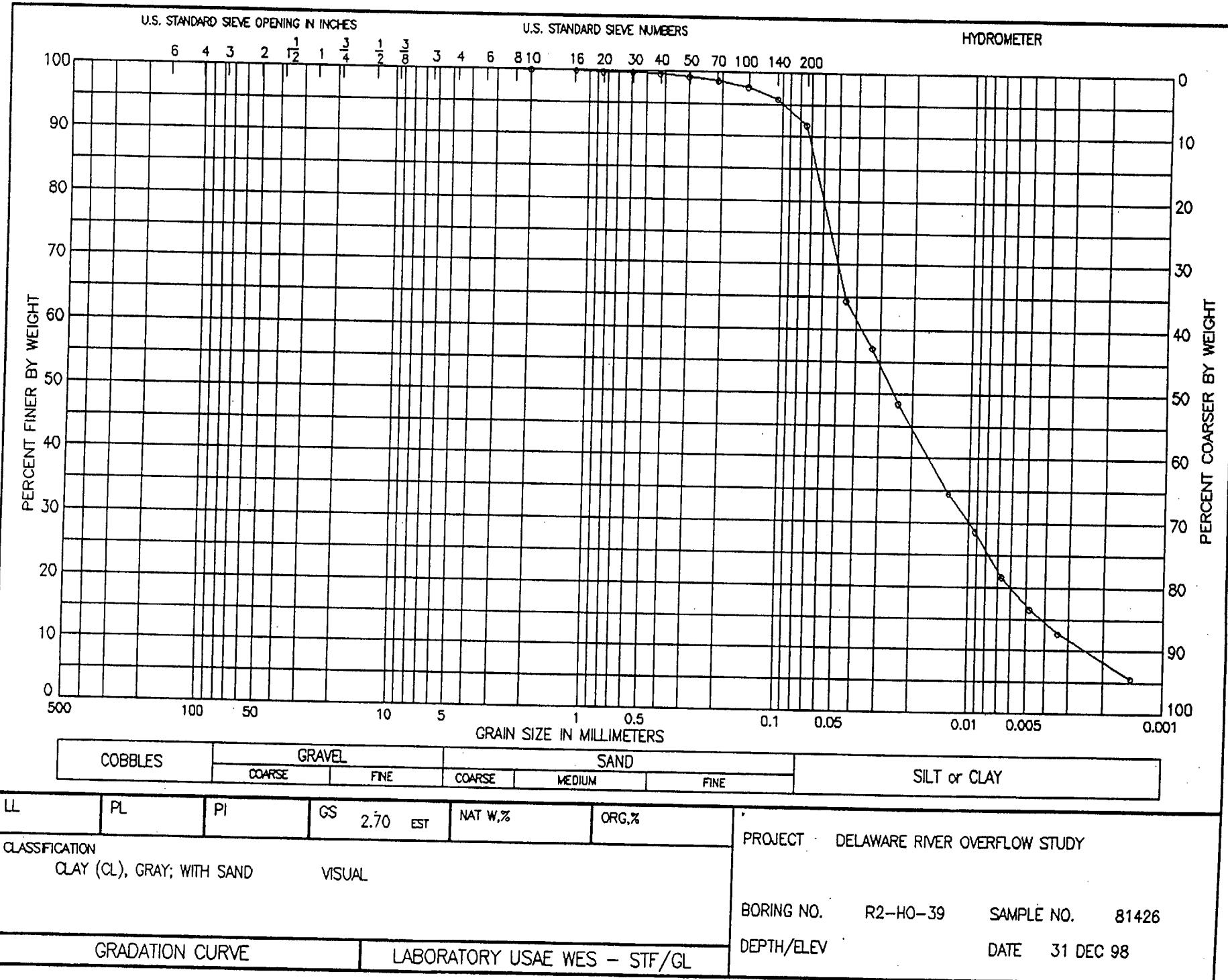
RDGS	TEMP			
26.5	24.0	.0428	75.2	24.8
22.0	24.0	.0319	62.6	37.4
19.0	24.0	.0233	54.2	45.8
12.8	24.0	.0128	36.8	63.2
10.5	24.0	.0092	30.3	69.7
8.5	24.0	.0066	24.7	75.3
6.2	24.0	.0048	18.2	81.8
3.5	24.0	.0034	10.7	89.3
2.3	24.0	.0014	7.3	92.7

PERCENT GRAVEL = .0

PERCENT SAND = 8.5

PERCENT FINES = 91.5

EDE



## SIEVE ANALYSIS

PROJECT: DELAWARE RIVER OVERFLOW STUDY

BORING: R2-HO-39      SAMPLE: 81426      DF: MD0199 .DAT  
 DEPTH:                    DATE: 31 DEC 98

NO-LIMITS-RAN      GS: 2.70 est      WC: .00  
 CLASSIFICATION: 471  
 CLAY (CL), GRAY; WITH SAND      VISUAL

TOTAL WEIGHT OF SAMPLE: .0 gms.  
 PARTIAL WEIGHT AFTER SPLIT: 53.7 gms.

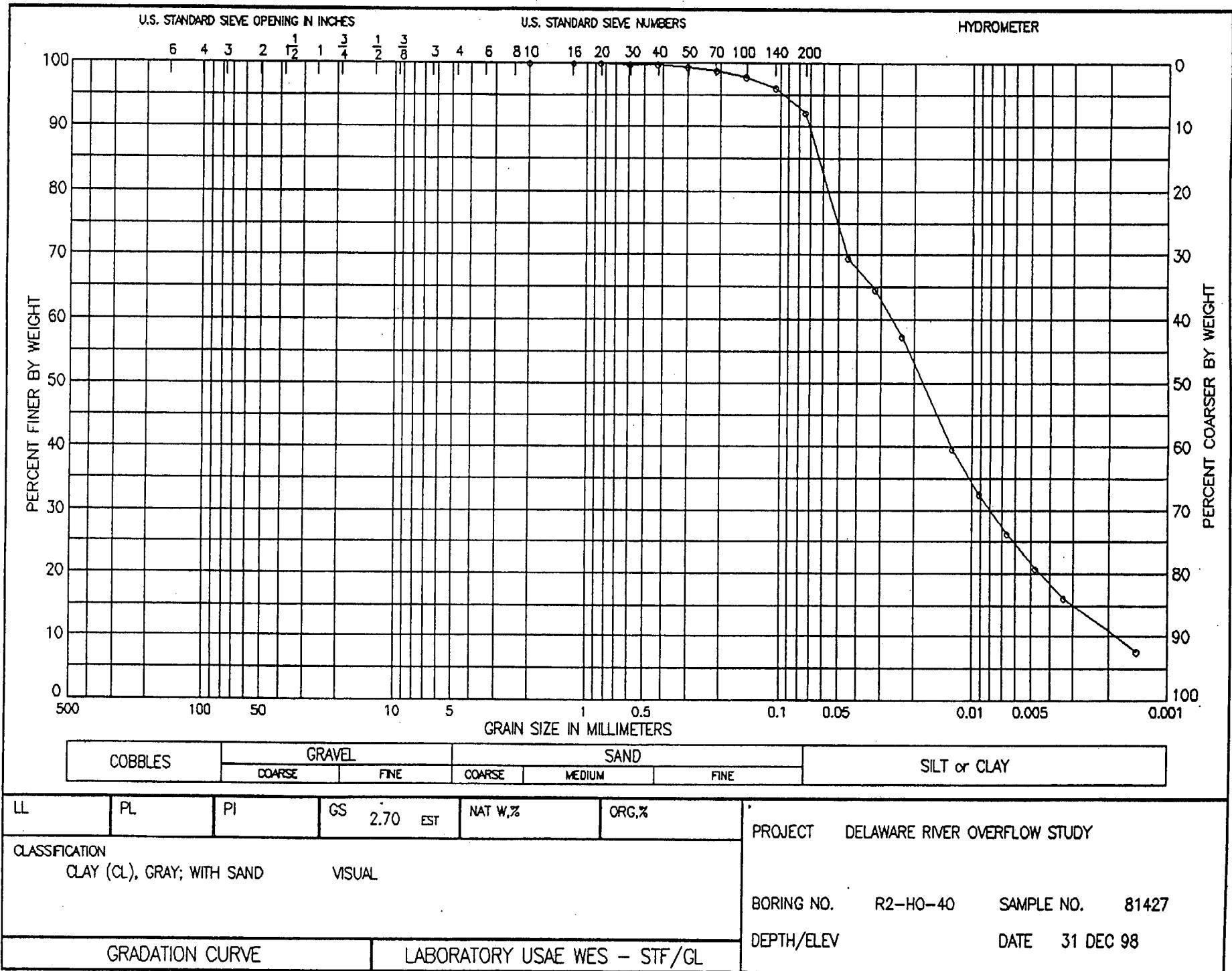
WEIGHTS gm.	SIEVE SIZE or NUMBER No.	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.1	No 20	.850	99.8	.2
.1	No 30	.600	99.8	.2
.2	No 40	.425	99.6	.4
.4	No 50	.300	99.3	.7
.7	No 70	.212	98.7	1.3
1.2	No 100	.150	97.8	2.2
2.2	No 140	.106	95.9	4.1
4.4	No 200	.075	91.8	8.2

HYDROMETER:

RDGS	TEMP			
21.5	24.0	.0453	64.5	35.5
19.0	24.0	.0329	57.1	42.9
16.1	24.0	.0239	48.5	51.5
11.4	24.0	.0129	34.6	65.4
9.4	24.0	.0093	28.7	71.3
7.0	24.0	.0067	21.6	78.4
5.3	24.0	.0048	16.6	83.4
4.0	24.0	.0034	12.7	87.3
2.0	22.0	.0015	5.6	94.4

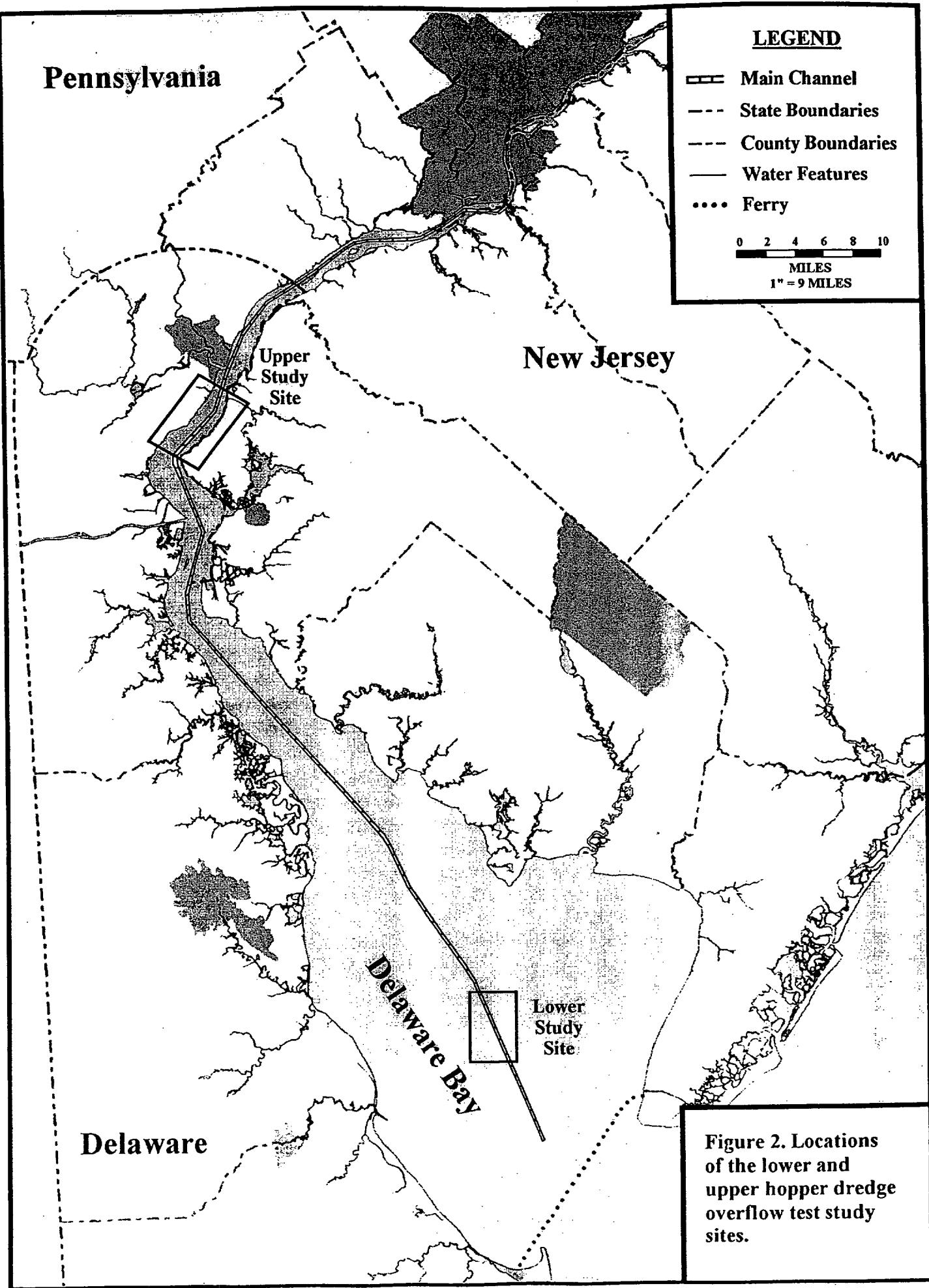
PERCENT GRAVEL = .0  
 PERCENT SAND = 8.2  
 PERCENT FINES = 91.8

EDE



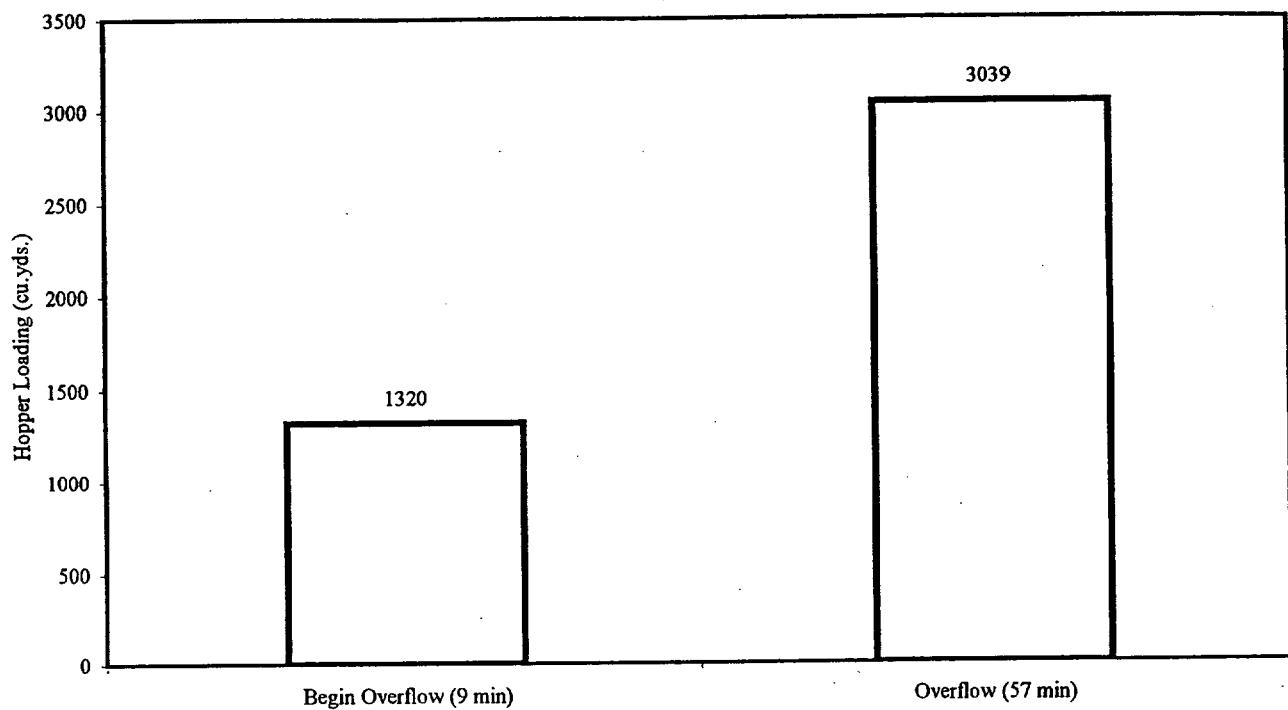


**Figure 1. Dredge McFarland**



**Figure 2. Locations of the lower and upper hopper dredge overflow test study sites.**

**Figure 3: Hopper Loading at Coarse-Grained Site**



**Figure 4: Hopper Loading at Fine-Grained Site**

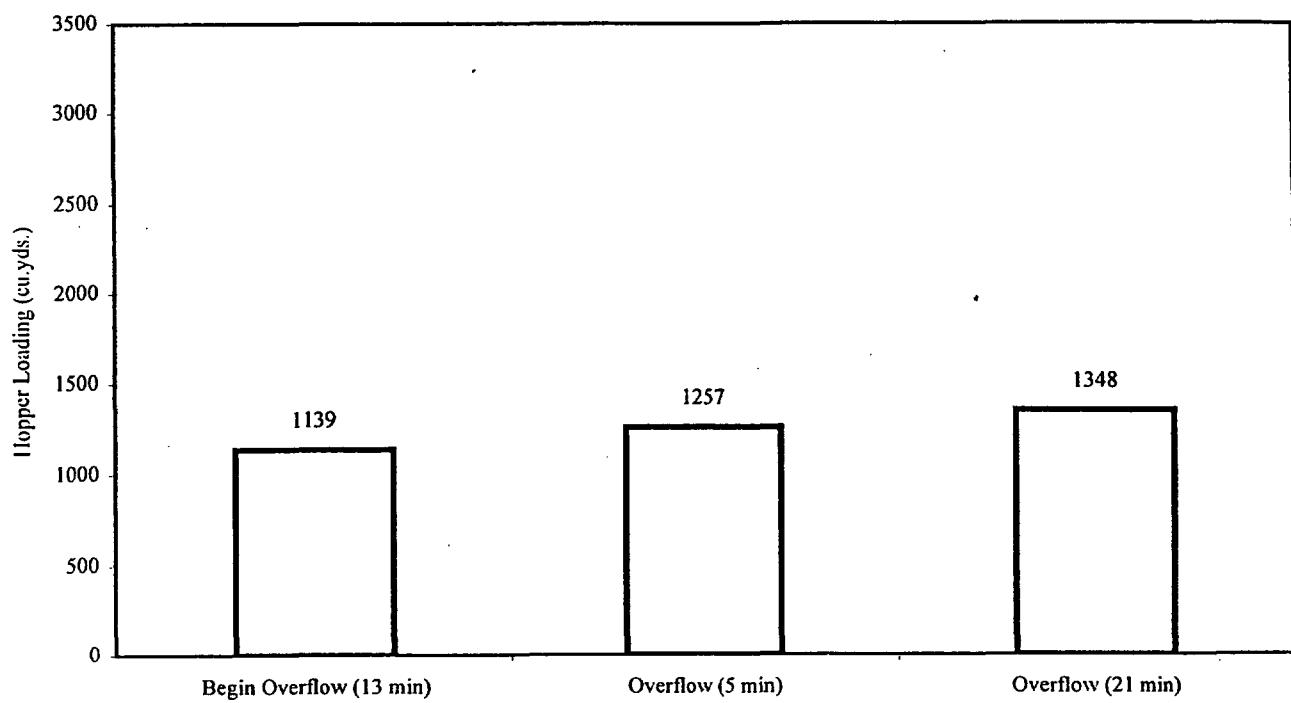


Figure 5: Range of Gradation Curves In-Situ sediment collected at the coarse-grained site.

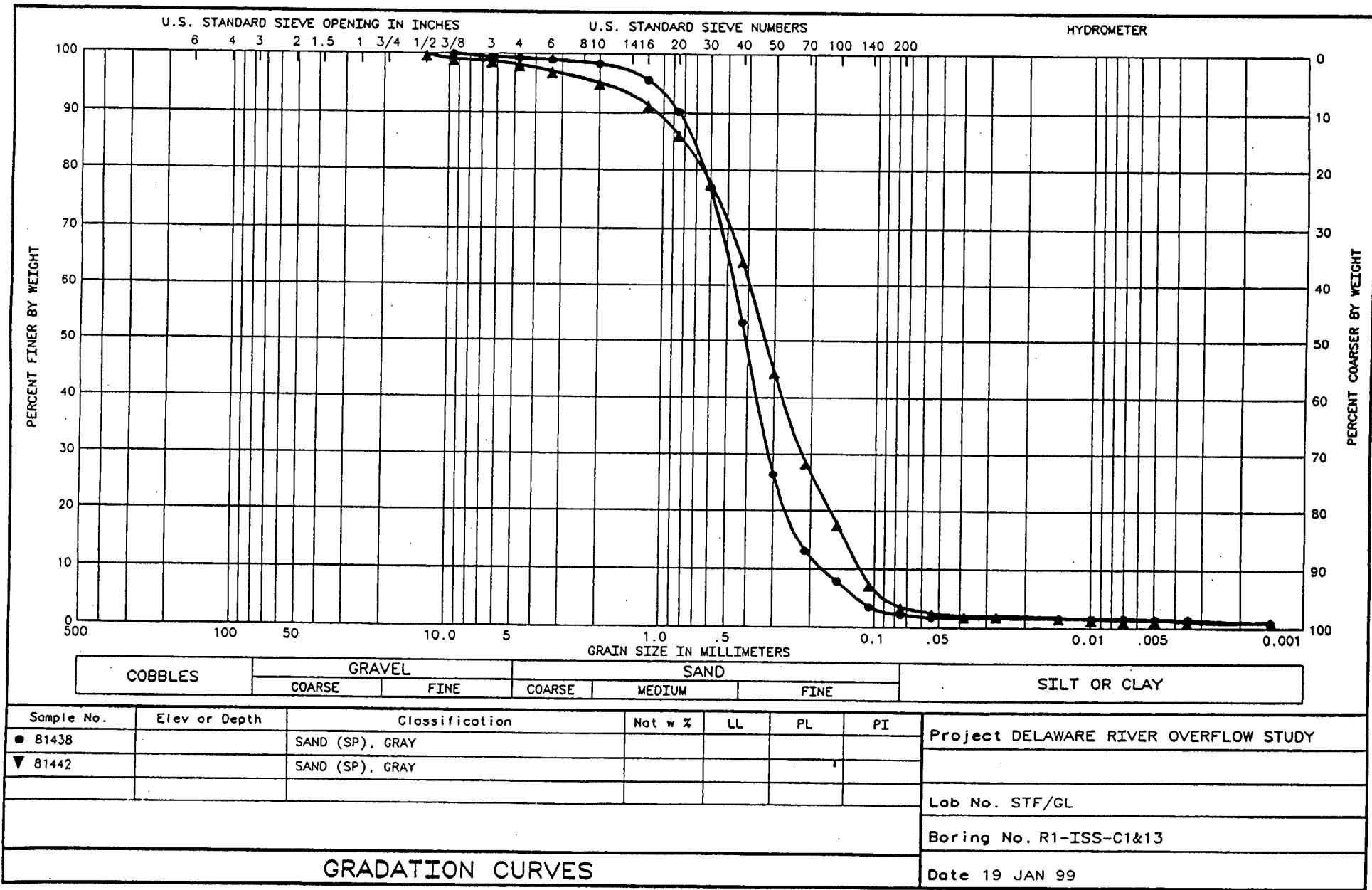


Figure 6: Range of Gradation Curves In-Situ sediment collected at the fine-grained site.

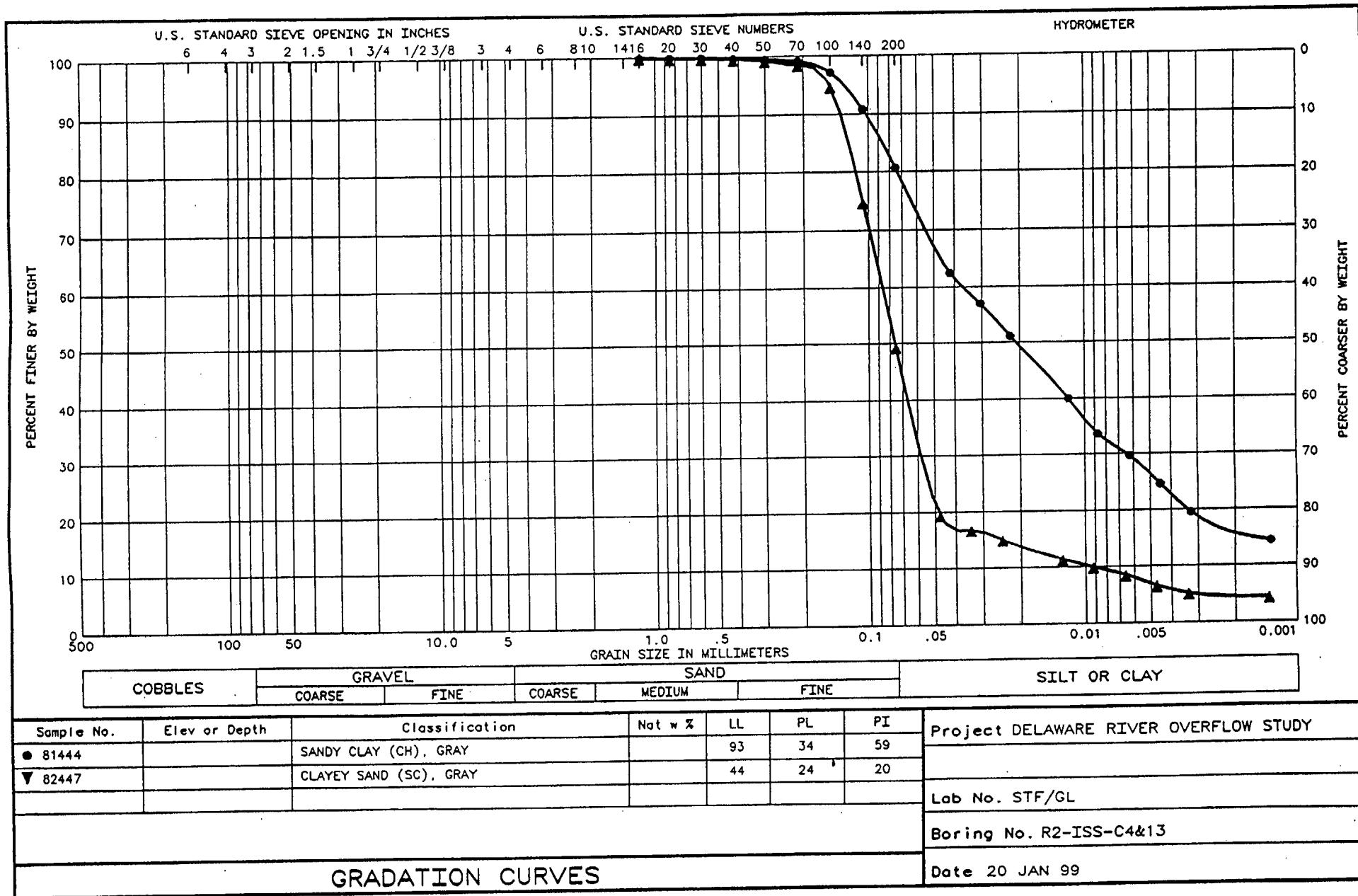


Figure 7: Range of Gradation Curves In-Situ sediment collected at the coarse-grained site.

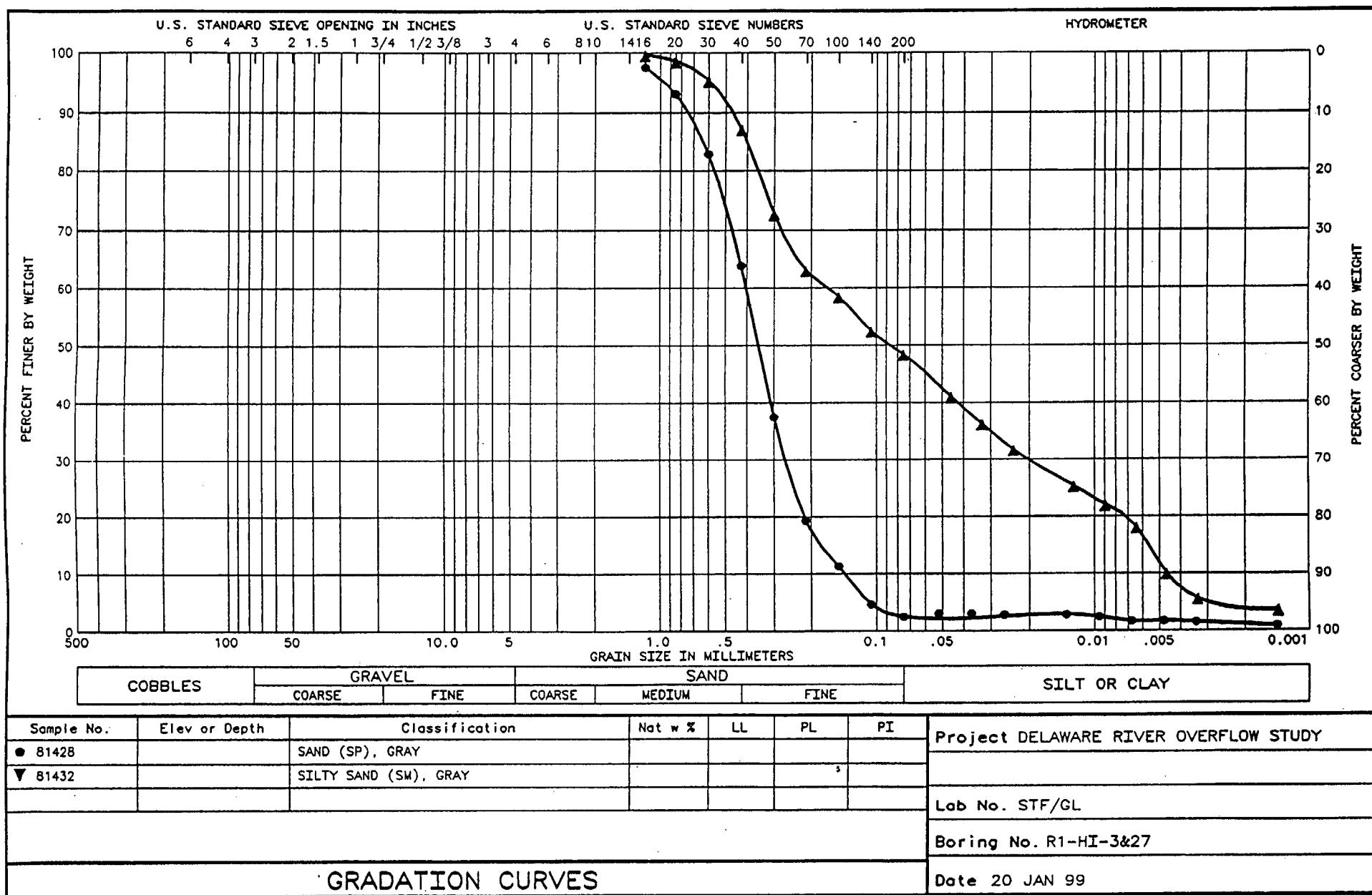
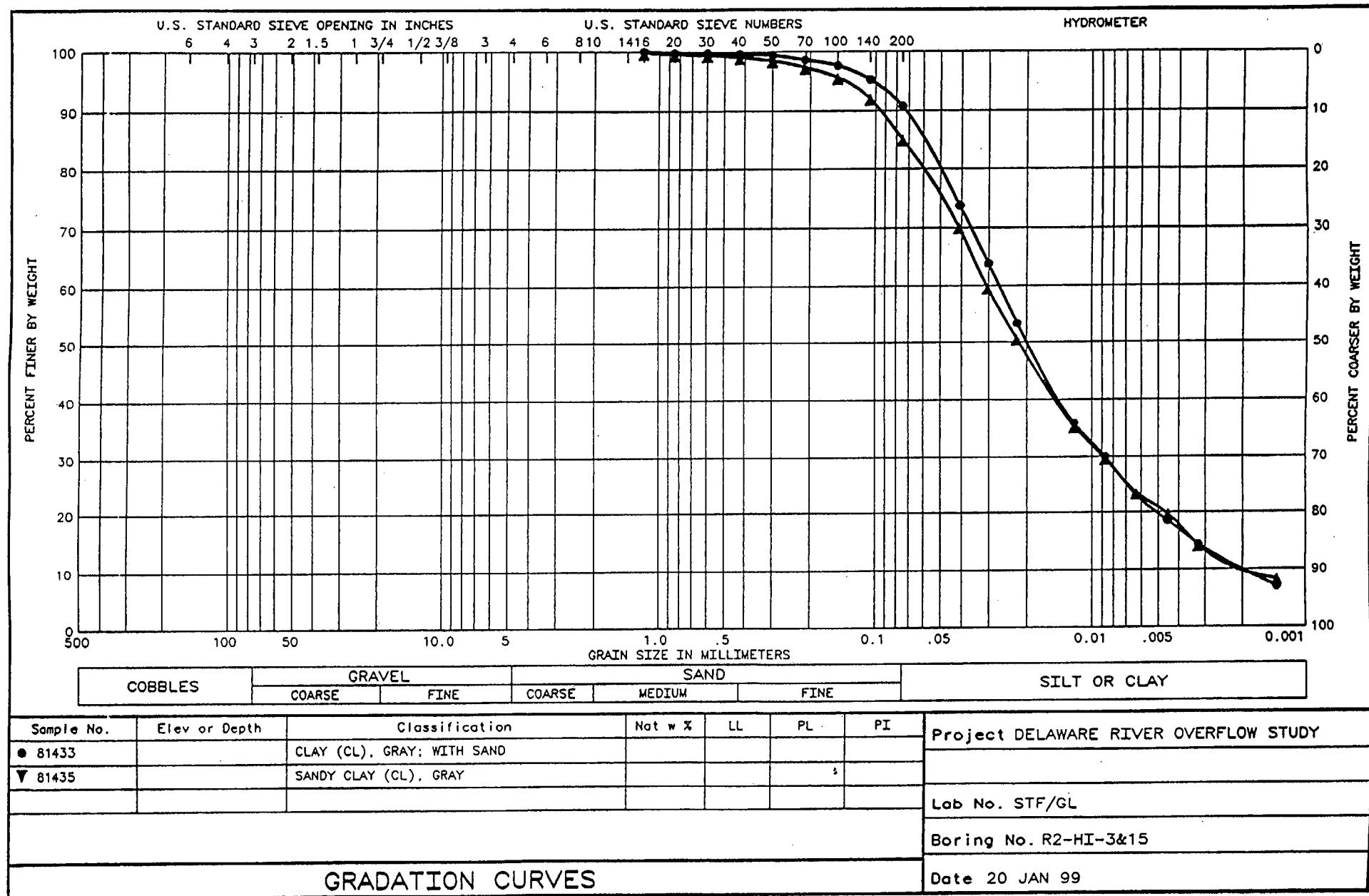
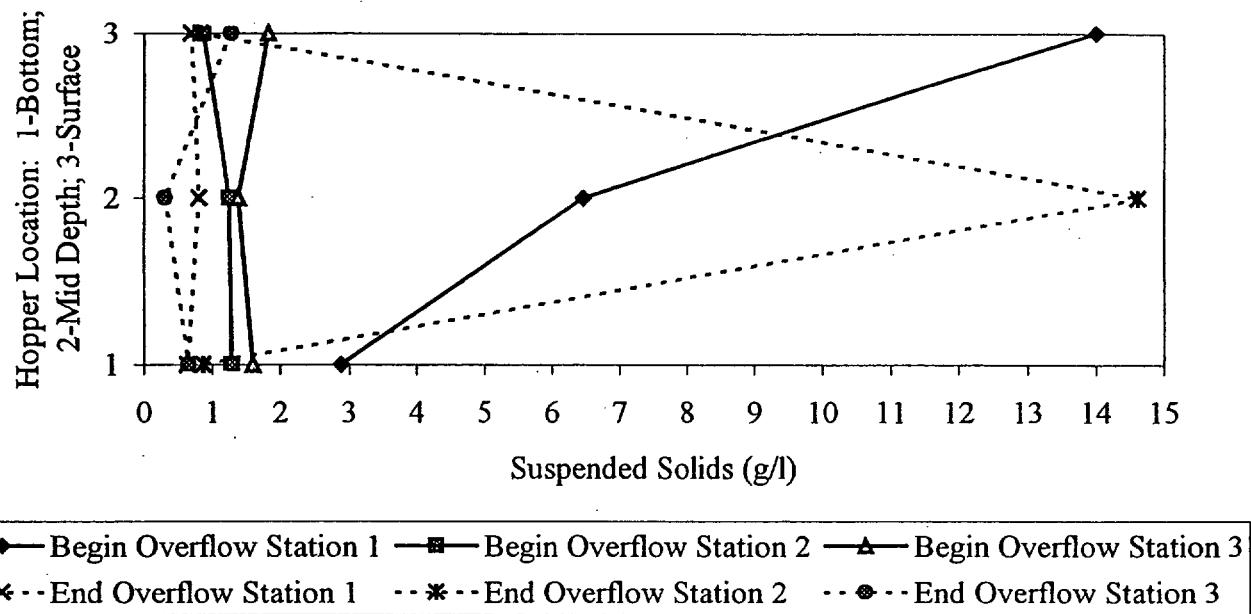


Figure 8: Range of Gradation Curves In-Situ sediment collected at the fine-grained site.



**Figure 9: Hopper Contents Solids Concentration  
Coarse Grained Material**



**Figure 10: Hopper Contents Solids Concentrations  
Fine Grained Material**

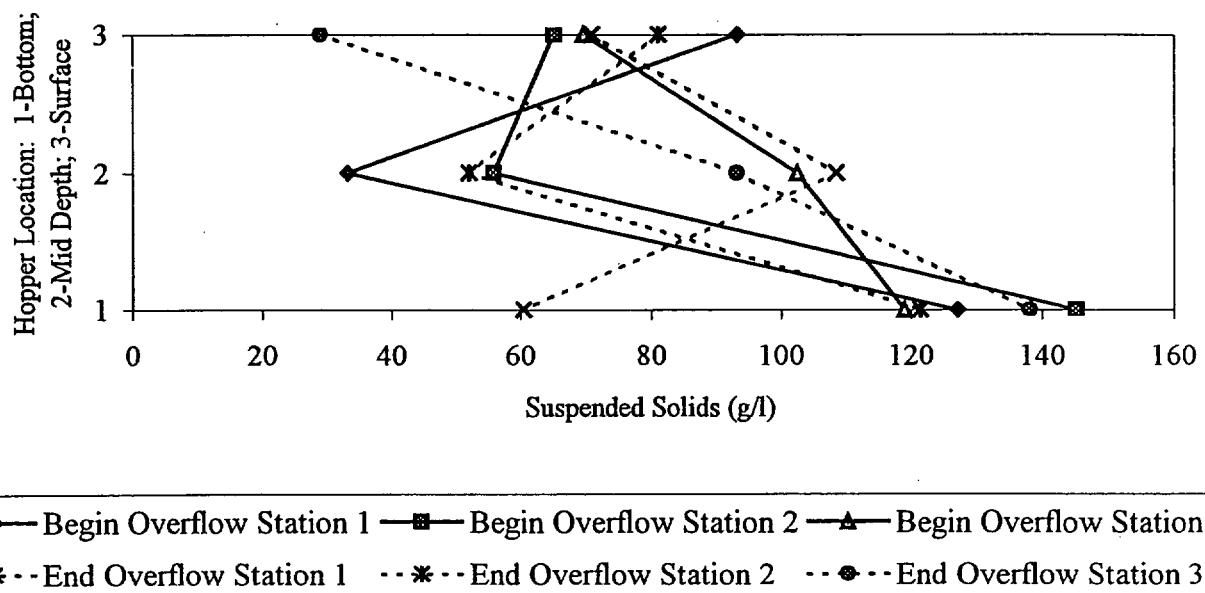


Figure 11: Range of Gradation Curves In-Situ sediment collected at the fine-grained site.

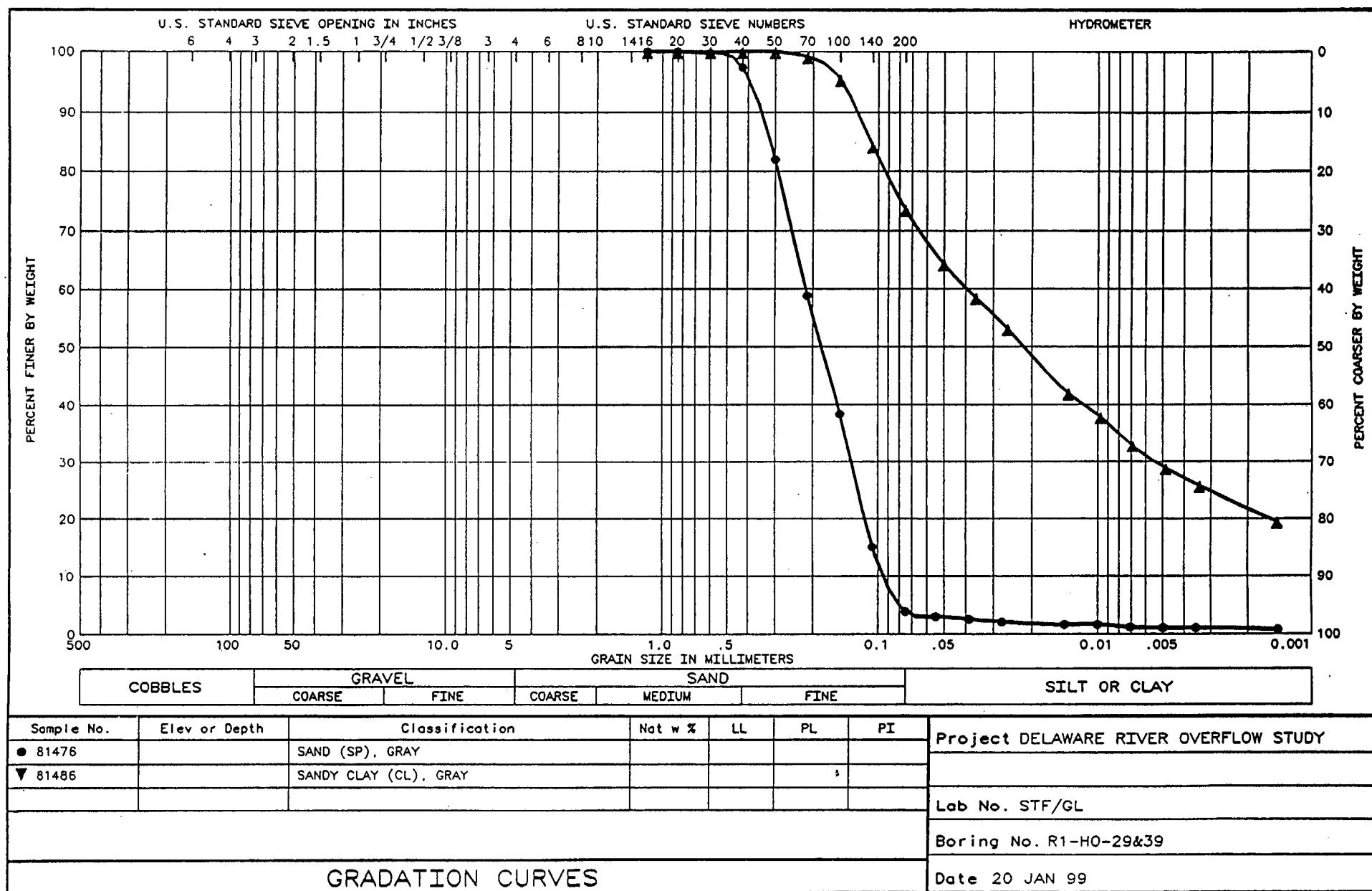


Figure 12: Range of Gradation Curves In-Situ sediment collected at the fine-grained site.

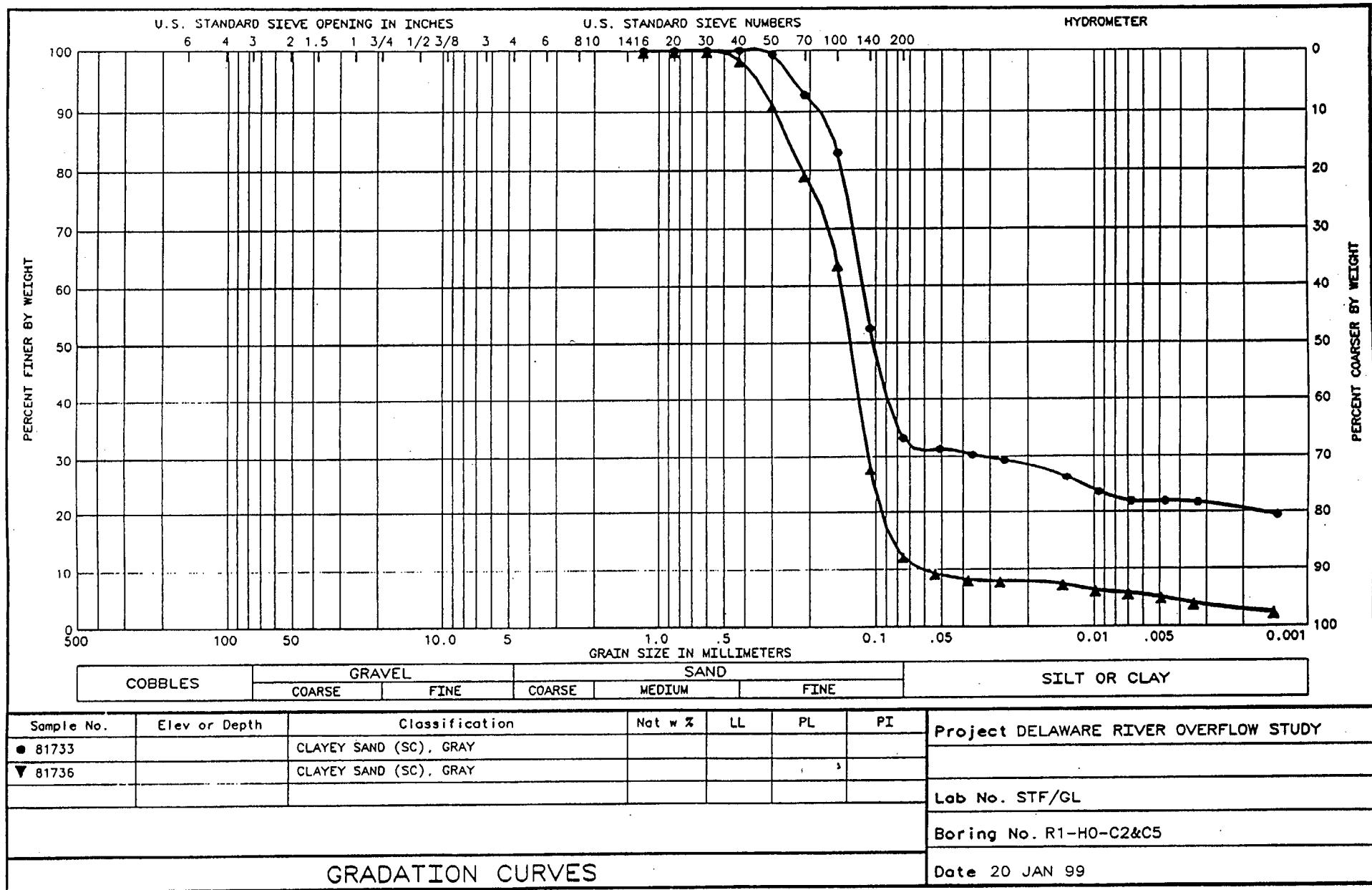


Figure 13: Range of Gradation Curves In-Situ sediment collected at the fine-grained site.

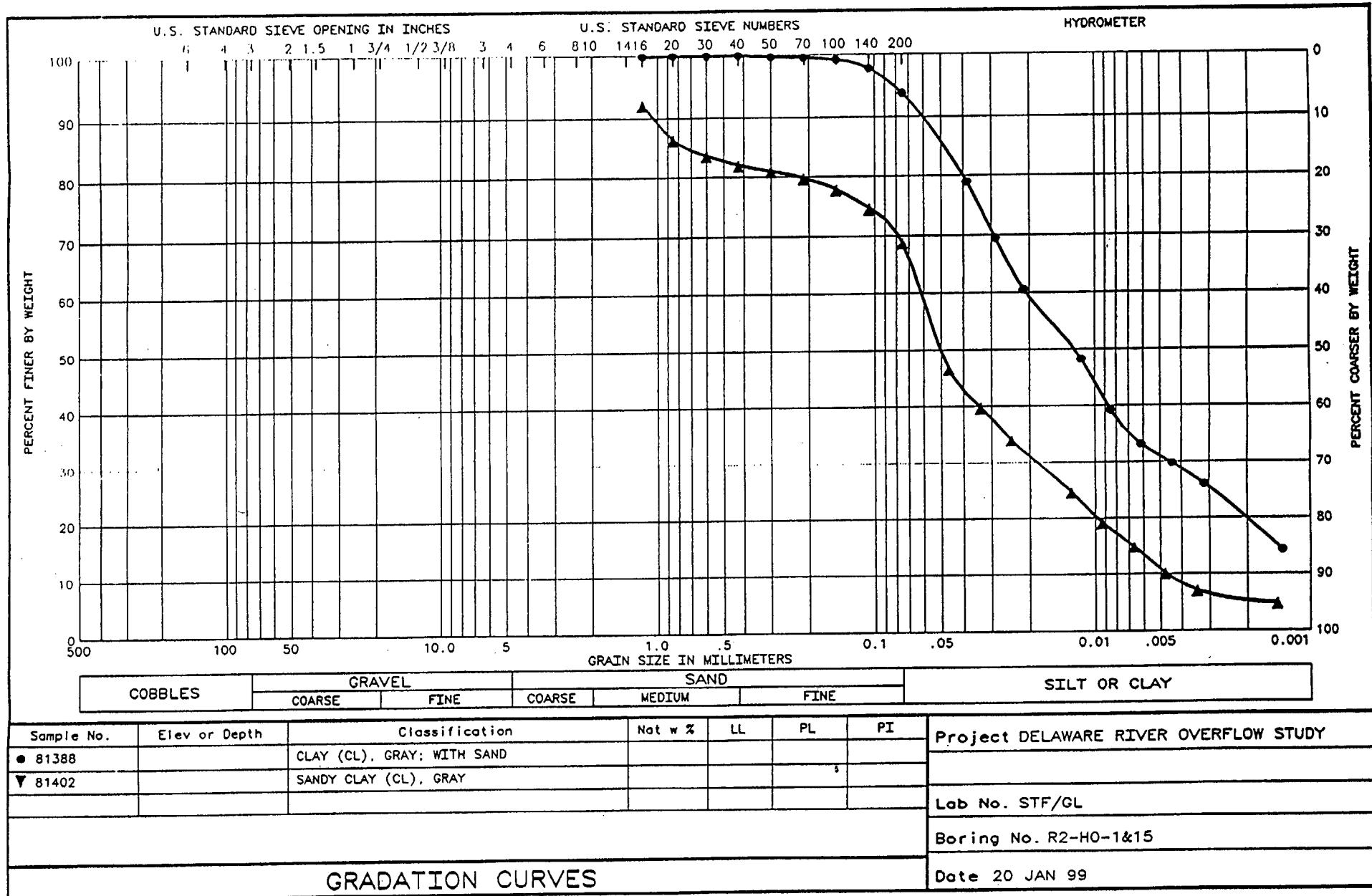
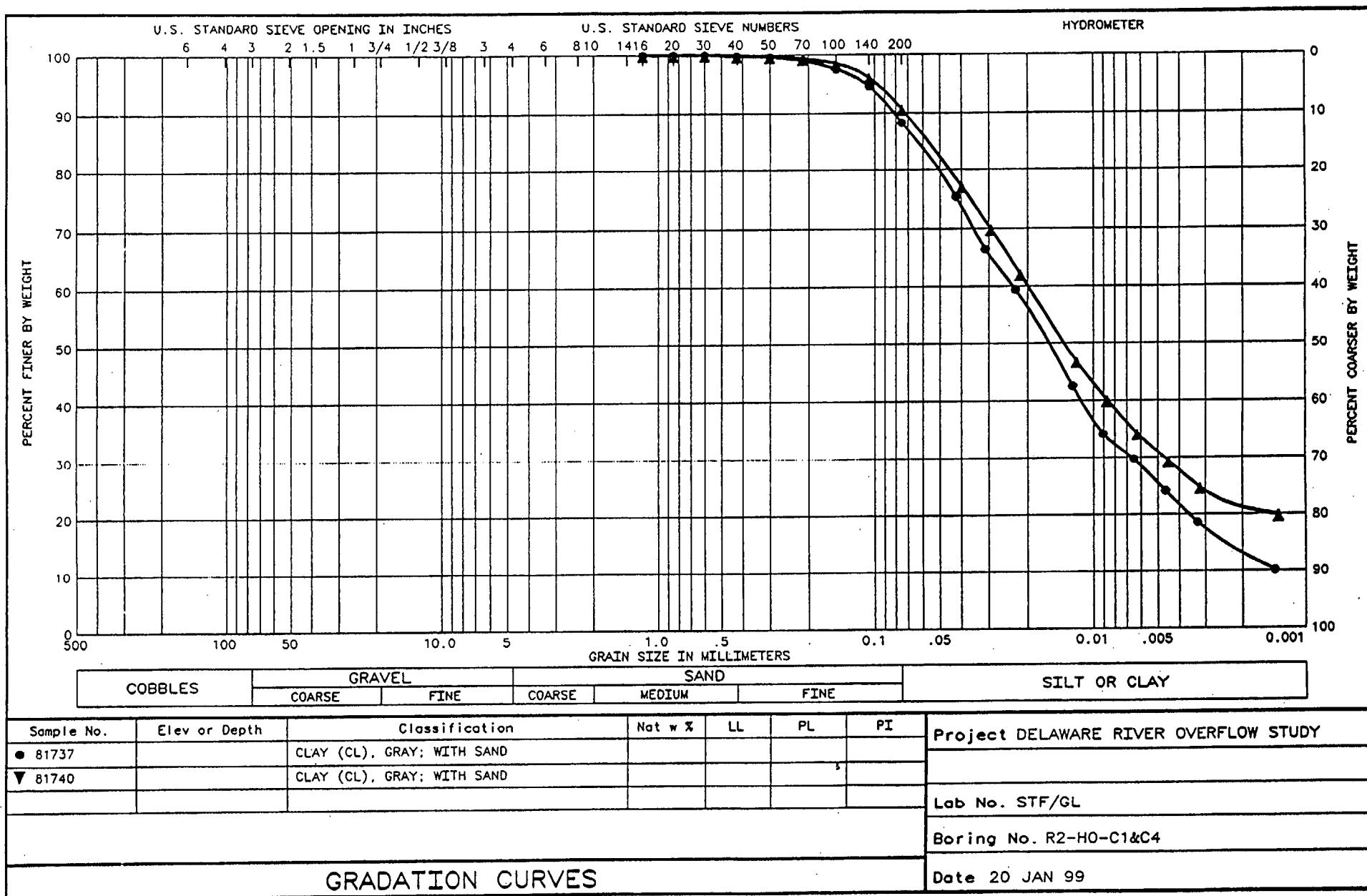
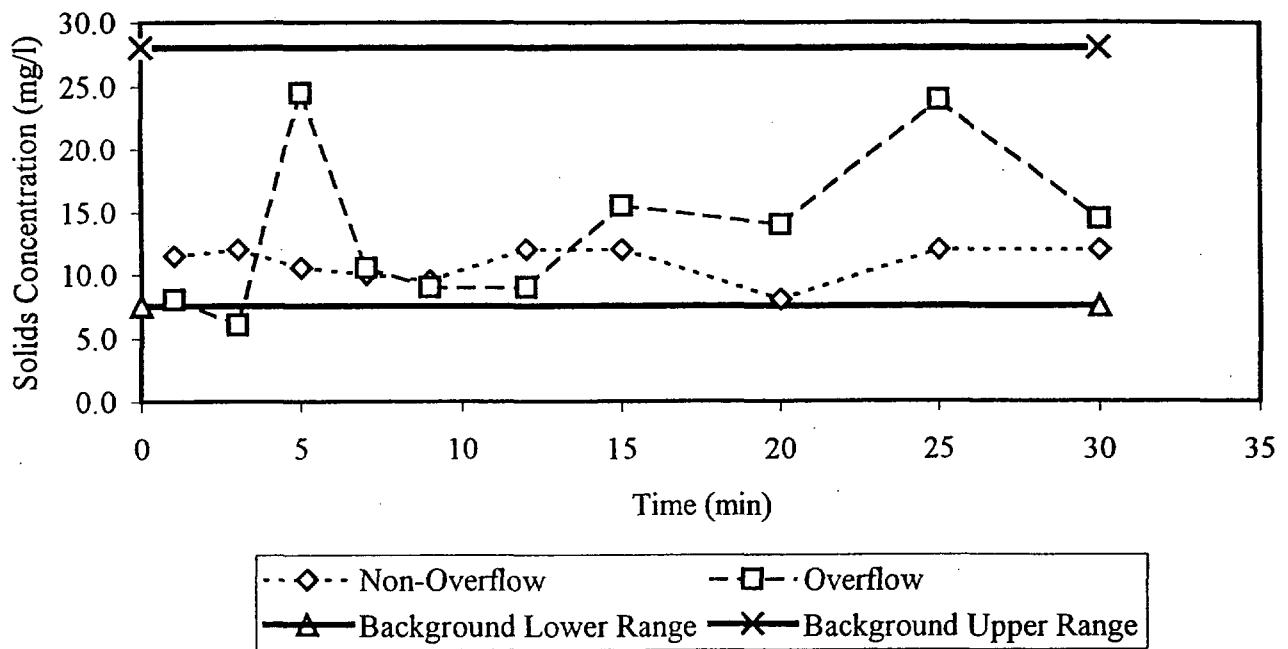


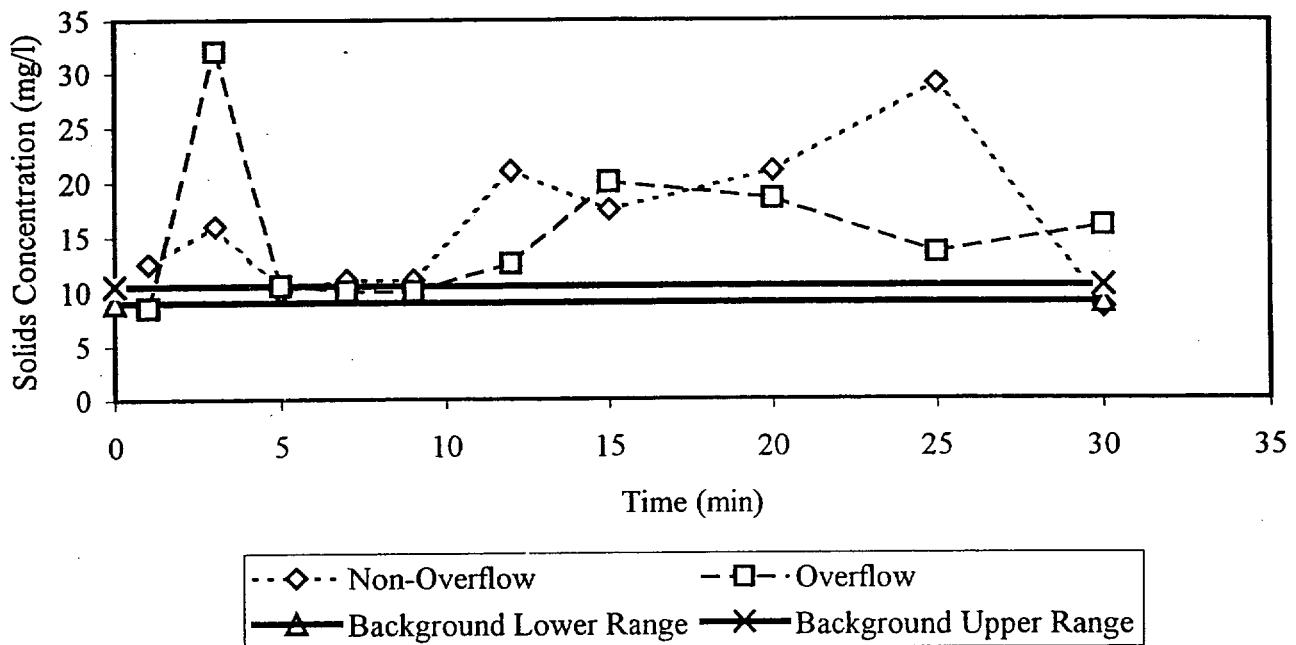
Figure 14: Range of Gradation Curves In-Situ sediment collected at the fine-grained site.



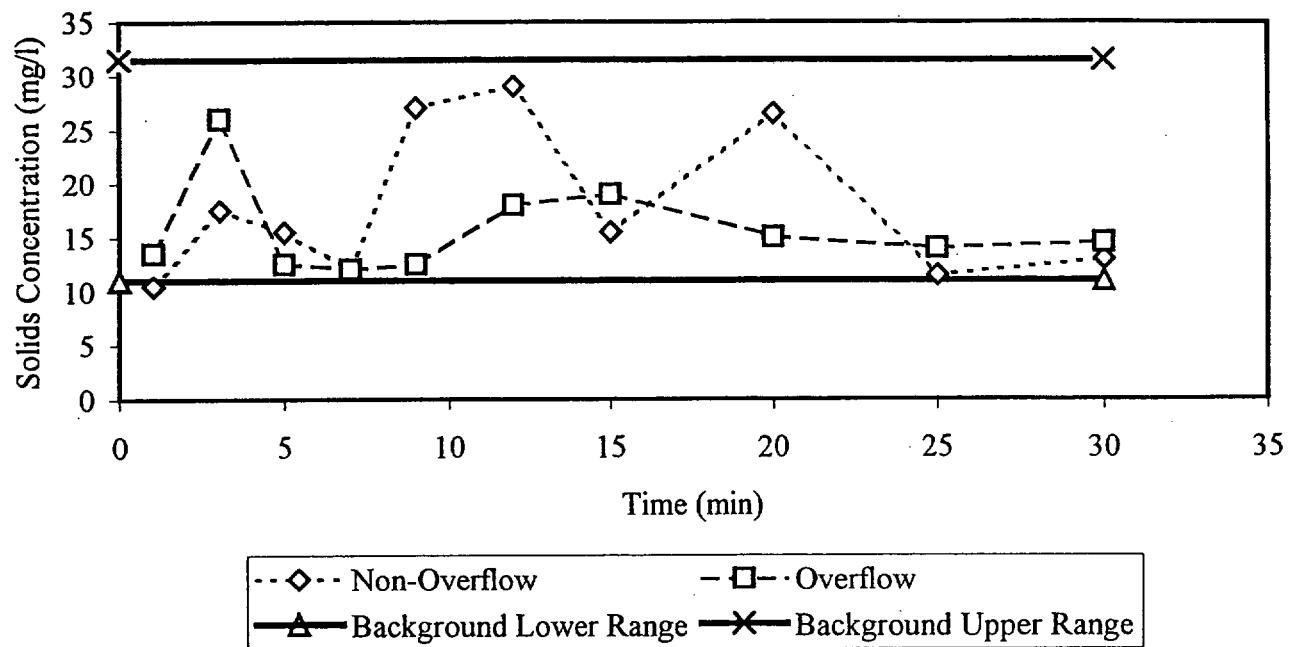
**Figure 15: Plume Solids Concentration at Surface  
(Coarse-Grained Material)**



**Figure 16: Plume Solids Concentration at Mid-Depth  
(Coarse-Grained Material)**

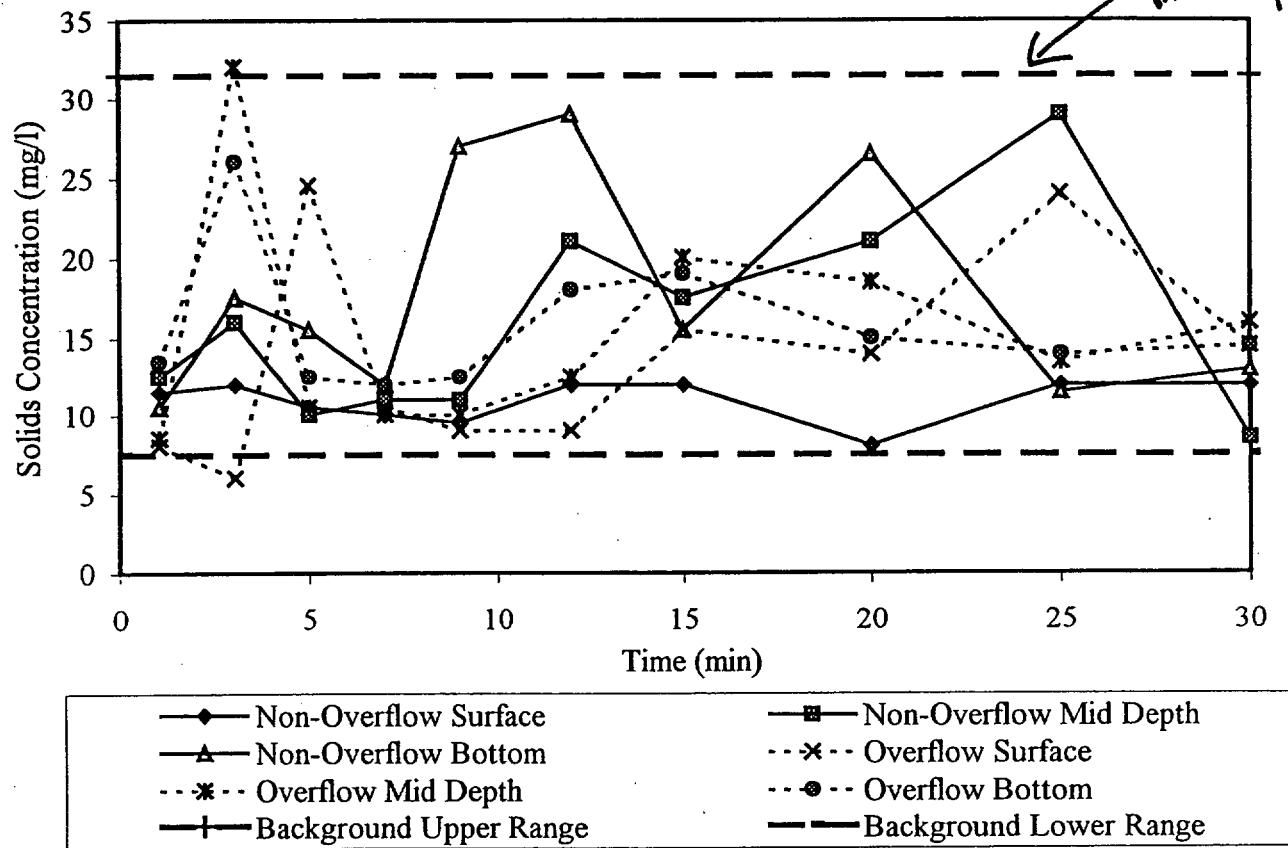


**Figure 17: Plume Solids Concentration at Bottom  
(Coarse-Grained Material)**

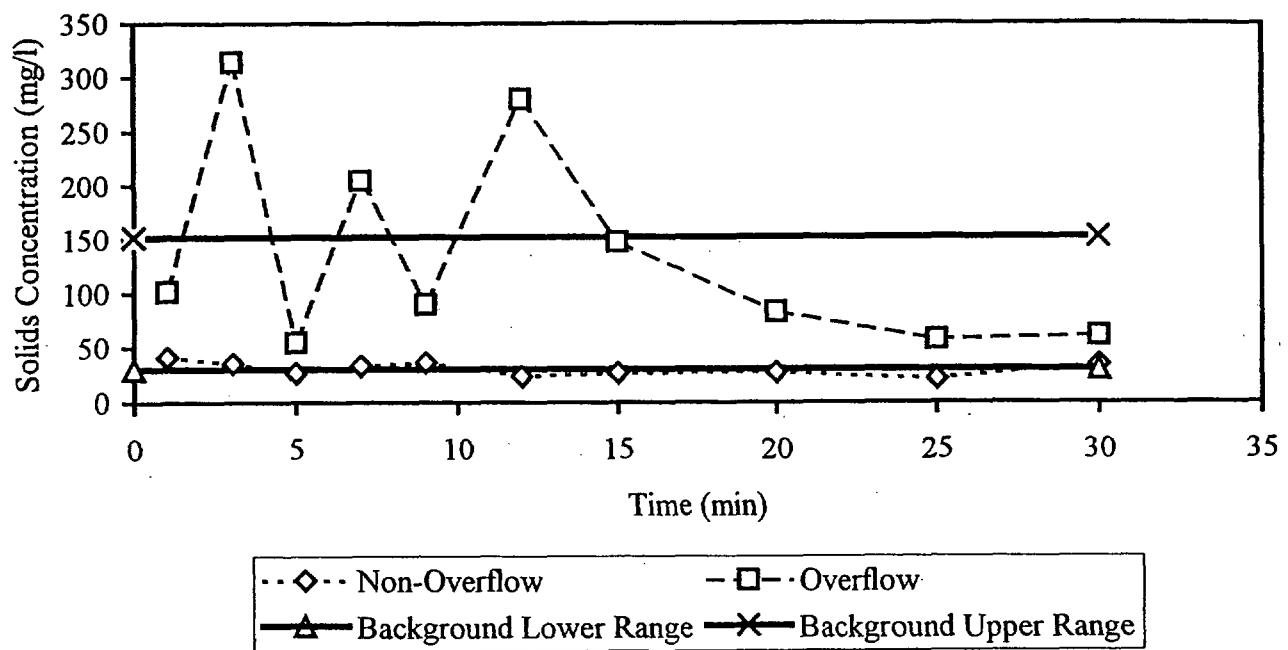


**Figure 18: Plume Solids Concentration Coarse Grained Site**

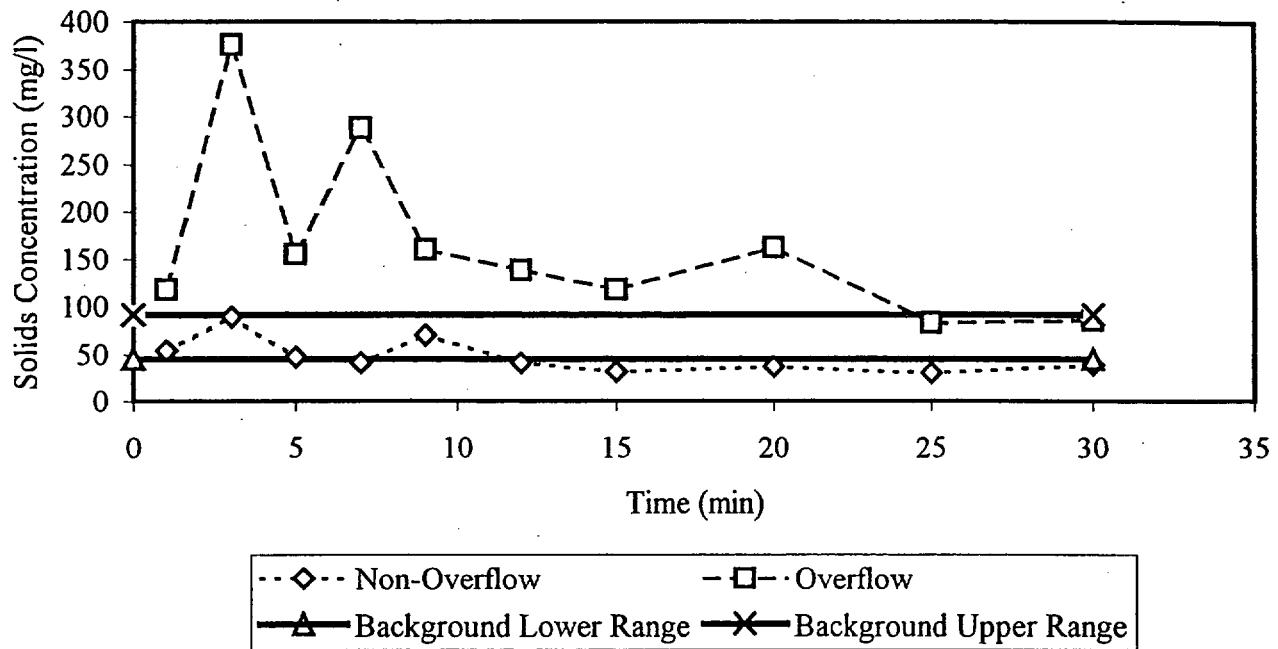
Incorrect marking according to the key



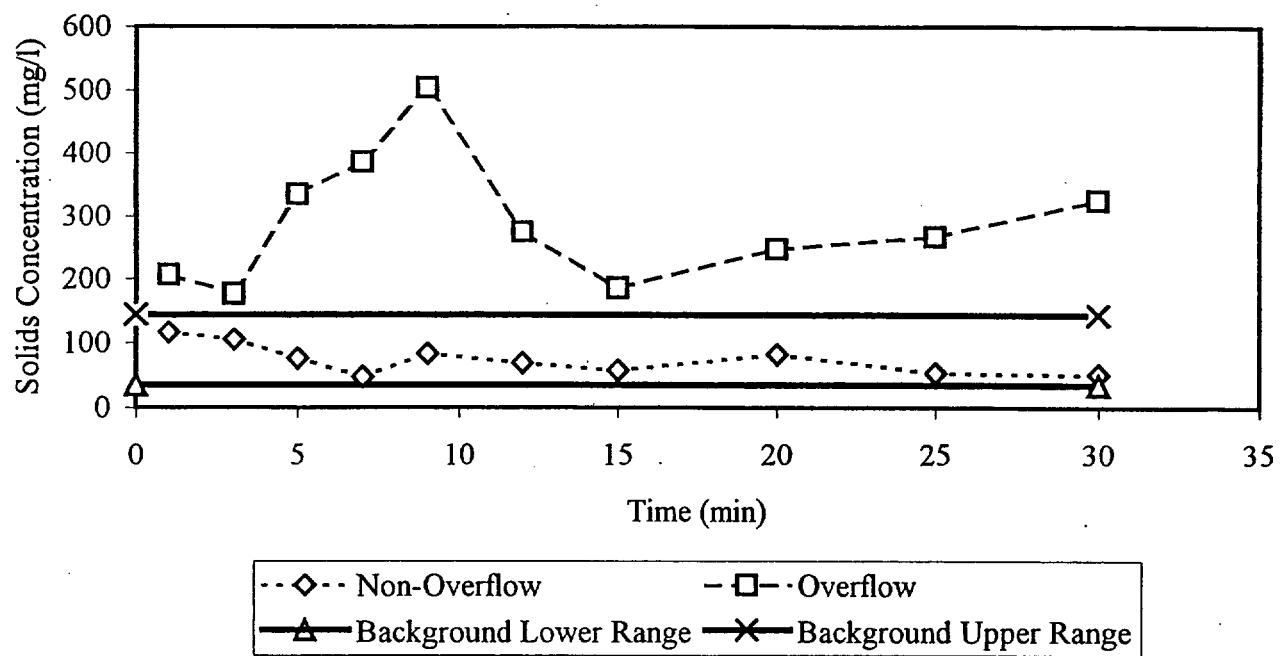
**Figure 19: Plume Solids Concentration at Surface  
(Fine-Grained Material)**



**Figure 20: Plume Solids Concentrations at Mid-Depth  
(Fine-Grained Material)**



**Figure 21: Plume Solids Concentration at Bottom  
(Fine-Grained Material)**



**Figure 22: Plume Solids Concentration Fine Grained Site**

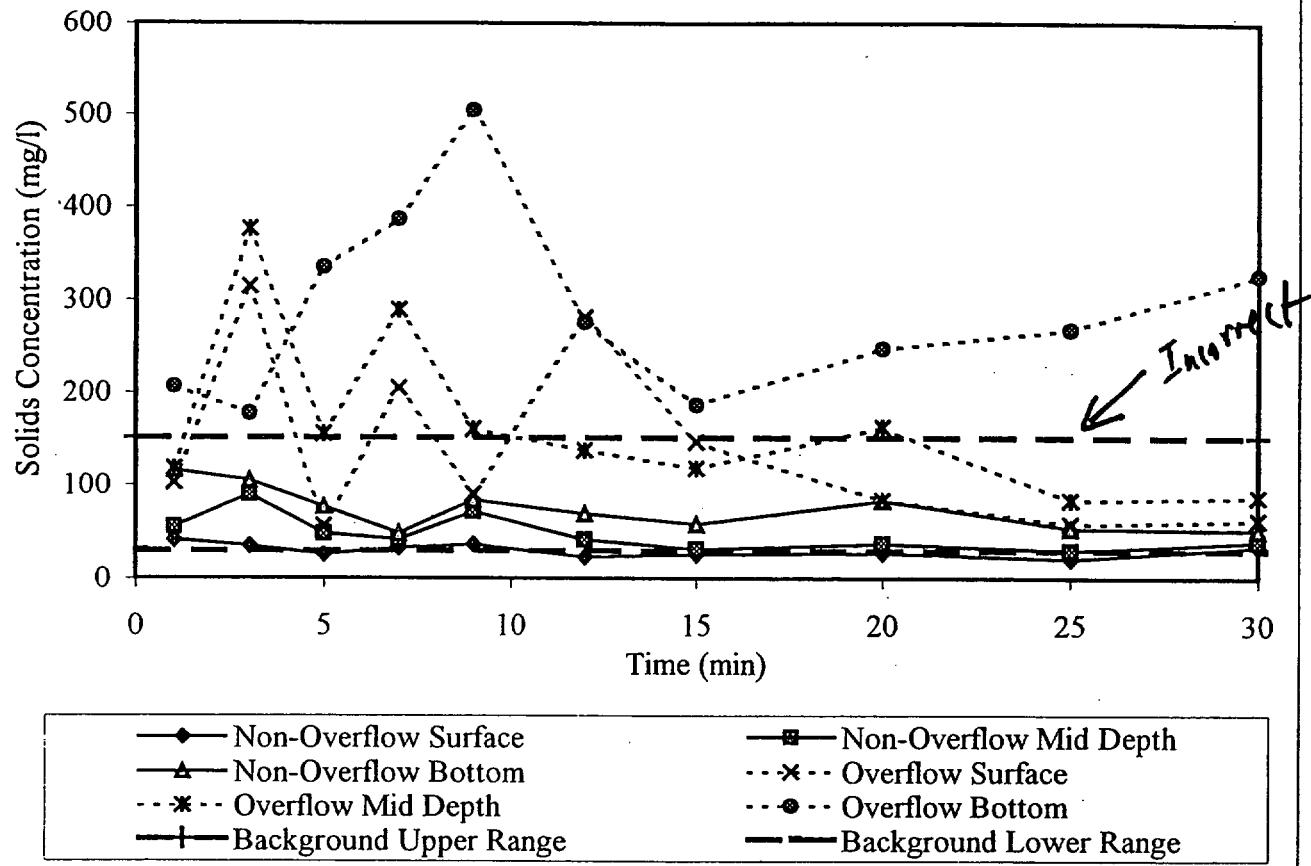


TABLE 1: Delaware River Coarse Grained Site  
SUMMARY OF SEDIMENT AND WATER QUALITY DATA

Effluent Suspended Solids Concentration - 1395.000 mg/l

PARAMETER	SEDIMENT CONC mg/kg	DETECTION LIMIT μg/l	<sup>1</sup> WATER QUALITY STANDARDS μg/l	BACKGROUND CONC μg/l	ELUTRIATE CONC μg/l	OVERFLOW CONC μg/l
2-METHYLNAPHTHALENE	0.000	0.3000	NL	BD	BD	BD
A-BHC	0.000	0.0250	NL	BD	BD	BD
A-ENDOSULFAN	0.000	0.0250	NL	BD	BD	BD
ACENAPHTHENE	0.000	0.3000	20	BD	BD	BD
ACENAPHTHYLENE	0.000	0.3000	NL	BD	BD	BD
ALDRIN	0.000	0.0250	0.65	BD	BD	BD
ALUMINUM (A1)	1673.000	25.0000	NA	BD	BD	BD
ANTHRACENE	0.000	0.3000	NL	BD	BD	BD
ANTIMONY	0.000	3.0000	NL	BD	BD	BD
ARSENIC (As)	3.170	2.0000	69	44.0000	49.6667	46
B-BHC	0.001	0.0250	NL	BD	BD	BD
B-ENDOSULFAN	0.000	0.0500	NL	BD	BD	BD
BARIUM (Ba)	4.900	2.0000	NL	39.0000	91.6667	117
BENXO(a)ANTHRACENE	0.017	0.3000	NL	BD	BD	BD
BENZO(G, H, I)PERYLENE	0.017	0.3000	NL	BD	BD	BD
BENZO(a)PYRENE	0.022	0.3000	NL	BD	BD	BD
BENZO(b)FLUORANTHENE	0.021	0.3000	NL	BD	BD	BD
BENZO(k)FLORANTHENE	0.022	0.3000	NL	BD	BD	BD
BERYLLIUM (Be)	0.200	1.0000	NL	BD	BD	BD
CADMIUM (Cd)	0.000	0.2000	43	BD	BD	BD
CHROMIUM (TRI)(Cr)	6.300	2.0000	NA	BD	2.0000	BD
CHRYSENE	0.019	0.3000	NL	BD	BD	BD
COBALT (Co)	2.300	2.0000	NL	BD	BD	BD
COPPER (Cu)	2.330	1.0000	5.3	13.0000	7.0000	5
D-BHC	0.000	0.0250	NL	BD	BD	BD
DIBENZO(A, H)ANTHRACENE	0.002	0.3000	NL	BD	BD	BD
DIELDRIN	0.001	0.0500	0.355	BD	BD	BD
ENDOSULFAN SULFATE	0.000	0.0500	NL	BD	BD	BD
ENDRIN	0.000	0.0500	0.019	BD	BD	BD
ENDRIN ALDEHYDE	0.000	0.0500	NL	BD	BD	BD
FLUORANTHENE	0.010	0.3000	NL	BD	BD	BD
FLUORENE	0.000	0.3000	NL	BD	BD	BD
G-BHC	0.003	0.0250	0.08	BD	BD	BD

PARAMETER	SEDIMENT CONC mg/kg	DETECTION LIMIT μg/l	<sup>1</sup> WATER QUALITY STANDARDS μg/l	BACKGROUND CONC μg/l	ELUTRIATE CONC μg/l	OVERFLOW CONC μg/l
HEPTACHLOR	0.001	0.0250	0.027	BD	BD	BD
HEPTACHLOR EPOXIDE	0.002	0.0250	NL	BD	BD	BD
INDENO(1,2,3-C,D) PYRENE	0.021	0.3000	NL	BD	BD	BD
IRON (Fe)	5903.000	20.0000	NL	BD	BD	BD
LEAD (Pb)	12.300	1.0000	220	BD	BD	BD
MANGANESE (Mn)	94.800	1.0000	NL	6.0000	1.6667	BD
MERCURY (Hg)	0.093	0.2000	2.1	BD	BD	BD
METHOXYCHLOR	0.000	0.2500	NL	BD	BD	BD
NAPHTHALENE	0.000	0.3000	NL	BD	BD	BD
NICKEL (Ni)	3.300	1.0000	75	9.0000	5.0000	BD
TOTAL PCB's			5.0			9
PCB 101	0.000	0.0010	NL	BD	0.0010	BD
PCB 105	0.000	0.0010	NL	BD	BD	BD
PCB 110	0.000	0.0010	NL	BD	BD	BD
PCB 114	0.000	0.0010	NL	BD	BD	BD
PCB 118	0.000	0.0010	NL	BD	BD	BD
PCB 119	0.000	0.0010	NL	BD	BD	BD
PCB 120	0.000	0.0010	NL	BD	BD	BD
PCB 121	0.000	0.0010	NL	BD	BD	BD
PCB 123	0.000	0.0010	NL	BD	BD	BD
PCB 126	0.000	0.0010	NL	BD	BD	BD
PCB 127	0.000	0.0010	NL	BD	BD	BD
PCB 128	0.000	0.0010	NL	BD	BD	BD
PCB 132	0.000	0.0010	NL	BD	BD	BD
PCB 135	0.000	0.0010	NL	BD	BD	BD
PCB 136	0.000	0.0010	NL	BD	BD	BD
PCB 137	0.000	0.0010	NL	BD	BD	BD
PCB 138	0.000	0.0010	NL	BD	BD	BD
PCB 141	0.000	0.0010	NL	BD	BD	BD
PCB 146	0.000	0.0010	NL	BD	BD	BD
PCB 149	0.000	0.0010	NL	BD	BD	BD
PCB 151	0.000	0.0010	NL	BD	BD	BD
PCB 153	0.000	0.0010	NL	BD	BD	BD
PCB 156	0.000	0.0010	NL	BD	BD	BD
PCB 157	0.000	0.0010	NL	BD	BD	BD
PCB 158	0.000	0.0010	NL	BD	BD	BD
PCB 166	0.000	0.0010	NL	BD	BD	BD
PCB 167	0.000	0.0010	NL	BD	BD	BD
PCB 168	0.000	0.0010	NL	BD	BD	BD

PARAMETER	SEDIMENT CONC mg/kg	DETECTION LIMIT µg/l	WATER QUALITY STANDARDS µg/l	BACKGROUND CONC µg/l	ELUTRIATE CONC µg/l	OVERFLOW CONC µg/l
PCB 169	0.000	0.0010	NL	BD	BD	BD
PCB 170	0.000	0.0010	NL	BD	BD	BD
PCB 171	0.000	0.0010	NL	BD	BD	BD
PCB 174	0.000	0.0010	NL	BD	BD	BD
PCB 177	0.000	0.0010	NL	BD	BD	BD
PCB 178	0.000	0.0010	NL	BD	BD	BD
PCB 179	0.000	0.0010	NL	BD	BD	BD
PCB 18	0.000	0.0010	NL	BD	BD	BD
PCB 180	0.000	0.0010	NL	BD	BD	BD
PCB 182	0.000	0.0010	NL	BD	BD	BD
PCB 183	0.000	0.0010	NL	BD	BD	BD
PCB 185	0.000	0.0010	NL	BD	BD	BD
PCB 187	0.000	0.0010	NL	BD	BD	BD
PCB 189	0.000	0.0010	NL	BD	BD	BD
PCB 190	0.000	0.0010	NL	BD	BD	BD
PCB 191	0.000	0.0010	NL	BD	BD	BD
PCB 194	0.000	0.0010	NL	BD	BD	BD
PCB 195	0.000	0.0010	NL	BD	BD	BD
PCB 196	0.000	0.0010	NL	BD	BD	BD
PCB 198	0.000	0.0010	NL	BD	BD	BD
PCB 200	0.000	0.0010	NL	BD	BD	BD
PCB 201	0.000	0.0010	NL	BD	BD	BD
PCB 203	0.000	0.0010	NL	BD	BD	BD
PCB 205	0.000	0.0010	NL	BD	BD	BD
PCB 206	0.000	0.0010	NL	0.0020	0.0024	0.0017
PCB 207	0.000	0.0010	NL	BD	BD	BD
PCB 208	0.000	0.0010	NL	BD	0.0012	BD
PCB 22	0.000	0.0010	NL	BD	BD	BD
PCB 28	0.000	0.0010	NL	BD	BD	BD
PCB 31	0.000	0.0010	NL	BD	0.0029	BD
PCB 33	0.000	0.0010	NL	BD	BD	BD
PCB 37	0.000	0.0010	NL	BD	BD	BD
PCB 40	0.000	0.0010	NL	BD	BD	BD
PCB 42	0.000	0.0010	NL	BD	BD	0.0014
PCB 44	0.000	0.0010	NL	0.0014	BD	BD
PCB 47	0.000	0.0010	NL	BD	BD	BD
PCB 49	0.000	0.0010	NL	BD	BD	BD
PCB 52	0.000	0.0010	NL	BD	0.0010	BD
PCB 60	0.000	0.0010	NL	BD	BD	BD

PARAMETER	SEDIMENT CONC mg/kg	DETECTION LIMIT μg/l	WATER QUALITY STANDARDS μg/l	BACKGROUND CONC μg/l	ELUTRIATE CONC μg/l	OVERFLOW CONC μg/l
PCB 64	0.000	0.0010	NL	BD	BD	BD
PCB 66	0.000	0.0010	NL	BD	BD	BD
PCB 70	0.000	0.0010	NL	BD	BD	BD
PCB 74	0.000	0.0010	NL	BD	BD	BD
PCB 77	0.000	0.0010	NL	BD	BD	BD
PCB 8	0.000	0.0010	NL	BD	BD	BD
PCB 80	0.000	0.0010	NL	BD	BD	BD
PCB 81	0.000	0.0010	NL	BD	BD	BD
PCB 82	0.000	0.0010	NL	BD	BD	BD
PCB 84	0.000	0.0010	NL	BD	BD	BD
PCB 86	0.000	0.0010	NL	BD	BD	BD
PCB 87	0.000	0.0010	NL	BD	BD	BD
PCB 91	0.000	0.0010	NL	BD	BD	BD
PCB 92	0.000	0.0010	NL	BD	BD	BD
PCB 95	0.000	0.0010	NL	BD	BD	BD
PCB 97	0.000	0.0010	NL	BD	BD	BD
PCB 99	0.000	0.0010	NL	BD	BD	BD
PHENANTHRENE	0.001	0.3000	NL	BD	BD	BD
PPDDDD	0.000	0.0500	NL	BD	BD	BD
PPDDE	0.000	0.0500	NL	BD	BD	BD
PPDDT	0.000	0.0500	NL	BD	BD	BD
PYRENE	0.013	0.3000	NL	BD	BD	BD
SELENIUM (Se)	0.866	2.0000	300	152.0000	167.6667	160
SILVER (Ag)	0.333	1.0000	2.3	BD	1.0000	BD
THALLIUM (Tl)	0.000	2.0000	NL	BD	BD	BD
TOC-TOTAL ORGANIC CARBON	166.700	3000.0000	NL	BD	BD	13160
TOXAPHENE	0.000	0.2500	0.21	BD	BD	BD
VANADIUM (V)	4.130	1.0000	NL	2.0000	1.6667	4
ZINC (Zn)	29.200	10.0000	95	BD	28.0000	27
a-CHLORDANE	0.000	0.0250	NL	BD	BD	BD
b-CHLORDANE	0.002	0.0250	NL	BD	BD	BD

BD = below detection

NA = not applicable

NL = not listed

0.000 = below detection for sediment conc. (mg/kg)

<sup>1</sup>Marine Objectives Acute

TABLE 2: Delaware River Fine Grained Site  
SUMMARY OF SEDIMENT AND WATER QUALITY DATA

Effluent Suspended Solids Concentration - 77385.000 mg/l

PARAMETER	SEDIMENT CONC mg/kg	DETECTION LIMIT μg/l	<sup>1</sup> WATER QUALITY STANDARDS μg/l	BACKGROUND CONC μg/l	ELUTRIATE CONC μg/l	OVERFLOW CONC μg/l
2-METHYLNAPHTHALENE	0.034	0.3000	NL	BD	BD	BD
A-BHC	0.000	0.0500	NL	BD	BD	BD
A-ENDOSULFAN	0.003	0.0500	NL	BD	BD	BD
ACENAPHTHENE	0.000	0.3000	NL	BD	BD	BD
ACENAPHTHYLENE	0.000	0.3000	NL	BD	BD	BD
ALDRIN	0.000	0.0500	0.65	BD	BD	BD
ALUMINUM (Al)	3367.000	25.0000	750	BD	136.0000	BD
ANTHRACENE	0.033	0.3000	NL	BD	BD	BD
ANTIMONY	0.410	3.0000	NL	BD	BD	BD
ARSENIC (As)	10.400	2.0000	69	7.0000	10.0000	9
B-BHC	0.001	0.0500	NL	BD	BD	BD
B-ENDOSULFAN	0.000	0.1000	NL	BD	BD	BD
BARIUM (Ba)	52.200	2.0000	NL	223.0000	234.3333	674
BENXO(a)ANTHRACENE	0.100	0.3000	NL	BD	BD	BD
BENZO(G, H, I)PERYLENE	0.067	0.3000	NL	BD	BD	BD
BENZO(a)PYRENE	0.091	0.3000	NL	BD	BD	BD
BENZO(b)FLUORANTHENE	0.079	0.3000	NL	BD	BD	BD
BENZO(k)FLORANTHENE	0.089	0.3000	NL	BD	BD	BD
BERYLLIUM (Be)	0.900	1.0000	NL	BD	BD	BD
CADMIUM (Cd)	0.297	0.2000	34	BD	BD	BD
CALCIUM (Ca)	2223.000	200.0000	NL	70200.000	66500.000	117000
CHROMIUM(TRI) (Cr)	41.500	2.0000	8340	BD	BD	BD
CHRYSENE	0.120	0.3000	NL	BD	BD	BD
COBALT (Co)	11.100	2.0000	NL	BD	2.3333	5
COPPER (Cu)	16.400	1.0000	5.3	4.0000	2.3333	BD
D-BHC	0.000	0.0500	NL	BD	BD	BD
DIBENZO(A, H)ANTHRACENE	0.008	0.3000	NL	BD	BD	BD
DIELDRIN	0.000	0.1000	0.355	BD	BD	BD
ENDOSULFAN SULFATE	0.006	0.1000	NL	BD	BD	BD
ENDRIN	0.000	0.1000	0.019	BD	BD	0.0754
ENDRIN ALDEHYDE	0.000	0.1000	NL	BD	BD	BD
FLUORANTHENE	0.150	0.3000	NL	BD	BD	BD
FLUORENE	0.015	0.3000	NL	BD	BD	BD
G-BHC	0.000	0.0500	0.08	BD	BD	BD

PARAMETER	SEDIMENT CONC mg/kg	DETECTION LIMIT μg/l	WATER QUALITY STANDARDS μg/l	BACKGROUND CONC μg/l	ELUTRIATE CONC μg/l	OVERFLOW CONC μg/l
HEPTACHLOR	0.001	0.0250	0.027	BD	0.0263	BD
HEPTACHLOR EPOXIDE	0.000	0.0500	NL	BD	BD	BD
INDENO(1,2,3-C,D)PYRENE	0.078	0.3000	NL	BD	BD	BD
IRON (Fe)	25567.000	20.0000	NL	BD	40.6667	5964
LEAD (Pb)	32.900	1.0000	48	4.500	BD	12
MAGNESIUM (Mg)	5080.000	200.0000	NL	1800000.000	147666.672	142000
MANGANESE (Mn)	1107.000	1.0000	NL	2.000	8230.000	7932
MERCURY (Hg)	0.157	0.2000	2.1	BD	BD	BD
METHOXYCHLOR	0.000	0.0500	NL	BD	BD	BD
NAPHTHALENE	0.060	0.3000	NL	BD	BD	BD
NICKEL (Ni)	21.800	1.0000	75	1.0000	2.3333	5
TOTAL PCB'S						
PCB 101	0.001	0.0010	NL	0.0011	0.0011	0.0010
PCB 105	0.000	0.0010	NL	BD	BD	BD
PCB 110	0.001	0.0010	NL	BD	BD	0.0010
PCB 114	0.000	0.0010	NL	BD	BD	BD
PCB 118	0.001	0.0010	NL	BD	BD	BD
PCB 119	0.000	0.0010	NL	BD	BD	BD
PCB 120	0.000	0.0010	NL	BD	BD	BD
PCB 121	0.000	0.0010	NL	BD	BD	BD
PCB 123	0.000	0.0010	NL	BD	BD	BD
PCB 126	0.000	0.0010	NL	BD	BD	BD
PCB 127	0.000	0.0010	NL	BD	BD	BD
PCB 128	0.000	0.0010	NL	BD	BD	BD
PCB 132	0.000	0.0010	NL	BD	BD	BD
PCB 135	0.000	0.0010	NL	BD	BD	BD
PCB 136	0.000	0.0010	NL	BD	BD	BD
PCB 137	0.000	0.0010	NL	BD	BD	BD
PCB 138	0.000	0.0010	NL	BD	BD	BD
PCB 141	0.000	0.0010	NL	BD	BD	BD
PCB 146	0.000	0.0010	NL	BD	BD	BD
PCB 149	0.001	0.0010	NL	BD	BD	BD
PCB 151	0.000	0.0010	NL	BD	BD	BD
PCB 153	0.001	0.0010	NL	BD	BD	BD
PCB 156	0.000	0.0010	NL	BD	BD	BD
PCB 157	0.000	0.0010	NL	BD	BD	BD
PCB 158	0.000	0.0010	NL	BD	BD	BD
PCB 166	0.000	0.0010	NL	BD	BD	BD
PCB 167	0.000	0.0010	NL	BD	BD	BD
PCB 168	0.000	0.0010	NL	BD	0.0011	BD

PARAMETER	SEDIMENT CONC mg/kg	DETECTION LIMIT μg/l	<sup>1</sup> WATER QUALITY STANDARDS μg/l	BACKGROUND CONC μg/l	ELUTRIATE CONC μg/l	OVERFLOW CONC μg/l
PCB 169	0.000	0.0010	NL	BD	BD	BD
PCB 170	0.000	0.0010	NL	BD	BD	BD
PCB 171	0.000	0.0010	NL	BD	BD	BD
PCB 174	0.000	0.0010	NL	BD	BD	BD
PCB 177	0.000	0.0010	NL	BD	BD	BD
PCB 178	0.000	0.0010	NL	BD	BD	BD
PCB 179	0.000	0.0010	NL	BD	BD	BD
PCB 18	0.000	0.0010	NL	BD	BD	BD
PCB 180	0.002	0.0010	NL	BD	BD	BD
PCB 182	0.000	0.0010	NL	BD	BD	BD
PCB 183	0.000	0.0010	NL	BD	BD	BD
PCB 185	0.000	0.0010	NL	BD	BD	BD
PCB 187	0.000	0.0010	NL	BD	BD	BD
PCB 189	0.000	0.0010	NL	BD	BD	BD
PCB 190	0.000	0.0010	NL	BD	BD	BD
PCB 191	0.000	0.0010	NL	BD	BD	BD
PCB 194	0.000	0.0010	NL	BD	BD	BD
PCB 195	0.000	0.0010	NL	BD	BD	BD
PCB 196	0.000	0.0010	NL	BD	BD	BD
PCB 198	0.000	0.0010	NL	BD	BD	BD
PCB 200	0.000	0.0010	NL	BD	BD	BD
PCB 201	0.000	0.0010	NL	BD	BD	BD
PCB 203	0.001	0.0010	NL	BD	BD	BD
PCB 205	0.000	0.0010	NL	BD	BD	BD
PCB 206	0.003	0.0010	NL	0.0025	0.0020	0.0017
PCB 207	0.000	0.0010	NL	BD	BD	BD
PCB 208	0.002	0.0010	NL	0.0013	BD	BD
PCB 22	0.000	0.0010	NL	BD	BD	BD
PCB 28	0.000	0.0010	NL	BD	BD	BD
PCB 31	0.000	0.0010	NL	0.0017	BD	0.0027
PCB 33	0.000	0.0010	NL	BD	BD	BD
PCB 37	0.000	0.0010	NL	BD	BD	BD
PCB 40	0.000	0.0010	NL	BD	BD	BD
PCB 42	0.000	0.0010	NL	BD	BD	BD
PCB 44	0.000	0.0010	NL	BD	BD	BD
PCB 47	0.000	0.0010	NL	BD	BD	BD
PCB 49	0.001	0.0010	NL	BD	BD	BD
PCB 52	0.002	0.0010	NL	BD	0.0010	0.0011
PCB 60	0.001	0.0010	NL	BD	BD	BD

PARAMETER	SEDIMENT	DETECTION	<sup>1</sup> WATER QUALITY	BACKGROUND	ELUTRIATE	OVERFLOW
	CONC	LIMIT	STANDARDS	CONC	CONC	CONC
	mg/kg	µg/l	µg/l	µg/l	µg/l	µg/l
PCB 64	0.000	0.0010	NL	BD	BD	BD
PCB 66	0.000	0.0010	NL	BD	BD	BD
PCB 70	0.002	0.0010	NL	BD	0.0014	BD
PCB 74	0.000	0.0010	NL	BD	BD	BD
PCB 77	0.000	0.0010	NL	BD	BD	BD
PCB 8	0.000	0.0010	NL	BD	BD	BD
PCB 80	0.000	0.0010	NL	BD	BD	BD
PCB 81	0.000	0.0010	NL	BD	BD	BD
PCB 82	0.000	0.0010	NL	BD	BD	BD
PCB 84	0.000	0.0010	NL	BD	BD	BD
PCB 86	0.000	0.0010	NL	BD	BD	BD
PCB 87	0.000	0.0010	NL	BD	BD	BD
PCB 91	0.000	0.0010	NL	BD	BD	BD
PCB 92	0.000	0.0010	NL	BD	BD	BD
PCB 95	0.000	0.0010	NL	BD	0.0010	0.0017
PCB 97	0.000	0.0010	NL	BD	BD	BD
PCB 99	0.001	0.0010	NL	BD	BD	BD
PHENANTHRENE	0.085	0.3000	NL	BD	BD	BD
POTASSIUM (K)	2340.000	200.0000	NL	56400.000	39066.6680	32220
PPDDD	0.011	0.1000	NL	BD	BD	BD
PPDDE	0.008	0.1000	NL	BD	BD	BD
PPDDT	0.010	0.1000	NL	BD	BD	BD
PYRENE	0.164	0.3000	NL	BD	BD	BD
SELENIUM (Se)	1.630	2.0000	20	19.000	24.3333	14
SILVER (Ag)	0.683	1.0000	2.3	BD	1.3333	1
THALLIUM (Tl)	0.000	2.0000	NL	BD	BD	BD
TOC-TOTAL ORGANIC CARBON	7603.000	3000.0000	BD	BD		
TOXAPHENE	0.000	0.0500	0.21	BD	BD	BD
VANADIUM (V)	37.800	2.0000	NL	4.0000	6.6667	BD
ZINC	131.000	10.0000	95	53.0000	74.6667	131
a-CHLORDANE	0.001	0.0500	0.045	BD	BD	BD
b-CHLORDANE	0.004	0.0500	0.045	BD	BD	BD

BD = below detection

NL = not listed

0.0 = below detection for sediment conc. (mg/kg)

<sup>1</sup>More stringent acute value of the freshwater or marine stream quality objectives.