

BLIND PASS INTERIM DREDGING STUDY

Prepared for:

Captiva Erosion Prevention District

March, 1999

COASTAL PLANNING & ENGINEERING, INC.



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BLIND PASS INTERIM DREDGING STUDY

INTRODUCTION

Authorization

At its meeting of November 12, 1998, the Captiva Erosion Prevention District (CEPD) authorized Coastal Planning & Engineering, Inc. of Boca Raton, Florida to conduct a hydraulic study and permitting for the interim dredging of Blind Pass. The study is funded by the State of Florida Department of Environmental Protection, West Coast Inland Navigation District, Lee County, City of Sanibel, and the CEPD.

Purpose and Scope

The purpose of the study is to evaluate the need for and feasibility of an interim dredging of the flood shoal in Blind Pass. Concerns have been raised that recent shoaling in the pass will lead to complete closure. Closure will interrupt tidal exchange and flushing in the Blind Pass/Dicken Bayou/Pine Island Sound system, causing a degradation of water quality. The proposed dredging project is designed to return sand that has deposited within the inlet since 1989 back onto adjacent beaches and restore flushing through the pass. This project will be an interim step, while the Florida Department of Environmental Protection completes and adopts the implementation plan for the Blind Pass Inlet Management Plan.

The study includes bathymetric surveys of the flood shoal and channel, tidal and flow measurements in the pass, collection of sediment samples, a biological survey, analysis of data, and recommendations for needed dredging.

Description of the Study Area

Blind Pass is located in Lee County on the Gulf Coast of South Florida, approximately 90 miles south of the entrance to Tampa Bay. The Gulf coastline consists of a series of barrier islands broken by passes (tidal connections) separated from the mainland by shallow tidal lagoons.

Blind Pass is bounded on the north by Captiva Island and on the south by Sanibel Island, and connects Pine Island Sound to the Gulf of Mexico. Captiva Island is about 5 miles long, and varies in width from about 200 feet near the south end to about 2,000 feet between the center and north end. Sanibel Island is approximately 13 miles long and varies in width from about 2 miles near the eastern end, to about ½ mile at the northwestern end. Natural ground elevations are generally less than 10 feet.

The adjacent inlet to the north is Redfish Pass. To the south an inlet is intermittently open to Clam Bayou and Old Blind Pass water bodies. At the south end of Sanibel Island, Pine Island Sound drains directly to the Gulf through San Carlos Bay entrance.

Access to both islands is by toll bridge from the mainland. Captiva can be reached by traveling north along Sanibel, then across the bridge over the channel of Blind Pass.

The Blind Pass study area includes a main channel (Wulfert Channel), connecting the Gulf of Mexico to Pine Island Sound, and an arm of Dinken Bayou. The project study area is bounded by the Gulf of Mexico approximately 900 feet south of the bridge, on the north by a line in Wulfert Channel approximately 2,000 feet north of the bridge, on the west by Captiva Island, and on the east by a line in Dinken Bayou, approximately 1,100 feet east of the center of the bridge.

History of Blind Pass

Blind Pass is a natural inlet that has existed for as long as 1,000 years, although its location has migrated at various times. This history is detailed in the Blind Pass Inlet Management Plan (CPE, 1993).

Prior to the opening of Redfish Pass, in 1921, Blind Pass was a more substantial inlet with a larger tidal prism. The Blind Pass ebb shoal associated with the larger (pre-Redfish Pass) tidal prism probably helped maintain the seaward position of the south end of Captiva Island and the north end of Sanibel Island.

When Redfish Pass opened, it captured a significant portion of the tidal prism of Blind Pass, making Blind Pass a smaller, more unstable inlet. The ebb shoal of Blind Pass migrated to shore and no longer provided protection for southern Captiva and northern Sanibel. The inlet cross section decreased (due to shoaling) to the point of complete closure of the channel. A cycle ensued in which Blind Pass was opened by storms and closed by shoaling. By 1964, the spit had once again migrated to the south and closed the pass. The pass was not reopened again until 1972 following Hurricane Agnes.

In 1972 a terminal groin was installed by Lee County on the north side of the pass, to protect the bridge by stabilizing the beach to the north at Turner Beach Park. The pass was closed again between 1975 and 1980. The pass was reopened in its present position by a subtropical storm in June of 1982.

In October and November of 1988, the terminal groin on the north side of Blind Pass was extended 100 feet, to stabilize the beach nourishment material which was placed along Captiva Island. In 1996 additional fill was placed on Captiva's beaches to allow sand movement through and around the groin to Sanibel Island. The beaches south of the pass along the first mile of Sanibel Island were nourished to provide both recreational beach at a public park and storm protection for the hurricane evacuation route. The nourishment helped reinstate the littoral budget of sand around the inlet, and to mitigate for the affects of road and beach improvements since 1972.

Subsequent to fill placement, increased shoaling has been observed in the interior of Blind Pass. This shoaling was confirmed by surveys in 1998.

Inlet Management Plan

The Florida Department of Environmental Protection, in partnership with Lee County and Captiva Erosion Prevention District, sponsored an inlet management study of Blind Pass. The study, Blind Pass Inlet Management Plan (Coastal Planning & Engineering, Inc., 1993) and the updated information provided in 1998, was conducted under the provisions of Section 161.161, F.S., to evaluate the erosion impact of the inlet on adjacent beaches, and to recommend corrective measures to mitigate identified impacts. A technical advisory committee, which included Lee County, West Coast Inland Navigation District, Captiva Erosion Prevention District, City of Sanibel, and the Florida Department of Environmental Protection, was formed to recommend an implementation plan for inlet management.

The Florida Department of Environmental Protection is currently evaluating the study and updated material, and developing the implementation plan for inlet management activities.

INLET CHARACTERISTICS

Inlet Bathymetry/Topography, Flood Shoal

The study area was surveyed in November, 1998, using standard land survey methods. The survey consisted of approximately fifty transects on 100' stations, with survey offsets typically 20' or at noticeable breaks in elevation.

The pass area consists generally of a main channel (Wulfert Channel), leading from the Gulf of Mexico to Pine Island Sound, and a side channel (Dinken Bayou) which surrounds a mangrove island called Albright Key (see Figure 1). In Wulfert Channel, the tidal channel lies adjacent to Captiva Island, with a bottom elevation generally about -3 NGVD. Outside the tidal channel is a flood tidal shoal that is exposed except at high tide. In Dinken Bayou, the flood tidal shoal has essentially blocked the tidal channel on the south side of Albright Key. Easterly of the shoal, remnants of a tidal channel exist with a bottom elevation of about -1 NGVD. This tidal channel leads to deeper water on the east side of Albright Key.

A 1989 survey (see Figure 2) indicates that the tidal channels in Blind Pass were better defined, and the flood shoal smaller, than in 1998. The tidal channel in Wulfert Channel was wider (130 - 220 feet) and deeper (bottom elevations -4 to -6 NGVD). In Dinken Bayou, the tidal channel was connected to Wulfert Channel, and had bottom elevations of -2.5 to -3 NGVD.

The 1998 bathymetry was compared to data collected in 1989 to assess volumetric changes in the period (see Figure 3). While the 1989 survey did not cover the entire 1998 study area, this comparison indicates significant accretion in Blind Pass. On average, the pass has accreted 2-3' of sand, with maximum accretion of 6' at the bridge.

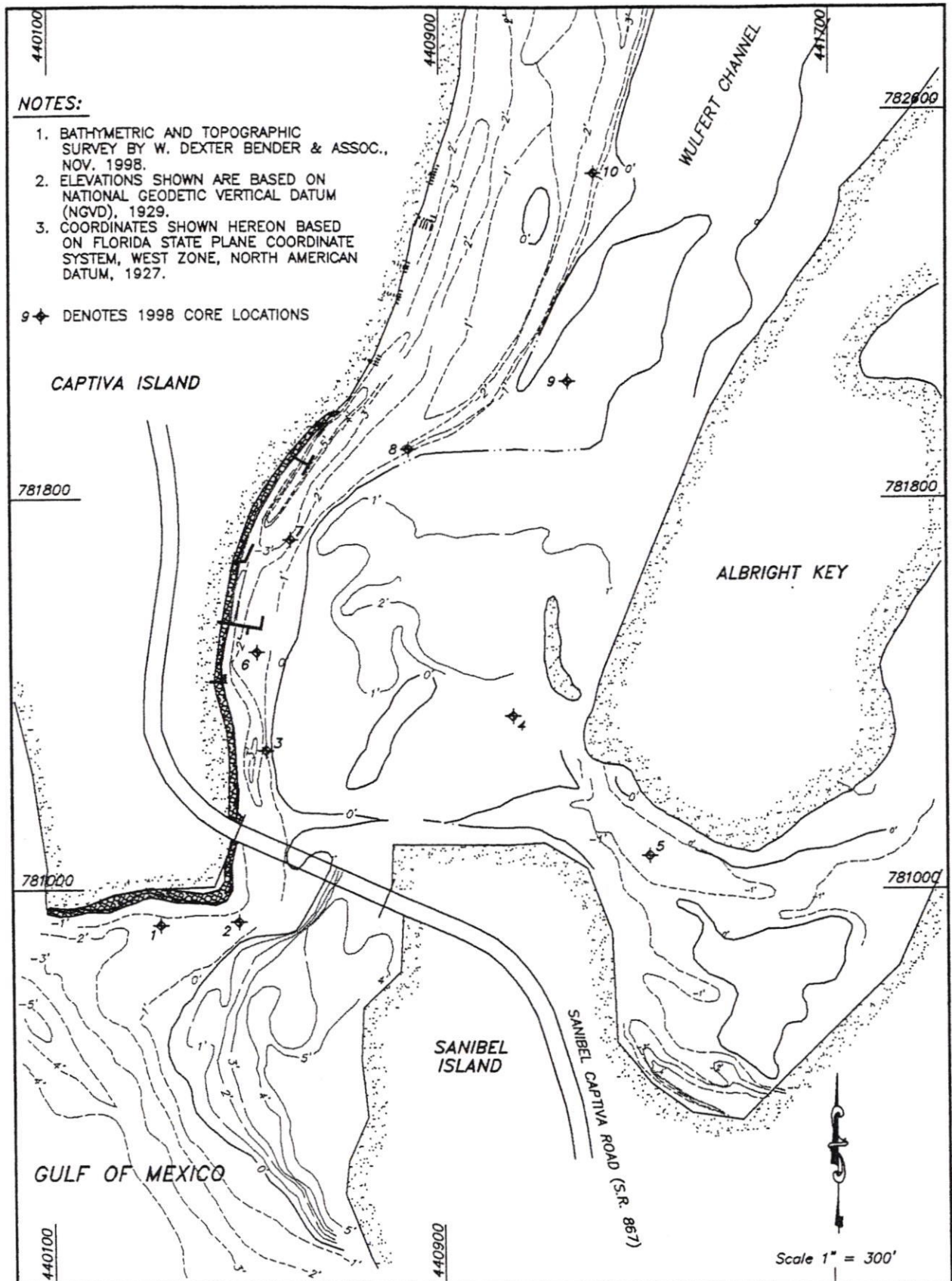
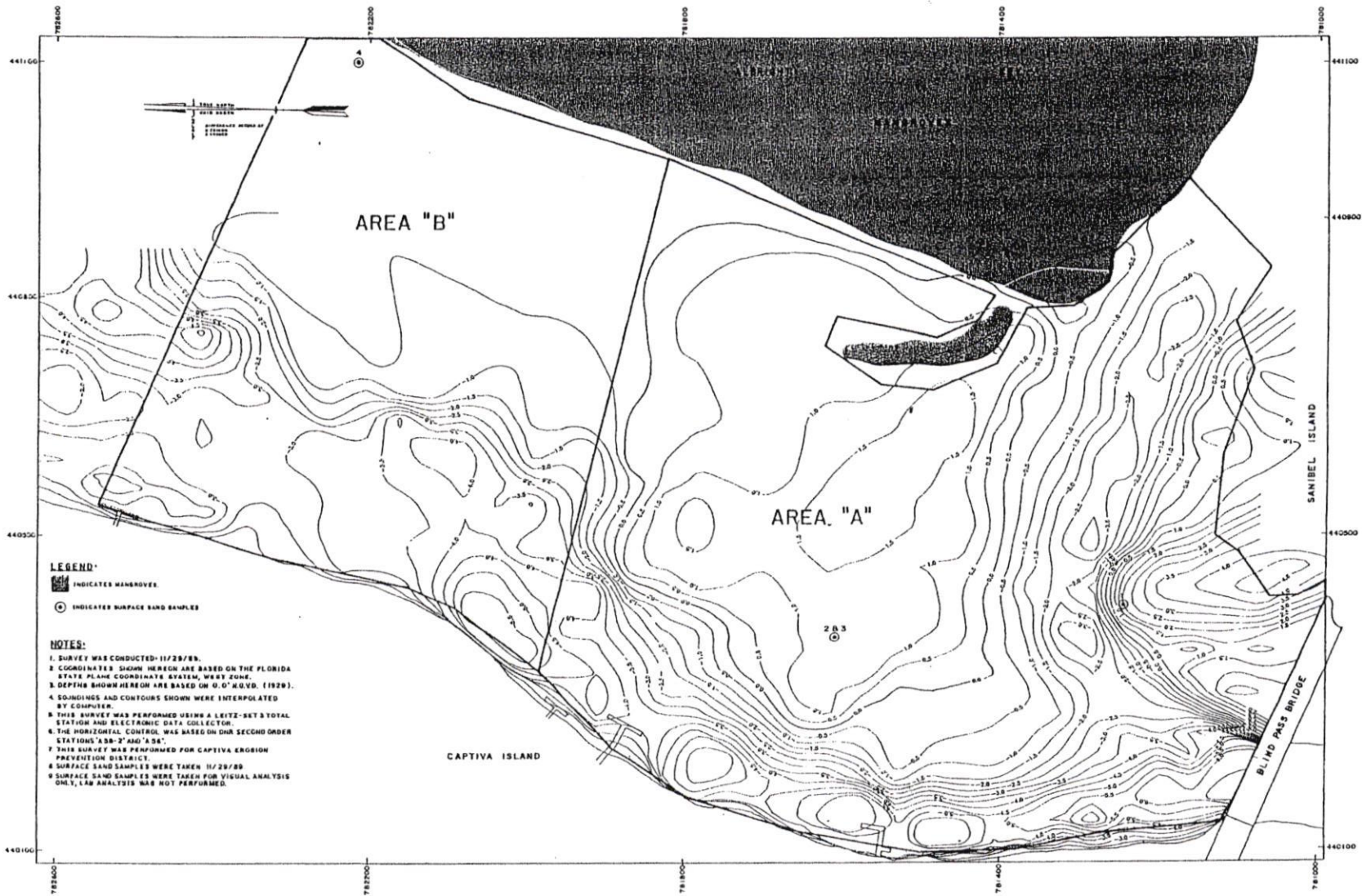


FIGURE 1

BLIND PASS
 LEE COUNTY, FLORIDA
 1998 BATHYMETRIC / TOPOGRAPHIC SURVEY



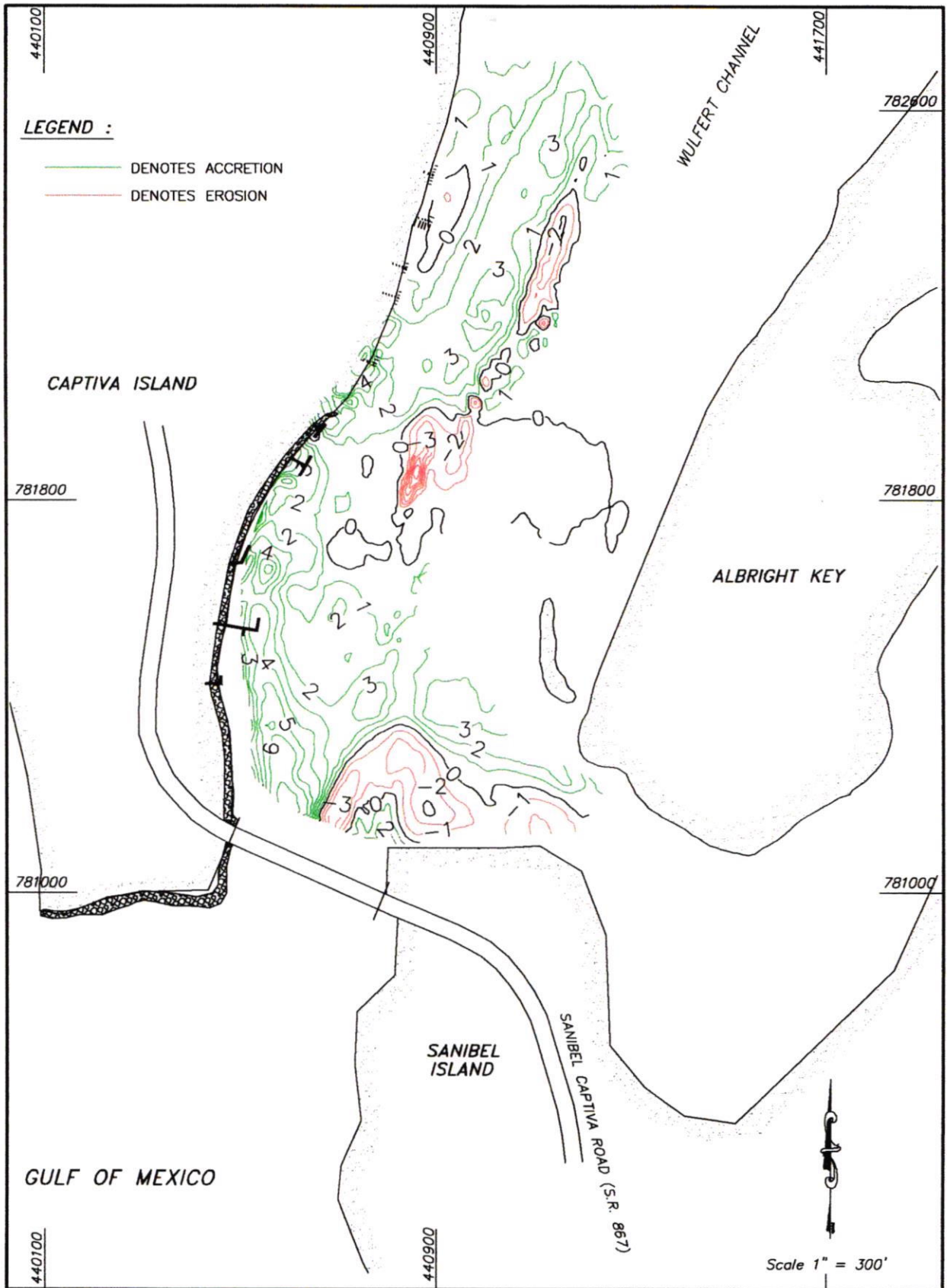


FIGURE 3

**BLIND PASS
LEE COUNTY, FLORIDA
1989 vs. 1998 BATHYMETRY / TOPOGRAPHY**

Hydraulic Characteristics

The tidal and current characteristics of the pass were measured on December 18 and 23, 1998. Velocity measurements were conducted during flood and ebb tides within the main channel using a low flow rotor at a stationary position. Data collected included hourly measurements of current velocities in the main tidal bore, and infusion of uranine marking dye at two locations in the mid-tide range, for an evaluation of surface flows using distance over time measurements.

Blind Pass Hydraulic Analysis

This analysis evaluates the change in tidal prism as a result of re-establishing a 660 square foot cross sectional area. The hydraulics of Blind Pass was modeled using Keulegan's relationships. The tide at Blind Pass is mixed with a stronger diurnal tide. As the tide period varies from 10.5 hours to 25 hours, the tide range increases from 0.7 feet to 3.7 feet (January 1999). The resulting tidal prisms also vary significantly as indicated in Table 1.

Table 1
Estimated Tidal Prism
At Blind Pass

| Condition | Tide Range Tide Period | 0.7 ft. 10.5 hrs | 3.7 ft. 25 hours |
|--------------------------------|---------------------------|--|-------------------------|
| Existing (120ft ²) | | 6.5 x 10 ⁶ ft ³ | 35.9 x 10 ⁶ |
| Proposed (660ft ²) | | 28.3 x 10 ⁶ ft ³ | 154.4 x 10 ⁶ |

The analysis indicates that the dredging of Blind Pass should increase the tidal prism over four times the existing quantity. This will improve water quality by improving the flushing of the Blind Pass/Dinken Bayou/Pine Island Sound area.

Stability Analysis

Inlet stability refers to an inlet's ability to remain open while sand is transported to the inlet. A preliminary analysis was made to evaluate the likelihood of the proposed channel remaining open. The previously described hydraulic calculations were extended to form a stability curve (Figure 4) as proposed by Escoffier (1967). The intersection of the proposed and existing curves with Obriens Equilibrium velocity curve on the right hand side of the curve indicates that a stable cross section will be 1200±sqft. Cross sections of 600±square feet are near the top of the curves which indicate that if sufficient sand is transported to the inlet the inlet could shoal and close. This appears to have occurred since the 1996 nourishment. Therefore, the following conclusions and recommendations are made:

1. Dredging of a 660 sq. ft. channel will recreate the 1989 flow cross section and tidal prism. Improvements in water quality should be expected.

HYDRAULIC STABILITY CURVES

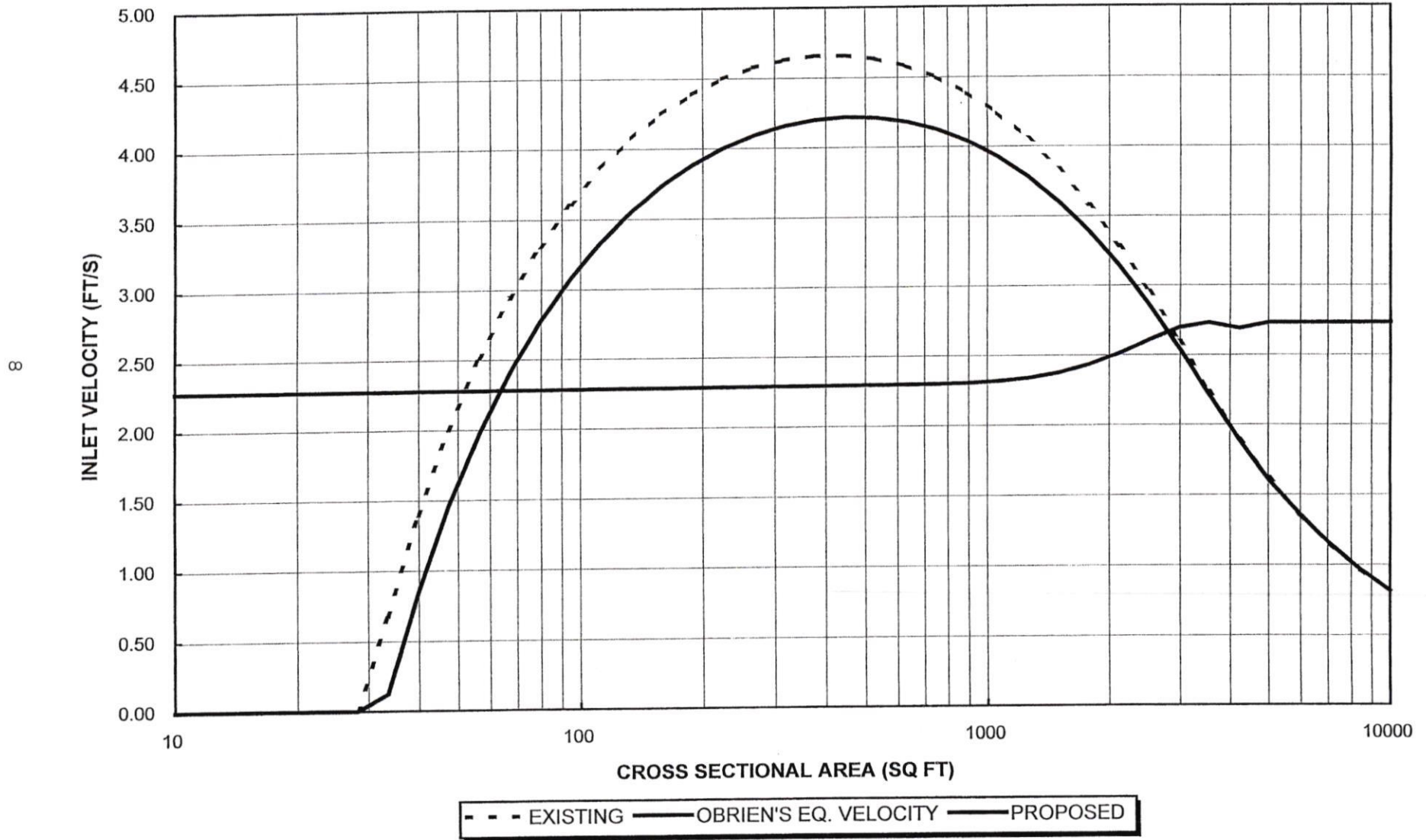


Figure 4

2. While a 660 square foot cross section is stable, the inlet should not be expected to remain open permanently. Based on the inlet history, a probable duration of inlet stability is 2 to 10 years.
3. Excavation of a 1200± square foot channel will provide greater long term stability. This may be viewed by the State as a significant improvement of a non-navigable inlet and may not be permitted.

Sediment Characteristics

Sediment core samples were collected on November 24 and 25, 1998. Sediment cores to a depth of 4' below bottom were collected at 10 locations in the study area (see Figure 1). Results of the analysis of these cores were used to determine the compatibility of dredging material from the proposed channel with the present beach material characteristics. In addition, the results were used in establishing the horizontal limits of dredging.

The cores were returned to the laboratory and split in half for analysis. Samples for sieve analysis were taken from one half while the other half was left undisturbed and archived. Visual descriptions, including an estimate of the effective length of each sample, were determined by texture changes (Appendix A). Sediment samples for analysis were taken from distinct layers within the core and a mechanical sieve analysis was performed on all samples. A total of 22 samples were analyzed.

Sieve analysis were performed in accordance with the American Society for Testing and Materials (ASTM) standard methods designation D 422-63 for particle-size analysis of soils (ASTM, 1987), and in accordance with the Shore Protection Manual (SPM, 1994 ed.) and TPG 77-6 "Review of Design Elements for Beach Fill Evaluation". These methods cover the quantitative determination of the distribution of sand size particles. The sieves used for the analysis were U.S. standard sieve sized (1/2 phi intervals) Nos. 230, 200, 170, 120, 80, 60, 45, 35, 25, 18, 14, 10, 7, 5, 5/16 inch and 5/8 inch.

The results from the sieve analysis were entered into a gradation analysis computer program that computes mean and median grain size, sorting (Folk Graphic and Moment Methods), silt percentage, and the phi-16 and phi-84 values for each sediment sample and composites.

The silt percentage was reported as the value identified as finer than the No. 200 (0.074mm) sieve, which is the amount of silt washed out of the sample on the washing sieve and the amount passing the No. 200 sieve after sieving. Gradation analysis reports (Appendix B) and grain size distribution curves (Appendix C) were computed for each core sample.

There are two main characteristics of sand in the study area that will determine its suitability as beach fill. The first is the mean grain size; the coarser the sand, the slower the erosion. The second characteristic is the amount of silt it contains. Silt is the very fine fraction of the fill that can affect water quality. High levels of silt will cloud the water and could can environmental damage. Permitting agencies often object to high silt

quantities. If sands are located with silt quantities in levels less than 10%, we do not anticipate that the agencies will object to permitting the material.

The composite mean grain size of the cores varies from 0.18mm to 1.28mm, with coarser material generally toward the gulf, and finer material generally toward Pine Island Sound. Material consists of layers of sand and sand/shell hash, indicating deposition from the Gulf and from material eroded from adjacent beaches. The percentage of silt for the 10 cores ranges from 1.2% nearest the Gulf to 18.2% nearest Pine Island Sound.

The eastern and southern limits of dredging were established to use sand with less than 10% silt. This eliminated the area of cores 9 and 10. The material in the resulting project area have mean grain sizes ranging from 0.29mm to 1.28mm (average 0.58mm), with silt contents ranging from 1.2% to 6.2% (average 3.1%). The dredged material is, therefore, compatible with the existing beach sand, which has a mean grain size of 0.53mm with 2.46% silt. The overfill ratio for the fill placement is 1.01.

Natural Resource Characteristics

A habitat survey of the study area (see Figure 5) was conducted on November 24, 1998. The survey was conducted to assess the environmental conditions within Blind Pass for the interim dredging of the channel and flood shoal area. The study area was surveyed at low tide. Weather conditions were sunny with a light chop. Underwater visibility was approximately four feet. Due to these favorable conditions, bottom conditions were noted by walking and wading. Each area was surveyed by the inspection of the bottom conditions on several passes through the study area, tying locations to the bathymetric survey baseline.

The survey revealed relatively shallow conditions along the length of the historic location of the channel, ranging from exposed to approximately 3' deep water at low tide. A majority of the study area is constantly exposed except during high tides. Surface and sub-bottom soil conditions were sampled by cores taken by CPE on November 24 and 25, 1998.

The benthic organisms identified occurred only north of the bridge and consisted primarily of red algae (*Gracilaria* sp.) And some patches of marine algae. Scattered polychaetes, snails, hermit (*Sesarma* sp.) and fiddler crabs (*Uca* sp.), horse conch (*Pleuroploca gigantea*), and Florida cone (*Conus floridana*) were also noted [in areas A and B?]. Pelagic organisms observed in the study area included horseshoe crabs (*Limulus* sp.), blue crabs (*Callinectes sapidus*), mullet (*Mugil* sp.), schooling "baitfish", and lobate comb jellies (*Mnemiopsis* sp.). Oysters (*Crassostrea* sp.), barnacles (*Balanus* sp.), and soft coral have colonized the rip rap along the northwest side of the channel and pilings on the docks. There were no seagrass beds or oyster bars identified within the project area. One living oyster bar (30' diameter) was identified approximately 1800' north of the bridge.

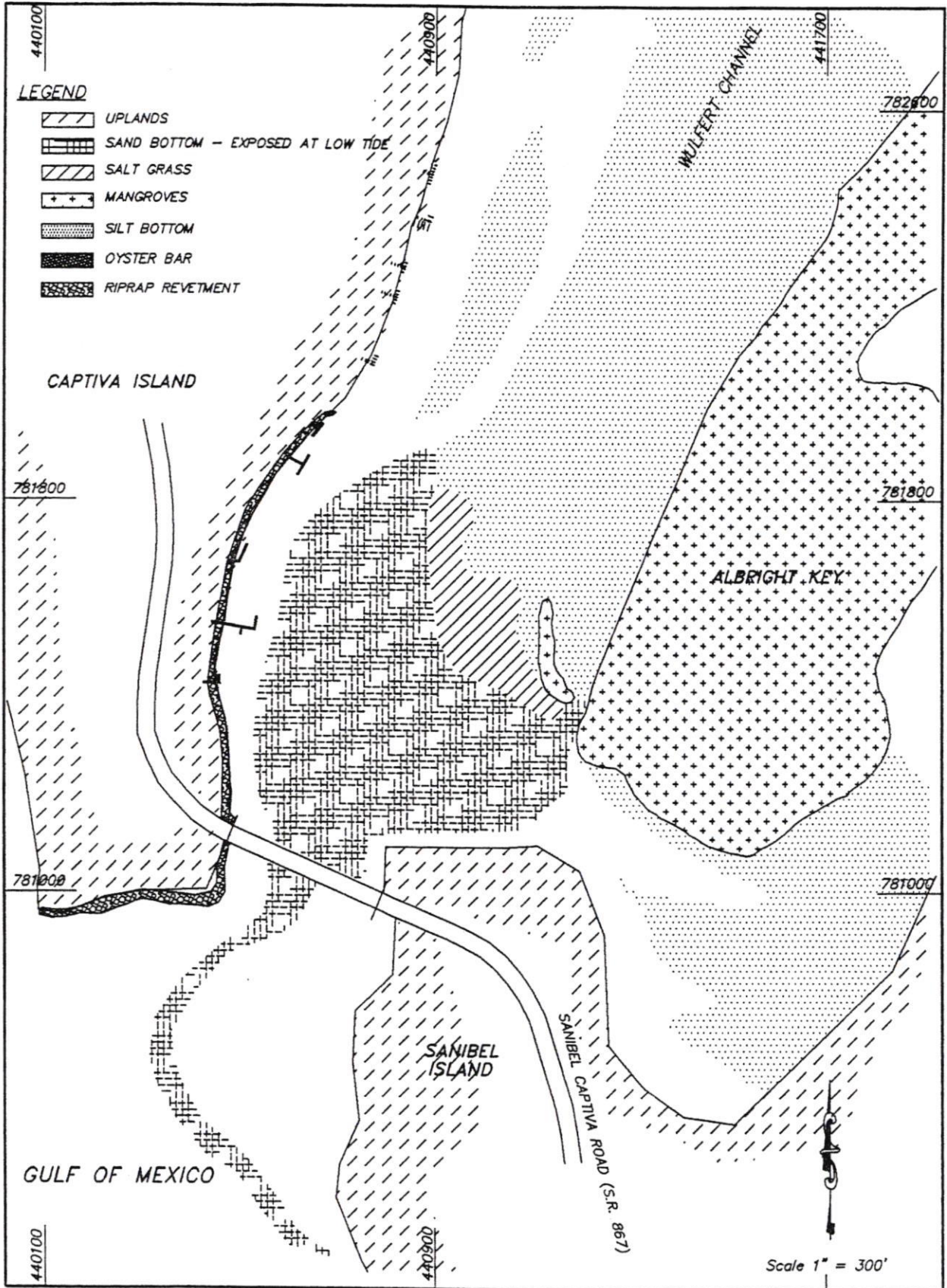


FIGURE 5

BLIND PASS
LEE COUNTY, FLORIDA
HABITAT SURVEY

PROPOSED INTERIM DREDGING

The proposed channel cuts in Blind Pass and Dinken Bayou were defined as seen in Figure 6. The project will generally replicate the 1989 conditions. These cuts will dredge approximately 78,500 cubic yards of material from Blind Pass. Dredged material will be placed on Sanibel Island, between DNR monuments R-115 and R-119. This area is south of the 1996 fill placement area, and is an area that has experienced noticeable recent erosion.

The design will increase the tidal prism over four times from the existing condition. This will result in improved flushing of the Blind Pass/Dinken Bayou/Pine Island Sound area, thus improving water quality. The selected cross section will be marginally stable, but should not be expected to remain open permanently. The probable duration of the inlet will be 2 to 10 years.

Sediments in the selected project area are compatible with those of the existing beaches in the deposition area on Sanibel Island. Mean grain size of the material is similar to the existing beach material, and the proportion of silt size material is low.

Dredging in the project area will not adversely impact natural communities. There are no seagrass beds or oyster beds in the project area. While threatened and endangered species, including marine turtles and manatees, are known in the area, standard programs for monitoring, avoidance, and relocation will protect these species.

Initial review by the Florida Department of Environmental Protection indicates that a permit modification will not be allowed. Therefore, a full permit application is required. This longer permit process will mean that dredging cannot be completed before marine turtle season. Additional marine turtle protection conditions, including nest relocation, daily monitoring, and nest protection may be required if construction is allowed during turtle nesting season.

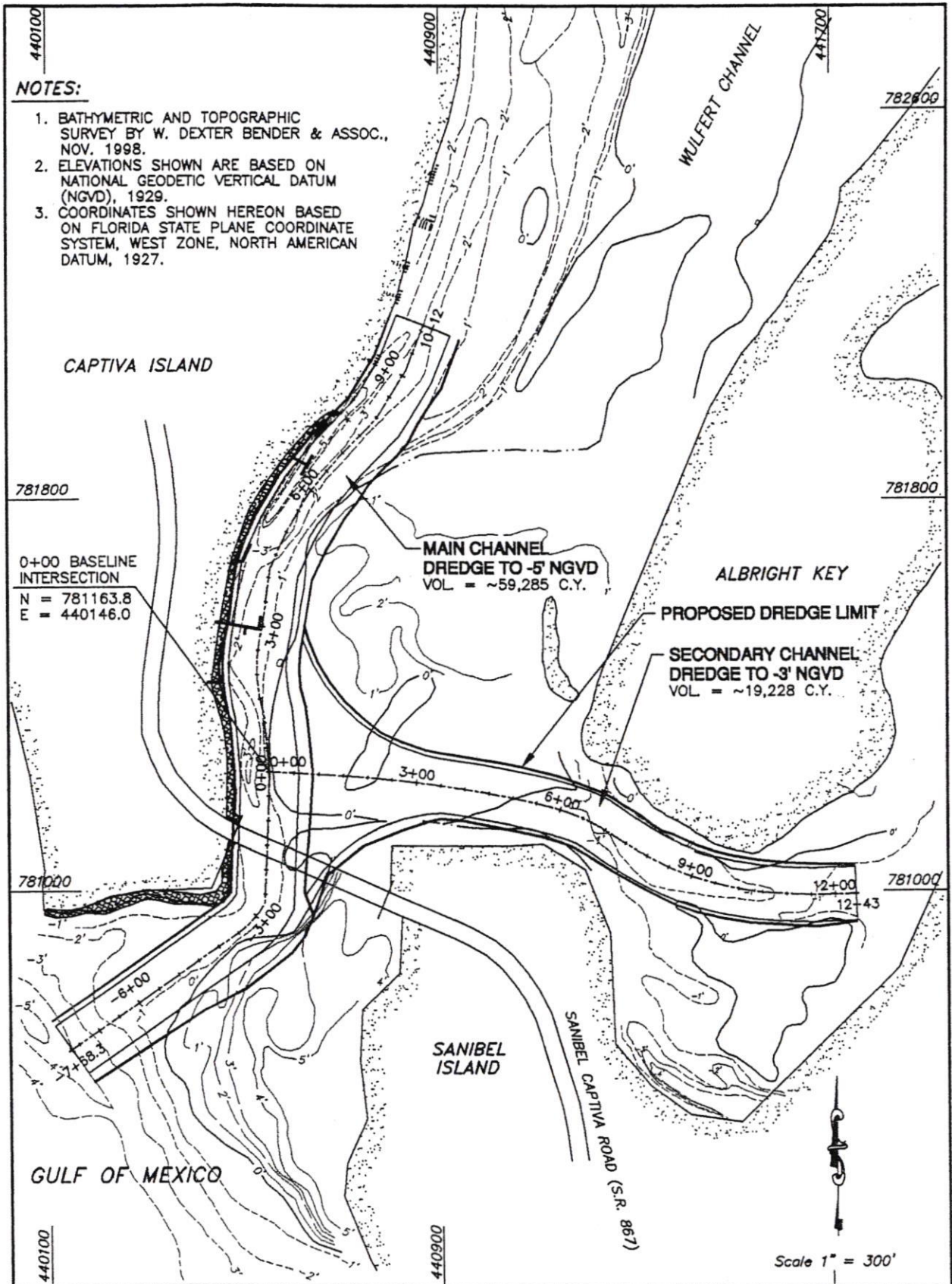





FIGURE 6

BLIND PASS
 LEE COUNTY, FLORIDA
 CHANNEL DREDGE LIMITS

APPENDIX A

CORE LOGS

| | | | |
|--|----------|--|-----------------|
| DRILLING LOG | DIVISION | INSTALLATION | SHEET 1 OF 1 |
| 1. PROJECT BLIND PASS FLOOD SHOAL | | 10. SIZE AND TYPE OF BIT | |
| 2. LOCATION (Coordinates or Station) X=439,918 Y=780,848 | | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD | |
| 3. DRILLING AGENCY CPE | | 12. MANUFACTURER'S DESIGNATION OF DRILL HAMMER | |
| 4. HOLE NO. (As shown on drawing title and file number) BP-98#1 | | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: undisturbed: 2 | |
| 5. NAME OF DRILLER LM, JW | | 14. TOTAL NUMBER OF CORE BOXES 1 | |
| 6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED | | 15. ELEVATION GROUND WATER NA | |
| 7. THICKNESS OF BURDEN 0 Ft. | | 16. DATE HOLE STARTED COMPLETED 11/25/98 11/25/98 | |
| 8. DEPTH DRILLED INTO ROCK 0 Ft. | | 17. ELEVATION TOP OF HOLE -2.1 Ft. | |
| 9. TOTAL DEPTH OF HOLE 4.0 Ft. | | 18. TOTAL CORE RECOVERY FOR BORING 50 % | |
| | | 19. SIGNATURE OF GEOLOGIST L. DALESSIO | |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS (Description) | CORE REC % | SAMPLE NUMBER | REMARKS |
|-------|-------|---|--|------------|---------------|--|
| -2.1 | .0 | | | | | -2.1 |
| | |  | SAND, lt.gray fine with 10-15% shell (5Y 7/1) | | #1 | Sample #1, Depth = 0.2' 0.25 mm, 0.99 phi sorting 1.7 % silt |
| -2.5 | .4 |  | SHELL HASH, lt.gray with shell fragments and whole shells and 20-30% fine sand (2.5Y 7/1) 0.1' shell at 1.3' | | #2 | Sample #2, Depth = 1.1' 1.11 mm, 1.61 phi sorting 1.0 % silt |
| -3.9 | 1.8 |  | SAND, white medium with 20% shells and shell fragments (5Y 8/1) | | | |
| -4.1 | 2.0 | | | | | |
| | | | | | | BP98-1 COMPOSITE 0.80 mm 1.47 phi sorting 1.2% silt |

| | | | | |
|--|--|---|--------------|-----------------|
| DRILLING LOG | | DIVISION | INSTALLATION | SHEET 1 OF 1 |
| 1. PROJECT BLIND PASS FLOOD SHOAL | | 10. SIZE AND TYPE OF BIT | | |
| 2. LOCATION (Coordinates or Station) X=440,077 Y=780,855 | | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD | | |
| 3. DRILLING AGENCY CPE | | 12. MANUFACTURER'S DESIGNATION OF DRILL HAMMER | | |
| 4. HOLE NO. (As shown on drawing title and file number) BP-98#2 | | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: undisturbed: 3 | | |
| 5. NAME OF DRILLER LM, JW | | 14. TOTAL NUMBER OF CORE BOXES 1 | | |
| 6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED | | 15. ELEVATION GROUND WATER NA | | |
| 7. THICKNESS OF BURDEN 0 Ft. | | 16. DATE HOLE STARTED COMPLETED 11/25/98 11/25/98 | | |
| 8. DEPTH DRILLED INTO ROCK 0 Ft. | | 17. ELEVATION TOP OF HOLE -0.5 Ft. | | |
| 9. TOTAL DEPTH OF HOLE 4.0 Ft. | | 18. TOTAL CORE RECOVERY FOR BORING 60 % | | |
| | | 19. SIGNATURE OF GEOLOGIST L. DALESSIO | | |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS (Description) | CORE REC % | SAMPLE NUMBER | REMARKS |
|-------|-------|--------|---|------------|---------------|--|
| -0.5 | 0.0 | | | | | -0.5 |
| | | | SAND, lt. brownish gray fine to medium with 50% shell hash and shell fragments (10YR 6/2) at 0.9' a 0.1' 80% shell fragment layer and at 1.5' a 10-20% shell hash layer | | #1 | Sample #1, Depth = 1.1' 0.41 mm, 1.09 phi sorting 1.0 % silt |
| -2.2 | 1.7 | | SAND, lt. gray fine (5Y 7/1) | | #2 | Sample #2, Depth = 1.8' 0.17 mm, 0.56 phi sorting 2.9 % silt |
| -2.4 | 1.9 | | SAND, lt. brown fine to medium with 40-50% shells (10YR 6/2) | | | |
| -2.7 | 2.2 | | SAND, fine to medium with 20% shell fragments, decomposing wood at 2.2' surrounded by organic matter, and 2 0.5' shells at 2.4' | | #3 | Sample #3, Depth = 2.3' 0.25 mm, 1.04 phi sorting 4.8 % silt |
| -2.9 | 2.4 | | | | | |
| | | | | | | BP98-2 COMPOSITE 0.37 mm 1.04 phi sorting 1.5% silt |

| | | | |
|--|----------|--|-----------------|
| DRILLING LOG | DIVISION | INSTALLATION | SHEET 1 OF 1 |
| 1. PROJECT BLIND PASS FLOOD SHOAL | | 10. SIZE AND TYPE OF BIT | |
| 2. LOCATION (Coordinates or Station) X=440,135 Y=781,205 | | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD | |
| 3. DRILLING AGENCY CPE | | 12. MANUFACTURER'S DESIGNATION OF DRILL HAMMER | |
| 4. HOLE NO. (As shown on drawing title and file number) BP-98#3 | | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: undisturbed: 1 | |
| 5. NAME OF DRILLER LM, JW | | 14. TOTAL NUMBER OF CORE BOXES 1 | |
| 6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED | | 15. ELEVATION GROUND WATER NA | |
| 7. THICKNESS OF BURDEN 0 Ft. | | 16. DATE HOLE STARTED COMPLETED 11/25/98 11/25/98 | |
| 8. DEPTH DRILLED INTO ROCK 0 Ft. | | 17. ELEVATION TOP OF HOLE -1.0 Ft. | |
| 9. TOTAL DEPTH OF HOLE 4.0 Ft. | | 18. TOTAL CORE RECOVERY FOR BORING 60 % | |
| | | 19. SIGNATURE OF GEOLOGIST L. DALESSIO | |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS (Description) | CORE REC % | SAMPLE NUMBER | REMARKS |
|-------|-------|--------|--|------------|---------------|--|
| -1.0 | .0 | | | | | -1.0 |
| | | | SHELL AND SHELL FRAGMENTS, lt. brownish gray with 20% fine sand (10YR 6/2) | | #1 | Sample #1, Depth = 1.1' 1.28 mm, 1.51 phi sorting 1.3 % silt |
| -3.4 | 2.4 | | | | | BP98-3 COMPOSITE 1.28 mm 1.51 phi sorting 1.3% silt |

| | | | |
|--|----------|---|-----------------|
| DRILLING LOG | DIVISION | INSTALLATION | SHEET 1 OF 1 |
| 1. PROJECT BLIND PASS FLOOD SHOAL | | 10. SIZE AND TYPE OF BIT | |
| 2. LOCATION (Coordinates or Station) X=440,641 Y=781,277 | | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD | |
| 3. DRILLING AGENCY CPE | | 12. MANUFACTURER'S DESIGNATION OF DRILL HAMMER | |
| 4. HOLE NO. (As shown on drawing title and file number) BP-98#4 | | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: undisturbed: 3 | |
| 5. NAME OF DRILLER LM, JW | | 14. TOTAL NUMBER OF CORE BOXES 1 | |
| 6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED | | 15. ELEVATION GROUND WATER NA | |
| 7. THICKNESS OF BURDEN 0 Ft. | | 16. DATE HOLE STARTED COMPLETED 11/25/98 11/25/98 | |
| 8. DEPTH DRILLED INTO ROCK 0 Ft. | | 17. ELEVATION TOP OF HOLE -0.2 Ft. | |
| 9. TOTAL DEPTH OF HOLE 4.0 Ft. | | 18. TOTAL CORE RECOVERY FOR BORING 83 % | |
| | | 19. SIGNATURE OF GEOLOGIST L. DALESSIO | |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS (Description) | CORE REC % | SAMPLE NUMBER | REMARKS |
|-------|-------|--------|---|------------|---------------|---|
| -2 | .0 | | | | | -2 |
| -4 | .2 | | SAND, gray fine silty (2.5Y 6/1) | | #1 | Sample #1, Depth = 0.1' 0.17 mm, 0.97 phi sorting 14.6 % silt |
| | | | SAND, lt. gray fine with 40-60% shell hash and shell fragments (2.5Y 7/1) | | #2 | Sample #2, Depth = 1.1' 0.88 mm, 1.97 phi sorting 1.6 % silt |
| -2.5 | 2.3 | | SAND, gray fine with some silt (5Y 6/1) | | #3 | Sample #3, Depth = 2.7' 0.15 mm, 1.00 phi sorting 14.0 % silt |
| -3.5 | 3.3 | | | | | BP98-4 COMPOSITE 0.46 mm 1.62 phi sorting 6.2% silt |



| | | | | |
|--|--|---|--------------|-----------------|
| DRILLING LOG | | DIVISION | INSTALLATION | SHEET 1 OF 1 |
| 1. PROJECT BLIND PASS FLOOD SHOAL | | 10. SIZE AND TYPE OF BIT | | |
| 2. LOCATION (Coordinates or Station) X=440,920 Y=780,981 | | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD | | |
| 3. DRILLING AGENCY CPE | | 12. MANUFACTURER'S DESIGNATION OF DRILL HAMMER | | |
| 4. HOLE NO. (As shown on drawing title and file number) BP-98#5 | | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: undisturbed: 3 | | |
| 5. NAME OF DRILLER LM, JW | | 14. TOTAL NUMBER OF CORE BOXES 1 | | |
| 6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED | | 15. ELEVATION GROUND WATER NA | | |
| 7. THICKNESS OF BURDEN 0 Ft. | | 16. DATE HOLE STARTED COMPLETED 11/25/98 11/25/98 | | |
| 8. DEPTH DRILLED INTO ROCK 0 Ft. | | 17. ELEVATION TOP OF HOLE -0.2 Ft. | | |
| 9. TOTAL DEPTH OF HOLE 4.0 Ft. | | 18. TOTAL CORE RECOVERY FOR BORING 70 % | | |
| | | 19. SIGNATURE OF GEOLOGIST L. DALESSIO | | |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS (Description) | CORE REC % | SAMPLE NUMBER | REMARKS |
|-------|-------|--------|--|------------|---------------|---|
| -0.2 | 0.0 | | | | | -0.2 |
| -0.5 | 0.3 | | SAND, gray fine silty (2.5Y 6/1) | | #1 | Sample #1, Depth = 0.2' 0.16 mm, 0.96 phi sorting 27.9 % silt |
| -1.9 | 1.7 | | SAND, lt. gray medium with 20% shells and shell fragments (5Y 7/1) | | #2 | Sample #2, Depth = 1.0' 0.34 mm, 1.04 phi sorting 0.6 % silt |
| -2.2 | 2.0 | | SAND, gray fine silty with 5% shell fragments (5Y 6/1) | | #3 | Sample #3, Depth = 1.9' 0.15 mm, 1.15 phi sorting 13.9 % silt |
| -3.0 | 2.8 | | SAND, lt. gray medium with 30% shell fragments (5Y 7/1) | | | |
| | | | | | | BP98-5 COMPOSITE 0.29 mm 1.04 phi sorting 4.9% silt |

| | | | |
|--|----------|--|-----------------|
| DRILLING LOG | DIVISION | INSTALLATION | SHEET 1 OF 1 |
| 1. PROJECT BLIND PASS FLOOD SHOAL | | 10. SIZE AND TYPE OF BIT | |
| 2. LOCATION (Coordinates or Station) X=440,117 Y=781,407 | | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD | |
| 3. DRILLING AGENCY CPE | | 12. MANUFACTURER'S DESIGNATION OF DRILL HAMMER | |
| 4. HOLE NO. (As shown on drawing title and file number) BP-98#6 | | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: undisturbed: 2 | |
| 5. NAME OF DRILLER LM, JW | | 14. TOTAL NUMBER OF CORE BOXES 1 | |
| 6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED | | 15. ELEVATION GROUND WATER NA | |
| 7. THICKNESS OF BURDEN 0 Ft. | | 16. DATE HOLE STARTED COMPLETED 11/25/98 11/25/98 | |
| 8. DEPTH DRILLED INTO ROCK 0 Ft. | | 17. ELEVATION TOP OF HOLE -1.0 Ft. | |
| 9. TOTAL DEPTH OF HOLE 4.0 Ft. | | 18. TOTAL CORE RECOVERY FOR BORING 85 % | |
| | | 19. SIGNATURE OF GEOLOGIST L. DALESSIO | |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS (Description) | CORE REC % | SAMPLE NUMBER | REMARKS |
|-------|-------|--------|---|------------|---------------|---|
| -1.0 | .0 | | | | | -1.0 |
| -1.6 | .8 | | SHELL AND SHELL FRAGMENTS, lt. brownish gray with 15% fine sand (2.5Y 6.5/2) | | | |
| -1.8 | .8 | | SAND, olive gray fine silty (5Y 5/2) | | | |
| | | | SHELL AND SHELL FRAGMENTS, lt. gray with 30% medium sand (5Y 7/2) 0.1' fine silty sand layer at 1.4' | | #1 | Sample #1, Depth = 1.1' 1.33 mm, 1.65 phi sorting 1.5 % silt |
| -3.3 | 2.3 | | SAND, white medium (2.5Y 8/1) | | | |
| -3.5 | 2.5 | | SAND, gray fine with some silt (5Y 8/1) | | #2 | Sample #2, Depth = 2.7' 0.16 mm, 0.92 phi sorting 14.5 % silt |
| -4.4 | 3.4 | | | | | BP98-6 COMPOSITE 0.70 mm 1.43 phi sorting 5.4% silt |

| | | | |
|--|----------|--|-----------------|
| DRILLING LOG | DIVISION | INSTALLATION | SHEET 1 OF 1 |
| 1. PROJECT BLIND PASS FLOOD SHOAL | | 10. SIZE AND TYPE OF BIT | |
| 2. LOCATION (Coordinates or Station) X=440,188 Y=781,637 | | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD | |
| 3. DRILLING AGENCY CPE | | 12. MANUFACTURER'S DESIGNATION OF DRILL HAMMER | |
| 4. HOLE NO. (As shown on drawing title and file number) BP-98#7 | | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: undisturbed: 2 | |
| 5. NAME OF DRILLER LM, JW | | 14. TOTAL NUMBER OF CORE BOXES 1 | |
| 6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED | | 15. ELEVATION GROUND WATER NA | |
| 7. THICKNESS OF BURDEN 0 Ft. | | 16. DATE HOLE STARTED COMPLETED 11/25/98 11/25/98 | |
| 8. DEPTH DRILLED INTO ROCK 0 Ft. | | 17. ELEVATION TOP OF HOLE -1.7 Ft. | |
| 9. TOTAL DEPTH OF HOLE 4.0 Ft. | | 18. TOTAL CORE RECOVERY FOR BORING 85 % | |
| | | 19. SIGNATURE OF GEOLOGIST L. DALESSIO | |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS (Description) | CORE REC % | SAMPLE NUMBER | REMARKS |
|-------|-------|--|---|------------|---------------|--|
| -1.7 | .0 | | | | | -1.7 |
| | |  | SAND, gray fine with some silt and 20-40% shell hash (5Y 6/1) | | #1 | Sample #1, Depth = 0.4' 0.32 mm, 1.45 phi sorting 4.7 % silt |
| -2.5 | .8 |  | SHELL HASH, gray with 40% fine sand (5Y 6/1), 2 0.1' shells at 2.4' | | #2 | Sample #2, Depth = 1.8' 0.62 mm, 1.56 phi sorting 1.3 % silt |
| -4.3 | 2.6 | | | | | BP98-7 COMPOSITE 0.51 mm 1.53 phi sorting 2.4% silt |

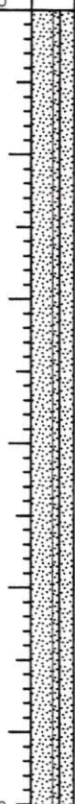
| | | | |
|--|----------|---|-----------------|
| DRILLING LOG | DIVISION | INSTALLATION | SHEET 1 OF 1 |
| 1. PROJECT BLIND PASS FLOOD SHOAL | | 10. SIZE AND TYPE OF BIT | |
| 2. LOCATION (Coordinates or Station) X=440,432 Y=781,823 | | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD | |
| 3. DRILLING AGENCY CPE | | 12. MANUFACTURER'S DESIGNATION OF DRILL HAMMER | |
| 4. HOLE NO. (As shown on drawing title and file number) BP-98#8 | | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: undisturbed: 1 | |
| 5. NAME OF DRILLER LM, JW | | 14. TOTAL NUMBER OF CORE BOXES 1 | |
| 6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED | | 15. ELEVATION GROUND WATER NA | |
| 7. THICKNESS OF BURDEN 0 Ft. | | 16. DATE HOLE STARTED COMPLETED 11/25/98 11/25/98 | |
| 8. DEPTH DRILLED INTO ROCK 0 Ft. | | 17. ELEVATION TOP OF HOLE -1.0 Ft. | |
| 9. TOTAL DEPTH OF HOLE 4.0 Ft. | | 18. TOTAL CORE RECOVERY FOR BORING 88 % | |
| | | 19. SIGNATURE OF GEOLOGIST L. DALESSIO | |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS (Description) | CORE REC % | SAMPLE NUMBER | REMARKS |
|-------|-------|--------|--|------------|---------------|--|
| -1.0 | .0 | | | | | -1.0 |
| | | *** | SHELL HASH AND SHELL FRAGMENTS, lt. gray with 10-15% fine sand (5Y 7/1) and a 0.1' layer of fine sand with some silt at 0.2' | | #1 | Sample #1, Depth = 0.4' 0.93 mm, 1.40 phi sorting 1.5 % silt |
| -3.7 | 2.7 | | | | | BP98-8 COMPOSITE 0.93 mm 1.40 phi sorting 1.5% silt |

| | | | |
|--|----------|--|-----------------|
| DRILLING LOG | DIVISION | INSTALLATION | SHEET 1 OF 1 |
| 1. PROJECT BLIND PASS FLOOD SHOAL | | 10. SIZE AND TYPE OF BIT | |
| 2. LOCATION (Coordinates or Station) X=440,755 Y=781,981 | | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD | |
| 3. DRILLING AGENCY CPE | | 12. MANUFACTURER'S DESIGNATION OF DRILL HAMMER | |
| 4. HOLE NO. (As shown on drawing title and file number) BP-98#9 | | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: undisturbed: 3 | |
| 5. NAME OF DRILLER LM, JW | | 14. TOTAL NUMBER OF CORE BOXES 1 | |
| 6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED | | 15. ELEVATION GROUND WATER NA | |
| 7. THICKNESS OF BURDEN 0 Ft. | | 16. DATE HOLE STARTED COMPLETED 11/25/98 11/25/98 | |
| 8. DEPTH DRILLED INTO ROCK 0 Ft. | | 17. ELEVATION TOP OF HOLE -0.8 Ft. | |
| 9. TOTAL DEPTH OF HOLE 4.0 Ft. | | 18. TOTAL CORE RECOVERY FOR BORING 73 % | |
| | | 19. SIGNATURE OF GEOLOGIST L. DALESSIO | |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS (Description) | CORE REC % | SAMPLE NUMBER | REMARKS |
|-------|-------|--------|---|------------|---------------|---|
| -0.8 | .0 | | | | | -0.8 |
| | | | SAND, gray fine silty with 10% shell (2.5Y 6/1) | | #1 | Sample #1, Depth = 0.3' 0.11 mm, 0.74 phi sorting 32.6 % silt |
| -1.6 | .8 | | SAND, gray fine silty, shell content increasing with depth to 40% (2.5Y 6/1) | | #2 | Sample #2, Depth = 1.2' 0.24 mm, 1.50 phi sorting 16.9 % silt |
| -2.4 | 1.6 | | SHELL HASH AND SHELL FRAGMENTS, lt. gray with 20% fine sand with some silt (2.5Y 7/1) | | #3 | Sample #3, Depth = 2.3' 0.60 mm, 1.45 phi sorting 2.9 % silt |
| -3.7 | 2.9 | | | | | BP98-9 COMPOSITE 0.29 mm 1.27 phi sorting 14.9% silt |

| | | | | |
|--|--|---|--------------|-----------------|
| DRILLING LOG | | DIVISION | INSTALLATION | SHEET 1 OF 1 |
| 1. PROJECT BLIND PASS FLOOD SHOAL | | 10. SIZE AND TYPE OF BIT | | |
| 2. LOCATION (Coordinates or Station) X=440,809 Y=782,390 | | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD | | |
| 3. DRILLING AGENCY CPE | | 12. MANUFACTURER'S DESIGNATION OF DRILL HAMMER | | |
| 4. HOLE NO. (As shown on drawing title and file number) BP-98#10 | | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: undisturbed: 2 | | |
| 5. NAME OF DRILLER LM, JW | | 14. TOTAL NUMBER OF CORE BOXES 1 | | |
| 6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED | | 15. ELEVATION GROUND WATER NA | | |
| 7. THICKNESS OF BURDEN 0 Ft. | | 16. DATE HOLE STARTED COMPLETED 11/25/98 11/25/98 | | |
| 8. DEPTH DRILLED INTO ROCK 0 Ft. | | 17. ELEVATION TOP OF HOLE -0.8 Ft. | | |
| 9. TOTAL DEPTH OF HOLE 4.0 Ft. | | 18. TOTAL CORE RECOVERY FOR BORING 70 % | | |
| | | 19. SIGNATURE OF GEOLOGIST L. DALESSIO | | |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS (Description) | CORE REC % | SAMPLE NUMBER | REMARKS |
|-------|-------|--|--|------------|---------------|--|
| -0.8 | 0.0 | | | | | -0.8 |
| | |  | SAND, lt. gray mixture of silty sand and fine to medium sand with increasing shell content with depth (5Y 7/1) | | #1 | Sample #1, Depth = 0.5' 0.16 mm, 0.87 phi sorting 22.3 % silt |
| | | | | | #2 | Sample #2, Depth = 1.8' 0.20 mm, 1.18 phi sorting 14.2 % silt |
| -3.6 | 2.8 | | | | | BP98-10 COMPOSITE 0.18 mm 1.03 phi sorting 18.2% silt |

APPENDIX B
GRADATION ANALYSIS REPORTS

GRADATION ANALYSIS REPORT
BLIND PASS INTERIM DREDGING
TESTED BY: ID ON: 1/99

SAMPLE NO.: BP98-1#1
SAMPLE ELEV. (FT. NGVD): -2.3
SAMPLE DEPTH (FT.): 0.2
SAMPLE TYPE: CORE SAMPLE

USCS DESCRIPTION: SP

DRY SAMPLE WEIGHT (GRAMS): 81.87
SAMPLE WEIGHT AFTER WASH (GRAMS): 80.50

| SIEVE SIZE | PHI SIZE | MESH SIZE (mm) | RETAINED (GRAMS) | RETAINED (%) | PASSED (%) |
|------------|----------|----------------|------------------|--------------|------------|
| 5/8 | -4.00 | 16.000 | 0.00 | 0.00 | 100.00 |
| 5/16 | -3.00 | 8.000 | 0.00 | 0.00 | 100.00 |
| 5 | -2.00 | 4.000 | 0.12 | 0.15 | 99.85 |
| 7 | -1.50 | 2.800 | 0.45 | 0.55 | 99.45 |
| 10 | -1.00 | 2.000 | 1.00 | 1.22 | 98.78 |
| 14 | -0.50 | 1.400 | 2.20 | 2.69 | 97.31 |
| 18 | 0.00 | 1.000 | 4.26 | 5.20 | 94.80 |
| 25 | 0.50 | 0.710 | 7.50 | 9.16 | 90.84 |
| 35 | 1.00 | 0.500 | 13.66 | 16.68 | 83.32 |
| 45 | 1.50 | 0.355 | 19.29 | 23.56 | 76.44 |
| 60 | 2.00 | 0.250 | 28.70 | 35.06 | 64.94 |
| 80 | 2.50 | 0.180 | 49.23 | 60.13 | 39.87 |
| 120 | 3.00 | 0.125 | 77.88 | 95.13 | 4.87 |
| 170 | 3.50 | 0.090 | 80.44 | 98.25 | 1.75 |
| 200 | 3.75 | 0.075 | 80.49 | 98.31 | 1.69 |
| 230 | 4.00 | 0.063 | 81.18 | 99.16 | 0.84 |
| PAN | | | 81.87 | 100.00 | 0.00 |

PHI(5): -0.04 PHI(16): 0.95 PHI(25): 1.56
PHI(50): 2.30 PHI(75): 2.71 PHI(84): 2.84
PHI(95): 3.00

SIEVE LOSS(g): 0.00 SILT/CLAY: 1.69%
SKEWNESS: -0.868 KURTOSIS: 1.083

GRAPHIC METHOD

MEAN (PHI): 1.81 SORTING: 0.94
MEAN (mm): 0.29 MEDIAN (mm): 0.20

NOTE: MEAN WAS CALCULATED USING 5 POINT METHOD

MOMENT METHOD

MEAN (PHI): 2.00 SORTING: 0.99
MEAN (mm): 0.25

DATA FILE NAME: BP981#1.TAB

GRADATION ANALYSIS REPORT
BLIND PASS INTERIM DREDGING
TESTED BY: ID ON: 1/99

SAMPLE NO.: BP98-1#2
SAMPLE ELEV. (FT. NGVD): -3.2
SAMPLE DEPTH (FT.): 1.1
SAMPLE TYPE: CORE SAMPLE

USCS DESCRIPTION: SP

DRY SAMPLE WEIGHT (GRAMS): 83.95
SAMPLE WEIGHT AFTER WASH (GRAMS): 83.13

| SIEVE SIZE | PHI SIZE | MESH SIZE (mm) | RETAINED (GRAMS) | RETAINED (%) | PASSED (%) |
|------------|----------|----------------|------------------|--------------|------------|
| 5/8 | -4.00 | 16.000 | 0.00 | 0.00 | 100.00 |
| 5/16 | -3.00 | 8.000 | 3.99 | 4.75 | 95.25 |
| 5 | -2.00 | 4.000 | 13.77 | 16.40 | 83.60 |
| 7 | -1.50 | 2.800 | 19.03 | 22.67 | 77.33 |
| 10 | -1.00 | 2.000 | 25.23 | 30.05 | 69.95 |
| 14 | -0.50 | 1.400 | 32.59 | 38.82 | 61.18 |
| 18 | 0.00 | 1.000 | 39.45 | 46.99 | 53.01 |
| 25 | 0.50 | 0.710 | 48.16 | 57.37 | 42.63 |
| 35 | 1.00 | 0.500 | 60.18 | 71.69 | 28.31 |
| 45 | 1.50 | 0.355 | 71.46 | 85.12 | 14.88 |
| 60 | 2.00 | 0.250 | 78.92 | 94.01 | 5.99 |
| 80 | 2.50 | 0.180 | 82.14 | 97.84 | 2.16 |
| 120 | 3.00 | 0.125 | 82.88 | 98.73 | 1.27 |
| 170 | 3.50 | 0.090 | 83.07 | 98.95 | 1.05 |
| 200 | 3.75 | 0.075 | 83.12 | 99.01 | 0.99 |
| 230 | 4.00 | 0.063 | 83.54 | 99.51 | 0.49 |
| PAN | | | 83.95 | 100.00 | 0.00 |

PHI (5): -2.98 PHI (16): -2.03 PHI (25): -1.34
PHI (50): 0.14 PHI (75): 1.12 PHI (84): 1.46
PHI (95): 2.13

SIEVE LOSS (g): 0.00 SILT/CLAY: 0.99%
SKEWNESS: -0.326 KURTOSIS: 0.849

GRAPHIC METHOD

MEAN (PHI): -0.26 SORTING: 1.75
MEAN (mm): 1.19 MEDIAN (mm): 0.90
NOTE: MEAN WAS CALCULATED USING 5 POINT METHOD

MOMENT METHOD

MEAN (PHI): -0.15 SORTING: 1.61
MEAN (mm): 1.11

DATA FILE NAME: BP981#2.TAB

GRADATION ANALYSIS REPORT
BLIND PASS INTERIM DREDGING
TESTED BY: ID ON: 1/99

SAMPLE NO.: BP98-2#1
SAMPLE ELEV. (FT. NGVD): -1.6
SAMPLE DEPTH (FT.): 1.1
SAMPLE TYPE: CORE SAMPLE

USCS DESCRIPTION: SP

DRY SAMPLE WEIGHT (GRAMS): 117.34
SAMPLE WEIGHT AFTER WASH (GRAMS): 116.16

| SIEVE SIZE | PHI SIZE | MESH SIZE (mm) | RETAINED (GRAMS) | RETAINED (%) | PASSED (%) |
|------------|----------|----------------|------------------|--------------|------------|
| 5/8 | -4.00 | 16.000 | 0.00 | 0.00 | 100.00 |
| 5/16 | -3.00 | 8.000 | 0.00 | 0.00 | 100.00 |
| 5 | -2.00 | 4.000 | 2.38 | 2.03 | 97.97 |
| 7 | -1.50 | 2.800 | 3.46 | 2.95 | 97.05 |
| 10 | -1.00 | 2.000 | 4.66 | 3.97 | 96.03 |
| 14 | -0.50 | 1.400 | 7.20 | 6.14 | 93.86 |
| 18 | 0.00 | 1.000 | 11.90 | 10.14 | 89.86 |
| 25 | 0.50 | 0.710 | 20.97 | 17.87 | 82.13 |
| 35 | 1.00 | 0.500 | 40.95 | 34.90 | 65.10 |
| 45 | 1.50 | 0.355 | 59.95 | 51.09 | 48.91 |
| 60 | 2.00 | 0.250 | 86.44 | 73.67 | 26.33 |
| 80 | 2.50 | 0.180 | 107.02 | 91.21 | 8.79 |
| 120 | 3.00 | 0.125 | 115.21 | 98.18 | 1.82 |
| 170 | 3.50 | 0.090 | 116.07 | 98.92 | 1.08 |
| 200 | 3.75 | 0.075 | 116.14 | 98.98 | 1.02 |
| 230 | 4.00 | 0.063 | 116.74 | 99.49 | 0.51 |
| PAN | | | 117.33 | 99.99 | 0.01 |

PHI(5): -0.76 PHI(16): 0.38 PHI(25): 0.71
PHI(50): 1.47 PHI(75): 2.04 PHI(84): 2.29
PHI(95): 2.77

SIEVE LOSS (g): 0.01 SILT/CLAY: 1.02%
SKEWNESS: -0.482 KURTOSIS: 1.090

GRAPHIC METHOD

MEAN (PHI): 1.23 SORTING: 0.96
MEAN (mm): 0.43 MEDIAN (mm): 0.36
NOTE: MEAN WAS CALCULATED USING 5 POINT METHOD

MOMENT METHOD

MEAN (PHI): 1.28 SORTING: 1.09
MEAN (mm): 0.41

DATA FILE NAME: BP982#1.TAB

GRADATION ANALYSIS REPORT
BLIND PASS INTERIM DREDGING
TESTED BY: ID ON: 1/99

SAMPLE NO.: BP98-2#2
SAMPLE ELEV. (FT. NGVD): -2.3
SAMPLE DEPTH (FT.): 1.8
SAMPLE TYPE: CORE SAMPLE

USCS DESCRIPTION: SP

DRY SAMPLE WEIGHT (GRAMS): 106.04
SAMPLE WEIGHT AFTER WASH (GRAMS): 103.33

| SIEVE SIZE | PHI SIZE | MESH SIZE (mm) | RETAINED (GRAMS) | RETAINED (%) | PASSED (%) |
|------------|----------|----------------|------------------|--------------|------------|
| 5/8 | -4.00 | 16.000 | 0.00 | 0.00 | 100.00 |
| 5/16 | -3.00 | 8.000 | 0.00 | 0.00 | 100.00 |
| 5 | -2.00 | 4.000 | 0.00 | 0.00 | 100.00 |
| 7 | -1.50 | 2.800 | 0.00 | 0.00 | 100.00 |
| 10 | -1.00 | 2.000 | 0.00 | 0.00 | 100.00 |
| 14 | -0.50 | 1.400 | 0.04 | 0.04 | 99.96 |
| 18 | 0.00 | 1.000 | 0.07 | 0.07 | 99.93 |
| 25 | 0.50 | 0.710 | 0.27 | 0.25 | 99.75 |
| 35 | 1.00 | 0.500 | 1.08 | 1.02 | 98.98 |
| 45 | 1.50 | 0.355 | 3.72 | 3.51 | 96.49 |
| 60 | 2.00 | 0.250 | 13.64 | 12.86 | 87.14 |
| 80 | 2.50 | 0.180 | 47.55 | 44.84 | 55.16 |
| 120 | 3.00 | 0.125 | 86.73 | 81.79 | 18.21 |
| 170 | 3.50 | 0.090 | 100.19 | 94.48 | 5.52 |
| 200 | 3.75 | 0.075 | 102.99 | 97.12 | 2.88 |
| 230 | 4.00 | 0.063 | 104.63 | 98.67 | 1.33 |
| PAN | | | 106.04 | 100.00 | 0.00 |

PHI(5): 1.58 PHI(16): 2.05 PHI(25): 2.19
PHI(50): 2.57 PHI(75): 2.91 PHI(84): 3.09
PHI(95): 3.55

SIEVE LOSS(g): 0.00 SILT/CLAY: 2.88%
SKEWNESS: -0.011 KURTOSIS: 1.123

GRAPHIC METHOD

MEAN (PHI): 2.57 SORTING: 0.52
MEAN (mm) : 0.17 MEDIAN (mm): 0.17
NOTE: MEAN WAS CALCULATED USING 5 POINT METHOD

MOMENT METHOD

MEAN (PHI): 2.54 SORTING: 0.56
MEAN (mm) : 0.17

DATA FILE NAME: BP982#2.TAB

GRADATION ANALYSIS REPORT
BLIND PASS INTERIM DREDGING
TESTED BY: ID ON: 1/99

SAMPLE NO.: BP98-2#3
SAMPLE ELEV. (FT. NGVD): -2.8
SAMPLE DEPTH (FT.): 2.3
SAMPLE TYPE: CORE SAMPLE

USCS DESCRIPTION: SP

DRY SAMPLE WEIGHT (GRAMS): 63.55
SAMPLE WEIGHT AFTER WASH (GRAMS): 60.60

| SIEVE SIZE | PHI SIZE | MESH SIZE (mm) | RETAINED (GRAMS) | RETAINED (%) | PASSED (%) |
|------------|----------|----------------|------------------|--------------|------------|
| 5/8 | -4.00 | 16.000 | 0.00 | 0.00 | 100.00 |
| 5/16 | -3.00 | 8.000 | 0.00 | 0.00 | 100.00 |
| 5 | -2.00 | 4.000 | 0.28 | 0.44 | 99.56 |
| 7 | -1.50 | 2.800 | 0.73 | 1.15 | 98.85 |
| 10 | -1.00 | 2.000 | 1.12 | 1.76 | 98.24 |
| 14 | -0.50 | 1.400 | 1.89 | 2.97 | 97.03 |
| 18 | 0.00 | 1.000 | 3.06 | 4.82 | 95.18 |
| 25 | 0.50 | 0.710 | 5.32 | 8.37 | 91.63 |
| 35 | 1.00 | 0.500 | 10.12 | 15.92 | 84.08 |
| 45 | 1.50 | 0.355 | 15.37 | 24.19 | 75.81 |
| 60 | 2.00 | 0.250 | 25.26 | 39.75 | 60.25 |
| 80 | 2.50 | 0.180 | 40.78 | 64.17 | 35.83 |
| 120 | 3.00 | 0.125 | 56.45 | 88.83 | 11.17 |
| 170 | 3.50 | 0.090 | 60.20 | 94.73 | 5.27 |
| 200 | 3.75 | 0.075 | 60.51 | 95.22 | 4.78 |
| 230 | 4.00 | 0.063 | 62.04 | 97.62 | 2.38 |
| PAN | | | 63.53 | 99.97 | 0.03 |

PHI (5): 0.03 PHI (16): 1.00 PHI (25): 1.53
PHI (50): 2.21 PHI (75): 2.72 PHI (84): 2.90
PHI (95): 3.64

SIEVE LOSS (g): 0.02 SILT/CLAY: 4.78%
SKEWNESS: -0.398 KURTOSIS: 1.241

GRAPHIC METHOD

MEAN (PHI): 1.96 SORTING: 0.95
MEAN (mm) : 0.26 MEDIAN (mm): 0.22
NOTE: MEAN WAS CALCULATED USING 5 POINT METHOD

MOMENT METHOD

MEAN (PHI): 1.97 SORTING: 1.04
MEAN (mm) : 0.25

DATA FILE NAME: BP982#3.TAB

GRADATION ANALYSIS REPORT
BLIND PASS INTERIM DREDGING
TESTED BY: ID ON: 1/99

SAMPLE NO.: BP98-3#1
SAMPLE ELEV. (FT. NGVD): -2.1
SAMPLE DEPTH (FT.): 1.1
SAMPLE TYPE: CORE SAMPLE

USCS DESCRIPTION: SP

DRY SAMPLE WEIGHT (GRAMS): 63.78
SAMPLE WEIGHT AFTER WASH (GRAMS): 62.95

| SIEVE SIZE | PHI SIZE | MESH SIZE (mm) | RETAINED (GRAMS) | RETAINED (%) | PASSED (%) |
|------------|----------|----------------|------------------|--------------|------------|
| 5/8 | -4.00 | 16.000 | 0.00 | 0.00 | 100.00 |
| 5/16 | -3.00 | 8.000 | 3.25 | 5.10 | 94.90 |
| 5 | -2.00 | 4.000 | 9.80 | 15.37 | 84.63 |
| 7 | -1.50 | 2.800 | 14.27 | 22.37 | 77.63 |
| 10 | -1.00 | 2.000 | 20.10 | 31.51 | 68.49 |
| 14 | -0.50 | 1.400 | 28.51 | 44.70 | 55.30 |
| 18 | 0.00 | 1.000 | 35.71 | 55.99 | 44.01 |
| 25 | 0.50 | 0.710 | 43.66 | 68.45 | 31.55 |
| 35 | 1.00 | 0.500 | 51.93 | 81.42 | 18.58 |
| 45 | 1.50 | 0.355 | 57.21 | 89.70 | 10.30 |
| 60 | 2.00 | 0.250 | 60.37 | 94.65 | 5.35 |
| 80 | 2.50 | 0.180 | 62.24 | 97.59 | 2.41 |
| 120 | 3.00 | 0.125 | 62.83 | 98.51 | 1.49 |
| 170 | 3.50 | 0.090 | 62.90 | 98.62 | 1.38 |
| 200 | 3.75 | 0.075 | 62.95 | 98.70 | 1.30 |
| 230 | 4.00 | 0.063 | 63.36 | 99.35 | 0.65 |
| PAN | | | 63.78 | 100.00 | 0.00 |

PHI (5): -3.02 PHI (16): -1.95 PHI (25): -1.36
PHI (50): -0.27 PHI (75): 0.75 PHI (84): 1.16
PHI (95): 2.06

SIEVE LOSS (g): 0.00 SILT/CLAY: 1.30%
SKEWNESS: -0.138 KURTOSIS: 0.987

GRAPHIC METHOD

MEAN (PHI): -0.40 SORTING: 1.56
MEAN (mm): 1.32 MEDIAN (mm): 1.20
NOTE: MEAN WAS CALCULATED USING 5 POINT METHOD

MOMENT METHOD

MEAN (PHI): -0.36 SORTING: 1.51
MEAN (mm): 1.28

DATA FILE NAME: BP983#1.TAB

GRADATION ANALYSIS REPORT
 BLIND PASS INTERIM DREDGING
 TESTED BY: ID ON: 1/99

SAMPLE NO.: BP98-4#1
 SAMPLE ELEV. (FT. NGVD): -0.3
 SAMPLE DEPTH (FT.): 0.1
 SAMPLE TYPE: CORE SAMPLE

USCS DESCRIPTION: SP-SM

DRY SAMPLE WEIGHT (GRAMS): 46.07
 SAMPLE WEIGHT AFTER WASH (GRAMS): 40.08

| SIEVE SIZE | PHI SIZE | MESH SIZE (mm) | RETAINED (GRAMS) | RETAINED (%) | PASSED (%) |
|------------|----------|----------------|------------------|--------------|------------|
| 5/8 | -4.00 | 16.000 | 0.00 | 0.00 | 100.00 |
| 5/16 | -3.00 | 8.000 | 0.00 | 0.00 | 100.00 |
| 5 | -2.00 | 4.000 | 0.00 | 0.00 | 100.00 |
| 7 | -1.50 | 2.800 | 0.09 | 0.20 | 99.80 |
| 10 | -1.00 | 2.000 | 0.20 | 0.43 | 99.57 |
| 14 | -0.50 | 1.400 | 0.40 | 0.87 | 99.13 |
| 18 | 0.00 | 1.000 | 0.88 | 1.91 | 98.09 |
| 25 | 0.50 | 0.710 | 1.76 | 3.82 | 96.18 |
| 35 | 1.00 | 0.500 | 3.78 | 8.20 | 91.80 |
| 45 | 1.50 | 0.355 | 6.00 | 13.02 | 86.98 |
| 60 | 2.00 | 0.250 | 10.11 | 21.94 | 78.06 |
| 80 | 2.50 | 0.180 | 15.89 | 34.49 | 65.51 |
| 120 | 3.00 | 0.125 | 28.40 | 61.65 | 38.35 |
| 170 | 3.50 | 0.090 | 37.48 | 81.35 | 18.65 |
| 200 | 3.75 | 0.075 | 39.34 | 85.39 | 14.61 |
| 230 | 4.00 | 0.063 | 42.79 | 92.89 | 7.11 |
| PAN | | | 46.05 | 99.96 | 0.04 |

PHI (5): 0.63 PHI (16): 1.67 PHI (25): 2.12
 PHI (50): 2.79 PHI (75): 3.34 PHI (84): 3.66
 PHI (95): 4.07

SIEVE LOSS (g): 0.02 SILT/CLAY: 14.61%
 SKEWNESS: -0.434 KURTOSIS: 1.157

GRAPHIC METHOD
 MEAN (PHI): 2.56 SORTING: 1.00
 MEAN (mm): 0.17 MEDIAN (mm): 0.15
 NOTE: MEAN WAS CALCULATED USING 5 POINT METHOD

MOMENT METHOD
 MEAN (PHI): 2.53 SORTING: 0.97
 MEAN (mm): 0.17

DATA FILE NAME: BP984#1.TAB

GRADATION ANALYSIS REPORT
BLIND PASS INTERIM DREDGING
TESTED BY: ID ON: 1/99

SAMPLE NO.: BP98-4#2
SAMPLE ELEV. (FT. NGVD): -1.3
SAMPLE DEPTH (FT.): 1.1
SAMPLE TYPE: CORE SAMPLE

USCS DESCRIPTION: SP

DRY SAMPLE WEIGHT (GRAMS): 91.29
SAMPLE WEIGHT AFTER WASH (GRAMS): 89.86

| SIEVE SIZE | PHI SIZE | MESH SIZE (mm) | RETAINED (GRAMS) | RETAINED (%) | PASSED (%) |
|------------|----------|----------------|------------------|--------------|------------|
| 5/8 | -4.00 | 16.000 | 0.00 | 0.00 | 100.00 |
| 5/16 | -3.00 | 8.000 | 7.55 | 8.27 | 91.73 |
| 5 | -2.00 | 4.000 | 18.10 | 19.83 | 80.17 |
| 7 | -1.50 | 2.800 | 22.35 | 24.48 | 75.52 |
| 10 | -1.00 | 2.000 | 26.93 | 29.50 | 70.50 |
| 14 | -0.50 | 1.400 | 31.41 | 34.41 | 65.59 |
| 18 | 0.00 | 1.000 | 35.60 | 39.00 | 61.00 |
| 25 | 0.50 | 0.710 | 40.94 | 44.85 | 55.15 |
| 35 | 1.00 | 0.500 | 48.85 | 53.51 | 46.49 |
| 45 | 1.50 | 0.355 | 59.44 | 65.11 | 34.89 |
| 60 | 2.00 | 0.250 | 74.24 | 81.32 | 18.68 |
| 80 | 2.50 | 0.180 | 85.06 | 93.18 | 6.82 |
| 120 | 3.00 | 0.125 | 88.24 | 96.66 | 3.34 |
| 170 | 3.50 | 0.090 | 89.59 | 98.14 | 1.86 |
| 200 | 3.75 | 0.075 | 89.84 | 98.41 | 1.59 |
| 230 | 4.00 | 0.063 | 90.57 | 99.21 | 0.79 |
| PAN | | | 91.29 | 100.00 | 0.00 |

PHI (5): -3.40 PHI (16): -2.33 PHI (25): -1.45
PHI (50): 0.80 PHI (75): 1.80 PHI (84): 2.11
PHI (95): 2.76

SIEVE LOSS (g): 0.00 SILT/CLAY: 1.59%
SKEWNESS: -0.501 KURTOSIS: 0.776

GRAPHIC METHOD

MEAN (PHI): -0.01 SORTING: 2.22
MEAN (mm): 1.01 MEDIAN (mm): 0.58
NOTE: MEAN WAS CALCULATED USING 5 POINT METHOD

MOMENT METHOD

MEAN (PHI): 0.19 SORTING: 1.97
MEAN (mm): 0.88

DATA FILE NAME: BP984#2.TAB

GRADATION ANALYSIS REPORT
BLIND PASS INTERIM DREDGING
TESTED BY: ID ON: 1/99

SAMPLE NO.: BP98-4#3
SAMPLE ELEV. (FT. NGVD): -2.9
SAMPLE DEPTH (FT.): 2.7
SAMPLE TYPE: CORE SAMPLE

USCS DESCRIPTION: SP-SM

DRY SAMPLE WEIGHT (GRAMS): 83.26
SAMPLE WEIGHT AFTER WASH (GRAMS): 72.42

| SIEVE SIZE | PHI SIZE | MESH SIZE (mm) | RETAINED (GRAMS) | RETAINED (%) | PASSED (%) |
|------------|----------|----------------|------------------|--------------|------------|
| 5/8 | -4.00 | 16.000 | 0.00 | 0.00 | 100.00 |
| 5/16 | -3.00 | 8.000 | 0.00 | 0.00 | 100.00 |
| 5 | -2.00 | 4.000 | 0.00 | 0.00 | 100.00 |
| 7 | -1.50 | 2.800 | 0.53 | 0.64 | 99.36 |
| 10 | -1.00 | 2.000 | 1.16 | 1.39 | 98.61 |
| 14 | -0.50 | 1.400 | 2.19 | 2.63 | 97.37 |
| 18 | 0.00 | 1.000 | 3.12 | 3.75 | 96.25 |
| 25 | 0.50 | 0.710 | 4.07 | 4.89 | 95.11 |
| 35 | 1.00 | 0.500 | 5.12 | 6.15 | 93.85 |
| 45 | 1.50 | 0.355 | 6.24 | 7.49 | 92.51 |
| 60 | 2.00 | 0.250 | 8.46 | 10.16 | 89.84 |
| 80 | 2.50 | 0.180 | 15.38 | 18.47 | 81.53 |
| 120 | 3.00 | 0.125 | 39.24 | 47.13 | 52.87 |
| 170 | 3.50 | 0.090 | 66.20 | 79.51 | 20.49 |
| 200 | 3.75 | 0.075 | 71.57 | 85.96 | 14.04 |
| 230 | 4.00 | 0.063 | 77.72 | 93.35 | 6.65 |
| PAN | | | 83.26 | 100.00 | 0.00 |

PHI (5): 0.54 PHI (16): 2.35 PHI (25): 2.61
PHI (50): 3.04 PHI (75): 3.43 PHI (84): 3.67
PHI (95): 4.06

SIEVE LOSS (g): 0.00 SILT/CLAY: 14.04%
SKEWNESS: -1.125 KURTOSIS: 1.763

GRAPHIC METHOD

MEAN (PHI): 2.73 SORTING: 0.66
MEAN (mm) : 0.15 MEDIAN (mm): 0.12
NOTE: MEAN WAS CALCULATED USING 5 POINT METHOD

MOMENT METHOD

MEAN (PHI): 2.78 SORTING: 1.00
MEAN (mm) : 0.15

DATA FILE NAME: BP984#3.TAB

GRADATION ANALYSIS REPORT
BLIND PASS INTERIM DREDGING
TESTED BY: ID ON: 1/99

SAMPLE NO.: BP98-5#1
SAMPLE ELEV. (FT. NGVD): -0.4
SAMPLE DEPTH (FT.): 0.2
SAMPLE TYPE: CORE SAMPLE

USCS DESCRIPTION: SP-SM

DRY SAMPLE WEIGHT (GRAMS): 69.68
SAMPLE WEIGHT AFTER WASH (GRAMS): 50.83

| SIEVE SIZE | PHI SIZE | MESH SIZE (mm) | RETAINED (GRAMS) | RETAINED (%) | PASSED (%) |
|------------|----------|----------------|------------------|--------------|------------|
| 5/8 | -4.00 | 16.000 | 0.00 | 0.00 | 100.00 |
| 5/16 | -3.00 | 8.000 | 0.00 | 0.00 | 100.00 |
| 5 | -2.00 | 4.000 | 0.36 | 0.52 | 99.48 |
| 7 | -1.50 | 2.800 | 0.50 | 0.72 | 99.28 |
| 10 | -1.00 | 2.000 | 0.69 | 0.99 | 99.01 |
| 14 | -0.50 | 1.400 | 0.97 | 1.39 | 98.61 |
| 18 | 0.00 | 1.000 | 1.25 | 1.79 | 98.21 |
| 25 | 0.50 | 0.710 | 2.27 | 3.26 | 96.74 |
| 35 | 1.00 | 0.500 | 2.95 | 4.23 | 95.77 |
| 45 | 1.50 | 0.355 | 4.61 | 6.62 | 93.38 |
| 60 | 2.00 | 0.250 | 7.73 | 11.09 | 88.91 |
| 80 | 2.50 | 0.180 | 18.54 | 26.61 | 73.39 |
| 120 | 3.00 | 0.125 | 42.91 | 61.58 | 38.42 |
| 170 | 3.50 | 0.090 | 48.96 | 70.26 | 29.74 |
| 200 | 3.75 | 0.075 | 50.24 | 72.10 | 27.90 |
| 230 | 4.00 | 0.063 | 60.17 | 86.36 | 13.64 |
| PAN | | | 69.66 | 99.97 | 0.03 |

PHI (5): 1.16 PHI (16): 2.16 PHI (25): 2.45
PHI (50): 2.83 PHI (75): 3.80 PHI (84): 3.96
PHI (95): 4.15

SIEVE LOSS (g): 0.02 SILT/CLAY: 27.90%
SKEWNESS: -0.198 KURTOSIS: 0.906

GRAPHIC METHOD

MEAN (PHI): 2.85 SORTING: 0.90
MEAN (mm): 0.14 MEDIAN (mm): 0.14
NOTE: MEAN WAS CALCULATED USING 5 POINT METHOD

MOMENT METHOD

MEAN (PHI): 2.67 SORTING: 0.96
MEAN (mm): 0.16

DATA FILE NAME: BP985#1.TAB

GRADATION ANALYSIS REPORT
BLIND PASS INTERIM DREDGING
TESTED BY: ID ON: 1/99

SAMPLE NO.: BP98-5#2
SAMPLE ELEV. (FT. NGVD): -1.2
SAMPLE DEPTH (FT.): 1.0
SAMPLE TYPE: CORE SAMPLE

USCS DESCRIPTION: SP

DRY SAMPLE WEIGHT (GRAMS): 86.28
SAMPLE WEIGHT AFTER WASH (GRAMS): 85.80

| SIEVE SIZE | PHI SIZE | MESH SIZE (mm) | RETAINED (GRAMS) | RETAINED (%) | PASSED (%) |
|------------|----------|----------------|------------------|--------------|------------|
| 5/8 | -4.00 | 16.000 | 0.00 | 0.00 | 100.00 |
| 5/16 | -3.00 | 8.000 | 0.00 | 0.00 | 100.00 |
| 5 | -2.00 | 4.000 | 1.27 | 1.47 | 98.53 |
| 7 | -1.50 | 2.800 | 2.27 | 2.63 | 97.37 |
| 10 | -1.00 | 2.000 | 3.21 | 3.72 | 96.28 |
| 14 | -0.50 | 1.400 | 5.14 | 5.96 | 94.04 |
| 18 | 0.00 | 1.000 | 7.16 | 8.30 | 91.70 |
| 25 | 0.50 | 0.710 | 10.73 | 12.44 | 87.56 |
| 35 | 1.00 | 0.500 | 17.15 | 19.88 | 80.12 |
| 45 | 1.50 | 0.355 | 27.85 | 32.28 | 67.72 |
| 60 | 2.00 | 0.250 | 51.00 | 59.11 | 40.89 |
| 80 | 2.50 | 0.180 | 79.33 | 91.94 | 8.06 |
| 120 | 3.00 | 0.125 | 85.23 | 98.78 | 1.22 |
| 170 | 3.50 | 0.090 | 85.72 | 99.35 | 0.65 |
| 200 | 3.75 | 0.075 | 85.79 | 99.43 | 0.57 |
| 230 | 4.00 | 0.063 | 86.03 | 99.71 | 0.29 |
| PAN | | | 86.27 | 99.99 | 0.01 |

PHI (5): -0.71 PHI (16): 0.74 PHI (25): 1.21
PHI (50): 1.83 PHI (75): 2.24 PHI (84): 2.38
PHI (95): 2.72

SIEVE LOSS(g): 0.01 SILT/CLAY: 0.57%
SKEWNESS: -1.007 KURTOSIS: 1.361

GRAPHIC METHOD

MEAN (PHI): 1.39 SORTING: 0.82
MEAN (mm): 0.38 MEDIAN (mm): 0.28
NOTE: MEAN WAS CALCULATED USING 5 POINT METHOD

MOMENT METHOD

MEAN (PHI): 1.56 SORTING: 1.04
MEAN (mm): 0.34

DATA FILE NAME: BP985#2.TAB

GRADATION ANALYSIS REPORT
BLIND PASS INTERIM DREDGING
TESTED BY: ID ON: 1/99

SAMPLE NO.: BP98-5#3
SAMPLE ELEV. (FT. NGVD): -2.1
SAMPLE DEPTH (FT.): 1.9
SAMPLE TYPE: CORE SAMPLE

USCS DESCRIPTION: SP-SM

DRY SAMPLE WEIGHT (GRAMS): 82.24
SAMPLE WEIGHT AFTER WASH (GRAMS): 72.75

| SIEVE SIZE | PHI SIZE | MESH SIZE (mm) | RETAINED (GRAMS) | RETAINED (%) | PASSED (%) |
|------------|----------|----------------|------------------|--------------|------------|
| 5/8 | -4.00 | 16.000 | 0.00 | 0.00 | 100.00 |
| 5/16 | -3.00 | 8.000 | 0.00 | 0.00 | 100.00 |
| 5 | -2.00 | 4.000 | 0.62 | 0.75 | 99.25 |
| 7 | -1.50 | 2.800 | 1.56 | 1.90 | 98.10 |
| 10 | -1.00 | 2.000 | 2.47 | 3.00 | 97.00 |
| 14 | -0.50 | 1.400 | 3.46 | 4.21 | 95.79 |
| 18 | 0.00 | 1.000 | 4.19 | 5.09 | 94.91 |
| 25 | 0.50 | 0.710 | 4.92 | 5.98 | 94.02 |
| 35 | 1.00 | 0.500 | 5.83 | 7.09 | 92.91 |
| 45 | 1.50 | 0.355 | 6.77 | 8.23 | 91.77 |
| 60 | 2.00 | 0.250 | 8.58 | 10.43 | 89.57 |
| 80 | 2.50 | 0.180 | 13.74 | 16.71 | 83.29 |
| 120 | 3.00 | 0.125 | 36.25 | 44.08 | 55.92 |
| 170 | 3.50 | 0.090 | 64.40 | 78.31 | 21.69 |
| 200 | 3.75 | 0.075 | 70.82 | 86.11 | 13.89 |
| 230 | 4.00 | 0.063 | 76.74 | 93.31 | 6.69 |
| PAN | | | 82.22 | 99.98 | 0.02 |

PHI (5): -0.05 PHI (16): 2.44 PHI (25): 2.65
PHI (50): 3.09 PHI (75): 3.45 PHI (84): 3.68
PHI (95): 4.06

SIEVE LOSS (g): 0.02 SILT/CLAY: 13.89%
SKEWNESS: -1.750 KURTOSIS: 2.106

GRAPHIC METHOD

MEAN (PHI): 2.64 SORTING: 0.62
MEAN (mm): 0.16 MEDIAN (mm): 0.12
NOTE: MEAN WAS CALCULATED USING 5 POINT METHOD

MOMENT METHOD

MEAN (PHI): 2.75 SORTING: 1.15
MEAN (mm): 0.15

DATA FILE NAME: BP985#3.TAB

GRADATION ANALYSIS REPORT
BLIND PASS INTERIM DREDGING
TESTED BY: ID ON: 1/99

SAMPLE NO.: BP98-6#1
SAMPLE ELEV. (FT. NGVD): -2.1
SAMPLE DEPTH (FT.): 1.1
SAMPLE TYPE: CORE SAMPLE

USCS DESCRIPTION: SP

DRY SAMPLE WEIGHT (GRAMS): 102.82
SAMPLE WEIGHT AFTER WASH (GRAMS): 101.32

| SIEVE SIZE | PHI SIZE | MESH SIZE (mm) | RETAINED (GRAMS) | RETAINED (%) | PASSED (%) |
|------------|----------|----------------|------------------|--------------|------------|
| 5/8 | -4.00 | 16.000 | 0.00 | 0.00 | 100.00 |
| 5/16 | -3.00 | 8.000 | 0.00 | 0.00 | 100.00 |
| 5 | -2.00 | 4.000 | 21.05 | 20.47 | 79.53 |
| 7 | -1.50 | 2.800 | 32.11 | 31.23 | 68.77 |
| 10 | -1.00 | 2.000 | 43.30 | 42.11 | 57.89 |
| 14 | -0.50 | 1.400 | 55.02 | 53.51 | 46.49 |
| 18 | 0.00 | 1.000 | 62.86 | 61.14 | 38.86 |
| 25 | 0.50 | 0.710 | 70.21 | 68.28 | 31.72 |
| 35 | 1.00 | 0.500 | 77.56 | 75.43 | 24.57 |
| 45 | 1.50 | 0.355 | 84.58 | 82.26 | 17.74 |
| 60 | 2.00 | 0.250 | 92.72 | 90.18 | 9.82 |
| 80 | 2.50 | 0.180 | 98.70 | 95.99 | 4.01 |
| 120 | 3.00 | 0.125 | 100.51 | 97.75 | 2.25 |
| 170 | 3.50 | 0.090 | 101.15 | 98.38 | 1.62 |
| 200 | 3.75 | 0.075 | 101.30 | 98.52 | 1.48 |
| 230 | 4.00 | 0.063 | 102.06 | 99.26 | 0.74 |
| PAN | | | 102.82 | 100.00 | 0.00 |

PHI (5): -2.76 PHI (16): -2.22 PHI (25): -1.79
PHI (50): -0.65 PHI (75): 0.97 PHI (84): 1.61
PHI (95): 2.41

SIEVE LOSS (g): 0.00 SILT/CLAY: 1.48%
SKEWNESS: 0.253 KURTOSIS: 0.768

GRAPHIC METHOD

MEAN (PHI): -0.32 SORTING: 1.91
MEAN (mm): 1.25 MEDIAN (mm): 1.57
NOTE: MEAN WAS CALCULATED USING 5 POINT METHOD

MOMENT METHOD

MEAN (PHI): -0.41 SORTING: 1.65
MEAN (mm): 1.33

DATA FILE NAME: BP986#1.TAB

GRADATION ANALYSIS REPORT
BLIND PASS INTERIM DREDGING
TESTED BY: ID ON: 1/99

SAMPLE NO.: BP98-6#2
SAMPLE ELEV. (FT. NGVD): -3.7
SAMPLE DEPTH (FT.): 2.7
SAMPLE TYPE: CORE SAMPLE

USCS DESCRIPTION: SP-SM

DRY SAMPLE WEIGHT (GRAMS): 100.88
SAMPLE WEIGHT AFTER WASH (GRAMS): 86.53

| SIEVE SIZE | PHI SIZE | MESH SIZE (mm) | RETAINED (GRAMS) | RETAINED (%) | PASSED (%) |
|------------|----------|----------------|------------------|--------------|------------|
| 5/8 | -4.00 | 16.000 | 0.00 | 0.00 | 100.00 |
| 5/16 | -3.00 | 8.000 | 0.00 | 0.00 | 100.00 |
| 5 | -2.00 | 4.000 | 1.03 | 1.02 | 98.98 |
| 7 | -1.50 | 2.800 | 1.25 | 1.24 | 98.76 |
| 10 | -1.00 | 2.000 | 1.54 | 1.53 | 98.47 |
| 14 | -0.50 | 1.400 | 1.86 | 1.84 | 98.16 |
| 18 | 0.00 | 1.000 | 2.24 | 2.22 | 97.78 |
| 25 | 0.50 | 0.710 | 2.69 | 2.67 | 97.33 |
| 35 | 1.00 | 0.500 | 3.58 | 3.55 | 96.45 |
| 45 | 1.50 | 0.355 | 4.82 | 4.78 | 95.22 |
| 60 | 2.00 | 0.250 | 11.22 | 11.12 | 88.88 |
| 80 | 2.50 | 0.180 | 28.11 | 27.86 | 72.14 |
| 120 | 3.00 | 0.125 | 65.37 | 64.80 | 35.20 |
| 170 | 3.50 | 0.090 | 84.72 | 83.98 | 16.02 |
| 200 | 3.75 | 0.075 | 86.19 | 85.44 | 14.56 |
| 230 | 4.00 | 0.063 | 93.60 | 92.79 | 7.21 |
| PAN | | | 100.87 | 99.99 | 0.01 |

PHI (5): 1.52 PHI (16): 2.15 PHI (25): 2.41
PHI (50): 2.80 PHI (75): 3.27 PHI (84): 3.50
PHI (95): 4.08

SIEVE LOSS (g): 0.01 SILT/CLAY: 14.56%
SKEWNESS: -0.005 KURTOSIS: 1.231

GRAPHIC METHOD

MEAN (PHI): 2.81 SORTING: 0.68
MEAN (mm): 0.14 MEDIAN (mm): 0.14
NOTE: MEAN WAS CALCULATED USING 5 POINT METHOD

MOMENT METHOD

MEAN (PHI): 2.64 SORTING: 0.92
MEAN (mm): 0.16

DATA FILE NAME: BP986#2.TAB

GRADATION ANALYSIS REPORT
BLIND PASS INTERIM DREDGING
TESTED BY: ID ON: 1/99

SAMPLE NO.: BP98-7#1
SAMPLE ELEV. (FT. NGVD): -2.1
SAMPLE DEPTH (FT.): 0.4
SAMPLE TYPE: CORE SAMPLE

USCS DESCRIPTION: SP

DRY SAMPLE WEIGHT (GRAMS): 88.36
SAMPLE WEIGHT AFTER WASH (GRAMS): 84.58

| SIEVE SIZE | PHI SIZE | MESH SIZE (mm) | RETAINED (GRAMS) | RETAINED (%) | PASSED (%) |
|------------|----------|----------------|------------------|--------------|------------|
| 5/8 | -4.00 | 16.000 | 0.00 | 0.00 | 100.00 |
| 5/16 | -3.00 | 8.000 | 0.00 | 0.00 | 100.00 |
| 5 | -2.00 | 4.000 | 0.89 | 1.01 | 98.99 |
| 7 | -1.50 | 2.800 | 1.68 | 1.90 | 98.10 |
| 10 | -1.00 | 2.000 | 3.62 | 4.10 | 95.90 |
| 14 | -0.50 | 1.400 | 7.51 | 8.50 | 91.50 |
| 18 | 0.00 | 1.000 | 12.19 | 13.80 | 86.20 |
| 25 | 0.50 | 0.710 | 19.21 | 21.74 | 78.26 |
| 35 | 1.00 | 0.500 | 29.35 | 33.22 | 66.78 |
| 45 | 1.50 | 0.355 | 39.09 | 44.24 | 55.76 |
| 60 | 2.00 | 0.250 | 46.49 | 52.61 | 47.39 |
| 80 | 2.50 | 0.180 | 54.00 | 61.11 | 38.89 |
| 120 | 3.00 | 0.125 | 66.55 | 75.32 | 24.68 |
| 170 | 3.50 | 0.090 | 80.29 | 90.87 | 9.13 |
| 200 | 3.75 | 0.075 | 84.21 | 95.30 | 4.70 |
| 230 | 4.00 | 0.063 | 86.38 | 97.76 | 2.24 |
| PAN | | | 88.34 | 99.98 | 0.02 |

PHI (5): -0.90 PHI (16): 0.14 PHI (25): 0.64
PHI (50): 1.84 PHI (75): 2.99 PHI (84): 3.28
PHI (95): 3.73

SIEVE LOSS (g): 0.02 SILT/CLAY: 4.70%
SKEWNESS: -0.271 KURTOSIS: 0.809

GRAPHIC METHOD

MEAN (PHI): 1.62 SORTING: 1.57
MEAN (mm): 0.33 MEDIAN (mm): 0.28
NOTE: MEAN WAS CALCULATED USING 5 POINT METHOD

MOMENT METHOD

MEAN (PHI): 1.66 SORTING: 1.45
MEAN (mm): 0.32

DATA FILE NAME: BP987#1.TAB

GRADATION ANALYSIS REPORT
BLIND PASS INTERIM DREDGING
TESTED BY: ID ON: 1/99

SAMPLE NO.: BP98-7#2
SAMPLE ELEV. (FT. NGVD): -3.5
SAMPLE DEPTH (FT.): 1.8
SAMPLE TYPE: CORE SAMPLE

USCS DESCRIPTION: SP

DRY SAMPLE WEIGHT (GRAMS): 96.87
SAMPLE WEIGHT AFTER WASH (GRAMS): 95.60

| SIEVE SIZE | PHI SIZE | MESH SIZE (mm) | RETAINED (GRAMS) | RETAINED (%) | PASSED (%) |
|------------|----------|----------------|------------------|--------------|------------|
| 5/8 | -4.00 | 16.000 | 0.00 | 0.00 | 100.00 |
| 5/16 | -3.00 | 8.000 | 0.00 | 0.00 | 100.00 |
| 5 | -2.00 | 4.000 | 6.50 | 6.71 | 93.29 |
| 7 | -1.50 | 2.800 | 9.33 | 9.63 | 90.37 |
| 10 | -1.00 | 2.000 | 14.13 | 14.59 | 85.41 |
| 14 | -0.50 | 1.400 | 21.22 | 21.91 | 78.09 |
| 18 | 0.00 | 1.000 | 30.28 | 31.26 | 68.74 |
| 25 | 0.50 | 0.710 | 41.64 | 42.99 | 57.01 |
| 35 | 1.00 | 0.500 | 56.28 | 58.10 | 41.90 |
| 45 | 1.50 | 0.355 | 65.08 | 67.18 | 32.82 |
| 60 | 2.00 | 0.250 | 74.87 | 77.29 | 22.71 |
| 80 | 2.50 | 0.180 | 81.64 | 84.28 | 15.72 |
| 120 | 3.00 | 0.125 | 90.90 | 93.84 | 6.16 |
| 170 | 3.50 | 0.090 | 95.21 | 98.29 | 1.71 |
| 200 | 3.75 | 0.075 | 95.59 | 98.68 | 1.32 |
| 230 | 4.00 | 0.063 | 96.24 | 99.34 | 0.66 |
| PAN | | | 96.87 | 100.00 | 0.00 |

PHI (5): -2.25 PHI (16): -0.90 PHI (25): -0.33
PHI (50): 0.73 PHI (75): 1.89 PHI (84): 2.48
PHI (95): 3.13

SIEVE LOSS (g): 0.00 SILT/CLAY: 1.32%
SKEWNESS: -0.174 KURTOSIS: 0.994

GRAPHIC METHOD

MEAN (PHI): 0.64 SORTING: 1.69
MEAN (mm): 0.64 MEDIAN (mm): 0.60
NOTE: MEAN WAS CALCULATED USING 5 POINT METHOD

MOMENT METHOD

MEAN (PHI): 0.68 SORTING: 1.56
MEAN (mm): 0.62

DATA FILE NAME: BP987#2.TAB

GRADATION ANALYSIS REPORT
BLIND PASS INTERIM DREDGING
TESTED BY: ID ON: 1/99

SAMPLE NO.: BP98-8#1
SAMPLE ELEV. (FT. NGVD): -2.3
SAMPLE DEPTH (FT.): 1.3
SAMPLE TYPE: CORE SAMPLE

USCS DESCRIPTION: SP

DRY SAMPLE WEIGHT (GRAMS): 99.13
SAMPLE WEIGHT AFTER WASH (GRAMS): 97.69

| SIEVE SIZE | PHI SIZE | MESH SIZE (mm) | RETAINED (GRAMS) | RETAINED (%) | PASSED (%) |
|------------|----------|----------------|------------------|--------------|------------|
| 5/8 | -4.00 | 16.000 | 0.00 | 0.00 | 100.00 |
| 5/16 | -3.00 | 8.000 | 1.41 | 1.42 | 98.58 |
| 5 | -2.00 | 4.000 | 10.02 | 10.11 | 89.89 |
| 7 | -1.50 | 2.800 | 14.77 | 14.90 | 85.10 |
| 10 | -1.00 | 2.000 | 21.02 | 21.20 | 78.80 |
| 14 | -0.50 | 1.400 | 29.33 | 29.59 | 70.41 |
| 18 | 0.00 | 1.000 | 38.90 | 39.24 | 60.76 |
| 25 | 0.50 | 0.710 | 53.28 | 53.75 | 46.25 |
| 35 | 1.00 | 0.500 | 73.27 | 73.91 | 26.09 |
| 45 | 1.50 | 0.355 | 86.77 | 87.53 | 12.47 |
| 60 | 2.00 | 0.250 | 92.96 | 93.78 | 6.22 |
| 80 | 2.50 | 0.180 | 95.80 | 96.64 | 3.36 |
| 120 | 3.00 | 0.125 | 97.33 | 98.18 | 1.82 |
| 170 | 3.50 | 0.090 | 97.67 | 98.53 | 1.47 |
| 200 | 3.75 | 0.075 | 97.68 | 98.54 | 1.46 |
| 230 | 4.00 | 0.063 | 98.41 | 99.27 | 0.73 |
| PAN | | | 99.13 | 100.00 | 0.00 |

PHI (5): -2.59 PHI (16): -1.41 PHI (25): -0.77
PHI (50): 0.37 PHI (75): 1.04 PHI (84): 1.37
PHI (95): 2.21

SIEVE LOSS (g): 0.00 SILT/CLAY: 1.46%
SKEWNESS: -0.401 KURTOSIS: 1.085

GRAPHIC METHOD

MEAN (PHI): -0.01 SORTING: 1.39
MEAN (mm): 1.01 MEDIAN (mm): 0.77
NOTE: MEAN WAS CALCULATED USING 5 POINT METHOD

MOMENT METHOD

MEAN (PHI): 0.10 SORTING: 1.40
MEAN (mm): 0.93

DATA FILE NAME: BP988#1.TAB

GRADATION ANALYSIS REPORT
BLIND PASS INTERIM DREDGING
TESTED BY: ID ON: 1/99

SAMPLE NO.: BP98-9#1
SAMPLE ELEV. (FT. NGVD): -1.1
SAMPLE DEPTH (FT.): 0.3
SAMPLE TYPE: CORE SAMPLE

USCS DESCRIPTION: SP-SM

DRY SAMPLE WEIGHT (GRAMS): 55.57
SAMPLE WEIGHT AFTER WASH (GRAMS): 38.79

| SIEVE SIZE | PHI SIZE | MESH SIZE (mm) | RETAINED (GRAMS) | RETAINED (%) | PASSED (%) |
|------------|----------|----------------|------------------|--------------|------------|
| 5/8 | -4.00 | 16.000 | 0.00 | 0.00 | 100.00 |
| 5/16 | -3.00 | 8.000 | 0.00 | 0.00 | 100.00 |
| 5 | -2.00 | 4.000 | 0.00 | 0.00 | 100.00 |
| 7 | -1.50 | 2.800 | 0.00 | 0.00 | 100.00 |
| 10 | -1.00 | 2.000 | 0.09 | 0.16 | 99.84 |
| 14 | -0.50 | 1.400 | 0.21 | 0.38 | 99.62 |
| 18 | 0.00 | 1.000 | 0.36 | 0.65 | 99.35 |
| 25 | 0.50 | 0.710 | 0.64 | 1.15 | 98.85 |
| 35 | 1.00 | 0.500 | 1.17 | 2.11 | 97.89 |
| 45 | 1.50 | 0.355 | 1.86 | 3.35 | 96.65 |
| 60 | 2.00 | 0.250 | 3.37 | 6.06 | 93.94 |
| 80 | 2.50 | 0.180 | 5.66 | 10.19 | 89.81 |
| 120 | 3.00 | 0.125 | 13.29 | 23.92 | 76.08 |
| 170 | 3.50 | 0.090 | 32.56 | 58.59 | 41.41 |
| 200 | 3.75 | 0.075 | 37.48 | 67.45 | 32.55 |
| 230 | 4.00 | 0.063 | 46.81 | 84.24 | 15.76 |
| PAN | | | 55.55 | 99.96 | 0.04 |

PHI (5): 1.80 PHI (16): 2.71 PHI (25): 3.02
PHI (50): 3.38 PHI (75): 3.86 PHI (84): 4.00
PHI (95): 4.16

SIEVE LOSS (g): 0.02 SILT/CLAY: 32.55%
SKEWNESS: -0.613 KURTOSIS: 1.140

GRAPHIC METHOD

MEAN (PHI): 3.21 SORTING: 0.64
MEAN (mm): 0.11 MEDIAN (mm): 0.10
NOTE: MEAN WAS CALCULATED USING 5 POINT METHOD

MOMENT METHOD

MEAN (PHI): 3.13 SORTING: 0.74
MEAN (mm): 0.11

DATA FILE NAME: BP989#1.TAB

GRADATION ANALYSIS REPORT
BLIND PASS INTERIM DREDGING
TESTED BY: ID ON: 1/99

SAMPLE NO.: BP98-9#2
SAMPLE ELEV. (FT. NGVD): -2.0
SAMPLE DEPTH (FT.): 1.2
SAMPLE TYPE: CORE SAMPLE

USCS DESCRIPTION: SP-SM

DRY SAMPLE WEIGHT (GRAMS): 99.73
SAMPLE WEIGHT AFTER WASH (GRAMS): 83.24

| SIEVE SIZE | PHI SIZE | MESH SIZE (mm) | RETAINED (GRAMS) | RETAINED (%) | PASSED (%) |
|------------|----------|----------------|------------------|--------------|------------|
| 5/8 | -4.00 | 16.000 | 0.00 | 0.00 | 100.00 |
| 5/16 | -3.00 | 8.000 | 0.00 | 0.00 | 100.00 |
| 5 | -2.00 | 4.000 | 1.12 | 1.12 | 98.88 |
| 7 | -1.50 | 2.800 | 3.19 | 3.20 | 96.80 |
| 10 | -1.00 | 2.000 | 5.41 | 5.42 | 94.58 |
| 14 | -0.50 | 1.400 | 8.15 | 8.17 | 91.83 |
| 18 | 0.00 | 1.000 | 10.82 | 10.85 | 89.15 |
| 25 | 0.50 | 0.710 | 14.34 | 14.38 | 85.62 |
| 35 | 1.00 | 0.500 | 18.96 | 19.01 | 80.99 |
| 45 | 1.50 | 0.355 | 24.12 | 24.19 | 75.81 |
| 60 | 2.00 | 0.250 | 32.22 | 32.31 | 67.69 |
| 80 | 2.50 | 0.180 | 44.92 | 45.04 | 54.96 |
| 120 | 3.00 | 0.125 | 63.45 | 63.62 | 36.38 |
| 170 | 3.50 | 0.090 | 79.35 | 79.56 | 20.44 |
| 200 | 3.75 | 0.075 | 82.82 | 83.04 | 16.96 |
| 230 | 4.00 | 0.063 | 91.41 | 91.65 | 8.35 |
| PAN | | | 99.72 | 99.99 | 0.01 |

PHI (5): -1.10 PHI (16): 0.67 PHI (25): 1.55
PHI (50): 2.63 PHI (75): 3.36 PHI (84): 3.78
PHI (95): 4.10

SIEVE LOSS (g): 0.01 SILT/CLAY: 16.96%
SKEWNESS: -0.730 KURTOSIS: 1.178

GRAPHIC METHOD

MEAN (PHI): 2.02 SORTING: 1.55
MEAN (mm): 0.25 MEDIAN (mm): 0.16
NOTE: MEAN WAS CALCULATED USING 5 POINT METHOD

MOMENT METHOD

MEAN (PHI): 2.08 SORTING: 1.50
MEAN (mm): 0.24

DATA FILE NAME: BP989#2.TAB

GRADATION ANALYSIS REPORT
BLIND PASS INTERIM DREDGING
TESTED BY: ID ON: 1/99

SAMPLE NO.: BP98-9#3
SAMPLE ELEV. (FT. NGVD): -3.1
SAMPLE DEPTH (FT.): 2.3
SAMPLE TYPE: CORE SAMPLE

USCS DESCRIPTION: SP

DRY SAMPLE WEIGHT (GRAMS): 118.40
SAMPLE WEIGHT AFTER WASH (GRAMS): 115.05

| SIEVE SIZE | PHI SIZE | MESH SIZE (mm) | RETAINED (GRAMS) | RETAINED (%) | PASSED (%) |
|------------|----------|----------------|------------------|--------------|------------|
| 5/8 | -4.00 | 16.000 | 0.00 | 0.00 | 100.00 |
| 5/16 | -3.00 | 8.000 | 0.00 | 0.00 | 100.00 |
| 5 | -2.00 | 4.000 | 4.17 | 3.52 | 96.48 |
| 7 | -1.50 | 2.800 | 8.52 | 7.20 | 92.80 |
| 10 | -1.00 | 2.000 | 15.38 | 12.99 | 87.01 |
| 14 | -0.50 | 1.400 | 25.89 | 21.87 | 78.13 |
| 18 | 0.00 | 1.000 | 36.87 | 31.14 | 68.86 |
| 25 | 0.50 | 0.710 | 49.10 | 41.47 | 58.53 |
| 35 | 1.00 | 0.500 | 63.63 | 53.74 | 46.26 |
| 45 | 1.50 | 0.355 | 74.40 | 62.84 | 37.16 |
| 60 | 2.00 | 0.250 | 91.69 | 77.44 | 22.56 |
| 80 | 2.50 | 0.180 | 106.49 | 89.94 | 10.06 |
| 120 | 3.00 | 0.125 | 112.64 | 95.14 | 4.86 |
| 170 | 3.50 | 0.090 | 114.82 | 96.98 | 3.02 |
| 200 | 3.75 | 0.075 | 115.03 | 97.15 | 2.85 |
| 230 | 4.00 | 0.063 | 116.71 | 98.58 | 1.42 |
| PAN | | | 118.40 | 100.00 | 0.00 |

PHI (5): -1.80 PHI (16): -0.83 PHI (25): -0.33
PHI (50): 0.85 PHI (75): 1.92 PHI (84): 2.26
PHI (95): 2.99

SIEVE LOSS (g): 0.00 SILT/CLAY: 2.85%
SKEWNESS: -0.164 KURTOSIS: 0.873

GRAPHIC METHOD

MEAN (PHI): 0.69 SORTING: 1.55
MEAN (mm): 0.62 MEDIAN (mm): 0.56
NOTE: MEAN WAS CALCULATED USING 5 POINT METHOD

MOMENT METHOD

MEAN (PHI): 0.73 SORTING: 1.45
MEAN (mm): 0.60

DATA FILE NAME: BP989#3.TAB

GRADATION ANALYSIS REPORT
BLIND PASS INTERIM DREDGING
TESTED BY: ID ON: 1/99

SAMPLE NO.: BP98-10#1
SAMPLE ELEV. (FT. NGVD): -1.3
SAMPLE DEPTH (FT.): 0.5
SAMPLE TYPE: CORE SAMPLE

USCS DESCRIPTION: SP-SM

DRY SAMPLE WEIGHT (GRAMS): 70.47
SAMPLE WEIGHT AFTER WASH (GRAMS): 55.16

| SIEVE SIZE | PHI SIZE | MESH SIZE (mm) | RETAINED (GRAMS) | RETAINED (%) | PASSED (%) |
|------------|----------|----------------|------------------|--------------|------------|
| 5/8 | -4.00 | 16.000 | 0.00 | 0.00 | 100.00 |
| 5/16 | -3.00 | 8.000 | 0.00 | 0.00 | 100.00 |
| 5 | -2.00 | 4.000 | 0.00 | 0.00 | 100.00 |
| 7 | -1.50 | 2.800 | 0.18 | 0.26 | 99.74 |
| 10 | -1.00 | 2.000 | 0.42 | 0.60 | 99.40 |
| 14 | -0.50 | 1.400 | 0.73 | 1.04 | 98.96 |
| 18 | 0.00 | 1.000 | 1.05 | 1.49 | 98.51 |
| 25 | 0.50 | 0.710 | 1.60 | 2.27 | 97.73 |
| 35 | 1.00 | 0.500 | 2.60 | 3.69 | 96.31 |
| 45 | 1.50 | 0.355 | 4.29 | 6.09 | 93.91 |
| 60 | 2.00 | 0.250 | 9.29 | 13.18 | 86.82 |
| 80 | 2.50 | 0.180 | 23.78 | 33.74 | 66.26 |
| 120 | 3.00 | 0.125 | 42.38 | 60.14 | 39.86 |
| 170 | 3.50 | 0.090 | 52.56 | 74.58 | 25.42 |
| 200 | 3.75 | 0.075 | 54.76 | 77.71 | 22.29 |
| 230 | 4.00 | 0.063 | 62.69 | 88.97 | 11.03 |
| PAN | | | 70.45 | 99.97 | 0.03 |

PHI (5): 1.27 PHI (16): 2.07 PHI (25): 2.29
PHI (50): 2.81 PHI (75): 3.53 PHI (84): 3.89
PHI (95): 4.13

SIEVE LOSS (g): 0.02 SILT/CLAY: 22.29%
SKEWNESS: -0.115 KURTOSIS: 0.941

GRAPHIC METHOD

MEAN (PHI): 2.83 SORTING: 0.91
MEAN (mm): 0.14 MEDIAN (mm): 0.14
NOTE: MEAN WAS CALCULATED USING 5 POINT METHOD

MOMENT METHOD

MEAN (PHI): 2.65 SORTING: 0.87
MEAN (mm): 0.16

DATA FILE NAME: BP9810#1.TAB

GRADATION ANALYSIS REPORT
BLIND PASS INTERIM DREDGING
TESTED BY: ID ON: 1/99

SAMPLE NO.: BP98-10#2
SAMPLE ELEV. (FT. NGVD): -2.6
SAMPLE DEPTH (FT.): 1.8
SAMPLE TYPE: CORE SAMPLE

USCS DESCRIPTION: SP-SM

DRY SAMPLE WEIGHT (GRAMS): 103.49
SAMPLE WEIGHT AFTER WASH (GRAMS): 89.19

| SIEVE SIZE | PHI SIZE | MESH SIZE (mm) | RETAINED (GRAMS) | RETAINED (%) | PASSED (%) |
|------------|----------|----------------|------------------|--------------|------------|
| 5/8 | -4.00 | 16.000 | 0.00 | 0.00 | 100.00 |
| 5/16 | -3.00 | 8.000 | 0.00 | 0.00 | 100.00 |
| 5 | -2.00 | 4.000 | 0.55 | 0.53 | 99.47 |
| 7 | -1.50 | 2.800 | 1.72 | 1.66 | 98.34 |
| 10 | -1.00 | 2.000 | 3.44 | 3.32 | 96.68 |
| 14 | -0.50 | 1.400 | 5.34 | 5.16 | 94.84 |
| 18 | 0.00 | 1.000 | 6.98 | 6.74 | 93.26 |
| 25 | 0.50 | 0.710 | 8.36 | 8.08 | 91.92 |
| 35 | 1.00 | 0.500 | 10.23 | 9.89 | 90.11 |
| 45 | 1.50 | 0.355 | 12.15 | 11.74 | 88.26 |
| 60 | 2.00 | 0.250 | 20.21 | 19.53 | 80.47 |
| 80 | 2.50 | 0.180 | 44.09 | 42.60 | 57.40 |
| 120 | 3.00 | 0.125 | 75.36 | 72.82 | 27.18 |
| 170 | 3.50 | 0.090 | 87.42 | 84.47 | 15.53 |
| 200 | 3.75 | 0.075 | 88.85 | 85.85 | 14.15 |
| 230 | 4.00 | 0.063 | 96.24 | 92.99 | 7.01 |
| PAN | | | 103.48 | 99.99 | 0.01 |

PHI (5): -0.54 PHI (16): 1.77 PHI (25): 2.12
PHI (50): 2.62 PHI (75): 3.09 PHI (84): 3.48
PHI (95): 4.07

SIEVE LOSS (g): 0.01 SILT/CLAY: 14.15%
SKEWNESS: -1.007 KURTOSIS: 1.939

GRAPHIC METHOD

MEAN (PHI): 2.28 SORTING: 0.85
MEAN (mm): 0.21 MEDIAN (mm): 0.16
NOTE: MEAN WAS CALCULATED USING 5 POINT METHOD

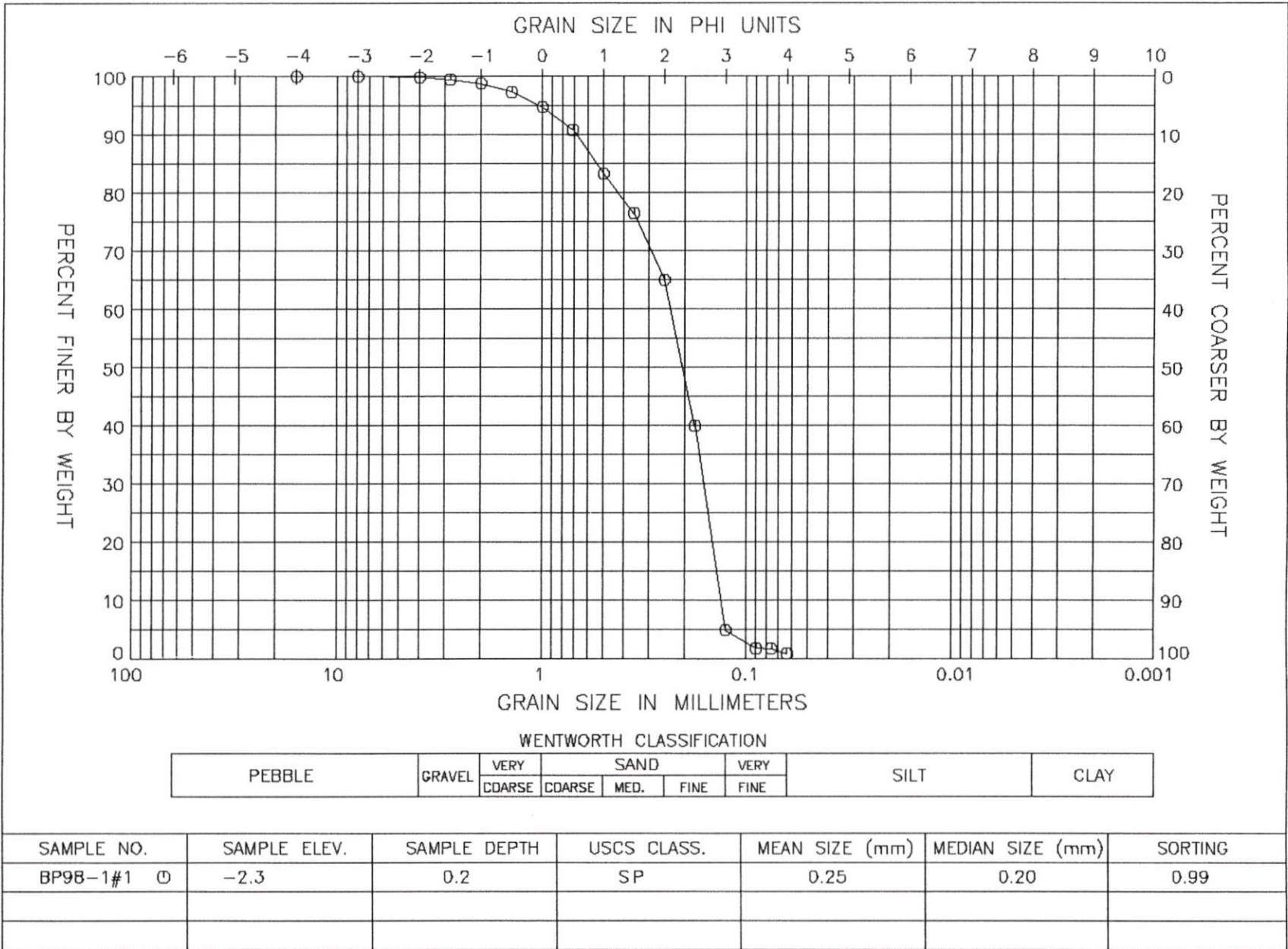
MOMENT METHOD

MEAN (PHI): 2.32 SORTING: 1.18
MEAN (mm): 0.20

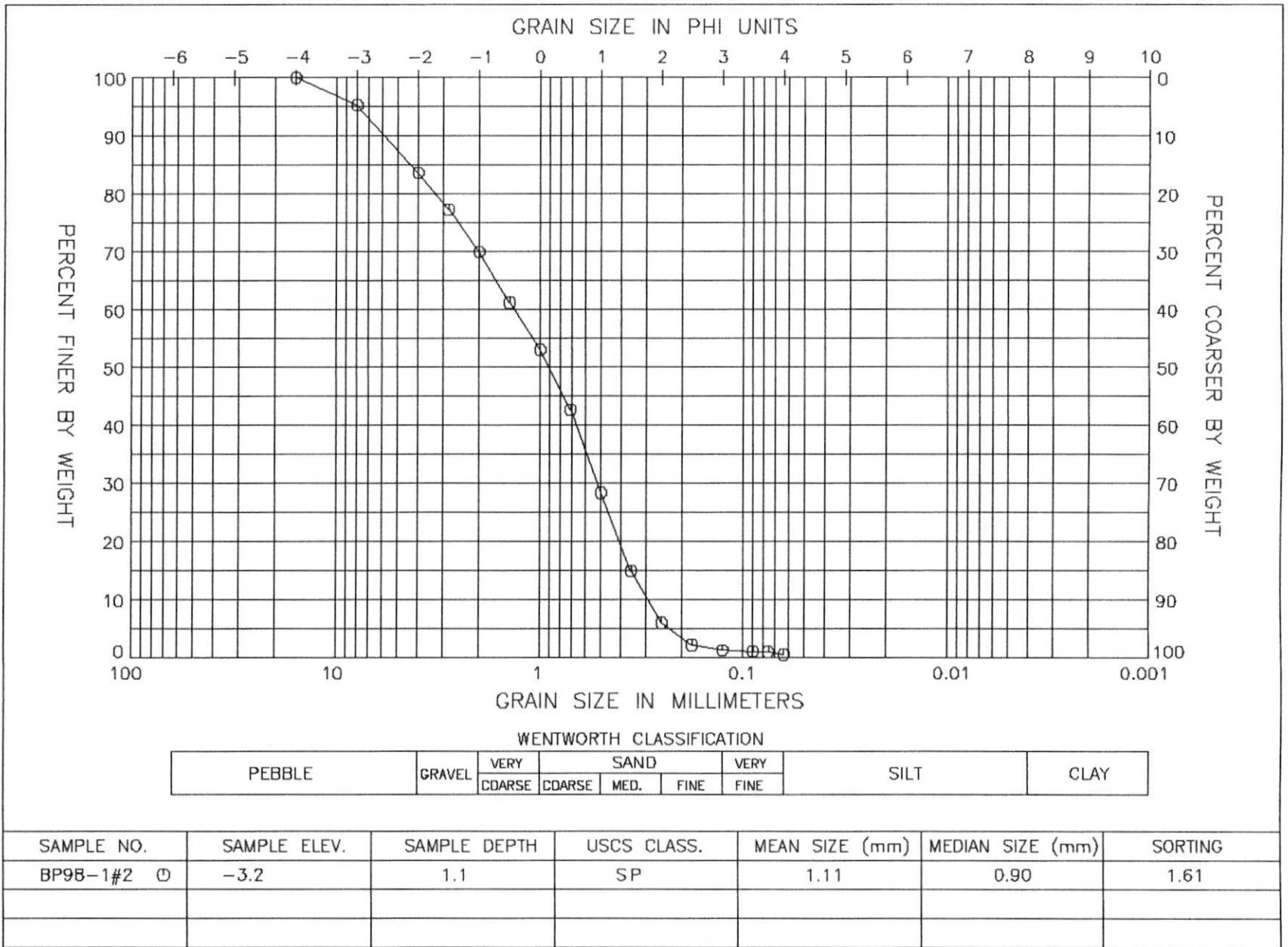
DATA FILE NAME: BP9810#2.TAB

APPENDIX C
GRAIN SIZE DISTRIBUTION CURVES

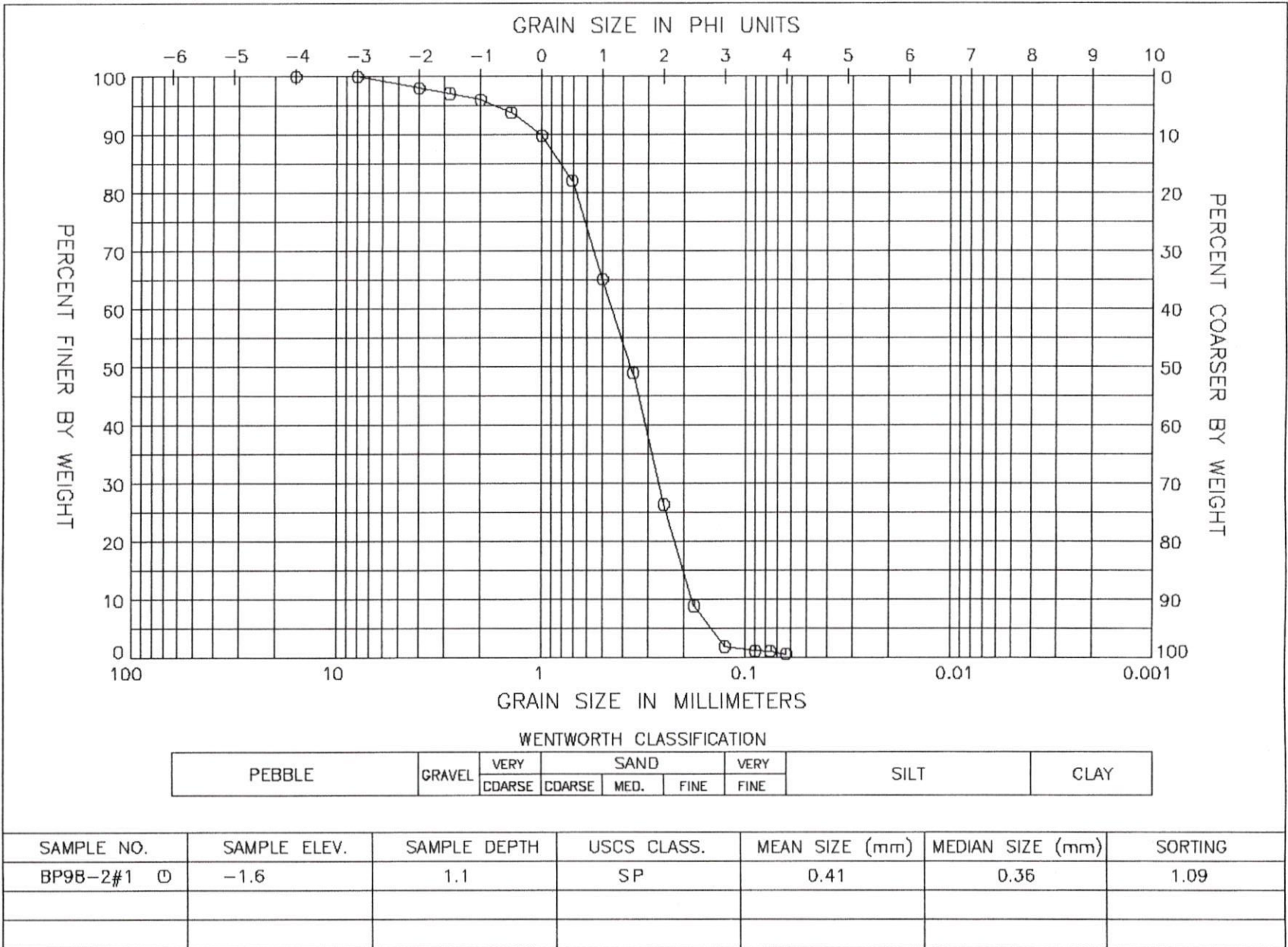
GRAIN SIZE DISTRIBUTION CURVE
BLIND PASS INTERIM DREDGING



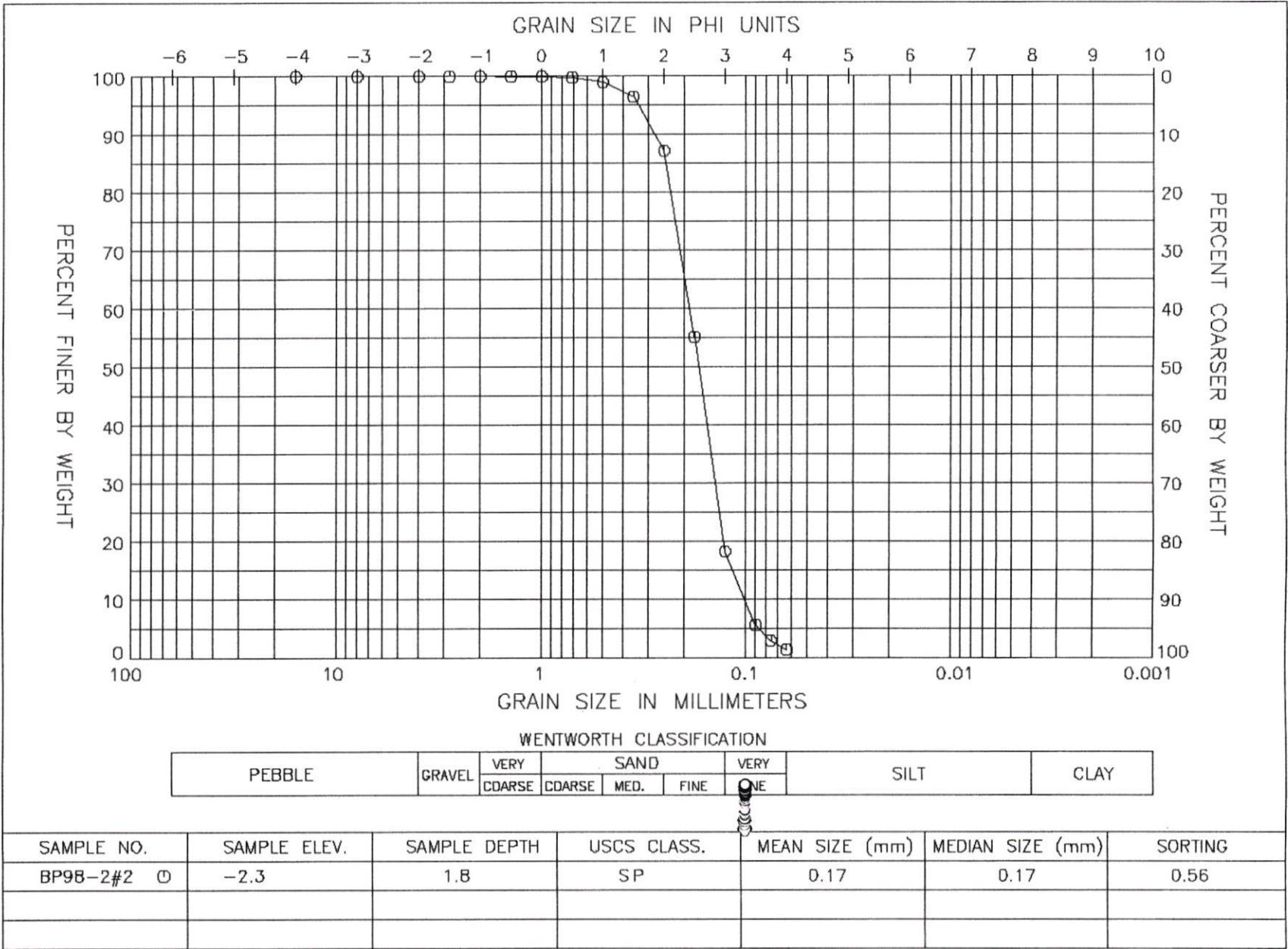
GRAIN SIZE DISTRIBUTION CURVE
BLIND PASS INTERIM DREDGING



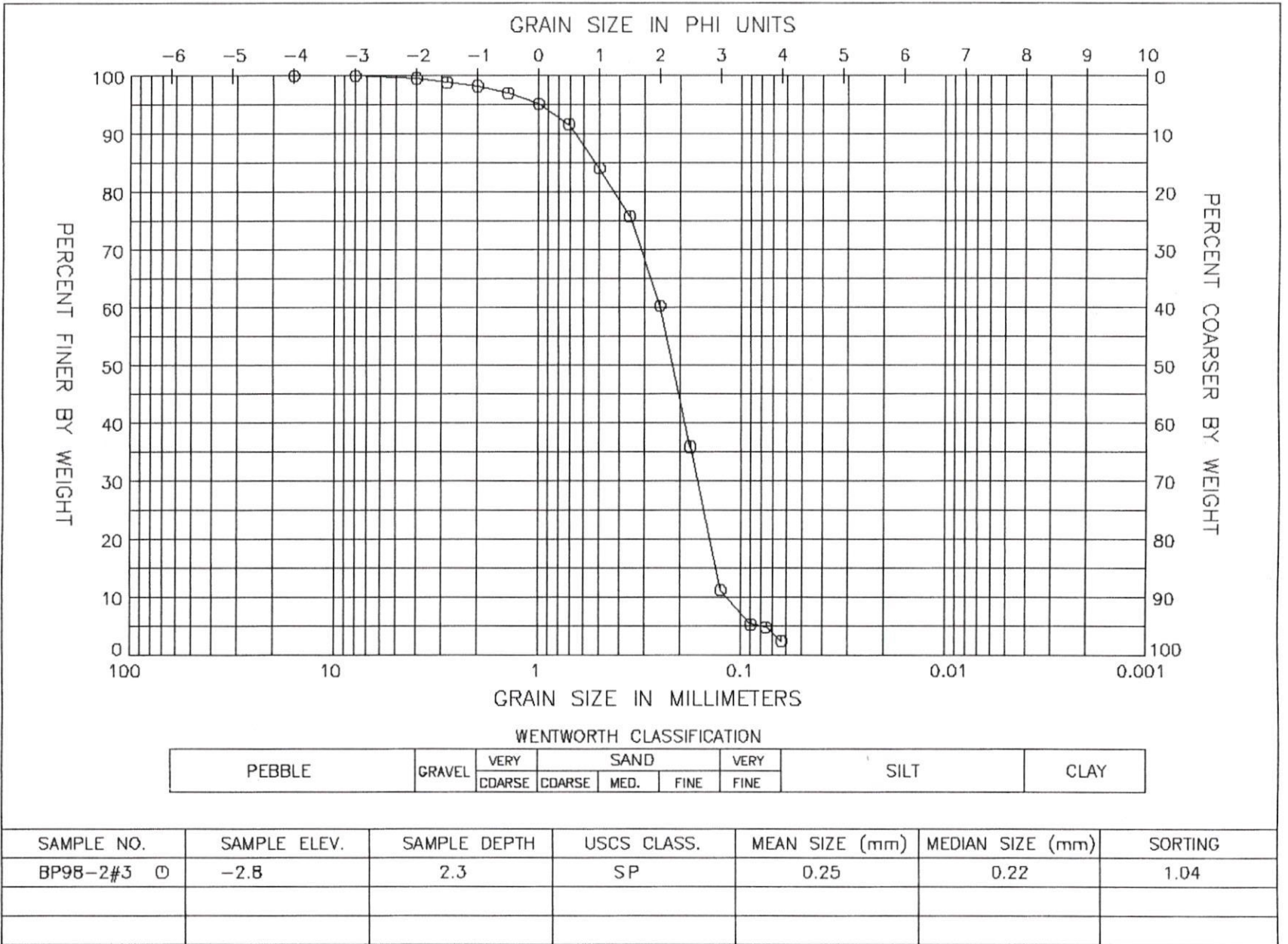
GRAIN SIZE DISTRIBUTION CURVE
BLIND PASS INTERIM DREDGING



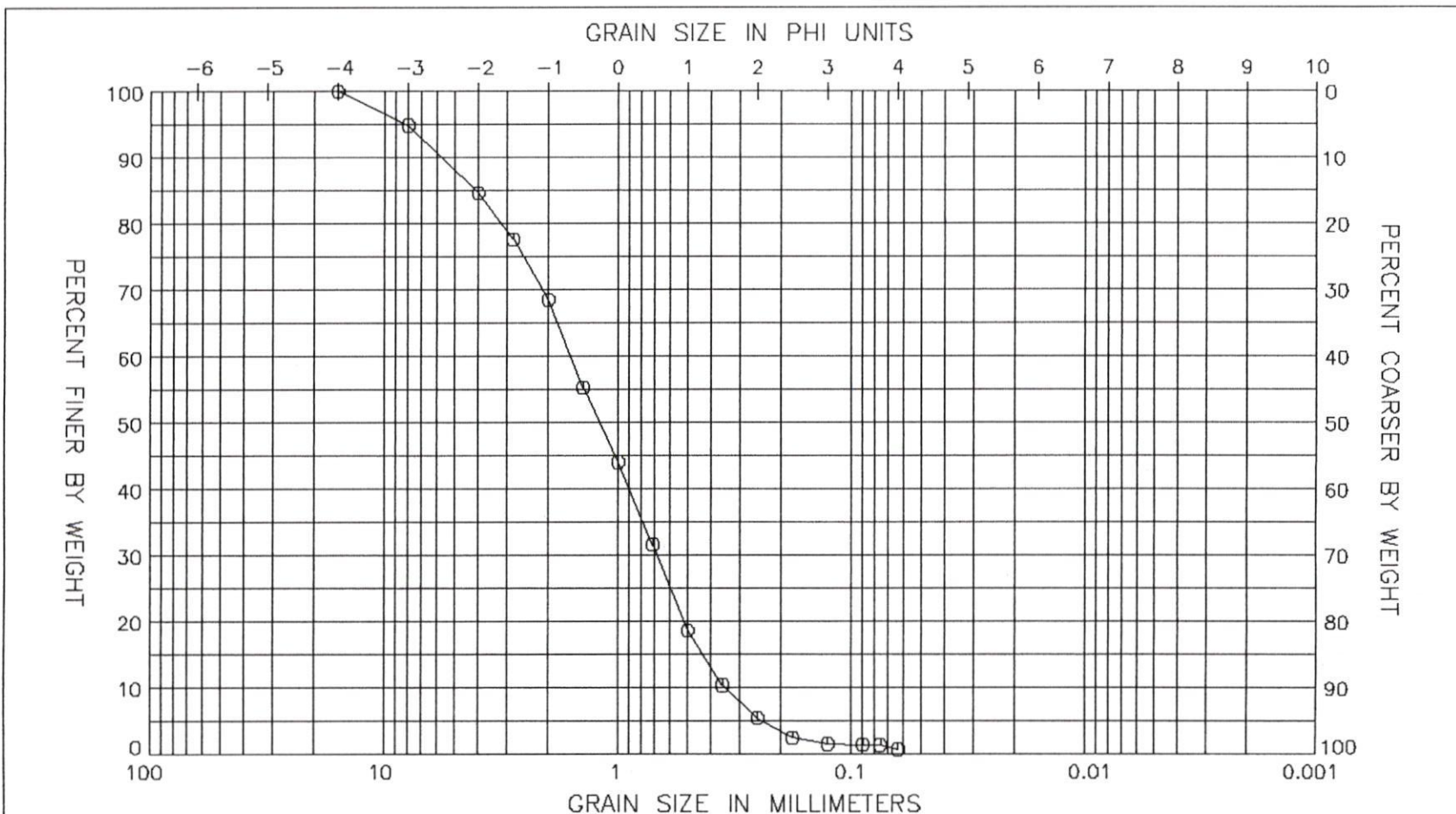
GRAIN SIZE DISTRIBUTION CURVE
BLIND PASS INTERIM DREDGING



GRAIN SIZE DISTRIBUTION CURVE
 BLIND PASS INTERIM DREDGING



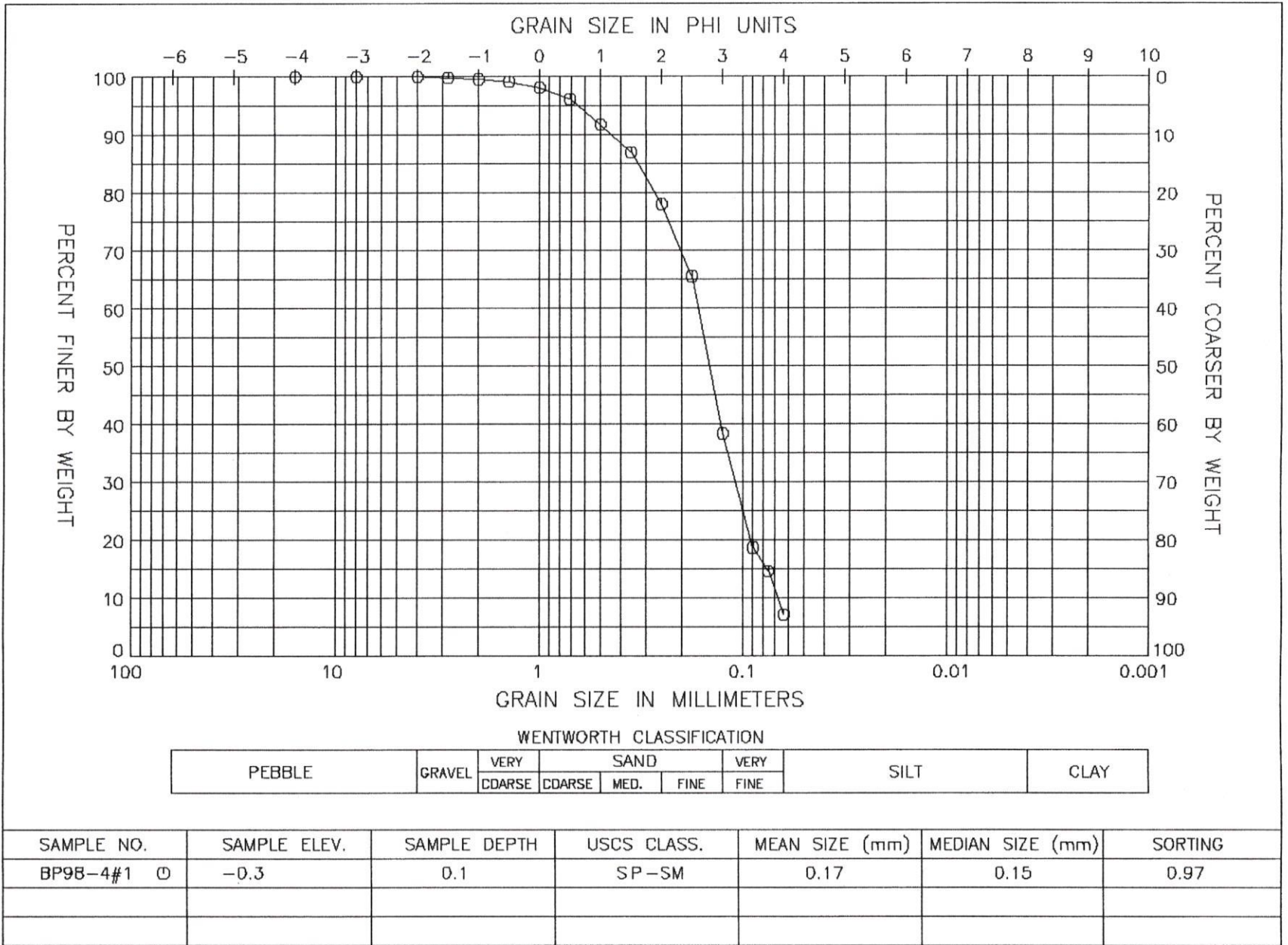
GRAIN SIZE DISTRIBUTION CURVE
BLIND PASS INTERIM DREDGING



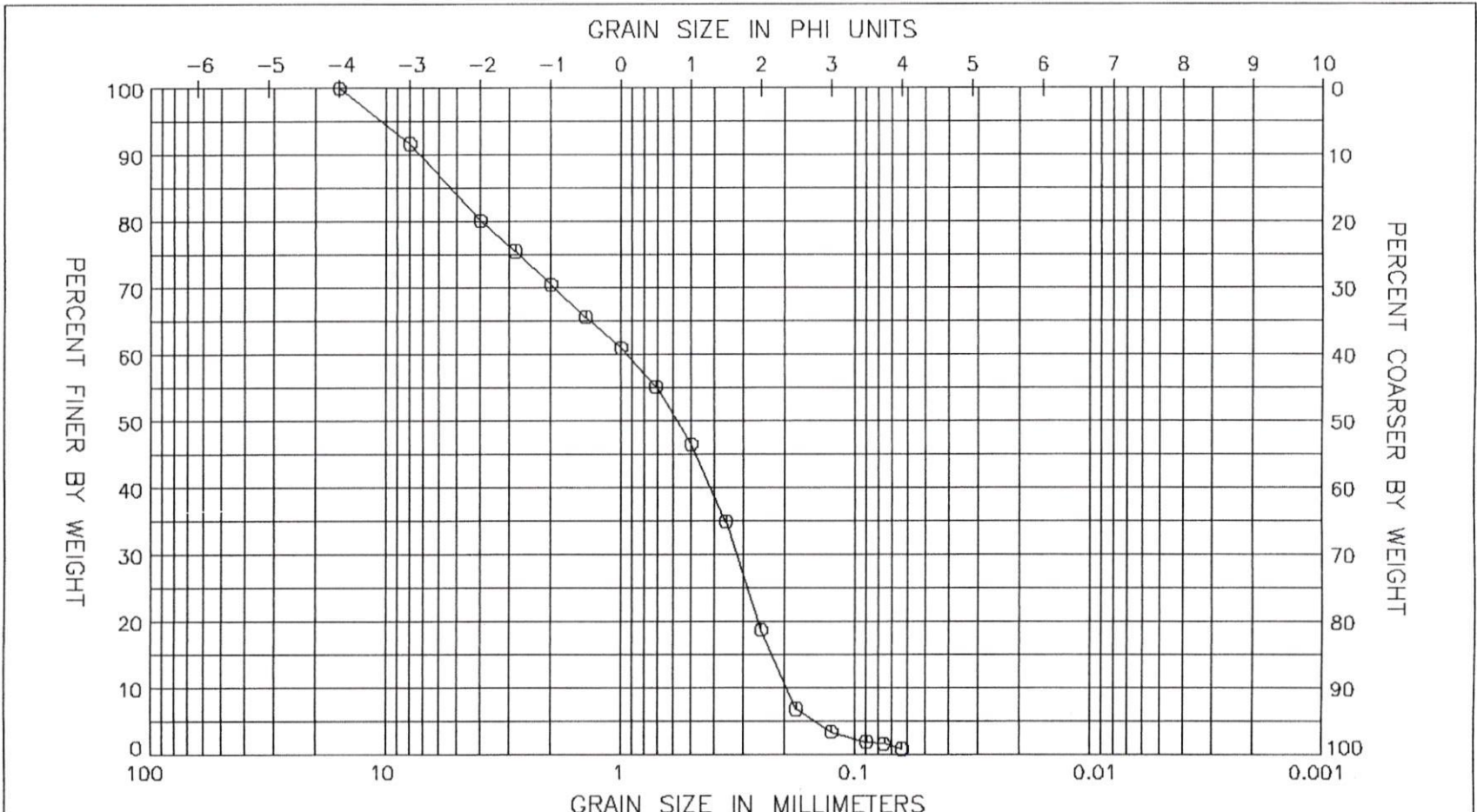
| | | | | | | | |
|--------------------------|--------|--------|--------|------|------|------|------|
| WENTWORTH CLASSIFICATION | | | | | | | |
| PEBBLE | GRAVEL | VERY | SAND | | VERY | SILT | CLAY |
| | | COARSE | COARSE | MED. | FINE | | |

| SAMPLE NO. | SAMPLE ELEV. | SAMPLE DEPTH | USCS CLASS. | MEAN SIZE (mm) | MEDIAN SIZE (mm) | SORTING |
|------------|--------------|--------------|-------------|----------------|------------------|---------|
| BP98-3#1 ⊕ | -2.1 | 1.1 | SP | 1.28 | 1.20 | 1.51 |
| | | | | | | |
| | | | | | | |

GRAIN SIZE DISTRIBUTION CURVE
BLIND PASS INTERIM DREDGING



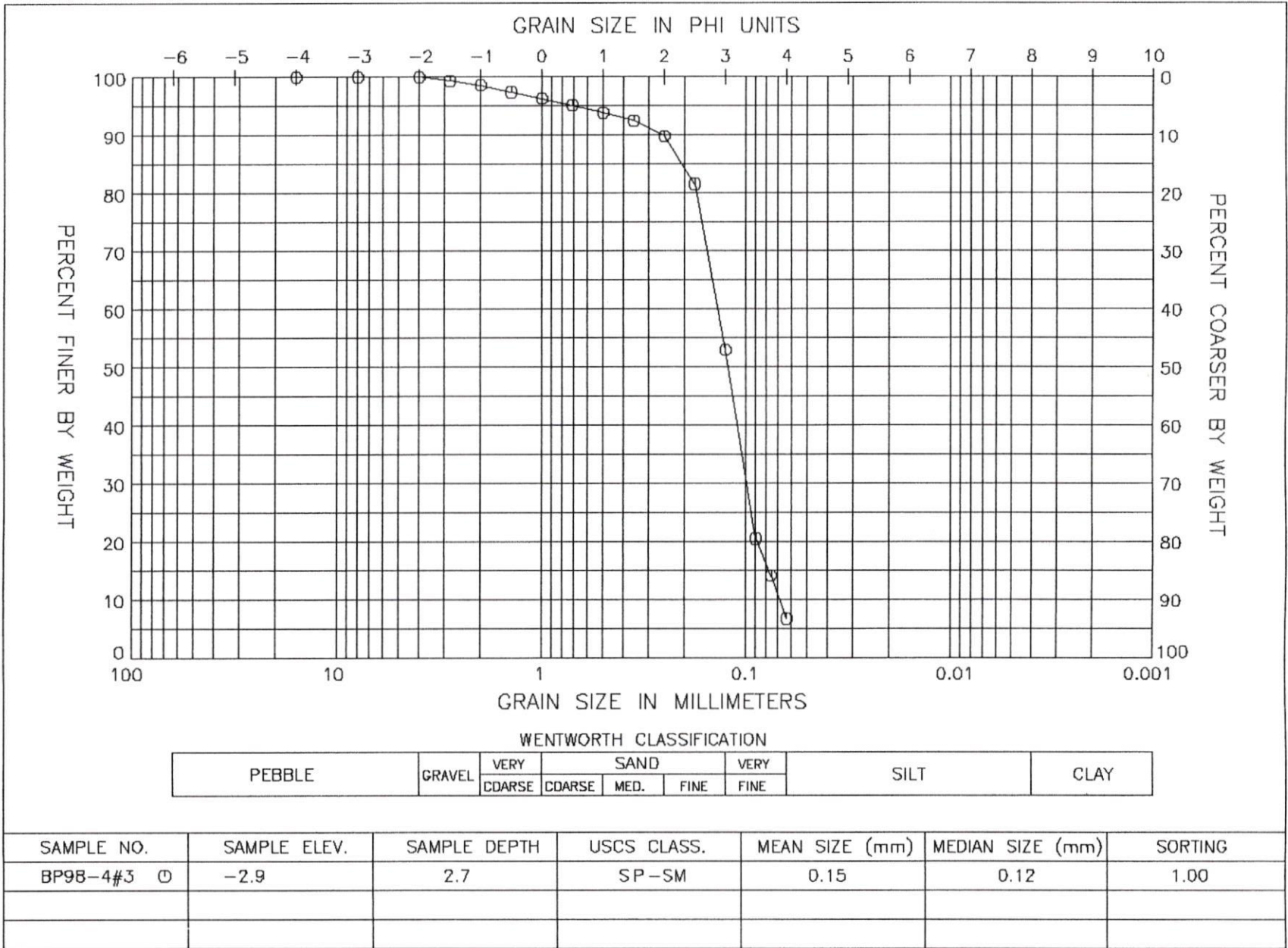
GRAIN SIZE DISTRIBUTION CURVE
BLIND PASS INTERIM DREDGING



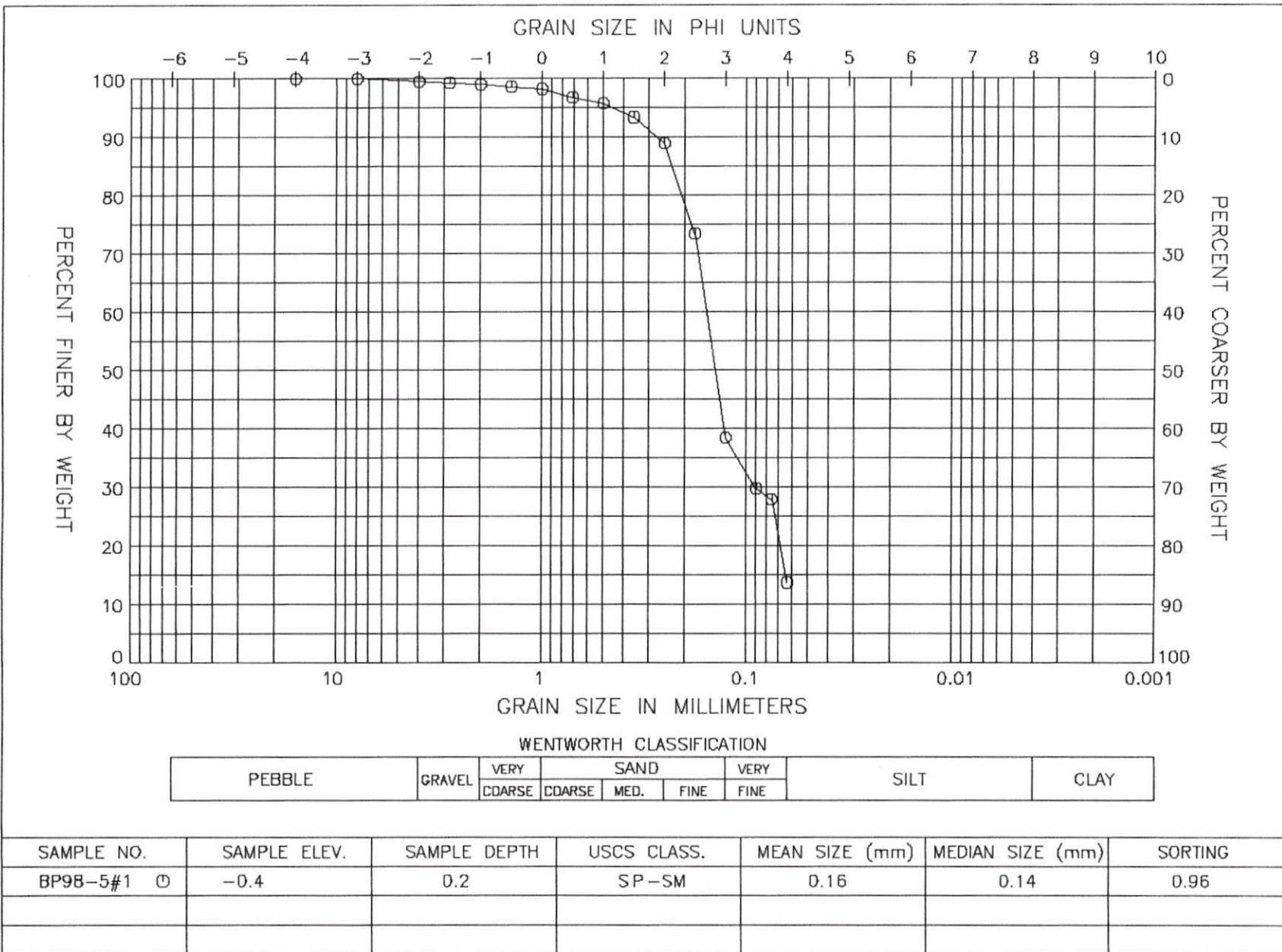
| | | | | | | | | |
|--------|--------|--------|--------|------|------|------|------|------|
| PEBBLE | GRAVEL | VERY | SAND | | | VERY | SILT | CLAY |
| | | CDARSE | CDARSE | MED. | FINE | FINE | | |

| SAMPLE NO. | SAMPLE ELEV. | SAMPLE DEPTH | USCS CLASS. | MEAN SIZE (mm) | MEDIAN SIZE (mm) | SORTING |
|------------------|--------------|--------------|-------------|----------------|------------------|---------|
| BP98-4#2 \odot | -1.3 | 1.1 | SP | 0.88 | 0.58 | 1.97 |
| | | | | | | |
| | | | | | | |

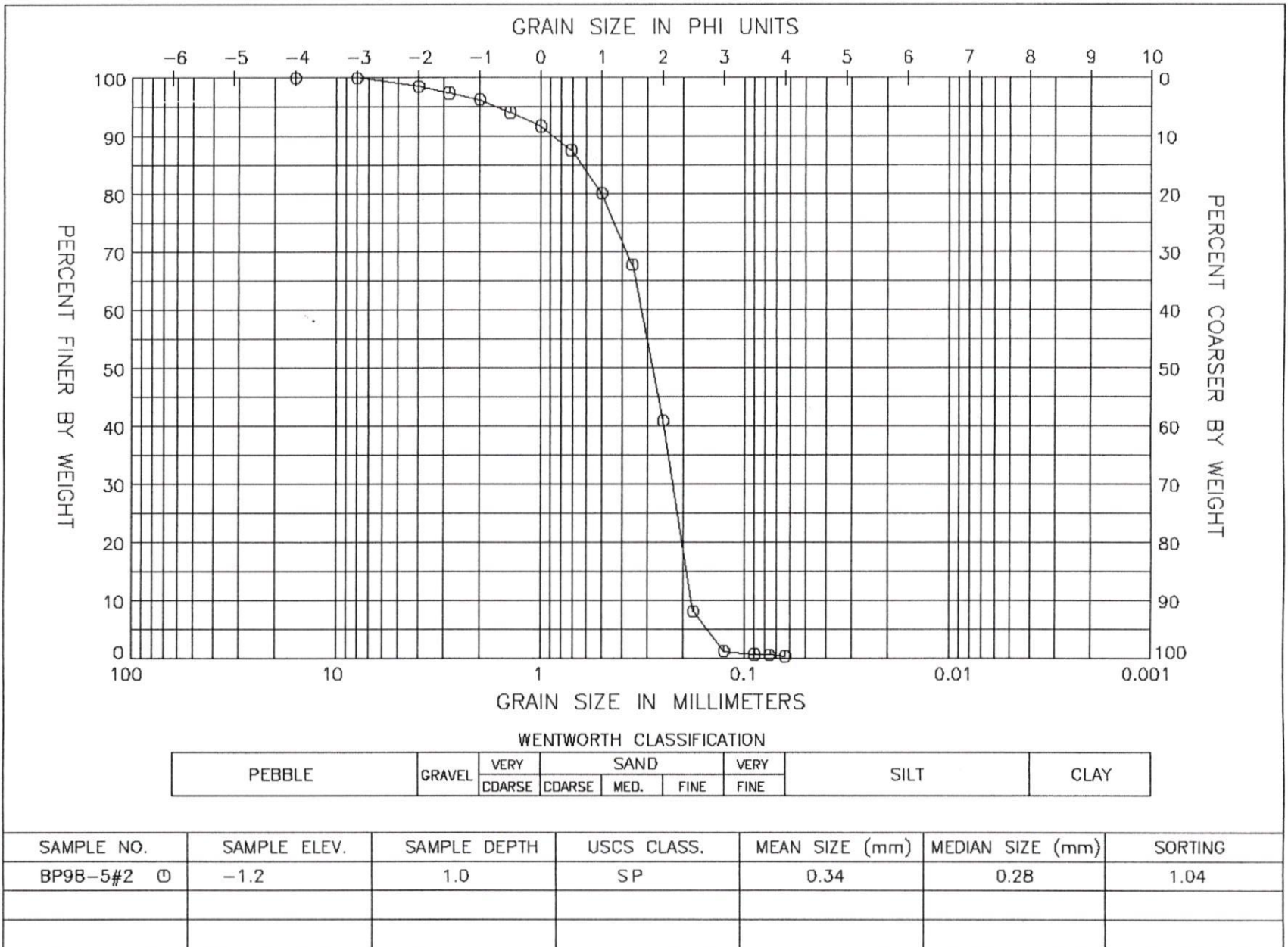
GRAIN SIZE DISTRIBUTION CURVE
BLIND PASS INTERIM DREDGING



GRAIN SIZE DISTRIBUTION CURVE
BLIND PASS INTERIM DREDGING



GRAIN SIZE DISTRIBUTION CURVE
BLIND PASS INTERIM DREDGING



GRAIN SIZE DISTRIBUTION CURVE
BLIND PASS INTERIM DREDGING

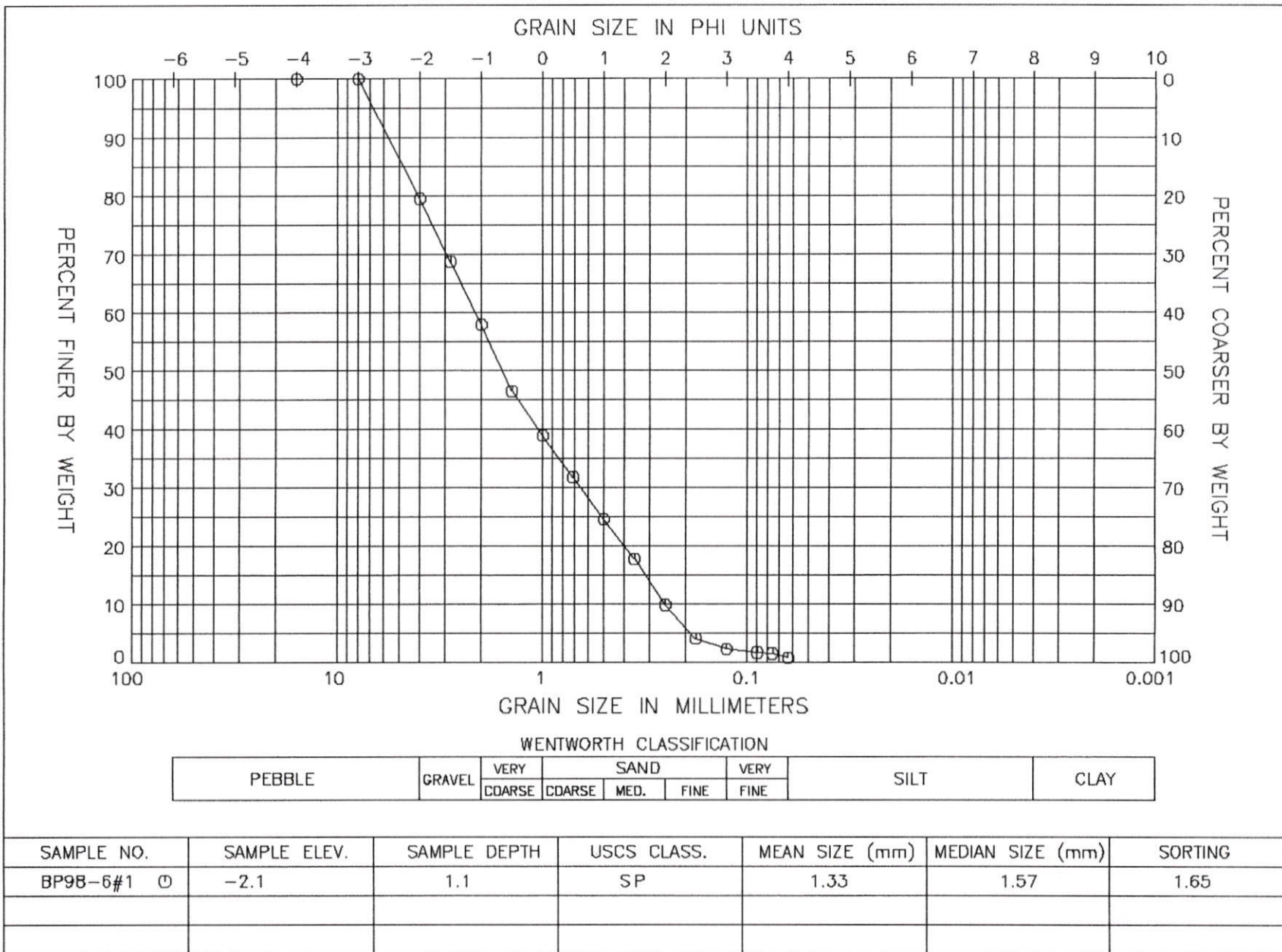


WENTWORTH CLASSIFICATION

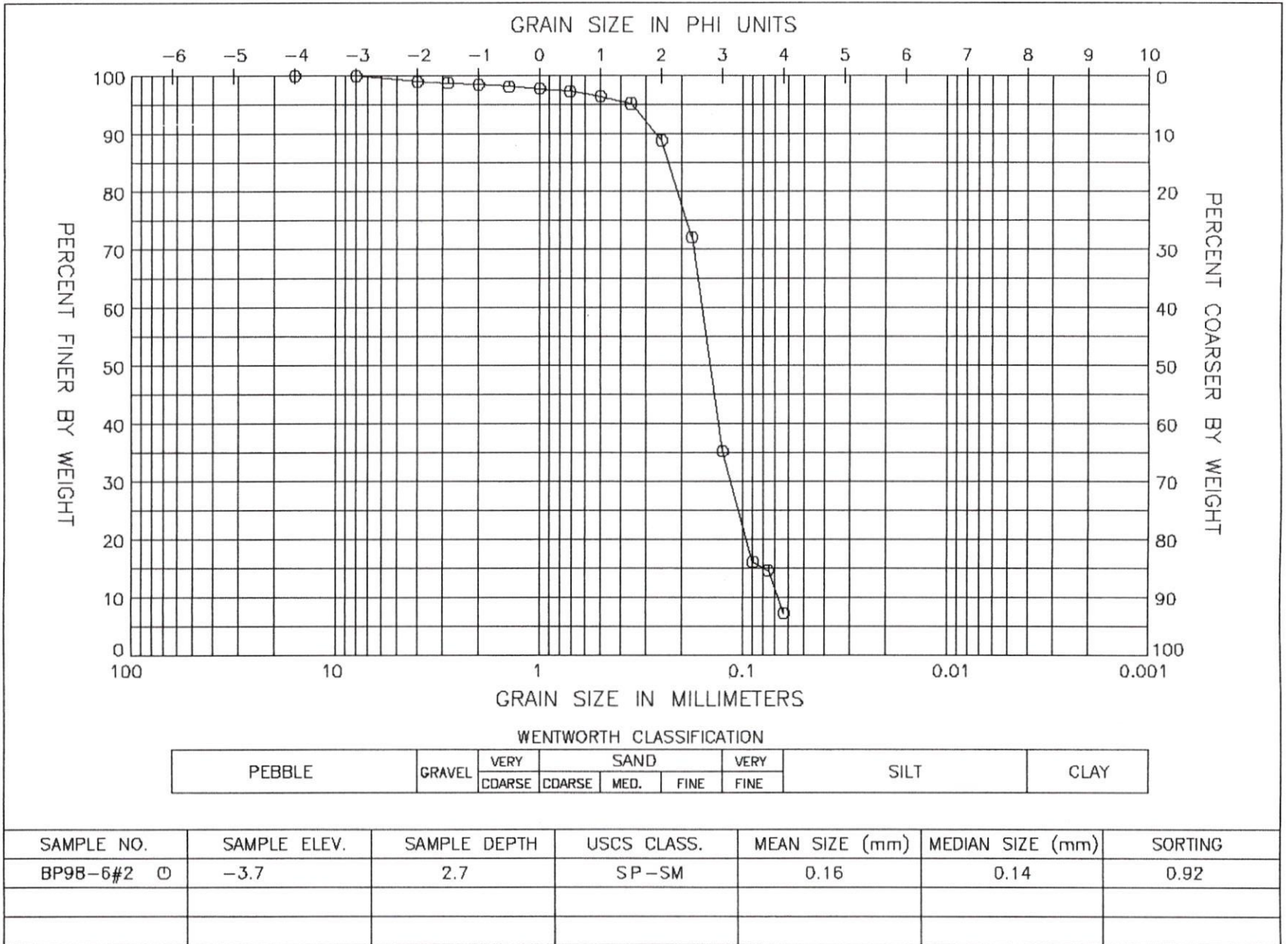
| | | | | | | | | |
|--------|--------|-------------|--------|------|------|-----------|------|------|
| PEBBLE | GRAVEL | SAND | | | | VERY FINE | SILT | CLAY |
| | | VERY COARSE | COARSE | MED. | FINE | | | |

| SAMPLE NO. | SAMPLE ELEV. | SAMPLE DEPTH | USCS CLASS. | MEAN SIZE (mm) | MEDIAN SIZE (mm) | SORTING |
|------------------|--------------|--------------|-------------|----------------|------------------|---------|
| BP9B-5#3 \odot | -2.1 | 1.9 | SP-SM | 0.15 | 0.12 | 1.15 |
| | | | | | | |
| | | | | | | |

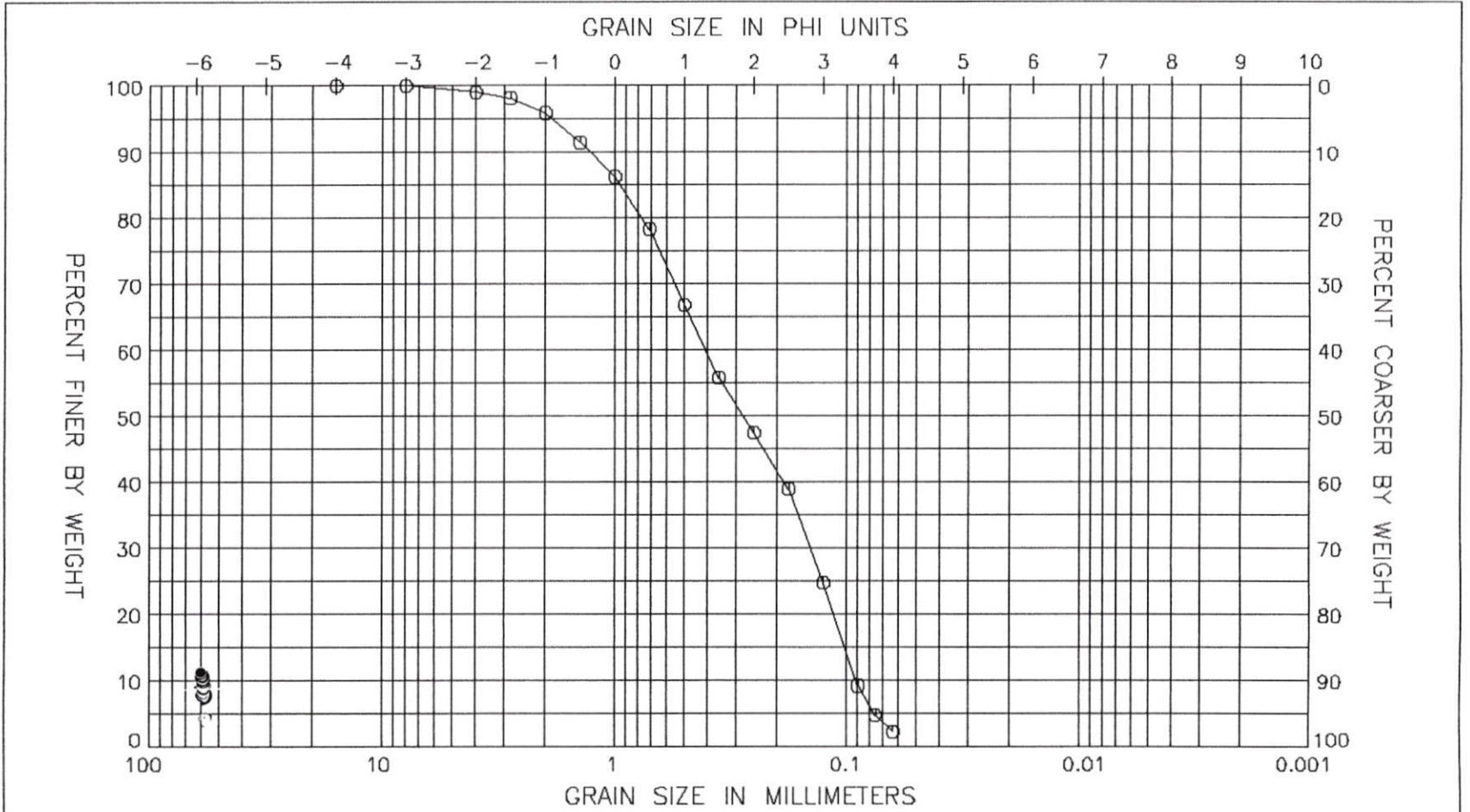
GRAIN SIZE DISTRIBUTION CURVE
BLIND PASS INTERIM DREDGING



GRAIN SIZE DISTRIBUTION CURVE
BLIND PASS INTERIM DREDGING



GRAIN SIZE DISTRIBUTION CURVE
BLIND PASS INTERIM DREDGING

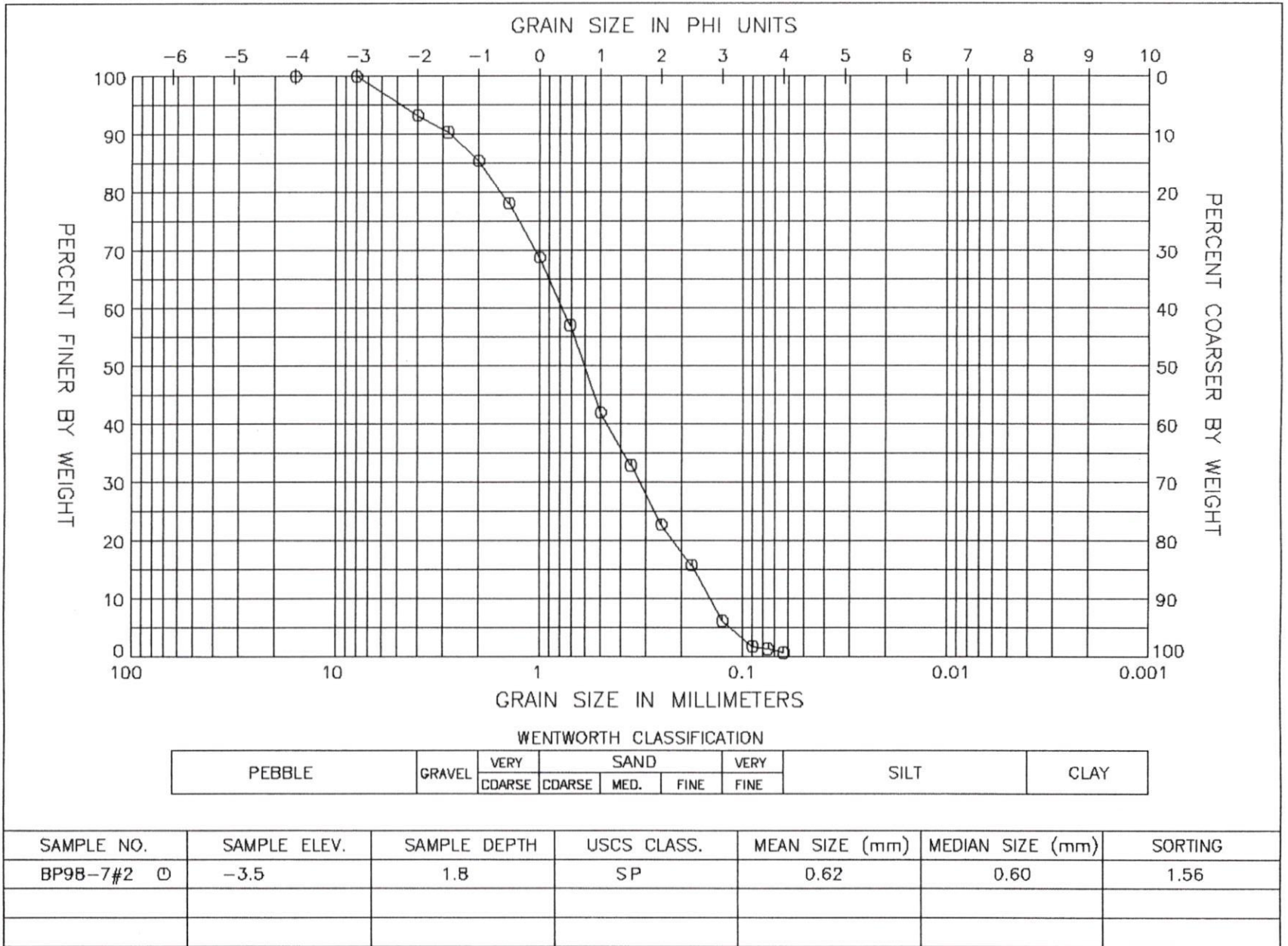


WENTWORTH CLASSIFICATION

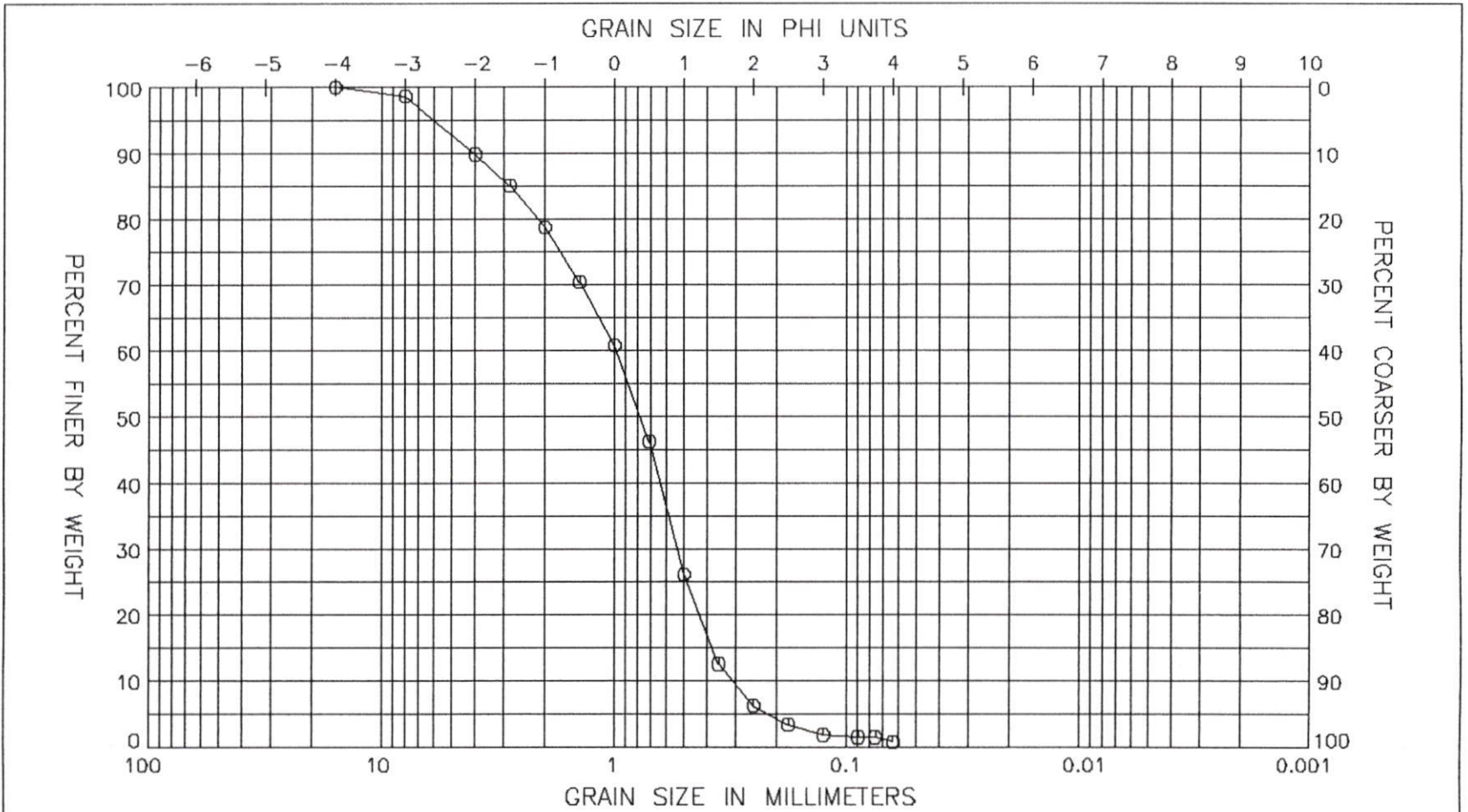
| | | | | | | | | |
|--------|--------|-------------|--------|------|------|-----------|------|------|
| PEBBLE | GRAVEL | SAND | | | | VERY FINE | SILT | CLAY |
| | | VERY COARSE | COARSE | MED. | FINE | | | |

| SAMPLE NO. | SAMPLE ELEV. | SAMPLE DEPTH | USCS CLASS. | MEAN SIZE (mm) | MEDIAN SIZE (mm) | SORTING |
|------------------|--------------|--------------|-------------|----------------|------------------|---------|
| BP98-7#1 \odot | -2.1 | 0.4 | SP | 0.32 | 0.28 | 1.45 |
| | | | | | | |
| | | | | | | |

GRAIN SIZE DISTRIBUTION CURVE
 BLIND PASS INTERIM DREDGING



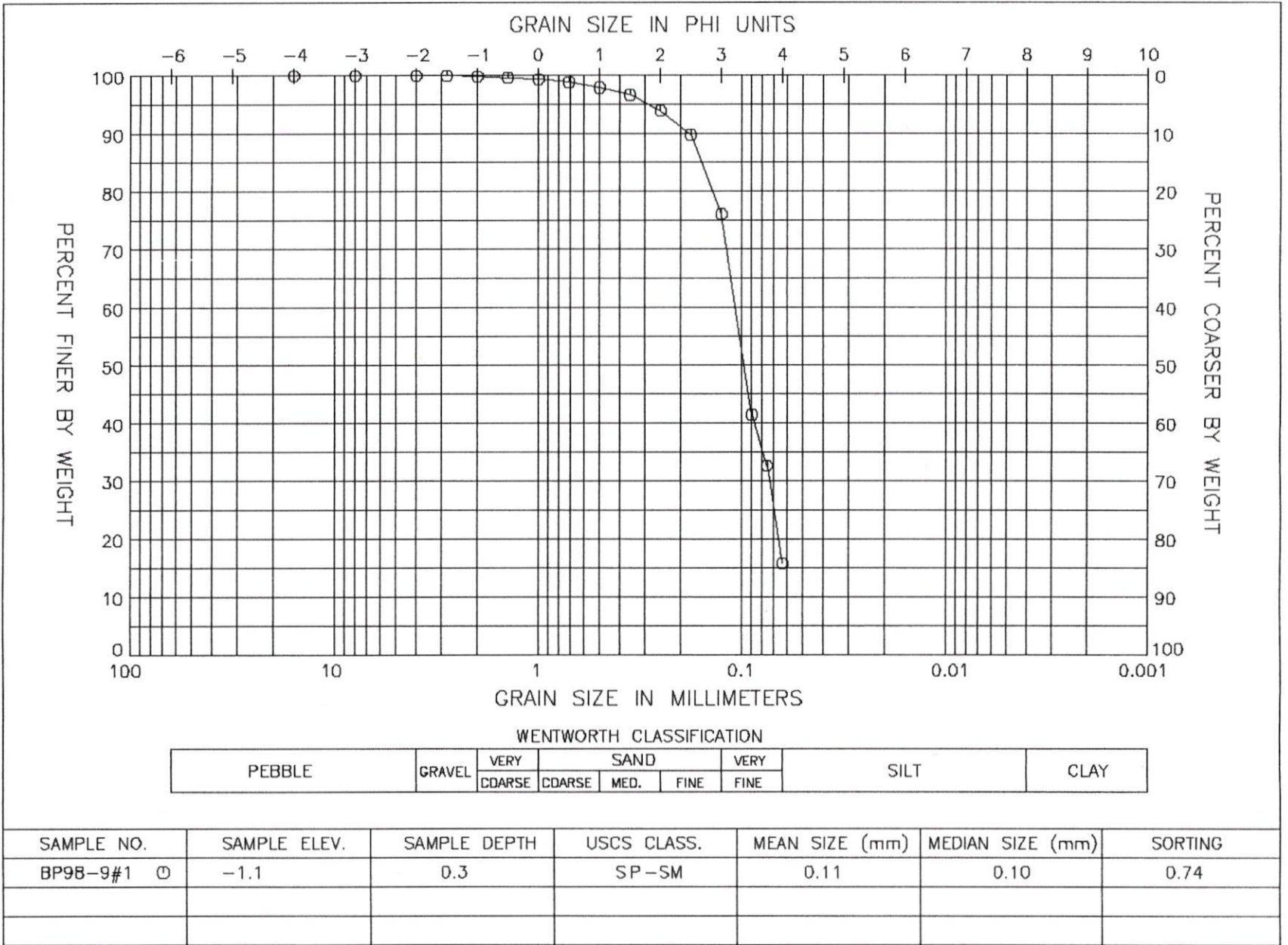
GRAIN SIZE DISTRIBUTION CURVE
BLIND PASS INTERIM DREDGING



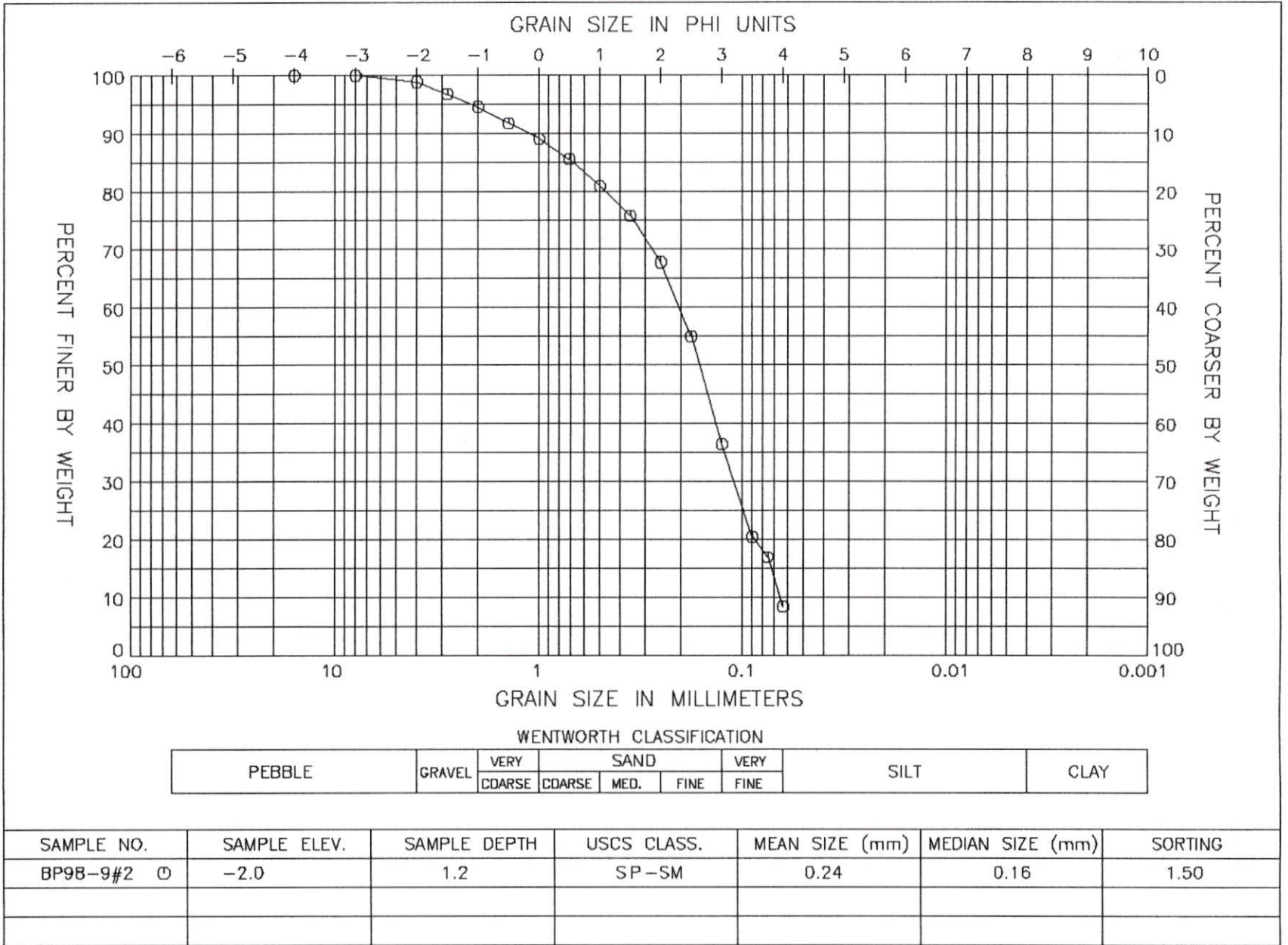
| | | | | | | | | |
|--------------------------|--------|--------|--------|------|------|------|------|------|
| WENTWORTH CLASSIFICATION | | | | | | | | |
| PEBBLE | GRAVEL | VERY | SAND | | | VERY | SILT | CLAY |
| | | COARSE | COARSE | MED. | FINE | FINE | | |

| SAMPLE NO. | SAMPLE ELEV. | SAMPLE DEPTH | USCS CLASS. | MEAN SIZE (mm) | MEDIAN SIZE (mm) | SORTING |
|------------|--------------|--------------|-------------|----------------|------------------|---------|
| BP98-8#1 ⊕ | -2.3 | 1.3 | SP | 0.93 | 0.77 | 1.40 |
| | | | | | | |
| | | | | | | |

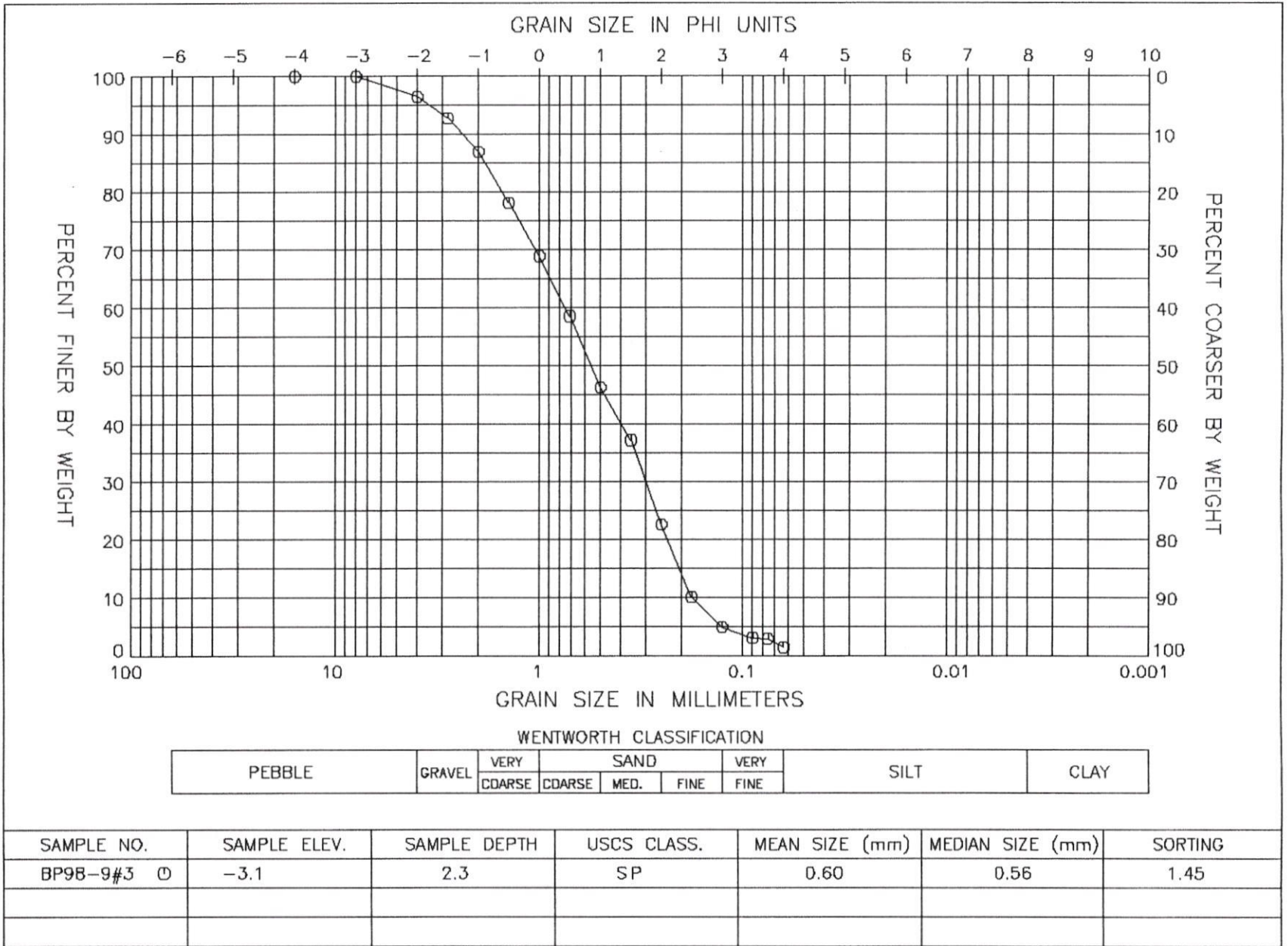
GRAIN SIZE DISTRIBUTION CURVE
BLIND PASS INTERIM DREDGING



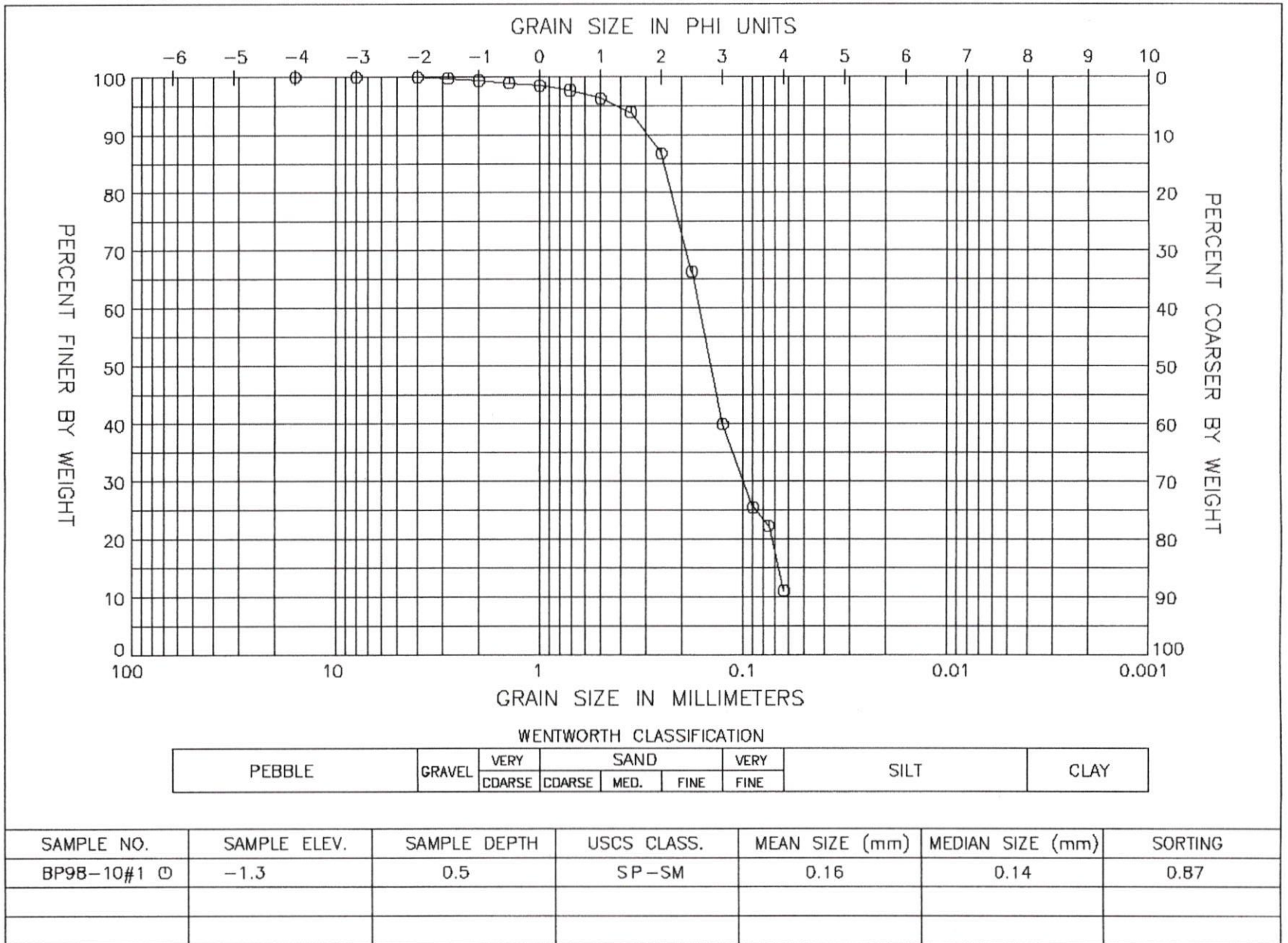
GRAIN SIZE DISTRIBUTION CURVE
 BLIND PASS INTERIM DREDGING



GRAIN SIZE DISTRIBUTION CURVE
BLIND PASS INTERIM DREDGING



GRAIN SIZE DISTRIBUTION CURVE
BLIND PASS INTERIM DREDGING



GRAIN SIZE DISTRIBUTION CURVE
BLIND PASS INTERIM DREDGING



| | | | | | | | |
|--------------------------|--------|--------|--------|------|------|------|------|
| WENTWORTH CLASSIFICATION | | | | | | | |
| PEBBLE | GRAVEL | VERY | SAND | | VERY | SILT | CLAY |
| | | COARSE | COARSE | MED. | FINE | | |

| SAMPLE NO. | SAMPLE ELEV. | SAMPLE DEPTH | USCS CLASS. | MEAN SIZE (mm) | MEDIAN SIZE (mm) | SORTING |
|-------------|--------------|--------------|-------------|----------------|------------------|---------|
| BP98-10#2 ⊕ | -2.6 | 1.8 | SP-SM | 0.20 | 0.16 | 1.18 |
| | | | | | | |
| | | | | | | |