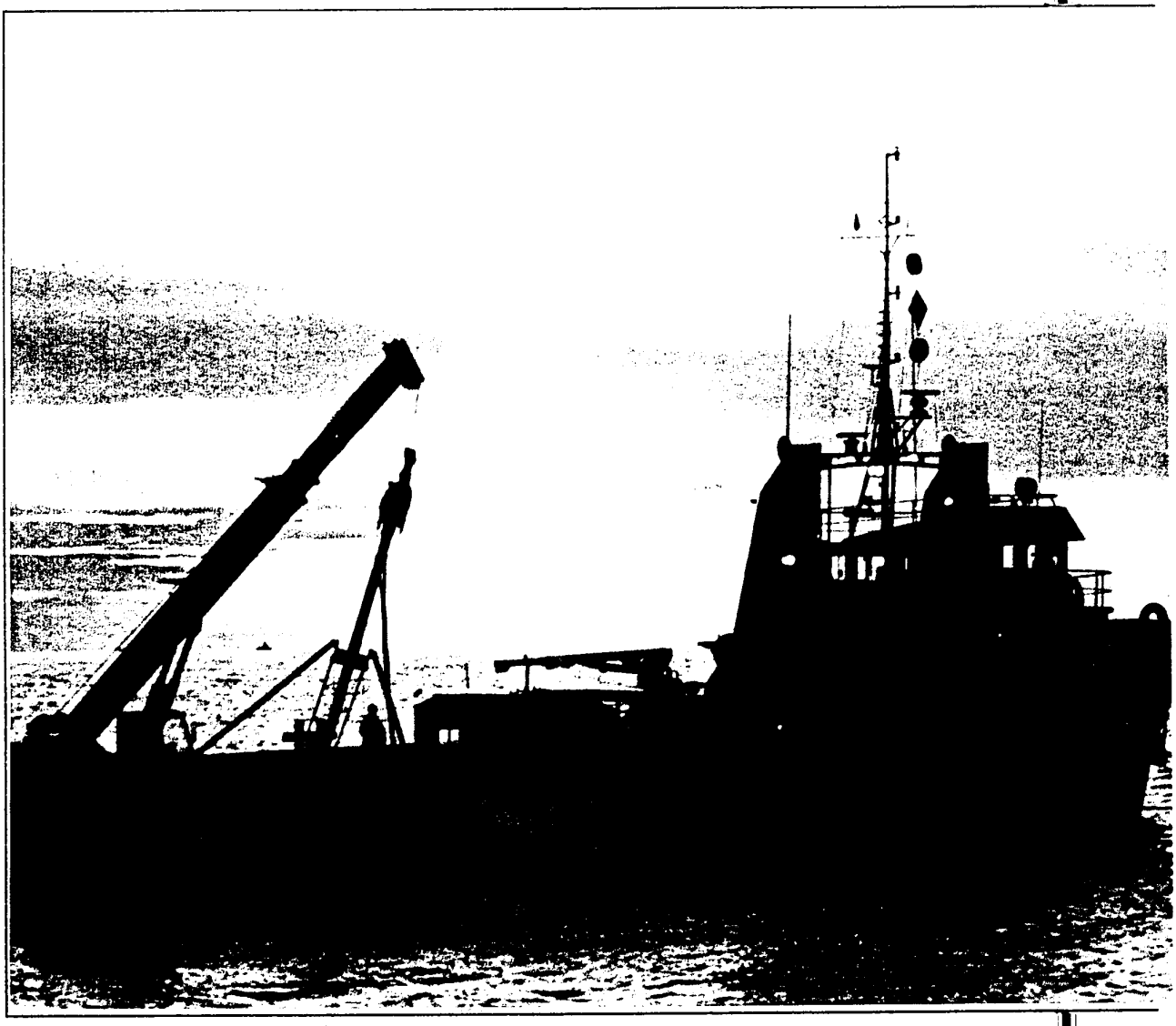
QUEENS GATE DREDGING

Geotechnical and Chemical Investigation

FINAL REPORT



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1. INTRODUCTION

The Port of Long Beach and the US Army Corps of Engineers are proposing to dredge a navigation channel from the Queens Gate entrance of the harbor seaward to the -76' contour depth to allow deeper draft vessels to enter the harbor. The proposed navigation channel will be approximately 1,200' wide, 15,000' in length, with a depth of -76' MLLW. It will be necessary to dredge approximately 5 million cubic yards of soil to construct the proposed navigation channel.

Ocean disposal to a designated disposal site and/or beach nourishment are being considered as potential disposal methods for the dredged material. The following areas are being considered as disposal sites:

1. LA-2 designated disposal site
2. Deep area (>60') between Island White and Island Grissom
3. City of Long Beach beaches
4. Surfside/Sunset beach
5. Seal Beach

The objectives of this geotechnical and chemical investigation project include:

- Prepare geotechnical information to be used in establishing engineering criteria for the design of the project.
- Perform the tests and provide data reports necessary to prepare the required environmental permits for the dredging and disposal activities.
- Assess the geotechnical nature of the project site through field explorations and laboratory testing.

The Port of Long Beach contracted Sea Surveyor, Inc. to perform the geotechnical and chemical investigation of the Queensgate Dredge Area. The scope of work included collecting 45 vibratory core samples of the ocean floor within the proposed dredge area; acquiring sediment samples at potential disposal sites; conducting mechanical and chemical testing of the samples; and preparing and submitting reports of the findings.

Sea Surveyor collected 45 vibratory cores within the dredge area (Figure 1) for geotechnical and grain-size analyses. Twenty-eight (28) of the sediment cores were subsampled for chemical analyses, while samples for grain-size analyses were obtained from all 45 sediment cores. The sediment cores were collected on November 8-11, 1994 using a 30' ALPINE vibracorer and the 151' vessel M/V *Recovery One*.

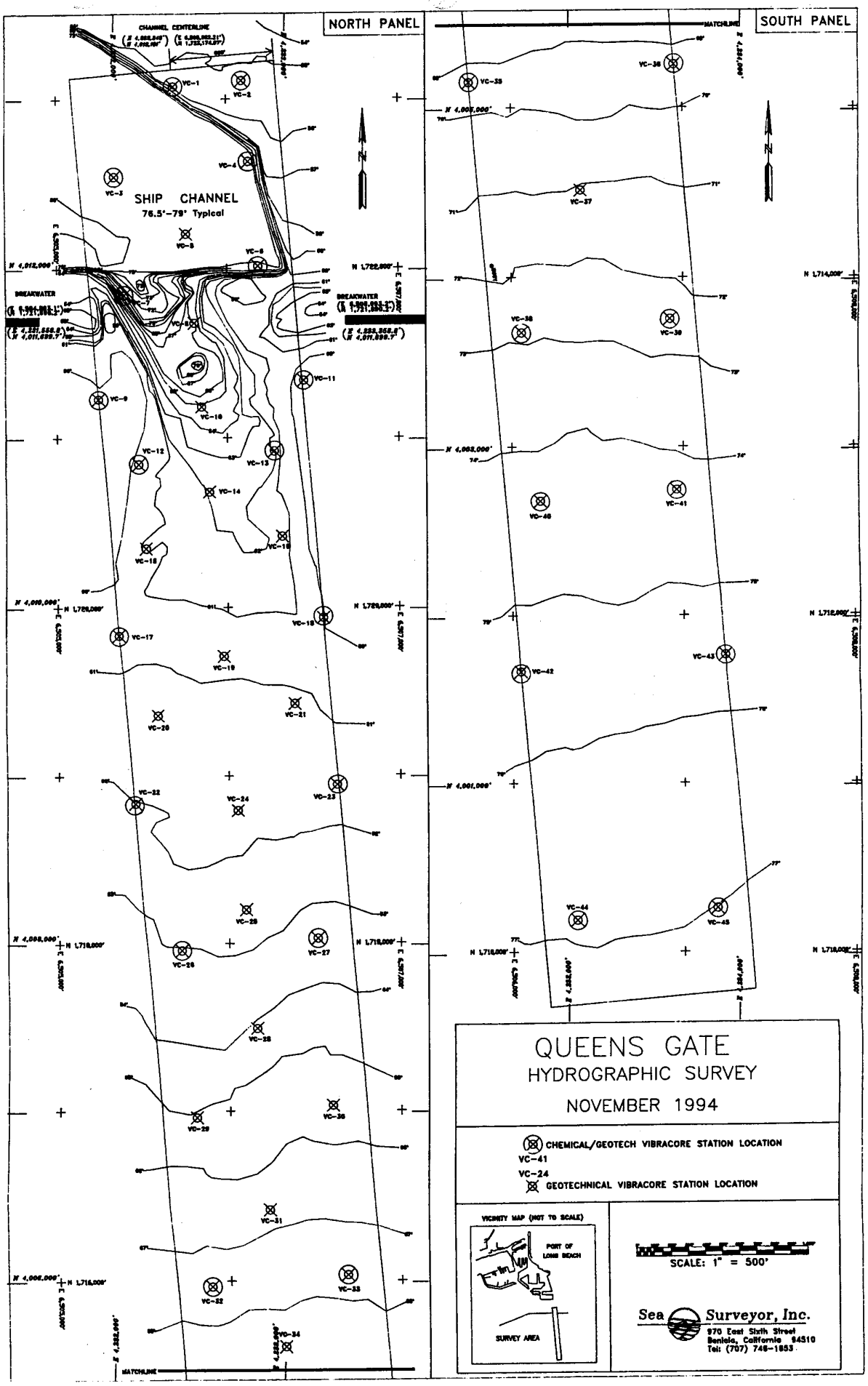

Figure 1 Page 4

Sediment samples were collected at the five potential disposal sites and an offshore Reference area for grain-size and chemical analyses. Sediment samples from the Reference area and LA-2 disposal site (Figure 2) were collected in 600' water depths using a Teflon-lined *VanVeen* grab sampler. Two sediment samples from the deep area (>60') between Island White and Island Grissom (Figure 3) were collected using a gravity dart corer. A SCUBA diver collected a total of 30 sand samples along two Beach Transects at each of the three beach areas (Figure 3) at 6' elevation intervals from +12' to -30' MLLW.

The grain-size analyses was conducted by MEC Analytical Systems, Inc. of Carlsbad, California. The sediment cores were logged and photographed by Diaz-Yourman & Associates of Tustin, California. Sediment chemistry was analyzed by Columbia Analytical Services, Inc. of Kelso, Washington.

2. EQUIPMENT SPECIFICATIONS AND SAMPLING PROCEDURES

Sediment samples were collected within the proposed Queensgate dredge area using a 30' *ALPINE* pneumatic vibracorer and the 151' vessel M/V *Recovery One*. Navigation was provided using differential GPS (±1m accuracy). Water depths were measured at each sediment sampling station using a survey-grade fathometer and NOAA-predicted tides. After completing the sediment sampling, Sea Surveyor performed a precision hydrographic survey of the proposed Queensgate dredge area using Class 1 survey methods. The results of the hydrographic survey is shown in Figure 1.

The following sections provide a detailed description of the survey equipment and sampling procedures used for the Queensgate Geotechnical and Chemical Investigation

2.1 Vessels

The use of a proper survey vessel is critical to the success of any marine survey. Unfortunately, a suitable vessel having a pedestal-mounted crane, 4-point anchoring system, and wet-lab was not available locally in mid-November 1994. Lacking a local vessel, Sea Surveyor mobilized the M/V *Recovery One* from San Diego. The *Recovery One* is a 151' multi-purpose tug that is used for offshore supply and survey purposes. Sea Surveyor mounted a 30-ton rough-terrain crane on the ship's stern. In Long Beach, a 3-point anchoring system was added to the ship, along with a 8' X 18' trailer for processing the sediment samples. A picture of the M/V *Recovery One* showing the vibracorer being deployed is provided in Figure 4.

The M/V *Recovery One* has a large open deck (75' X 26') and a load capacity of 300 tons. The *Recovery One* is operated by COAST ENTERPRISES of San Diego, California. A 70' assist tug was also provided in case of emergency (Figure 5).

2.2 Vibratory Coring

Sediment samples were collected at a total of forty-five (45) locations within the proposed Queensgate dredge area using an *ALPINE* pneumatic vibratory corer. The *ALPINE* vibracorer is the most powerful vibratory corer ever manufactured. The *ALPINE* vibratory corer was assembled, complete with stand and penetration recorder, in a configuration suitable for collecting

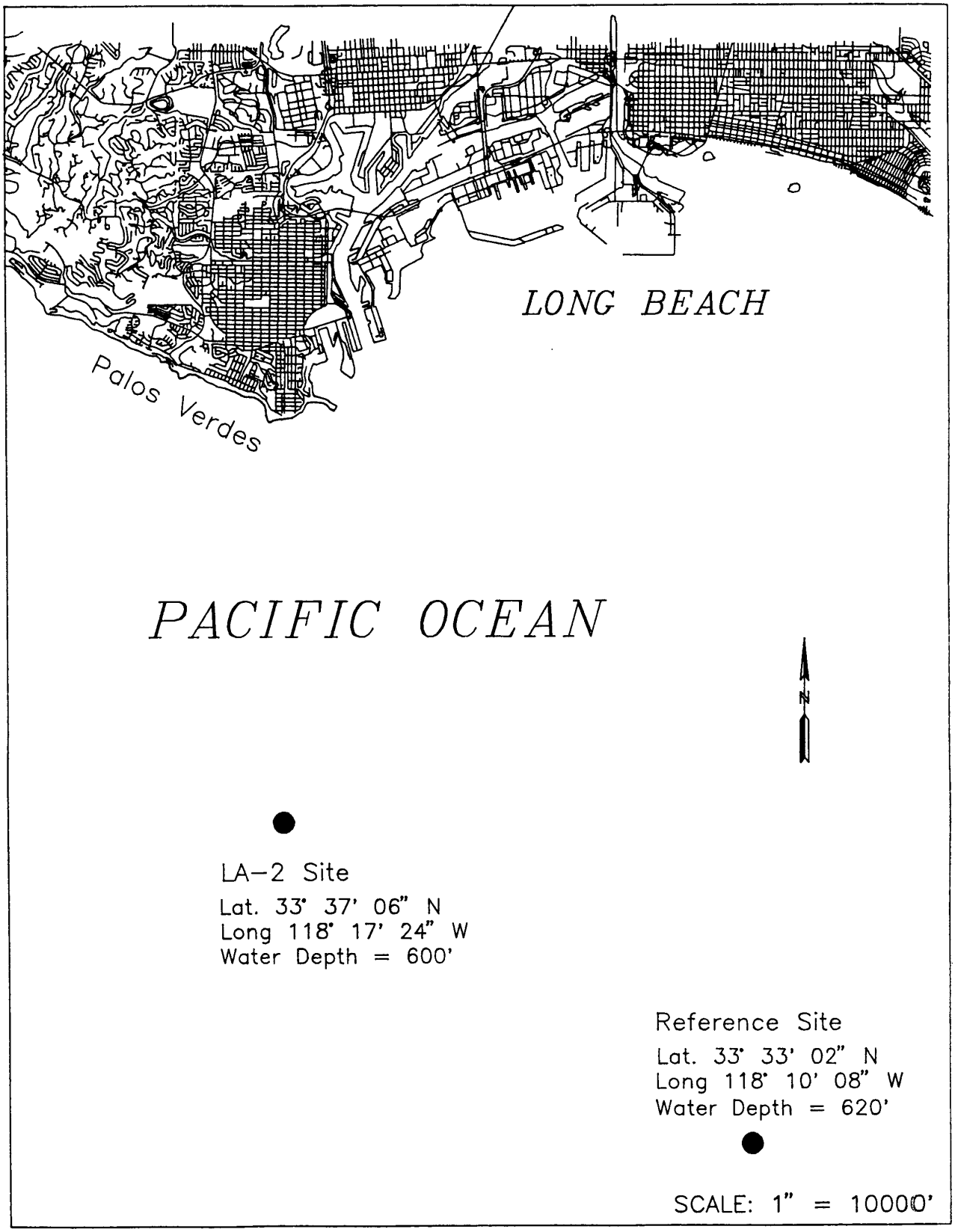

Figure 2: Vicinity Map Showing Reference Site and LA-2 Disposal Site.

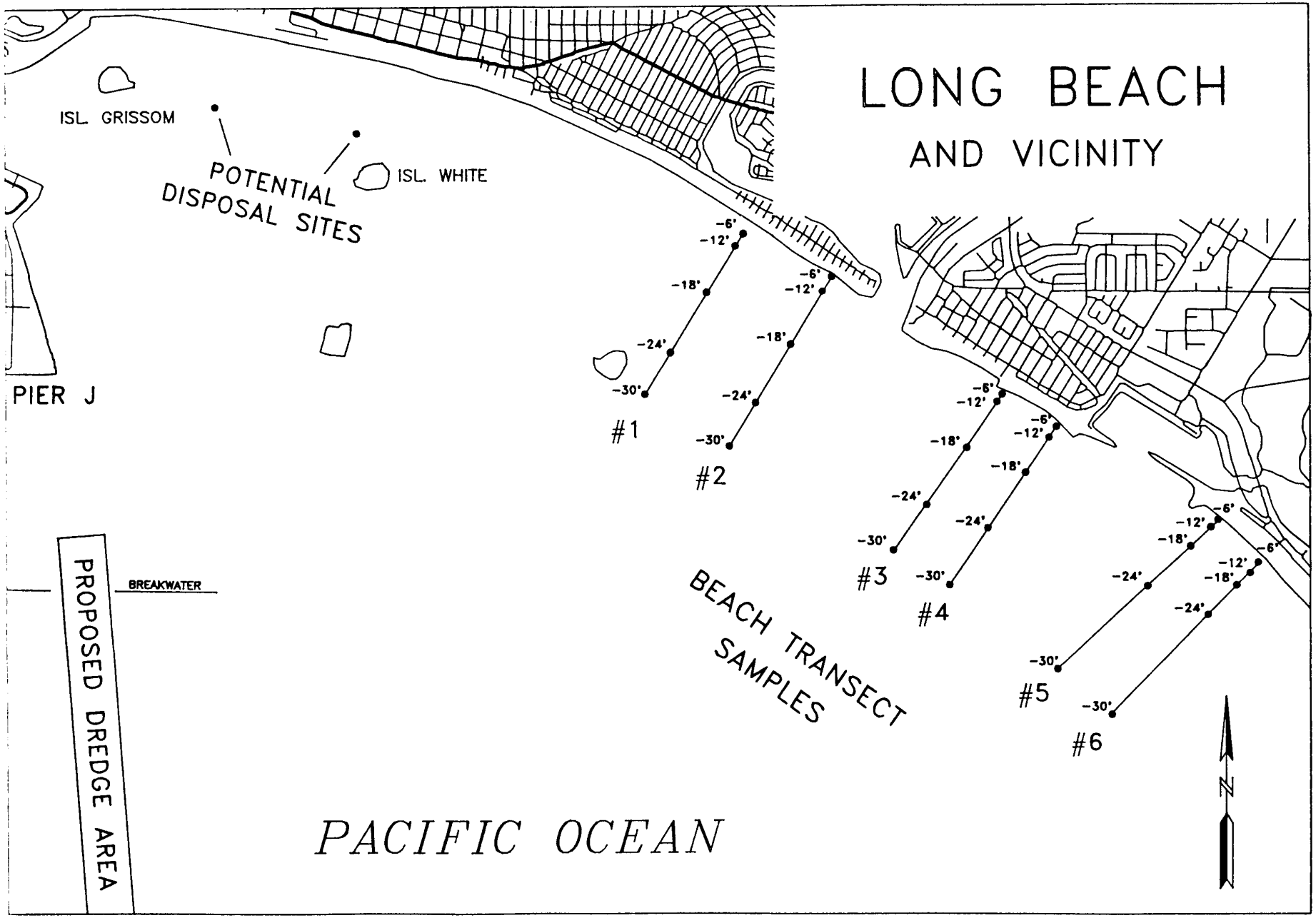

Figure 3: Beach Samples and Potential Disposal sites.

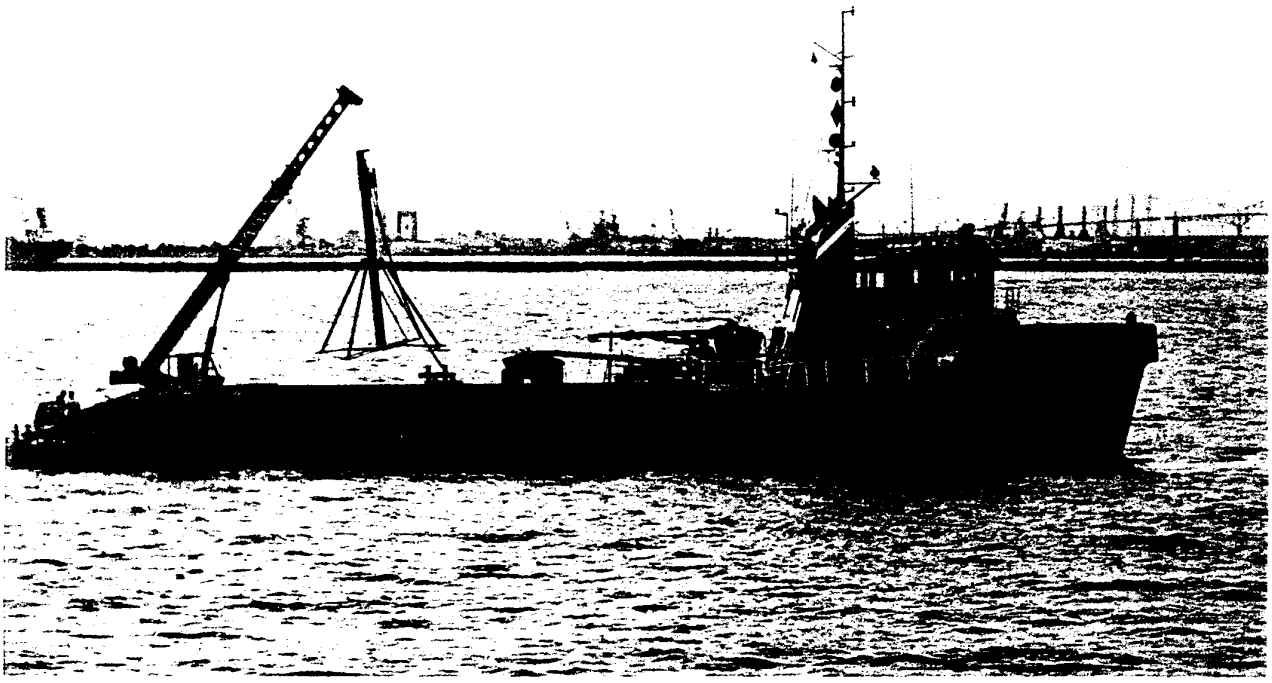

Figure 4: M/V RECOVERY ONE. Note Vibracore being deployed.

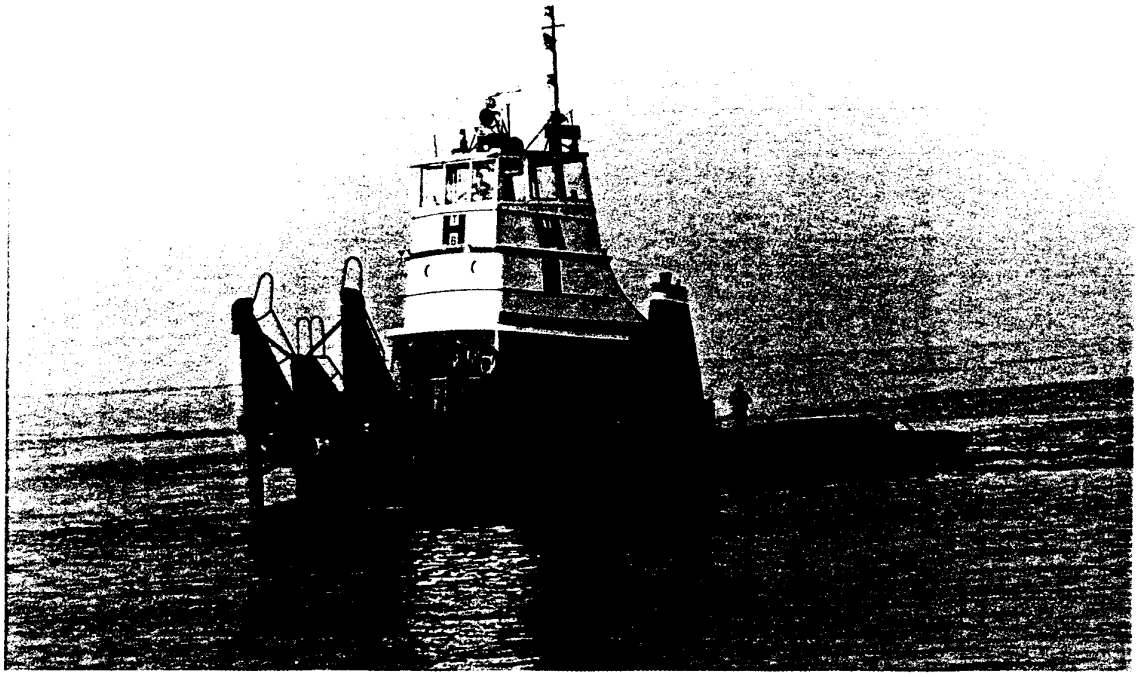

Figure 5: Assist Tug "Feather River".

continuous cores of 30' penetration into the seafloor. Figures 6-9 show the *ALPINE* vibratory corer being deployed.

The *ALPINE* vibracorer consists of a *pneumatic impacting bin vibrator* mounted on top of a coring barrel made of 4"-diameter standard steel pipe. The vibrating head and barrel are supported in the vertical position by a steel "H" beam mast held upright by four 10' legs. The vibrator head and coring barrel are mounted to a slide attached to the guide mast, and thus are free to move vertically with the weight of the slide exerting a constant downward pressure on the core barrel.

The coring barrel is designed to be vibrated into the sediment, then pulled back with the intact core sample into the frame before being lifted from the seafloor. The frame provides a 2-to-1 mechanical advantage in extracting the coring barrel from the seafloor and assists in pulling the barrel straight out of the bottom so that it will not bend. A check valve at the top of the core barrel and a spring-leaf core retainer at the bottom of the barrel retains the core sample in the liner during withdrawal and raising of the vibracorer.

The 4"-diameter core barrel contains a 3.5"-ID tubular liner to contain the core sample. The clear liners were produced from cellulose acetate butyrate (CAB) that are approved for collection of sediment samples for Tier 2 chemical/bioassay analyses. The sediment samples contained within the CAB liners were capped to prevent sample contamination while awaiting logging/sub-sampling by chemists and geologists in the shipboard wetlab trailer.

Monitoring the penetration rate of the vibracorer is important because penetration vs. time is an indirect measure of the relative density or stiffness of the material. Monitoring the penetration rate also ensures that the vibracorer reaches its refusal depth.

Sea Surveyor used a "penetration recorder" to monitor and record the rate at which the vibracorer penetrated the seafloor (Figure 10). The penetration recorder is a system for determining and recording the penetration of the core barrel into the seafloor as a function of time. The penetration recorder consists of a 360-degree potentiometer housed in a waterproof case mounted on the vibrator slide. The potentiometer is turned by a sprocket drive and roller chain stretched the length of the mast. The potentiometer makes one revolution for each foot of penetration into the sediment. An electrical signal cable transmits the data to a single-channel strip chart recorder on the support vessel.

After the vibracorer achieved the refusal depth and was returned to the vessel, the vibracore penetration into the seafloor was confirmed by measuring the length of mud on the barrel (Figure 11).

2.3 Offshore Navigation

A differential global positioning system (DGPS) was used to record the ship's location during the vibracoring project. The accuracy of the DGPS navigation is $\pm$1m. GPS satellite surveying is a 3-dimensional measurement system based on observations of the microwave signals of the US Department of Defense's *NAVSTAR* satellite system.

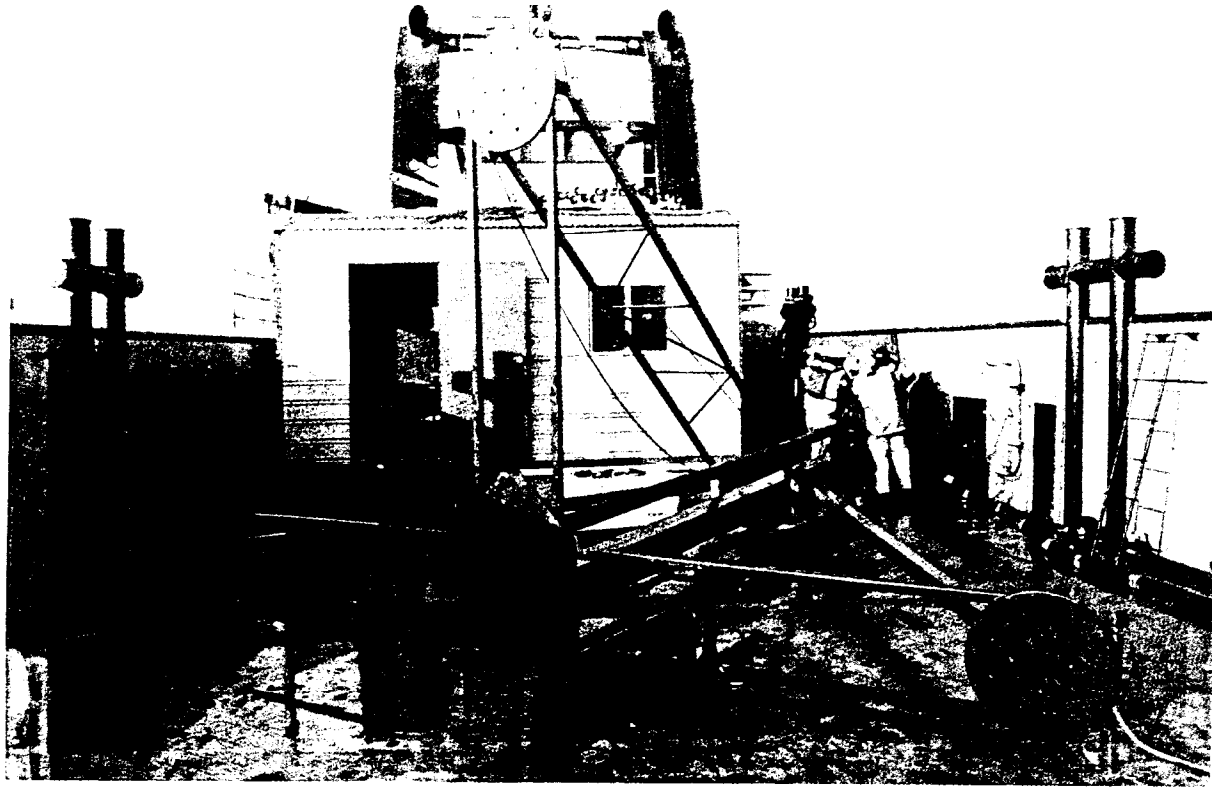

Figure 6: ALPINE Vibracore on Deck.

Figure 7: ALPINE Vibracore being Lifted.

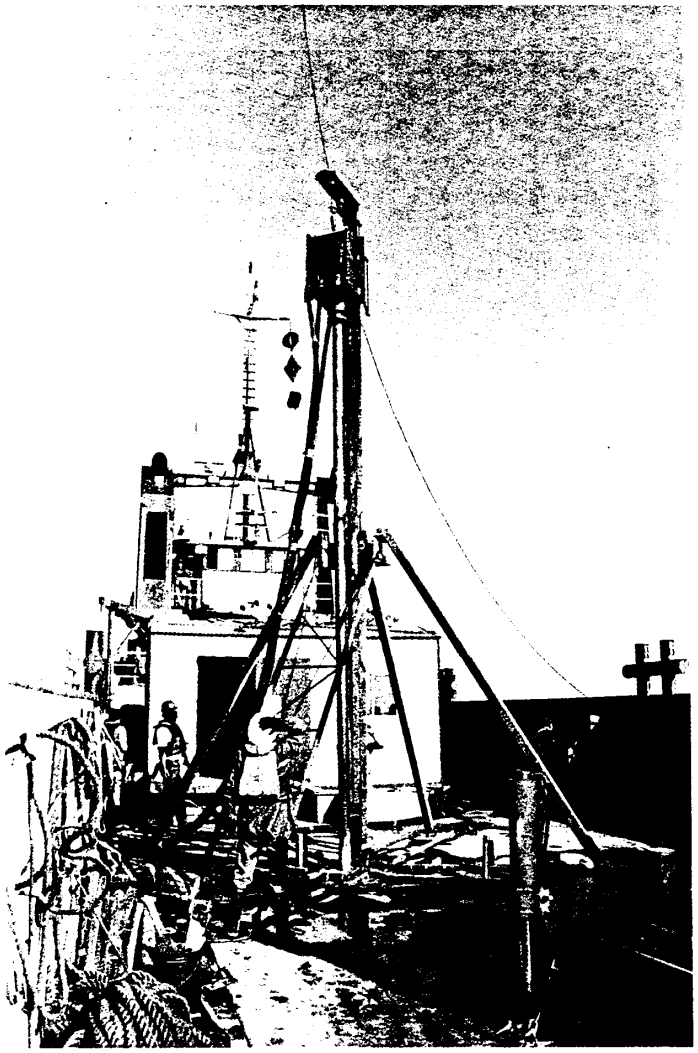

Figure 8:

ALPINE Vibracore
Standing on deck.

Figure 9:
ALPINE Vibracore
Being Lowered to
the Seafloor.
NOTE: Buoy marks
Station Location.

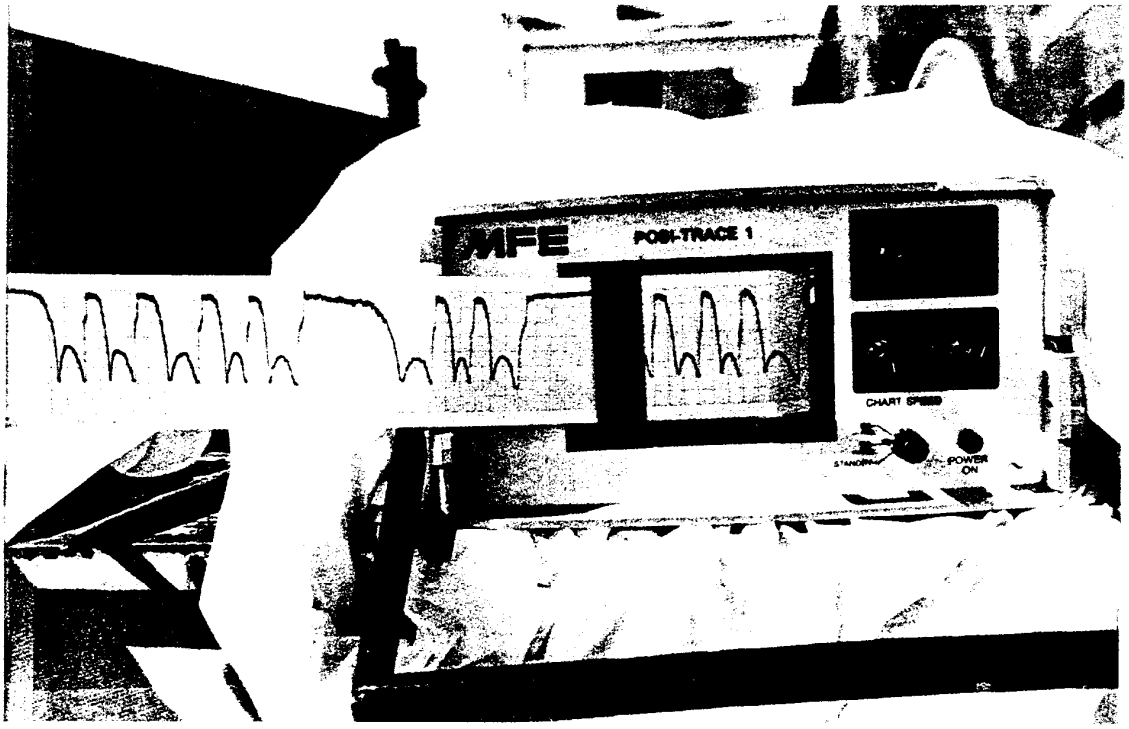

Figure 10: Penetration Recorder Monitors Vibracore Penetration into the Seafloor.

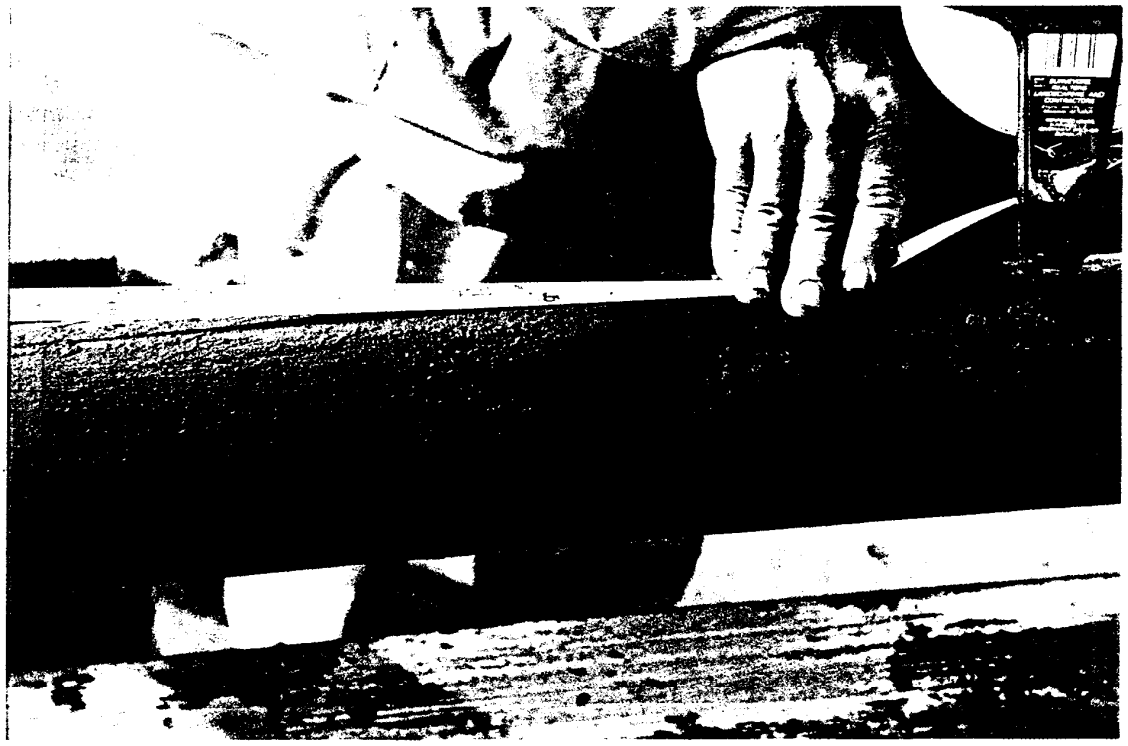

Figure 11: Length of Muddy Barrel was Measured to Confirm Vibracore Penetration.

The Department of Defense induces an error into the *NAVSTAR* satellite system; however, this error can be measured, and corrected, using differential GPS. Differential GPS uses two GPS units receiving signals from the same satellites at the same time. One GPS unit, called the "base station", is always positioned on a known point on shore, while the second GPS unit is aboard the survey boat. The GPS base station measures the error induced into the *NAVSTAR* satellite system by the US Department of Defense, and transmits the correction factor to the boat's GPS unit via an RF telemetry link. The boat's GPS unit determines its location via the *NAVSTAR* satellite system, corrects for the induced error, and then inputs the data into the navigation computer.

The differential GPS navigation data was displayed in Sea Surveyor's *NAV-GATOR* computer program during sediment sampling operations at the proposed Queensgate dredge site, Reference area, and 5 potential disposal sites. The *NAV-GATOR* software collects differential GPS data once each second and makes a real-time calculation of the ship's position on a standard survey grid. The vessel's position is displayed on a CRT screen superimposed over a digital nautical chart showing the Port of Long Beach. The ship's captain uses the computer display as a helmsman's aid to position the vibracore directly over the intended station location. The trackline control system provides a real-time display of vessel position in relation to intended coring locations, and digitally displays range and bearing to the intended coring station, vessel speed, and speed at which the vessel is approaching the coring station.

During the precision hydrographic survey of the Queensgate dredge area, the GPS navigation data was put into a software program called *HYDRO* that resides in an IBM-compatible 486-series 33-MHz laptop computer (Figure 12). The *HYDRO* software was developed by TRIMBLE NAVIGATION of Sunnyvale, California. The *HYDRO* software is similar to Sea Surveyor's *NAV-GATOR* software, but records water depths 10-times per second.

2.4 Depth Sounding

Sea Surveyor obtained water depth measurements using an *INNERSPACE* Model 448 survey-grade fathometer. The *INNERSPACE* fathometer records water depths digitally by transmitting data 20-times each second into the navigation computer. The fathometer also creates a continuous stripchart recording of the water depth. The fathometer is interfaced with the navigation computer to allow automated event marks triggered from the navigation computer to be displayed on the graphic recorder. This interface allows accurate correlation of position and depth information.

Calibration is one of the most critical factors in acquisition of accurate sounding data. The fathometer was calibrated at the beginning and end of day using the *bar check* procedure. The bar check procedure consists of lowering an acoustic target (a circular metal plate) on a measured sounding line to the maximum project depth. The fathometer's speed-of-sound control was then adjusted until the target reflection was printed precisely at its known depth. After calibrating the fathometer for the maximum practical depth, the target was raised to shallower depths, at 10' intervals, and the calibration readings at these depths were recorded. No variations between the echo sounder trace and the depth of the acoustic target were encountered.

During the sediment sampling phase of the project, fathometer operation and survey practices were in accordance with established hydrographic standards (US Army Corps of Engineers, Engineer Manual No. 1110-2-1003) for Class 3 hydrographic surveys. Changes in the elevation

Figure 12: Differential GPS Navigation System and "HYDRO" Software.

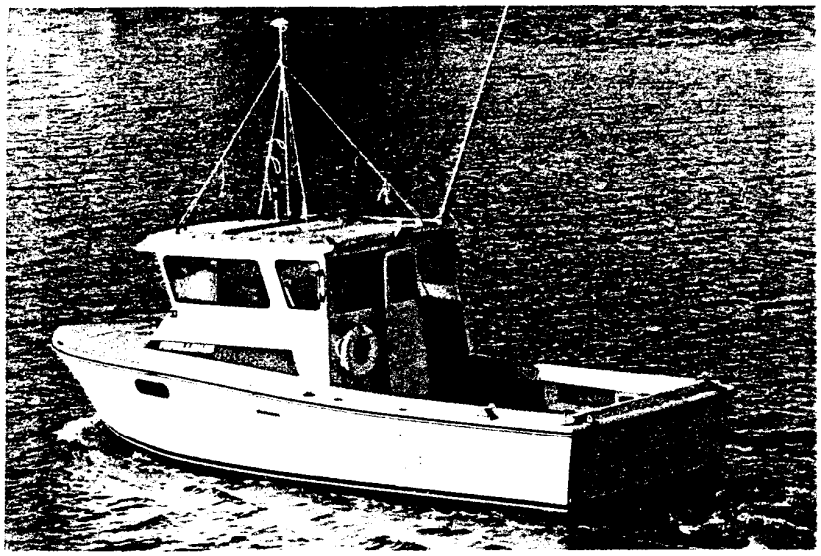

Figure 13: 25' Survey Vessel used to Conduct Bathymetric Survey and Collect Beach and Dumpsite Sediment Samples.

of the water surface were estimated during the sediment sampling project using NOAA-predicted tides.

After completing the sediment sampling, Sea Surveyor conducted a Class 1 hydrographic survey of the proposed Queensgate dredge area using our 25' survey vessel, an INNERSPACE Model 448 survey-grade fathometer, and TSS heave compensator (Figure 13). The hydrographic survey data was corrected for tides using tide data recorded by the Port of Long Beach at Pier J.

2.5 Sediment Sampling At Beach Transects And Offshore Sites

Diver sampling along the beach transects was conducted using Sea Surveyor's 25' survey vessel *BETTY JO*. Using a differential GPS navigation system, a survey-grade fathometer, and NOAA-predicted tidal information, Sea Surveyor maneuvered the boat over the beach sampling sites. A SCUBA diver descended to the seafloor and collected a sediment sample using a diver-operated sampling device. The sediment sample was brought aboard the boat, logged, sub-sampled, labeled and properly stored on ice for later laboratory analyses.

The deepwater sediment samples at the LA-2 dumpsite and Reference Site were collected by Sea Surveyor using our 25' survey vessel, a differential GPS navigation system, survey-grade fathometer, and a Teflon-coated VanVeen grab sampler. Two sediment samples from the deep area (>60') between Island White and Island Grissom were collected using a gravity dart corer.

2.6 Field Methods

A total of 45 subsurface cores were collected from Dredge Area stations VC-1 through VC-45. Core locations are shown on Figure 1 and the tabulated results of the vibracore investigation is presented in Table 1.

Before each core was taken, the station location was marked with an anchored buoy and the water depth was recorded. The *ALPINE* vibracorer was lowered to the seafloor within ±3m of the desired hole location. The vibracorer was vibrated until the desired elevation of -80' MLLW was achieved, or until refusal. Refusal was defined as less than 0.1' of penetration per minute.

After the vibracorer was lifted aboard the vessel, Sea Surveyor personnel removed the sediment core in the CAB liners from the vibracore barrel (Figure 14). The sediment cores were immediately sealed with Teflon-caps, measured, and labeled. The cores were then transported to the wetlab trailer on board for processing. Each core liner was opened lengthwise using a hooked stainless steel blade. Representatives from MEC Analytical Systems were responsible for obtaining sub-samples for laboratory analyses (Figure 15). Collected samples were stored on ice until overnight shipment to the laboratory.

Sediments for chemical testing were obtained after geotechnical evaluations were made for each core. The core was then longitudinally split in half with a pre-cleaned Teflon spatula, left in the core liner, and placed in wooden racks for processing. Cores less than or equal to 5 feet in length were composited whole. Cores over 5 feet in length were visually characterized by a qualified geotechnical engineer for sediment stratification. If stratification existed, the core was separated

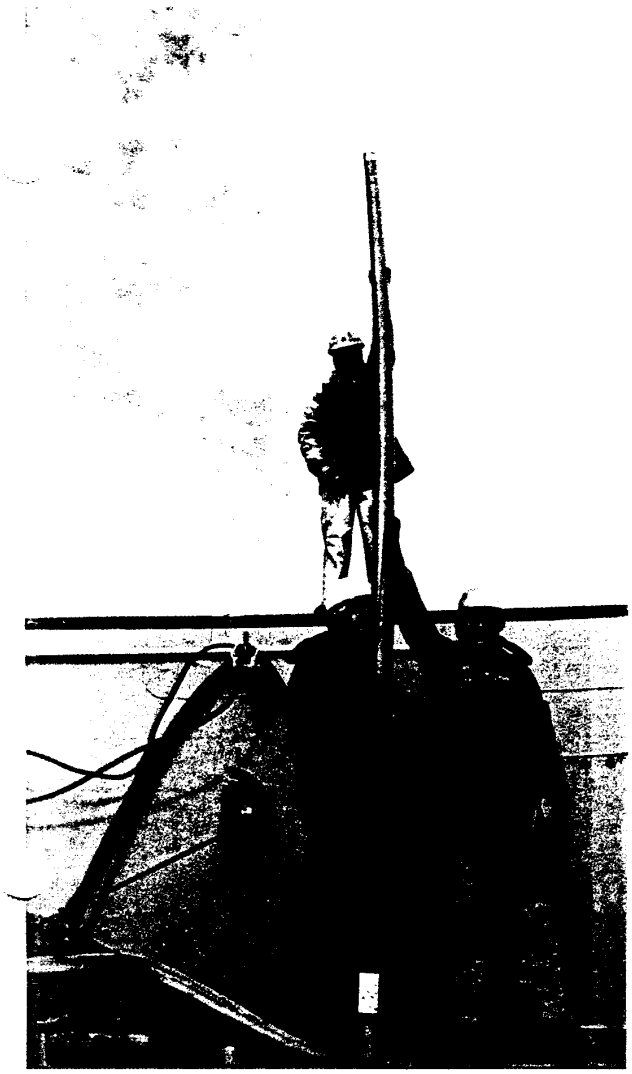

Figure 14: A full Vibracore Sample Shown in Upright Position.

Figure 15: Chemists and Geologists Subsampled and Logged the Sediment cores in a Wetlab Trailer aboard the Vessel.

CORE NO.	WATER DEPTH (MLLW)	LENGTH OF VIBRACORER PENETRATION	MAX. DEPTH OF VIBRACORE PENETRATION (MLLW)	LENGTH OF CORE RECOVERED	MAX DEPTH OF CORE RECOVERED (MLLW)	EASTING (NAD 83) CA ZONE 5	NORTHING (NAD 83) CA ZONE 5
VC-1	56.6'	19.5'	76.1'	15.7'	72.3'	6,505,691'	1,723,076'
VC-2	56.0'	20.0'	76.0'	13.5'	69.5'	6,506,090'	1,723,109'
VC-3	78.5'	10.0'	88.5'	9.7'	88.2'	6,505,339'	1,722,544'
VC-4	77.0'	10.0'	87.0'	9.3'	86.3'	6,506,126'	1,722,629'
VC-5	76.8'	13.0'	89.8'	9.9'	86.7'	6,505,761'	1,722,206'
VC-6	75.5'	13.0'	88.5'	9.6'	85.1'	6,506,182'	1,722,013'
VC-7	69.7'	17.0'	86.7'	13.2'	82.9'	6,505,393'	1,721,846'
VC-8	65.8'	14.8'	80.6'	11.0'	76.8'	6,505,808'	1,721,680'
VC-9	60.6'	19.0'	79.6'	11.7'	72.3'	6,505,244'	1,721,231'
VC-10	65.9'	15.0'	80.9'	12.9'	78.8'	6,505,851'	1,721,182'
VC-11	60.5'	20.0'	80.5'	17.2'	77.7'	6,506,448'	1,721,339'
VC-12	61.0'	17.0'	78.0'	15.2'	76.2'	6,505,477'	1,720,849'
VC-13	62.6'	16.0'	78.6'	13.8'	76.4'	6,506,274'	1,720,924'
VC-14	62.6'	18.0'	80.6'	14.5'	77.1'	6,505,892'	1,720,684'
VC-15	61.1'	16.0'	77.1'	14.0'	75.1'	6,505,519'	1,720,351'
VC-16	61.3'	14.0'	75.3'	12.5'	73.8'	6,506,316'	1,720,419'
VC-17	60.8'	18.0'	78.8'	14.4'	75.2'	6,505,361'	1,719,836'
VC-18	61.1'	19.0'	80.1'	14.4'	75.5'	6,506,558'	1,719,937'
VC-19	61.4'	13.0'	74.4'	11.8'	73.2'	6,505,977'	1,719,710'
VC-20	61.7'	14.0'	75.7'	11.0'	72.7'	6,505,586'	1,719,357'
VC-21	61.7'	15.5'	77.2'	11.3'	73.0'	6,506,389'	1,719,424'
VC-22	62.9'	19.0'	81.9'	18.9'	81.8'	6,505,452'	1,718,832'
VC-23	62.3'	18.0'	80.3'	13.9'	76.2'	6,506,630'	1,718,943'
VC-24	62.1'	19.0'	81.1'	12.9'	75.0'	6,506,052'	1,718,790'
VC-25	63.4'	13.5'	76.9'	9.6'	73.0'	6,506,100'	1,718,196'
VC-26	63.2'	19.5'	82.7'	13.8'	77.0'	6,505,720'	1,717,959'
VC-27	63.5'	16.0'	79.5'	11.8'	75.3'	6,506,517'	1,718,027'
VC-28	64.4'	13.0'	77.4'	9.3'	73.7'	6,506,161'	1,717,495'
VC-29	65.3'	13.5'	78.8'	9.5'	74.8'	6,505,804'	1,716,963'
VC-30	66.2'	13.5'	79.7'	9.3'	75.5'	6,506,601'	1,717,030'
VC-31	67.2'	13.5'	80.7'	13.0'	80.2'	6,506,235'	1,716,420'
VC-32	68.0'	13.5'	81.5'	10.0	78.0'	6,505,888'	1,715,967
VC-33	67.9'	13.5'	81.4'	9.5'	77.4'	6,506,685'	1,716,033'
VC-34	68.8'	12.0'	80.8'	10.7'	79.5'	6,506,318'	1,715,621'
VC-35	70.1'	14.5'	84.6'	10.5'	80.6'	6,505,756'	1,715,152'
VC-36	69.4'	13.5'	82.9'	10.2'	79.6'	6,506,951'	1,715,253'
VC-37	71.4'	13.5'	84.9'	12.0'	83.4'	6,506,407'	1,714,514'
VC-38	72.6'	13.5'	86.1'	12.0'	84.6'	6,506,059'	1,713,674'
VC-39	73.3'	12.0'	85.3'	9.5'	82.8'	6,506,925'	1,713,753'
VC-40	75.4'	12.0'	87.4'	8.6'	84.0'	6,506,165'	1,712,678'
VC-41	74.9'	8.0'	82.9'	7.3'	82.2'	6,506,962'	1,712,745'
VC-42	75.7'	11.0'	86.7'	9.2'	84.9'	6,506,049'	1,711,665'
VC-43	76.3'	8.0'	84.3'	6.2'	82.5'	6,507,245'	1,711,765'
VC-44	77.9'	10.0'	87.9'	7.3'	85.2'	6,506,374'	1,710,187'
VC-45	77.5'	10.2'	87.7'	7.2'	84.7'	6,507,191'	1,710,255'

Table 1: Summary of Vibracores Collected

at the point(s) of discontinuity and each section was measured and composited individually for chemical analysis. The top 2-10 cm of the surface sediment was removed for processing from each Van Veen sample using pre-cleaned Teflon spatulas.

Individual surface samples and core subsamples were homogenized in a pre-cleaned stainless steel mixing pan by mixing thoroughly with a Teflon spatula. All equipment used in sediment processing was decontaminated between each sample. The decontamination process included an Alconox wash, followed by tapwater, methanol, and deionized water rinsates. A closed in working area was used and polyethylene gloves were worn by the technician to prevent any ship born contamination of sediment samples. One liter chemistry subsamples were collected from each sediment composite and placed in certified clean borosilicate glass containers, maintained at 4°C, and shipped to the analytical laboratory using a 24 hour delivery service. All samples for grain size and TOC were placed in separate ziplock storage bags and stored at 4°C and transported to the laboratory for testing within 48 hours of the completion of sampling. Chain of custody forms accompanied each batch of samples sent to the laboratories.

3. CHEMICAL TESTING: METHODS AND RESULTS

A total of 45 subsurface cores were collected from Dredge Area Stations VC-1 through VC-45. Twenty-eight (28) of the sediment cores were subsampled for chemical analyses. Core locations are shown in Figure 1. The tabulated results of the vibracore investigation is presented in Table 1.

Samples for chemical analyses were collected after taking samples for geotechnical analyses by compositing all or discrete portions of the vibracores. Vibracores more than 5'-long were examined to evaluate whether there was a discontinuity that may be attributable to scouring or depositional processes. Cores were composited when a discontinuity in a core was observed or suspected to be present. When no discontinuity was present, the entire core was composited and a single sample was taken.

Each sediment core was divided into one to four core segments, ranging from two to five feet in length, for a total of 56 sediment subsamples (Figure 16).

Two surface samples were collected from the +12' and -30' elevation for each of six Beach Transects, for a total of 12 sediment samples from the potential Beach Replenishment (Figure 3). In addition, two surface samples were collected from an inner harbor disposal site located near Island White (Figure 3). Two surface samples were collected from the U.S. EPA's LA-2 open ocean disposal site and disposal reference site (Figure 2).

3.1 ANALYTICAL LABORATORIES

Sediment chemical analyses were performed by Columbia Analytical Services, Inc. (CAS), located in Kelso, Washington. Complete copies of all reports issued by the analytical laboratory is presented in Appendix G.

CAS is a California state certified environmental testing laboratory and participates in a number of state and federal sediment testing programs, including the U.S. EPA and ACOE dredged material testing using: 1) Puget Sound Dredged Disposal Analysis (PSDDA) and San Francisco Bay Area (PN-93-2) guidelines; 2) the U.S. Navy NEESA program; and 3) various federal programs conducted for RCRA, NRDA, and/or CERCLA assessments. All chemical analyses were performed using U.S. EPA (SW-846), National Oceanic and Atmospheric Administration (NOAA), or American Society for Testing and Materials (ASTM) methods; however, modifications were used to obtain detection limits that were lower than those specified in the prescribed methodologies. Sediments were analyzed for seven heavy metals, selenium, and arsenic using an inductively coupled plasma spectroscopy method with mass spectrometer detector (ICP/MS) (EPA 200.8); mercury using cold vapor extraction with atomic absorption/graphite furnace (AA/GF) (EPA 7471); chlorinated pesticides and polychlorinated biphenyls (PCBs) using gas chromatography with electron capture detector (EPA 8080 - modified); polynuclear aromatic hydrocarbons (PAHs), phenols and phthalates using GC/MS combined with selective ion monitoring (SIM) (EPA 8270 - modified); total recoverable petroleum hydrocarbons (TRPH) using infra-red spectroscopy (EPA 418.1); and organotins using a GC/FPD method (Krone, et. al., 1988 and Unger, et. al., 1986).

Analysis of total organic carbon (TOC) was performed by MEC Analytical Systems, Inc. (MEC) located in Carlsbad, California using a combustion method with an infra-red spectrometric detector (ASTM D2579 - modified for sediment). The results of the TOC analyses is presented in Appendix H.

Chemical analyses were performed using quality control criteria specified in Guidelines for Establishing Test Procedures for Analysis of Pollutants (EPA, 1983) and Test Methods for Evaluating Solid Wastes (SW-846) (EPA, 1986), as well as each laboratory's internal quality control criteria.

3.2 RESULTS AND DISCUSSION

Summary results of chemical testing of sediments are shown on Tables 2 and 3; complete reports issued by the analytical laboratories are included in Appendix G and H. Results summaries are discussed in the following subsections. Concentrations of detected target analytes were compared to the Probable Effects Levels (PEL) established by the Florida Department of Environmental Regulation (1993). When PEL values were not available, the Effects Range-Low (ER-L) and Effects Range-Median (ER-M) values from Long and Morgan (1990) were employed for comparison. The State of Florida PEL values were derived from a revised and expanded version of the Long and Morgan data set and represent an improvement of the original analysis, as new information was included and the data were restricted to marine and estuarine sites.

Moderate to high concentrations of primarily bis(2-ethylhexyl) phthalate were detected in nearly all samples. Although this compound is found in the buterate core liners used during subsurface sediment sampling, the contamination most likely was introduced by the analytical laboratory. This is because the highest concentrations were measured in surface sediments, which were collected without liners and relatively high concentrations were reported in laboratory method blanks. Phthalate contamination is discussed in detail in Section 3.3 (Quality Control Summary).

3.2.1 Queensgate Dredge Area

Sediments collected from the Queensgate Dredge Area were generally low in total organic carbon (TOC) with mean concentrations ranging from 0.30 to 0.74% for the four core segments. Only one sample (Station VC-42, surface core) had greater than 2% TOC, which is considered high. Fewer than ten total samples had detectable concentrations of PAHs, phenols, PCBs, mono- or di-butyltins, or selenium, with most detectable concentrations reported for the surface core segment. The only PCB detected was Aroclor 1260, which was detected in only four samples. Concentrations were very low, ranging from 0.01 to 0.02 mg/Kg. The PEL for total Aroclors (all 7) is 0.270 mg/Kg as compared to the reported concentration of <0.02 mg/Kg; there are no PELs cited for individual Aroclors. Arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc were all detected at relatively low concentrations ranging from 0.02 mg/Kg for mercury to 90.9 mg/Kg for zinc. Concentrations of these metals were all comparable to or lower than median concentrations reported for a clean California coastal area (Kennish 1992). Median concentrations for the California coastal site are shown on Table 2. Dredge Area concentrations were also lower than any of the available PELs or Long and Morgan's ER-Ms reported for analogous metals.

Most subsurface core samples had detectable concentrations of total recoverable petroleum hydrocarbons (TRPH) (e.g. > 10 mg/Kg), regardless of core segment depth. The highest concentrations were reported for the top segments, which ranged from 11 to 93 mg/Kg. EPA method 418.1 used to measure TRPH was developed for matrices void of organic interferences (e.g. soils and freshwater) and was never intended to be used on marine sediments which can have numerous organic interferences resulting in false detections (EPA 1991). PAHs are a much more reliable indicator of petroleum and petroleum products. The low concentrations of PAHs measured in these sediments (24-46 µg/Kg) indicate that TRPH concentrations are most likely elevated from organic sources other than petroleum (e.g. planktonic or detrital material, fatty acids, colloids). PEL's for individual PAHs are one to two orders of magnitude higher than those detected in these sediments. The only chlorinated pesticide detected was 4,4'-DDE, with extremely low concentrations ranging from 0.02 to 0.09 mg/Kg. The PEL value for DDE is 0.100 mg/Kg.

3.2.2 Beach Replenishment Site

Sediments collected from the six beach transects displayed low concentrations of TOC (mean = 0.16%) as compared to the Queensgate Dredge Area. Only one sample, collected at Beach Transect 1, had greater than 0.4% TOC. Most heavy metal concentrations were detected at the same order of magnitude as those measured at the Dredge Area, with concentrations for most metals only slightly higher in Dredge Area sediments. There were no detectable concentrations of selenium in these sediments.

In general, concentrations of organic contaminants were only slightly lower than those measured in Dredge Area sediments. Although it is unlikely that concentrations are significantly different between sites, comparative statistical testing (e.g. unbalanced ANOVA) would be difficult due to the large number of non-detect concentrations reported for most analytes.

There were no detectable concentrations of PAHs, PCBs or monobutyltin. A trace concentration of 4,4'-DDE was detected in only one sample collected from Beach Transect 1 at 0.02 mg/Kg. Although TRPH was largely nondetected in these sediments, two samples had concentrations greater than 100 mg/Kg. Again, these concentrations could be attributable to non-petroleum interferences.

Since there were detectable concentrations of PAHs in only four of the Dredge Area sediments and concentrations were very low (e.g. < 50 µg/kg) for this and other reported analytes, beach sites should be considered as an acceptable disposal site for Dredge Area sediments based on chemical contaminant concentrations only. Dredge Area sediments displayed moderate concentrations of TOC for all core depths (e.g. segments 1 through 4, Table 2), while the mean TOC concentration for the Beach Replenishment Site was only 0.16%. Determination of Beach Replenishment areas (Beach Transects 1 - 6) as an appropriate disposal area for Dredge Area sediments must necessarily be based on suitability of physical parameters alone (e.g. grain size distribution).

3.2.3 Island White Disposal Site

Sediments collected from the Island White disposal site were high in TOC (> 1.5%), and in general, had the highest contaminant burdens of any of the sediments sampled. Comparison of contaminant concentrations between Dredge Area and Island White sediments revealed much higher contaminant burdens for nearly all of metals, TRPH, DDE, Aroclor 1260, and total PAHs for the Island White sediments. This is related, in part, to higher TOC concentrations in the Island White sediments as compared to the Dredge Area sediments. TOC adsorbs both organic and inorganic contaminants, resulting in a direct correlation between contaminant burden and TOC for most sediments.

Nearly all metals were one order of magnitude higher than any of the Dredge Area sediments. Moderate concentrations of most heavy molecular weight PAHs were detected in both samples. These compounds are primarily associated with combusted petroleum products, especially when detected in the absence of the light molecular weight PAHs. TRPH was much higher (710 and 1200 mg/Kg) in these samples, indicating a likely petroleum source. All butyltins were detected, ranging from 3 µg/kg monobutyltin to 23 µg/kg tributyltin. There were no phenols detected in these sediments.

Based on evaluation of chemical contaminants only, Dredge Area sediments are considered acceptable for disposal at the Island White Disposal Site.

3.2.4 LA-2 Reference Site

Sediments collected from the LA-2 Reference Site had moderate concentrations of TOC (0.97 and 0.98%). There were no detectable concentrations of phenols, PAHs, PCBs, monobutyltin, dibutyltin, or selenium. Tributyltin was detected in one sample only at 1.0 µg/kg.

All metals were detected at the same order of magnitude as those reported for Dredge Area sediments. In general, most metal concentrations were slightly higher for these sediments as compared to Dredge Area sediments. TRPH was detected in both reference samples in moderate concentrations of 38 and 49 mg/Kg. A trace amount of 4,4'-DDE was the only pesticide detected (0.03 mg/Kg in one sample only), which was slightly higher than concentrations reported for any of the Dredge Area sediments.

Since there were detectable concentrations of PAHs in only four of the Dredge Area sediments and concentrations were very low (e.g. < 50 µg/kg) for this and other reported analytes, this site should be considered as an acceptable disposal site for Dredge Area sediments.

3.3 QUALITY CONTROL SUMMARY

Data quality objectives were established for precision and accuracy for all data generated for the project. Precision and accuracy objectives were established for method reporting limits, spike recoveries and duplicate analyses. Method reporting limits for individual analytes are shown on Tables 2 and 3; however, for cases where only total analytes are shown (e.g. total PAH), method reporting limits can be found in laboratory reports (Appendix G). Laboratory MRLs exceeded MRL criteria only in cases where target analytes exceeded the upper linear range of the calibration

(it was necessary to dilute the sample) or where there were matrix interferences. In general, laboratory detection limits met or exceeded criteria established for the contract required detection limits (CRDLs), especially since laboratory detection limits are reported as dry weight units and CRDLs are wet weight units (reporting in dry weight increases the detection limit since sediments contain moisture).

Performance was evaluated by the use of reference materials, methods blanks, spiked samples, and duplicate samples, which were performed at a frequency of 5 percent or once every analytical batch (e.g. 20 samples). All of the surrogate recoveries for organic analyses were within the appropriate recovery range established for the method. Sediment matrix spike analyses for metals, chlorinated pesticides, PCBs, phthalates, PAHs, and phenols were within laboratory acceptance criteria. Sediment matrix spike analyses results for organotins were not applicable, however, as the amount spiked was less than five times the background level. Acceptance criteria for matrix spike and surrogate recoveries for the organotin method have not yet been established by the laboratory. Duplicate sample analyses showed good agreement for all analytes. Phthalate esters were detected in nearly all samples, including both subsurface (Dredge Area) and surface (beach and reference). The presence of phthalate esters, particularly bis(2-ethylhexyl)phthalate, most likely resulted from laboratory generated contamination. This is substantiated by the presence of this compound in nearly all corresponding method blanks, which are internal laboratory QC samples. Concentrations reported for the sediments sampled are most likely too high to be representative of actual concentrations. Other possible sources for this contaminant include shaving or leachates from buterate core liners and/or plastic gloves used in sampling. Even though phthalates were detected in laboratory method blanks, these other sources cannot be dismissed. With the exception of bis(2-ethylhexyl)phthalate, quality control data for all other analytes met or exceeded method protocol. Quality control results are included in the final data package submitted by CAS and are presented in Appendix G.

3.4 SUMMARY

- Dredge Area sediment contaminant concentrations were below those suspected of causing biological effects for all analytes tested, except bis(2-ethylhexyl)phthalate (e.g. PEL, NOAA ER-M were not exceeded in these sediments).

- The presence of bis(2-ethylhexyl)phthalate in nearly all samples can be attributed to laboratory contamination.

- Dredge Area sediment contaminant concentrations were comparable (same order of magnitude) to sediments collected from the Beach Replenishment Site and the LA-2 Disposal Site.

- Dredge Area sediment contaminant concentrations were generally much lower than those measured in Island White sediments.

- Based on evaluation of chemical contaminants only, Dredge Area sediments are considered acceptable for disposal at the Beach Replenishment Site, the LA-2 Disposal Site, or the Island White disposal site.

3.5 REFERENCES

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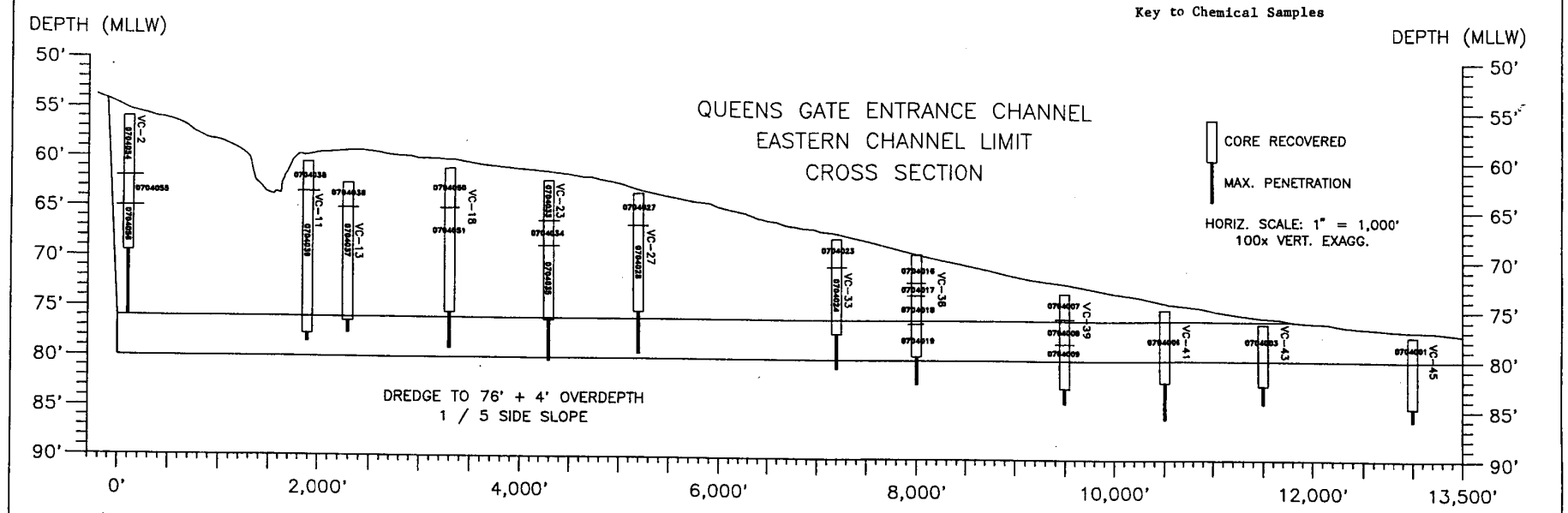
Figure 16

Key to Chemical Samples



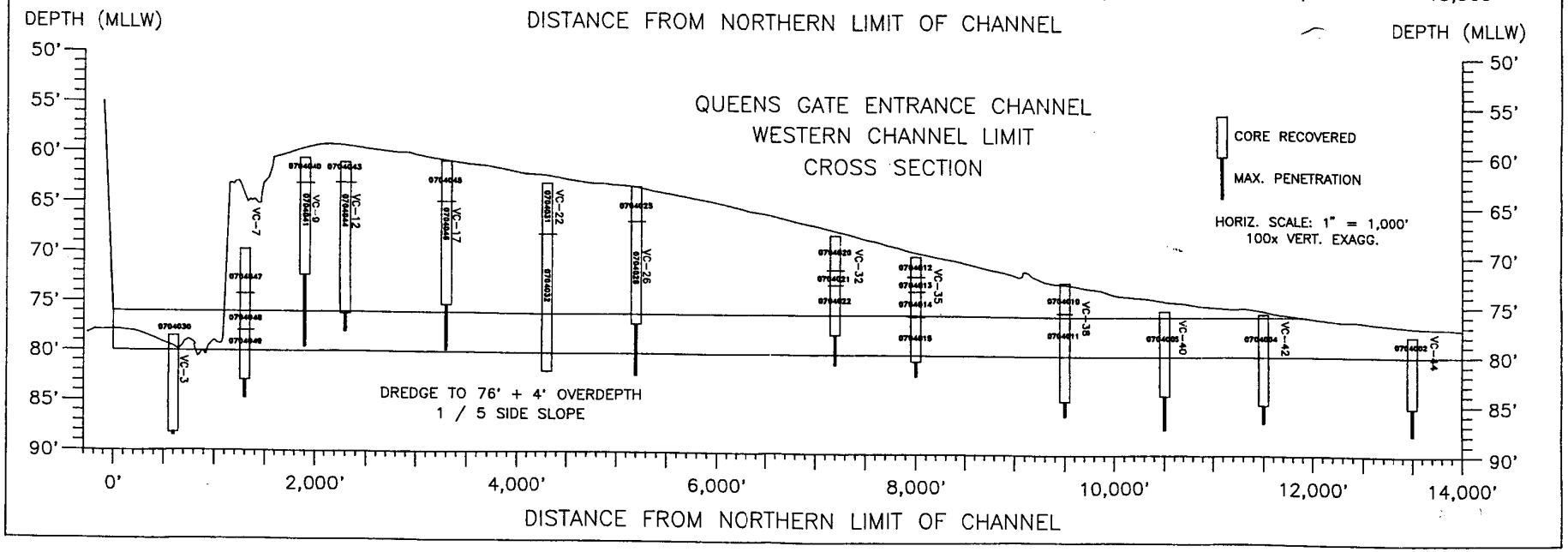


Table 2: Summary of Organic Chemical Testing Results (dry weight)

Core Segment	Station	Core Segment Length (subsurface)	TOC (%)	Total PAH (µg/Kg)	Total Phthalates (µg/Kg)	Total Phenols (µg/Kg)	TRPH (mg/Kg)	Butyltins			4,4'-DDE (mg/Kg)	Total PCBs (mg/Kg)
								MBT (µg/Kg)	DBT (µg/Kg)	TBT (µg/Kg)		
1	VC-1	4	0.67	ND	76	ND	45	-1	-1	1	-0.02	ND
	VC-2	6	0.84	ND	58	ND	60	-1	-1	2	-0.02	ND
	VC-3	1.5	0.53	ND	77	ND	20	-1	-1	1	-0.02	ND
	VC-4	3	0.72	ND	86	ND	47	-1	-1	3	-0.02	ND
	VC-6	4.5	1.03	ND	52	ND	25	-1	-1	2	-0.02	ND
	VC-7	4.5	0.5	ND	103	ND	-10	-1	-1	1	-0.02	ND
	VC-9	2.5	1.32	ND	72	ND	-10	-1	-1	2	-0.02	ND
	VC-11	3	0.61	ND	58	ND	12	-1	-1	2	-0.02	ND
	VC-12	2	0.61	ND	68	ND	-10	-1	-1	6	-0.02	ND
	VC-13	2.5	0.63	ND	69	ND	11	-1	-1	-1	-0.02	ND
	VC-17	4	0.46	ND	590	ND	-10	-1	-1	2	-0.02	ND
	VC-18	4	0.75	24	420	ND	38	-1	-1	-1	-0.02	ND
	VC-22	5	0.72	ND	68	ND	32	-1	-1	1	0.02	ND
	VC-23	4	0.94	43	41	ND	47	-1	-1	1	0.02	ND
	VC-26	3.5	0.65	ND	38	ND	37	-1	-1	1	0.03	ND
	VC-27	3.2	0.83	ND	71	ND	40	-1	-1	-1	0.04	ND
	VC-32	3	0.61	ND	86	ND	51	-1	1	4	0.04	ND
	VC-33	2.8	0.65	ND	110	ND	56	-1	-1	12	0.05	ND

NOTES:
Detected concentrations only were used in statistical calculations
Negative values indicate analyte not detected below indicted concentration
See laboratory reports (Appendix) for individual analyte detection limits for all "Total" analytes
N = number of samples used in calculations
STD = Standard Deviation
NA = Not Applicable

Table 2: Continued)

Core Segment	Station	Core Segment Length (subsurface)	TOC (%)	Total PAH (µg/Kg)	Total Phthalates (µg/Kg)	Total Phenols (µg/Kg)	TRPH (mg/Kg)	Butyltins			4,4'-DDE (mg/Kg)	Total PCBs (mg/Kg)
								MBT (µg/Kg)	DBT (µg/Kg)	TBT (µg/Kg)		
1	VC-35	2	0.77	44	57	ND	93	-1	2	4	0.09	0.02
	VC-36	2.8	0.55	ND	40	ND	41	-1	-1	3	0.04	0.01
	VC-38	3	0.56	46	120	ND	22	-1	-1	3	0.03	ND
	VC-39	2.5	0.46	ND	130	ND	27	-1	2	2	0.04	0.01
	VC-40	4.6	0.43	ND	ND	ND	-10	-1	5	-1	-0.02	ND
	VC-41	5	0.28	ND	40	ND	21	-1	-1	-1	0.03	ND
	VC-42	4.3	2.87	ND	24	ND	20	-1	4	-1	0.02	ND
	VC-43	2	0.43	ND	26	ND	77	-1	2	-1	0.02	ND
	VC-44	2	0.54	ND	52	ND	50	-1	2	-1	0.05	ND
	VC-45	1.5	0.63	ND	140	ND	66	-1	-1	2	0.1	0.01
	N	28.0	28.0	4	27	NA	23	NA	7	20		
	MEAN	3.3	0.74	39	103	NA	41	NA	3	3		
	STD	1.2	0.47	10	122	NA	21	NA	1	3		
	MIN	1.5	0.28	24	24	NA	11	NA	1	1		
	MAX	6	2.87	46	590	NA	93	NA	5	12		
2	VC-1	15	0.44	ND	33	ND	-10	-1	-1	-1	-0.02	ND
	VC-2	9	0.25	ND	44	ND	-10	-1	-1	-1	-0.02	ND

NOTES:
Detected concentrations only were used in statistical calculations
Negative values indicate analyte not detected below indicted concentration
See laboratory reports (Appendix) for individual analyte detection limits for all "Total" analytes
N = number of samples used in calculations
STD = Standard Deviation
NA = Not Applicable

Table 2: (Continued)

Core Segment	Station	Core Segment Length (subsurface)	TOC (%)	Total PAH (µg/Kg)	Total Phthalates (µg/Kg)	Total Phenols (µg/Kg)	TRPH (mg/Kg)	Butyltins			4,4'-DDE (mg/Kg)	Total PCBs (mg/Kg)
								MBT (µg/Kg)	DBT (µg/Kg)	TBT (µg/Kg)		
2	VC-7	8.2	0.1	ND	340	ND	-10	-1	-1	-1	-0.02	ND
	VC-9	11.7	0.57	ND	59	ND	20	-1	-1	2	-0.02	ND
	VC-11	17.5	0.31	ND	64	ND	-10	-1	-1	1	-0.02	ND
	VC-12	15.2	0.64	ND	110	ND	-10	-1	-1	2	-0.02	ND
	VC-13	13.8	0.25	ND	84	ND	-10	-1	-1	1	-0.02	ND
	VC-17	14.4	0.52	ND	390	ND	-10	-1	-1	2	-0.02	ND
	VC-18	14.4	0.2	ND	170	ND	-10	-1	-1	-1	-0.02	ND
	VC-22	17	0.36	ND	49	ND	-10	-1	-1	-1	-0.02	ND
	VC-23	6.5	0.23	ND	31	ND	-10	-1	-1	1	-0.02	ND
	VC-26	13.8	0.3	ND	27	ND	-10	-1	-1	-1	-0.02	ND
	VC-27	11.8	0.3	ND	65	ND	-10	-1	-1	-1	-0.02	ND
	VC-32	4.5	0.15	ND	30	ND	-10	-1	-1	2	-0.02	ND
	VC-33	9.5	0.62	ND	63	ND	-10	-1	-1	1	-0.02	ND
	VC-35	3.5	0.31	ND	39	ND	10	-1	-1	2	-0.02	ND
	VC-36	4.1	0.53	ND	ND	ND	-10	-1	-1	3	-0.02	ND
	VC-38	7.4	0.6	ND	113	35	-10	-1	-1	-1	-0.02	ND
	VC-39	5	0.84	ND	21	ND	-10	-1	-1	2	-0.02	ND

NOTES:
Detected concentrations only were used in statistical calculations
Negative values indicate analyte not detected below indicted concentration
See laboratory reports (Appendix) for individual analyte detection limits for all "Total" analytes
N = number of samples used in calculations
STD = Standard Deviation
NA = Not Applicable

Table 2: (Continued)

Core Segment	Station	Core Segment Length (subsurface)	TOC (%)	Total PAH (µg/Kg)	Total Phthalates (µg/Kg)	Total Phenols (µg/Kg)	TRPH (mg/Kg)	Butyltins			4,4'-DDE (mg/Kg)	Total PCBs (mg/Kg)
								MBT (µg/Kg)	DBT (µg/Kg)	TBT (µg/Kg)		
2	N	19.0	19.0	ND	18	1	2	NA	NA	11		
	MEAN	10.6	0.4	ND	96	35	15	NA	NA	2		
	STD	4.6	0.2	ND	105	ND	7	NA	NA	1		
	MIN	3.5	0.1	ND	21	35	10	NA	NA	1		
	MAX	17.5	0.84	ND	390	35	20	NA	NA	3		
3	VC-2	13.5	0.51	ND	92	ND	-10	-1	-1	3	-0.02	ND
	VC-7	13.2	0.5	ND	110	ND	-10	-1	-1	-1	-0.02	ND
	VC-23	13.9	0.13	ND	52	ND	-10	-1	-1	-1	-0.02	ND
	VC-32	9.5	0.22	ND	58	ND	12	-1	-1	-1	-0.02	ND
	VC-35	6	0.33	ND	ND	ND	-10	-1	-1	3	-0.02	ND
	VC-36	6.9	0.46	ND	42	ND	13	-1	-1	2	-0.02	ND
	VC-39	6.7	0.79	ND	38	ND	-10	-1	-1	-1	-0.02	ND
	N	7	7	ND	6	NA	2	NA	NA	3		
	MEAN	10	0.42	ND	65	NA	13	NA	NA	3		
	STD	3.5	0.22	ND	29	NA	1	NA	NA	1		
	MIN	6	0.13	ND	38	NA	12	NA	NA	2		
	MAX	13.9	0.79	ND	110	NA	13	NA	NA	3		

NOTES:
Detected concentrations only were used in statistical calculations
Negative values indicate analyte not detected below indicted concentration
See laboratory reports (Appendix) for individual analyte detection limits for all "Total" analytes
N = number of samples used in calculations
STD = Standard Deviation
NA = Not Applicable

Table 2: . (Continued)

Core Segment	Station	Core Segment Length (subsurface)	TOC (%)	Total PAH (µg/Kg)	Total Phthalates (µg/Kg)	Total Phenols (µg/Kg)	TRPH (mg/Kg)	Butyltins			4,4'-DDE (mg/Kg)	Total PCBs (mg/Kg)
								MBT (µg/Kg)	DBT (µg/Kg)	TBT (µg/Kg)		
4	VC-35	10.5	0.13	ND	41	ND	-10	-1	-1	2	-0.02	ND
	VC-36	10.2	0.48	ND	30	ND	-10	-1	-1	2	-0.02	ND
	N	2	2	ND	2	NA	NA	NA	NA	2		
	MEAN	10.4	0.3	ND	36	NA	NA	NA	NA	2		
1	Trans.1+12		0.09	ND	22	ND	-10	-1	-1	-1	-0.02	ND
	Trans.1-30		0.72	ND	275	ND	238	-1	3	3	0.02	ND
	Trans.2+12		0.02	ND	43	ND	-10	-1	-1	-1	-0.02	ND
	Trans.2-30		0.35	ND	140	21	125	-1	3	3	-0.02	ND
	Trans.3+12		0.1	ND	ND	ND	-10	-1	-1	-1	-0.02	ND
	Trans.3-30		0.15	ND	57	ND	39	-1	-1	-1	-0.02	ND
	Trans.4+12		0.07	ND	27	ND	-10	-1	-1	-1	-0.02	ND
	Trans.4-30		0.2	ND	87	ND	25	-1	-1	1	-0.02	ND
	Trans.5+12		0.02	ND	25	ND	-10	-1	-1	-1	-0.02	ND
	Trans.5-30		0.07	ND	ND	ND	-10	-1	-1	-1	-0.02	ND
	Trans.6+12		0.06	ND	53	ND	-10	-1	-1	-1	-0.02	ND
	Trans.6-30		0.12	ND	21	ND	12	-1	-1	-1	-0.02	ND
	N		12	NA	10	1	5	NA	2	3		

NOTES:
Detected concentrations only were used in statistical calculations
Negative values indicate analyte not detected below indicted concentration
See laboratory reports (Appendix) for individual analyte detection limits for all "Total" analytes
N = number of samples used in calculations
STD = Standard Deviation
NA = Not Applicable

Table 2: (Continued)

Core Segment	Station	Core Segment Length (subsurface)	TOC (%)	Total PAH (µg/Kg)	Total Phthalates (µg/Kg)	Total Phenols (µg/Kg)	TRPH (mg/Kg)	Butyltins			4,4'-DDE (mg/Kg)	Total PCBs (mg/Kg)
								MBT (µg/Kg)	DBT (µg/Kg)	TBT (µg/Kg)		
1	MEAN		0.16	NA	75	21	88	NA	3	2		
	STD		0.2	NA	79	ND	95	NA	0	1		
	MIN		0.02	NA	21	21	12	NA	3	1		
	MAX		0.72	NA	275	21	238	NA	3	3		
	Is.White#1		2.06	255	1900	ND	1200	3	12	23	0.03	0.17
	Is.White#2		1.55	156	552	ND	710	7	17	20	0.03	0.10
	N		2	2	2	.	2	2	2	2		
	MEAN		1.81	206	1226	.	955	5	15	22		
	Ref.Site#1		0.97	ND	72	ND	38	-1	-1	1	0.03	ND
	Ref.Site#2		0.98	ND	140	ND	49	-1	-1	-1	-0.02	ND
	N		2	NA	2	NA	2	NA	NA	1		
	MEAN		0.97	NA	106	NA	44	NA	NA	1		
	LA-2Site#1		1.22	251	214	ND	236	-1	5	8	0.05	0.05
	LA-2Site#2		1.07	295	152	50	232	-1	1	6	0.03	0.04
	N		2	2	2	1	2	NA	2	2		
	MEAN		1.15	273	183	50	234	NA	3	7		

NOTES:
Detected concentrations only were used in statistical calculations
Negative values indicate analyte not detected below indicted concentration
See laboratory reports (Appendix) for individual analyte detection limits for all "Total" analytes
N = number of samples used in calculations
STD = Standard Deviation
NA = Not Applicable

Table 3: Summary of Metals Chemical Testing Results (mg/Kg, dry weight)

Core Segment	Station	Core Segment Length	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc
1	VC-1	4.0	3.3	0.10	15.3	7.07	4.27	0.03	9.2	-0.5	0.02	29.3
	VC-2	6.0	4.8	0.17	20.9	14.50	12.50	0.04	12.5	-0.5	0.06	46.7
	VC-3	1.5	7.3	0.13	21.0	20.70	6.81	0.05	16.0	-0.5	0.03	51.1
	VC-4	3.0	6.4	0.26	29.0	29.80	14.10	0.07	20.9	0.5	0.03	70.1
	VC-6	4.5	5.1	0.12	21.6	19.60	8.75	0.04	16.4	-0.5	0.04	50.7
	VC-7	4.5	8.7	0.07	28.7	25.30	9.93	0.05	23.4	-0.5	0.04	59.8
	VC-9	2.5	3.3	0.10	13.3	6.79	2.92	0.17	8.4	-0.5	0.03	24.8
	VC-11	3.0	3.5	0.12	14.9	7.31	4.12	0.03	9.3	-0.5	-0.02	31.8
	VC-11	2.0	2.7	0.09	12.2	5.00	2.58	-0.02	7.3	-0.5	0.03	22.1
	VC-13	2.5	4.1	0.11	12.3	5.32	2.10	-0.02	7.8	-0.5	-0.02	27.9
	VC-17	4.0	2.7	0.08	13.0	6.01	2.82	-0.02	8.2	-0.5	0.05	27.3
	VC-18	4.0	3.6	0.11	16.4	8.13	7.04	0.04	8.7	-0.5	0.04	30.1
	VC-22	5.0	3.8	0.16	17.1	9.60	6.80	0.03	9.3	0.5	0.05	35.4
	VC-23	4.0	4.3	0.19	17.5	11.50	8.13	0.05	10.7	-0.5	0.05	40.0
	VC-26	3.5	3.7	0.14	15.1	8.65	5.67	0.04	8.3	-0.5	0.03	31.1
	VC-27	3.2	4.0	0.15	18.8	10.50	9.92	0.04	9.0	-0.5	0.06	37.0
	VC-32	3.0	4.0	0.14	17.2	8.68	7.82	0.04	8.2	-0.5	0.04	33.2
	VC-33	2.8	4.2	0.13	17.2	8.83	7.39	0.05	8.3	-0.5	0.04	33.2
	VC-35	2.0	6.0	0.22	26.8	14.30	15.40	0.09	11.0	0.5	0.11	48.7
	VC-36	2.8	4.2	0.11	17.0	8.39	6.24	0.05	8.4	-0.5	0.02	32.5
	VC-38	3.0	4.5	0.11	16.3	5.42	4.04	0.05	7.0	-0.5	-0.02	25.5
	VC-39	2.5	4.9	0.13	18.6	7.13	5.98	0.03	7.8	-0.5	0.03	30.3
	VC-40	4.6	6.1	0.11	25.9	23.10	8.57	0.04	17.0	-0.5	-0.02	54.1
	VC-41	5.0	3.2	0.08	14.9	9.22	5.33	0.03	8.0	-0.5	-0.02	30.8
	VC-42	4.3	3.2	0.06	17.3	11.50	4.35	0.03	11.1	-0.5	-0.02	38.8

NOTES:
Detected concentrations only were used in statistical calculations
Negative values indicate analyte not detected below indicated concentration
N = number of samples used in calculations
STD = Standard Deviation
NA = Not Applicable

Core Segment	Station	Core Segment Length	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc
1	VC-43	2.0	4.8	0.11	18.8	5.57	5.39	0.02	6.6	-0.5	-0.02	27.2
	VC-44	2.0	5.3	0.14	20.4	6.78	8.68	0.04	6.9	-0.5	0.04	29.4
	VC-45	1.5	5.2	0.17	21.9	8.24	9.67	0.06	7.2	-0.5	0.07	31.2
	N	28.0	28.0	28.00	28.0	28.00	28.00	25.00	28.0	3.0	21.00	28.0
	MEAN	3.3	4.5	0.13	18.6	11.18	7.05	0.05	10.5	0.5	0.04	36.8
	STD	1.2	1.4	0.04	4.6	6.59	3.35	0.03	4.3	0.0	0.02	11.7
	MIN	1.5	2.7	0.06	12.2	5.00	2.10	0.02	6.6	0.5	0.02	22.1
	MAX	6.0	8.7	0.26	29.0	29.80	15.40	0.17	23.4	0.5	0.11	70.1
2	VC-1	15.0	6.7	0.16	25.2	23.00	7.25	0.06	20.9	-0.5	-0.02	62.3
	VC-2	9.0	3.0	0.07	22.3	20.60	6.30	-0.02	18.0	-0.5	-0.02	62.9
	VC-7	8.2	2.6	0.03	9.3	7.84	2.77	-0.02	7.8	-0.5	0.05	28.3
	VC-9	11.7	5.8	0.18	24.3	27.40	10.80	0.04	19.2	-0.5	0.05	54.9
	VC-11	17.5	2.4	0.04	21.7	19.00	5.37	0.02	16.3	-0.5	-0.02	61.2
	VC-12	15.2	5.9	0.07	24.3	21.80	8.02	0.03	19.3	-0.5	0.03	59.9
	VC-13	13.8	4.5	0.04	23.2	19.30	6.67	0.03	18.0	-0.5	-0.02	61.0
	VC-17	14.4	3.5	0.07	18.7	21.00	5.35	-0.02	16.2	-0.5	0.06	50.0
	VC-18	14.4	3.2	0.04	17.4	13.10	4.47	-0.02	13.2	-0.5	-0.02	46.1
	VC-22	17.0	4.0	0.07	22.5	20.00	6.35	0.03	17.3	-0.5	-0.02	58.1
	VC-23	6.5	8.1	0.08	22.7	21.50	6.60	0.04	17.6	-0.5	-0.02	55.7
	VC-26	13.8	5.3	0.08	21.8	20.90	5.90	0.03	17.9	-0.5	-0.02	56.4
	VC-27	11.8	5.1	0.07	17.2	13.80	4.66	-0.02	13.2	-0.5	-0.02	43.7
	VC-32	4.5	0.9	0.06	13.7	10.10	3.28	-0.02	11.0	-0.5	-0.02	42.3
	VC-33	9.5	5.6	0.11	26.2	28.10	9.21	0.04	20.1	-0.5	0.07	63.8
	VC-35	3.5	4.2	0.11	12.2	4.34	2.52	-0.02	6.6	-0.5	-0.02	23.6
	VC-36	4.1	19.2	0.19	29.8	31.60	10.80	0.02	23.2	-0.5	0.08	77.2
	VC-38	7.4	8.8	0.12	33.7	34.10	12.30	0.05	24.0	0.0	0.00	76.4
	VC-39	5.0	5.8	0.15	27.2	25.00	8.80	0.04	18.9	-0.5	-0.02	64.3

NOTES:
Detected concentrations only were used in statistical calculations
Negative values indicate analyte not detected below indicated concentration
N = number of samples used in calculations
STD = Standard Deviation
NA = Not Applicable

Core Segment	Station	Core Segment Length	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc
2	N	19.0	19.0	19.00	19.0	19.00	19.00	12.00	19.0	NA	6.00	19.0
	MEAN	10.6	5.5	0.09	21.8	20.13	6.71	0.04	16.8	NA	0.06	55.2
	STD	4.6	3.9	0.05	6.0	7.72	2.75	0.01	4.6	NA	0.02	13.8
	MIN	3.5	0.9	0.03	9.3	4.34	2.52	0.02	6.6	NA	0.03	23.6
	MAX	17.5	19.2	0.19	33.7	34.10	12.30	0.06	24.0	NA	0.08	77.2
3	VC-2	13.5	5.6	0.17	27.9	25.50	9.10	0.06	25.7	-0.5	0.17	70.6
	VC-7	13.2	4.9	0.16	25.7	27.60	9.83	0.05	21.2	-0.5	0.09	57.0
	VC-23	13.9	1.2	-0.02	6.7	5.61	1.81	-0.02	5.3	-0.5	-0.02	20.7
	VC-32	9.5	5.3	0.08	11.5	18.60	5.04	0.04	14.5	-0.5	-0.02	49.3
	VC-35	6.0	9.7	0.07	28.5	29.60	9.08	0.06	22.1	-0.5	-0.02	70.9
	VC-36	6.9	11.2	0.15	27.3	26.10	9.11	0.04	21.2	0.6	-0.02	66.9
	VC-39	6.7	6.5	0.18	42.1	41.90	16.60	0.04	29.7	-0.5	0.07	90.9
	N	7.0	7.0	6.00	7.0	7.00	7.00	6.00	7.0	1.0	3.00	7.0
	MEAN	10.0	6.3	0.14	24.2	24.99	8.65	0.05	20.0	0.6	0.11	60.9
	STD	3.5	3.3	0.05	11.8	11.04	4.56	0.01	8.0	.	0.05	22.0
	MIN	6.0	1.2	0.07	6.7	5.61	1.81	0.04	5.3	0.6	0.07	20.7
	MAX	13.9	11.2	0.18	42.1	41.90	16.60	0.06	29.7	0.6	0.17	90.9
4	VC-35	10.5	1.7	0.05	12.7	11.20	3.32	-0.02	10.0	-0.5	-0.02	34.0
	VC-36	10.2	5.6	0.07	27.8	21.80	8.46	0.04	17.6	-0.5	0.02	54.9
	N	2.0	2.0	2.00	2.0	2.00	2.00	1.00	2.0	NA	1.00	2.0
	MEAN	10.4	3.7	0.06	20.3	16.50	5.89	0.04	13.8	NA	0.02	44.5
	STD	0.2	2.8	0.01	10.7	7.50	3.63	.	5.4	NA	NA	14.8
	MIN	10.2	1.7	0.05	12.7	11.20	3.32	0.04	10.0	NA	0.02	34.0
	MAX	10.5	5.6	0.07	27.8	21.80	8.46	0.04	17.6	NA	0.02	54.9
1	Trans.1+12	1.3	-0.02	2.5	1.55	1.65	0.00	1.9	-0.5	-0.02	9.0	
	Trans.1-30	6.7	0.35	29.3	26.90	34.30	0.09	19.7	-0.5	0.15	94.3	
	Trans.2+12	1.1	-0.02	2.6	1.69	1.84	-0.20	2.1	-0.5	-0.02	10.5	

NOTES:
Detected concentrations only were used in statistical calculations
Negative values indicate analyte not detected below indicated concentration
N = number of samples used in calculations
STD = Standard Deviation
NA = Not Applicable

Core Segment	Station	Core Segment Length	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc
1	Trans.2-30	3.9	0.21	17.0	15.20	21.10	0.05	11.5	-0.5	0.07	61.9	
	Trans.3+12	1.5	-0.02	2.2	1.16	2.05	-0.20	1.5	-0.5	-0.02	8.2	
	Trans.3-30	2.6	0.09	11.9	7.74	10.20	-0.20	7.6	-0.5	-0.02	36.3	
	Trans.4+12	1.5	-0.02	2.2	1.30	2.17	-0.20	1.7	-0.5	-0.02	8.1	
	Trans.4-30	2.8	0.04	8.8	4.63	7.43	-0.20	5.1	-0.5	-0.02	25.0	
	Trans.5+12	1.6	-0.02	4.2	2.12	1.50	-0.20	2.2	-0.5	-0.02	10.7	
	Trans.5-30	3.5	-0.02	4.4	1.50	3.52	-0.20	1.7	-0.5	-0.02	8.6	
	Trans.6+12	1.4	-0.02	3.9	1.57	1.29	-0.20	1.8	-0.5	0.00	8.0	
	Trans.6-30	2.7	0.03	9.7	3.96	6.60	-0.20	4.9	-0.5	-0.02	22.9	
	N		12.0	5.00	12.0	12.00	12.00	2.00	12.0	NA	2.00	12.0
	MEAN		2.6	0.14	8.2	5.78	7.80	0.07	5.1	NA	0.11	25.3
	STD		1.6	0.14	8.1	7.80	10.11	0.03	5.5	NA	0.06	27.1
	MIN		1.1	0.03	2.2	1.16	1.29	0.05	1.5	NA	0.07	8.0
	MAX		6.7	0.35	29.3	26.90	34.30	0.09	19.7	NA	0.15	94.3
	CleanCACoast	NA	0.33	22.0	8.30	6.10	0.04	9.7	NA	0.20	43.0	
	Is.White#1	11.2	1.52	47.9	66.10	144.00	0.24	34.3	0.9	0.41	20.0	
	Is.White#2	10.3	0.91	46.5	60.00	118.00	0.24	31.7	1.2	0.37	90.0	
	N		2.0	2.00	2.0	2.00	2.00	2.00	2.0	2.0	2.00	2.0
	MEAN		10.8	1.22	47.2	63.05	131.00	0.24	33.0	1.1	0.39	5.0
	Ref.Site#1	2.5	0.20	25.0	12.50	6.94	0.04	12.4	-0.5	0.12	48.5	
	Ref.Site#2	3.6	0.20	28.4	13.90	8.42	0.04	14.3	-0.5	0.14	56.6	
	N		2.0	2.00	2.0	2.00	2.00	2.00	2.0	NA	2.00	2.0
	MEAN		3.1	0.20	26.7	13.20	7.68	0.04	13.4	NA	0.13	52.6
	LA-2Site#1	9.5	0.56	37.6	39.10	46.10	0.19	24.2	-0.5	0.30	23.0	
	LA-2Site#2	7.9	0.48	32.1	33.50	43.40	0.17	20.5	-0.5	0.25	94.1	
	N		2.0	2.00	2.0	2.00	2.00	2.00	2.0	NA	2.00	2.0
	MEAN		8.7	0.52	34.9	36.30	44.75	0.18	22.4	NA	0.28	8.6

NOTES:
Detected concentrations only were used in statistical calculations
Negative values indicate analyte not detected below indicated concentration
N = number of samples used in calculations
STD = Standard Deviation
NA = Not Applicable

4. GEOTECHNICAL TESTING

A total of 45 subsurface cores were collected from Dredge Area Stations VC-1 through VC-45. Core locations are shown in Figure 1. The tabulated results of the vibracore investigation is presented in Table 1.

4.1 GEOTECHNICAL LOGGING AND TESTING

The soil observed in the vibracores was visually classified in general accordance with the American Society for Testing and Materials (ASTM) D2488-90, summarized on Plate B1 in Appendix B. Vibracores were examined and photographed upon opening to help document visible signs of stratification. The vibracore logs are presented on Plates B2 through B46 in Appendix B.

Field torvane shear strength tests were performed on vibracore soils to help substantiate the visual classification and to evaluate shear strength on fine-grained soils. Logs of the vibracores presented on Plates B2 through B46 were prepared from visual examination of the samples and review of particle size analysis (see Appendix C for a discussion of the particle size analysis).

Based on observation of the vibracore samples, the amount of sample washout was minimal. The bottom 1-foot of penetration was generally "lost" because of the vibracore sample shoe, sand catcher, and the inset of the plastic liner. Therefore, nearly all of the difference between vibracore penetration and sample recovery can be attributed to consolidation during sampling. The depth of penetration and sample recovery is noted on the vibracore logs.

The classification of the surface samples was based on the results of the particle size analysis only.

Geotechnical soil samples were obtained by MEC personnel from the vibracores at 3-foot intervals and/or each significant change of material type. The samples were tested for particle size distribution in MEC's laboratory using an expanded sieve nest (Table 4). The results of individual particle size analyses are presented in Appendix C. Summaries of the particle size analyses are presented on the vibracore logs in Appendix B. The tests were performed in accordance with EPA/CE-81-1 technical report (see reference list). A summary of the results of particle size analyses is presented in Appendix C in Tables C1 and C2 for the vibracore and surface samples, respectively.

Summaries of the particle size analyses are presented on the vibracore logs in Appendix B. To "translate" to the particle sizes frequently used for engineering purposes, the computer program gINT interpolated the percent passing from adjacent sieves. For example, the percent passing the number 40 sieve was estimated from the percentage passing the number 35 and 45 sieves.

4.2 GEOLOGICAL SETTING

San Pedro Bay is located on the inner margin of the southern California Continental Borderland, south of the Palos Verdes peninsula and north of the Newport submarine canyon (see Plates 3 and 4). The inner margin lies within the system of northwest-southwest trending structures that are typical of the borderland and the northern Peninsular Ranges province south of the east-west trending Transverse Ranges province. Of these structures, the major active Palos Verdes fault zone and the 50-mile long Palos Verdes uplift are the most significant tectonic features of the San Pedro margin. The project dredge area overlies the Wilmington graben, a down-dropped block between the Palos Verdes fault zone to the south and the THUMS-Huntington Beach fault to the north (Plate 4) (Junger and Wagner 1977, Fischer and others, 1977, 1987 and Nardin and Henyey, 1978). Within this subsiding block the thickness of Neogene units, as well as the Holocene sediment veneer, increases abruptly. For example, the thickness of Holocene age sediment is 30 to 60 feet in the project area and thins to zero (0) feet over the Palos Verdes uplift to the south (Rudat, 1980, Fischer and Rudat, 1987, Fischer and Lee, 1992).

The project dredge area lies within the 12-mile wide shelf of San Pedro Bay and extends from inside the breakwater of the Port south to the 80-foot isobath. To the southeast, the width of the shelf decreases sharply to less than one mile off Newport Beach (Plate 3).

4.2.1 Previous Studies

On-land studies of the southern Los Angeles basin (Yerkes and others 1965, Yeats, 1973, Wright, 1991) and the Palos Verdes peninsula (Woodring and others, 1946, Conrad and Ehlig 1987, Stephenson and others [in press]) have been extended into the margin by numerous other workers. See the Bibliography for references sited. A subject index and annotated Bibliography is presented in Appendix D. The more recent definitive studies of the San Pedro margin include Junger and Wagner (1977), Nardin and Henyey (1978), Rudat (1980), Fischer and others (1983 and 1987), Osborne and others (1983), and Vedder and others (1986).

Studies of the Palos Verdes fault zone by Yerkes and others (1965), Fischer and others (1977), Nardin and Henyey (1978), Darrow and Fischer (1983), Fischer and others (1987) Wright (1991), and Fischer (1992b) have in general described this fault as a steeply dipping oblique-slip fault zone. Activity of the fault across the San Pedro shelf (Junger and Wagner 1977, Vedder and others 1986, Fischer and others, 1987) through the Los Angeles harbor (Fischer, 1992a) and on shore (Valensise and Ward, 1992 and Stephenson and others, in press) is well documented. However, the seismicity of the fault is considered low (Vedder, 1986, Petersen and Wesnousky, 1994). This contrasts with the well-documented and high-level seismic activity of the Newport-Inglewood fault zone, which has been described as a classical strike-slip fault zone by Harding (1973), Yeats (1973), Fischer and Mills (1991), Petersen and Wesnousky (1994) and other workers.

Recently, seismotectonic studies by Hauksson (1988) and Hauksson and others (1988, 1989 and 1992) and balanced-cross sections and subsurface maps by Namson and Davis (1988) and Shaw and Suppe (in press) have modified our classical structural concepts of steeply dipping lateral and reverse faults that rupture the surface. Deep, nearly flat, "blind" thrust planes that ramp upward forming anticlinal fold trends, but not reaching the surface have been mapped across the Los

Angeles basin and San Pedro margin by these workers. The Torrance-Wilmington fault, a "blind thrust" that extends from the northern Santa Monica margin south through the Palos Verdes anticlinorium and across the San Pedro margin ending (?) near Newport Beach has been proposed by Hauksson, 1988, Shaw and Suppe, 1993. It is at least partially coincident with the southern portion of the Torrance-Wilmington thrust. These postulated thrust faults occur at depths of 6 to 9 miles (10-15 kilometers [km]) and may dominate the seismotectonic setting of the San Pedro margin (Dames and Moore, 1991). However, as stated by Peterson and Wesnousky, 1994, "the study of blind thrusts and their relationship to seismic hazard is still in its infancy."

The marine geology of the San Pedro shelf and margin is well known. Early studies by Emery (1952 and 1960), Moore (1954), Gorsline and Grant (1972) and Welday and Williams (1975) emphasized surficial materials and sediments and the relief of the shelf-slope surface. Karl (1976) and Drake and others (1985) investigated bottom currents and sediment transport the shelf. Studies by Greene and others, (1985), Fischer and others (1977) Nardin and Henyey (1978), Rudat (1980), Fischer and others (1983), Osborne and others (1980 and 1983) and Fischer and Lee (1992) used high resolution seismic reflection profiles, vibracores, and geotechnical borings) to identify and determine the thickness, aerial distribution, seismic facies and age of the Quaternary units of the margin.

Ongoing sediment, sediment transport, oceanographic and other studies by the Marine Geology branch of the U.S. Geological Survey in Menlo Park, California and others (e.g., Scripps Institute of Oceanography) are not yet available to the public.

4.2.2 Subdivision of the San Pedro Bay Margin

A two-fold division of the San Pedro margin separated by the northwest trending, seismically active Palos Verdes fault zone is shown on Plate 4. These geomorphic tectonic blocks are summarized below.

> The *Northeastern* or *Wilmington Graben Block* flanks the Palos Verdes fault along its southern limit and is bounded on the north by the northwest trending fault splays of the THUMS-Huntington Beach fault zone (Wright 1991, Fischer 1992b) or the "Unamed fault" of Junger and Wagner (1977).
>
> The *Southwestern* or *Outer Margin Block* is separated from the northeastern block by the Palos Verdes fault and uplift. This fault is a northwest-southeast trending structure that bisects the shelf from the Palos Verdes peninsula south to the Lasuen Sea Mount (Junger and Wagner 1977, Darrow and Fischer, 1983 and Vedder and others 1986, Fischer and others, 1987). Along the uplift, Neogene formations are exposed or thinly covered by Holocene-late Pleistocene age sediments.

4.2.3 Stratigraphy

A structural-stratigraphic cross section of the San Pedro margin is shown on Plate 5 (Fischer and others, 1987). Essentially, the stratigraphic sections of the San Pedro margin and the southern block of the Los Angeles basin are identical. The Mesozoic Catalina Schist, which is the

equivalent of the Franciscan Complex, underlies a thick Neogene section that includes the Miocene Monterey Formation and Pliocene sedimentary rocks. Unconformably overlying the Neogene units is a cyclic sequence of Quaternary sedimentary deposits.

4.2.3.1 Bedrock Stratigraphic Units: Basement rocks of the southern Los Angeles basin and the San Pedro margin are the Jurassic Catalina Schist (Yerkes and others 1965). These basement rocks are exposed near Point Fermin along the crest of the Palos Verdes uplift, southwest of the Palos Verdes fault. The Catalina Schist underlies the shelf at depths that range between surface exposures to 10,000 feet below sea level (Yerkes and others 1965, Fischer and others 1987, Wright, 1991).

Unconformably overlying the Catalina Schist are middle Miocene rocks of the San Onofre Breccia (?) and/or the Monterey Formation (Vedder and others, 1986, Fischer and others, 1987). The middle-late Miocene age Monterey Formation is well exposed on the Palos Verdes peninsula, and is penetrated by deep wells along the San Pedro margin and in Shell's Beta field. In the western margin block along the southern extension of the Palos Verdes uplift, the Monterey Formation either outcrops or is thinly veneered by Pliocene to Holocene sediment (Junger and Wagner 1977, Nardin and Henyey 1978, Vedder and others 1986).

Lithologies of the Monterey Formation on the Palos Verdes hills consist of shales, diatomaceous shales, mudstones, chert, phosphatic shales, sandstones, volcanic dikes and sills, and volcanic ash beds or bentonic clay (Woodring and others 1946, Conrad and Ehlig, 1980).

Pliocene bedrock is exposed along the uplift and slope near the San Pedro Canyon (Junger and Wagner 1977, and Vedder and others 1986). Pliocene bedrock of the "Pico" and "Repetto" Formations underlies the late Quaternary sedimentary veneer of the inner shelf.

4.2.3.2 Quaternary Deposits: In the Northeastern Block, Quaternary deposits and the underlying Neogene units fill the Wilmington graben, a fault bounded trough that was formed during late mid-Miocene time (Junger and Wagner, 1977, Fischer and others, 1987). Unconformities mark the boundaries betwen Pliocene and Pleistocene and between Pleistocene and Holocene strata (Plate 6).

Uncemented or weakly consolidated Holocene deposits in the Northeastern Block are on the order of 0 to 60 feet thick as shown by Plate 7 (Rudat 1980, Fischer and others, 1983). The unconsolidated or soft latest Pleistocene (?)-Holocene sediment will be a major consideration for the future design and construction of dredge channels and disposal sites especially for sediment or soils with a high percentage of fine-grained material. The pre-latest Pleistocene deposits are generally a denser and more cohesive soil than the overlying latest Pleistocene-Holocene sediment due to compaction and time.

The sediment sources of the San Pedro margin prior to 1930 and the construction of the Los Angeles harbor were dominated by the ancestral Los Angeles River (Poland and others 1956). Today, wave erosion of the adjoining cliffs of the Palos Verdes Peninsula and offshore ridges supplies most of the sediment to margin (Emery 1960).

4.2.3.3 Previous Investigations: Numerous sediment or soil sampling and geophysical investigations in the San Pedro margin have been performed in the past and are listed in Table 5. The following field investigations provide well documented results that were used in more recent interpretations of the Quaternary history and sediment or soil characteristics of the inner to outer margin (Fischer and others, 1977, Osborne and others 1983, Fischer and others 1983, 1987, Fischer and Rudat, 1987 and Fischer, 1992. Other than the Fugro-McClelland (1991- 1994) investigations for the "2020 PLAN" for the Port of Los Angeles, studies conducted in the harbors or shoreward of the breakwater are not included in this listing.

4.2.3.4 Pleistocene Strata: A succession of cross-bedded strata observed in seismic reflection profiles are characteristic of early (?) Pleistocene strata (Junger and Wagner 1977, Fischer and others, 1987). These workers postulated that the large-scale forest beds were formed by a south to southwesterly prograding delta of the Los Angeles river during the Pleistocene, and may be equivalent in age to the cross-bedded San Pedro Formation, which is less than 1 million years (m.a.) old in the Palos Verdes hills (Bandy 1972).

Offshore Pleistocene deposits typically consist of red-brown (iron oxide stained) alternating very thin to massive beds of fine to medium-grained "shelly" sand. Surface exposures of Pleistocene sediment occur along the flanks of the Palos Verdes uplift (Drake and others, 1985).

4.2.3.5 Pleistocene (?) - Holocene Sediments: Rudat (1980) and Fischer and others (1983) and Osborne and others (1983) using the seismic-reflection data collected by California State University Northridge (CSUN), University of Southern California, the COE, the (U. S. Geological Survey [USGS]) and others, prepared isopachs of the late Quaternary sediment deposits. The thickness of the "unconsolidated" sediment is 0 to 60 feet and is shown on the map entitled Holocene isopach (Plate 8 from Fischer and others, 1983). Thicknesses were calculated by using a constant seismic velocity of 5,700 feet/second and as determined by Fischer and others (1977). Ages were determined from borings on the outer shelf-slope by Fischer and others (1977) and correlated over the shelf using seismic reflection profiles (Rudat, 1980, Fischer and others, 1983). Surficial sediments are shown on Plate 9.

Vibracore samples of Holocene and Pleistocene (?) sediment south of the Port of Long Beach consist of dark-medium olive-gray, clays and silty, sandy, pebbly granule-gravel sized material according to Osborne and others (1983) (Plates 10, 11, and 12).

4.2.3.6 Modern Sediment: Plate 9 illustrates surficial materials and sediment grain size based upon the mapping of Drake and others (1985). Sediment types represent the predominant sediment in core samples collected from the surficial or upper 3 feet of sediment or soil (Emery, 1960, Wimberly, 1964).

Surficial sediment grain size as shown by Plate 9, displays a trend of decreasing sediment grain size toward the outer margin. In the eastern shelf area, surficial sediments are mainly cohesionless soils of fine sand to gravel. Surficial shelly sands of late Pleistocene age are exposed along the inner Palos Verdes uplift (Drake and others, 1985).

4.3 TECTONIC SETTING

The northwestward motion of the Pacific plate relative to the motion of the North American plate results in both strike-slip movement along the San Andreas fault and related faults (including the Newport-Inglewood and the Palos Verdes faults), and compressional stress normal to the San Andreas Fault. The east-west trending reverse or thrust faults that bound the southern Transverse Ranges province and the newly discovered "blind thrusts" are the result of these compressional stresses.

Recently, the January 1994 Northridge and the October 1987 Whittier earthquakes have been attributed to movement on a deep-seated nearly flat-lying thrust fault, the Elysian Park fault zone (Hauksson and others 1988, Yeats, 1994). A second deep-seated thrust fault proposed by Hauksson (1989 and 1992) extends from the vicinity of Newport Beach north under the Palos Verdes peninsula and across the Santa Monica margin to the southern boundary of the Elysian Park fault. Shaw (1993) and Shaw and Suppe (1994) have mapped a "blind-thrust", named the Compton-Los Alamitos trend, that merges, or is coincident with the southern Torrance-Wilmington trend.

The tectonic stresses that formed the regional structural elements are active, resulting in the relatively high level of seismicity of this region. Numerous historically active, active, and potentially active faults occur on shore southwest of the San Andreas fault zone and in the southern California continental borderland. The major faults in the region that are considered to be historically active, active, or potentially active are shown on Plate 13.

Table 6 categorizes faults as 1) historically active (H), with the date of last earthquake; 2) active (A) in Holocene time (the past 11,000 years) and; 3) potentially active (P), those which have not moved in more than 11,000 years but in less than 2 million years (Pleistocene), or faults that are intimately associated with active faults.

4.3.1 San Andreas Fault

The San Andreas fault is an active, right lateral strike-slip fault and is the principal fault in the large seismically active northwest trending system in California. Two of the three largest historic earthquakes in California have occurred along the San Andreas including the Magnitude 8+, 1857 Fort Tejon earthquake. This fault is capable of producing the largest magnitude earthquake (M 7 1/2 - 8) in southern California, (Peterson and Wesnousky, 1994).

4.3.2 Newport - Inglewood Fault

The Newport-Inglewood fault is located approximately four miles northeast of the project area site. It has an on-shore length of about 40 miles but most investigators (e.g. Fischer and Mills, 1991) connect it with a well defined zone of offshore faulting and extend the zone to the Rose Canyon fault in the San Diego area, with a total length of 150 miles.

The Newport-Inglewood zone ranges from 0.5 to 3 miles in width and is composed of a complex of fault segments and anticlines. This fault was the source for the 1933 Long Beach earthquake

(Magnitude 6.3) located north of Newport Beach and probably for the 1812 Capistrano earthquake, as well as many other smaller events. The segment that ruptured in 1933 extends from Signal Hill to Newport Beach (Peterson and Wesnousky, 1994).

4.3.3 Palos Verdes Fault

The Palos Verdes fault system has been well studied in the Los Angeles harbor area but its offshore extension north of the Palos Verdes Peninsula is less clearly defined due to a smaller amount of subsurface data (Fischer and others, 1987; Fischer 1992; MAA, 1992; Valensise and Ward 1992). Traditionally the Palos Verdes fault is shown as the northeastern boundary of the Palos Verdes peninsula with offshore extensions to the northwest, terminating somewhere north of the center of the Santa Monica Bay (Ziony and others 1974, Greene and others 1975, Jennings 1992). To the southeast the fault zone extends across the San Pedro margin into offshore San Diego County where it is a series of usually short, en echelon traces which may reach a total length of 80 miles. Holocene offset is observed on the San Pedro margin area (Fischer and others, 1977, 1987, Fischer and others 1992, Vedder and others 1986). Many small earthquakes have been attributed to the Palos Verdes fault, but no Magnitude 5 or larger has been reported. Yerkes and others (1967) and Nardin (1976) suggest the present northern terminus of the Palos Verdes fault is near Redondo Canyon, near its projected intersection with the Redondo Canyon fault. Vedder and others (1986) follow the previous USGS studies but do show the fault to be inferred. The segment between the Palos Verdes peninsula and the Santa Monica submarine canyon is shown as only cutting Miocene or older strata and not potentially active or active faults. Based on this rather ambiguous evidence in the Santa Monica Bay area, the continuous length of the active Palos Verdes fault in the project area is estimated at 40-45 miles.

The Palos Verdes fault exhibits a complex displacement history. The fault has been shown to exhibit southwesterly dips onshore (although some seismologic studies indicate northeasterly dips) and regional theory would suggest right lateral transcurrent movement. Dames and Moore (1977) suggest that the Redondo Canyon and Palos Verdes faults combine to form a tectonic boundary that is decoupled from the Santa Monica Bay segment. Such tectonic possibilities lead to the observation of several possible orientations and displacement directions which may have changed in geologic time. Some segments of the Palos Verdes fault have been active from late-middle Miocene to Holocene times (Fischer and others 1987). Holocene activity of the Palos Verdes fault (including age dating of events, recurrence intervals and slip rates) has been investigated in the Los Angeles harbor by Fischer (1992), MAA, (1992) and Fugro - McClelland (1992 and in preparation). See Plate 14.

4.3.4 Dume - Malibu - Santa Monica Fault Zones

The Dume, Malibu, and Santa Monica faults are part of a zone of a discontinuous (?) faults that extend from the western limit of the Channel Island platform to Santa Monica and probably further to the east as the Hollywood and Raymond Hill faults (Dolan and Sieh 1992). The total length of this zone as given by Slosson and Associates (1977) is 188 miles (190 km). A maximum of over 7,000 feet of vertical offset along the zone was noted by Junger and Wagner (1977).

Late Quaternary movement of these east-west faults has been demonstrated at several locations along the coast (e.g. Dolan and Sieh 1992, Vedder and others 1986). Dibblee (1982) has shown

evidence of recent activity on the onshore portion of the Malibu Coast fault, but this segment may represent an older, offset section of the primary fault zone.

The relationship between the Santa Monica, Malibu Coast, Anacapa, and other faults has been studied by Vedder and others (1986) and seismologically by Stierman and Ellsworth (1976) and Hauksson and Saldivar (1986). This fault system is probably responsible for earthquakes with magnitudes greater than 5 (but less than 6) in 1930, 1970, 1973, and 1979. Fault segments should be considered active, although the Malibu Coast fault may represent an older, less active feature (H.A. Adams personal comment).

4.3.5 Torrance - Wilmington/Compton - Los Alamitos Trend

This trend of thrust faults and ramps (Plate 15) has been described by Hauksson (1990) and Shaw and Suppe (1993, 1993). A summary of the trend is presented by Peterson and Wesnousky (1994).

4.4 SEISMOLOGIC ENVIRONMENT

The San Pedro Bay margin area is characterized by recurring small earthquakes with magnitudes less than 4.5. The area is also subject to the effects of moderate to large, regional events that could occur on the San Andreas, the Newport-Inglewood (eg. the 1933 Magnitude 6.3 Long Beach earthquake), the Torrance-Wilmington Compton-Los Alamitos trend, and various faults in the Los Angeles basin, and offshore.

Activity along the Palos Verdes fault has been restricted to small events, typically smaller than Magnitue 4.5.

4.4.1 Regional Seismicity

The San Pedro Bay margin area has four local seismogenic sources: 1) the Newport-Inglewood fault, 2) the Palos Verdes fault, 3) the THUMS-Huntington Beach fault zone, and 4) the Torrance- Wilmington Compton-Los Alamitos trend or "blind thrust". These sources are briefly described or are summarized in Table 6.

4.4.2 Historic Earthquakes

Plate 16 shows the seismicity of the region around the project area. A brief description of some of these events and other larger, regional earthquakes is presented by MAA (1992) and Peterson and Wesnousky (1994).

4.5 VIBRACORE INVESTIGATIONS

4.5.1 Previous Work

Osborne and others (1983), using vibracores cores collected by the COE - Coastal Engineering Research Center (CERC) during June and July of 1974 and by the University of Southern California, during May and June of 1978 and October of 1979 define two potential borrow sites for beach replenishment that straddle the project area. Area A-III is located along the western border of the proposed dredge limit and area A-II is located about 1.5 miles to the east of the PDL (Plates 10 and 11). COE-CERC grain size criteria (Plate 10) for determining sand suitability for use in beach replenishment are shown at all vibracore locations by these authors. Of the cores nearest the proposed dredge limits (PDL), three were classified as MF (marginally fine) and one core located immediately seaward of the PDL as S (suitable) (Figure 10b). Core log V-10 from borrow area A-III as shown by Plate 12 is a representative log from Osborne and others. (Note that the sharp lower contact or discontinuity at the base of the fine-medium grained sand with abundant shell fragments at 69 inches [176 centimeters] below seafloor may be correlative with a similar discontinuity observed in cores from this project.)

Potential Borrow Areas A-III and A-II that lie to the west and east, respectively, of the project area, are summarized Osborne and others, (1983) (Plates 10, 11, 12). Their descriptions are quoted below:

> "Borrow area A-III is located between the 16 and 24 (meter) isobaths southeast of Palos Verdes Peninsula and south of the Los Angeles-Long Beach breakwater. The strata included within this borrow area are assigned to the undifferentiated Holocene package with minor quantities assigned to Pleistocene units PI and PII. The target material generally consists of fossiliferous, dark- to olive- to yellow-gray, moderately- to well-sorted, fine- to medium-grained sand. This borrow area is estimated to contain from 34.0 to 78.8 x 10^6 m^3 of suitable sand." (Plate 11)
>
> "Borrow area A-II lies between the 2 and 29 m isobaths and extends from the eastern end of the Los Angeles-Long Beach breakwater southeastward to Huntington Beach. These strata are assigned to the undifferentiated Holocene unit with a minor quantity assigned to Pleistocene units PI and PII. Lithologically, these beds consist of dark- to medium-gray, moderately will-sorted, silty, fine- to medium-grained sand. Borrow area A-II is the largest of the potential borrow sites in San Pedro Bay, and is estimated to contain from 148.3 to 168.2 x 10^6 m^3 of suitable sand."

4.5.2 Present Investigation

As described, the vibracores collected for this study typically penetrate an upper fine- to medium-grained sand unit that contains beds or zones of marine shells and shell debris or hash. This base of this unit is typically a sharp discontinuity or an erosional contact with the underlying sediment. The mixture of whole shells (turban, whelk, and various pelecypods) with highly fragmented shell debris including razor clams suggests mixing of material from different environments (or sources) by storm waves. Several cores contain repetitive sequences of

shell-rich horizons that we interpret as periodic storm wave depositional events alternating with the more typical detrital inner shelf silty sands. Subsurface profiles in the dredge area are presented on Plates 17 through 19.

This upper sequence is mappable using isopach or unit thickness mapping techniques and high resolution profiles. From this map the volume of potential beach replenishment material may be estimated; provided the grain or particle size distribution is suitable.

Below this upper unit the stratigraphy of the cores is highly variable. Environments of deposition include outer deltaic plain-low energy clay and silt units, beach sands of limited thickness and extent, and inner shelf detrital sediments. Grain size distribution of these sediments is highly variable and the predictability of volumes of suitable materials for beach replenishment is questionable.

The results of the surface sampling indicates that the potential disposal sites near Isands White and Grisson are relatively similar to the soils encountered in the potential dredge area. However, the surface soils samples along Beach Transects 1 through 6 have significantly less fines (passing the number 200 sieve) than the soils in the proposed dredge areas.

TABLE 4
EXPANDED SIEVE NEST

OPENING (mm)	PHI NO.	SIEVE NO.
2.83	-1.5	7
2.00	-1.0	10
1.41	-0.5	14
1.00	0.0	18
0.71	0.5	25
0.50	1.0	35
0.35	1.5	45
0.25	2.0	60
0.177	2.5	80
0.125	3.0	120
0.088	3.5	170
0.074	3.75	200

TABLE 5
SAN PEDRO MARGIN, INVESTIGATION
(BOTTOM SAMPLES, CORES, GEOTECHNICAL BORINGS AND GEOPHYSICAL TRACKLINES)

- In 1954 Moore using 361 bottom samples (grab and rock dredge) described the bottom materials of the San Pedro shelf as predominantly fine sand to coarse silt over the project area.
- In 1960 Moore published the first high resolution profiles collected from the San Pedro shelf.
- Emery's (1960) classic "The Sea off Southern California" contains summaries of sediment and bedrock studies of the San Pedro margin.
- Sediment analyses of 645 cores collected from the southern California shelf were performed and described by Wimberly (1964).
- Gorsline and Grant (1972) describe bottom sediment textural patterns of the San Pedro shelf based upon 240 bottom samples.
- The Army Corps of Engineers in 1973 to 1974 collected 140 miles of seismic reflection trackline data and 23 vibracores from the inner San Pedro shelf.
- Welday and Williams in 1975 describe the offshore surficial materials of the California margin on a map sheet (scale 1:750,000)
- Karl in 1976 describes the transportation and deposition of sediment on the San Pedro shelf.
- Seismic reflection studies of the margin were conducted by the United States Geologic Survey in 1964 to 1974. The most comprehensive interpretation of these data was reported by Junger and Wagner (1977).
- From the outer shelf and upper basin slope consultants for the Shell Oil company drilled logged and analyzed 3 geotechnical borings 500 feet deep (Fischer and others, 1977).
- Nardin and Henyey, (1978) reported lithology and ages from jet and dart cores released by the oil industry.

TABLE 5
SAN PEDRO MARGIN, INVESTIGATION (continued)
(BOTTOM SAMPLES, CORES, GEOTECHNICAL BORINGS AND GEOPHYSICAL TRACKLINES)

- Bottom samples from the outer margin were collected for the Bureau of Land Management baseline study by the University of Southern California and analyzed by Fischer and others (Science Application International, Cre, 1978).
- Marine Studies (Geological Sciences - California State University at Northridge) collected 160 miles of high resolution (3.5 kilo hertz) profiling data over the margin in 1979.
- In 1980, Rudat using available seismic reflection profiles and core data completed a study of the Quaternary geology of the San Pedro shelf.
- Thirty-four vibracores (averaging 10 feet in length) were collected by the University of Southern California between 1978 and 1979. These cores and the U.S. Army Corps of Engineers cores of 1973-1974 were described and mapped by Osborne and others (1980 and 1983).
- Fischer and others (1983) produced isopach maps of the late Quaternary sediment layer over the southern California margin, including the San Pedro shelf.
- Drake and others (1985) measured bottom current velocities and discuss sediment transport of the San Pedro shelf.
- Vedder and others (1986) compiled previous offshore studies by theUSGS into a set of map sheets showing geophysical tracklines, bedrock geology, structure and seismicity.
- Fischer and others (1987) show geophysical tracklines as of 1983 (including USGS, private industry, and university) bedrock geology, sediment thickness and fault activity.
- Fischer and Lee (1992) provide updated isopach maps of the late Quaternary "sediment veneer" of the Palos Verdes-San Pedro margin.
- MESA[3], Inc. plotted trackline and core data on 1:24,000 scale proprietary map sheets.
- Fugro-McClelland (1991 - present) investigated the "soils" of the outer Los Angeles harbor, and the inner shelf and the activity of the Palos Verdes fault using geotechnical boring, age dating (Carbon[14]) and digital seismic reflection data.

TABLE 6
SAN PEDRO BAY - MARGIN SIGNIFICANT FAULTS

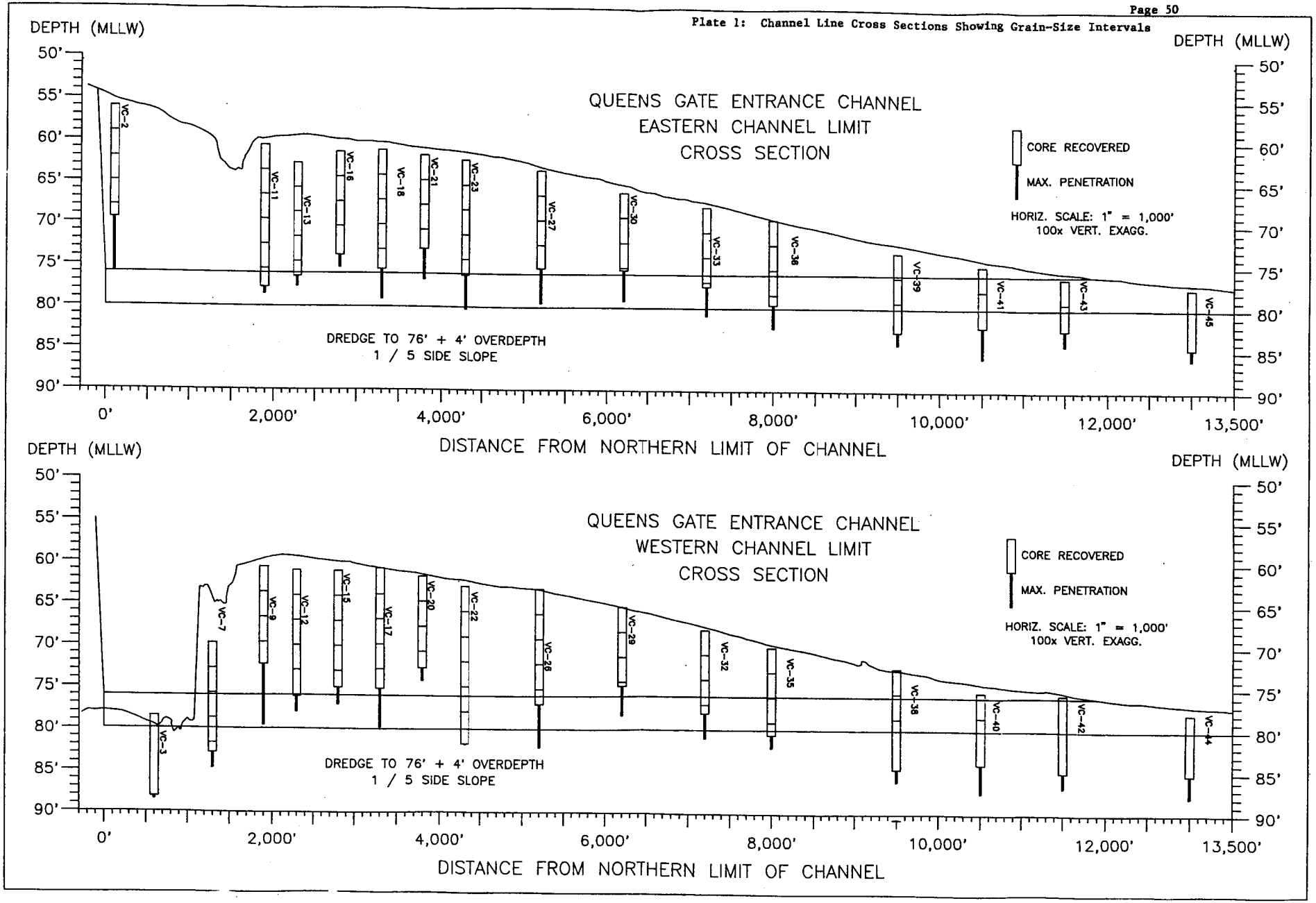
Fault/ Trend	Activity Rating	Limiting Earthquake	Slip Rate (mm/yr)	Distance mi (km)	Reference(s)
Malibu Coast/ Santa Monica	P	7 - 7 1/2	0.3-4	26 (44)	M, P&W
Newport-Inglewood (NIFZ)(1)	H,1933	7	1±	5 (3)	P&W; F&M
Norwalk	A?	6	?	14 (23)	J
Palos Verdes(1)	A	7	3	3 (5)	F, S, V&W
San Andreas (SAF)	H,1857	7 1/2 - 8	30-35	51 (85)	WG
San Pedro	A?	7	–	8 (5)	J
Torrance-Wilmington/Compton -Los Alamitos Trend (TW-CLA)	A	6 1/2 - 7	1.4	0?	H, S&S
Whittier	A	7	2-3	18 (30)	G

KEY
- A- Active H- Historically Active P- Potentially Active
- 1933 - date of historical event

NOTES
(1) Distances to NIFZ and the Palos Verdes fault depend on location within project area. All distances are rounded to the nearest mile or kilometer.
(2) Other than the San Andreas and the Malibu Coast - Santa Monica Zones, faults that lie over 20 mi (33 km) from the project area are not listed in this brief review.

REFERENCES
F - Fischer, 1992, Fischer and others, 1987
F&M- Fischer and Mills, 1991
G - Gath and others, 1992
H - Hauksson, 1989
J - Jennings, 1992
M - Molnar, 1991
P&W- Peterson and Wesnousky, 1994
S - Stephenson and others (in press)
S&S - Shaw and Suppe, 1993, 1994
V&W- Valensise and Ward, 1992
WG - WGCEP, 1988

Plate 1: Channel Line Cross Sections Showing Grain-Size Intervals



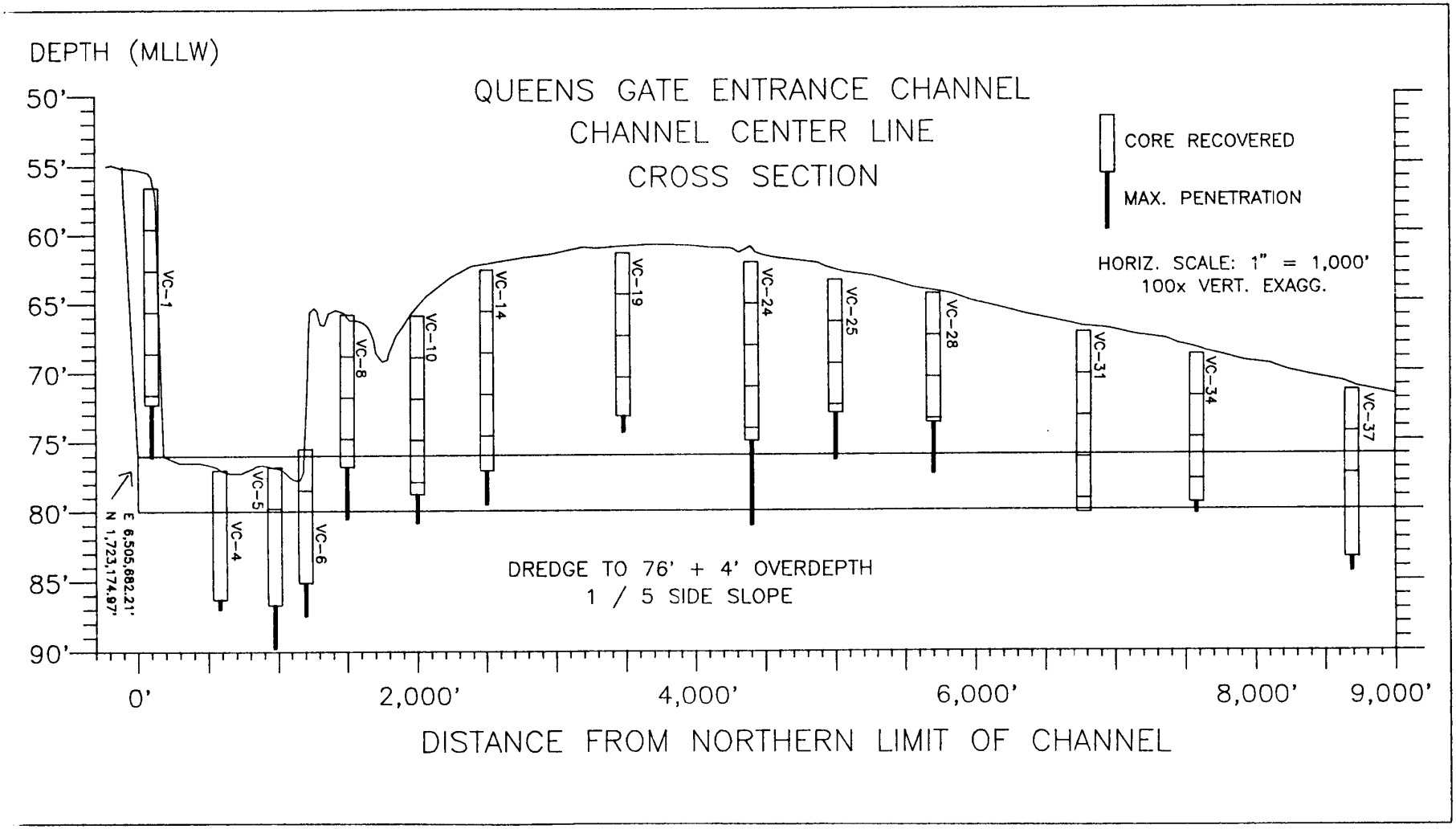
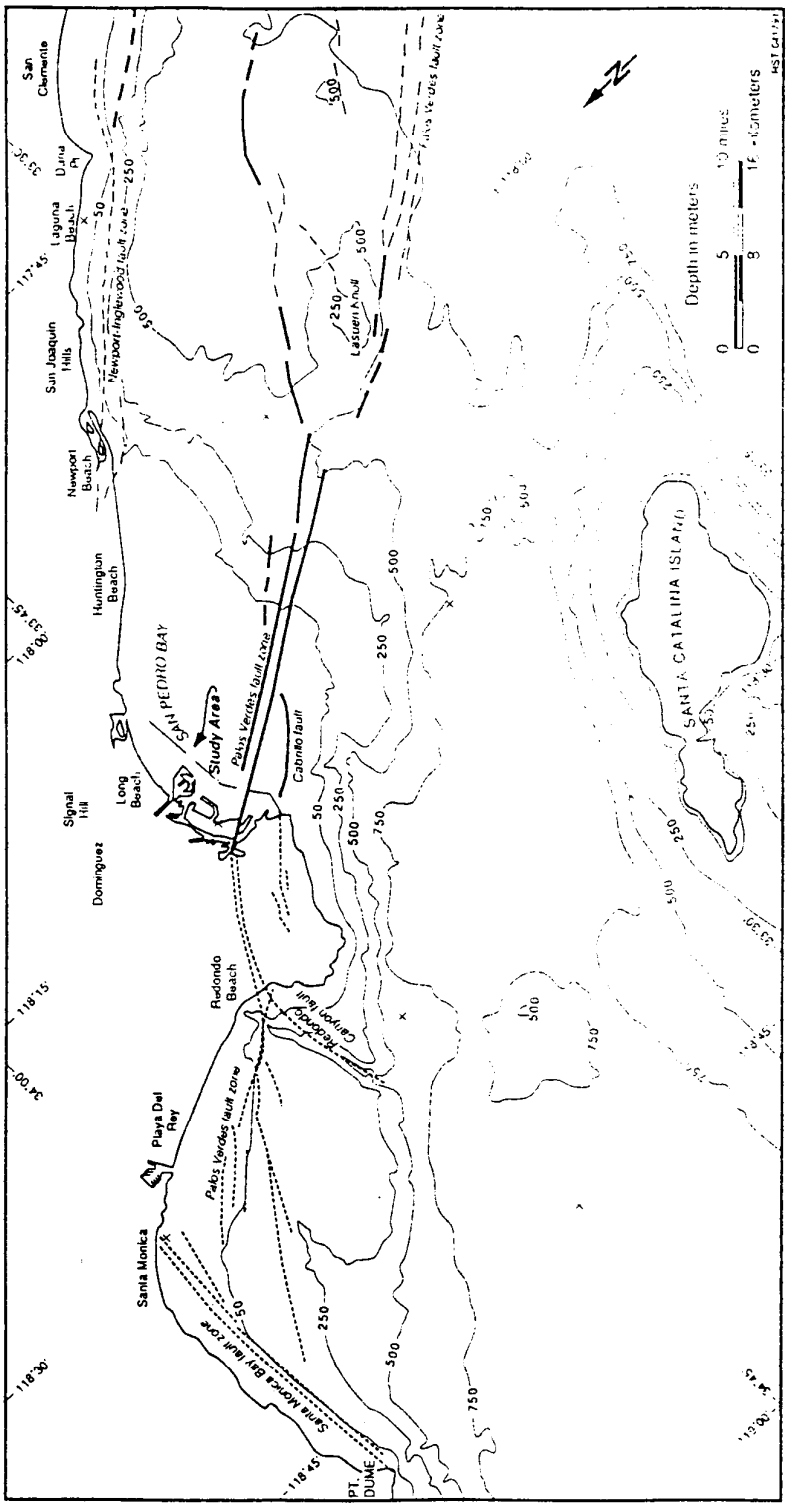


Plate 2: Centerline Cross Section Showing Grain-Size Intervals



Regional Setting of the San Pedro Bay and Margin (Fischer and others, 1987)

NO.: 143-01	APPR.: HR	Regional Setting Queen's Gate Dredging San Pedro Bay, California	PLATE 3
BY: KJD	DATE: 12/23/94		

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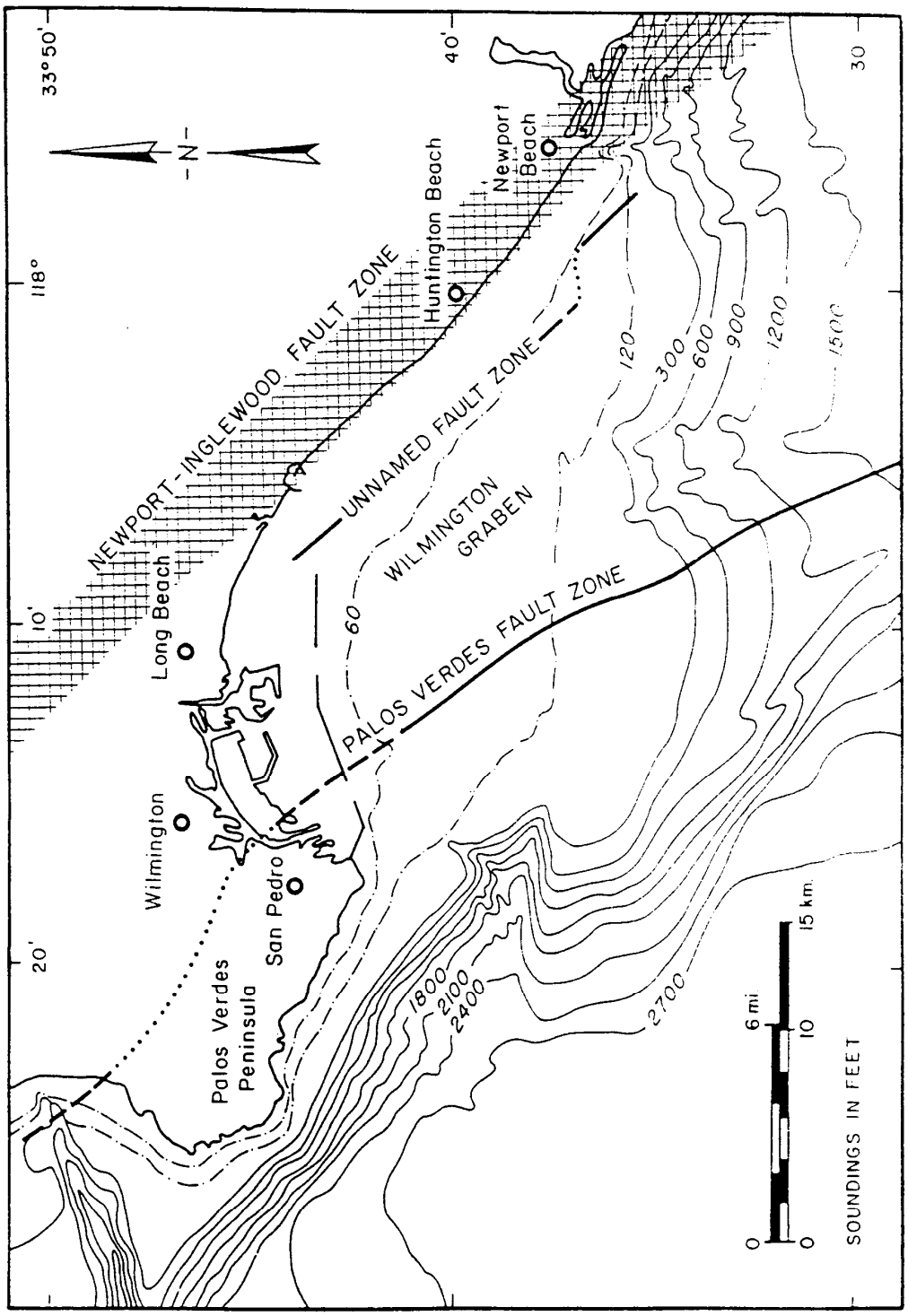

Tectonic Setting of the San Pedro Bay and Margin (Fischer and others, 1987)

NO.: 143-01 BY: KJD	APPR.: HR DATE: 12/23/94	Tectonic Setting Queen's Gate Dredging San Pedro Bay, California	PLATE 4

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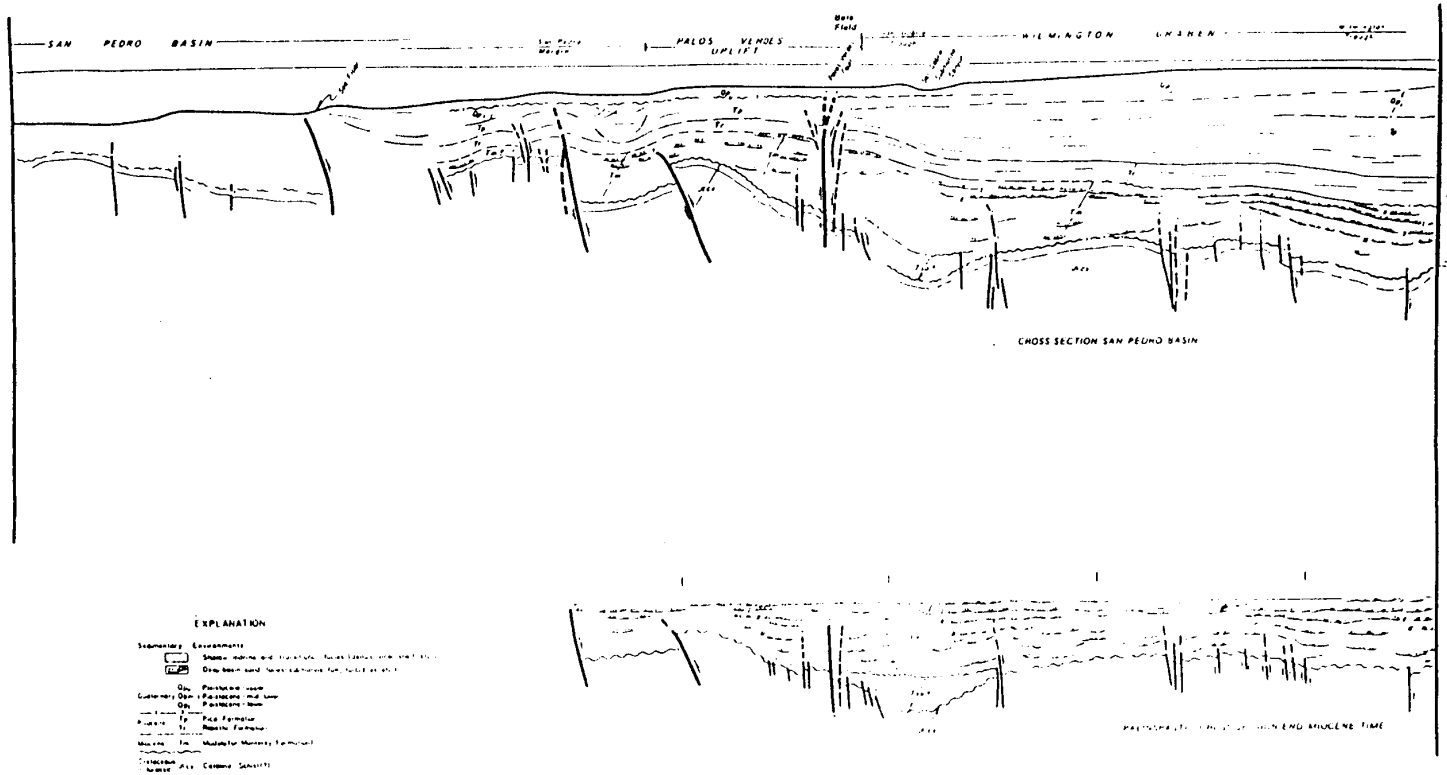

Cross section A-A' along CDP-stacked seismic reflection profile across southeast San Pedro margin.

Palinspastic cross section A-A' along CDP-stacked seismic reflection profile across southeast San Pedro margin.

Structural - Stratigraphic Cross Section of the San Pedro Margin (Fischer and others, 1987)

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APPR.: HR
DATE: 12/23/94

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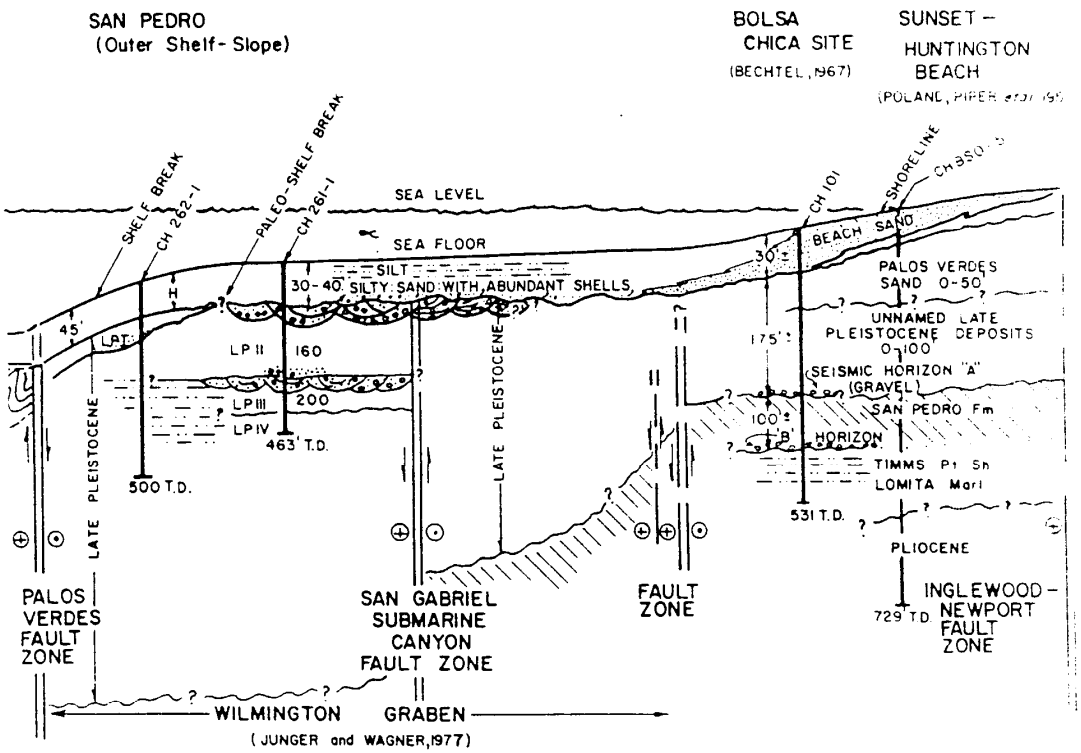
Structural - Stratigraphic Cross Section
Queen's Gate Dredging
San Pedro Bay, California

PLATE 5



Quaternary Cross Section of the San Pedro Margin (Fischer and others, 1977)

NO.: 143-01	APPR.: HR	Quaternary Cross Section Queen's Gate Dredging San Pedro Bay, California	PLATE
BY: KJD	DATE: 12/23/94		6
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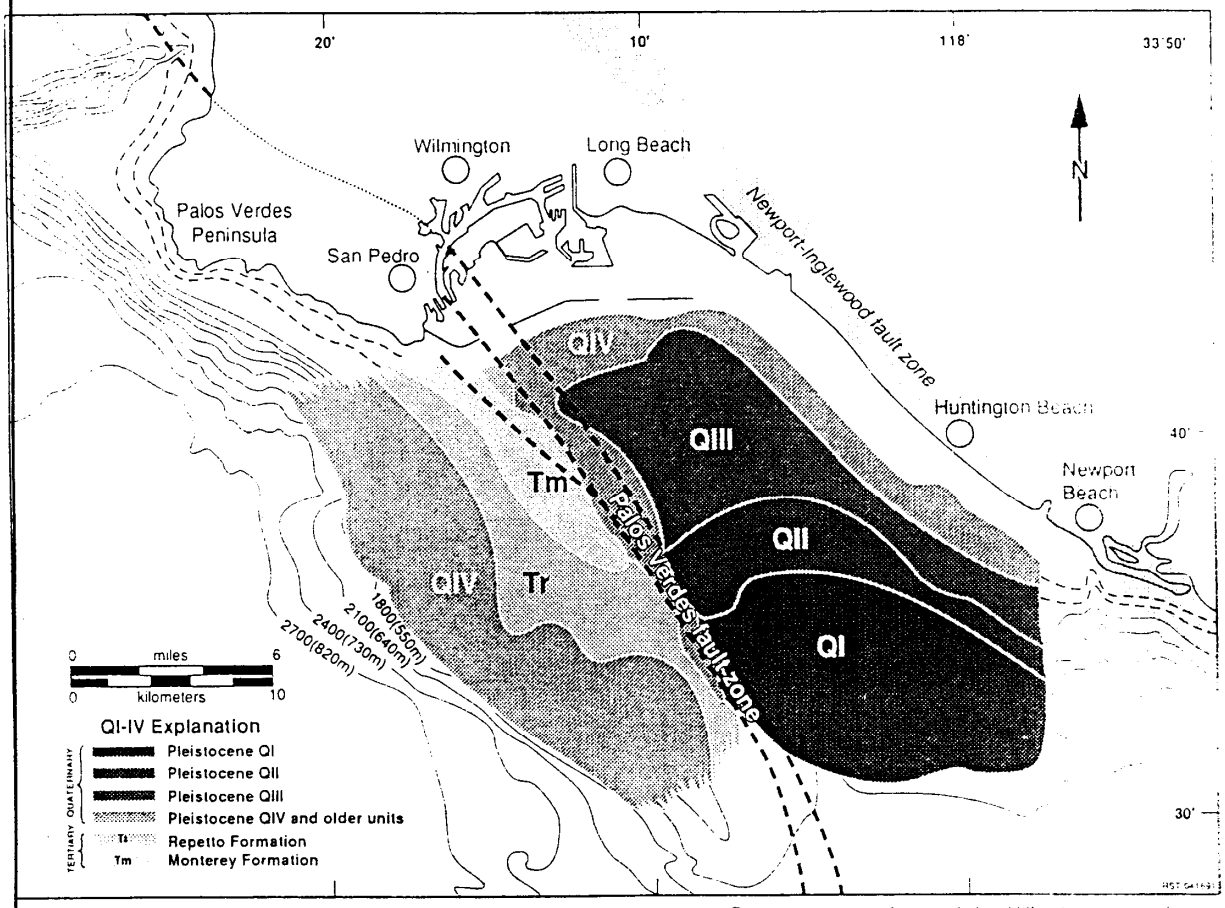

Neogene bedrock along the Palos Verdes uplift and late Quaternary geology of the Wilmington graben (from Fischer and Rudat, 1987). Map is a subcrop below the Holocene.

NO.: 143-01	APPR.: HR	Quaternary Geology Queen's Gate Dredging San Pedro Bay, California	PLATE
BY: KJD	DATE: 12/23/94		7

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Holocene Isopach (San Pedro Margin) (Fischer and others, 1983)

NO.: 143-01	APPR.: HR	Holocene Isopach Queen's Gate Dredging San Pedro Bay, California	PLATE
BY: KJD	DATE: 12/23/94		8

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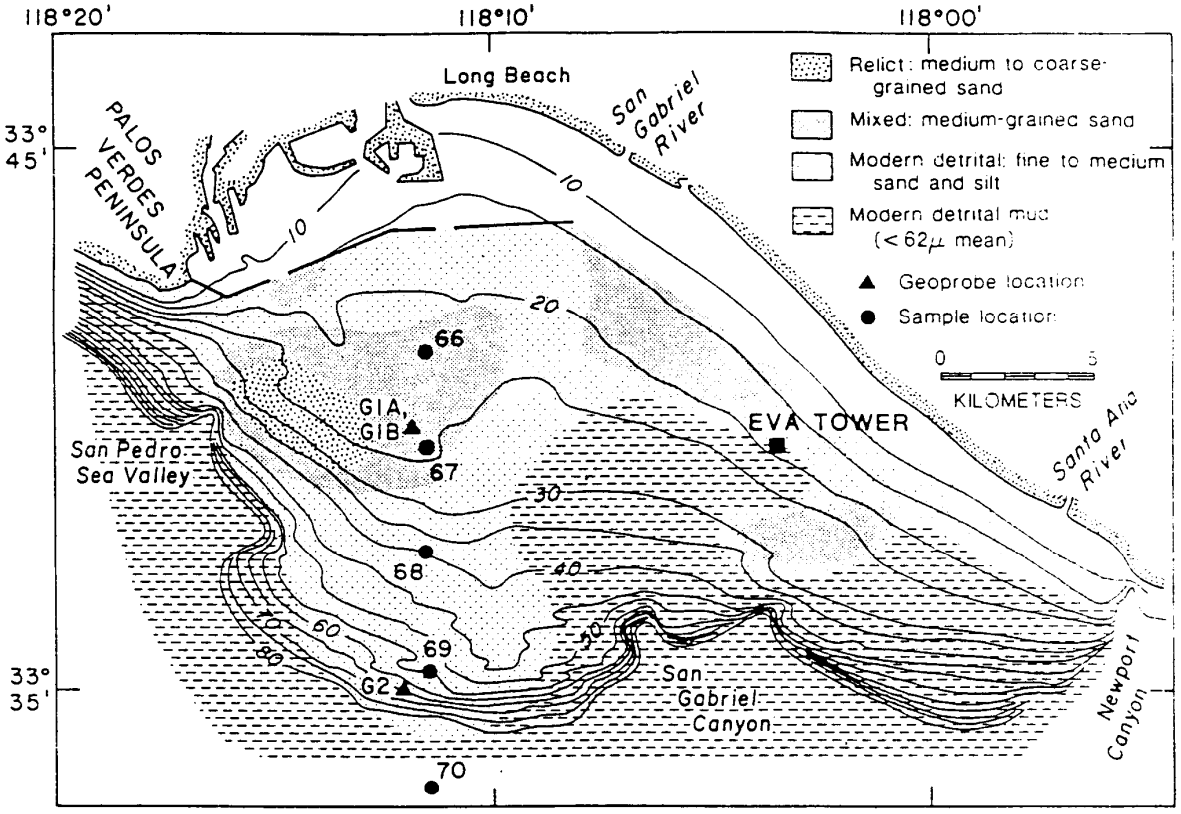

—Location of San Pedro shelf off southern California showing GEOPROBE sites and sampling stations. Bathymetry in meters. Areal distribution of the principal sediment types on San Pedro shelf is based on Gorsline and Grant (1972) and Karl (1976).

Surficial Sediment Types (San Pedro Margin)(Drake and others, 1985)

NO.: 143-01	APPR.: HR	Surficial Sediment Types Queen's Gate Dredging San Pedro Bay, California	PLATE
BY: KJD	DATE: 12/23/94		9
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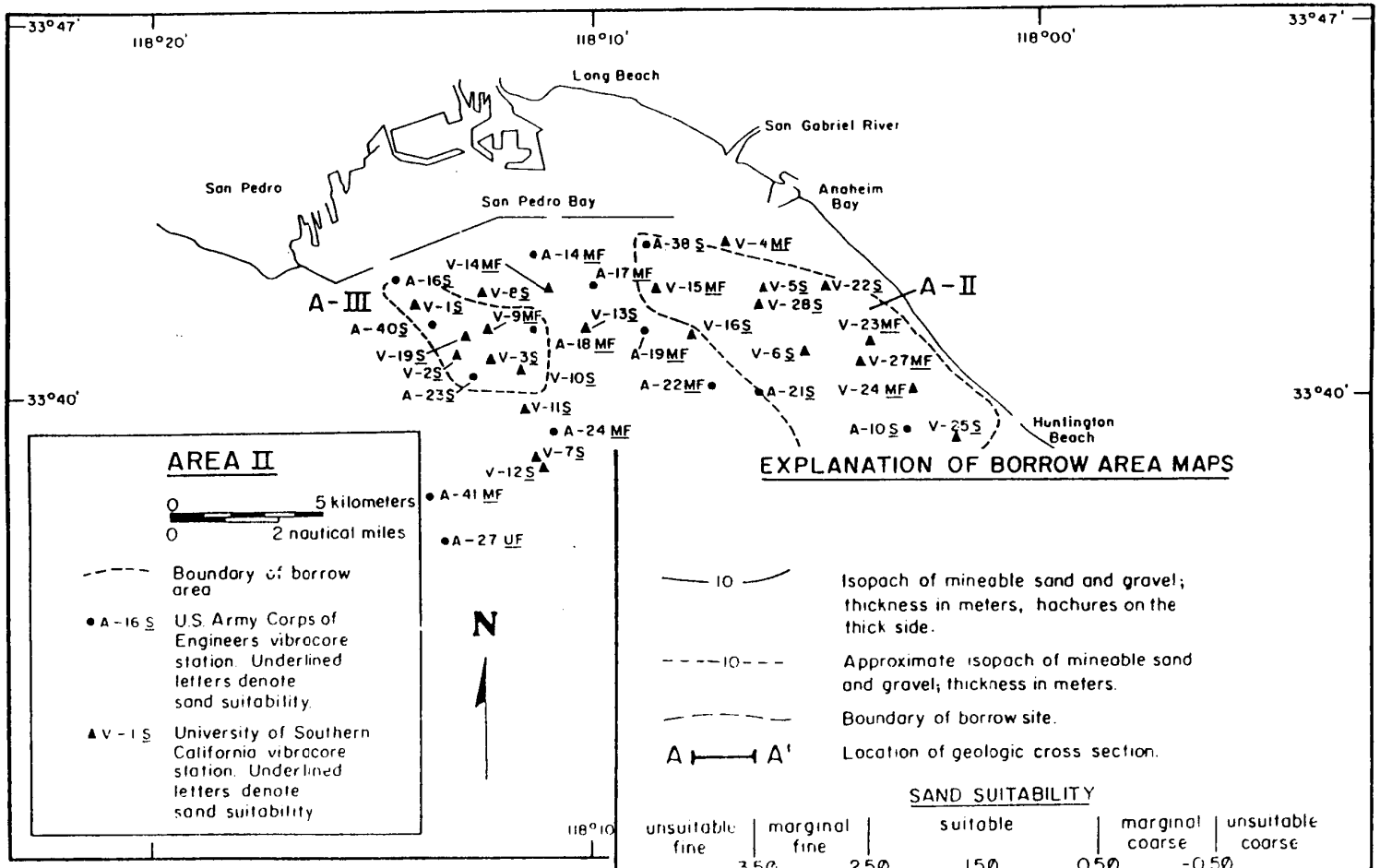

Location of Borrow Areas for Beach Replenishment (Osborne and others, 1983)

Figure [illegible] Sand Suitability and Explanation for Borrow Areas

NO.: 143-01
BY: KJD
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DATE: 12/23/94

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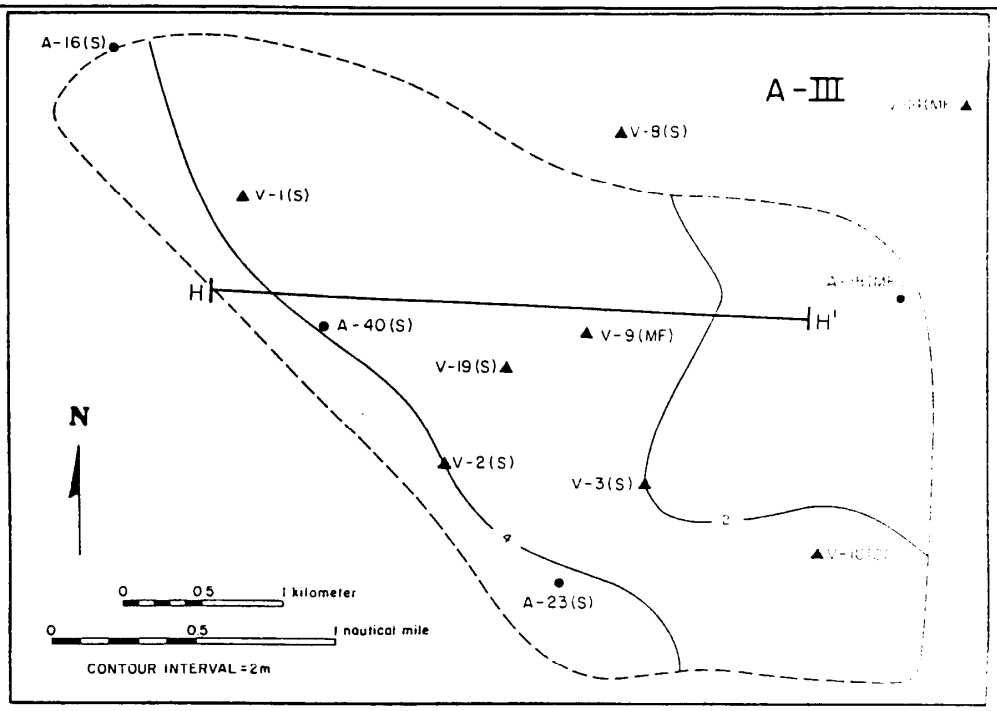
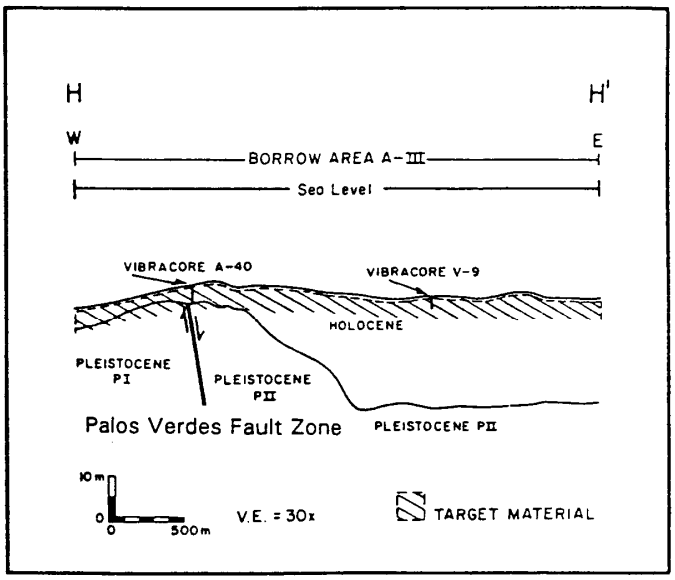
Borrow Areas
Queen's Gate Dredging
San Pedro Bay, California

PLATE 10



Borrow Area A-III (San Pedro Margin) (Osborne and others, 1983)



Cross Section of Borrow Area A-III (San Pedro Margin)
(Osborne and others, 1983)

NO.: 143-01 BY: K JD	APPR.: HR DATE: 12/23/94	Cross Section of Borrow Area Queen's Gate Dredging San Pedro Bay, California	PLATE 11
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VIBRACORE LOG

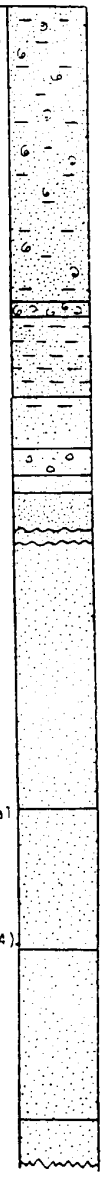
Core number: V-10 Date: 11/81

Total core length (cm): 665 Sheet 1 of

Number of core sections: 3

Water depth (ft): Vertical scale: 1 cm = 25 cm

Distance in cm from top of core	Description
0-109	Sand: fine-medium grained; ranges from clay silt size material to medium sand; light olive gray (5 Y 5/2); shell fragments; gradational lower contact.
109-170	Sand: fine-medium grained; ranges from clay silt size material thru medium sand; dark gray (5 GY 4/1); abundant shell fragments; sharp lower contact.
170-176	Sand: fine-medium grained; moderate yellow brown (10 YR 5/4); abundant shell fragments; sharp lower contact.
176-222	Sand: fine grained; ranges from silt to fine sand; dark grey (N3); sparse shell fragments.
222-252	Sand: fine grained; ranges from clay-silt material to some coarse pebbles; olive gray (5 Y 3/2); abundant shell fragments; sharp lower contact.
252-267	Sand: fine-medium grained; ranges from fine sand to cobble size; dark gray (N3); sharp lower contact.
267-277	Sand: fine-medium grained; yellow gray (5 Y 7/2); some layering shown by concentration of darker material; sharp color change below.
277-300	Sand: fine-grained; medium dark gray (N4) to dark gray (N3); slightly mottled appearance; sharp lower contact.
300-305	Sand: fine-medium grained; yellow gray (5 Y 7/2); contorted looking bed; sharp, comforted lower contact.
305-323	Sand: fine grained; gray black (N2); gradational lower contact.
323-357	Sand: fine grained; medium dark gray (N4); gradational contact concave up.
357-377	Sand: fine-medium grained; yellow gray (5 Y 7/2); gradational lower contact.
377-459	Sand: fine-medium grained; green gray (5 GY 6/1); mottled with fine-medium sand colored dary gray (N4).
459-542	Sand: fine-medium grained; 2 basic colors; dary gray (N3) and green gray (5 GY 6/1); darkness is a function of high % of dark minerals, not organics.
542-640	Sand: fine-medium grained; interbedding between beds colored dark gray (N3) and green gray (5 GY 6/1); noticable lack of fossil fragments in this whole core; interbeds here dip at 60° angle due to vibracores going in at an angle.
640-665	Sand: fine-medium grained as in 459-542.



Vibracore Log (VC) -10; from Borrow Area A-III (Osborne and others 1982)

NO.: 143-01	APPR.: HR	Vibracore Log Queen's Gate Dredging San Pedro Bay, California	PLATE
BY: KJD	DATE: 12/23/94		12

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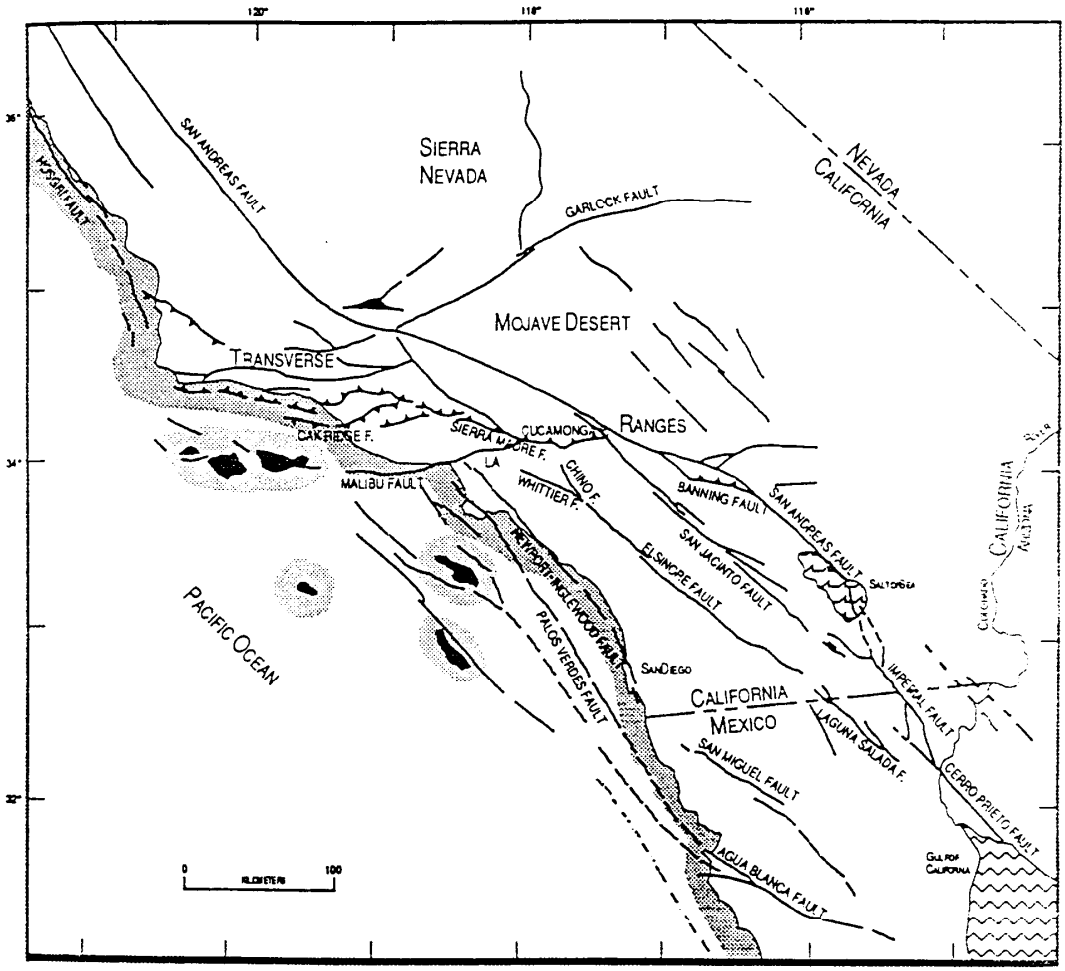

Active, Fault Map of Southern California (Gath and others, 1993)

NO.: 143-01	APPR.: HR	Active Fault Map Queen's Gate Dredging San Pedro Bay, California	PLATE 13
BY: KJD	DATE: 12/23/94		

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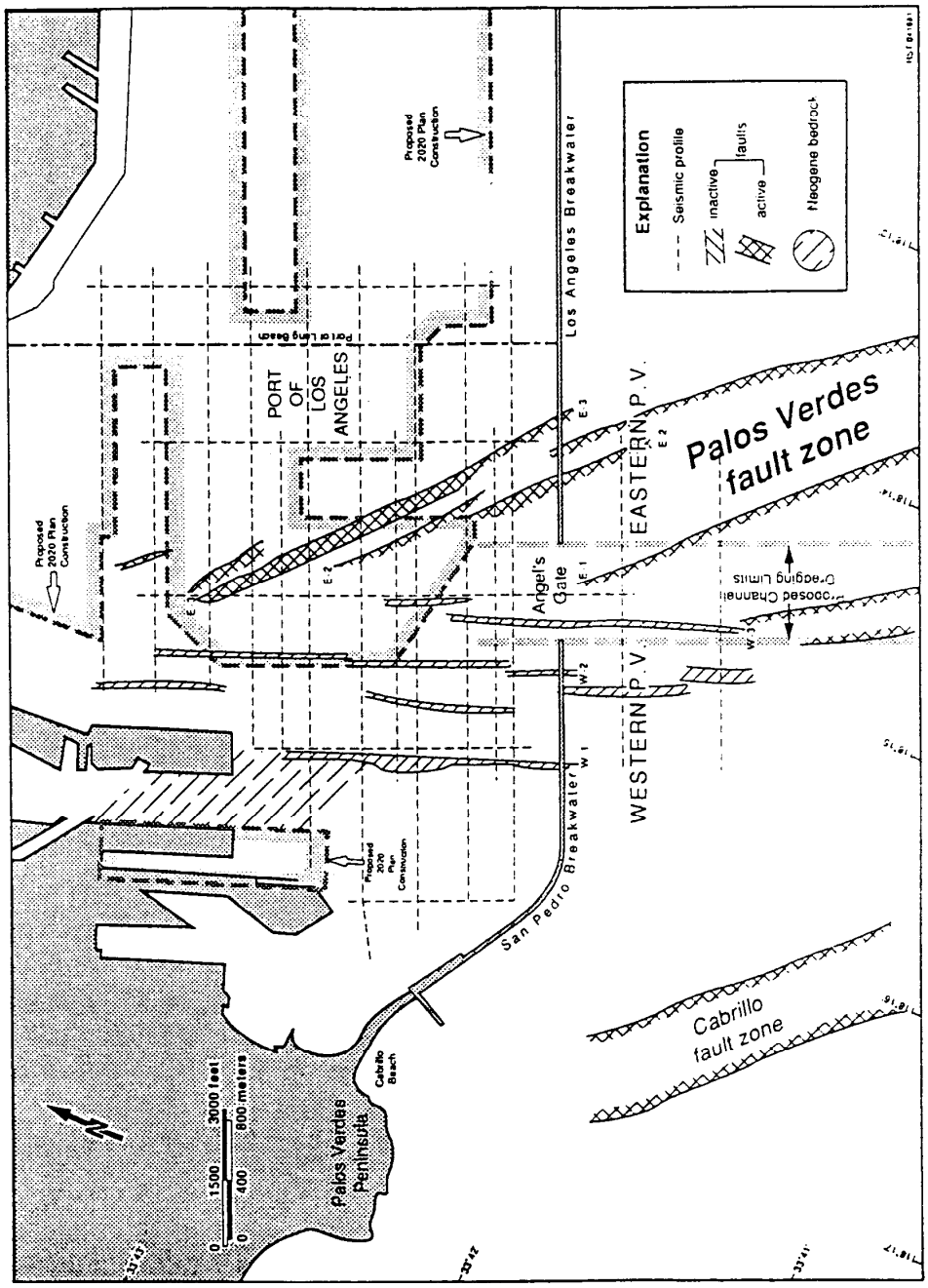

The Palos Verdes fault zone in the Los Angeles harbor area. (Seismic profiling grid from Harding Lawson Associates, 1989)

NO.: 143-01	APPR.: HR	Palos Verdes Fault Zone Queen's Gate Dredging San Pedro Bay, California	PLATE
BY: KJD	DATE: 12/23/94		14

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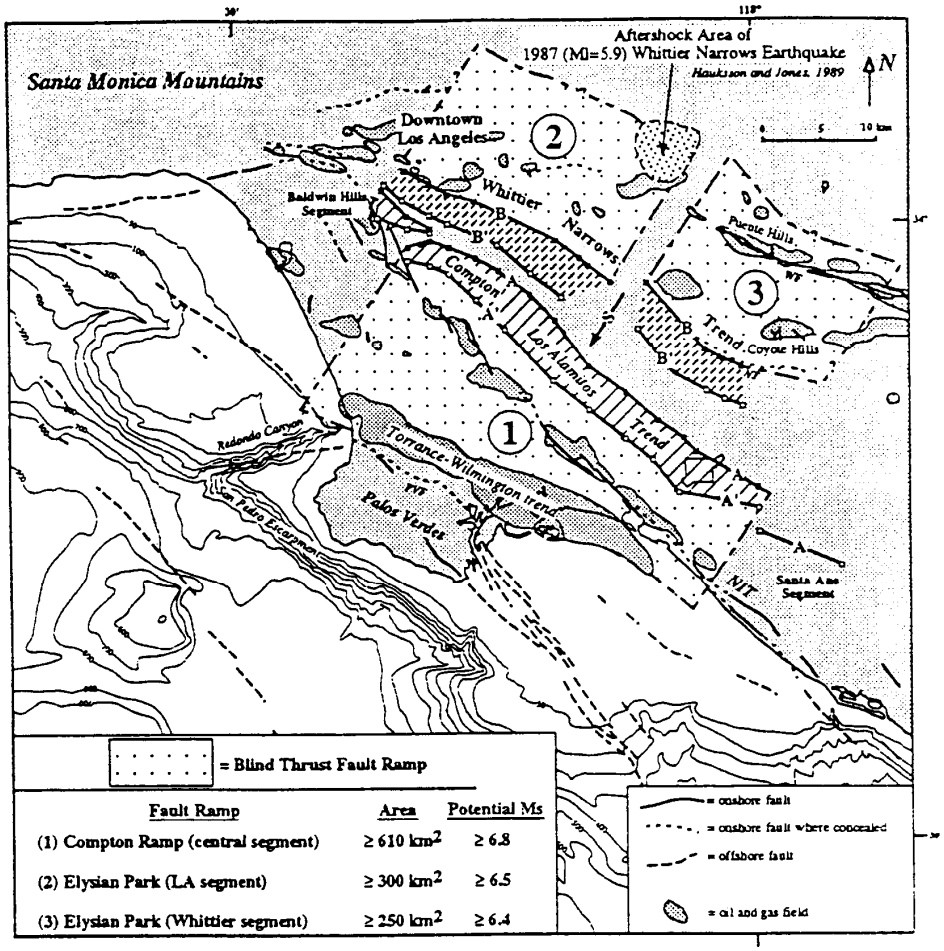

Segments of the active Compton and Elysian Park blind-thrust ramps are defined by the geometry of overlying fold trends. Offsets in map-view of the Compton - Los Alamitos and Whittier Narrows trends (Figure 14) overlie potential segment boundaries of the underlying Compton and Elysian Park ramps. Fault ramp areas are used through empirical relationships between rupture area and earthquake magnitude to estimate the sizes of potential blind thrust events (*lower left*). Axial surfaces are mapped by the parallel projection method.

The Torrance - Wilmington/ Compton-Los Alamitos Trend (Shaw and Suppe, 1993)

NO.: 143-01	APPR.: HR	Thrust Trend Map Queen's Gate Dredging San Pedro Bay, California	PLATE 15
BY: KJD	DATE: 12/23/94		

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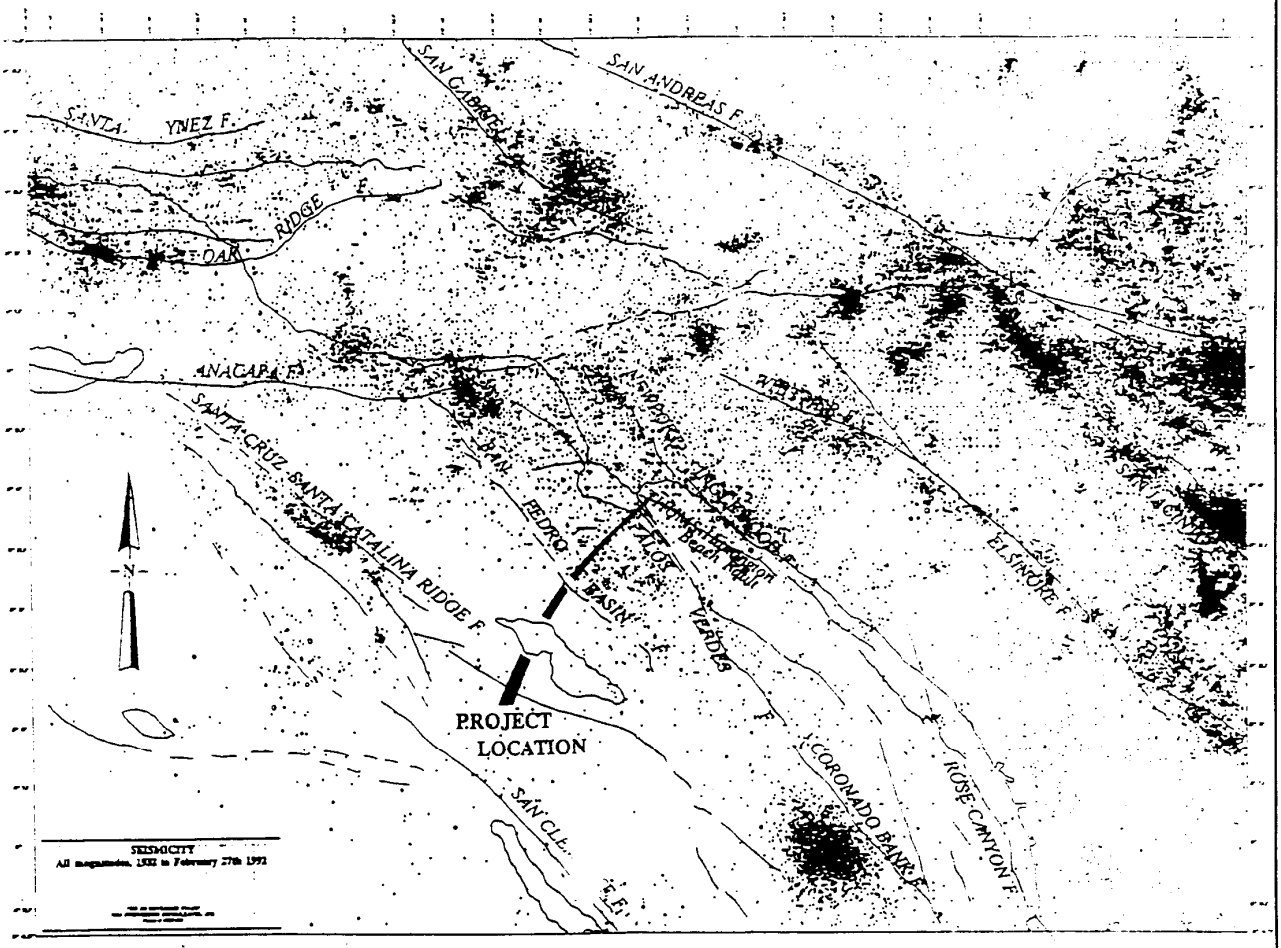

0 30 60 KM

SCALE

NO.: 143-01 APPR.: HR BY: KJD DATE: 12/23/94	San Pedro Margin Seismicity Queen's Gate Dredging San Pedro Bay, California	PLATE 16

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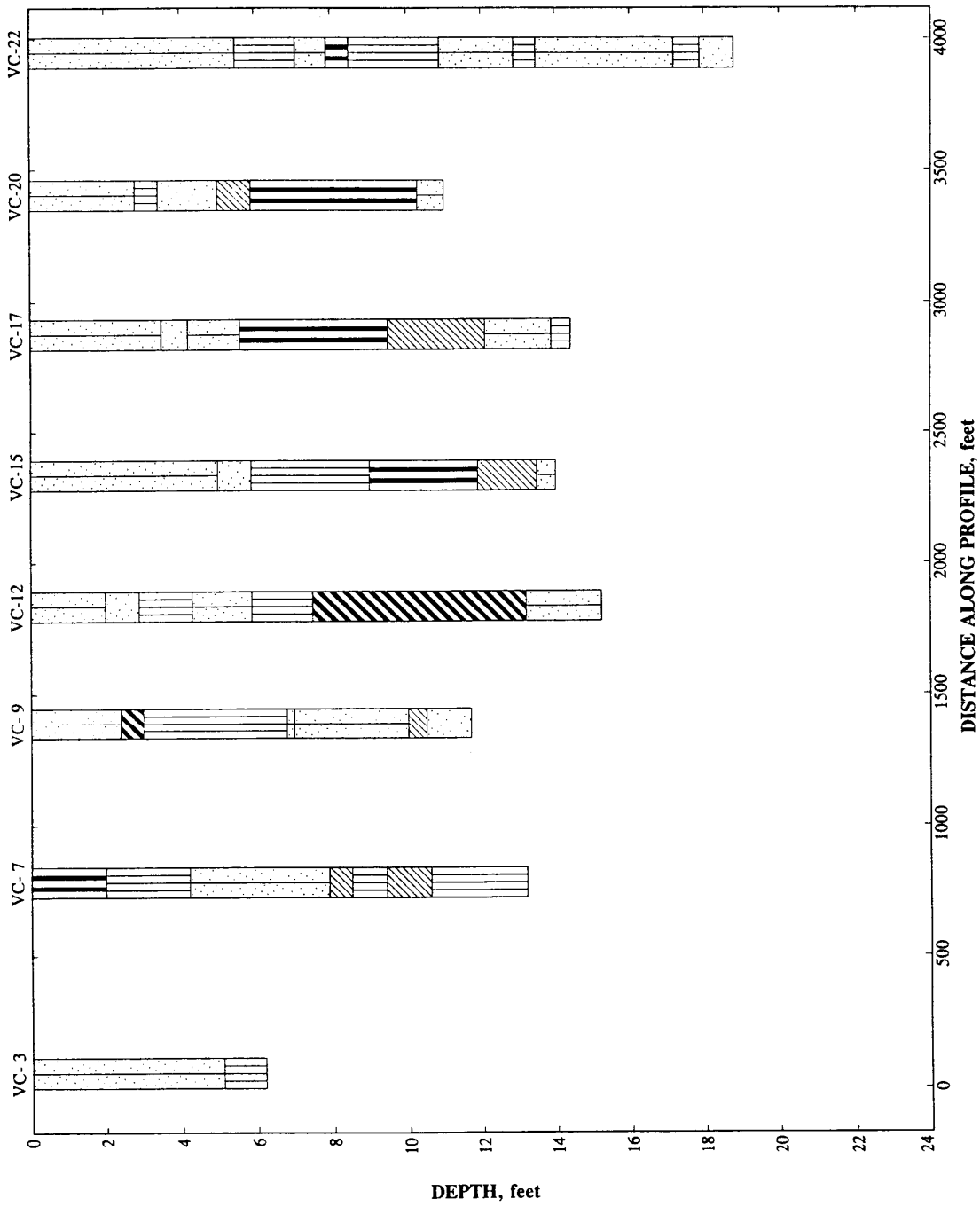
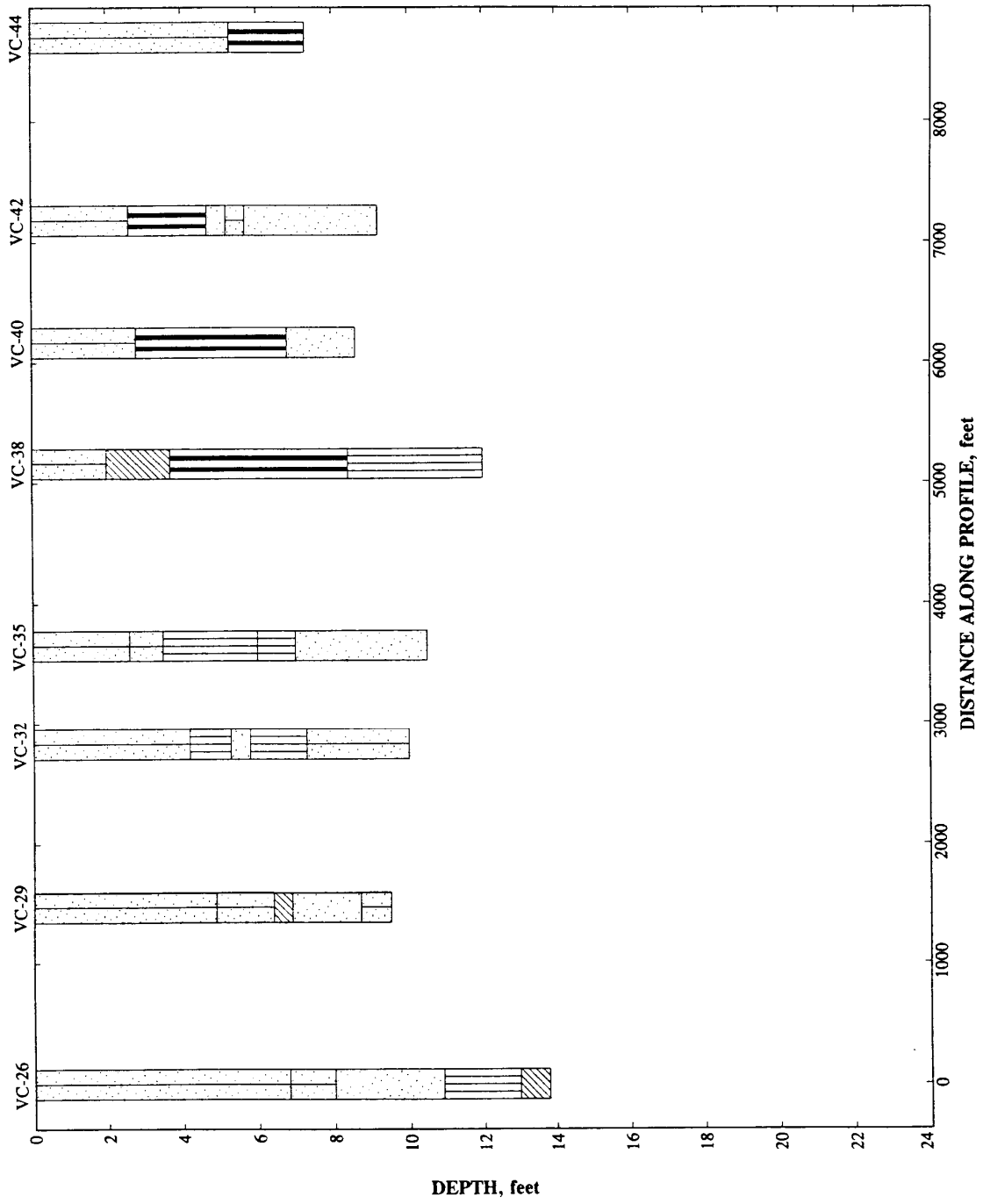
Template: DYBX11DP; Prj ID: 14301



See Plate B1 for graphic symbol legend.

NO.: 143-01	APPR.: dy	**CROSS SECTION A1-A1'**	PLATE
BY: dy	DATE: 12/94	Queens Gate Dredging San Pedro Bay, California	17A
DIAZ • YOURMAN & ASSOCIATES			

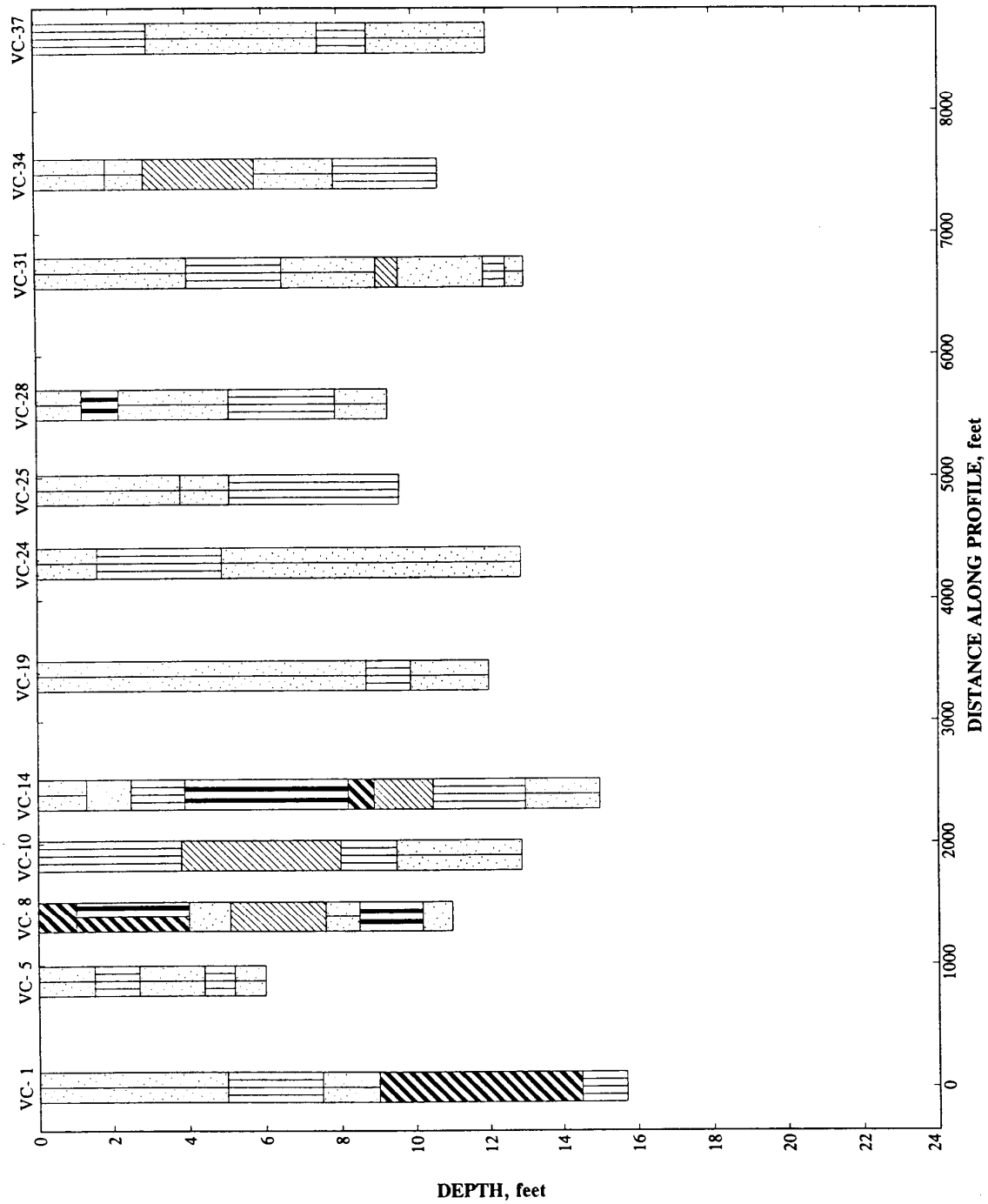
Template: DY8X11DP; Prj ID: 14301



See Plate B1 for graphic symbol legend.

NO.: 143-01	APPR.: ay	**CROSS SECTION A2-A2'**	PLATE
BY: ay	DATE: 12/94	Queens Gate Dredging San Pedro Bay, California	17B
DIAZ • YOURMAN & ASSOCIATES			

Template: D IDP: Prj ID: 14301



See Plate B1 for graphic symbol legend.

NO.: 143-01	APPR.: ay	**CROSS SECTION B-B'**	PLATE
BY: ay	DATE: 12/94	Queens Gate Dredging San Pedro Bay, California	18A
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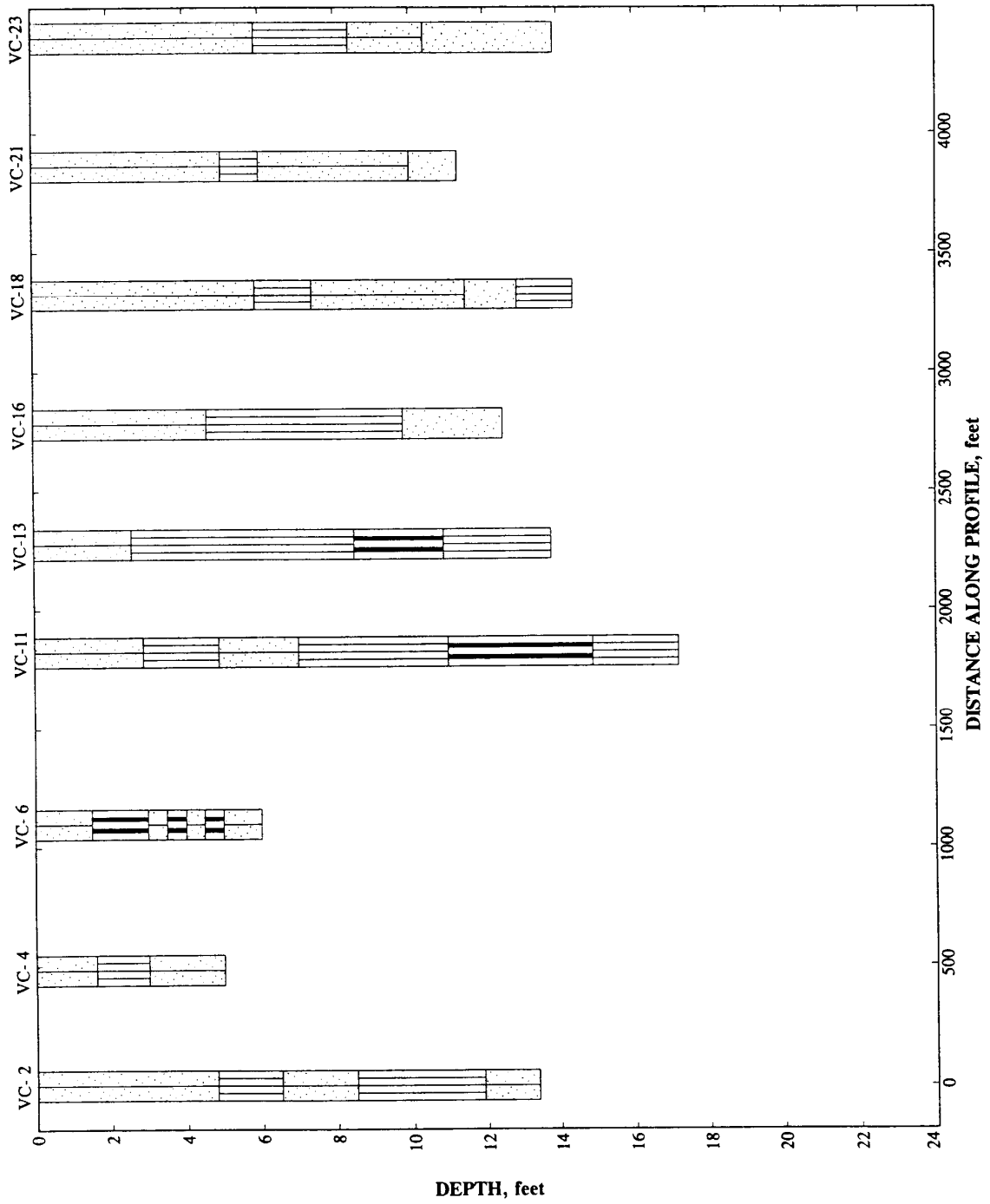
Template: DY8x11DP; Prj ID: 14301



See Plate B1 for graphic symbol legend.

NO.: 143-01	APPR.: ay	**CROSS SECTION C1-C1'**	PLATE
BY: ay	DATE: 12/94	Queens Gate Dredging San Pedro Bay, California	19A
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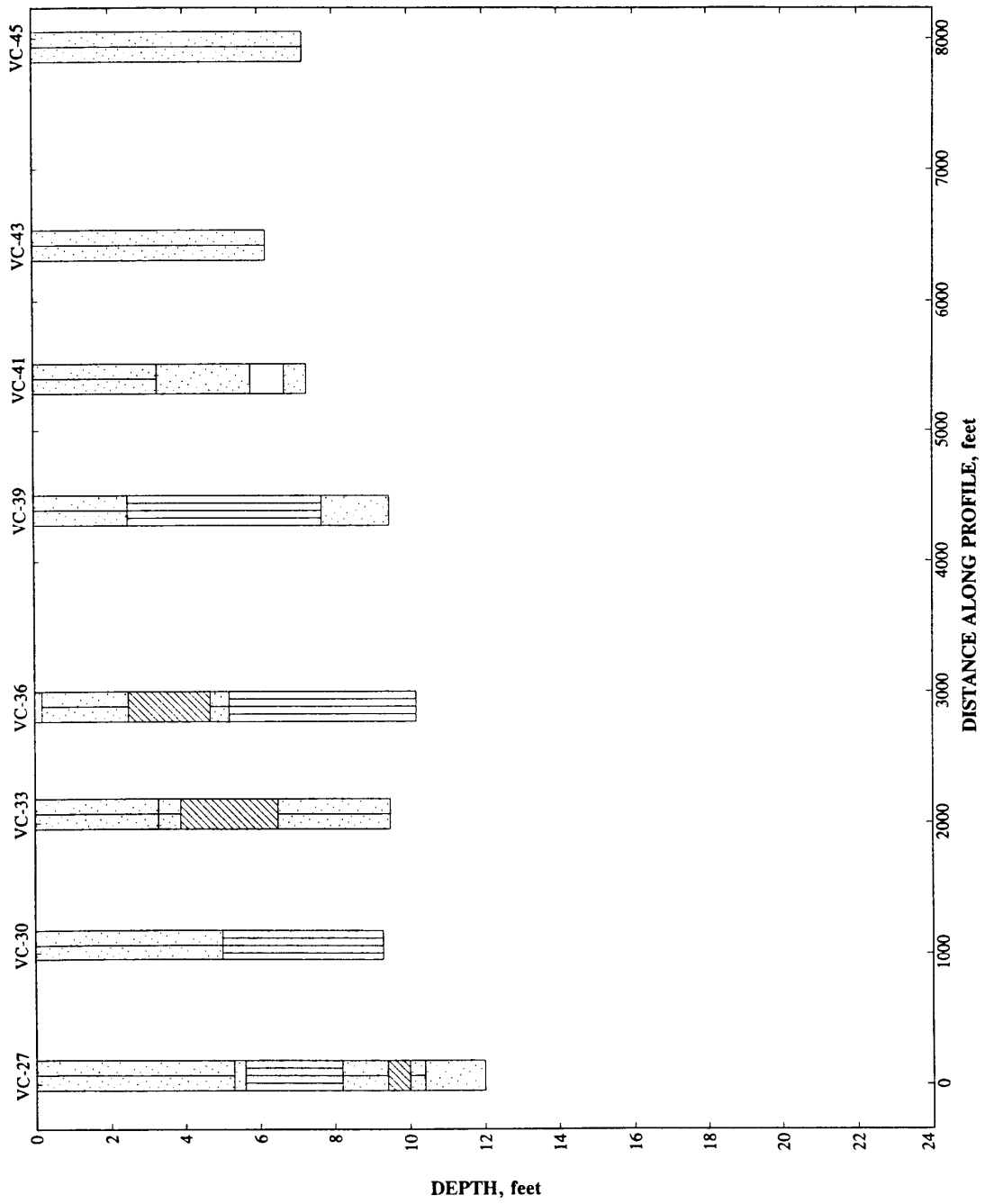
Template: DYbA11DP; Prj ID: 14301



See Plate B1 for graphic symbol legend.

NO.: 143-01	APPR.: ay	**CROSS SECTION C2-C2'**	PLATE
BY: ay	DATE: 12/94	Queens Gate Dredging San Pedro Bay, California	19B
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APPENDIX B

LOGS OF VIBRACORES

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& ASSOCIATES
Geotechnical Services

Report Prepared for:

Sea Surveyor, Inc.
821 East 2nd Street, Suite 201
Benicia, California 94510

GEOTECHNICAL SERVICES
QUEEN'S GATE DREDGING GEOTECHNICAL
AND CHEMICAL INVESTIGATION
SAN PEDRO BAY, CALIFORNIA

Project No. 143-01

by

Peter J. Fischer
Registered Geologist 1902

Allen M. Yourman Jr.
Allen M. Yourman, Jr.
Geotechnical Engineer 925

REGISTERED PROFESSIONAL ENGINEER
ALLEN MILES YOURMAN, JR.
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STATE OF CALIFORNIA

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(714)838-8565

December 27, 1994

M:\PROJECTS\143-01\1VIBRATW.WPD

APPENDIX B

FIELD INVESTIGATION AND LOGS OF VIBRACORES

A summary of vibracoring depths, dates, and time of vibracoring is presented in Table B1.

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

Bag sample

No.: 143-01 APPR.: HR
BY: DATE: 12/27/94

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SOIL CLASSIFICATION CHART

Queens Gate Dredging

San Pedro Bay, California

PLATE
B1

LOCATION (feet): N 1723076 E 6505691	**MUDLINE ELEVATION/DATUM (feet):** -56.6 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 15.7	**PENETRATION (feet):** 19.5
DATE AND TIME STARTED: 11/10/94 @ 16:00	**DATE AND TIME COMPLETED:** 11/10/94 @ 16:15
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** MS
-	**SAMPLER DIAMETER (inches)-** ID: 3.5 OD: 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				< 0.1		CH	SILTY SAND (SM), olive green to gray, wet, fine grained, some shell debris.		98	97	28		
							6-inches of marine shell debris at 2 feet.						
-60						CH	2-inches of marine shell debris at 3 feet.		99	99	48		
							Discontinuity/sharp contact at base of unit						
	5				0.2	CH	SILT with SAND (ML), gray to olive green, wet, low to medium plasticity.	100	100	100	85		
-65							SILTY SAND (SM), olive green, wet, fine-rounded grained, micaceous.						
						CH	FAT CLAY (CH), olive green, wet, high plasticity, micaceous	100	100	100	57		
	10				0.3								
						CH		100	100	100	100		
-70					0.35								
	15					CH	SILT with SAND (ML), olive green, wet, low plasticity, fine to medium grained, sand, little clay, micaceous.	100	100	100	74		
							Vibracore refusal at 19.5 feet. 15.7 feet of sample recovery						
				0.5									
-75				1									
				0.5									
	20			2									
-80													
	25												
-85													

NO.: 143-01 APPR.: HR
BY: JGS DATE: 12/94

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LOG OF VIBRACORE VC- 1
Page 1 of 1
Queens Gate Dredging
San Pedro Bay, California

PLATE
B2

LOCATION (feet): N 1723109 E 6506090	**MUDLINE ELEVATION/DATUM (feet):** -56.0 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 13.5	**PENETRATION (feet):** 20.0
DATE AND TIME STARTED: 11/10/94 @ 12:05	**DATE AND TIME COMPLETED:** 11/10/94 @ 12:10
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** MS
	SAMPLER DIAMETER (inches)- ID: 3.5 OD: 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				< 0.1		CH	SILTY SAND (SM), gray, wet, fine grained, micaceous.	100	100	99	39		
							Sea shell debris from 2 to 3 feet.						
						CH							
-60						CH			91	90	39		
							6-inches of marine shell debris at 4 to 4.5 feet.						
	5						Discontinuity/sharp contact at base of unit.						
					0.2		SILT with SAND (ML), olive green, wet, medium plasticity.						
						CH	SILTY SAND (SM), olive green, wet, fine grained, micaceous.	100	100	99	80		
-65													
						CH	SILT (ML), gray to olive green, wet, medium plasticity, micaceous	100	100	100	99		
	10				0.35								
						CH	SILTY SAND (SM), gray, wet, fine grained, micaceous.	100	100	100	44		
-70							Vibracore refusal at 20 feet. 13.5 feet of sample recovery.						
	15												
				1									
				1.5									
-75				0.5									
	20			0.3									
-80													
	25												
-85													

NO.: 143-01 APPR.:	**LOG OF VIBRACORE VC- 2**	PLATE
BY: JGS DATE: 12/94	Page 1 of 1	B3
	Queens Gate Dredging	
DIAZ • YOURMAN & ASSOCIATES	San Pedro Bay, California	

LOCATION (feet): N 1722544 E 6505339	**MUDLINE ELEVATION/DATUM (feet):** -78.5 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 9.7	**PENETRATION (feet):** 10.0
DATE AND TIME STARTED: 11/9/94 @ 16:00	**DATE AND TIME COMPLETED:** 11/9/94 @ 16:04
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** PF
	SAMPLER DIAMETER (inches)- ID: 3.5 OD: 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
						CH	SILTY SAND (SM), gray, wet, fine to medium grained, rounded, trace of marine shell debris, micaceous.		99	97	40		
-80				< 0.1	0.05								
	5						SILT (ML), gray, wet, medium plasticity.						
-85					0.15		Vibracore terminated at 10 feet. 9.7 feet of sample recovery. Bottom 3.5 feet of sample not logged.						
				0.2									
	10			1									
-90													
	15												
-95													
	20												
-100													
	25												
-105													

NO.: 143-01 APPR.: BY: JGS DATE: 12/94	**LOG OF VIBRACORE VC- 3** Page 1 of 1 Queens Gate Dredging San Pedro Bay, California	PLATE **B4**

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LOCATION (feet): N 1722629 E 6506126	**MUDLINE ELEVATION/DATUM (feet):** -77.0 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 9.3	**PENETRATION (feet):** 10.0
DATE AND TIME STARTED: 11/9/94 @ 16:20	**DATE AND TIME COMPLETED:** 11/9/94 @ 16:25
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** PF
	SAMPLER DIAMETER (inches)- **ID:** 3.5 **OD:** 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				< 0.1	0.05	CH	SILTY SAND (SM), dark gray, wet, fine to medium grained. Increasing SILT, low plasticity.	100	100	99	43		
-80					0.2		SILT (ML), gray, wet, medium plasticity.						
	5						SILTY SAND (SM), gray, wet, fine to medium grained, micaceous.						
-85				0.2			Vibracore terminated at 10 feet. 9.3 feet of sample recovery. Bottom 4.3 feet of sample not logged.						
	10			0.5									
-90													
	15												
-95													
	20												
-100													
	25												
-105													

NO.: 143-01 APPR.:
BY: JGS DATE: 12/94

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LOG OF VIBRACORE VC- 4
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Queens Gate Dredging
San Pedro Bay, California

PLATE
B5

LOCATION (feet): N 1722206 E 6505761	**MUDLINE ELEVATION/DATUM (feet):** -76.8 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 9.9	**PENETRATION (feet):** 13.0
DATE AND TIME STARTED: 11/10/94 @ 16:45	**DATE AND TIME COMPLETED:** 11/10/94 @ 16:52
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:**
	SAMPLER DIAMETER (inches)- ID: 3.5 OD: 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				< 0.1		CH	SILTY SAND (SM), dark gray, wet, fine to medium grained.	100	100	98	16		
					0.2		SILT (ML), olive green, wet, medium plasticity. Discontinuity (?) at base of unit.						
-80						CH	SILTY SAND (SM), light gray, wet, fine to medium grained, rounded.	100	100	96	40		
	5				0.4		SILT (ML), gray, wet, low plasticity,						
							SILTY SAND (SM), gray, wet, fine to medium grained, micaceous.						
							Vibracore terminated at 13 feet. 9.9 feet of sample recovery. Bottom 3.9 feet of sample not logged.						
-85				0.5									
				0.7									
	10												
				0.5									
-90				2									
	15												
-95													
	20												
-100													
	25												
-105													

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	Queens Gate Dredging	
DIAZ • YOURMAN & ASSOCIATES	San Pedro Bay, California	

LOCATION (feet): N 1722013 E 6506182	**MUDLINE ELEVATION/DATUM (feet):** -75.5 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 9.6	**PENETRATION (feet):** 13.0
DATE AND TIME STARTED: 11/10/94 @ 13:45	**DATE AND TIME COMPLETED:** 11/10/94 @ 13:50
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** MS
	SAMPLER DIAMETER (inches)- ID: 3.5 OD: 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				< 0.1		CH	SILTY SAND (SM), gray, wet, fine grained, some marine shell debris.		90	87	22		
							Discontinuity/sharp contact at base of unit.						
						CH	ELASTIC SILT (MH), olive green, wet, medium to high plasticity.						
-80	5						SILTY SAND (SM), gray, wet, fine grained, rounded.		98	97	25		
							ELASTIC SILT (MH), gray, wet, medium to high plasticity,						
							SILTY SAND (SM), gray, wet, fine grained.						
							ELASTIC SILT (MH), gray, wet, medium to high plasticity.						
							SILTY SAND (SM), gray, wet, fine grained.						
							Vibracore terminated at 13 feet.						
				0.2			9.6 feet of sample recovery.						
-85	10			0.5			Bottom 3.6 feet of sample not logged.						
				0.8									
				0.5									
-90	15												
-95	20												
-100	25												
-105													

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	Queens Gate Dredging	
DIAZ•YOURMAN & ASSOCIATES	San Pedro Bay, California	

LOCATION (feet): N 1721846 E 6505393	**MUDLINE ELEVATION/DATUM (feet):** -69.7 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 13.2	**PENETRATION (feet):** 17.0
DATE AND TIME STARTED: 11/10/94 @ 15:01	**DATE AND TIME COMPLETED:** 11/10/94 @ 15:06
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** MS
	SAMPLER DIAMETER (inches)- ID: 3.5 OD: 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
						CH	ELASTIC SILT (MH), gray, wet, high plasticity.		99	99	96		
				< 0.1	0.45		Discontinuity at base of unit.						
							SILT with SAND (ML),olive green, wet, medium plasticity.		84	83	77		
							Discontinuity at base of unit.						
-75	5						SAND with SILT (SP-SM), olive green, wet, medium grained.						
				0.5		CH		100	100	98	11		
				1			Discontinuity (?) at base of unit.						
				1.2	0.4		LEAN CLAY (CL), olive green, wet, medium plasticity.						
				1.5		CH	SANDY SILT (ML), gray, wet, little clay, medium plasticity.	100	100	98	63		
-80	10			2	0.3		LEAN CLAY (CL), gray to olive green, wet, low to medium plasticity.						
				1.8	0.45		SILT with SAND (ML), dark gray, wet, low to medium plasticity, little clay.						
				1		CH		100	100	98	70		
				0.5			Vibracore terminated at 17 feet.						
				0.1			13.2 feet of sample recovery.						
-85	15			0.5									
				0.6									
-90	20												
-95	25												

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DIAZ • YOURMAN & ASSOCIATES

LOCATION (feet): N 1721680 E 6505808	**MUDLINE ELEVATION/DATUM (feet):** -65.8 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 11.0	**PENETRATION (feet):** 14.8
DATE AND TIME STARTED: 11/10/94 @ 14:35	**DATE AND TIME COMPLETED:** 11/10/94 @ 14:42
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:**
-	**SAMPLER DIAMETER (inches)-** ID: 3.5 OD: 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
					0.1	CH	FAT CLAY with SAND (CH), olive green, wet, high plasticity.		96	94	84		
				< 0.1			SILTY CLAY (CH/MH), gray to olive green, wet, medium stiff, medium to high plasticity.						
					0.15	CH	Discontinuity (?) at base of unit.	100	100	100	95		
-70							SAND (SP), dark gray, wet, medium to coarse grained. Discontinuity (?) at base of unit.						
	5						LEAN CLAY (CL), gray, wet, medium plasticity.						
						CH		100	100	99	93		
					0.3								
					0.25		SAND to SILTY SAND (SM), olive green, wet, fine grained.						
-75						CH	ELASTIC SILT (MH), gray to olive green, wet, high plasticity.	100	100	99	89		
	10				0.2								
				0.5			SAND (SP), gray, wet, fine to medium grained, rounded, micaceous.						
				0.3			Vibracore refusal at 14.8 feet. 11.0 of sample recovery.						
-80				0.7									
	15			4									
-85													
	20												
-90													
	25												
-95													

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DIAZ • YOURMAN & ASSOCIATES

LOCATION (feet): N 1721231 E 6505244	**MUDLINE ELEVATION/DATUM (feet):** -60.6 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 11.7	**PENETRATION (feet):** 19.0
DATE AND TIME STARTED: 11/10/94 @ 11:15	**DATE AND TIME COMPLETED:** 11/10/94 @ 11:20
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** MS
-	**SAMPLER DIAMETER (inches)-** **ID:** 3.5 **OD:** 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				< 0.1		CH	SILTY SAND (SM), gray, wet, fine to medium grained, micaceous, abundant of marine shell debris. No marine shells at 0.6 feet. Increasing marine shell debris at 1.1 feet. Discontinuity at base of unit		95	92	16		
						CH	FAT CLAY (CH), olive green, wet, high plasticity.	100	100	99	93		
-65	5						SILT (ML), olive green to gray, wet, medium to high plasticity.						
					0.1	CH		100	100	100	86		
					0.15		2 inches of SILTY SAND at 7 feet.						
							SAND with SILT (SP-SM), light brown, wet, medium to coarse grained.						
-70						CH			96	71	10		
	10				0.25		SILTY CLAY (CL), olive green, wet, medium plasticity.						
				0.3			SAND (SP), gray, wet, fine to medium grained, rounded, micaceous.						
				0.8		CH	Vibracore refusal at 19 feet.						
				0.2			11.7 of sample recovery.						
-75													
	15					CH							
				0.7									
				3									
-80				4.3									
	20												
-85													
	25												
-90													

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PLATE

B10

DIAZ • YOURMAN & ASSOCIATES

LOCATION (feet): N 1721182 E 6505851	**MUDLINE ELEVATION/DATUM (feet):** -65.9 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 12.9	**PENETRATION (feet):** 15.0
DATE AND TIME STARTED: 11/10/94 @ 14:15	**DATE AND TIME COMPLETED:** 11/10/94 @ 14:23
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:**
	SAMPLER DIAMETER (inches)- ID: 3.5 OD: 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				< 0.1		CH	SANDY SILT (ML), olive gray, wet, low plasticity, medium to coarse grained sand, little clay, micaceous, trace of marine shell debris.		98	96	54		
						CH		100	100	100	67		
-70	5						LEAN CLAY (CL), olive green, wet, medium plasticity.						
						CH		100	100	100	98		
					0.25		SILT with SAND (ML), gray, wet, low to medium plasticity, micaceous.						
-75						CH		100	100	100	71		
	10						SILTY SAND (SM), gray, wet, fine to medium grained, rounded, micaceous.						
				0.3									
				0.8		CH			100	100	48		
-80				0.5			Vibracore refusal at 15 feet. 12.9 feet of sample recovery.						
	15			4									
-85													
	20												
-90													
	25												
-95													

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PLATE
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DIAZ•YOURMAN & ASSOCIATES

LOCATION (feet): N 1721339 E 6506448	**MUDLINE ELEVATION/DATUM (feet):** -60.5 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 17.2	**PENETRATION (feet):** 20.0
DATE AND TIME STARTED: 11/10/94 @ 10:50	**DATE AND TIME COMPLETED:** 11/10/94 @ 11:03
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** MS
-	**SAMPLER DIAMETER (inches)-** ID: 3.5 OD: 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				< 0.1		CH	SILTY SAND (SM), gray, wet, fine grained, micaceous, abundant marine shell debris. 6-inches of marine shell debris at 1 feet.		98	96	13		
						CH	SANDY SILT to SILTY SAND (ML/SM), gray, wet, low plasticity. Marine shell debris at 3.7 feet.		99	99	51		
-65	5					CH	SILTY SAND (SM), gray, wet, fine to medium grained, micaceous. Discontinuity (?) at base of unit.	100	100	99	32		
-70	10					CH	SILT (ML), gray, wet, low to medium plasticity, micaceous.	100	100	100	92		
						CH	ELASTIC SILT (MH), gray, wet, high plasticity, micaceous.	100	100	100	98		
-75	15			0.2		CH	SILT with SAND (ML), olive green, wet, low to medium plasticity.	100	100	99	72		
-80	20			0.5 0.6			Vibracore refusal at 20 feet. 17.2 feet of sample recovery.						
-85	25												
-90													

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DIAZ • YOURMAN & ASSOCIATES

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LOCATION (feet): N 1720849 E 6505477	**MUDLINE ELEVATION/DATUM (feet):** -61.0 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 15.2	**PENETRATION (feet):** 17.0
DATE AND TIME STARTED: 11/10/94 @ 09:30	**DATE AND TIME COMPLETED:** 11/10/94 @ 09:39
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** MS
	SAMPLER DIAMETER (inches)- **ID:** 3.5 **OD:** 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				< 0.1		CH	SILTY SAND (SM), gray, wet, fine grained, abundant marine shells.		95	92	19		
							SAND (SP), gray, wet, fine grained, some with debris. Discontinuity (?) at base of unit.						
-65						CH	SILT with SAND (ML), olive, wet, low to medium plasticity.	100	100	100	76		
	5						SILTY SAND (SM), olive green, wet, fine grained, micaceous.						
				CH			SILT (ML), gray, wet, stiff, low plasticity.	100	100	100	91		
							ELASTIC SILT (MH), gray, wet, medium to high plasticity.						
-70					0.25	CH		100	100	100	99		
	10			0.2									
					0.3	CH		100	100	100	99		
-75							SILTY SAND (SM), gray, wet, fine grained, micaceous.						
				0.5			Becoming medium grained.						
	15			1.5		CH	Vibracore refusal at 17 feet. 15.2 feet of sample recovery.	100	100	97	21		
				1									
				2.2									
-80													
	20												
-85													
	25												
-90													

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PLATE

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DIAZ • YOURMAN & ASSOCIATES

LOCATION (feet): N 1720924 E 6506274	**MUDLINE ELEVATION/DATUM (feet):** -62.6 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 13.8	**PENETRATION (feet):** 16.0
DATE AND TIME STARTED: 11/10/94 @ 10:30	**DATE AND TIME COMPLETED:** 11/10/94 @ 10:40
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** MS
-	**SAMPLER DIAMETER (inches)-** ID: 3.5 OD: 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				< 0.1		CH	SILTY SAND (SM), olive green, wet, fine grained, abundant marine shell debris.		94	91	24		
-65							Abundant marine shell debris at 2.6 feet/discontinuity (?).						
						CH	SANDY SILT (ML), olive green, wet, low to medium plasticity.	100	100	100	67		
	5			0.2									
				0.1		CH	SILT with SAND (ML), olive green, wet.	100	100	100	85		
-70													
				0.2		CH	ELASTIC SILT (MH), olive green, wet, medium plasticity.	100	100	100	95		
	10												
							SANDY SILT (ML), olive green, wet, fine to coarse grained sand.						
-75				0.2		CH		100	100	100	56		
				0.5			Vibracore refusal at 16 feet. 13.8 of sample recovery.						
	15			1									
				1									
-80													
	20												
-85													
	25												
-90													

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PLATE
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LOCATION (feet): N 1720684 E 6505892	**MUDLINE ELEVATION/DATUM (feet):** -62.6 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 14.5	**PENETRATION (feet):** 18.0
DATE AND TIME STARTED: 11/9/94 @ 15:00	**DATE AND TIME COMPLETED:** 11/9/94 @ 15:10
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** MS
-	**SAMPLER DIAMETER (inches)-** ID: 3.5 OD: 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
						CH	SILTY SAND (SM), gray, wet, medium grained, marine shell hash.		88	86	20		
				< 0.1			SAND (SP), gray, wet, medium grained, intermitent marine shell debris.						
-65							Discontinuity (?) at base of unit.						
						CH	SILT with SAND (ML), olive green, wet, medium plasticity.	100	100	99	74		
							ELASTIC SILT (MH), olive green, wet, medium plasticity.						
	5												
					0.25	CH		100	100	100	98		
-70							Gray, medium to high plasticity.						
							FAT CLAY (CH), gray, wet, high plasticity, micaceous.						
						CH	LEAN CLAY (CL), olive green, wet, medium plasticity.	100	100	100	95		
	10				0.2								
					0.2		SANDY SILT (ML), olive gray, wet, stiff, low plasticity, micaceous.						
-75					0.25	CH		100	100	100	50		
				0.1			SILTY SAND (SM), olive green, wet, fine, medium to coarse grained, micaceous, decreasing grain size with depth, 6-inches of sample was lost or washed out.						
				0.5									
	15			0.3		CH	Vibracore refusal at 18 feet.	100	100	95	17		
				0.8			14.5 feet of sample recovery.						
-80				2.5									
				3									
	20												
-85													
	25												
-90													

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PLATE
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LOCATION (feet): N 1720351 E 6505519	**MUDLINE ELEVATION/DATUM (feet):** -61.1 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 14.0	**PENETRATION (feet):** 16.0
DATE AND TIME STARTED: 11/9/94 @ 14:30	**DATE AND TIME COMPLETED:** 11/9/94 @ 14:40
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** MS
-	**SAMPLER DIAMETER (inches)-** **ID:** 3.5 **OD:** 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				< 0.1			SILTY SAND (SM), gray, wet, fine to medium grained, marine shell hash. Abundant marine shell debris at 2 feet.						
-65						CH			98	96	41		
	5			0.2			Discontinuity (?) at base of unit.						
						CH	SAND (SP), gray, wet, medium grained, increasing marine shell debris.	100	100	100	82		
							SILT with SAND (ML), olive green, wet, medium plasticity, micaceous.						
-70					0.25	CH	ELASTIC SILT (MH), olive green, wet, medium to high plasticity, micaceous.	100	100	100	95		
	10				0.2	CH	LEAN CLAY with SAND (CL), dark gray, wet, low to medium plasticity.	100	100	99	84		
-75				0.5		CH	SILTY SAND (SM), gray, wet, fine to medium to coarse grained, micaceous.	100	100	99	37		
	15						Vibracore refusal at 16 feet. 14.0 feet of sample recovery.						
				2									
-80													
	20												
-85													
	25												
-90													

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LOCATION (feet): N 1720419 E 6506316	**MUDLINE ELEVATION/DATUM (feet):** -61.3 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 12.5	**PENETRATION (feet):** 14.0
DATE AND TIME STARTED: 11/9/94 @ 15:30	**DATE AND TIME COMPLETED:** 11/9/94 @ 15:38
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** MS
	SAMPLER DIAMETER (inches)- **ID:** 3.5 **OD:** 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				< 0.1		CH	SILTY SAND (SM), gray, wet, medium grained, trace of marine shell debris.		99	99	32		
-65						CH	Abundant marine shell debris at 3.5 feet.	100	100	94	22		
	5						Discontinuity at base of unit. SILT (ML), olive green, wet, medium plasticity, micaceous.						
				0.1	0.2	CH		100	100	100	94		
-70							Becoming SANDY SILT.						
					0.2	CH		100	100	100	52		
	10						SAND (SP), gray, wet, fine to medium to coarse grained, rounded, micaceous.						
-75				0.5			Vibracore refusal at 14 feet. 12.5 feet of sample recovery.						
				0.5									
	15												
-80													
	20												
-85													
	25												
-90													

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PLATE
B17

LOCATION (feet): N 1719836 E 6505361	**MUDLINE ELEVATION/DATUM (feet):** -60.8 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 14.4	**PENETRATION (feet):** 18.0
DATE AND TIME STARTED: 11/11/94 @ 09:00	**DATE AND TIME COMPLETED:** 11/11/94 @ 09:12
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** MS
-	**SAMPLER DIAMETER (inches)-** ID: 3.5 OD: 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				< 0.1		CH	SILTY SAND (SM), dark gray, wet, fine grained.	100	100	99	26		
							Abundant marine shell debris from 2 to 2.9 feet; decreasing shell/debris to base of unit.						
						CH	Trace marine shells.		87	84	17		
-65							SAND (SP), gray, wet, fine grained, little marine shell debris.						
	5						SILTY SAND (SM), gray, wet, fine grained.						
							Discontinuity (?) at base of unit.						
				0.1		CH	ELASTIC SILT (MH), olive green, wet, high plasticity.	100	100	99	97		
				< 0.1									
-70				0.1		CH		100	100	100	99		
	10						LEAN CLAY (CL), gray to olive green, wet, medium plasticity.						
						CH	SILTY SAND (SM), light brown to gray, wet, fine to medium grained.	100	100	100	36		
				< 0.1									
-75							SILT (ML), olive green, wet, low plasticity.						
	15			0.8			Vibracore refusal at 18 feet. 14.4 feet of sampale recovery.						
				3									
				3.5									
				1.5									
-80													
	20												
-85													
	25												
-90													

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PLATE
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EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 14.4	**PENETRATION (feet):** 19.0
DATE AND TIME STARTED: 11/10/94 @ 08:20	**DATE AND TIME COMPLETED:** 11/10/94 @ 08:32
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** MS
-	**SAMPLER DIAMETER (inches)-** ID: 3.5 OD: 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				< 0.1		CH	SILTY SAND (SM), dark gray, wet, fine to medium grained. Some marine shells at 0.9 feet.	100	100	99	25		
-65	5					CH	No shells from 2.9 to 3.9 feet. Abundant marine shell debris from 4.6 to 5.6 feet/discontinuity at base of shell debris unit.		92	88	14		
					0.1	CH	SILT (ML), olive green, wet, low to medium plasticity.		96	95	87		
					0.2		SILTY SAND (SM), light gray, to olive green, wet, fine to medium grained, micaceous.						
-70	10			0.1		CH		100	100	100	23		
				0.2		CH	SAND (SP), gray, wet, medium grained.	100	100	98	4		
-75				0.5	0.25		SILT (ML), olive green, wet, low plasticity.						
	15			0.1			Vibracore refusal at 19 feet. 14.4 feet of sample recovery.						
-80	20			0.2									
-85	25												
-90													

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PLATE
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LOCATION (feet): N 1719710 E 6505977	**MUDLINE ELEVATION/DATUM (feet):** -61.4 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 11.8	**PENETRATION (feet):** 13.0
DATE AND TIME STARTED: 11/9/94 @ 11:45	**DATE AND TIME COMPLETED:** 11/9/94 @ 11:52
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** MS
-	**SAMPLER DIAMETER (inches)-** **ID:** 3.5 **OD:** 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				0.1		CH	SILTY SAND (SM), gray, wet, fine to medium grained, abundant marine sea shell debris.		98	97	17		
-65				0.2		CH	Increasing medium grained sand.		99	98	33		
	5					CH	Olive green, micaceous, brownish colored interbbeded.	100	100	100	40		
-70				0.1	0.25		Discountinuity (?) at base of unit.						
						CH	SILT (ML), olive green, wet, brownish colored interbbeded, micaceous.	100	100	100	99		
	10			0.1			SILTY SAND (SM), gray, wet, fine to medium grained.						
				0.5		CH	Vibracore refusal at 13 feet.	100	100	100	15		
-75				2.5			11.8 feet of sample recovery.						
	15												
-80													
	20												
-85													
	25												
-90													

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PLATE
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LOCATION (feet): N 1719357 E 6505586	**MUDLINE ELEVATION/DATUM (feet):** -61.7 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 11.0	**PENETRATION (feet):** 14.0
DATE AND TIME STARTED: 11/9/94 @ 10:30	**DATE AND TIME COMPLETED:** 11/9/94 @ 10:35
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** PF
	SAMPLER DIAMETER (inches)- **ID:** 3.5 **OD:** 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				<0.1		CH	SILTY SAND (SM), dark gray, wet, fine to medium grained. Abundant marine shell debris at 2 feet.	100	100	99	29		
-65						CH	SANDY SILT (ML), gray, wet, fine to medium grained sand, micaceous.		97	95	55		
	5						SAND (SP), light gray, wet, fine to medium grained, some marine shell debris.						
				0.1		CH	LEAN CLAY (CL), gray, wet, low plasticity, micaceous.	100	100	99	93		
							ELASTIC SILT (MH), gray, wet, medium plasticity, micaceous.						
-70								100	100	100	98		
	10						SAND to SILTY SAND (SP/SM), gray, wet, fine grained, rounded micaceous.						
				0.2		CH	Vibracore refusal at 14 feet. 11.0 feet of sample recovery.						
-75				0.5									
				4									
	15												
-80													
	20												
-85													
	25												
-90													

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LOCATION (feet): N 1719424 E 6506389	**MUDLINE ELEVATION/DATUM (feet):** -61.7 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 11.3	**PENETRATION (feet):** 15.5
DATE AND TIME STARTED: 11/9/94 @ 11:15	**DATE AND TIME COMPLETED:** 11/9/94 @ 11:23
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** PF
-	**SAMPLER DIAMETER (inches)-** **ID:** 3.5 **OD:** 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				<0.1		CH	SILTY SAND (SM), dark gray, wet, fine to medium grained, rounded, micaceous, marine shell debris.	100	100	99	25		
-65						CH			94	91	27		
				0.1			Medium to coarse grained, trace of marine shell debris/discontinuity (?) base of unit.						
	5						SANDY SILT (ML), gray, wet, low plasticity.						
				0.2		CH	SILTY SAND (SM), light gray, wet, fine to medium grained.	100	100	97	23		
-70							Trace of coarse sand.						
				0.5		CH		100	100	88	28		
	10			0.6			SAND (SP), light gray, wet, medium grained, trace of coarse grains, rounded, micaceous.						
				0.5			Vibracore refual at 15.5 feet.						
				0.1			11.3 feet of sample recovery.						
-75													
				0.2									
	15			1									
				3.2									
-80													
	20												
-85													
	25												
-90													

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LOCATION (feet): N 1718832 E 6505452	**MUDLINE ELEVATION/DATUM (feet):** -62.9 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 18.9	**PENETRATION (feet):** 19.0
DATE AND TIME STARTED: 11/10/94 @ 07:15	**DATE AND TIME COMPLETED:** 11/10/94 @ 07:30
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** MS
	SAMPLER DIAMETER (inches)- ID: 3.5 OD: 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				<0.1		CH	SILTY SAND (SM), gray, wet, fine to medium grained, rounded, few marine shell debris.		99	98	30		
-65													
				0.1		CH	2-inches of marine shell debris.		89	86	19		
	5						Discontinuity (?) at base of unit.						
-70					0.2	CH	SILT (ML), olive green, wet, medium plasticity,	100	100	100	87		
							SILTY SAND (SM), gray, wet, fine grained.						
							ELASTIC SILT (MH), olive green, wet, medium to high plasticity.						
	10				0.15		SILT with SAND (ML), olive green, wet, medium stiff, low plasticity.	100	100	99	73		
-75				0.1		CH	SILTY SAND (SM), olive green, wet, fine grained, rounded, micaceous.	100	100	98	24		
				0.3	0.2		SILT (ML), olive green, wet, low plasticity.						
	15			0.3		CH	SILTY SAND (SM), gray, wet, medium grained, rounded, micaceous.	100	100	88	18		
-80				1									
							SILT (ML), gray, wet, low plasticity.						
				0.5			SAND (SP), gray, wet, fine to medium grained, micaceous.						
				0.8			Vibracore terminated at 19 feet. 18.9 feet of sample recovery.						
	20												
-85													
	25												
-90													

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PLATE
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LOCATION (feet): N 1718943 E 6506630	**MUDLINE ELEVATION/DATUM (feet):** -62.3 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 13.9	**PENETRATION (feet):** 18.0
DATE AND TIME STARTED: 11/10/94 @ 07:45	**DATE AND TIME COMPLETED:** 11/10/94 @ 07:57
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** MS
-	**SAMPLER DIAMETER (inches)-** **ID:** 3.5 **OD:** 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				0.1		CH	SILTY SAND (SM), dark gray, wet, fine to medium grained, rounded marine shells, 1-inch of dry dark brown shale.	100	100	99	22		
-65						CH	Abundant marine sea shell debris/discontinuity between gray and brown sand units. Light brown, little marine shell debris.		87	85	22		
	5				0.2	CH	SILT (ML), olive green, wet, medium plasticity.		99	99	95		
-70				0.2	0.15								
				0.5		CH	SILTY SAND (SM), gray, wet, fine grained, rounded, micaceous.	100	100	94	32		
	10			0.3			SAND (SP), brownish white to light brown, wet, medium to coarse grained, rounded, micaceous.						
-75				0.4		CH		100	100	78	2		
				2.1									
				2.1			Vibracore refusal at 18 feet. 13.9 feet of sample recovery.						
	15			1.8									
				1.5									
-80				0.8									
				1.2									
	20												
-85													
	25												
-90													

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PLATE
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LOCATION (feet): N 1718790 E 6506052	**MUDLINE ELEVATION/DATUM (feet):** -62.1 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 12.9	**PENETRATION (feet):** 19.0
DATE AND TIME STARTED: 11/9/94 @ 10:15	**DATE AND TIME COMPLETED:** 11/9/94 @ 10:22
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** PF
-	**SAMPLER DIAMETER (inches)-** **ID:** 3.5 **OD:** 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				<0.1		CH	SILTY SAND (SM), dark gray, wet, fine grained, few marine shells.	100	100	93	39		
-65						CH	SANDY SILT (ML), light gray, wet, low to medium plasticity, fine to medium grained sand, trace of coarse sand.	100	99	93	60		
	5					CH	SILTY SAND (SM), gray, wet, medium to coarse grained.	100	100	97	29		
-70				0.1 0.2									
	10			0.6 1.5 2.2		CH	Decreasing coarse grained sand at 8.8 feet. Abundant marine shells/debris at 9.5 to 10 feet.		96	93	20		
-75				0.3		CH		100	100	99	35		
							Vibracore refusal at 19 feet. 12.9 feet of sample recovery.						
	15			0.6 1.1 0.7									
-80				1 1.8									
	20												
-85													
	25												
-90													

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PLATE
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LOCATION (feet): N 1718196 E 6506100	**MUDLINE ELEVATION/DATUM (feet):** -63.4 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 9.6	**PENETRATION (feet):** 13.5
DATE AND TIME STARTED: 11/9/94 @ 09:30	**DATE AND TIME COMPLETED:** 11/9/94 @ 09:35
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** PF
-	**SAMPLER DIAMETER (inches)-** **ID:** 3.5 **OD:** 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
-65				<0.1		CH	SILTY SAND (SM), dark gray, wet, fine to, medium grained, micaceous, trace of marine shell debris.	100	100	100	31		
						CH			91	87	21		
				0.1			SAND with SILT (SP-SM), gray, wet, fine grained, rounded, micaceous, some abundant marine shell debris/discontinuity.						
	5						SILT (ML), gray, wet, low plasticity.						
-70						CH		100	100	100	96		
						CH		100	100	100	89		
	10			<0.1			Vibracore refusal at 13.5 feet. 9.6 feet of sample recovery.						
-75				0.2									
				0.1									
				2.5									
	15												
-80													
	20												
-85													
	25												
-90													

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LOCATION (feet): N 1717959 E 6505720	**MUDLINE ELEVATION/DATUM (feet):** -63.2 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 13.8	**PENETRATION (feet):** 19.5
DATE AND TIME STARTED: 11/9/94 @ 12:00	**DATE AND TIME COMPLETED:** 11/9/94 @ 12:10
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** PF
-	**SAMPLER DIAMETER (inches)-** **ID:** 3.5 **OD:** 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
						CH	SILTY SAND (SM), dark gray, wet, fine to medium grained, few marine shells.	100	100	99	32		
-65													
				<0.1		CH	Sand with Silt (SP-SM). Abundant marine shell debris at 3 feet/discontinuity base shell unit. Increasing silt at 3.5 feet, low plasticity.		81	79	12		
	5												
-70						CH		100	100	99	40		
				0.2			SILTY SAND to SANDY SILT (SM/ML), gray to dark gray, wet, low plasticity.						
				0.1		CH	SAND (SP), gray, wet, medium grained, micaceous.	100	100	100	5		
	10												
-75				0.5		CH	SANDY SILT (ML), gray, wet, low plasticity, little clay, micaceous.		99	98	65		
							SILTY CLAY (CL), gray, wet, medium plasticity, micaceous.						
							Vibracore refusal at 19.5 feet. 13.8 feet of sample recovery.						
	15												
-80				0.6									
				0.5 3									
	20												
-85													
	25												
-90													

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LOCATION (feet): N 1718027 E 6506517	**MUDLINE ELEVATION/DATUM (feet):** -63.5 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 11.8	**PENETRATION (feet):** 16.0
DATE AND TIME STARTED: 11/9/94 @ 13:35	**DATE AND TIME COMPLETED:** 11/9/94 @ 13:42
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** PF
-	**SAMPLER DIAMETER (inches)-** **ID:** 3.5 **OD:** 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
						CH	SILTY SAND (SM), dark gray, wet, fine to grained sand, micaceous, few marine shell debris.	100	100	100	31		
-65				0.1			Fine grained, abundant marine shell debris/shells/discontinuity.						
						CH	Fine to medium grained, abundant marine shell fragments.		88	87	24		
	5						SAND (SP), light gray, wet, medium grained.						
-70						CH	SILT with SAND (ML), dark gray, wet, medium plasticity, little clay, trace of fine grained sand.	100	99	98	75		
				0.9	0.15								
				0.3		CH	SILTY SAND (SM), gray, wet, fine to medium grained, micaceous.	100	100	100	19		
	10			0.9	0.2		SILTY CLAY (CL), gray to gray, wet, medium plasticity.						
							SILTY SAND (SM), gray, wet, fine grained.						
-75				0.1			SAND (SP), gray, wet, fine to medium grained, rounded, trace of coarse.						
							Vibracore refusal at 16 feet. 11.8 feet of sample recovery.						
				0.3									
	15			1.2									
-80				2.1									
	20												
-85													
	25												
-90													

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LOCATION (feet): N 1717495 E 6506161	**MUDLINE ELEVATION/DATUM (feet):** -64.4 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 9.3	**PENETRATION (feet):** 13.0
DATE AND TIME STARTED: 11/8/94 @ 16:40	**DATE AND TIME COMPLETED:** 11/8/94 @ 16:45
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** AMY
-	**SAMPLER DIAMETER (inches)-** **ID:** 3.5 **OD:** 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
-65						CH	SILTY SAND (SM), dark gray, wet, fine grained, some marine shell debris.	100	100	99	37		
				<0.1			SILT (MH), dark gray, wet, high plasticity, some shell debris.						
						CH	SAND with SILT (SP-SM), dark gray, wet, fine grained, micaceous, some sea shells. Few marine shells. Some sea shells at 4.4 feet/Discountinuty (?) at base of unit.		85	83	10		
-70	5			0.2			SILT (ML), gray, wet, low plasticity, micaceous.						
				<0.1		CH		100	100	100	98		
							SAND with SILT (SP-SM), light gray, wet, fine to medium grained, rounded, micaceous.						
						CH	Vibracore refusal at 13 feet. 9.3 feet of sample recovery.	100	100	100	8		
-75	10			0.5									
				0.8									
				0.5									
				3.5									
-80	15												
-85	20												
-90	25												

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LOCATION (feet): N 1716963 E 6505804	**MUDLINE ELEVATION/DATUM (feet):** -65.3 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 9.5	**PENETRATION (feet):** 13.5
DATE AND TIME STARTED: 11/8/94 @ 15:15	**DATE AND TIME COMPLETED:** 11/8/94 @ 15:23
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** AMY
	SAMPLER DIAMETER (inches)- ID: 3.5 OD: 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				<0.1		CH	SILTY SAND (SM), dark gray, wet, fine grained sand, some shell debris.		94	93	19		
							Increasing marine shell debris at 2.2 feet.						
						CH		100	100	100	20		
-70	5						SAND with SILT (SP-SM), gray, wet, fine to medium grained. Discontinuity at base of unit.						
				0.2		CH	LEAN CLAY (CL), dark gray, wet, medium plasticity.	100	100	100	6		
							SAND (SP), gray, wet, fine to medium grained, rounded. Discontinuity at base of unit.						
-75	10					CH	SILTY SAND (SM), gray, wet, fine to medium grained.	100	100	90	36		
							Vibracore refusal at 13.5 feet. 9.5 feet of sample recovery.						
				0.5									
				0.7 4.5									
-80	15												
-85	20												
-90	25												

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DATE AND TIME STARTED: 11/8/94 @ 16:00	**DATE AND TIME COMPLETED:** 11/8/94 @ 16:07
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** AMY
	SAMPLER DIAMETER (inches)- **ID:** 3.5 **OD:** 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				<0.1		CH	SILTY SAND (SM), dark gray, wet, fine grained, trace of marine shell debris, micaceous. Increasing fine grained sand, micaceous, abundant marine shell debris.	100	100	100	35		
-70						CH			87	85	24		
	5						Discontinuity at base of unit.						
				0.1		CH	SILT with SAND (ML), gray, wet, low plasticity, fine grained sand. Little clay, micaceous.	100	100	100	80		
-75													
				<0.1		CH	Vibracore refusal at 13.5 feet. 9.3 feet of sample recovery.		99	99	71		
	10												
-80				0.1 5									
	15												
-85													
	20												
-90													
	25												
-95													

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PLATE
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& ASSOCIATES

LOCATION (feet): N 1716420 E 6506235	**MUDLINE ELEVATION/DATUM (feet):** -67.2 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 13.0	**PENETRATION (feet):** 13.5
DATE AND TIME STARTED: 11/8/94 @ 14:50	**DATE AND TIME COMPLETED:** 11/8/94 @ 15:00
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** AMY
-	**SAMPLER DIAMETER (inches)-** ID: 3.5 OD: 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				<0.1		CH	SILTY SAND (SM), dark gray, wet, fine to medium grained, trace of coarse sand. Some marine shell debris.	100	100	99	33		
-70						CH	Decreasing marine shell debris at 3 feet. Discontinuity (?) at base of unit.		98	98	19		
	5						SANDY SILT (ML), gray, wet, medium plasticity.						
						CH	SILTY SAND (SM), light gray, wet, fine to medium grained, rounded, micaceous.		99	97	57		
-75				0.2		CH	SANDY CLAY (CL), gray, wet, medium plasticity.	100	100	100	55		
	10						SAND to SILTY SAND (SP/SM), gray, wet, fine grained, rounded, micaceous.						
-80				0.5		CH	SANDY SILT (ML), gray, wet, low to medium plasticity, fine grained sand, Little clay, micaceous.	100	100	99	64		
				1.0			SILTY SAND (SM), gray, wet, fine grained sand, micaceous.						
				2.8			Vibracore refusal at 13.5 feet. 13.0 feet of sample recovery.						
	15												
-85													
	20												
-90													
	25												
-95													

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PLATE
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LOCATION (feet): N 1715967 E 6505888	**MUDLINE ELEVATION/DATUM (feet):** -68.0 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 10.0	**PENETRATION (feet):** 13.5
DATE AND TIME STARTED: 11/9/94 @ 09:00	**DATE AND TIME COMPLETED:** 11/9/94 @ 09:06
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** PF
-	**SAMPLER DIAMETER (inches)-** **ID:** 3.5 **OD:** 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				<0.1		CH	SILTY SAND (SM), dark gray, wet, fine to medium grained,	100	100	99	35		
						CH	trace of marine shell debris.						
-70						CH	Abundant marine shell debris.						
						CH	Decreasing marine shell debris at 2.5 feet.		87	82	17		
							Discontinuity (?) at base of unit.						
	5						SILT (ML), gray, wet, medium plasticity.						
						CH	SAND (SP), light gray, wet, fine to medium grained, rounded, micaceous.	100	100	99	59		
-75					0.2		SANDY SILT (ML), light gray, wet, medium plasticity.						
							SILTY SAND (SM), light gray, wet, medium grained sand.						
				0.2		CH		100	100	96	24		
	10						Vibracore refusal at 13.5 feet.						
							10.0 feet of sample recovery.						
				0.1									
-80				0.2									
				0.8									
				3									
	15												
-85													
	20												
-90													
	25												
-95													

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PLATE
B33

LOCATION (feet): N 1716033 E 6506685	**MUDLINE ELEVATION/DATUM (feet):** -67.9 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 9.5	**PENETRATION (feet):** 13.5
DATE AND TIME STARTED: 11/9/94 @ 08:27	**DATE AND TIME COMPLETED:** 11/9/94 @ 08:32
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** PF
	SAMPLER DIAMETER (inches)- ID: 3.5 OD: 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				<0.1	0.05	CH	SILTY SAND (SM), dark gray, wet, fine to medium grained sand.		100	99	19		
-70							Decreasing silt, fine grained sand, abundant marine shell debris at 1 foot.						
				0.1		CH	Medium grained/discontinuity.	100	100	98	14		
							SILTY SAND (SM), gray, wet, medium grained sand.						
	5				0.15		LEAN CLAY (CL), gray, wet, low to medium plasticity.						
						CH		100	100	98	60		
-75							SILTY SAND (SM), light gray, wet, medium grained, rounded, micaceous.						
					0.25								
						CH		100	100	97	19		
	10						Vibracore refusal at 13.5 feet. 9.5 feet of sample recovery.						
-80				0.2									
				0.5									
				3.7									
	15												
-85													
	20												
-90													
	25												
-95													

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LOCATION (feet): N 1715621 E 6506318	**MUDLINE ELEVATION/DATUM (feet):** -68.8 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 10.7	**PENETRATION (feet):** 12.0
DATE AND TIME STARTED: 11/8/94 @ 14:20	**DATE AND TIME COMPLETED:** 11/8/94 @ 14:25
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** AMY
-	**SAMPLER DIAMETER (inches)-** **ID:** 3.5 **OD:** 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
-70				<0.1			SILTY SAND (SM), dark gray, wet, fine grained.						
							SAND with SILT (SP-SM), light gray, wet, fine to medium grained, rounded, micaceous, little clay, abundant marine shell debris. Discontinuity (?) at base of unit.						
	5						LEAN CLAY (CL), light gray, wet, medium plasticity, some marine shell debris.						
-75							SILTY SAND (SM), gray, wet, fine to medium grained.						
				0.1		CH	SILT (ML), light gray, wet, low to medium plasticity.	100	100	99	91		
	10			0.5									
-80				0.9			Vibracore refusal at 12 feet. 10.7 feet of sample recovery.						
				2.4									
	15												
-85													
	20												
-90													
	25												
-95													

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PLATE
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LOCATION (feet): N 1715152 E 6505756	**MUDLINE ELEVATION/DATUM (feet):** -70.1 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 10.5	**PENETRATION (feet):** 14.5
DATE AND TIME STARTED: 11/9/94 @ 06:55	**DATE AND TIME COMPLETED:** 11/9/94 @ 07:04
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** PF
-	**SAMPLER DIAMETER (inches)-** ID: 3.5 OD: 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				<0.1		CH	SILTY SAND (SM), dark gray, wet, fine grained, micaceous, abundant marine shell debris.	100	100	99	26		
							Increasing fine sand towards base of unit.						
						CH	SAND with SILT (SP-SM), fine grained. Discontinuity at base of unit.		91	85	9		
-75	5						SILT (ML), light gray, wet, medium plasticity.						
					0.18	CH	SANDY SILT (ML), light gray, wet, fine grained, rounded, micaceous.	100	100	98	52		
							SAND (SP), light gray, wet, fine grained sand, micaceous.						
-80	10			0.1		CH	Becoming medium grained sand.	100	100	94	5		
							Vibracore refusal at 14.5 feet. 10.5 feet of sample recovery.						
				0.2									
-85	15			1.9 3.5									
-90	20												
-95	25												

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LOCATION (feet): N 1715253 E 6506951	**MUDLINE ELEVATION/DATUM (feet):** -69.4 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 10.2	**PENETRATION (feet):** 13.5
DATE AND TIME STARTED: 11/9/94 @ 07:55	**DATE AND TIME COMPLETED:** 11/9/94 @ 08:00
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** PF
-	**SAMPLER DIAMETER (inches)-** **ID:** 3.5 **OD:** 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
-70				<0.1		CH	SILTY SAND (SM), dark gray, wet, medium grained.	100	100	97	19		
							SILTY SAND to SANDY SILT (SM/ML), dark gray, wet, low plasticity, fine to medium grained sand, some sea shell/debris. Decreasing marine shell debris at 0.7 feet.						
						CH	Abundant marine shell debris at 1.7 feet/discontinuity at base of unit.	100	100	100	87		
							LEAN CLAY (CL), gray, wet, low to medium plasticity.						
	5				0.15		SILTY SAND (SM), gray, wet, fine to medium grained.						
-75					0.1	CH	SANDY SILT (ML), gray, wet, low plasticity. Little clay, micaceous.	100	100	100	64		
					0.25	CH		100	100	100	81		
	10			0.2			Vibracore refusal at 13.5 feet. 10.2 feet of sample recoverty.						
-80													
				0.3									
				2.8									
	15												
-85													
	20												
-90													
	25												
-95													

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LOCATION (feet): N 1714514 E 6506407	**MUDLINE ELEVATION/DATUM (feet):** -71.4 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 12.0	**PENETRATION (feet):** 13.5
DATE AND TIME STARTED: 11/8/94 @ 13:45	**DATE AND TIME COMPLETED:** 11/8/94 @ 13:53
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** AMY
-	**SAMPLER DIAMETER (inches)-** ID: 3.5 OD: 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				<0.1		CH	SILT (ML), gray, wet, low to medium plasticity	100	100	99	92		
							Discontinuity (?) at base of unit.						
-75						CH	SILTY SAND (SM), gray, wet, fine to medium grained, little clay.	100	100	100	50		
	5												
						CH		100	100	99	38		
							SILT (ML), gray, wet, low plasticity.						
-80													
							SANDY SILT to SILTY SAND (ML/SM), light gray, wet, low plasticity, fine to medium grained sand.						
	10												
							Becoming silty sand, gray, fine grained, rounded.						
							Vibracore terminated at 13.5 feet. 12.0 feet of sample recovery.						
-85				0.1 1.6									
	15												
-90													
	20												
-95													
	25												
-100													

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LOCATION (feet): N 1713674 E 6506059	**MUDLINE ELEVATION/DATUM (feet):** -72.6 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 12.0	**PENETRATION (feet):** 13.5
DATE AND TIME STARTED: 11/8/94 @ 11:45	**DATE AND TIME COMPLETED:** 11/8/94 @ 11:52
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** AMY
-	**SAMPLER DIAMETER (inches)-** **ID:** 3.5 **OD:** 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				<0.1		CH	SILTY SAND (SM), gray, wet, fine to medium grained with marine shell debris.	100	100	96	22		
-75							Discontinuity at base of unit.						
					0.1	CH	LEAN CLAY (CL), dark gray, wet, soft to medium stiff, low to medium plasticity.	100	100	99	94		
	5						ELASTIC SILT (MH), gray to light gray, wet, medium to high plasticity, marine shell debris.						
						CH	Low to medium plasticity.	100	100	100	98		
-80					0.15								
							SANDY SILT to SILT (ML), gray, wet, low plasticity.						
	10						Increasing sand, dark gray, fine to medium grained.						
				0.1			Decreasing fine grained sand						
-85				0.2			Vibracore refusal at 13.5 feet.						
				0.3			12.0 feet of sample recovery.						
				2.5									
	15												
-90													
	20												
-95													
	25												
-100													

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PLATE
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LOCATION (feet): N 1713753 E 6506925	**MUDLINE ELEVATION/DATUM (feet):** -73.3 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 9.5	**PENETRATION (feet):** 12.0
DATE AND TIME STARTED: 11/8/94 @ 11:25	**DATE AND TIME COMPLETED:** 11/8/94 @ 11:30
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** AMY
-	**SAMPLER DIAMETER (inches)-** **ID:** 3.5 **OD:** 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				<0.1		CH	SILTY SAND (SM), dark gray, wet, medium grained, some marine shell debris.		99	97	21		
-75							Discontinuity (?) at base of unit.						
						CH	SANDY SILT (ML), gray, wet, low plasticity.		99	97	57		
	5												
-80						CH		100	100	98	57		
				0.1			SAND (SP), light gray, wet, fine grained.						
							Becoming medium grained sand.						
	10			0.5			Vibracore refusal at 12 feet. 9.5 feet of sample recovery.						
-85				1.0									
				2.5									
	15												
-90													
	20												
-95													
	25												
-100													

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LOCATION (feet): N 1712678 E 6506165	**MUDLINE ELEVATION/DATUM (feet):** -75.4 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 8.6	**PENETRATION (feet):** 12.0
DATE AND TIME STARTED: 11/8/94 @ 10:25	**DATE AND TIME COMPLETED:** 11/8/94 @ 10:29
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** AMY
-	**SAMPLER DIAMETER (inches)-** **ID:** 3.5 **OD:** 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				<0.1		CH	SAND with SILT (SP-SM), dark gray, wet, fine to medium grained, rounded, micaceous, with marine shell debris.	100	100	99	10		
					1.5	CH	Discontinuity at base of unit. ELASTIC SILT (MH), ligth gray, wet, medium stiff to stiff, medium to high plasticity.	100	99	99	98		
-80	5				2.0								
					1.5		SAND (SP), gray, wet, fine to medium grained, rounded.						
				0.1									
-85	10			0.4			Vibracore refusal at 12 feet. 8.6 feet of sample recovery.						
				1									
				1.2									
				2									
-90	15												
-95	20												
-100	25												

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LOCATION (feet): N 1712745 E 6506962	**MUDLINE ELEVATION/DATUM (feet):** -74.9 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 7.3	**PENETRATION (feet):** 8.0
DATE AND TIME STARTED: 11/8/94 @ 11:00	**DATE AND TIME COMPLETED:** 11/8/94 @ 11:03
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** AMY
-	**SAMPLER DIAMETER (inches)-** **ID:** 3.5 **OD:** 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				<0.1		CH	SILTY SAND (SM), dark gray, wet, fine grained. Decreasing silt, marine shell debris.	100	100	97	14		
						CH	SAND (SP), light gray, wet, fine to medium grained, rounded.	100	100	95	4		
-80	5			0.1									
				0.2			Void from 9.5 to 10.4 feet						
				0.8			SAND (SP), light gray, wet, fine to medium grained, rounded. Micaceous.						
				1.2			Vibracore terminated at 8 feet. 7.3 feet of sample recovery.						
-85	10												
-90	15												
-95	20												
-100	25												

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LOCATION (feet): N 1711665 E 6506049	**MUDLINE ELEVATION/DATUM (feet):** -75.7 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 9.2	**PENETRATION (feet):** 11.0
DATE AND TIME STARTED: 11/8/94 @ 09:24	**DATE AND TIME COMPLETED:** 11/8/94 @ 09:28
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** AMY
	SAMPLER DIAMETER (inches)- ID: 3.5 OD: 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				<0.1		CH	SAND with SILT (SP-SM), gray, wet, medium grained with marine shell debris.	100	100	95	10		
							Discontinuity at base of unit.						
					0.64		ELASTIC SILT (MH), ligth gray, wet, medium to high plasticity.						
-80													
	5						SAND (SP), gray, wet, medium grained.						
							SANDY SILT (ML), light gray, wet, low plasticity.						
							SAND (SP), gray, wet, medium to coarse grained.						
				0.1			Becoming fine to medium grained sand.						
-85													
	10			0.5			Vibracore terminated at 11 feet. 9.2 feet of sample recovery.						
				1.0									
-90													
	15												
-95													
	20												
-100													
	25												
-105													

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DIAZ•YOURMAN & ASSOCIATES	San Pedro Bay, California	

EQUIPMENT: Alpine/BBN	SAMPLING METHOD: Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 6.2	PENETRATION (feet): 8.0
DATE AND TIME STARTED: 11/8/94 @ 09:50	DATE AND TIME COMPLETED: 11/8/94 @ 09:53
OPERATOR : Sea Surveyor	LOGGED BY: JGS CHECKED BY: AMY
-	SAMPLER DIAMETER (inches)- ID: 3.5 OD: 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				<0.1		CH	SILTY SAND (SM), light gray, wet, medium to coarse grained.	100	100	94	17		
							Some marine shell debris at 3.8 feet.						
-80						CH	Becoming fine to medium grained sand.	100	100	100	17		
	5			0.1									
							Vibracore terminated at 8 feet. 6.2 feet of sample recovery.						
				0.8									
-85				1.2									
	10												
-90													
	15												
-95													
	20												
-100													
	25												
-105													

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DIAZ•YOURMAN & ASSOCIATES

LOCATION (feet): N 1710187 E 6506374	**MUDLINE ELEVATION/DATUM (feet):** -77.9 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 7.3	**PENETRATION (feet):** 10.0
DATE AND TIME STARTED: 11/8/94 @ 08:20	**DATE AND TIME COMPLETED:** 11/8/94 @ 08:25
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** AMY
-	**SAMPLER DIAMETER (inches)-** **ID:** 3.5 **OD:** 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				<0.1		CH	SAND with SILT (SP-SM), gray, wet, fine grained.		99	96	8		
-80							Some marine shell debris at 3.3 feet.						
	5						Discontinuity at base of unit.						
							ELASTIC SILT (MH), gray, wet, high plasticity.						
-85							Vibracore terminated at 10 feet. 7.3 feet of sample recovery.						
				0.1									
	10			0.4									
-90													
	15												
-95													
	20												
-100													
	25												
-105													

NO.: 143-01 APPR.: HR BY: JGS DATE: 12/94	**LOG OF VIBRACORE VC-44** Page 1 of 1 Queens Gate Dredging San Pedro Bay, California	PLATE **B45**

DIAZ • YOURMAN & ASSOCIATES

LOCATION (feet): N 1710255 E 6507191	**MUDLINE ELEVATION/DATUM (feet):** -77.5 MLLW
EQUIPMENT: Alpine/BBN	**SAMPLING METHOD:** Vibratory Coring
RECOVERED SAMPLE LENGTH (feet): 7.2	**PENETRATION (feet):** 10.2
DATE AND TIME STARTED: 11/8/94 @ 08:02	**DATE AND TIME COMPLETED:** 11/8/94 @ 08:07
OPERATOR : Sea Surveyor	**LOGGED BY:** JGS **CHECKED BY:** AMY
-	**SAMPLER DIAMETER (inches)-** **ID:** 3.5 **OD:** 4.0

Elevation-MLLW (feet)	Depth (feet)	Sampler	Symbol	Penetration (minutes/foot)	Shear Strength (tsf)	Tests	DESCRIPTION	Percent Passing # 4	Percent Passing # 16	Percent Passing # 40	Percent Passing # 200	Liquid Limit	Plasticity Index
				<0.1		CH	SAND with SILT (SP-SM), gray, wet, fine to medium grained.	100	100	97	12		
-80							Slightly coarser sand with marine shell debris at 1.7 feet. Decreasing shell debris.						
	5												
-85							Vibracore terminated at 10.2 feet. 7.2 feet of sample recovery.						
				0.1									
	10			0.3 0.7									
-90													
	15												
-95													
	20												
-100													
	25												
-105													

NO.: 143-01 APPR.: HR
BY: JGS DATE: 12/94

DIAZ • YOURMAN & ASSOCIATES

LOG OF VIBRACORE VC-45

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Queens Gate Dredging
San Pedro Bay, California

PLATE
B46

APPENDIX C

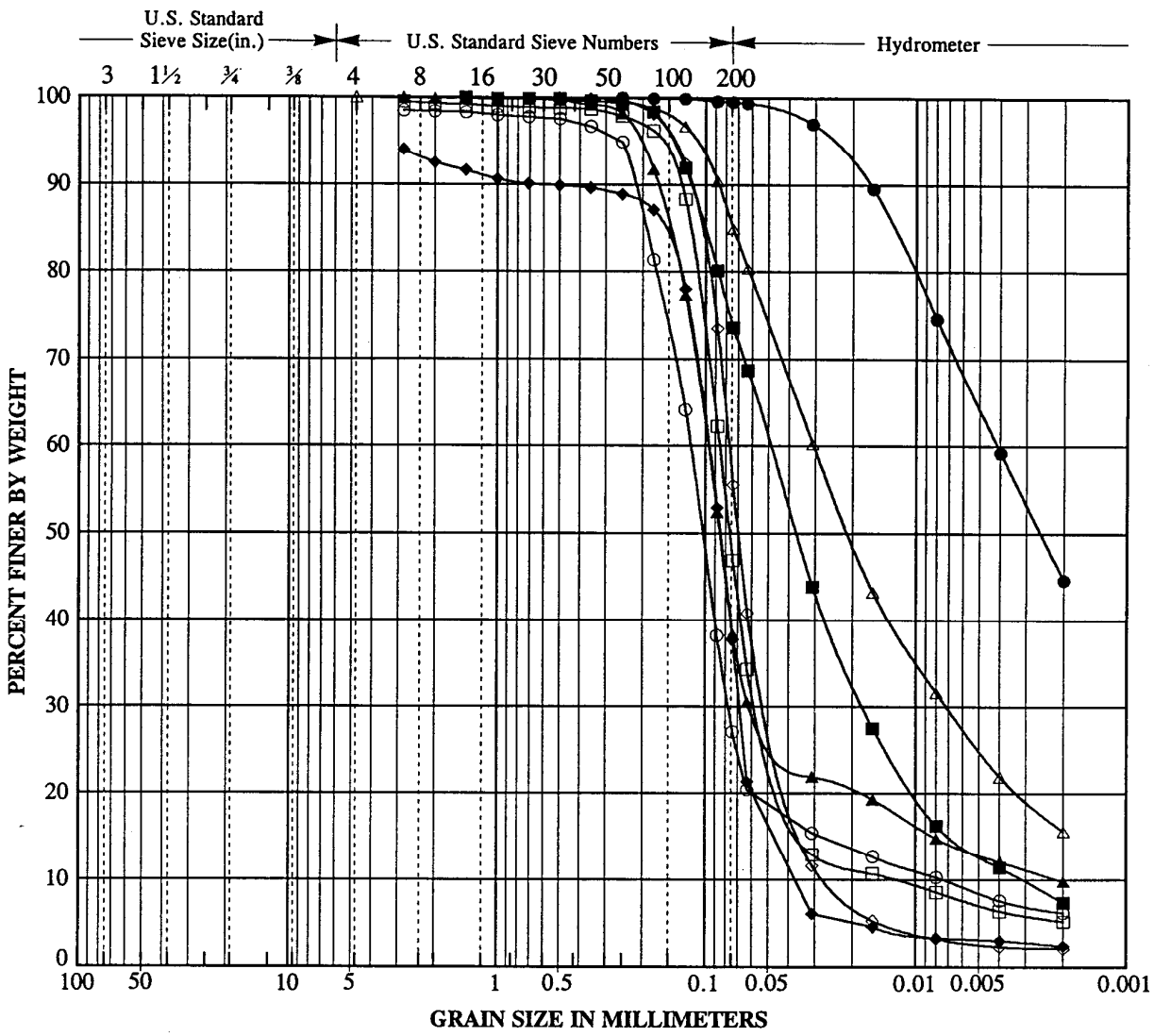
PLOTS OF PARTICLE SIZE ANALYSES

APPENDIX C

GEOTECHNICAL LABORATORY TEST RESULTS

The tests were performed in accordance with EPA/CE-81-1 technical report (see reference list). A summary of the results of particle size analyses is presented in Tables C1 and C2 for vibracore and surface samples, respectively. Summaries of the particle size analyses are presented on the vibracore logs.

Template: ...1; Prj ID: 14301



COBBLES	Coarse	Fine	Coarse	Medium	Fine	SILT or CLAY
	GRAVEL		SAND			

Laboratory Testing by: MEC Analytical Services, Inc.

Symbol	Source	Depth (feet)	Classification	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	VC- 1	0.0	Silty Sand (SM)			28
□	VC- 1	3.0	Silty Sand (SM)			48
△	VC- 1	6.0	Silt with Sand (ML)			85
◇	VC- 1	9.0	Fat Clay (CH)			57
●	VC- 1	12.0	Fat Clay (CH)			100
■	VC- 1	15.0	Silt with Sand (ML)			74
▲	VC- 2	0.0	Silty Sand (SM)			39
◆	VC- 2	3.0	Silty Sand (SM)			39

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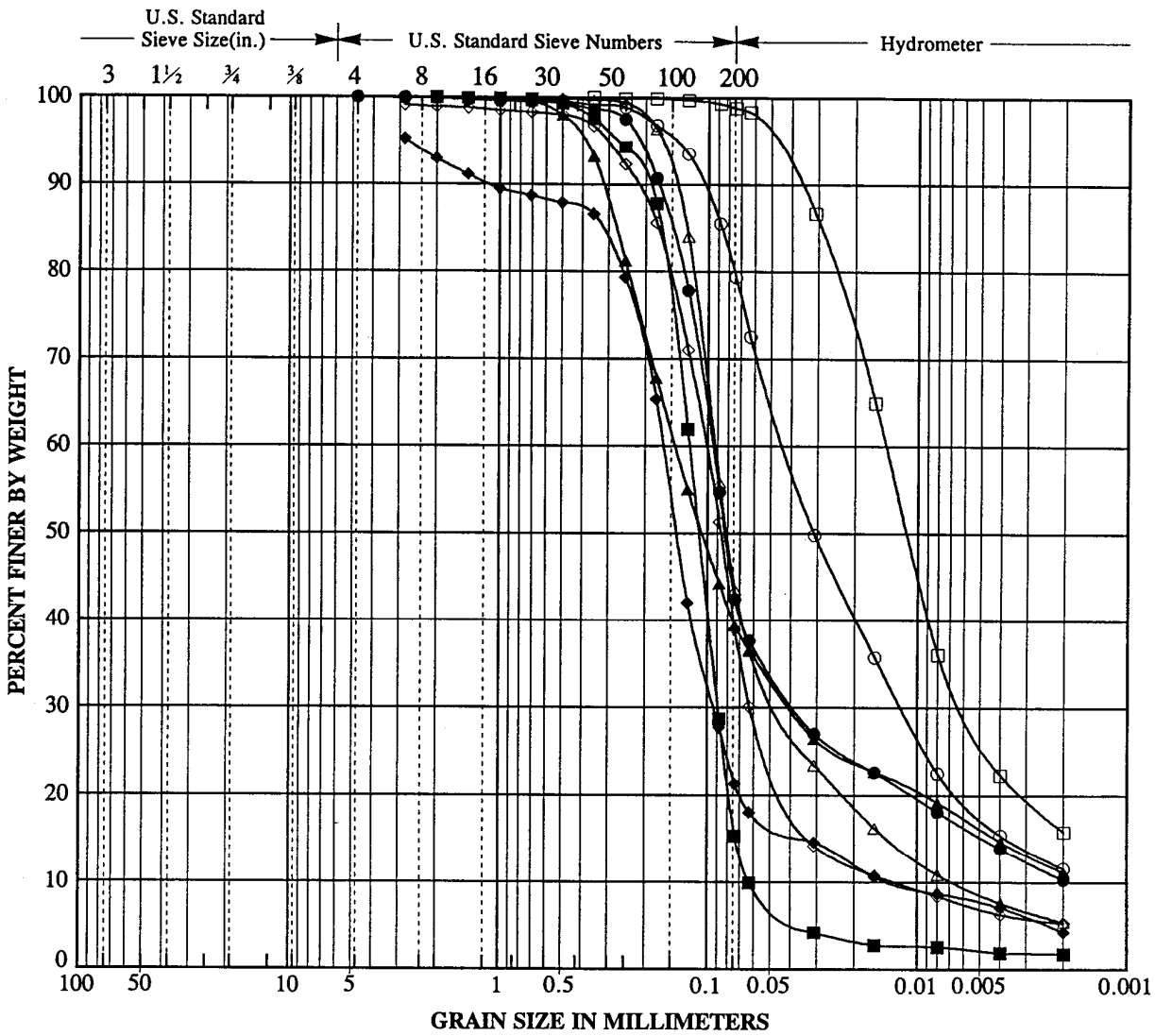
DIAZ • YOURMAN & ASSOCIATES

PARTICLE SIZE ANALYSIS

Queens Gate Dredging
San Pedro Bay, California

PLATE C1

Template: ; Prj ID: 14301



COBBLES	Coarse	Fine	Coarse	Medium	Fine	SILT or CLAY
	GRAVEL		SAND			

Laboratory Testing by: MEC Analytical Services, Inc.

Symbol	Source	Depth (feet)	Classification	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	VC- 2	6.0	Silt with Sand (ML)			80
□	VC- 2	9.0	Silt (ML)			99
△	VC- 2	12.0	Silty Sand (SM)			44
◇	VC- 3	0.0	Silty Sand (SM)			40
●	VC- 4	0.0	Silty Sand (SM)			43
■	VC- 5	0.0	Silty Sand (SM)			16
▲	VC- 5	3.0	Silty Sand (SM)			40
◆	VC- 6	0.0	Silty Sand (SM)			22

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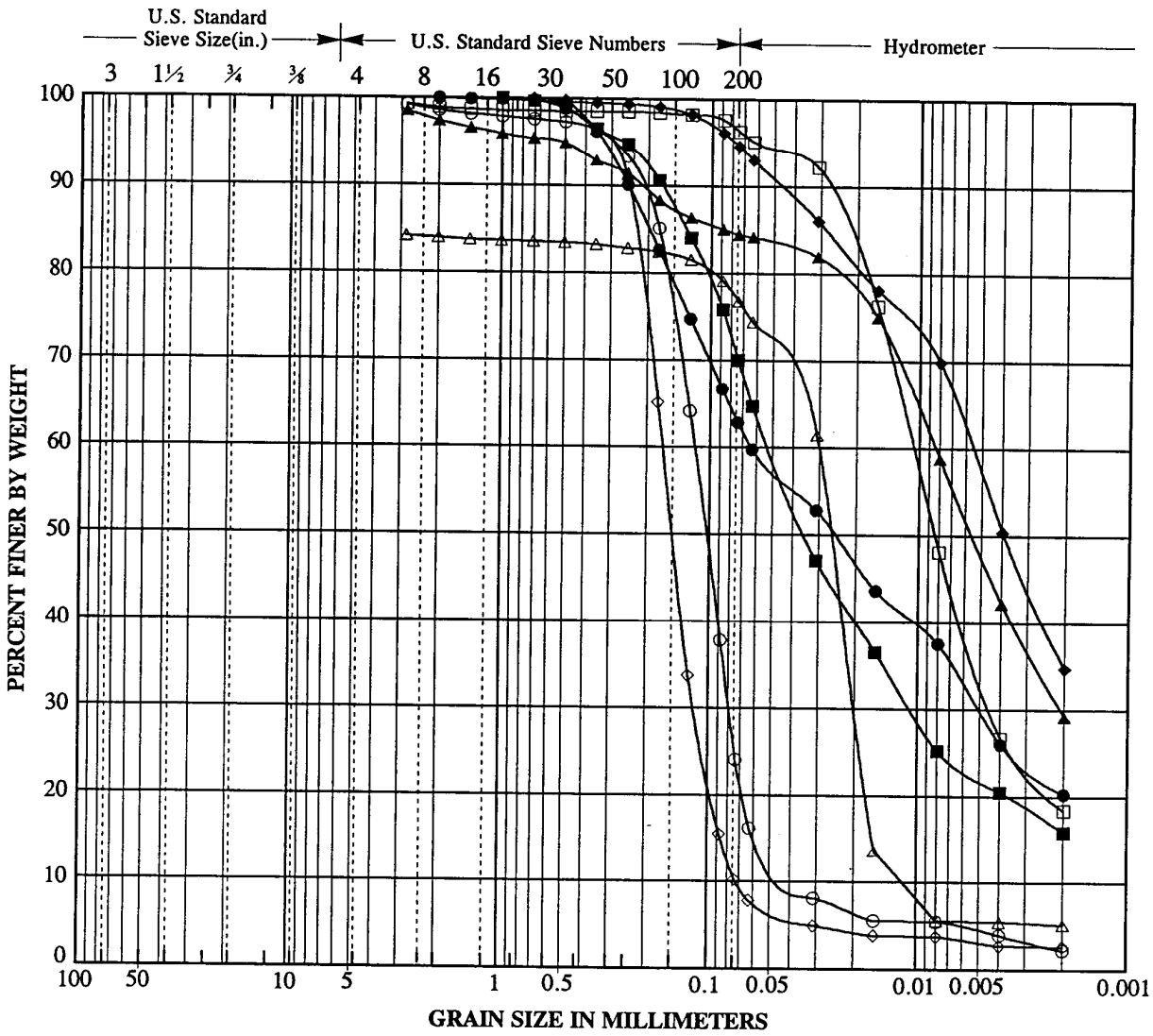
DIAZ • YOURMAN & ASSOCIATES

PARTICLE SIZE ANALYSIS

Queens Gate Dredging
San Pedro Bay, California

PLATE C2



COBBLES	Coarse	Fine	Coarse	Medium	Fine	SILT or CLAY
	GRAVEL		SAND			

Laboratory Testing by: MEC Analytical Services, Inc.

Symbol	Source	Depth (feet)	Classification	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	VC- 6	3.0	Silty Sand (SM)			25
□	VC- 7	0.0	Elastic Silt (MH)			96
△	VC- 7	3.0	Silt with Sand (ML)			77
◇	VC- 7	6.0	Sand with Silt (SP-SM)			11
●	VC- 7	9.0	Sandy Silt (ML)			63
■	VC- 7	12.0	Silt with Sand (ML)			70
▲	VC- 8	0.0	Fat Clay with Sand (CH)			84
◆	VC- 8	3.0	Silty Clay (CH/MH)			95

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DIAZ • YOURMAN & ASSOCIATES

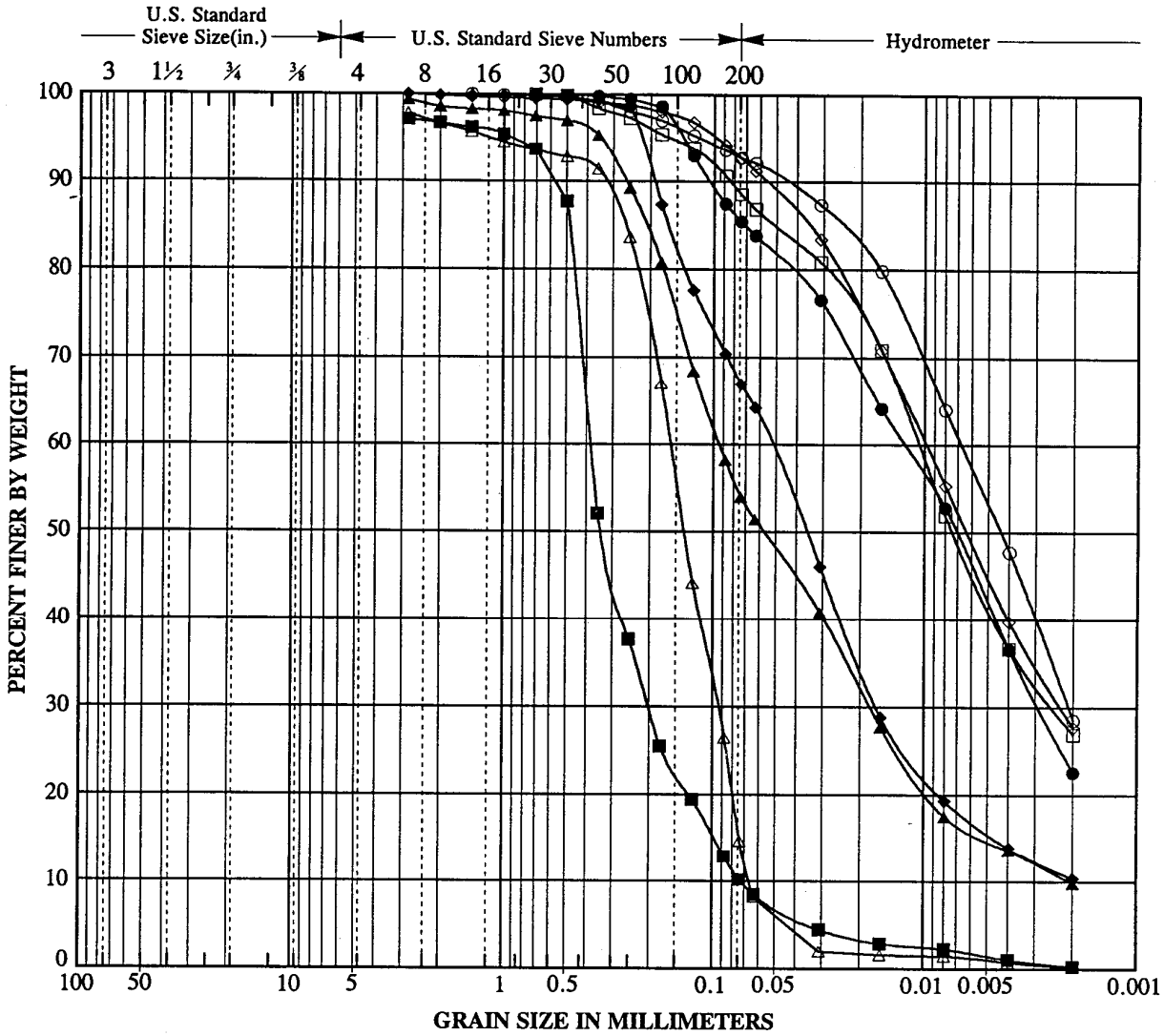
PARTICLE SIZE ANALYSIS

Queens Gate Dredging
San Pedro Bay, California

PLATE C3

Template: ; Prj ID: 14301

Template: 1: Prj ID: 14301



COBBLES	Coarse	Fine	Coarse	Medium	Fine	SILT or CLAY
	GRAVEL		SAND			

Laboratory Testing by: MEC Analytical Services, Inc.

Symbol	Source	Depth (feet)	Classification	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	VC- 8	6.0	Lean Clay (CL)			93
□	VC- 8	9.0	Elastic Silt (MH)			89
△	VC- 9	0.0	Silty Sand (SM)			16
◇	VC- 9	3.0	Fat Clay (CH)			93
●	VC- 9	6.0	Silt (ML)			86
■	VC- 9	9.0	Sand with Silt (SP-SM)			10
▲	VC-10	0.0	Sandy Silt (ML)			54
◆	VC-10	3.0	Sandy Silt (ML)			67

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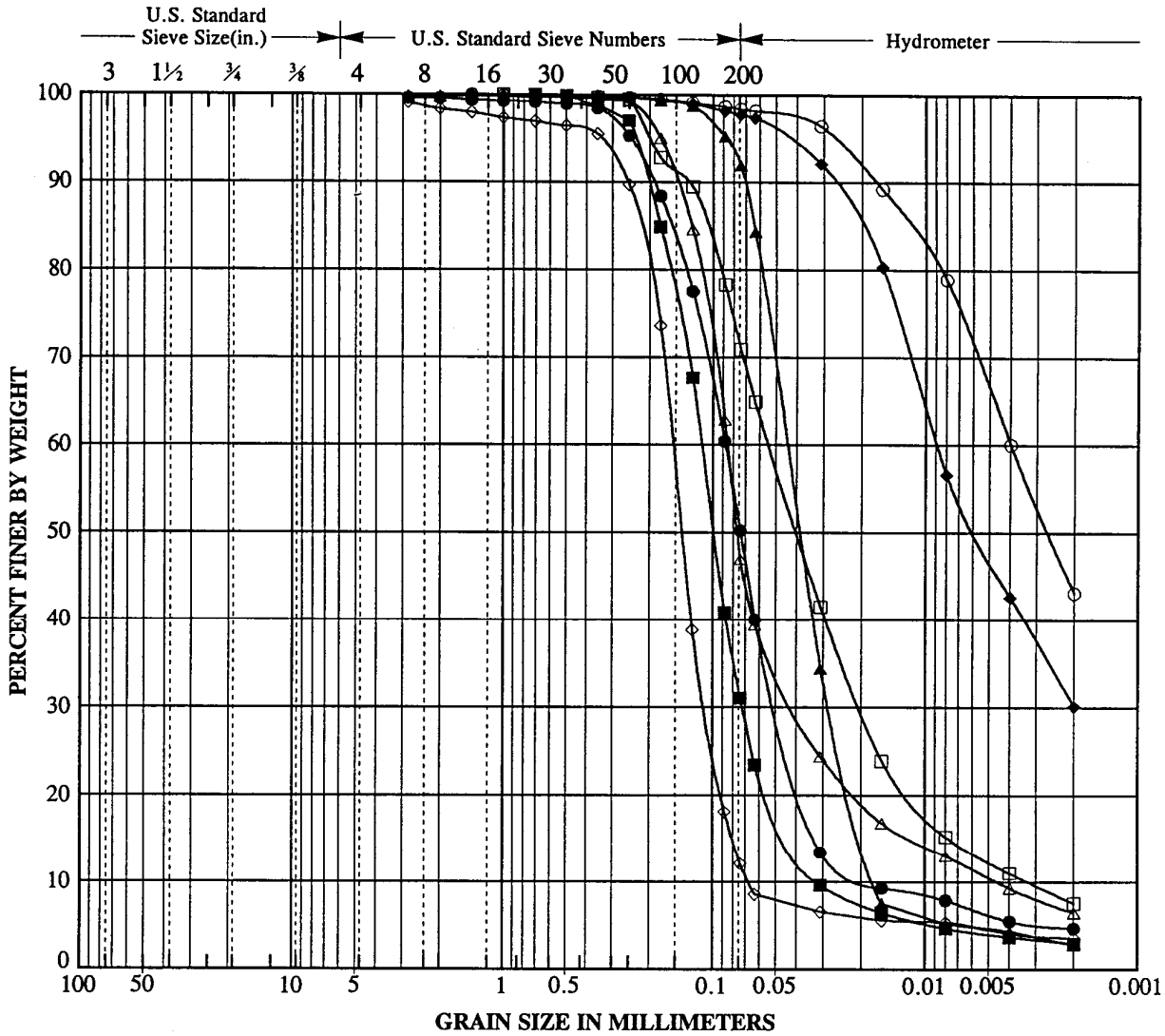
DIAZ • YOURMAN & ASSOCIATES

PARTICLE SIZE ANALYSIS

Queens Gate Dredging
San Pedro Bay, California

PLATE C4

Template: 1; Prj ID: 14301



COBBLES	Coarse	Fine	Coarse	Medium	Fine	SILT or CLAY
	GRAVEL		SAND			

Laboratory Testing by: MEC Analytical Services, Inc.

Symbol	Source	Depth (feet)	Classification	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	VC-10	6.0	Lean Clay (CL)			98
□	VC-10	9.0	Silt with Sand (ML)			71
△	VC-10	12.0	Silty Sand (SM)			48
◇	VC-11	0.0	Silty Sand (SM)			13
●	VC-11	3.0	Sandy Silt to Silty Sand (ML/SM)			51
■	VC-11	6.0	Silty Sand (SM)			32
▲	VC-11	9.0	Silt (ML)			92
◆	VC-11	12.0	Elastic Silt (MH)			98

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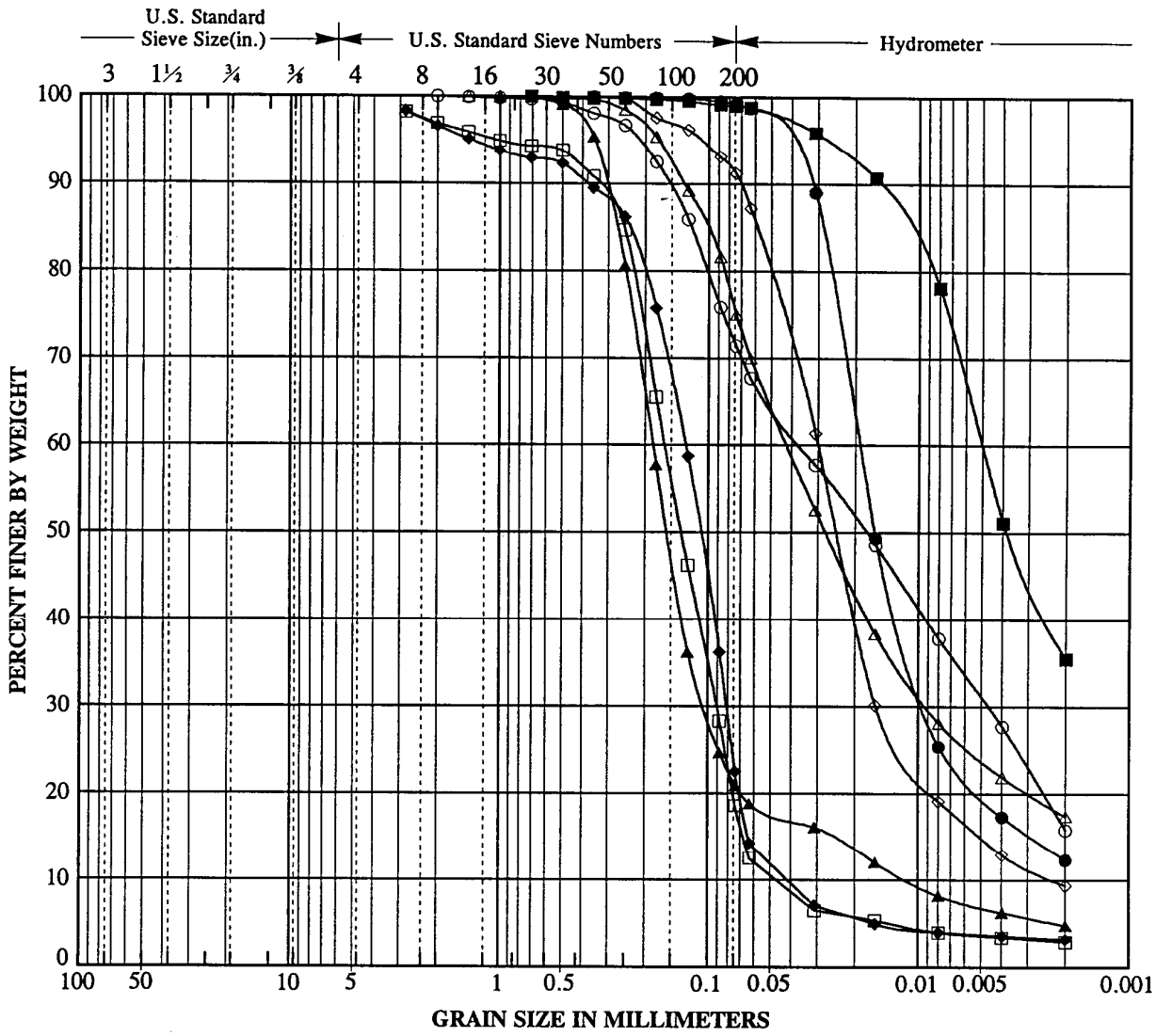
DIAZ • YOURMAN & ASSOCIATES

PARTICLE SIZE ANALYSIS

Queens Gate Dredging
San Pedro Bay, California

PLATE C5

Template: E1; Prj ID: 14301



COBBLES	Coarse	Fine	Coarse	Medium	Fine	SILT or CLAY
	GRAVEL		SAND			

Laboratory Testing by: MEC Analytical Services, Inc.

Symbol	Source	Depth (feet)	Classification	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	VC-11	15.0	Silt with Sand (ML)			72
□	VC-12	0.0	Silty Sand (SM)			19
△	VC-12	3.0	Silt with Sand (ML)			76
◇	VC-12	6.0	Silt (ML)			91
●	VC-12	9.0	Elastic Silt (MH)			99
■	VC-12	12.0	Elastic Silt (MH)			99
▲	VC-12	15.0	Silty Sand (SM)			21
◆	VC-13	0.0	Silty Sand (SM)			24

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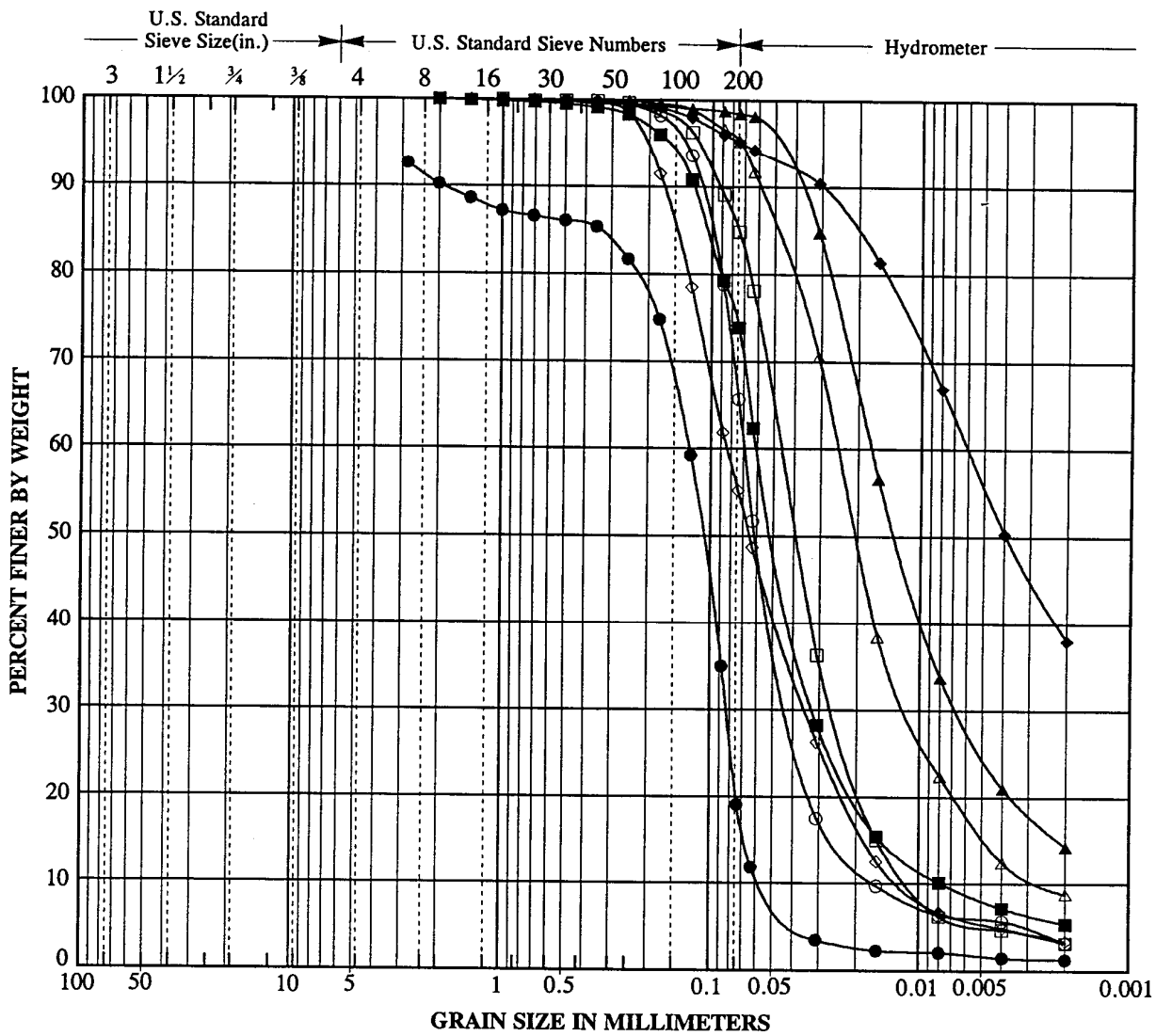
DIAZ • YOURMAN & ASSOCIATES

PARTICLE SIZE ANALYSIS

Queens Gate Dredging
San Pedro Bay, California

PLATE C6



COBBLES	Coarse	Fine	Coarse	Medium	Fine	SILT or CLAY
	GRAVEL		SAND			

Laboratory Testing by: MEC Analytical Services, Inc.

Symbol	Source	Depth (feet)	Classification	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	VC-13	3.0	Sandy Silt (ML)			67
□	VC-13	6.0	Silt with Sand (ML)			85
△	VC-13	9.0	Elastic Silt (MH)			95
◇	VC-13	12.0	Sandy Silt (ML)			56
●	VC-14	0.0	Silty Sand (SM)			20
■	VC-14	3.0	Silt with Sand (ML)			74
▲	VC-14	6.0	Elastic Silt (MH)			98
◆	VC-14	9.0	Lean Clay (CL)			95

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DIAZ • YOURMAN & ASSOCIATES

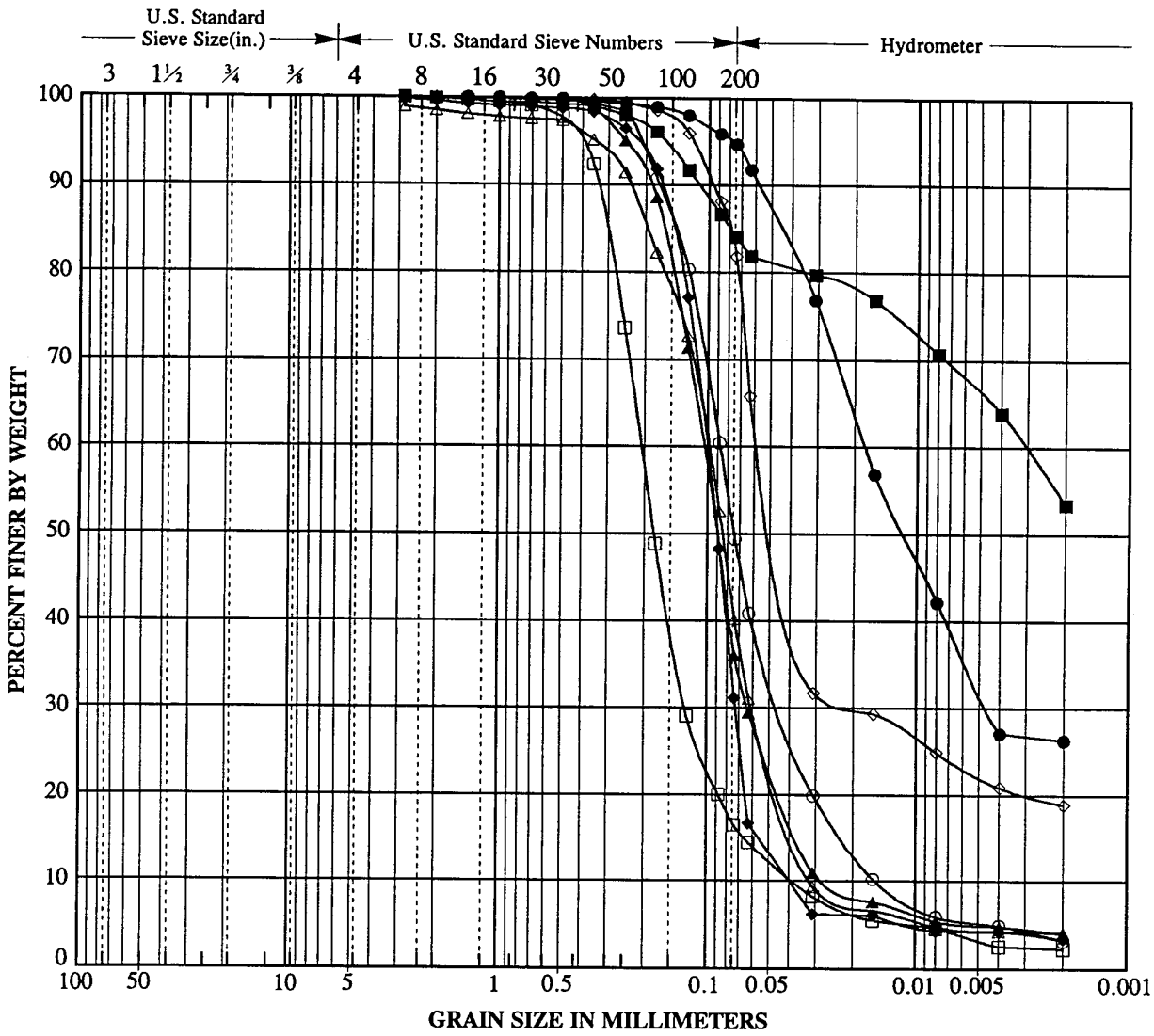
PARTICLE SIZE ANALYSIS

Queens Gate Dredging
San Pedro Bay, California

PLATE C7

Template: ...1; Prj ID: 14301

Template: ...1; Prj ID: 14301



COBBLES	Coarse	Fine	Coarse	Medium	Fine	SILT or CLAY
	GRAVEL		SAND			

Laboratory Testing by: MEC Analytical Services, Inc.

Symbol	Source	Depth (feet)	Classification	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	VC-14	12.0	Sandy Silt (ML)			50
□	VC-14	15.0	Silty Sand (SM)			17
△	VC-15	3.0	Silty Sand (SM)			41
◇	VC-15	6.0	Silt with Sand (ML)			82
●	VC-15	9.0	Elastic Silt (MH)			95
■	VC-15	12.0	Lean Clay with Sand (CL)			84
▲	VC-15	14.0	Silty Sand (SM)			37
◆	VC-16	0.0	Silty Sand (SM)			32

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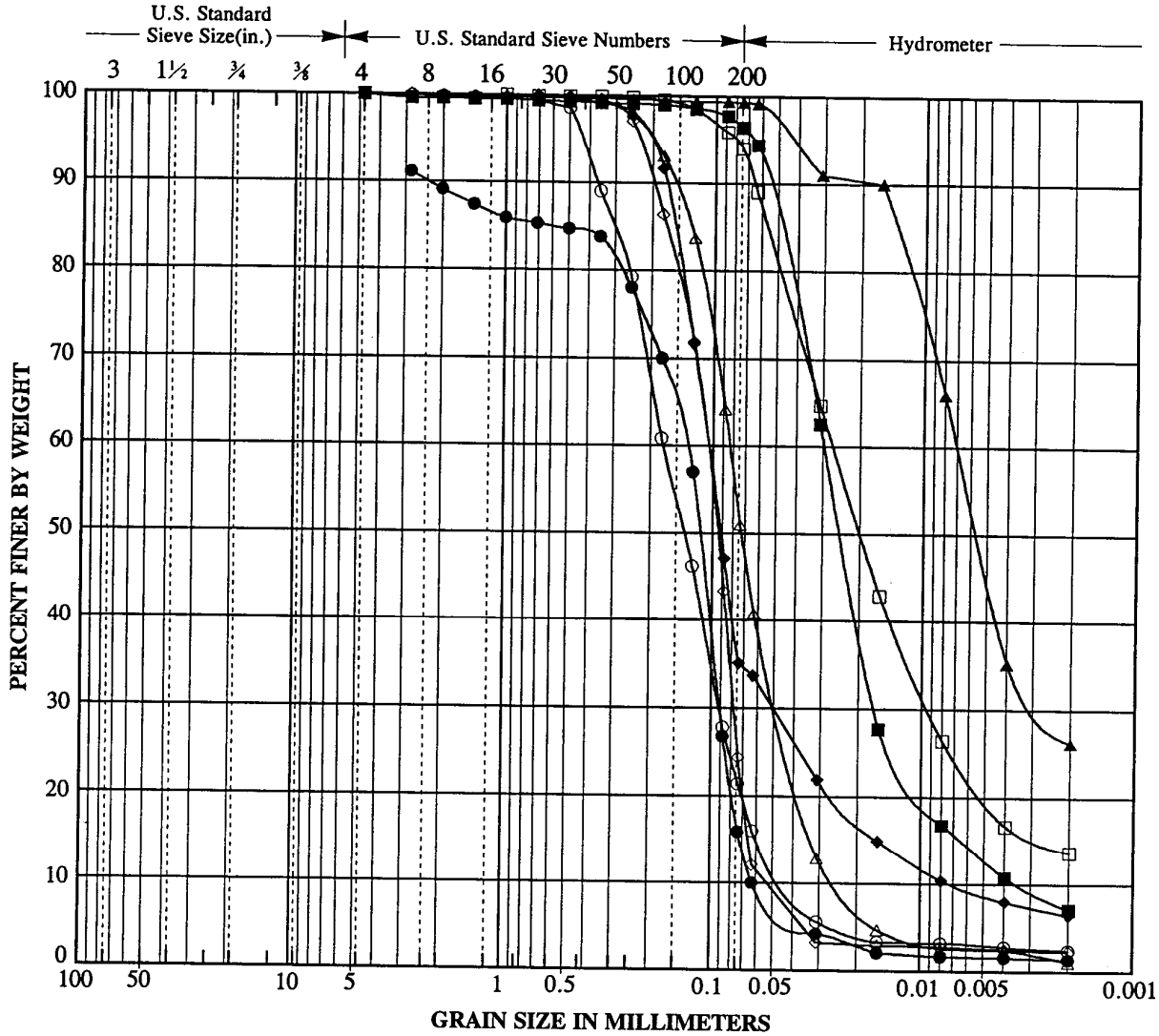
PARTICLE SIZE ANALYSIS

Queens Gate Dredging
San Pedro Bay, California

PLATE C8

Template: 1: Prj ID: 14301



COBBLES	Coarse	Fine	Coarse	Medium	Fine	SILT or CLAY
	GRAVEL		SAND			

Laboratory Testing by: MEC Analytical Services, Inc.

Symbol	Source	Depth (feet)	Classification	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	VC-16	3.0	Silty Sand (SM)			22
□	VC-16	6.0	Silt (ML)			94
△	VC-16	9.0	Sandy Silt (ML)			52
◇	VC-17	0.0	Silty Sand (SM)			26
●	VC-17	3.0	Silty Sand (SM)			17
■	VC-17	6.0	Elastic Silt (MH)			97
▲	VC-17	9.0	Elastic Silt (MH)			99
◆	VC-17	12.0	Silty Sand (SM)			36

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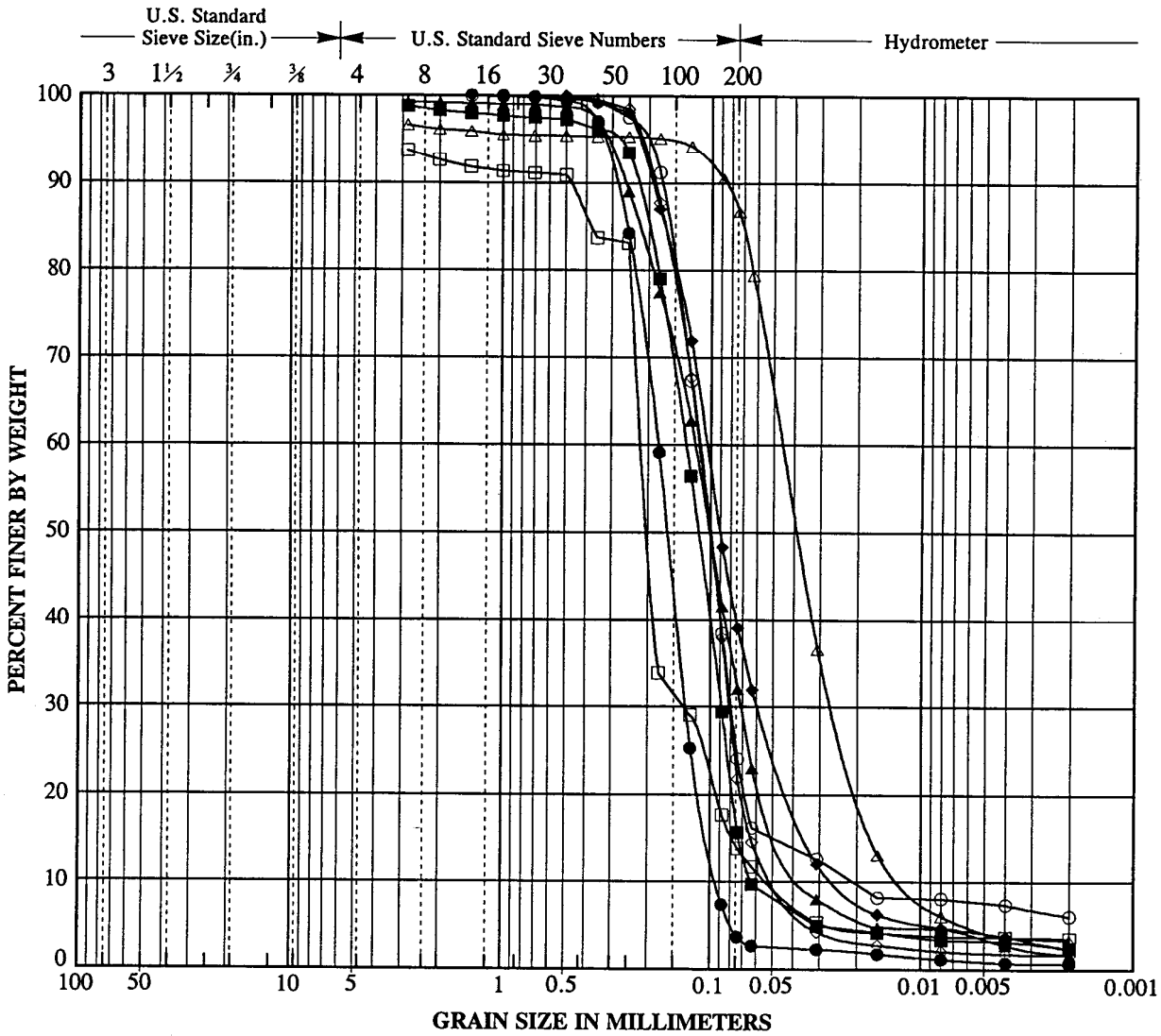
DIAZ • YOURMAN & ASSOCIATES

PARTICLE SIZE ANALYSIS

Queens Gate Dredging
San Pedro Bay, California

PLATE C9

Template: 1; Prj ID: 14301



COBBLES	Coarse	Fine	Coarse	Medium	Fine	SILT or CLAY
	GRAVEL		SAND			

Laboratory Testing by: MEC Analytical Services, Inc.

Symbol	Source	Depth (feet)	Classification	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	VC-18	0.0	Silty Sand (SM)			25
□	VC-18	3.0	Silty Sand (SM)			14
△	VC-18	6.0	Silt (ML)			87
◇	VC-18	9.0	Silty Sand (SM)			23
●	VC-18	12.0	Sand (SP)			4
■	VC-19	0.0	Silty Sand (SM)			17
▲	VC-19	3.0	Silty Sand (SM)			33
◆	VC-19	6.0	Silty Sand (SM)			40

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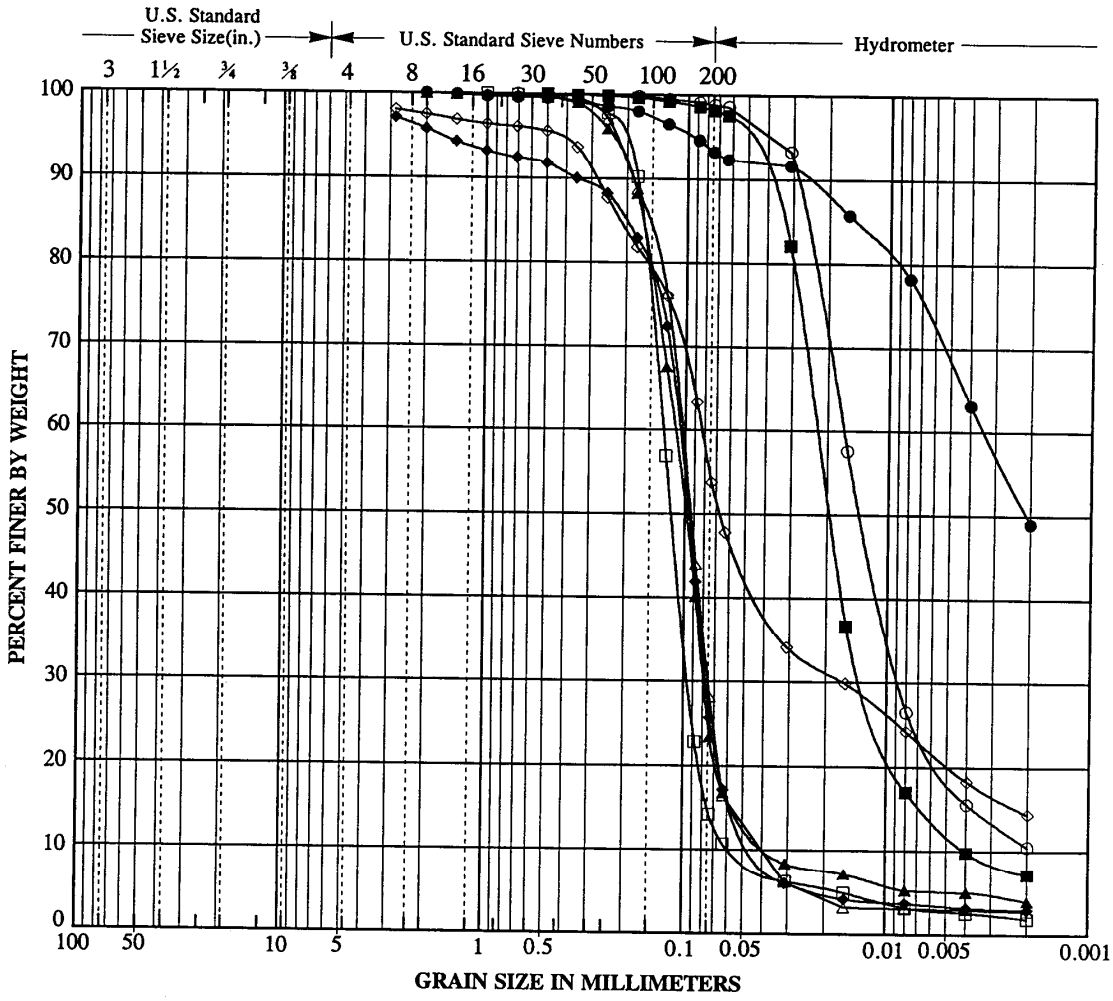
DIAZ • YOURMAN & ASSOCIATES

PARTICLE SIZE ANALYSIS

Queens Gate Dredging
San Pedro Bay, California

PLATE C10



COBBLES	Coarse	Fine	Coarse	Medium	Fine	SILT or CLAY
	GRAVEL		SAND			

Laboratory Testing by: MEC Analytical Services, Inc.

Symbol	Source	Depth (feet)	Classification	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	VC-19	9.0	Silt (ML)			99
□	VC-19	12.0	Silty Sand (SM)			15
△	VC-20	0.0	Silty Sand (SM)			29
◇	VC-20	3.0	Sandy Silt (ML)			55
●	VC-20	6.0	Elastic Silt (MH)			93
■	VC-20	9.0	Elastic Silt (MH)			98
▲	VC-21	0.0	Silty Sand (SM)			25
◆	VC-21	3.0	Silty Sand (SM)			27

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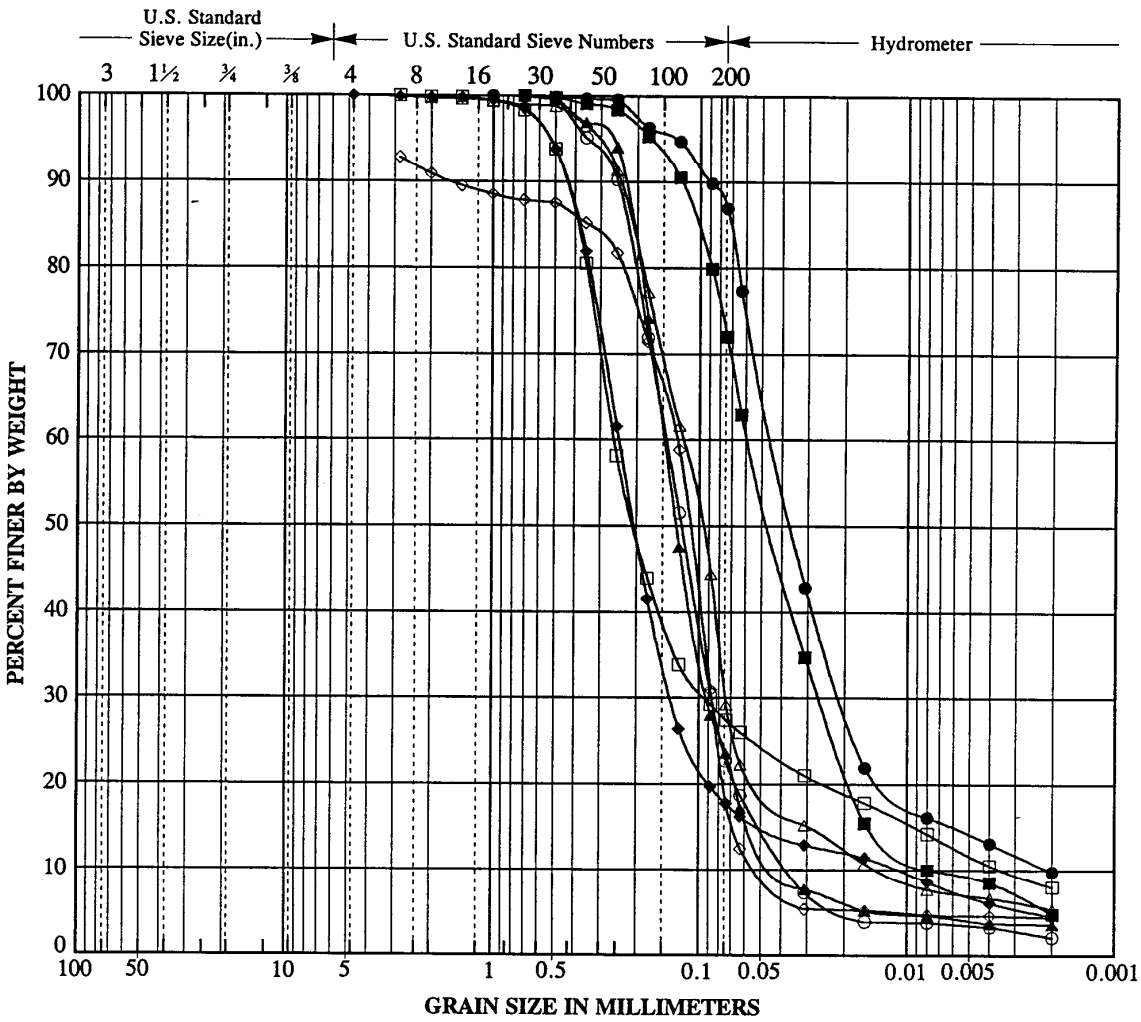
DIAZ • YOURMAN & ASSOCIATES

PARTICLE SIZE ANALYSIS

Queens Gate Dredging
San Pedro Bay, California

PLATE C11

Template: 21; Prj ID: 14301



COBBLES	Coarse	Fine	Coarse	Medium	Fine	SILT or CLAY
	GRAVEL		SAND			

Laboratory Testing by: MEC Analytical Services, Inc.

Symbol	Source	Depth (feet)	Classification	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	VC-21	6.0	Silty Sand (SM)			23
□	VC-21	9.0	Silty Sand (SM)			28
△	VC-22	0.0	Silty Sand (SM)			30
◇	VC-22	3.0	Silty Sand (SM)			19
●	VC-22	6.0	Silt (ML)			87
■	VC-22	9.0	Silt with Sand (ML)			73
▲	VC-22	12.0	Silty Sand (SM)			24
◆	VC-22	15.0	Silty Sand (SM)			18

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DIAZ • YOURMAN & ASSOCIATES

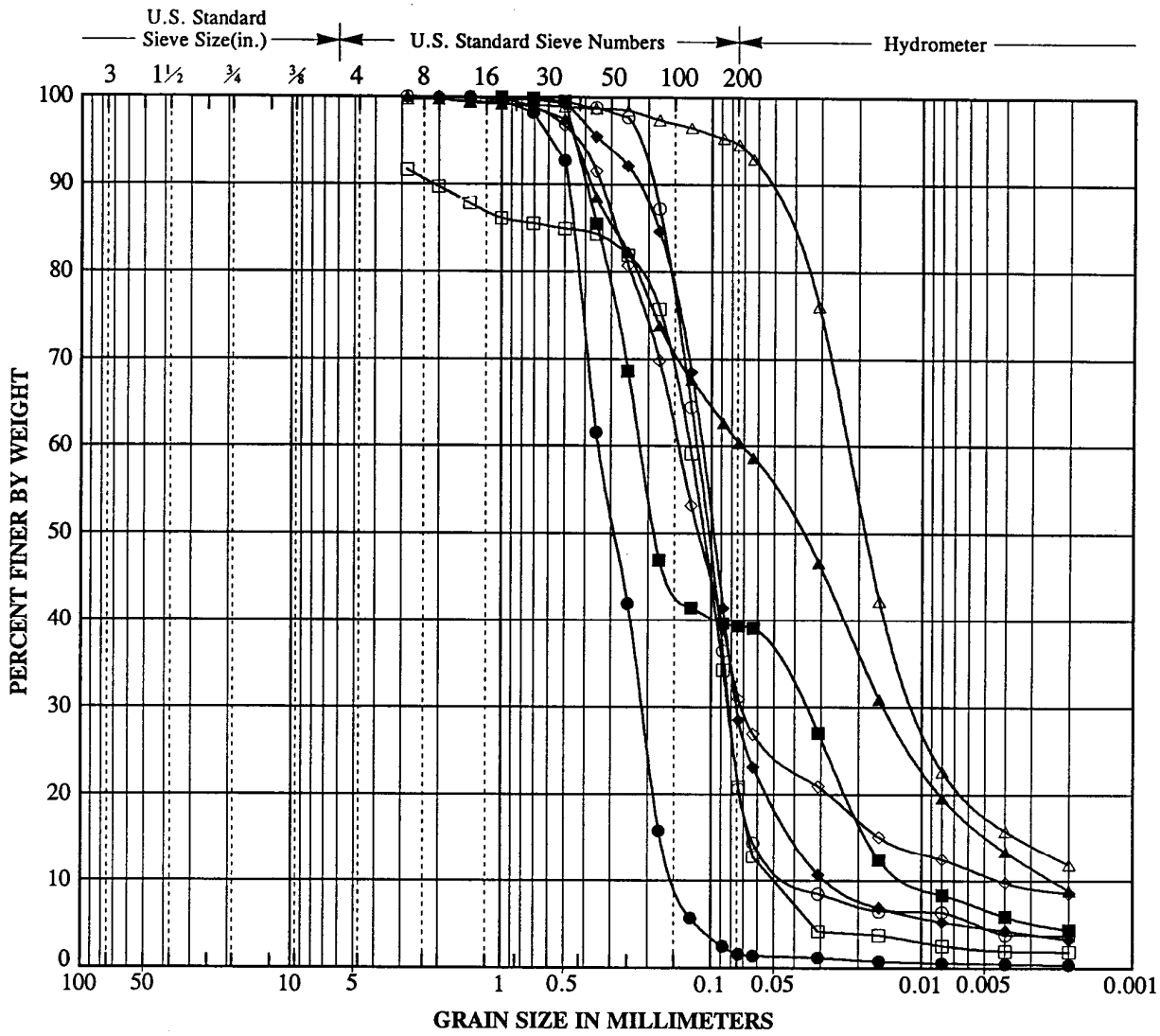
PARTICLE SIZE ANALYSIS

Queens Gate Dredging
San Pedro Bay, California

PLATE C12

Template: Prj ID: 14301

Template: 1; Prj ID: 14301



COBBLES	Coarse	Fine	Coarse	Medium	Fine	SILT or CLAY
	GRAVEL		SAND			

Laboratory Testing by: MEC Analytical Services, Inc.

Symbol	Source	Depth (feet)	Classification	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	VC-23	0.0	Sitly Sand (SM)			22
□	VC-23	3.0	Silty Sand (SM)			22
△	VC-23	6.0	Silt (ML)			95
◇	VC-23	9.0	Silty Sand (SM)			32
●	VC-23	12.0	Sand (SP)			2
■	VC-24	0.0	Silty Sand (SM)			39
▲	VC-24	3.0	Sandy Silt (ML)			60
◆	VC-24	6.0	Silty Sand (SM)			29

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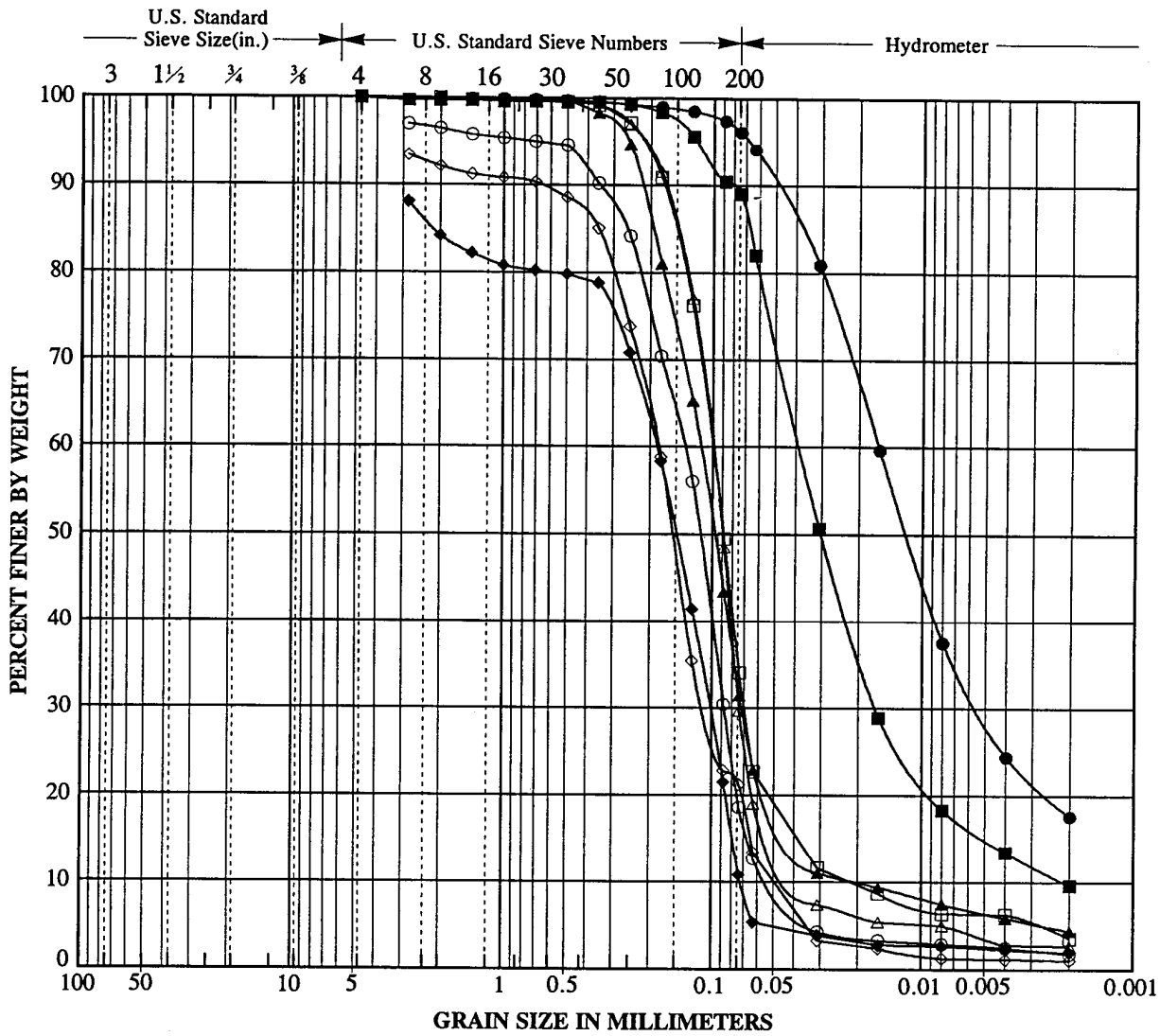
DIAZ • YOURMAN & ASSOCIATES

PARTICLE SIZE ANALYSIS

Queens Gate Dredging
San Pedro Bay, California

PLATE C13



COBBLES	Coarse	Fine	Coarse	Medium	Fine	SILT or CLAY
	GRAVEL		SAND			

Laboratory Testing by: MEC Analytical Services, Inc.

Symbol	Source	Depth (feet)	Classification	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	VC-24	9.0	Silty Sand (SM)			20
□	VC-24	12.0	Silty Sand (SM)			35
△	VC-25	0.0	Silty Sand (SM)			31
◇	VC-25	3.0	Silty Sand (SM)			21
●	VC-25	6.0	Silt (ML)			96
■	VC-25	9.0	Silt (ML)			89
▲	VC-26	0.0	Silty Sand (SM)			32
◆	VC-26	3.0	Sand with Silt (SP-SM)			12

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DIAZ • YOURMAN & ASSOCIATES

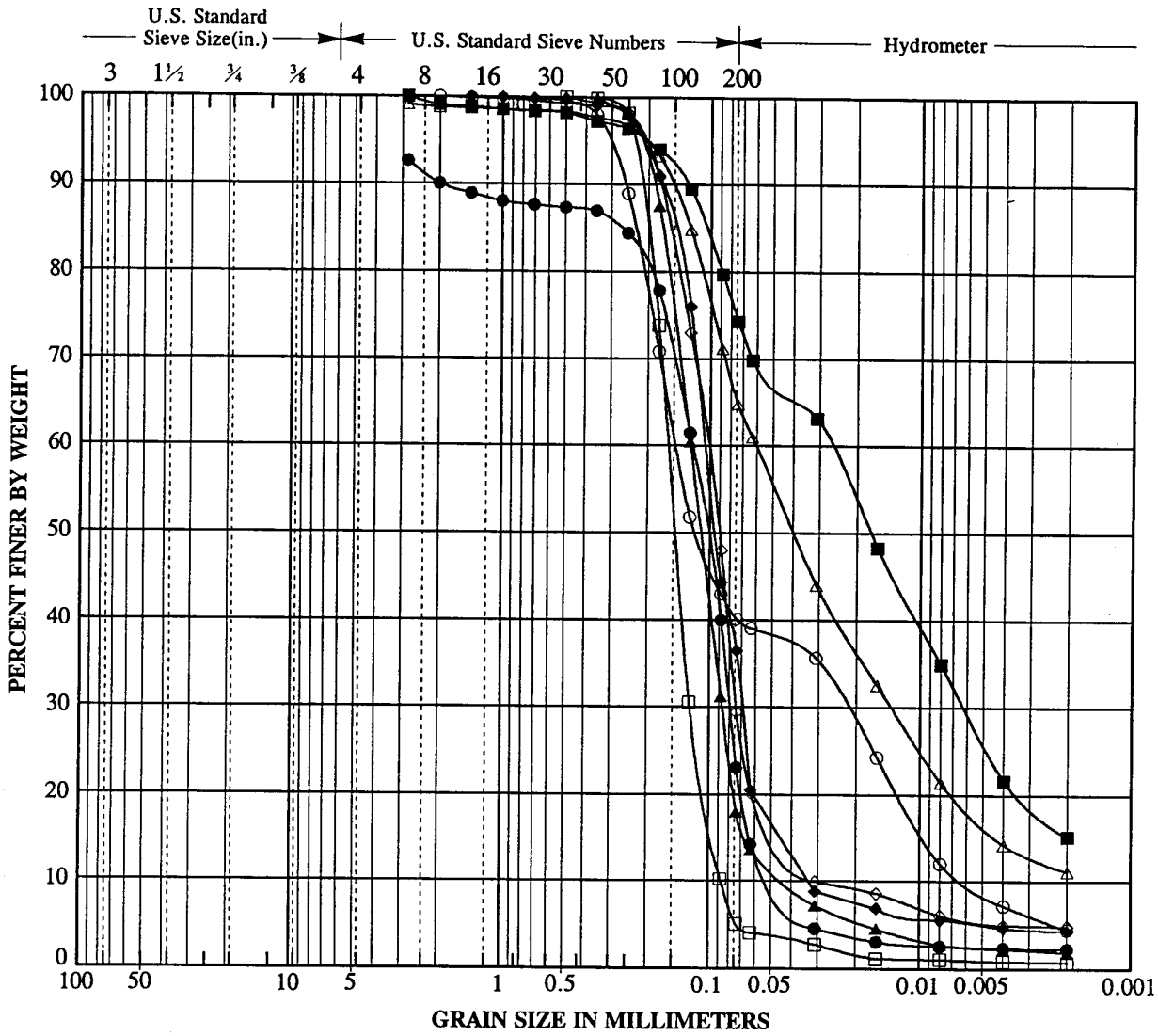
PARTICLE SIZE ANALYSIS

Queens Gate Dredging
San Pedro Bay, California

PLATE C14

Template: ...1; Prj ID: 14301

Template: Prj ID: 14301



COBBLES	Coarse	Fine	Coarse	Medium	Fine	SILT or CLAY
	GRAVEL		SAND			

Laboratory Testing by: MEC Analytical Services, Inc.

Symbol	Source	Depth (feet)	Classification	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	VC-26	6.0	Silty Sand (SM)			40
□	VC-26	9.0	Sand (SP)			5
△	VC-26	12.0	Sandy Silt (ML)			65
◇	VC-27	0.0	Silty Sand (SM)			31
●	VC-27	3.0	Silty Sand (SM)			24
■	VC-27	6.0	Silt with Sand (ML)			75
▲	VC-27	9.0	Silty Sand (SM)			19
◆	VC-28	0.0	Silty Sand (SM)			37

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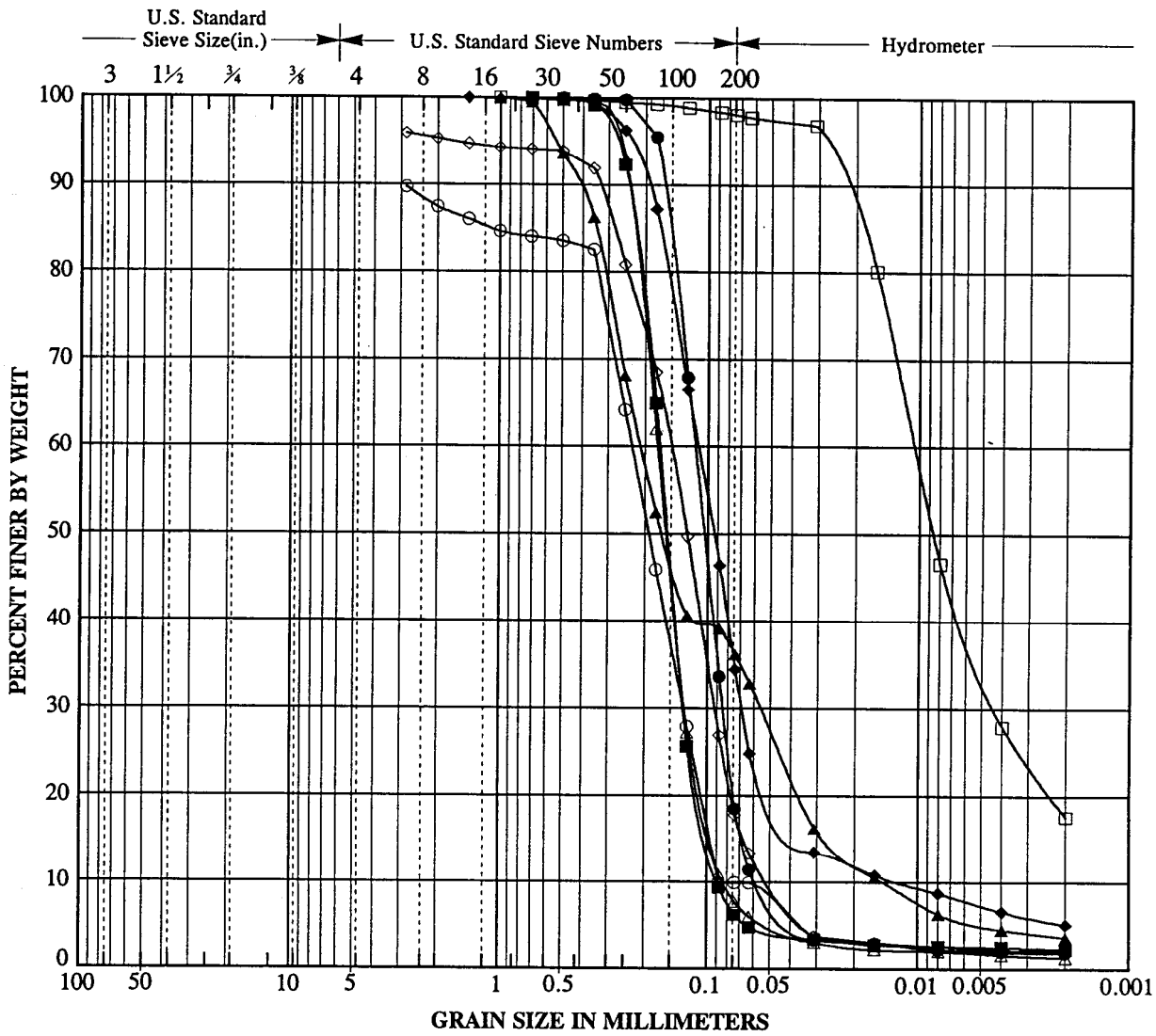
PARTICLE SIZE ANALYSIS

Queens Gate Dredging
San Pedro Bay, California

PLATE C15



COBBLES	Coarse	Fine	Coarse	Medium	Fine	SILT or CLAY
	GRAVEL		SAND			

Laboratory Testing by: MEC Analytical Services, Inc.

Symbol	Source	Depth (feet)	Classification	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	VC-28	3.0	Sand with Silt (SP-SM)			10
□	VC-28	6.0	Silt (ML)			98
△	VC-28	9.0	Sand with Silt (SP-SM)			8
◇	VC-29	0.0	Silty Sand (SM)			19
●	VC-29	3.0	Silty Sand (SM)			20
■	VC-29	6.0	Sand with Silt (SP-SM)			6
▲	VC-29	9.0	Silty Sand (SM)			36
◆	VC-30	0.0	Silty Sand (SM)			35

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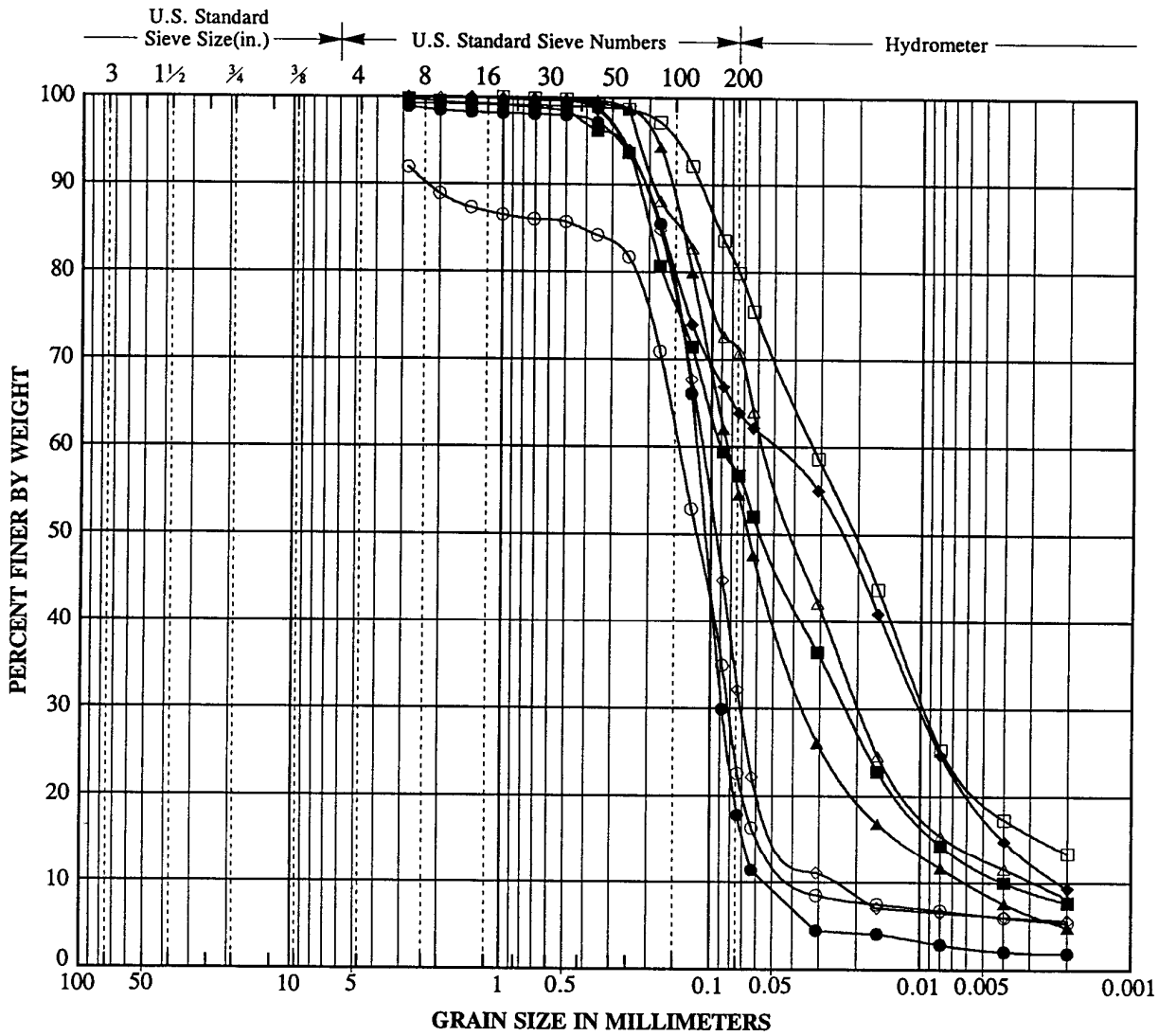
PARTICLE SIZE ANALYSIS

Queens Gate Dredging
San Pedro Bay, California

PLATE C16

Template: ei1; Prj ID: 14301



COBBLES	Coarse	Fine	Coarse	Medium	Fine	SILT or CLAY
	GRAVEL		SAND			

Laboratory Testing by: MEC Analytical Services, Inc.

Symbol	Source	Depth (feet)	Classification	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	VC-30	3.0	Silty Sand (SM)			24
□	VC-30	6.0	Silt with Sand (ML)			80
△	VC-30	9.0	Silt with Sand (ML)			71
◇	VC-31	0.0	Silty Sand (SM)			33
●	VC-31	3.0	Silty Sand (SM)			19
■	VC-31	6.0	Sandy Silt (ML)			57
▲	VC-31	9.0	Sandy Clay (CL)			55
◆	VC-31	12.0	Sandy Silt (ML)			64

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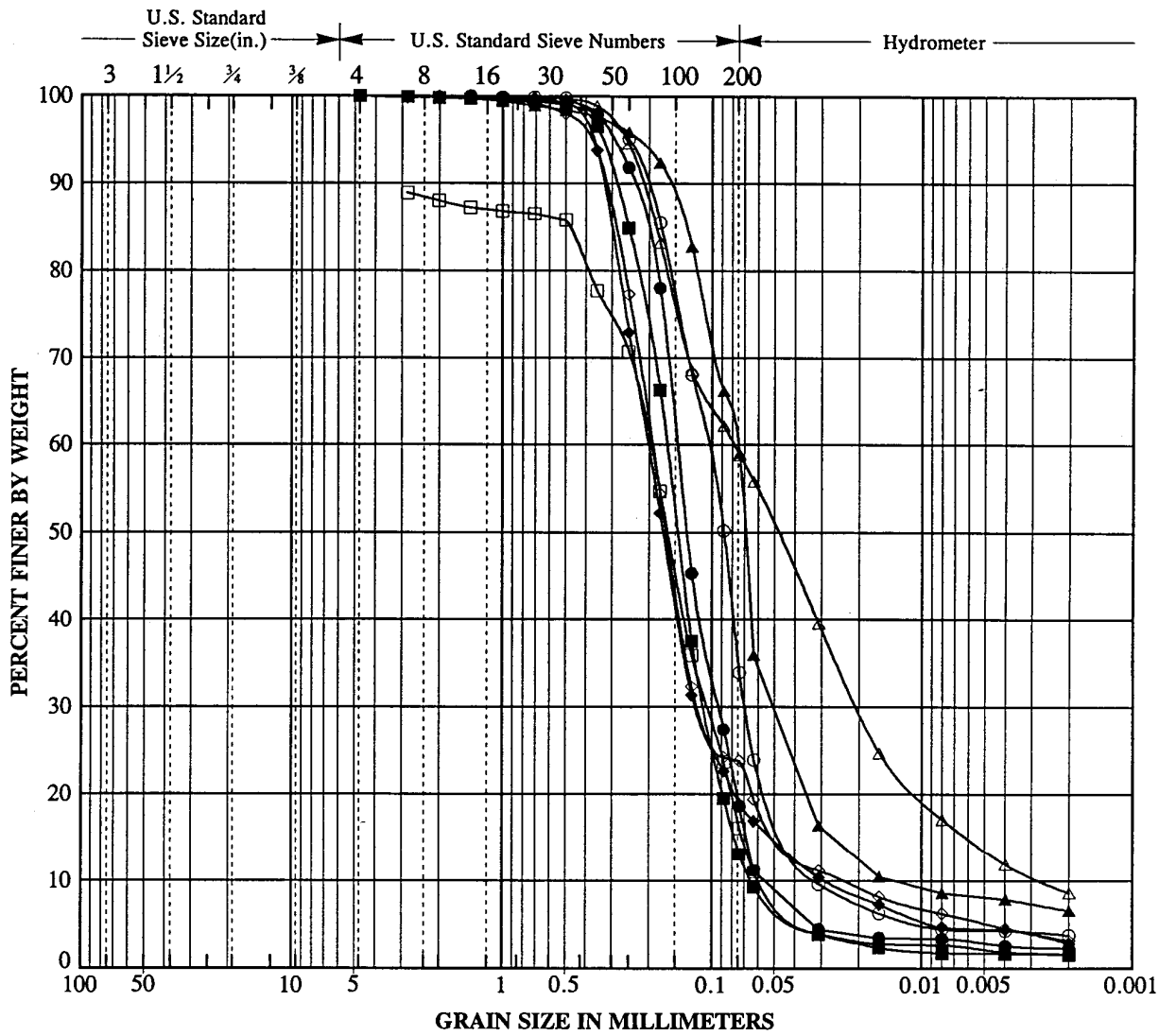
PARTICLE SIZE ANALYSIS

Queens Gate Dredging
San Pedro Bay, California

PLATE C17

Template: Prj ID: 14301

Template: .1; Prj ID: 14301



COBBLES	Coarse	Fine	Coarse	Medium	Fine	SILT or CLAY
	GRAVEL		SAND			

Laboratory Testing by: MEC Analytical Services, Inc.

Symbol	Source	Depth (feet)	Classification	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	VC-32	0.0	Silty Sand(SM)			35
□	VC-32	3.0	Silty Sand (SM)			17
△	VC-32	6.0	Sandy Silt (ML)			59
◇	VC-32	9.0	Silty Sand (SM)			24
●	VC-33	0.0	Silty Sand (SM)			19
■	VC-33	3.0	Silty Sand (SM)			14
▲	VC-33	6.0	Lean Clay (CL)			60
◆	VC-33	9.0	Silty Sand (SM)			19

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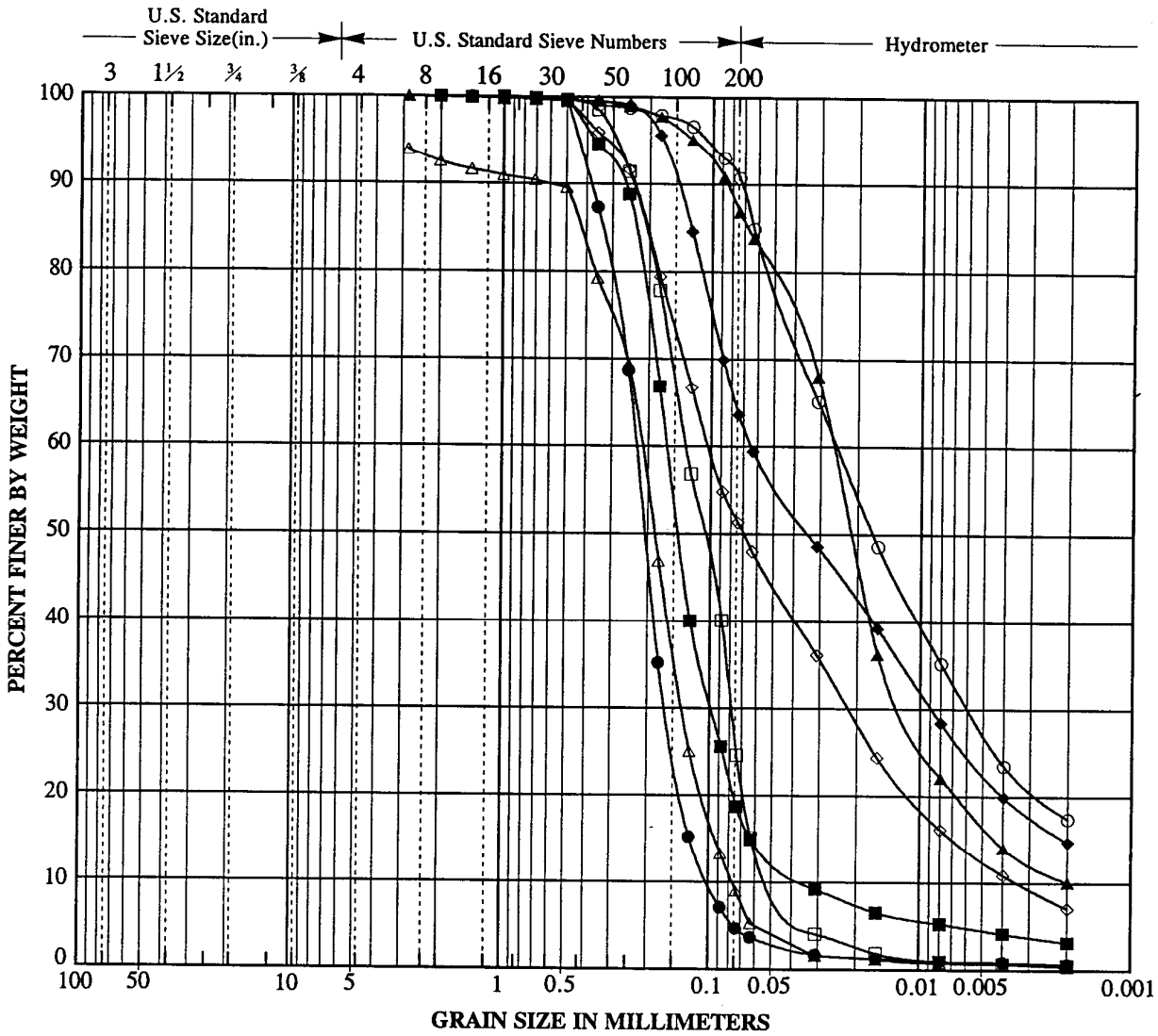
PARTICLE SIZE ANALYSIS

Queens Gate Dredging
San Pedro Bay, California

PLATE C18

Template: Prj ID: 14301



COBBLES	Coarse	Fine	Coarse	Medium	Fine	SILT or CLAY
	GRAVEL		SAND			

Laboratory Testing by: MEC Analytical Services, Inc.

Symbol	Source	Depth (feet)	Classification	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	VC-34	9.0	Silt (ML)			91
□	VC-35	0.0	Silty Sand (SM)			26
△	VC-35	3.0	Sand with Silt (SP-SM)			9
◇	VC-35	6.0	Sandy Silt (ML)			52
●	VC-35	9.0	Sand (SP)			5
■	VC-36	0.0	Silty Sand (SM)			19
▲	VC-36	3.0	Lean Clay (CL)			87
◆	VC-36	6.0	Sandy Silt (ML)			64

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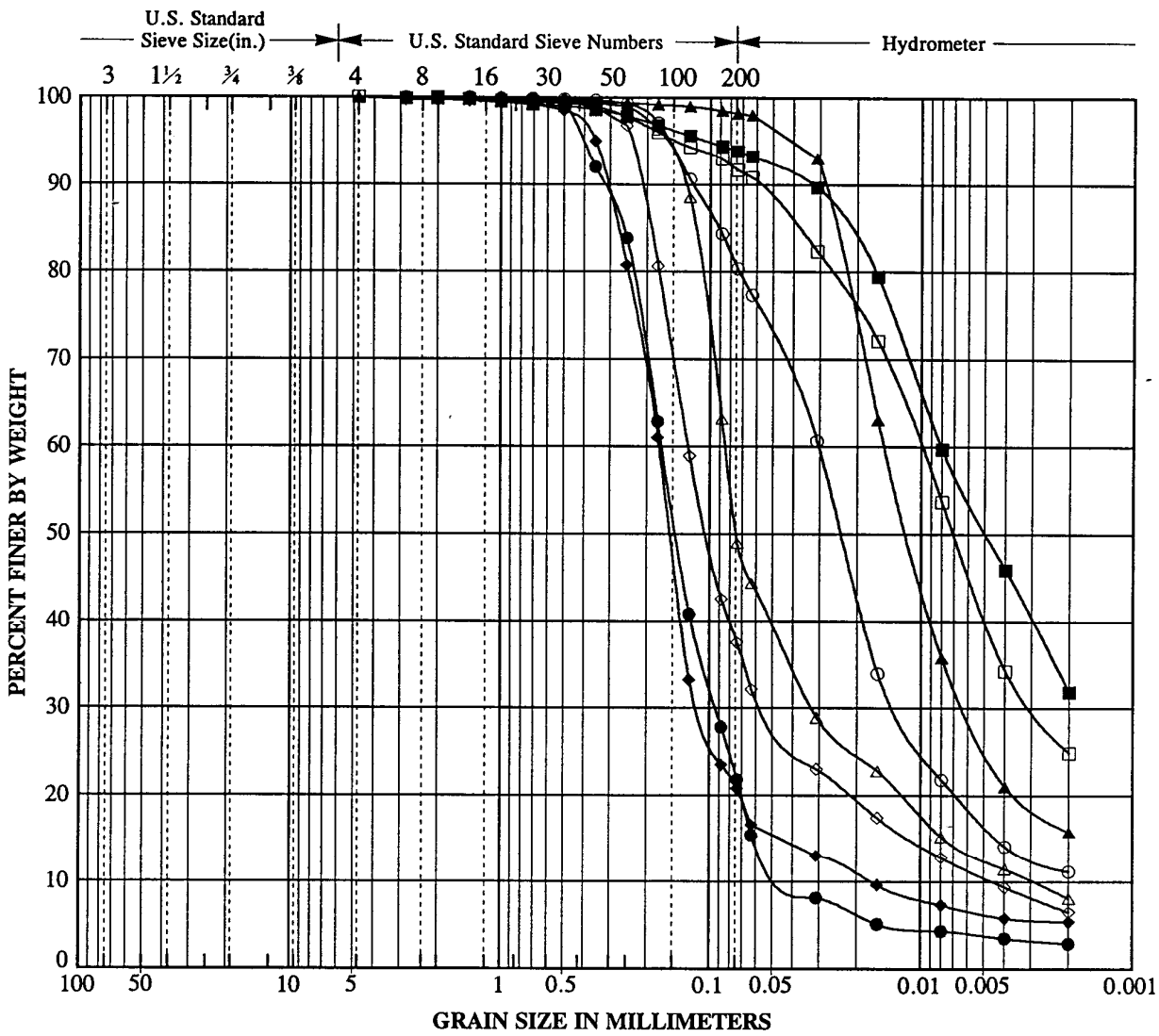
PARTICLE SIZE ANALYSIS

Queens Gate Dredging
San Pedro Bay, California

PLATE C19



COBBLES	Coarse	Fine	Coarse	Medium	Fine	SILT or CLAY
	GRAVEL		SAND			

Laboratory Testing by: MEC Analytical Services, Inc.

Symbol	Source	Depth (feet)	Classification	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	VC-36	9.0	Silt with Sand (ML)			81
□	VC-37	0.0	Silt (ML)			92
△	VC-37	3.0	Silty Sand (SM)			50
◇	VC-37	6.0	Silty Sand (SM)			38
●	VC-38	0.0	Silty Sand (SM)			22
■	VC-38	3.0	Lean Clay (CL)			94
▲	VC-38	6.0	Elastic Silt (MH)			98
◆	VC-39	0.0	Silty Sand (SM)			21

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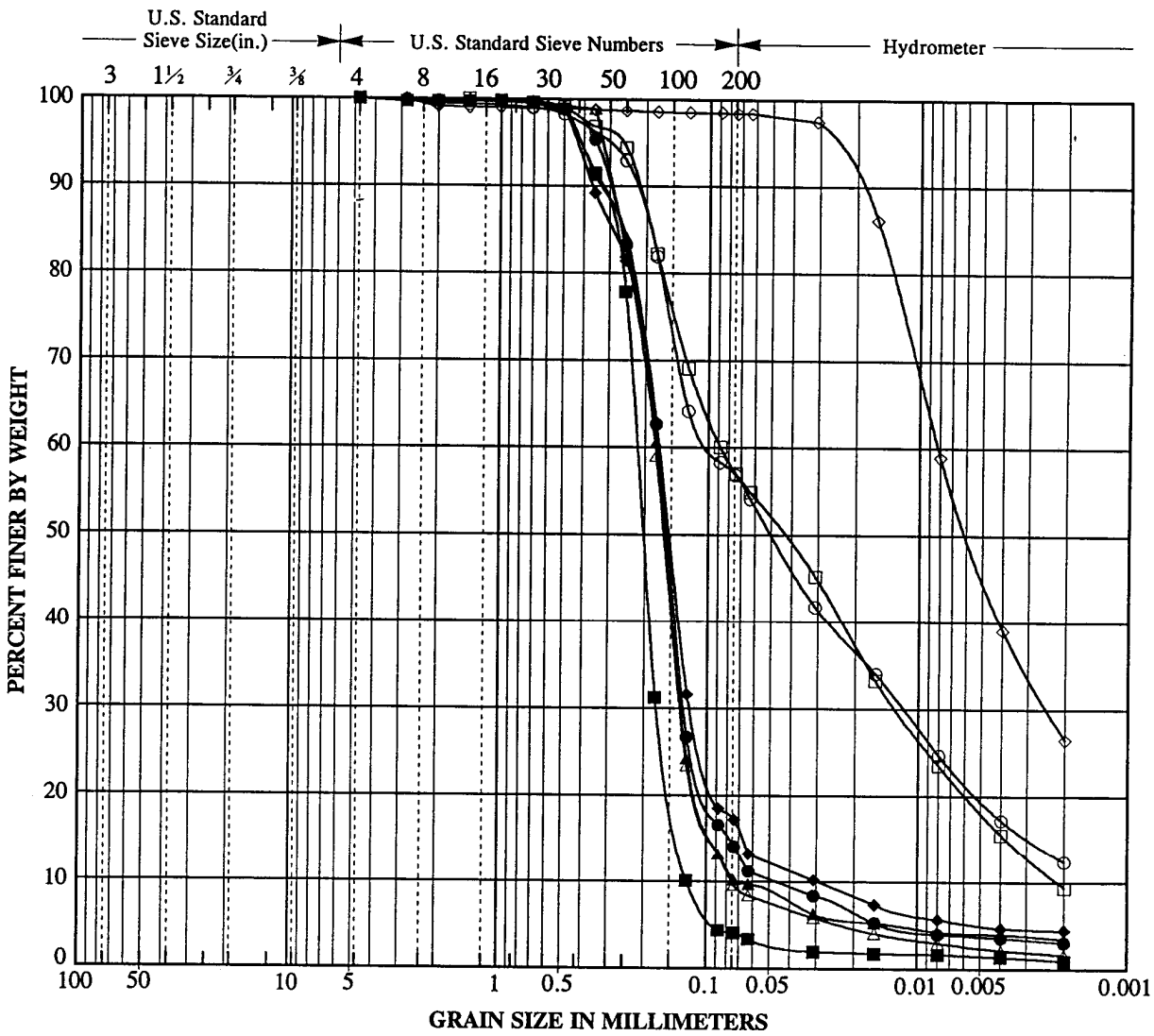
PARTICLE SIZE ANALYSIS

Queens Gate Dredging
San Pedro Bay, California

PLATE C20

Template: ...1; Prj ID: 14301

Template: 1: Prj ID: 14301



COBBLES	Coarse	Fine	Coarse	Medium	Fine	SILT or CLAY
	GRAVEL		SAND			

Laboratory Testing by: MEC Analytical Services, Inc.

Symbol	Source	Depth (feet)	Classification	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	VC-39	3.0	Sandy Silt (ML)			57
□	VC-39	6.0	Sandy Silt (ML)			57
△	VC-40	0.0	Sand with Silt (SP-SM)			10
◇	VC-40	3.0	Elastic Silt (MH)			98
●	VC-41	0.0	Silty Sand (SM)			14
■	VC-41	3.0	Sand (SP)			4
▲	VC-42	0.0	Sand with Silt (SP-SM)			10
◆	VC-43	0.0	Silty Sand (SM)			17

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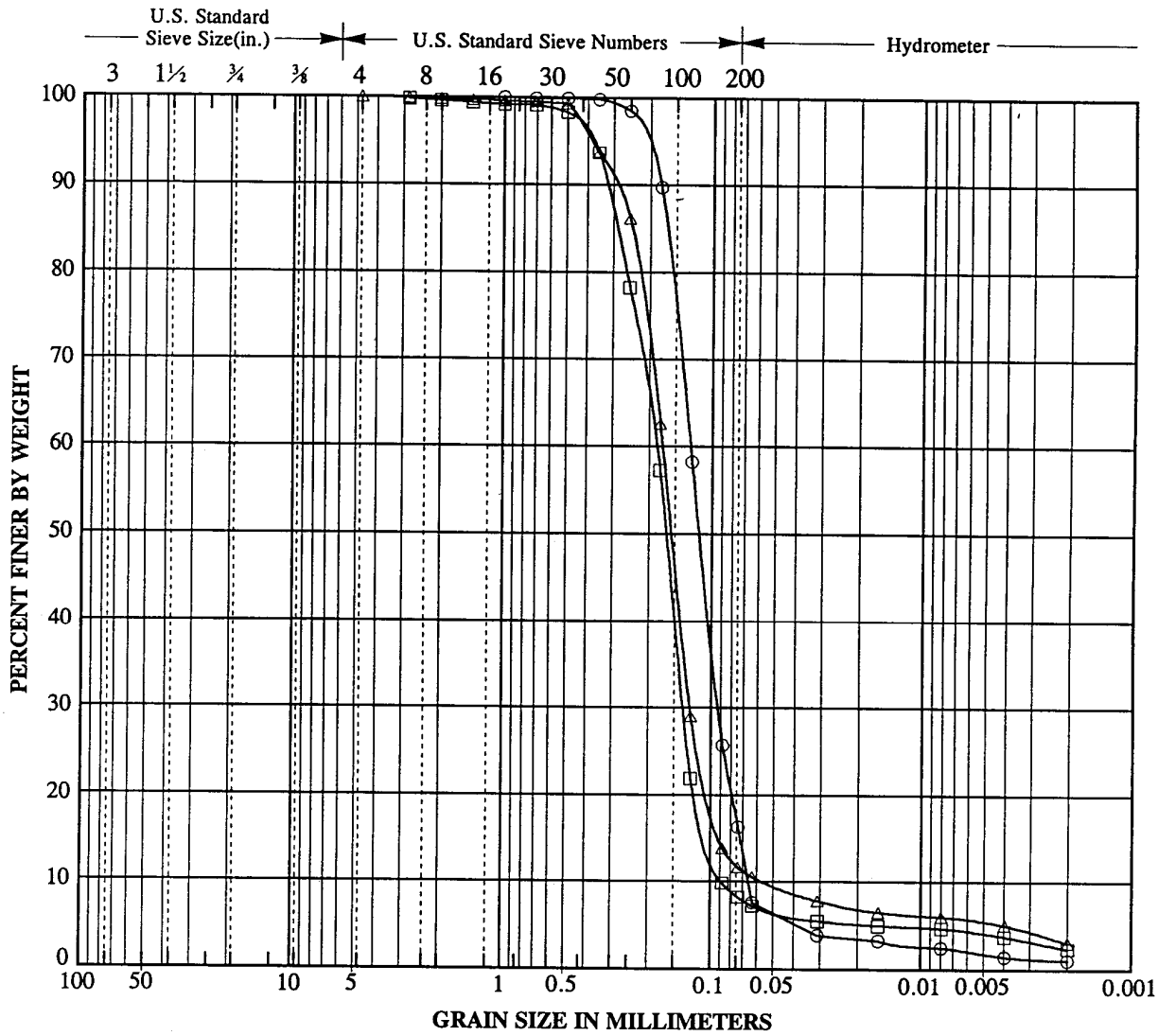
PARTICLE SIZE ANALYSIS

Queens Gate Dredging
San Pedro Bay, California

PLATE C21

Template: 1; Prj ID: 14301



COBBLES	Coarse	Fine	Coarse	Medium	Fine	SILT or CLAY
	GRAVEL		SAND			

Laboratory Testing by: MEC Analytical Services, Inc.

Symbol	Source	Depth (feet)	Classification	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	VC-43	3.0	Silty Sand (SM)			17
□	VC-44	0.0	Sand with Silt (SP-SM)			8
△	VC-45	0.0	Sand with Silt (SP-SM)			12

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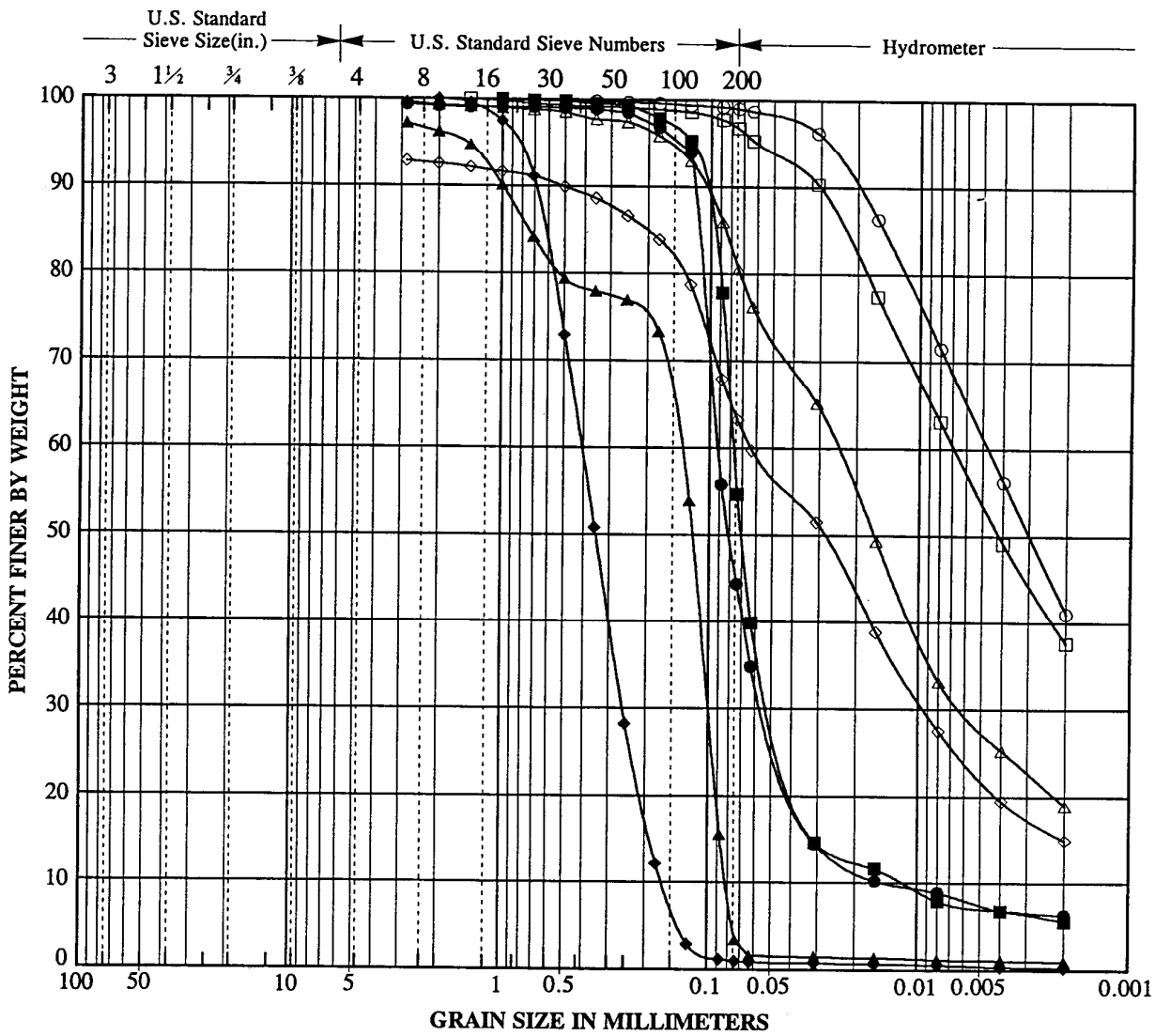
PARTICLE SIZE ANALYSIS

Queens Gate Dredging
San Pedro Bay, California

PLATE C22

Template: 1; Prj ID: 14301



COBBLES	Coarse	Fine	Coarse	Medium	Fine	SILT or CLAY
	GRAVEL		SAND			

Laboratory Testing by: MEC Analytical Services, Inc.

Symbol	Source	Depth (feet)	Classification	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	I.W.1	0.0	Clay (CL)			99
□	I.W.2	0.0	Clay (CL)			97
△	LA-2.S.1	0.0	Clay with Sand (CL)			81
◇	LA-2.S.2	0.0	Sandy Clay (CL)			64
●	R.S.1	0.0	Silty Sand (SM)			45
■	R.S.2	0.0	Sandy Silt (ML)			56
▲	TR.1 0	0.0	Sand (SP)			4
◆	TR.1 +12	0.0	Sand (SP)			1

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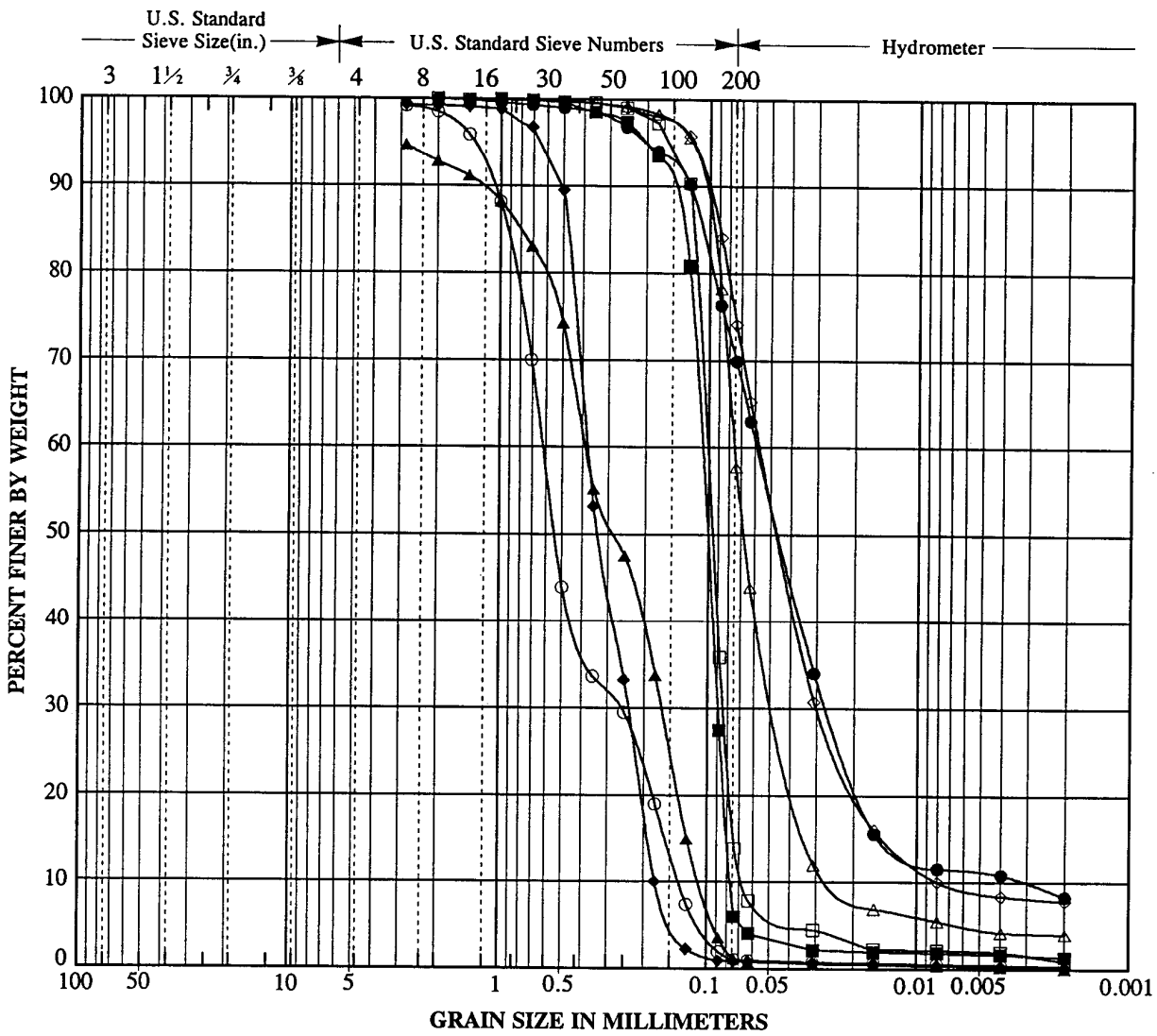
PARTICLE SIZE ANALYSIS

Queens Gate Dredging
San Pedro Bay, California

PLATE C23

Template: 1; Prj ID: 14301



COBBLES	Coarse	Fine	Coarse	Medium	Fine	SILT or CLAY
	GRAVEL		SAND			

Laboratory Testing by: MEC Analytical Services, Inc.

Symbol	Source	Depth (feet)	Classification	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	TR.1 +6	0.0	Sand (SP)			1
□	TR.1 -12	0.0	Silty Sand (SM)			16
△	TR.1 -18	0.0	Sandy Silt (ML)			59
◇	TR.1 -24	0.0	Silt with Sand (ML)			75
●	TR.1 -30	0.0	Silt with Sand (ML)			70
■	TR.1 -6	0.0	Sand with Silt (SP-SM)			8
▲	TR.2 0	0.0	Sand (SP)			1
◆	TR.2 +12	0.0	Sand (SP)			1

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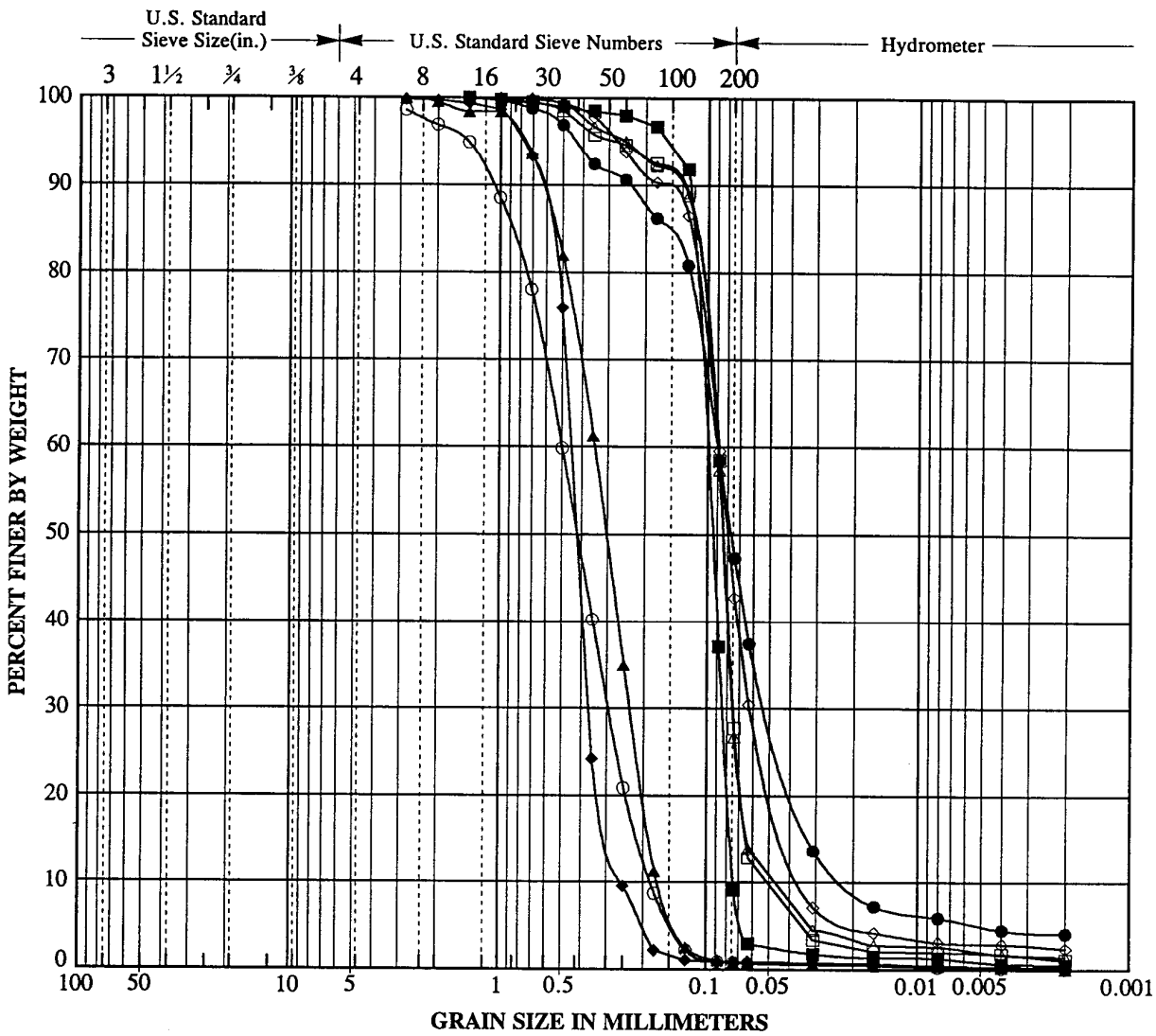
PARTICLE SIZE ANALYSIS

Queens Gate Dredging
San Pedro Bay, California

PLATE C24

Template: 21: Prj ID: 14301



COBBLES	Coarse	Fine	Coarse	Medium	Fine	SILT or CLAY
	GRAVEL		SAND			

Laboratory Testing by: MEC Analytical Services, Inc.

Symbol	Source	Depth (feet)	Classification	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	TR.2 +6	0.0	Sand (SP)			1
□	TR.2 -12	0.0	Silty Sand (SM)			30
△	TR.2 -18	0.0	Silty Sand (SM)			29
◇	TR.2 -24	0.0	Silty Sand (SM)			44
●	TR.2 -30	0.0	Silty Sand (SM)			48
■	TR.2 -6	0.0	Sand with Silt (SP-SM)			11
▲	TR.3 0	0.0	Sand (SP)			1
◆	TR.3 +12	0.0	Sand (SP)			1

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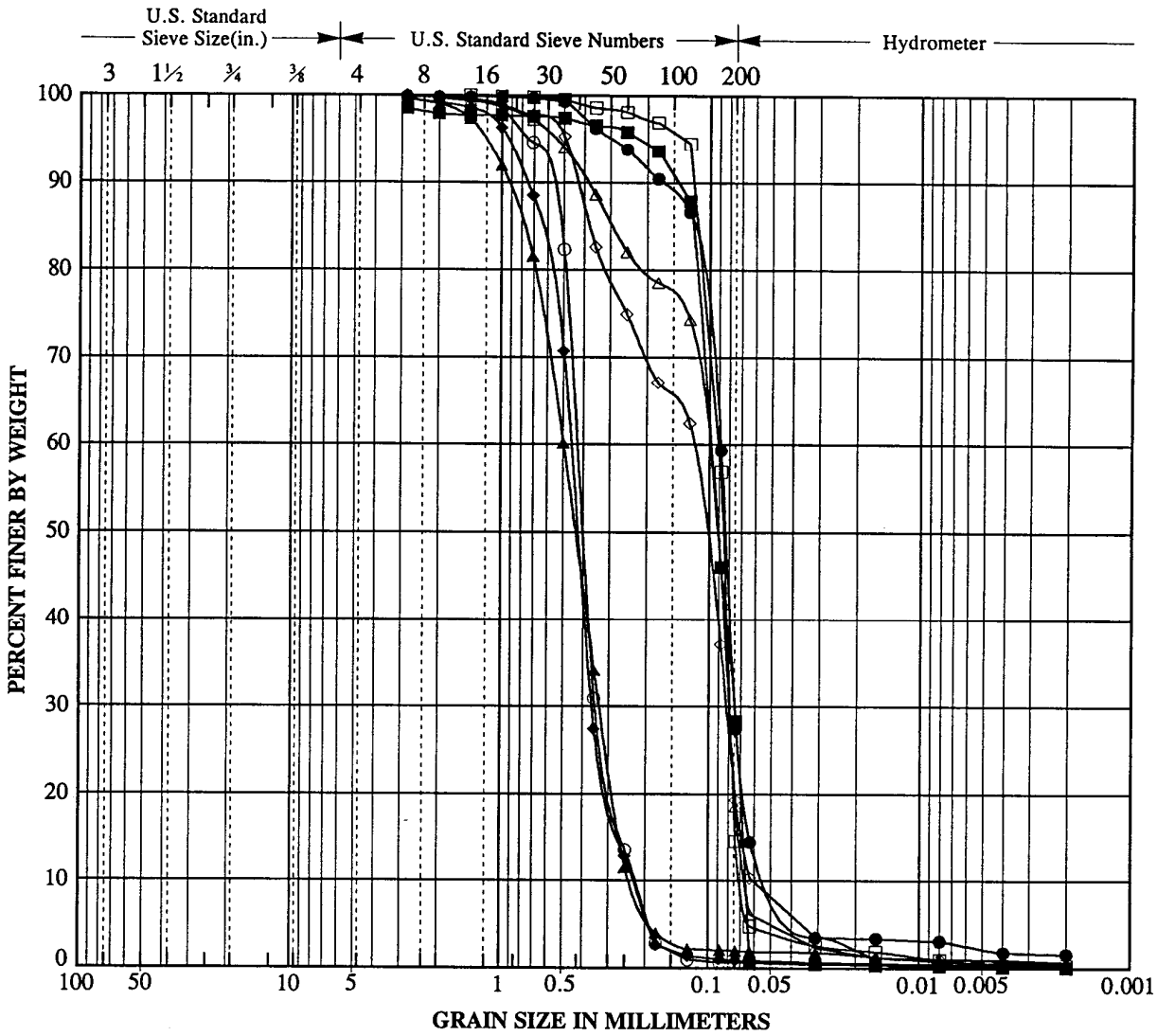
PARTICLE SIZE ANALYSIS

Queens Gate Dredging
San Pedro Bay, California

PLATE C25

Template: 1; Prj ID: 14301



COBBLES	Coarse	Fine	Coarse	Medium	Fine	SILT or CLAY
	GRAVEL		SAND			

Laboratory Testing by: MEC Analytical Services, Inc.

Symbol	Source	Depth (feet)	Classification	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	TR.3 +6	0.0	Sand (SP)			1
□	TR.3 -12	0.0	Silty Sand (SM)			18
△	TR.3 -18	0.0	Silty Sand (SM)			21
◇	TR.3 -24	0.0	Silty Sand (SM)			21
●	TR.3 -30	0.0	Silty Sand (SM)			30
■	TR.3 -6	0.0	Silty Sand (SM)			30
▲	TR.4 0	0.0	Sand (SP)			2
◆	TR.4 +12	0.0	Sand (SP)			1

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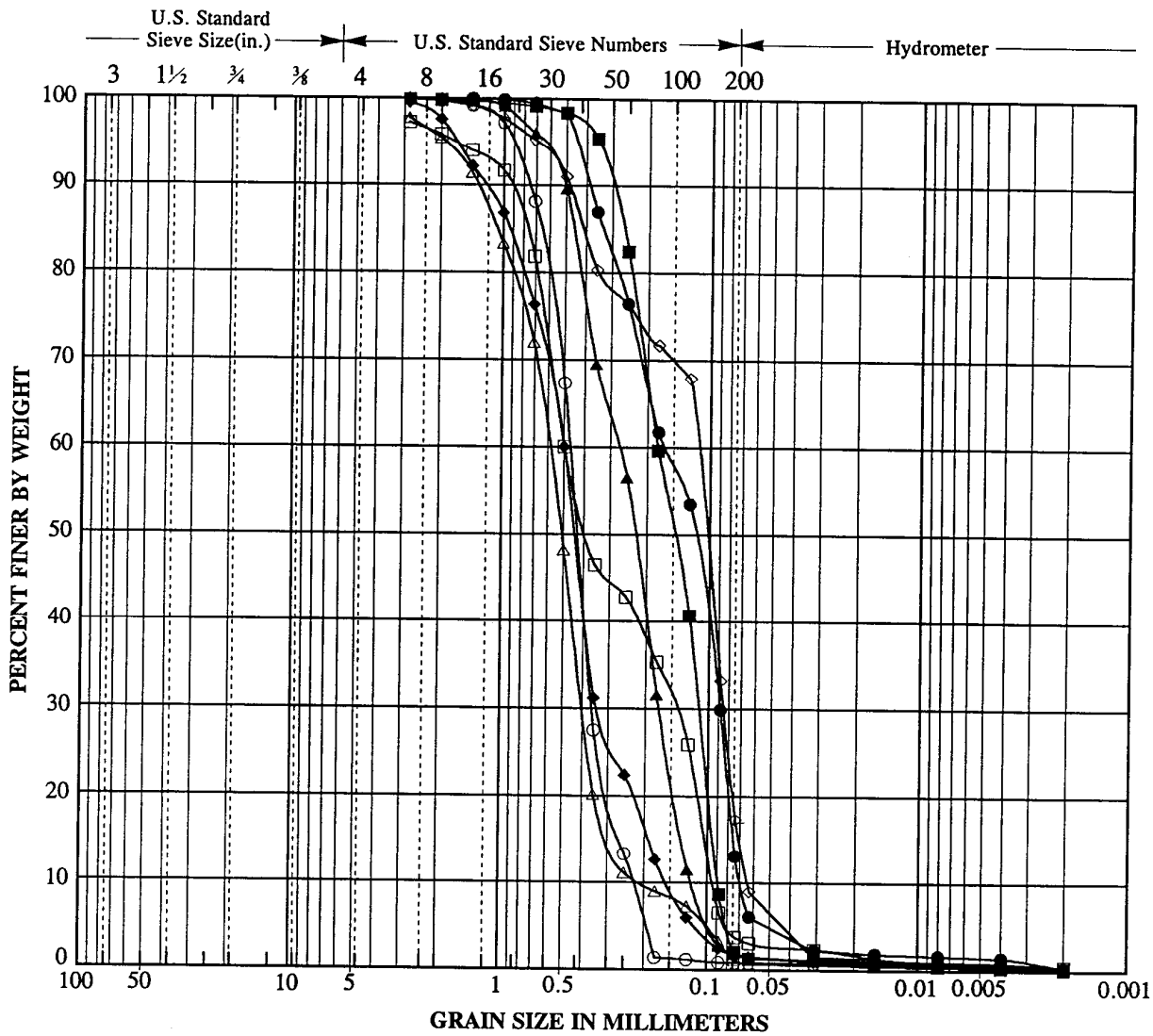
PARTICLE SIZE ANALYSIS

Queens Gate Dredging
San Pedro Bay, California

PLATE C26

Template: 1; Prj ID: 14301



COBBLES	Coarse	Fine	Coarse	Medium	Fine	SILT or CLAY
	GRAVEL		SAND			

Laboratory Testing by: MEC Analytical Services, Inc.

Symbol	Source	Depth (feet)	Classification	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	TR.4 +6	0.0	Sand (SP)			1
□	TR.4 -12	0.0	Sand (SP)			4
△	TR.4 -18	0.0	Sand (SP)			1
◇	TR.4 -24	0.0	Silty Sand (SM)			19
●	TR.4 -30	0.0	Silty Sand (SM)			14
■	TR.4 -6	0.0	Sand (SP)			3
▲	TR.5 0	0.0	Sand (SP)			2
◆	TR.5 +12	0.0	Sand (SP)			2

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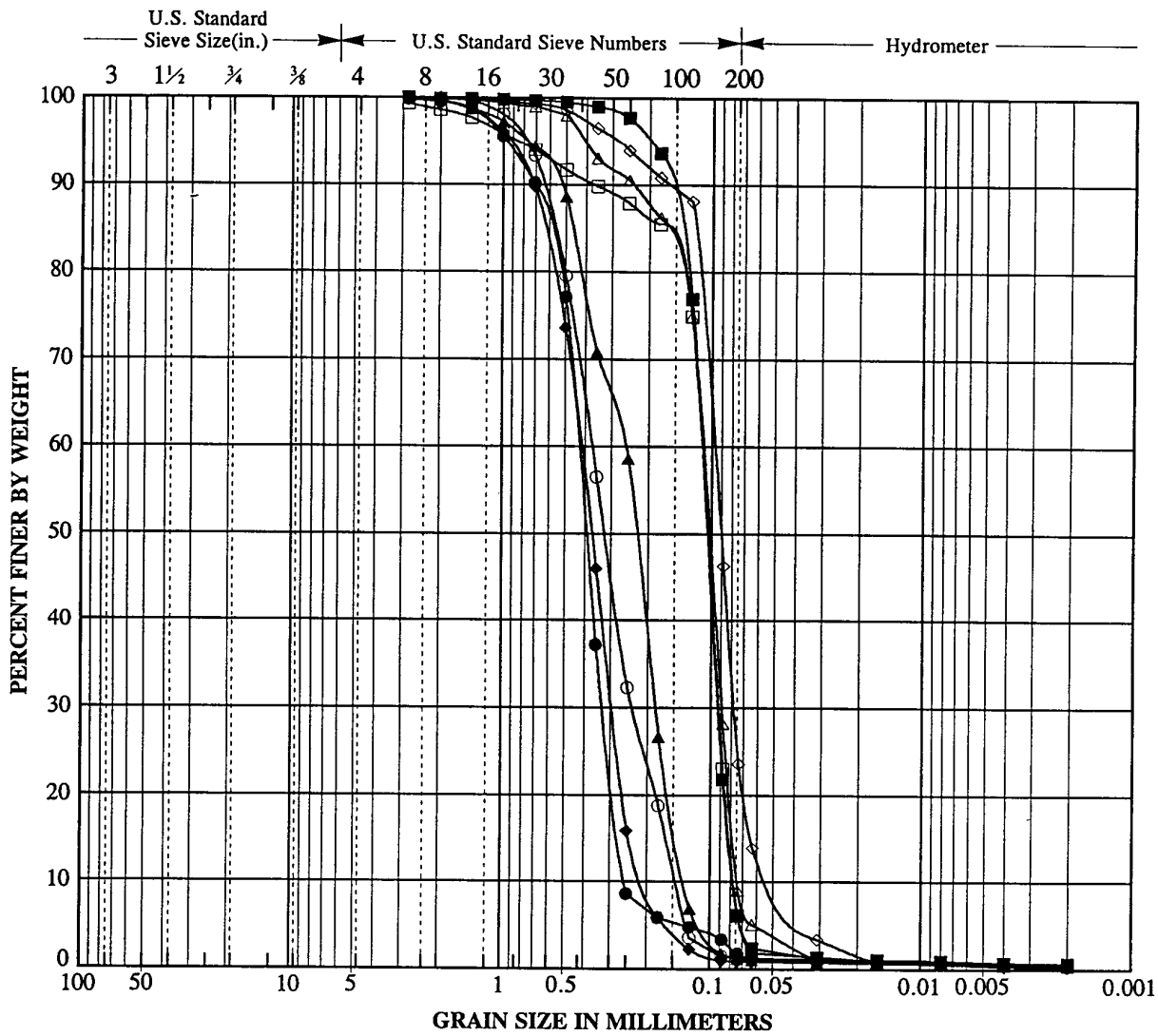
PARTICLE SIZE ANALYSIS

Queens Gate Dredging
San Pedro Bay, California

PLATE C27

Template: 1; Prj ID: 14301



COBBLES	Coarse	Fine	Coarse	Medium	Fine	SILT or CLAY
	GRAVEL		SAND			

Laboratory Testing by: MEC Analytical Services, Inc.

Symbol	Source	Depth (feet)	Classification	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	TR.5 +6	0.0	Sand (SP)			1
□	TR.5 -12	0.0	Sand with Silt (SP-SM)			8
△	TR.5 -18	0.0	Sand with Silt (SP-SM)			10
◇	TR.5 -24	0.0	Silty Sand (SM)			25
●	TR.5 -30	0.0	Sand (SP)			2
■	TR.5 -6	0.0	Sand with Silt (SP-SM)			7
▲	TR.6 0	0.0	Sand (SP)			1
◆	TR.6 +12	0.0	Sand (SP)			1

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PARTICLE SIZE ANALYSIS

Queens Gate Dredging
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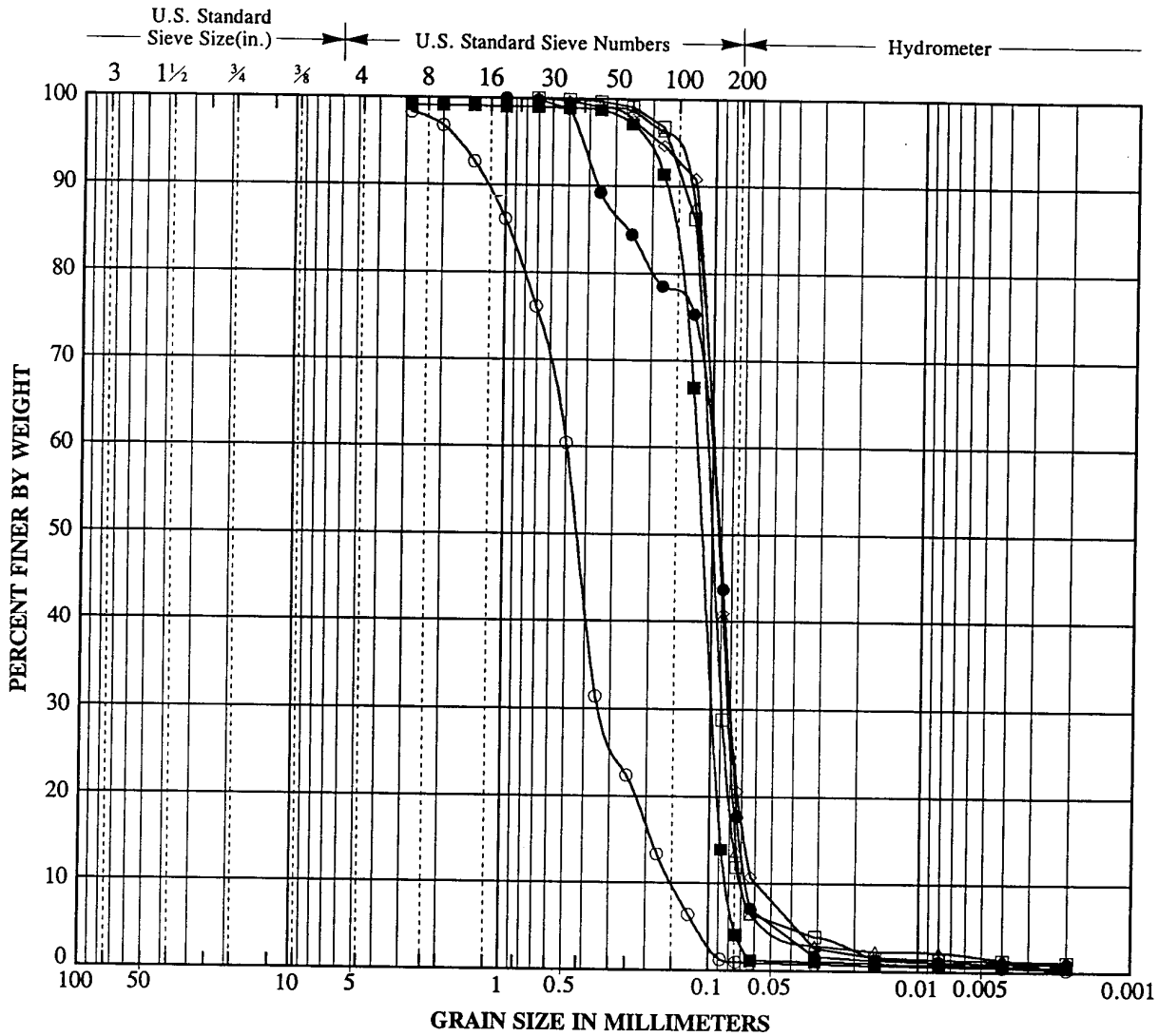
PLATE C28

Template: ...1; Prj ID: 14301



COBBLES	Coarse	Fine	Coarse	Medium	Fine	SILT or CLAY
	GRAVEL		SAND			

Laboratory Testing by: MEC Analytical Services, Inc.

Symbol	Source	Depth (feet)	Classification	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	TR.6 +6	0.0	Sand (SP)			1
□	TR.6 -12	0.0	Silty Sand (SM)			13
△	TR.6 -18	0.0	Silty Sand (SM)			16
◇	TR.6 -24	0.0	Silty Sand (SM)			22
●	TR.6 -30	0.0	Silty Sand (SM)			20
■	TR.6 -6	0.0	Sand (SP)			5

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PARTICLE SIZE ANALYSIS

Queens Gate Dredging
San Pedro Bay, California

PLATE C29

TABLE C1
SUMMARY OF PARTICLE SIZE ANALYSIS

SOURCE	DEPTH (feet)	ELEV. MLLW (feet)	PERCENT PASSING											
			#7	#10	#14	#18	#25	#35	#45	#60	#80	#120	#170	#200
VC- 1	0	-57		98	98	98	98	98	97	95	81	64	38	28
VC- 1	3	-60		99	99	99	99	99	99	98	96	88	62	48
VC- 1	6	-63		100	100	100	100	100	100	100	99	97	90	85
VC- 1	9	-66	100	100	100	100	100	100	100	100	98	92	74	57
VC- 1	12	-69	100	100	100	100	100	100	100	100	100	100	100	100
VC- 1	15	-72	100	100	100	100	100	100	100	99	98	92	80	74
VC- 2	0	-56	100	100	100	100	100	100	99	98	92	77	52	39
VC- 2	3	-59		93	92	91	90	90	90	89	87	78	53	39
VC- 2	6	-62	100	100	100	100	100	100	99	99	97	94	86	80
VC- 2	9	-65	100	100	100	100	100	100	100	100	100	100	99	99
VC- 2	12	-68	100	100	100	100	100	100	100	99	96	84	56	44
VC- 3	0	-79		99	99	99	98	98	97	92	86	71	51	40
VC- 4	0	-77		100	100	100	100	99	99	98	91	78	55	43
VC- 5	0	-77	100	100	100	100	100	99	97	94	88	62	29	16
VC- 5	3	-80	100	100	100	100	100	98	93	81	68	55	44	40
VC- 6	0	-76		93	91	90	89	88	86	79	65	42	28	22
VC- 6	3	-79		99	98	98	98	97	96	93	85	64	38	25
VC- 7	0	-70		99	99	99	99	99	99	99	98	98	98	96
VC- 7	3	-73		84	84	84	84	83	83	83	82	82	79	77
VC- 7	6	-76	100	100	100	100	100	100	96	91	65	34	16	11
VC- 7	9	-79	100	100	100	100	100	99	96	90	83	75	67	63

TABLE C1
SUMMARY OF PARTICLE SIZE ANALYSIS

SOURCE	DEPTH (feet)	ELEV. MLLW (feet)	PERCENT PASSING											
			#7	#10	#14	#18	#25	#35	#45	#60	#80	#120	#170	#200
VC- 7	12	-82	100	100	100	100	100	99	96	95	91	84	76	70
VC- 8	0	-66		97	97	96	95	95	93	91	88	86	85	84
VC- 8	3	-69	100	100	100	100	100	100	99	99	99	98	96	95
VC- 8	6	-72	100	100	100	100	100	100	99	98	97	95	94	93
VC- 8	9	-75	100	100	100	100	100	100	98	97	95	94	91	89
VC- 9	0	-61		97	96	95	94	93	91	84	67	44	27	16
VC- 9	3	-64	100	100	100	100	100	99	99	99	98	97	94	93
VC- 9	6	-67	100	100	100	100	100	100	100	100	99	93	87	86
VC- 9	9	-70		97	96	95	94	88	52	38	26	19	13	10
VC-10	0	-66		99	98	98	98	97	95	89	81	68	58	54
VC-10	3	-69	100	100	100	100	100	100	99	99	87	78	70	67
VC-10	6	-72	100	100	100	100	100	100	100	100	100	99	99	98
VC-10	9	-75	100	100	100	100	100	100	100	100	93	90	78	71
VC-10	12	-78		100	100	100	100	100	99	99	95	85	63	48
VC-11	0	-61		98	98	97	97	97	95	90	74	39	18	13
VC-11	3	-64		100	99	99	99	99	98	95	88	78	60	51
VC-11	6	-67	100	100	100	100	100	100	99	97	85	68	41	32
VC-11	9	-70	100	100	100	100	100	100	100	100	99	99	95	92
VC-11	12	-73	100	100	100	100	100	100	100	100	99	99	98	98
VC-11	15	-76	100	100	100	100	100	99	98	97	93	86	76	72
VC-12	0	-61		97	96	95	94	94	91	85	65	46	28	19

TABLE C1
SUMMARY OF PARTICLE SIZE ANALYSIS

SOURCE	DEPTH (feet)	ELEV. MLLW (feet)	PERCENT PASSING											
			#7	#10	#14	#18	#25	#35	#45	#60	#80	#120	#170	#200
VC-12	3	-64	100	100	100	100	100	100	100	99	95	89	82	76
VC-12	6	-67	100	100	100	100	100	100	100	100	98	96	93	91
VC-12	9	-70	100	100	100	100	100	100	100	100	100	100	100	99
VC-12	12	-73	100	100	100	100	100	100	100	100	100	100	99	99
VC-12	15	-76	100	100	100	100	100	99	95	81	58	36	25	21
VC-13	0	-63		97	95	94	93	92	89	86	76	59	36	24
VC-13	3	-66	100	100	100	100	100	100	100	99	98	94	79	67
VC-13	6	-69	100	100	100	100	100	100	100	100	99	96	89	85
VC-13	9	-72	100	100	100	100	100	100	100	100	100	99	97	95
VC-13	12	-75	100	100	100	100	100	100	99	99	92	79	62	56
VC-14	0	-63		90	89	87	87	86	85	82	75	59	35	20
VC-14	3	-66	100	100	100	100	100	100	99	98	96	91	79	74
VC-14	6	-69	100	100	100	100	100	100	100	100	99	99	99	98
VC-14	9	-72	100	100	100	100	100	100	100	100	99	98	96	95
VC-14	12	-75	100	100	100	100	100	100	99	99	91	80	60	50
VC-14	15	-78	100	100	100	100	99	98	92	74	49	29	20	17
VC-15	3	-64		99	98	98	98	97	95	91	82	73	53	41
VC-15	6	-67	100	100	100	100	100	100	100	100	99	96	88	82
VC-15	9	-70	100	100	100	100	100	100	99	99	99	98	96	95
VC-15	12	-73	100	100	100	100	100	99	99	98	96	92	87	84
VC-15	15	-76	100	100	100	100	100	100	99	95	89	71	49	37

TABLE C1
SUMMARY OF PARTICLE SIZE ANALYSIS

SOURCE	DEPTH (feet)	ELEV. MLLW (feet)	PERCENT PASSING											
			#7	#10	#14	#18	#25	#35	#45	#60	#80	#120	#170	#200
VC-16	0	-61		100	99	99	99	99	98	97	92	77	48	32
VC-16	3	-64		100	100	100	99	99	89	79	61	46	28	22
VC-16	6	-67	100	100	100	100	100	100	100	100	100	99	96	94
VC-16	9	-70	100	100	100	100	100	100	99	98	93	84	64	52
VC-17	0	-61	100	100	100	100	100	100	99	97	86	72	43	26
VC-17	3	-64		89	87	86	85	85	84	78	70	57	27	17
VC-17	6	-67		100	100	100	99	99	99	99	99	99	98	97
VC-17	9	-70	100	100	100	100	100	100	100	100	100	99	99	99
VC-17	12	-73	100	100	100	100	100	100	100	98	92	72	47	36
VC-18	0	-61	100	100	100	100	100	100	99	98	91	67	38	25
VC-18	3	-64		93	92	91	91	91	84	83	34	29	18	14
VC-18	6	-67		96	96	96	95	95	95	95	95	94	91	87
VC-18	9	-70	100	100	100	100	100	100	100	99	88	68	38	23
VC-18	12	-73	100	100	100	100	100	99	97	84	59	25	7	4
VC-19	0	-61		98	98	98	98	97	96	94	79	56	29	17
VC-19	3	-64		99	99	99	99	99	97	89	77	63	42	33
VC-19	6	-67	100	100	100	100	100	100	99	98	87	72	48	40
VC-19	9	-70	100	100	100	100	100	100	100	100	100	100	99	99
VC-19	12	-73	100	100	100	100	100	100	100	98	90	57	23	15
VC-20	0	-62	100	100	100	100	100	100	99	97	89	76	44	29
VC-20	3	-65		98	97	96	96	96	94	88	82	76	63	55

TABLE C1
SUMMARY OF PARTICLE SIZE ANALYSIS

SOURCE	DEPTH (feet)	ELEV. MLLW (feet)	PERCENT PASSING											
			#7	#10	#14	#18	#25	#35	#45	#60	#80	#120	#170	#200
VC-20	6	-68	100	100	100	100	100	100	99	99	98	97	95	93
VC-20	9	-71	100	100	100	100	100	100	100	100	100	99	99	98
VC-21	0	-62	100	100	100	100	100	100	99	96	88	68	40	25
VC-21	3	-65		96	94	93	92	92	90	88	83	72	42	27
VC-21	6	-68	100	100	100	100	100	100	95	90	72	52	30	23
VC-21	9	-71	100	100	100	99	98	94	80	58	44	34	29	28
VC-22	0	-63		100	100	99	99	99	96	91	77	62	44	30
VC-22	3	-66		91	89	89	88	88	85	82	71	59	31	19
VC-22	6	-69	100	100	100	100	100	100	100	100	96	95	90	87
VC-22	9	-72	100	100	100	100	100	100	99	98	95	91	80	73
VC-22	12	-75	100	100	100	100	100	100	97	94	74	48	28	24
VC-22	15	-78		100	100	100	99	94	81	62	42	26	20	18
VC-23	0	-62	100	100	100	100	100	100	99	98	87	64	36	22
VC-23	3	-65		90	88	86	86	85	84	82	76	59	34	22
VC-23	6	-68		100	99	99	99	99	99	99	97	97	95	95
VC-23	9	-71	100	100	100	100	99	97	91	81	70	53	39	32
VC-23	12	-74	100	100	100	100	98	93	61	42	16	6	3	2
VC-24	0	-62	100	100	100	100	100	100	85	69	47	41	40	39
VC-24	3	-65	100	100	99	99	99	98	88	82	74	68	63	60
VC-24	6	-68	100	100	100	100	100	99	95	92	85	69	41	29
VC-24	9	-71		97	96	95	95	95	90	84	70	56	30	20

TABLE C1
SUMMARY OF PARTICLE SIZE ANALYSIS

SOURCE	DEPTH (feet)	ELEV. MLLW (feet)	PERCENT PASSING											
			#7	#10	#14	#18	#25	#35	#45	#60	#80	#120	#170	#200
VC-24	12	-74	100	100	100	100	100	100	99	97	91	76	50	35
VC-25	0	-63	100	100	100	100	100	100	99	97	92	77	49	31
VC-25	3	-66		92	91	91	90	89	85	74	59	35	23	21
VC-25	6	-69	100	100	100	100	100	100	100	99	99	99	97	96
VC-25	9	-72		100	100	100	100	100	99	99	98	96	90	89
VC-26	0	-63	100	100	100	100	100	100	98	95	81	65	43	32
VC-26	3	-66		84	82	81	80	80	79	71	58	41	22	12
VC-26	6	-69	100	100	100	100	100	99	98	89	71	52	43	40
VC-26	9	-72	100	100	100	100	100	100	100	98	74	31	10	5
VC-26	12	-75		99	99	99	99	98	98	97	93	85	71	65
VC-27	0	-64	100	100	100	100	100	100	99	98	91	73	48	31
VC-27	3	-67		90	89	88	88	87	87	84	78	61	40	24
VC-27	6	-70	100	99	99	99	98	98	97	96	94	90	80	75
VC-27	9	-73	100	100	100	100	100	100	100	98	88	60	31	19
VC-28	0	-64	100	100	100	100	100	100	99	98	91	76	44	37
VC-28	3	-67		87	86	85	84	84	82	64	46	28	10	10
VC-28	6	-70	100	100	100	100	100	100	100	100	99	99	98	98
VC-28	9	-73	100	100	100	100	100	100	99	93	62	27	11	8
VC-29	0	-65		95	95	94	94	94	92	81	69	50	27	19
VC-29	3	-68	100	100	100	100	100	100	100	100	96	68	34	20
VC-29	6	-71	100	100	100	100	100	100	99	92	65	26	9	6

TABLE C1
SUMMARY OF PARTICLE SIZE ANALYSIS

SOURCE	DEPTH (feet)	ELEV. MLLW (feet)	PERCENT PASSING											
			#7	#10	#14	#18	#25	#35	#45	#60	#80	#120	#170	#200
VC-29	9	-74	100	100	100	100	100	94	86	68	52	41	39	36
VC-30	0	-66	100	100	100	100	100	100	99	96	87	67	46	35
VC-30	3	-69		89	87	87	86	86	84	82	71	53	35	24
VC-30	6	-72	100	100	100	100	100	100	99	99	97	92	84	80
VC-30	9	-75		99	99	99	99	99	99	99	88	83	73	71
VC-31	0	-67	100	100	100	100	100	100	99	94	85	68	45	33
VC-31	3	-70		99	98	98	98	98	97	94	86	66	30	19
VC-31	6	-73		100	99	99	99	99	96	94	81	71	59	57
VC-31	9	-76	100	100	100	100	100	100	100	99	94	80	62	55
VC-31	12	-79	100	100	100	100	100	100	98	94	85	74	67	64
VC-32	0	-68	100	100	100	100	100	100	98	95	86	68	50	35
VC-32	3	-71		88	87	87	87	86	77	71	55	36	24	17
VC-32	6	-74	100	100	100	100	100	100	99	95	83	69	62	59
VC-32	9	-77		100	100	100	99	98	93	77	54	32	24	24
VC-33	0	-68		100	100	100	100	99	98	92	78	45	27	19
VC-33	3	-71		100	100	100	99	99	96	85	66	38	20	14
VC-33	6	-74	100	100	100	99	99	98	98	96	92	83	66	60
VC-33	9	-77	100	100	100	100	100	99	93	73	52	31	23	19
VC-34	9	-78	100	100	100	100	100	100	99	99	98	97	93	91
VC-35	0	-70	100	100	100	100	100	100	98	91	78	57	40	26
VC-35	3	-73		93	92	91	90	90	79	69	47	25	13	9

TABLE C1
SUMMARY OF PARTICLE SIZE ANALYSIS

SOURCE	DEPTH (feet)	ELEV. MLLW (feet)	PERCENT PASSING											
			#7	#10	#14	#18	#25	#35	#45	#60	#80	#120	#170	#200
VC-35	6	-76	100	100	100	100	100	100	96	92	79	67	55	52
VC-35	9	-79	100	100	100	100	100	100	87	69	35	15	7	5
VC-36	0	-69	100	100	100	100	100	100	94	89	67	40	26	19
VC-36	3	-72	100	100	100	100	100	100	99	99	98	95	91	87
VC-36	6	-75	100	100	100	100	100	100	99	99	96	85	70	64
VC-36	9	-78	100	100	100	100	100	100	100	99	97	91	84	81
VC-37	0	-71		100	100	100	100	99	99	98	96	94	93	92
VC-37	3	-74	100	100	100	100	100	100	99	99	96	89	63	50
VC-37	6	-77	100	100	100	100	100	100	99	97	81	59	43	38
VC-38	0	-73	100	100	100	100	100	99	92	84	63	41	28	22
VC-38	3	-76	100	100	100	100	99	99	99	98	97	96	94	94
VC-38	6	-79		100	100	100	100	100	99	99	99	99	99	98
VC-39	0	-73		100	100	99	99	99	95	81	61	33	24	21
VC-39	3	-76		100	99	99	99	98	96	93	82	64	58	57
VC-39	6	-79	100	100	100	100	100	99	97	95	82	69	60	57
VC-40	0	-75		100	100	100	100	99	98	82	59	23	13	10
VC-40	3	-78	100	99	99	99	99	99	99	99	99	99	99	98
VC-41	0	-75		100	100	100	100	99	95	83	63	27	17	14
VC-41	3	-78		100	100	100	100	99	91	78	31	10	4	4
VC-42	0	-76	100	100	100	100	100	99	91	84	61	24	13	10
VC-43	0	-76		100	100	100	100	99	89	81	63	32	19	17

TABLE C1
SUMMARY OF PARTICLE SIZE ANALYSIS

SOURCE	DEPTH (feet)	ELEV. MLLW (feet)	PERCENT PASSING											
			#7	#10	#14	#18	#25	#35	#45	#60	#80	#120	#170	#200
VC-43	3	-79	100	100	100	100	100	100	100	99	90	58	26	17
VC-44	0	-78		100	99	99	99	98	93	78	57	22	10	8
VC-45	0	-78		100	100	100	100	99	93	86	63	29	14	12

VC = Vibracore

APPENDIX D

GEOTECHNICAL SUBJECT INDEX AND ANNOTATED BIBLIOGRAPHY

APPENDIX D

SUBJECT INDEX AND ANNOTATED BIBLIOGRAPHY

D.1 BIBLIOGRAPHIES

Dailey and others, 1993, A compilation of existing data and reports (sediments, oceanography, biology, etc).

Emery, 1960, The sea off Southern California: Wiley, 366 p. Still a classic and excellent source.

Howell, D., 1976, Aspects of the geologic history of the California Continental Borderland, Pacific Section AAPG Miscellaneous Publication 24, 561 p. Note: Although not a true bibliography this collection of papers provides an extensive set of references and background readings.

MESA^2, INC., 1983, Geologic hazards and geotechnical assessment of the Southern California Continental Borderland: Final Report 83-14 (3 volumes including regional maps, vol. III Bibliography 88 p. with Appendix of topical content and map coverage of significant references). (Proprietary study) Note: With regional maps of the Southern California Continental Borderland this study is the most complete and current bibliographic reference available.

Roberts, A. E., 1975, Selected geologic literature on the California Continental Borderland and adjacent areas, to January 1, 1975: U.S. Geological Survey, Circular 714. Note: An excellent bibliography that includes a subject index and published abstracts.

Southern California Earthquake Center (SCEC), 1993 & 1994, Annual Reports (summaries of studies by principal investigators).

SCEC 1993 & 1994 Annual Technical Reports, VI, II & III, (Technical reports on earthquake ground motions for design purposes)

D.2 GEOPHYSICAL TRACKLINES

Fischer and others, 1987, reduced trackline map sheets of all available geophysical trackline data.

MESA[3], INC., 1986, SCIMAP sheets 1:24,000 scale map sheets of all available geophysical trackline data. Note: This proprietary set of map sheets provides tracklines, "shot-points" (locations) and core hole locations of all available data sets, including digitally processed data.

Nardin, T., 1976 and 1981. Figures showing tracklines are reproduced in these studies. Note: The availability of navigation information and high quality record copies is doubtful.

Osborne and others, 1980 and 1983. Tracklines of Army Corps of Engineers (CERC) data and data collected by the authors are shown on figures in these reports. Note: Their Appendix A (1983) contains 1:55,000 scale maps of tracklines without location-navigation control (e.g. "shot-points").

Rudat, J., 1980. Tracklines of all available data over the San Pedro margin (scale 1:24,000).

U.S. Geological Survey, Vedder and others, 1986, Map Sheet No. 1 of 4. This map sheet (1:250,000 scale) provides the generalized locations (no shot points) of all U.S. Geological Survey data. Note: Tracklines used or collected by Field and others, Greene and others, Junger and Wagner (1977) are included in this synthesis.

Woods, M., 1984. Two trackline plates (scale 1:24,000) of inner margin from eastern edge of project area to Newport Beach.

D.3 SEDIMENT AND BEDROCK

Nardin and Henyey, 1978. Bedrock lithology and age based upon oil industry data.

Nardin, 1981. Seismic stratigraphy and interpretations of bottom reflector types are used to present figures of depositional systems tracts of the slope, submarine fan and basin plain facies and to make other environmental interpretations (e.g. mass movement). Slumps and other areas of instability along the slope are figured and the submarine fans that border the margin are described in considerable detail. Text contains an excellent discussion of depositional rates and volumes of the basin and margin. A new or revised interpretation of the San Pedro Basin fault is shown by the author. Generalized geophysical tracklines of high resolution and air gun data largely confined to the slope and basin are presented as figures by the author.

Osborne, R., Darigo, and Scheidemann, 1983, Potential offshore sand and gravel resources (with 5 Appendices). Appendices (not part of text referenced above): A - Vibracore logs, B - Results of sediment grain size analysis, C - Cumulative frequency curves for sediment samples, D - Results of modal analysis, and E - Map sets (scale ~ 1:55,000): location of vibracore stations, tracklines of geophysical (high resolution profiles) data (without "shot-points") and bathymetry by MESA^2, INC. The series of publications by Osborne and his coworkers (USC graduate students) is the most detailed study of the shallow subsurface units (the Late Quaternary sediment veneer) of the inner San Pedro shelf). Five examples of vibracore logs for the five borrow sites – for beach replenishment – are presented in the text. (All vibracore logs are presented in their Appendix A. Cross-sections of the inner-mid shelf through these borrow sites based upon the vibracores and high resolution profiles are also presented Note: Most vibracores are shoaler than 20 m (~66 ft); three stations are located near the project area. (see Plates 10, 11, & 12 from Osborne and others 1983 in the text of this report).

Welday, E., and Williams, J., 1975, Offshore surficial geology of California: California Division of Mines and Geology Map Sheet 25 (scale 1:500,000). Gross sediment grain size of surficial sediment is shown as gravel, coarse sand, medium sand etc. Original data plotted on 1:125,000 scale maps.

Wimberley, S., 1964, Sediments of the Southern California mainland shelf (Ph.D. dissert.): University of Southern California. Grain size, sorting, standard deviation, skewness, clay content, silt content of surficial sediment collected using an "orange-peel" dredge (2.5' wide) with 6: to 30" depth of penetration. Sample density over the margin area is excellent from nearshore to beyond the shelf break (ca 50 fm/300 ft). Reference contains selected figures showing sediment parameters of the San Pedro Bay. Note: This is a comprehensive study of the surficial sediment characteristics of the San Pedro margin. The sampling technique used, however, may result in the loss of fines and disruption of the sample. (Box cores are the preferred sampling method for this type of study.)

D.4 STRUCTURE AND SEISMICITY

Field, M., Clarke, S., and Greene, G., 1977, Evaluation of geologic hazards in OCS petroleum lease areas, Southern California Continental Borderland: Offshore Technical Conference, OTC 2736, p. 69-73. (6 small figures including: faults, earthquakes, slumps, oil-gas seeps and geophysical tracklines – scale ~ 1"≈20 mi).

Fischer, P. J. and others (1977, 1983 & 1987) and Fischer (1992), Detailed geologic maps, isopachs and structural interpretations of the Palos Verdes fault zone.

Junger and Wagner, 1977. Probably the best structural interpretation of the San Pedro and Santa Monica margins, but the geophysical data were entirely analog and in some cases poorly located (no radio-navigation system). Bedrock interpretation and stratigraphic

interpretation and discussion in text are excellent. Note: The map by Vedder and others (1986) is based largely upon the work of these authors.

MESA²-MAA, 1994, Seismicity of the greater Los Angeles area based upon USC, USGS and CIT data files.

Nardin and Henyey, 1978. An excellent synthesis of all known geophysical data and interpretations, but structure map of these authors is inadequate. New analog seismic reflection profiles collected.

Nardin, 1981. (Also under "Sediment and Bedrock"). A more continuous interpretation of the San Pedro Basin fault than shown by Vedder and others (1986) and other workers is shown by the author. If active this fault will play a significant role in the seismic risk assessment of the San Pedro Bay area.

Vedder, Greene, and Kennedy, 1986. Four 1:250,000 color map sheets of the geology, seismicity, mapping and data sources and geophysical tracklines of Southern California represent the most current geologic synthesis of the margin area – based upon USGS studies. Faults, fault activity (Holocene, Pleistocene, Quaternary), potential fault activity, bedrock units and mass movements (slumps, etc.) are shown on the geologic map sheet. Note: This is an excellent synthesis of the shallow geology of the San Pedro Bay or margin.

BATHYMETRY

Bathymetric maps in feet, fathoms and meters produced by various governmental and industry sources vary in scale, detail and interpretation. Significant maps include:

- Continental Shelf Data Systems (CDSD), Denver, CO

Small scale reproduction shown in Appendix A. Large scale (1:24,000 and 1:48,000) versions of CSDS maps are excellent and may be the most reliable maps. We (MESA[3]) have checked these maps in the San Pedro and Santa Barbara basins with precision bathymetric profiles and found them to be excellent (contoured in feet).
Note: These maps were purchased by the California Department of Boating and Waterways and may be available from this agency.

- MESA[2], INC.
  1:24,000 scale map sheets based upon CSDS maps, NOAA charts and USGS mapping. Locally verified with detailed bathymetric data and profiles (Fischer and others, 1977) (contoured in meters). Reproduction at 1/2 scale in Fischer and others (1983).

- USC&G/NOAA Charts
  1:40,000 scale NOAA chart 18 was contoured in the area of the "shelf projection" using 1 fm interval.

- USGS
  Bathymetric map of the San Pedro Bay and margin area is the base map used by Vedder and others (1986). Larger scale versions are available from the USGS (contoured in meters).

DISTRIBUTION

1 Copy: Sea Surveyors, Inc.
821 East 2nd Street, Suite E
Benicia, California 94510
Attention: Mr. Steve Sullivan

QUALITY CONTROL REVIEWER

Gerald M. Diaz, P.E., G.E.
President

APPENDIX F

SEDIMENT GRAIN-SIZE DATA

GRAIN SIZE ANALYSIS
LABORATORY SAMPLE ID/STATION ID KEY

Grain Size Sample ID	Station ID	Core Segment Length (ft.)
	TEST SITES	
0704101	VC-45	0.0 - 1.5
0704102	VC-44	0.0 - 2.1
0704103	VC-42	0.0 - 3.0
0704104	VC-42	3.0 - 4.3
0704105	VC-43	0.0 - 3.7
0704106	VC-40	0.0 - 3.0
0704107	VC-40	3.0 - 4.6
0704108	VC-41	0.0 - 3.0
0704109	VC-41	3.0 - 5.1
0704110	VC-39	0.0 - 3.0
0704111	VC-39	3.0 - 6.0
0704112	VC-39	6.0 - 6.7
0704113	VC-38	0.0 - 3.0
0704114	VC-38	3.0 - 6.0
0704115	VC-38	6.0 - 7.4
0704116	VC-37	0.0 - 3.0
0704117	VC-37	3.0 - 6.0
0704118	VC-37	6.0 - 9.0
0704119	VC-34	0.0 - 3.0
0704120	VC-34	3.0 - 6.0
0704121	VC-34	6.0 - 9.0
0704122	VC-28	0.0 - 3.0
0704123	VC-28	3.0 - 6.0
0704124	VC-28	6.0 - 9.0
0704125	VC-28	9.0 - 12.0
0704126	VC-30	0.0 - 3.0
0704127	VC-30	3.0 - 6.0
0704128	VC-30	6.0 - 9.0
0704129	VC-30	9.0 - 12.0
0704130	VC-31	0.0 - 3.0
0704131	VC-31	3.0 - 6.0
0704132	VC-31	6.0 - 9.0
0704133	VC-31	9.0 - 12.0
0704134	VC-31	12.0 - 12.8
0704135	VC-34	0.0 - 3.0
0704136	VC-34	3.0 - 6.0
0704137	VC-34	6.0 - 9.0
0704138	VC-34	9.0 - 12.0
0704140	VC-35	3.0 - 6.0

GRAIN SIZE ANALYSIS
LABORATORY SAMPLE ID/STATION ID KEY

Grain Size Sample ID	Station ID	Core Segment Length (ft.)
0704141	VC-35	6.0 - 9.0
0704142	VC-35	9.0 - 9.9
0704143	VC-36	0.0 - 3.0
0704144	VC-36	3.0 - 6.0
0704145	VC-36	6.0 - 9.0
0704146	VC-36	9.0 - 10.6
0704147	VC-32	0.0 - 3.0
0704148	VC-32	3.0 - 6.0
0704149	VC-32	6.0 - 9.0
0704150	VC-32	9.0 - 9.5
0704151	VC-33	0.0 - 3.0
0704152	VC-33	3.0 - 6.0
0704153	VC-33	6.0 - 9.0
0704154	VC-33	9.0 - 9.5
0704155	VC-24	0.0 - 3.0
0704156	VC-24	3.0 - 6.0
0704157	VC-24	6.0 - 9.0
0704158	VC-24	9.0 - 12.0
0704159	VC-24	12.0 - 12.9
0704160	VC-26	0.0 - 3.0
0704161	VC-26	3.0 - 6.0
0704162	VC-26	6.0 - 9.0
0704163	VC-26	9.0 - 12.0
0704164	VC-26	12.0 - 13.8
0704165	VC-25	0.0 - 3.0
0704166	VC-25	3.0 - 6.0
0704167	VC-25	6.0 - 9.0
0704168	VC-25	9.0 - 12.0
0704169	VC-21	0.0 - 3.0
0704170	VC-21	3.0 - 6.0
0704171	VC-21	6.0 - 9.0
0704172	VC-21	9.0 - 12.0
0704173	VC-20	0.0 - 3.0
0704174	VC-20	3.0 - 6.0
0704175	VC-20	6.0 - 9.0
0705176	VC-20	9.0 - 12.0
0704177	VC-27	0.0 - 3.0
0704178	VC-27	3.0 - 6.0
0704179	VC-27	6.0 - 9.0
0704180	VC-27	9.0 - 11.8

GRAIN SIZE ANALYSIS
LABORATORY SAMPLE ID/STATION ID KEY

Grain Size Sample ID	Station ID	Core Segment Length (ft.)
0704181	VC-4	0.0 - 3.0
0704182	VC-3	0.0 - 1.5
0704183	VC-4	3.0 - 6.0
0704183A	VC-15	0.0 - 3.0
0704184	VC-15	3.0 - 6.0
0704185	VC-15	6.0 - 9.0
0704186	VC-15	9.0 - 12.0
0704187	VC-15	12.0 - 15.0
0704188	VC-15	15.0 - 18.0
0704190	VC-22	3.0 - 6.0
0704191	VC-22	6.0 - 9.0
0704192	VC-22	9.0 - 12.0
0704193	VC-22	12.0 - 15.0
0704194	VC-22	15.0 - 17.1
0704195	VC-23	0.0 - 3.0
0704196	VC-23	3.0 - 6.0
0704197	VC-23	6.0 - 9.0
0704198	VC-23	9.0 - 12.0
0704199	VC-23	12.0 - 13.9
0704200	VC-14	0.0 - 3.0
0704201	VC-14	3.0 - 6.0
0704202	VC-14	6.0 - 9.0
0704203	VC-14	9.0 - 12.0
0704204	VC-14	12.0 - 15.0
0704205	VC-14	15.0 - 18.0
0704206	VC-19	0.0 - 3.0
0704207	VC-19	3.0 - 6.0
0704208	VC-19	6.0 - 9.0
0704209	VC-19	9.0 - 12.0
0704210	VC-19	12.0 - 15.0
0704211	VC-13	0.0 - 3.0
0704212	VC-13	3.0 - 6.0
0704213	VC-13	6.0 - 9.0
0704214	VC-13	9.0 - 12.0
0704215	VC-13	12.0 - 13.8
0704216	VC-11	0.0 - 3.0
0704217	VC-11	3.0 - 6.0
0704218	VC-11	6.0 - 9.0
0704219	VC-11	9.0 - 12.0
0704220	VC-11	12.0 - 15.0

3 F-C

GRAIN SIZE ANALYSIS
LABORATORY SAMPLE ID/STATION ID KEY

Grain Size Sample ID	Station ID	Core Segment Length (ft.)
0704221	VC-11	15.0 - 17.2
0704222	VC-16	0.0 - 3.0
0704223	VC-16	3.0 - 6.0
0704224	VC-16	6.0 - 9.0
0704225	VC-16	9.0 - 12.0
0704226	VC-9	0.0 - 3.0
0704227	VC-9	3.0 - 6.0
0704228	VC-9	6.0 - 9.0
0704229	VC-9	9.0 - 11.7
0704230	VC-6	0.0 - 3.0
0704231	VC-6	3.0 - 4.5
0704232	VC-12	0.0 - 3.0
0704233	VC-12	3.0 - 6.0
0704234	VC-12	6.0 - 9.0
0704235	VC-12	9.0 - 12.0
0704236	VC-12	12.0 - 15.0
0704237	VC-12	15.0 - 15.2
0704238	VC-17	0.0 - 3.0
0704239	VC-17	3.0 - 6.0
0704240	VC-17	6.0 - 9.0
0704241	VC-17	9.0 - 12.0
0704242	VC-17	12.0 - 14.4
0704243	VC-7	0.0 - 3.0
0704244	VC-7	3.0 - 6.0
0704245	VC-7	6.0 - 9.0
0704246	VC-7	9.0 - 12.0
0704247	VC-18	12.0 - 13.2
0704248	VC-18	0.0 - 3.0
0704249	VC-18	3.0 - 6.0
0704250	VC-18	6.0 - 9.0
0704251	VC-18	9.0 - 12.0
0704252	VC-18	12.0 - 14.4
0704253	VC-1	0.0 - 3.0
0704254	VC-1	3.0 - 6.0
0704255	VC-1	6.0 - 9.0
0704256	VC-1	9.0 - 12.0
0704257	VC-1	12.0 - 15.0
0704258	VC-1	15.0 - 15.7
0704259	VC-2	0.0 - 3.0
0704260	VC-2	3.0 - 6.0

F-D

GRAIN SIZE ANALYSIS
LABORATORY SAMPLE ID/STATION ID KEY

Grain Size Sample ID	Station ID	Core Segment Length (ft.)
0704261	VC-2	6.0 - 9.0
0704262	VC-2	9.0 - 12.0
0704263	VC-2	12.0 - 13.5
0704264	VC-5	0.0 - 3.0
0704265	VC-5	3.0 - 6.0
0704266	VC-10	0.0 - 3.0
0704267	VC-10	3.0 - 6.0
0704268	VC-10	6.0 - 9.0
0704269	VC-10	9.0 - 12.0
0704270	VC-10	12.0 - 12.9
0704271	VC-8	0.0 - 3.0
0704272	VC-8	3.0 - 6.0
0704273	VC-8	6.0 - 9.0
0704274	VC-8	9.0 - 12.0
0704275	VC-29	0.0 - 3.0
0704276	VC-29	3.0 - 6.0
0704277	VC-29	6.0 - 9.0
0704278	VC-29	9.0 - 12.0
BEACH SITES		
0704279	Trans. 1 -30	0.5 - 3.0
0704280	Trans. 2 -30	0.5 - 3.0
0704281	Trans. 3 -30	0.5 - 3.0
0704282	Trans. 4 -30	0.5 - 3.0
0704283	Trans. 5 -30	0.5 - 3.0
0704284	Trans. 6 -30	0.5 - 3.0
0704285	Trans. 1 +12	0.5 - 3.0
0704286	Trans. 2 +12	0.5 - 3.0
0704287	Trans. 3 +12	0.5 - 3.0
0704288	Trans. 4 +12	0.5 - 3.0
0704289	Trans. 5 +12	0.5 - 3.0
0704290	Trans. 6 +12	0.5 - 3.0
0704293	Trans. 1 -24	0.5 - 3.0
0704294	Trans. 1 -18	0.5 - 3.0
0704295	Trans. 1 -12	0.5 - 3.0
0704296	Trans. 1 -6	0.5 - 3.0
0704297	Trans. 1 0	0.5 - 3.0
0704298	Trans. 1 +6	0.5 - 3.0
0704299	Trans. 2 -24	0.5 - 3.0
0704300	Trans. 2 -18	0.5 - 3.0
0704301	Trans. 2 -12	0.5 - 3.0

GRAIN SIZE ANALYSIS
LABORATORY SAMPLE ID/STATION ID KEY

Grain Size Sample ID	Station ID	Core Segment Length (ft.)
0704302	Trans. 2 -6	0.5 - 3.0
0704303	Trans. 2 0	0.5 - 3.0
0704304	Trans. 2 +6	0.5 - 3.0
0704305	Trans. 3 -24	0.5 - 3.0
0704306	Trans. 3 -18	0.5 - 3.0
0704307	Trans. 3 -12	0.5 - 3.0
0704308	Trans. 3 -6	0.5 - 3.0
0704309	Trans. 3 0	0.5 - 3.0
0704310	Trans. 3 +6	0.5 - 3.0
0704312	Trans. 4 -24	0.5 - 3.0
0704313	Trans. 4 -18	0.5 - 3.0
0704314	Trans. 4 -12	0.5 - 3.0
0704315	Trans. 4 -6	0.5 - 3.0
0704316	Trans. 4 0	0.5 - 3.0
0704317	Trans. 4 +6	0.5 - 3.0
0704318	Trans. 5 -24	0.5 - 3.0
0704319	Trans. 5 -18	0.5 - 3.0
0704320	Trans. 5 -12	0.5 - 3.0
0704321	Trans. 5 -6	0.5 - 3.0
0704322	Trans. 5 0	0.5 - 3.0
0704323	Trans. 5 +6	0.5 - 3.0
0704325	Trans. 6 -24	0.5 - 3.0
0704326	Trans. 6 -18	0.5 - 3.0
0704327	Trans. 6 -12	0.5 - 3.0
0704328	Trans. 6 -6	0.5 - 3.0
0704329	Trans. 6 0	0.5 - 3.0
0704330	Trans. 6 +6	0.5 - 3.0
REFERENCE SITES		
0704291	Is. White #1	0.16 - 0.33
0704292	Is. White #2	0.16 - 0.33
0704311	LA-2 Ref. Site #1	0.16 - 0.33
0704324	LA-2 Ref. Site #2	0.16 - 0.33
0704331	LA-2 Disposal Site #1	0.16 - 0.33
0704332	LA-2 Disposal Site #2	0.16 - 0.33

to F-F

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704253
Station = VC-1
Depth (ft) = 0

Total sample weight = 29.337 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.439	1.496	1.496
2000.000	-1.00	0.033	0.112	1.609
1414.214	-0.50	0.038	0.130	1.738
1000.000	0.00	0.081	0.276	2.015
707.107	0.50	0.066	0.225	2.240
500.000	1.00	0.062	0.211	2.451
353.553	1.50	0.261	0.890	3.341
250.000	2.00	0.529	1.803	5.144
176.777	2.50	3.975	13.550	18.693
125.000	3.00	5.053	17.224	35.917
88.388	3.50	7.592	25.879	61.796
74.325	3.75	3.265	11.129	72.926
62.500	4.00	1.973	6.725	79.651
31.250	5.00	1.461	4.978	84.630
15.625	6.00	0.771	2.628	87.257
7.813	7.00	0.730	2.489	89.746
3.906	8.00	0.771	2.628	92.374
1.953	9.00	0.406	1.383	93.757
0.977	> 9.0	1.832	6.243	100.000

% < 4 phi = 20.349
% > 1 phi = 2.240
% gravel = 1.609
% sand = 78.042
% silt = 12.723
% clay = 7.626

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.272	103.52	3.637	80.38	1.236	0.295

*** 95th percentile not reached ***

5th percentile = 1.960
16th percentile = 2.401
50th percentile = 3.272
84th percentile = 4.874
95th percentile = .

MEC Analytical Systems, Inc.
2433 Impala Drive
Carlsbad, CA 92008

F-1

VC-1-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704254
Station = VC-1
Depth (ft) = 3

Total sample weight = 28.769 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.153	0.532	0.532
2000.000	-1.00	0.041	0.143	0.674
1414.214	-0.50	0.049	0.170	0.845
1000.000	0.00	0.045	0.156	1.001
707.107	0.50	0.024	0.083	1.084
500.000	1.00	0.028	0.097	1.182
353.553	1.50	0.042	0.146	1.328
250.000	2.00	0.217	0.754	2.082
176.777	2.50	0.500	1.738	3.820
125.000	3.00	2.268	7.883	11.703
88.388	3.50	7.505	26.087	37.790
74.325	3.75	4.413	15.339	53.129
62.500	4.00	3.620	12.583	65.712
31.250	5.00	6.167	21.435	87.147
15.625	6.00	0.609	2.115	89.262
7.813	7.00	0.609	2.115	91.377
3.906	8.00	0.649	2.256	93.634
1.953	9.00	0.325	1.128	94.762
0.977	> 9.0	1.507	5.238	100.000

% < 4 phi = 34.288
% > 1 phi = 1.084
% gravel = 0.674
% sand = 65.038
% silt = 27.922
% clay = 6.366

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.699	77.00	3.968	63.91	0.885	0.304

*** 95th percentile not reached ***

5th percentile = 2.575
16th percentile = 3.082
50th percentile = 3.699
84th percentile = 4.853
95th percentile = .

MEC Analytical Systems, Inc.
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Carlsbad, CA 92008

F-2

VC-1-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704255
Station = VC-1
Depth (ft) = 6

Total sample weight = 27.595 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.019	0.069	0.069
2000.000	-1.00	0.001	0.004	0.072
1414.214	-0.50	0.002	0.007	0.080
1000.000	0.00	0.009	0.033	0.112
707.107	0.50	0.021	0.076	0.188
500.000	1.00	0.011	0.040	0.228
353.553	1.50	0.035	0.127	0.355
250.000	2.00	0.046	0.167	0.522
176.777	2.50	0.182	0.660	1.181
125.000	3.00	0.587	2.127	3.309
88.388	3.50	1.724	6.247	9.556
74.325	3.75	1.528	5.537	15.093
62.500	4.00	1.273	4.613	19.706
31.250	5.00	5.558	20.142	39.848
15.625	6.00	4.666	16.907	56.755
7.813	7.00	3.205	11.614	68.370
3.906	8.00	2.678	9.703	78.073
1.953	9.00	1.745	6.322	84.395
0.977	> 9.0	4.306	15.605	100.000

% < 4 phi = 80.294
% > 1 phi = 0.188
% gravel = 0.072
% sand = 19.634
% silt = 58.366
% clay = 21.927

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
5.600	20.61	6.368	12.10	2.569	0.299

*** 95th percentile not reached ***

5th percentile = 3.135
16th percentile = 3.799
50th percentile = 5.600
84th percentile = 8.938
95th percentile = .

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F-3

VC-1-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704256
Station = VC-1
Depth (ft) = 9

Total sample weight = 29.068 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.000	0.000	0.000
707.107	0.50	0.005	0.017	0.017
500.000	1.00	0.007	0.024	0.041
353.553	1.50	0.028	0.096	0.138
250.000	2.00	0.042	0.144	0.282
176.777	2.50	0.469	1.613	1.896
125.000	3.00	1.649	5.673	7.568
88.388	3.50	5.496	18.907	26.476
74.325	3.75	5.244	18.040	44.516
62.500	4.00	4.276	14.710	59.226
31.250	5.00	8.479	29.170	88.396
15.625	6.00	1.826	6.281	94.676
7.813	7.00	0.609	2.094	96.770
3.906	8.00	0.284	0.977	97.747
1.953	9.00	0.041	0.140	97.886
0.977	> 9.0	0.614	2.114	100.000

% < 4 phi = 40.774
% > 1 phi = 0.017
% gravel = 0.000
% sand = 59.226
% silt = 38.521
% clay = 2.253

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.843	69.68	4.036	60.95	0.813	0.237

5th percentile = 2.774
16th percentile = 3.223
50th percentile = 3.843
84th percentile = 4.849
95th percentile = 6.155

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F-4

VC-1-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704257
Station = VC-1
Depth (ft) = 12

Total sample weight = 13.929 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.000	0.000	0.000
707.107	0.50	0.000	0.000	0.000
500.000	1.00	0.000	0.000	0.000
353.553	1.50	0.000	0.000	0.000
250.000	2.00	0.004	0.029	0.029
176.777	2.50	0.010	0.072	0.101
125.000	3.00	0.007	0.050	0.151
88.388	3.50	0.029	0.208	0.359
74.325	3.75	0.019	0.136	0.495
62.500	4.00	0.020	0.144	0.639
31.250	5.00	0.325	2.330	2.969
15.625	6.00	1.055	7.573	10.542
7.813	7.00	2.069	14.854	25.396
3.906	8.00	2.150	15.437	40.832
1.953	9.00	2.029	14.563	55.395
0.977	> 9.0	6.213	44.605	100.000

% < 4 phi = 99.361
% > 1 phi = 0.000
% gravel = 0.000
% sand = 0.639
% silt = 40.193
% clay = 59.168

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
8.630	2.52	8.666	2.46	2.298	0.016

*** 84th percentile extrapolated ***
*** 95th percentile not reached ***

5th percentile = 5.268
16th percentile = 6.367
50th percentile = 8.630
84th percentile = 10.964
95th percentile = .

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F-5

VC-1-12

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704258
Station = VC-1
Depth (ft) = 15

Total sample weight = 28.767 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.013	0.045	0.045
1000.000	0.00	0.008	0.028	0.073
707.107	0.50	0.011	0.038	0.111
500.000	1.00	0.010	0.035	0.146
353.553	1.50	0.039	0.136	0.282
250.000	2.00	0.103	0.358	0.640
176.777	2.50	0.291	1.012	1.651
125.000	3.00	1.856	6.452	8.103
88.388	3.50	3.390	11.784	19.887
74.325	3.75	1.865	6.483	26.370
62.500	4.00	1.417	4.926	31.296
31.250	5.00	7.159	24.886	56.182
15.625	6.00	4.689	16.300	72.481
7.813	7.00	3.266	11.351	83.833
3.906	8.00	1.382	4.803	88.635
1.953	9.00	1.130	3.929	92.565
0.977	> 9.0	2.139	7.435	100.000

% < 4 phi = 68.704
% > 1 phi = 0.111
% gravel = 0.000
% sand = 31.296
% silt = 57.339
% clay = 11.365

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
4.752	37.12	5.185	27.49	1.850	0.234

*** 95th percentile not reached ***

5th percentile = 2.760
16th percentile = 3.335
50th percentile = 4.752
84th percentile = 7.035
95th percentile = .

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F-6

VC-1-15

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704254
Station = VC-1
Depth (ft) = 3

Total sample weight = 28.769 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.153	0.532	0.532
2000.000	-1.00	0.041	0.143	0.674
1414.214	-0.50	0.049	0.170	0.845
1000.000	0.00	0.045	0.156	1.001
707.107	0.50	0.024	0.083	1.084
500.000	1.00	0.028	0.097	1.182
353.553	1.50	0.042	0.146	1.328
250.000	2.00	0.217	0.754	2.082
176.777	2.50	0.500	1.738	3.820
125.000	3.00	2.268	7.883	11.703
88.388	3.50	7.505	26.087	37.790
74.325	3.75	4.413	15.339	53.129
62.500	4.00	3.620	12.583	65.712
31.250	5.00	6.167	21.435	87.147
15.625	6.00	0.609	2.115	89.262
7.813	7.00	0.609	2.115	91.377
3.906	8.00	0.649	2.256	93.634
1.953	9.00	0.325	1.128	94.762
0.977	> 9.0	1.507	5.238	100.000

% < 4 phi = 34.288
% > 1 phi = 1.084
% gravel = 0.674
% sand = 65.038
% silt = 27.922
% clay = 6.366

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.699	77.00	3.968	63.91	0.885	0.304

*** 95th percentile not reached ***

5th percentile = 2.575
16th percentile = 3.082
50th percentile = 3.699
84th percentile = 4.853
95th percentile = .

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GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704260A
Station = VC-2
Depth (ft) = 3

Total sample weight = 32.192 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	1.945	6.042	6.042
2000.000	-1.00	0.484	1.503	7.545
1414.214	-0.50	0.289	0.898	8.443
1000.000	0.00	0.297	0.923	9.366
707.107	0.50	0.159	0.494	9.860
500.000	1.00	0.093	0.289	10.149
353.553	1.50	0.074	0.230	10.378
250.000	2.00	0.218	0.677	11.056
176.777	2.50	0.582	1.808	12.864
125.000	3.00	2.958	9.189	22.052
88.388	3.50	8.052	25.013	47.065
74.325	3.75	4.922	15.290	62.354
62.500	4.00	5.249	16.305	78.660
31.250	5.00	4.898	15.216	93.876
15.625	6.00	0.502	1.561	95.436
7.813	7.00	0.419	1.301	96.737
3.906	8.00	0.084	0.260	96.997
1.953	9.00	0.209	0.650	97.647
0.977	> 9.0	0.757	2.353	100.000

% < 4 phi = 21.340
% > 1 phi = 9.860
% gravel = 7.545
% sand = 71.115
% silt = 18.337
% clay = 3.003

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.548	85.50	3.511	87.73	0.840	-0.044

*** 5th percentile not obtainable ***

5th percentile = .
16th percentile = 2.671
50th percentile = 3.548
84th percentile = 4.351
95th percentile = 5.720

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F-8

VC-2-3A

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704260B
Station = VC-2
Depth (ft) = 3

Total sample weight = 30.422 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	1.696	5.575	5.575
2000.000	-1.00	0.735	2.416	7.991
1414.214	-0.50	0.382	1.256	9.247
1000.000	0.00	0.363	1.193	10.440
707.107	0.50	0.164	0.539	10.979
500.000	1.00	0.095	0.312	11.291
353.553	1.50	0.087	0.286	11.577
250.000	2.00	0.207	0.680	12.257
176.777	2.50	0.701	2.304	14.562
125.000	3.00	2.765	9.089	23.650
88.388	3.50	7.565	24.867	48.517
74.325	3.75	5.312	17.461	65.978
62.500	4.00	4.276	14.055	80.033
31.250	5.00	4.228	13.899	93.932
15.625	6.00	0.377	1.239	95.171
7.813	7.00	0.167	0.550	95.721
3.906	8.00	0.167	0.550	96.272
1.953	9.00	0.335	1.101	97.373
0.977	> 9.0	0.799	2.627	100.000

% < 4 phi = 19.967
% > 1 phi = 10.979
% gravel = 7.991
% sand = 72.043
% silt = 16.239
% clay = 3.728

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.521	87.10	3.432	92.64	0.853	-0.104

*** 5th percentile not obtainable ***

5th percentile = .
16th percentile = 2.579
50th percentile = 3.521
84th percentile = 4.285
95th percentile = 5.862

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F-9

VC-2-3B

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704261
Station = VC-2
Depth (ft) = 6

Total sample weight = 24.554 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.016	0.065	0.065
1414.214	-0.50	0.016	0.065	0.130
1000.000	0.00	0.033	0.134	0.265
707.107	0.50	0.021	0.086	0.350
500.000	1.00	0.017	0.069	0.419
353.553	1.50	0.089	0.362	0.782
250.000	2.00	0.089	0.362	1.144
176.777	2.50	0.511	2.081	3.226
125.000	3.00	0.812	3.307	6.533
88.388	3.50	1.961	7.987	14.519
74.325	3.75	1.508	6.142	20.661
62.500	4.00	1.684	6.858	27.519
31.250	5.00	5.568	22.677	50.197
15.625	6.00	3.475	14.152	64.349
7.813	7.00	3.224	13.129	77.478
3.906	8.00	1.758	7.161	84.639
1.953	9.00	0.921	3.751	88.390
0.977	> 9.0	2.851	11.610	100.000

% < 4 phi = 72.481
% > 1 phi = 0.350
% gravel = 0.065
% sand = 27.454
% silt = 57.120
% clay = 15.361

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
4.991	31.44	5.736	18.77	2.175	0.342

*** 95th percentile not reached ***

5th percentile = 2.768
16th percentile = 3.560
50th percentile = 4.991
84th percentile = 7.911
95th percentile = .

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F-10

VC-2-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704262
Station = VC-2
Depth (ft) = 9

Total sample weight = 28.384 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.000	0.000	0.000
707.107	0.50	0.008	0.028	0.028
500.000	1.00	0.001	0.004	0.032
353.553	1.50	0.005	0.018	0.049
250.000	2.00	0.007	0.025	0.074
176.777	2.50	0.011	0.039	0.113
125.000	3.00	0.048	0.169	0.282
88.388	3.50	0.130	0.458	0.740
74.325	3.75	0.129	0.454	1.194
62.500	4.00	0.159	0.560	1.754
31.250	5.00	3.266	11.505	13.259
15.625	6.00	6.196	21.829	35.089
7.813	7.00	8.206	28.909	63.998
3.906	8.00	3.893	13.717	77.715
1.953	9.00	1.842	6.490	84.205
0.977	> 9.0	4.483	15.795	100.000

% < 4 phi = 98.246
% > 1 phi = 0.028
% gravel = 0.000
% sand = 1.754
% silt = 75.960
% clay = 22.285

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
6.516	10.93	7.047	7.56	1.921	0.276

*** 95th percentile not reached ***

5th percentile = 4.282
16th percentile = 5.126
50th percentile = 6.516
84th percentile = 8.968
95th percentile = .

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VC-2-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704263
Station = VC-2
Depth (ft) = 12

Total sample weight = 30.857 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.017	0.055	0.055
707.107	0.50	0.007	0.023	0.078
500.000	1.00	0.010	0.032	0.110
353.553	1.50	0.054	0.175	0.285
250.000	2.00	0.096	0.311	0.596
176.777	2.50	0.943	3.056	3.652
125.000	3.00	3.799	12.312	15.964
88.388	3.50	8.724	28.273	44.237
74.325	3.75	3.771	12.221	56.458
62.500	4.00	2.212	7.169	63.626
31.250	5.00	4.019	13.025	76.651
15.625	6.00	2.219	7.191	83.842
7.813	7.00	1.633	5.291	89.134
3.906	8.00	1.005	3.256	92.390
1.953	9.00	0.670	2.171	94.561
0.977	> 9.0	1.678	5.439	100.000

% < 4 phi = 36.374
% > 1 phi = 0.078
% gravel = 0.000
% sand = 63.626
% silt = 28.764
% clay = 7.610

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.618	81.45	4.515	43.73	1.515	0.592

*** 95th percentile not reached ***

5th percentile = 2.555
16th percentile = 3.001
50th percentile = 3.618
84th percentile = 6.030
95th percentile = .

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VC-2-12

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704182
Station = VC-3
Depth (ft) = 0

Total sample weight = 27.749 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.259	0.933	0.933
2000.000	-1.00	0.046	0.166	1.099
1414.214	-0.50	0.037	0.133	1.232
1000.000	0.00	0.069	0.249	1.481
707.107	0.50	0.061	0.220	1.701
500.000	1.00	0.095	0.342	2.043
353.553	1.50	0.358	1.290	3.333
250.000	2.00	1.202	4.332	7.665
176.777	2.50	1.872	6.746	14.411
125.000	3.00	4.059	14.627	29.039
88.388	3.50	5.452	19.647	48.686
74.325	3.75	3.417	12.314	61.000
62.500	4.00	2.459	8.861	69.861
31.250	5.00	4.422	15.936	85.797
15.625	6.00	0.933	3.363	89.160
7.813	7.00	0.690	2.485	91.645
3.906	8.00	0.568	2.047	93.692
1.953	9.00	0.284	1.023	94.715
0.977	> 9.0	1.466	5.285	100.000

% < 4 phi = 30.139
% > 1 phi = 1.701
% gravel = 1.099
% sand = 68.762
% silt = 23.831
% clay = 6.308

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.527	86.77	3.721	75.85	1.166	0.166

*** 95th percentile not reached ***

5th percentile = 1.692
16th percentile = 2.554
50th percentile = 3.527
84th percentile = 4.887
95th percentile = .

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VC-3-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704181
Station = VC-4
Depth (ft) = 0

Total sample weight = 28.434 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.034	0.120	0.120
2000.000	-1.00	0.008	0.028	0.148
1414.214	-0.50	0.036	0.127	0.274
1000.000	0.00	0.033	0.116	0.390
707.107	0.50	0.026	0.091	0.482
500.000	1.00	0.026	0.091	0.573
353.553	1.50	0.219	0.770	1.343
250.000	2.00	0.342	1.203	2.546
176.777	2.50	1.918	6.745	9.292
125.000	3.00	3.671	12.911	22.202
88.388	3.50	6.574	23.120	45.323
74.325	3.75	3.484	12.253	57.576
62.500	4.00	1.387	4.878	62.454
31.250	5.00	3.002	10.558	73.012
15.625	6.00	1.258	4.423	77.435
7.813	7.00	1.258	4.423	81.859
3.906	8.00	1.217	4.280	86.139
1.953	9.00	1.014	3.567	89.706
0.977	> 9.0	2.927	10.294	100.000

% < 4 phi = 37.546
% > 1 phi = 0.482
% gravel = 0.148
% sand = 62.306
% silt = 23.685
% clay = 13.861

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.595	82.73	5.130	28.56	2.370	0.647

*** 95th percentile not reached ***

5th percentile = 2.182
16th percentile = 2.760
50th percentile = 3.595
84th percentile = 7.500
95th percentile = .

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F-14

VC-4-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704183
Station = VC-4
Depth (ft) = 3

Total sample weight = 25.576 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.084	0.328	0.328
2000.000	-1.00	0.008	0.031	0.360
1414.214	-0.50	0.018	0.070	0.430
1000.000	0.00	0.018	0.070	0.500
707.107	0.50	0.017	0.066	0.567
500.000	1.00	0.015	0.059	0.626
353.553	1.50	0.095	0.371	0.997
250.000	2.00	0.191	0.747	1.744
176.777	2.50	0.903	3.531	5.275
125.000	3.00	2.480	9.697	14.971
88.388	3.50	0.254	0.993	15.964
74.325	3.75	8.090	31.631	47.596
62.500	4.00	1.875	7.331	54.927
31.250	5.00	2.962	11.580	66.507
15.625	6.00	0.771	3.014	69.521
7.813	7.00	1.420	5.552	75.073
3.906	8.00	1.866	7.297	82.369
1.953	9.00	1.420	5.552	87.921
0.977	> 9.0	3.089	12.079	100.000

% < 4 phi = 45.073
% > 1 phi = 0.567
% gravel = 0.360
% sand = 54.567
% silt = 27.442
% clay = 17.631

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.832	70.22	5.897	16.78	2.397	0.862

*** 95th percentile not reached ***

5th percentile = 2.461
16th percentile = 3.500
50th percentile = 3.832
84th percentile = 8.294
95th percentile = .

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VC-4-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704264
Station = VC-5
Depth (ft) = 0

Total sample weight = 31.386 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.003	0.010	0.010
1414.214	-0.50	0.018	0.057	0.067
1000.000	0.00	0.016	0.051	0.118
707.107	0.50	0.023	0.073	0.191
500.000	1.00	0.154	0.491	0.682
353.553	1.50	0.533	1.698	2.380
250.000	2.00	1.054	3.358	5.738
176.777	2.50	2.022	6.442	12.181
125.000	3.00	8.129	25.900	38.081
88.388	3.50	10.415	33.184	71.265
74.325	3.75	4.214	13.426	84.691
62.500	4.00	1.703	5.426	90.117
31.250	5.00	1.800	5.736	95.853
15.625	6.00	0.419	1.334	97.187
7.813	7.00	0.084	0.267	97.453
3.906	8.00	0.209	0.667	98.120
1.953	9.00	0.042	0.133	98.254
0.977	> 9.0	0.548	1.746	100.000

% < 4 phi = 9.883
% > 1 phi = 0.191
% gravel = 0.010
% sand = 90.107
% silt = 8.003
% clay = 1.880

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.180	110.37	3.155	112.23	0.582	-0.042

5th percentile = 1.890
16th percentile = 2.574
50th percentile = 3.180
84th percentile = 3.737
95th percentile = 4.851

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F-1.6

VC-5-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704265
Station = VC-5
Depth (ft) = 3

Total sample weight = 33.600 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.006	0.018	0.018
1000.000	0.00	0.023	0.068	0.086
707.107	0.50	0.097	0.289	0.375
500.000	1.00	0.553	1.646	2.021
353.553	1.50	1.622	4.827	6.848
250.000	2.00	4.024	11.976	18.824
176.777	2.50	4.488	13.357	32.181
125.000	3.00	4.317	12.848	45.029
88.388	3.50	3.606	10.732	55.761
74.325	3.75	1.627	4.842	60.603
62.500	4.00	0.967	2.878	63.481
31.250	5.00	3.391	10.092	73.574
15.625	6.00	1.256	3.738	77.312
7.813	7.00	1.172	3.489	80.801
3.906	8.00	1.507	4.486	85.286
1.953	9.00	1.172	3.489	88.775
0.977	> 9.0	3.772	11.225	100.000

% < 4 phi = 36.519
% > 1 phi = 0.375
% gravel = 0.000
% sand = 63.481
% silt = 21.805
% clay = 14.714

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.232	106.46	4.798	35.95	2.916	0.537

*** 95th percentile not reached ***

5th percentile = 1.309
16th percentile = 1.882
50th percentile = 3.232
84th percentile = 7.713
95th percentile = .

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VC-5-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704230A
Station = VC-6
Depth (ft) = 0

Total sample weight = 27.501 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	1.318	4.792	4.792
2000.000	-1.00	0.641	2.331	7.123
1414.214	-0.50	0.493	1.793	8.916
1000.000	0.00	0.432	1.571	10.487
707.107	0.50	0.226	0.822	11.308
500.000	1.00	0.215	0.782	12.090
353.553	1.50	0.364	1.324	13.414
250.000	2.00	2.018	7.338	20.752
176.777	2.50	3.843	13.974	34.725
125.000	3.00	6.407	23.297	58.022
88.388	3.50	3.938	14.319	72.342
74.325	3.75	1.746	6.349	78.690
62.500	4.00	0.905	3.291	81.981
31.250	5.00	0.933	3.393	85.374
15.625	6.00	1.095	3.983	89.357
7.813	7.00	0.527	1.918	91.275
3.906	8.00	0.446	1.623	92.898
1.953	9.00	0.771	2.803	95.700
0.977	> 9.0	1.182	4.300	100.000

% < 4 phi = 18.019
% > 1 phi = 11.308
% gravel = 7.123
% sand = 74.858
% silt = 10.916
% clay = 7.102

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.828	140.84	3.136	113.78	1.459	0.211

5th percentile = -1.455
16th percentile = 1.676
50th percentile = 2.828
84th percentile = 4.595
95th percentile = 8.750

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VC-6-0A

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704230B
Station = VC-6
Depth (ft) = 0

Total sample weight = 28.845 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.957	3.318	3.318
2000.000	-1.00	0.402	1.394	4.711
1414.214	-0.50	0.494	1.713	6.424
1000.000	0.00	0.269	0.933	7.356
707.107	0.50	0.234	0.811	8.168
500.000	1.00	0.163	0.565	8.733
353.553	1.50	0.962	3.335	12.068
250.000	2.00	1.642	5.692	17.760
176.777	2.50	5.229	18.128	35.888
125.000	3.00	6.172	21.397	57.285
88.388	3.50	5.239	18.162	75.447
74.325	3.75	1.641	5.689	81.136
62.500	4.00	1.054	3.654	84.790
31.250	5.00	1.014	3.516	88.306
15.625	6.00	0.649	2.250	90.556
7.813	7.00	0.568	1.969	92.525
3.906	8.00	0.893	3.094	95.619
1.953	9.00	0.406	1.406	97.026
0.977	> 9.0	0.858	2.974	100.000

% < 4 phi = 15.210
% > 1 phi = 8.168
% gravel = 4.711
% sand = 80.078
% silt = 10.830
% clay = 4.381

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.830	140.65	2.896	134.37	1.050	0.063

5th percentile = -0.916
16th percentile = 1.845
50th percentile = 2.830
84th percentile = 3.946
95th percentile = 7.800

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VC-6-03

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704231
Station = VC-6
Depth (ft) = 3

Total sample weight = 30.513 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.254	0.832	0.832
2000.000	-1.00	0.165	0.541	1.373
1414.214	-0.50	0.144	0.472	1.845
1000.000	0.00	0.085	0.279	2.124
707.107	0.50	0.074	0.243	2.366
500.000	1.00	0.111	0.364	2.730
353.553	1.50	0.264	0.865	3.595
250.000	2.00	0.905	2.966	6.561
176.777	2.50	2.550	8.357	14.918
125.000	3.00	6.400	20.974	35.892
88.388	3.50	8.024	26.297	62.189
74.325	3.75	4.184	13.712	75.901
62.500	4.00	2.398	7.859	83.760
31.250	5.00	2.475	8.110	91.870
15.625	6.00	0.771	2.526	94.396
7.813	7.00	0.041	0.133	94.529
3.906	8.00	0.446	1.463	95.992
1.953	9.00	0.527	1.728	97.720
0.977	> 9.0	0.696	2.280	100.000

% < 4 phi = 16.240
% > 1 phi = 2.366
% gravel = 1.373
% sand = 82.387
% silt = 12.232
% clay = 4.008

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.268	103.79	3.278	103.11	0.752	0.013

5th percentile = 1.737
16th percentile = 2.526
50th percentile = 3.268
84th percentile = 4.030
95th percentile = 7.322

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VC-6-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704243
Station = VC-7
Depth (ft) = 0

Total sample weight = 25.060 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.186	0.742	0.742
2000.000	-1.00	0.092	0.367	1.109
1414.214	-0.50	0.045	0.180	1.289
1000.000	0.00	0.032	0.128	1.417
707.107	0.50	0.008	0.032	1.449
500.000	1.00	0.004	0.016	1.464
353.553	1.50	0.009	0.036	1.500
250.000	2.00	0.006	0.024	1.524
176.777	2.50	0.022	0.088	1.612
125.000	3.00	0.041	0.164	1.776
88.388	3.50	0.166	0.662	2.438
74.325	3.75	0.314	1.253	3.691
62.500	4.00	0.299	1.193	4.884
31.250	5.00	0.732	2.920	7.805
15.625	6.00	3.984	15.899	23.704
7.813	7.00	7.074	28.229	51.933
3.906	8.00	5.367	21.415	73.348
1.953	9.00	2.073	8.274	81.622
0.977	> 9.0	4.606	18.378	100.000

% < 4 phi = 95.116
% > 1 phi = 1.449
% gravel = 1.109
% sand = 3.775
% silt = 68.464
% clay = 26.652

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
6.932	8.19	7.336	6.19	1.820	0.222

*** 84th percentile extrapolated ***
*** 95th percentile not reached ***

5th percentile = 4.040
16th percentile = 5.515
50th percentile = 6.932
84th percentile = 9.156
95th percentile = .

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VC-7-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704244
Station = VC-7
Depth (ft) = 3

Total sample weight = 29.073 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	4.624	15.905	15.905
2000.000	-1.00	0.069	0.237	16.142
1414.214	-0.50	0.046	0.158	16.301
1000.000	0.00	0.039	0.134	16.435
707.107	0.50	0.032	0.110	16.545
500.000	1.00	0.024	0.083	16.627
353.553	1.50	0.048	0.165	16.792
250.000	2.00	0.111	0.382	17.174
176.777	2.50	0.132	0.454	17.628
125.000	3.00	0.253	0.870	18.498
88.388	3.50	0.696	2.394	20.893
74.325	3.75	0.684	2.353	23.245
62.500	4.00	0.674	2.318	25.564
31.250	5.00	3.781	13.006	38.569
15.625	6.00	13.905	47.827	86.396
7.813	7.00	2.317	7.971	94.367
3.906	8.00	0.041	0.140	94.507
1.953	9.00	0.081	0.280	94.787
0.977	> 9.0	1.516	5.213	100.000

% < 4 phi = 74.436
% > 1 phi = 16.545
% gravel = 16.142
% sand = 9.421
% silt = 68.943
% clay = 5.493

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
5.239	26.48	2.325	199.57	3.625	-0.804

*** 5th percentile not obtainable ***
*** 95th percentile not reached ***

5th percentile = .
16th percentile = -1.300
50th percentile = 5.239
84th percentile = 5.950
95th percentile = .

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VC-7-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704245
Station = VC-7
Depth (ft) = 6

Total sample weight = 32.541 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.006	0.018	0.018
707.107	0.50	0.003	0.009	0.028
500.000	1.00	0.043	0.132	0.160
353.553	1.50	1.041	3.199	3.359
250.000	2.00	1.933	5.940	9.299
176.777	2.50	8.342	25.635	34.934
125.000	3.00	10.217	31.397	66.332
88.388	3.50	5.910	18.162	84.493
74.325	3.75	1.731	5.319	89.813
62.500	4.00	0.783	2.406	92.219
31.250	5.00	0.894	2.749	94.968
15.625	6.00	0.366	1.124	96.092
7.813	7.00	0.041	0.125	96.217
3.906	8.00	0.325	1.000	97.216
1.953	9.00	0.041	0.125	97.341
0.977	> 9.0	0.865	2.659	100.000

% < 4 phi = 7.781
% > 1 phi = 0.028
% gravel = 0.000
% sand = 92.219
% silt = 4.998
% clay = 2.784

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.740	149.69	2.809	142.74	0.678	0.101

5th percentile = 1.638
16th percentile = 2.131
50th percentile = 2.740
84th percentile = 3.486
95th percentile = 5.029

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VC-7-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704246
Station = VC-7
Depth (ft) = 9

Total sample weight = 30.073 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.009	0.030	0.030
1414.214	-0.50	0.011	0.037	0.067
1000.000	0.00	0.006	0.020	0.086
707.107	0.50	0.047	0.156	0.243
500.000	1.00	0.286	0.951	1.194
353.553	1.50	0.784	2.607	3.801
250.000	2.00	1.847	6.142	9.943
176.777	2.50	2.251	7.485	17.428
125.000	3.00	2.370	7.881	25.309
88.388	3.50	2.417	8.037	33.346
74.325	3.75	1.148	3.817	37.163
62.500	4.00	0.956	3.179	40.342
31.250	5.00	2.073	6.895	47.237
15.625	6.00	2.765	9.193	56.430
7.813	7.00	1.830	6.084	62.514
3.906	8.00	3.456	11.491	74.005
1.953	9.00	1.708	5.678	79.683
0.977	> 9.0	6.110	20.317	100.000

% < 4 phi = 59.658
% > 1 phi = 0.243
% gravel = 0.030
% sand = 40.312
% silt = 33.663
% clay = 25.995

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
5.301	25.37	5.971	15.94	3.567	0.188

*** 84th percentile extrapolated ***
*** 95th percentile not reached ***

5th percentile = 1.598
16th percentile = 2.405
50th percentile = 5.301
84th percentile = 9.538
95th percentile = .

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VC-7-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704247
Station = VC-7
Depth (ft) = 12

Total sample weight = 29.783 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.014	0.047	0.047
707.107	0.50	0.084	0.282	0.329
500.000	1.00	0.190	0.638	0.967
353.553	1.50	0.751	2.522	3.489
250.000	2.00	0.548	1.840	5.329
176.777	2.50	1.211	4.066	9.395
125.000	3.00	1.958	6.574	15.969
88.388	3.50	2.456	8.246	24.216
74.325	3.75	1.735	5.826	30.041
62.500	4.00	1.553	5.214	35.256
31.250	5.00	5.285	17.746	53.002
15.625	6.00	3.131	10.511	63.513
7.813	7.00	3.374	11.330	74.844
3.906	8.00	1.382	4.641	79.485
1.953	9.00	1.382	4.641	84.127
0.977	> 9.0	4.728	15.873	100.000

% < 4 phi = 64.744
% > 1 phi = 0.329
% gravel = 0.000
% sand = 35.256
% silt = 44.230
% clay = 20.515

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
4.831	35.14	5.987	15.76	2.985	0.387

*** 95th percentile not reached ***

5th percentile = 1.911
16th percentile = 3.002
50th percentile = 4.831
84th percentile = 8.973
95th percentile = .

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VC-7-12

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704271
Station = VC-8
Depth (ft) = 0

Total sample weight = 21.816 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.330	1.513	1.513
2000.000	-1.00	0.236	1.082	2.594
1414.214	-0.50	0.180	0.825	3.420
1000.000	0.00	0.160	0.733	4.153
707.107	0.50	0.108	0.495	4.648
500.000	1.00	0.098	0.449	5.097
353.553	1.50	0.428	1.962	7.059
250.000	2.00	0.347	1.591	8.650
176.777	2.50	0.665	3.048	11.698
125.000	3.00	0.437	2.003	13.701
88.388	3.50	0.288	1.320	15.021
74.325	3.75	0.126	0.578	15.599
62.500	4.00	0.069	0.316	15.915
31.250	5.00	0.487	2.232	18.147
15.625	6.00	1.501	6.881	25.028
7.813	7.00	3.530	16.179	41.207
3.906	8.00	3.611	16.551	57.758
1.953	9.00	2.840	13.018	70.776
0.977	> 9.0	6.375	29.224	100.000

% < 4 phi = 84.085
% > 1 phi = 4.648
% gravel = 2.594
% sand = 13.321
% silt = 41.843
% clay = 42.242

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
7.531	5.41	6.986	7.89	2.948	-0.185

*** 84th percentile extrapolated ***
*** 95th percentile not reached ***

5th percentile = 0.892
16th percentile = 4.038
50th percentile = 7.531
84th percentile = 9.935
95th percentile = .

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VC-8-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704272
Station = VC-8
Depth (ft) = 3

Total sample weight = 24.313 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.012	0.049	0.049
1414.214	-0.50	0.012	0.049	0.099
1000.000	0.00	0.017	0.070	0.169
707.107	0.50	0.023	0.095	0.263
500.000	1.00	0.031	0.128	0.391
353.553	1.50	0.023	0.095	0.485
250.000	2.00	0.038	0.156	0.642
176.777	2.50	0.074	0.304	0.946
125.000	3.00	0.218	0.897	1.843
88.388	3.50	0.505	2.077	3.920
74.325	3.75	0.371	1.526	5.446
62.500	4.00	0.386	1.588	7.033
31.250	5.00	1.704	7.008	14.041
15.625	6.00	1.907	7.843	21.884
7.813	7.00	1.988	8.176	30.060
3.906	8.00	4.747	19.523	49.583
1.953	9.00	3.814	15.685	65.268
0.977	> 9.0	8.444	34.732	100.000

% < 4 phi = 92.967
% > 1 phi = 0.263
% gravel = 0.049
% sand = 6.984
% silt = 42.550
% clay = 50.417

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
8.027	3.83	7.722	4.74	2.472	-0.123

*** 84th percentile extrapolated ***
*** 95th percentile not reached ***

5th percentile = 3.677
16th percentile = 5.250
50th percentile = 8.027
84th percentile = 10.194
95th percentile = .

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VC-8-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704273
Station = VC-8
Depth (ft) = 6

Total sample weight = 27.065 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.011	0.041	0.041
1000.000	0.00	0.017	0.063	0.103
707.107	0.50	0.016	0.059	0.163
500.000	1.00	0.048	0.177	0.340
353.553	1.50	0.135	0.499	0.839
250.000	2.00	0.297	1.097	1.936
176.777	2.50	0.282	1.042	2.978
125.000	3.00	0.459	1.696	4.674
88.388	3.50	0.474	1.751	6.425
74.325	3.75	0.231	0.854	7.279
62.500	4.00	0.179	0.661	7.940
31.250	5.00	1.298	4.797	12.737
15.625	6.00	2.029	7.495	20.232
7.813	7.00	4.260	15.739	35.971
3.906	8.00	4.422	16.339	52.310
1.953	9.00	5.193	19.187	71.497
0.977	> 9.0	7.714	28.503	100.000

% < 4 phi = 92.060
% > 1 phi = 0.163
% gravel = 0.000
% sand = 7.940
% silt = 44.370
% clay = 47.690

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
7.859	4.31	7.550	5.34	2.114	-0.146

*** 84th percentile extrapolated ***
*** 95th percentile not reached ***

5th percentile = 3.093
16th percentile = 5.435
50th percentile = 7.859
84th percentile = 9.664
95th percentile = .

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VC-8-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704274
Station = VC-8
Depth (ft) = 9

Total sample weight = 28.526 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.001	0.004	0.004
707.107	0.50	0.009	0.032	0.035
500.000	1.00	0.028	0.098	0.133
353.553	1.50	0.431	1.511	1.644
250.000	2.00	0.314	1.101	2.745
176.777	2.50	0.543	1.904	4.648
125.000	3.00	0.440	1.542	6.191
88.388	3.50	0.931	3.264	9.455
74.325	3.75	0.590	2.068	11.523
62.500	4.00	0.485	1.700	13.223
31.250	5.00	1.704	5.973	19.197
15.625	6.00	2.840	9.956	29.152
7.813	7.00	5.396	18.916	48.068
3.906	8.00	4.382	15.360	63.428
1.953	9.00	2.759	9.671	73.099
0.977	> 9.0	7.674	26.901	100.000

% < 4 phi = 86.777
% > 1 phi = 0.035
% gravel = 0.000
% sand = 13.223
% silt = 50.205
% clay = 36.572

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
7.126	7.16	7.175	6.92	2.710	0.018

*** 84th percentile extrapolated ***
*** 95th percentile not reached ***

5th percentile = 2.614
16th percentile = 4.465
50th percentile = 7.126
84th percentile = 9.884
95th percentile = .

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VC-8-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704226
Station = VC-9
Depth (ft) = 0

Total sample weight = 30.221 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.679	2.247	2.247
2000.000	-1.00	0.329	1.089	3.335
1414.214	-0.50	0.291	0.963	4.298
1000.000	0.00	0.367	1.214	5.513
707.107	0.50	0.265	0.877	6.390
500.000	1.00	0.252	0.834	7.224
353.553	1.50	0.409	1.353	8.577
250.000	2.00	2.379	7.872	16.449
176.777	2.50	5.016	16.598	33.047
125.000	3.00	6.905	22.849	55.895
88.388	3.50	5.326	17.624	73.519
74.325	3.75	3.569	11.810	85.329
62.500	4.00	1.953	6.462	91.791
31.250	5.00	1.866	6.175	97.967
15.625	6.00	0.122	0.403	98.369
7.813	7.00	0.041	0.134	98.504
3.906	8.00	0.203	0.671	99.175
1.953	9.00	0.203	0.671	99.846
0.977	> 9.0	0.046	0.154	100.000

% < 4 phi = 8.209
% > 1 phi = 6.390
% gravel = 3.335
% sand = 88.456
% silt = 7.384
% clay = 0.825

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.871	136.69	2.847	139.02	0.875	-0.028

5th percentile = -0.211
16th percentile = 1.971
50th percentile = 2.871
84th percentile = 3.722
95th percentile = 4.520

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F-30

VC-9-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704227
Station = VC-9
Depth (ft) = 3

Total sample weight = 23.858 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.033	0.138	0.138
1414.214	-0.50	0.037	0.155	0.293
1000.000	0.00	0.026	0.109	0.402
707.107	0.50	0.024	0.101	0.503
500.000	1.00	0.020	0.084	0.587
353.553	1.50	0.064	0.268	0.855
250.000	2.00	0.081	0.340	1.195
176.777	2.50	0.184	0.771	1.966
125.000	3.00	0.288	1.207	3.173
88.388	3.50	0.631	2.645	5.818
74.325	3.75	0.345	1.446	7.264
62.500	4.00	0.374	1.568	8.831
31.250	5.00	1.866	7.822	16.653
15.625	6.00	3.002	12.583	29.237
7.813	7.00	3.692	15.474	44.711
3.906	8.00	3.732	15.644	60.355
1.953	9.00	2.840	11.903	72.258
0.977	> 9.0	6.619	27.742	100.000

% < 4 phi = 91.169
% > 1 phi = 0.503
% gravel = 0.138
% sand = 8.693
% silt = 51.524
% clay = 39.645

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
7.338	6.18	7.397	5.93	2.480	0.024

*** 84th percentile extrapolated ***
*** 95th percentile not reached ***

5th percentile = 3.345
16th percentile = 4.916
50th percentile = 7.338
84th percentile = 9.877
95th percentile = .

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Carlsbad, CA 92008

F-31

VC-9-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704228
Station = VC-9
Depth (ft) = 6

Total sample weight = 23.238 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.001	0.004	0.004
1000.000	0.00	0.004	0.017	0.022
707.107	0.50	0.007	0.030	0.052
500.000	1.00	0.005	0.022	0.073
353.553	1.50	0.029	0.125	0.198
250.000	2.00	0.068	0.293	0.491
176.777	2.50	0.218	0.938	1.429
125.000	3.00	1.309	5.633	7.062
88.388	3.50	1.278	5.500	12.562
74.325	3.75	0.480	2.066	14.627
62.500	4.00	0.359	1.545	16.172
31.250	5.00	1.704	7.333	23.505
15.625	6.00	2.880	12.396	35.901
7.813	7.00	2.637	11.348	47.249
3.906	8.00	3.773	16.237	63.486
1.953	9.00	3.246	13.967	77.453
0.977	> 9.0	5.239	22.547	100.000

% < 4 phi = 83.828
% > 1 phi = 0.052
% gravel = 0.000
% sand = 16.172
% silt = 47.313
% clay = 36.514

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
7.169	6.95	6.704	9.59	2.732	-0.170

*** 84th percentile extrapolated ***
*** 95th percentile not reached ***

5th percentile = 2.817
16th percentile = 3.972
50th percentile = 7.169
84th percentile = 9.437
95th percentile = .

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Carlsbad, CA 92008

F-32

VC-9-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704229
Station = VC-9
Depth (ft) = 9

Total sample weight = 32.432 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.951	2.932	2.932
2000.000	-1.00	0.110	0.339	3.271
1414.214	-0.50	0.187	0.577	3.848
1000.000	0.00	0.242	0.746	4.594
707.107	0.50	0.559	1.724	6.318
500.000	1.00	1.927	5.942	12.260
353.553	1.50	11.558	35.638	47.898
250.000	2.00	4.715	14.538	62.436
176.777	2.50	3.912	12.062	74.498
125.000	3.00	1.970	6.074	80.572
88.388	3.50	2.124	6.549	87.122
74.325	3.75	0.859	2.649	89.770
62.500	4.00	0.553	1.705	91.475
31.250	5.00	1.298	4.003	95.478
15.625	6.00	0.527	1.626	97.105
7.813	7.00	0.203	0.625	97.730
3.906	8.00	0.365	1.126	98.856
1.953	9.00	0.284	0.876	99.732
0.977	> 9.0	0.087	0.268	100.000

% < 4 phi = 8.525
% > 1 phi = 6.318
% gravel = 3.271
% sand = 88.204
% silt = 7.381
% clay = 1.144

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
1.572	336.27	2.157	224.21	1.105	0.529

5th percentile = 0.118
16th percentile = 1.052
50th percentile = 1.572
84th percentile = 3.262
95th percentile = 4.880

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F-33

VC-9-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704266
Station = VC-10
Depth (ft) = 0

Total sample weight = 27.877 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.166	0.595	0.595
2000.000	-1.00	0.214	0.768	1.363
1414.214	-0.50	0.087	0.312	1.675
1000.000	0.00	0.073	0.262	1.937
707.107	0.50	0.151	0.542	2.479
500.000	1.00	0.152	0.545	3.024
353.553	1.50	0.474	1.700	4.724
250.000	2.00	1.682	6.034	10.758
176.777	2.50	2.384	8.552	19.310
125.000	3.00	3.433	12.315	31.625
88.388	3.50	2.849	10.220	41.844
74.325	3.75	1.153	4.136	45.980
62.500	4.00	0.732	2.626	48.606
31.250	5.00	2.962	10.624	59.230
15.625	6.00	3.651	13.098	72.328
7.813	7.00	2.840	10.187	82.515
3.906	8.00	1.095	3.929	86.444
1.953	9.00	1.055	3.784	90.228
0.977	> 9.0	2.724	9.772	100.000

% < 4 phi = 51.394
% > 1 phi = 2.479
% gravel = 1.363
% sand = 47.243
% silt = 37.838
% clay = 13.556

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
4.131	57.07	4.842	34.86	2.536	0.280

*** 95th percentile not reached ***

5th percentile = 1.523
16th percentile = 2.306
50th percentile = 4.131
84th percentile = 7.378
95th percentile = .

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F-34

VC-10-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704267
Station = VC-10
Depth (ft) = 3

Total sample weight = 28.068 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.019	0.068	0.068
1414.214	-0.50	0.015	0.053	0.121
1000.000	0.00	0.006	0.021	0.143
707.107	0.50	0.014	0.050	0.192
500.000	1.00	0.027	0.096	0.289
353.553	1.50	0.116	0.413	0.702
250.000	2.00	0.217	0.773	1.475
176.777	2.50	3.157	11.248	12.723
125.000	3.00	2.729	9.723	22.445
88.388	3.50	2.017	7.186	29.632
74.325	3.75	0.970	3.456	33.088
62.500	4.00	0.762	2.715	35.802
31.250	5.00	5.112	18.212	54.015
15.625	6.00	4.828	17.200	71.215
7.813	7.00	2.678	9.540	80.755
3.906	8.00	1.501	5.348	86.103
1.953	9.00	0.974	3.469	89.572
0.977	> 9.0	2.927	10.428	100.000

% < 4 phi = 64.198
% > 1 phi = 0.192
% gravel = 0.068
% sand = 35.735
% silt = 50.301
% clay = 13.897

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
4.780	36.41	5.138	28.41	2.469	0.145

*** 95th percentile not reached ***

5th percentile = 2.157
16th percentile = 2.669
50th percentile = 4.780
84th percentile = 7.607
95th percentile = .

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VC-10-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704268
Station = VC-10
Depth (ft) = 6

Total sample weight = 26.375 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.011	0.042	0.042
1000.000	0.00	0.004	0.015	0.057
707.107	0.50	0.012	0.045	0.102
500.000	1.00	0.008	0.030	0.133
353.553	1.50	0.011	0.042	0.174
250.000	2.00	0.036	0.136	0.311
176.777	2.50	0.047	0.178	0.489
125.000	3.00	0.097	0.368	0.857
88.388	3.50	0.129	0.489	1.346
74.325	3.75	0.075	0.284	1.630
62.500	4.00	0.055	0.209	1.839
31.250	5.00	0.446	1.692	3.531
15.625	6.00	1.907	7.230	10.761
7.813	7.00	2.718	10.306	21.067
3.906	8.00	4.990	18.920	39.987
1.953	9.00	4.463	16.920	56.907
0.977	> 9.0	11.366	43.093	100.000

% < 4 phi = 98.161
% > 1 phi = 0.102
% gravel = 0.000
% sand = 1.839
% silt = 38.148
% clay = 60.013

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
8.592	2.59	8.555	2.66	2.046	-0.018

*** 84th percentile extrapolated ***
*** 95th percentile not reached ***

5th percentile = 5.203
16th percentile = 6.508
50th percentile = 8.592
84th percentile = 10.601
95th percentile = .

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F-36

VC-10-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704269
Station = VC-10
Depth (ft) = 9

Total sample weight = 28.865 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.002	0.007	0.007
1414.214	-0.50	0.000	0.000	0.007
1000.000	0.00	0.005	0.017	0.024
707.107	0.50	0.013	0.045	0.069
500.000	1.00	0.021	0.073	0.142
353.553	1.50	0.048	0.166	0.308
250.000	2.00	0.044	0.152	0.461
176.777	2.50	1.941	6.724	7.185
125.000	3.00	0.964	3.340	10.525
88.388	3.50	3.226	11.176	21.701
74.325	3.75	2.132	7.386	29.087
62.500	4.00	1.760	6.097	35.185
31.250	5.00	6.735	23.332	58.517
15.625	6.00	5.071	17.569	76.086
7.813	7.00	2.515	8.714	84.800
3.906	8.00	1.217	4.217	89.016
1.953	9.00	0.974	3.373	92.390
0.977	> 9.0	2.197	7.610	100.000

% < 4 phi = 64.815
% > 1 phi = 0.069
% gravel = 0.007
% sand = 35.178
% silt = 53.832
% clay = 10.984

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
4.635	40.25	5.077	29.63	1.832	0.241

*** 95th percentile not reached ***

5th percentile = 2.338
16th percentile = 3.245
50th percentile = 4.635
84th percentile = 6.908
95th percentile = .

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VC-10-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704270A
Station = VC-10
Depth (ft) = 12

Total sample weight = 30.074 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.063	0.209	0.209
2000.000	-1.00	0.000	0.000	0.209
1414.214	-0.50	0.006	0.020	0.229
1000.000	0.00	0.003	0.010	0.239
707.107	0.50	0.013	0.043	0.283
500.000	1.00	0.017	0.057	0.339
353.553	1.50	0.041	0.136	0.475
250.000	2.00	0.062	0.206	0.682
176.777	2.50	1.269	4.220	4.901
125.000	3.00	3.163	10.517	15.418
88.388	3.50	6.555	21.796	37.214
74.325	3.75	4.752	15.801	53.015
62.500	4.00	2.278	7.575	60.590
31.250	5.00	4.503	14.974	75.564
15.625	6.00	2.312	7.689	83.253
7.813	7.00	1.136	3.777	87.030
3.906	8.00	1.095	3.642	90.672
1.953	9.00	0.852	2.833	93.505
0.977	> 9.0	1.953	6.495	100.000

% < 4 phi = 39.410
% > 1 phi = 0.283
% gravel = 0.209
% sand = 60.380
% silt = 30.082
% clay = 9.328

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.702	76.82	4.606	41.08	1.592	0.567

.95th percentile not reached.

5th percentile = 2.505
16th percentile = 3.013
50th percentile = 3.702
84th percentile = 6.198
95th percentile = .

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VC-10-12A

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704270B
Station = VC-10
Depth (ft) = 12

Total sample weight = 30.190 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.461	1.527	1.527
2000.000	-1.00	0.034	0.113	1.640
1414.214	-0.50	0.060	0.199	1.838
1000.000	0.00	0.022	0.073	1.911
707.107	0.50	0.017	0.056	1.968
500.000	1.00	0.022	0.073	2.040
353.553	1.50	0.024	0.079	2.120
250.000	2.00	0.043	0.142	2.262
176.777	2.50	0.197	0.653	2.915
125.000	3.00	1.726	5.717	8.632
88.388	3.50	7.700	25.505	34.138
74.325	3.75	3.890	12.885	47.023
62.500	4.00	3.127	10.358	57.381
31.250	5.00	5.680	18.814	76.194
15.625	6.00	2.394	7.929	84.123
7.813	7.00	1.055	3.494	87.617
3.906	8.00	0.933	3.091	90.708
1.953	9.00	0.771	2.553	93.261
0.977	> 9.0	2.034	6.739	100.000

% < 4 phi = 42.619
% > 1 phi = 1.968
% gravel = 1.640
% sand = 55.741
% silt = 33.327
% clay = 9.292

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.822	70.71	4.564	42.26	1.420	0.523

*** 95th percentile not reached ***

5th percentile = 2.682
16th percentile = 3.144
50th percentile = 3.822
84th percentile = 5.984
95th percentile = .

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VC-10-12B

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704216
Station = VC-11
Depth (ft) = 0

Total sample weight = 30.998 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.288	0.929	0.929
2000.000	-1.00	0.224	0.723	1.652
1414.214	-0.50	0.123	0.397	2.049
1000.000	0.00	0.178	0.574	2.623
707.107	0.50	0.117	0.377	3.000
500.000	1.00	0.144	0.465	3.465
353.553	1.50	0.277	0.894	4.358
250.000	2.00	1.839	5.933	10.291
176.777	2.50	4.983	16.075	26.366
125.000	3.00	10.794	34.822	61.188
88.388	3.50	6.428	20.737	81.925
74.325	3.75	1.843	5.946	87.870
62.500	4.00	1.106	3.568	91.438
31.250	5.00	0.610	1.967	93.405
15.625	6.00	0.325	1.049	94.455
7.813	7.00	0.041	0.131	94.586
3.906	8.00	0.407	1.312	95.897
1.953	9.00	0.163	0.525	96.422
0.977	> 9.0	1.109	3.578	100.000

% < 4 phi = 8.562
% > 1 phi = 3.000
% gravel = 1.652
% sand = 89.786
% silt = 4.459
% clay = 4.103

Graphic Moments

Median phi	Median microns	Mean phi	Mean microns	Dispersion	Skewness
2.839	139.72	2.882	135.61	0.705	0.061

5th percentile = 1.554
16th percentile = 2.178
50th percentile = 2.839
84th percentile = 3.587
95th percentile = 7.316

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VC-11-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704217
Station = VC-11
Depth (ft) = 3

Total sample weight = 31.349 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.135	0.431	0.431
2000.000	-1.00	0.007	0.022	0.453
1414.214	-0.50	0.051	0.163	0.616
1000.000	0.00	0.040	0.128	0.743
707.107	0.50	0.035	0.112	0.855
500.000	1.00	0.051	0.163	1.018
353.553	1.50	0.139	0.443	1.461
250.000	2.00	0.981	3.129	4.590
176.777	2.50	2.213	7.059	11.649
125.000	3.00	3.418	10.903	22.553
88.388	3.50	5.344	17.047	39.599
74.325	3.75	3.192	10.182	49.781
62.500	4.00	3.201	10.211	59.992
31.250	5.00	8.357	26.659	86.652
15.625	6.00	1.258	4.012	90.663
7.813	7.00	0.446	1.424	92.087
3.906	8.00	0.771	2.459	94.546
1.953	9.00	0.243	0.776	95.322
0.977	> 9.0	1.466	4.678	100.000

% < 4 phi = 40.008
% > 1 phi = 0.855
% gravel = 0.453
% sand = 59.539
% silt = 34.553
% clay = 5.454

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.755	74.05	3.800	71.79	1.101	0.041

5th percentile = 2.029
16th percentile = 2.700
50th percentile = 3.755
84th percentile = 4.901
95th percentile = 8.585

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VC-11-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704218
Station = VC-11
Depth (ft) = 6

Total sample weight = 29.507 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.005	0.017	0.017
707.107	0.50	0.011	0.037	0.054
500.000	1.00	0.028	0.095	0.149
353.553	1.50	0.270	0.915	1.064
250.000	2.00	0.537	1.820	2.884
176.777	2.50	3.607	12.224	15.108
125.000	3.00	5.094	17.264	32.372
88.388	3.50	7.922	26.848	59.220
74.325	3.75	2.880	9.760	68.981
62.500	4.00	2.250	7.625	76.606
31.250	5.00	4.057	13.749	90.355
15.625	6.00	0.933	3.162	93.518
7.813	7.00	0.527	1.787	95.305
3.906	8.00	0.284	0.962	96.268
1.953	9.00	0.203	0.687	96.955
0.977	> 9.0	0.898	3.045	100.000

% < 4 phi = 23.394
% > 1 phi = 0.054
% gravel = 0.000
% sand = 76.606
% silt = 19.662
% clay = 3.732

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.328	99.56	3.532	86.46	1.006	0.202

5th percentile = 2.087
16th percentile = 2.526
50th percentile = 3.328
84th percentile = 4.538
95th percentile = 6.829

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VC-11-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704219
Station = VC-11
Depth (ft) = 9

Total sample weight = 28.824 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.006	0.021	0.021
707.107	0.50	0.006	0.021	0.042
500.000	1.00	0.011	0.038	0.080
353.553	1.50	0.022	0.076	0.156
250.000	2.00	0.032	0.111	0.267
176.777	2.50	0.096	0.333	0.600
125.000	3.00	0.185	0.642	1.242
88.388	3.50	1.005	3.487	4.729
74.325	3.75	0.980	3.400	8.129
62.500	4.00	2.174	7.542	15.671
31.250	5.00	14.402	49.966	65.637
15.625	6.00	7.749	26.883	92.520
7.813	7.00	0.649	2.252	94.772
3.906	8.00	0.243	0.844	95.616
1.953	9.00	0.446	1.548	97.165
0.977	> 9.0	0.817	2.835	100.000

% < 4 phi = 84.329
% > 1 phi = 0.042
% gravel = 0.000
% sand = 15.671
% silt = 79.945
% clay = 4.384

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
4.687	38.82	4.845	34.80	0.838	0.188

5th percentile = 3.520
16th percentile = 4.007
50th percentile = 4.687
84th percentile = 5.683
95th percentile = 7.270

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VC-11-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704220A
Station = VC-11
Depth (ft) = 12

Total sample weight = 27.376 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.007	0.026	0.026
1000.000	0.00	0.010	0.037	0.062
707.107	0.50	0.008	0.029	0.091
500.000	1.00	0.014	0.051	0.142
353.553	1.50	0.022	0.080	0.223
250.000	2.00	0.029	0.106	0.329
176.777	2.50	0.069	0.252	0.581
125.000	3.00	0.117	0.427	1.008
88.388	3.50	0.216	0.789	1.797
74.325	3.75	0.107	0.391	2.188
62.500	4.00	0.117	0.427	2.615
31.250	5.00	1.461	5.335	7.950
15.625	6.00	3.205	11.707	19.658
7.813	7.00	6.491	23.711	43.369
3.906	8.00	3.854	14.078	57.447
1.953	9.00	3.408	12.448	69.895
0.977	> 9.0	8.242	30.105	100.000

% < 4 phi = 97.385
% > 1 phi = 0.091
% gravel = 0.000
% sand = 2.615
% silt = 54.832
% clay = 42.553

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
7.471	5.64	7.886	4.23	2.198	0.189

*** 84th percentile extrapolated ***
*** 95th percentile not reached ***

5th percentile = 4.447
16th percentile = 5.688
50th percentile = 7.471
84th percentile = 10.084
95th percentile = .

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VC-11-12A

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704220B
Station = VC-11
Depth (ft) = 12

Total sample weight = 26.849 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.054	0.201	0.201
1414.214	-0.50	0.019	0.071	0.272
1000.000	0.00	0.032	0.119	0.391
707.107	0.50	0.022	0.082	0.473
500.000	1.00	0.018	0.067	0.540
353.553	1.50	0.022	0.082	0.622
250.000	2.00	0.046	0.171	0.793
176.777	2.50	0.067	0.250	1.043
125.000	3.00	0.137	0.510	1.553
88.388	3.50	0.322	1.199	2.752
74.325	3.75	0.111	0.413	3.166
62.500	4.00	0.028	0.104	3.270
31.250	5.00	0.365	1.360	4.630
15.625	6.00	3.611	13.448	18.079
7.813	7.00	5.599	20.853	38.931
3.906	8.00	4.422	16.471	55.402
1.953	9.00	4.990	18.586	73.988
0.977	> 9.0	6.984	26.012	100.000

% < 4 phi = 96.730
% > 1 phi = 0.473
% gravel = 0.201
% sand = 3.069
% silt = 52.132
% clay = 44.598

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
7.672	4.90	7.700	4.81	1.854	0.015

*** 84th percentile extrapolated ***
*** 95th percentile not reached ***

5th percentile = 5.028
16th percentile = 5.845
50th percentile = 7.672
84th percentile = 9.554
95th percentile = .

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VC-11-12B

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704221
Station = VC-11
Depth (ft) = 15

Total sample weight = 28.995 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.029	0.100	0.100
1000.000	0.00	0.016	0.055	0.155
707.107	0.50	0.036	0.124	0.279
500.000	1.00	0.082	0.283	0.562
353.553	1.50	0.400	1.380	1.942
250.000	2.00	0.404	1.393	3.335
176.777	2.50	1.203	4.149	7.484
125.000	3.00	1.928	6.649	14.134
88.388	3.50	2.923	10.081	24.215
74.325	3.75	1.264	4.359	28.574
62.500	4.00	1.068	3.683	32.258
31.250	5.00	2.921	10.074	42.332
15.625	6.00	2.637	9.095	51.427
7.813	7.00	3.124	10.774	62.201
3.906	8.00	2.921	10.074	72.275
1.953	9.00	3.448	11.893	84.168
0.977	> 9.0	4.590	15.832	100.000

% < 4 phi = 67.742
% > 1 phi = 0.279
% gravel = 0.000
% sand = 32.258
% silt = 40.018
% clay = 27.725

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
5.843	17.42	6.039	15.21	2.947	0.067

*** 95th percentile not reached ***

5th percentile = 2.201
16th percentile = 3.093
50th percentile = 5.843
84th percentile = 8.986
95th percentile = .

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VC-11-15

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704232
Station = VC-12
Depth (ft) = 0

Total sample weight = 31.451 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.573	1.822	1.822
2000.000	-1.00	0.390	1.240	3.062
1414.214	-0.50	0.338	1.075	4.137
1000.000	0.00	0.290	0.922	5.059
707.107	0.50	0.193	0.614	5.672
500.000	1.00	0.170	0.541	6.213
353.553	1.50	0.954	3.033	9.246
250.000	2.00	1.910	6.073	15.319
176.777	2.50	6.052	19.243	34.561
125.000	3.00	6.067	19.290	53.852
88.388	3.50	5.613	17.847	71.698
74.325	3.75	3.065	9.745	81.444
62.500	4.00	1.895	6.025	87.469
31.250	5.00	1.907	6.063	93.532
15.625	6.00	0.325	1.032	94.563
7.813	7.00	0.446	1.419	95.982
3.906	8.00	0.203	0.645	96.627
1.953	9.00	0.162	0.516	97.143
0.977	> 9.0	0.898	2.857	100.000

% < 4 phi = 12.531
% > 1 phi = 5.672
% gravel = 3.062
% sand = 84.407
% silt = 9.159
% clay = 3.373

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.900	133.96	2.937	130.59	0.919	0.040

5th percentile = -0.032
16th percentile = 2.018
50th percentile = 2.900
84th percentile = 3.856
95th percentile = 6.308

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VC-12-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704233
Station = VC-12
Depth (ft) = 3

Total sample weight = 27.593 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.014	0.051	0.051
1000.000	0.00	0.008	0.029	0.080
707.107	0.50	0.017	0.062	0.141
500.000	1.00	0.013	0.047	0.188
353.553	1.50	0.040	0.145	0.333
250.000	2.00	0.324	1.174	1.508
176.777	2.50	0.864	3.131	4.639
125.000	3.00	1.702	6.168	10.807
88.388	3.50	2.085	7.556	18.363
74.325	3.75	1.825	6.614	24.977
62.500	4.00	1.384	5.016	29.993
31.250	5.00	4.828	17.496	47.489
15.625	6.00	3.935	14.262	61.751
7.813	7.00	2.799	10.145	71.896
3.906	8.00	1.704	6.175	78.071
1.953	9.00	1.258	4.558	82.629
0.977	> 9.0	4.793	17.371	100.000

% < 4 phi = 70.007
% > 1 phi = 0.141
% gravel = 0.000
% sand = 29.993
% silt = 48.078
% clay = 21.929

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
5.176	27.66	6.252	13.12	2.909	0.370

*** 84th percentile extrapolated ***
*** 95th percentile not reached ***

5th percentile = 2.529
16th percentile = 3.344
50th percentile = 5.176
84th percentile = 9.161
95th percentile = .

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VC-12-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704234
Station = VC-12
Depth (ft) = 6

Total sample weight = 26.810 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.000	0.000	0.000
707.107	0.50	0.000	0.000	0.000
500.000	1.00	0.000	0.000	0.000
353.553	1.50	0.006	0.022	0.022
250.000	2.00	0.017	0.063	0.086
176.777	2.50	0.620	2.313	2.398
125.000	3.00	0.368	1.373	3.771
88.388	3.50	0.831	3.100	6.871
74.325	3.75	0.530	1.977	8.847
62.500	4.00	1.064	3.969	12.816
31.250	5.00	6.937	25.876	38.692
15.625	6.00	8.357	31.173	69.865
7.813	7.00	2.962	11.047	80.911
3.906	8.00	1.663	6.204	87.116
1.953	9.00	0.933	3.480	90.596
0.977	> 9.0	2.521	9.404	100.000

% < 4 phi = 87.184
% > 1 phi = 0.000
% gravel = 0.000
% sand = 12.816
% silt = 74.300
% clay = 12.884

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
5.363	24.30	5.810	17.82	1.687	0.265

*** 95th percentile not reached ***

5th percentile = 3.198
16th percentile = 4.123
50th percentile = 5.363
84th percentile = 7.498
95th percentile = .

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VC-12-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704235
Station = VC-12
Depth (ft) = 9

Total sample weight = 28.465 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.000	0.000	0.000
707.107	0.50	0.000	0.000	0.000
500.000	1.00	0.008	0.028	0.028
353.553	1.50	0.001	0.004	0.032
250.000	2.00	0.012	0.042	0.074
176.777	2.50	0.008	0.028	0.102
125.000	3.00	0.028	0.098	0.200
88.388	3.50	0.084	0.295	0.495
74.325	3.75	0.090	0.316	0.812
62.500	4.00	0.154	0.541	1.353
31.250	5.00	2.759	9.692	11.044
15.625	6.00	11.278	39.622	50.666
7.813	7.00	6.816	23.944	74.610
3.906	8.00	2.312	8.124	82.734
1.953	9.00	1.420	4.988	87.722
0.977	> 9.0	3.495	12.278	100.000

% < 4 phi = 98.647
% > 1 phi = 0.000
% gravel = 0.000
% sand = 1.353
% silt = 81.381
% clay = 17.266

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
5.983	15.81	6.689	9.69	1.564	0.451

*** 95th percentile not reached ***

5th percentile = 4.376
16th percentile = 5.125
50th percentile = 5.983
84th percentile = 8.254
95th percentile = .

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VC-12-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704236
Station = VC-12
Depth (ft) = 12

Total sample weight = 22.334 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.002	0.009	0.009
707.107	0.50	0.010	0.045	0.054
500.000	1.00	0.004	0.018	0.072
353.553	1.50	0.012	0.054	0.125
250.000	2.00	0.018	0.081	0.206
176.777	2.50	0.018	0.081	0.287
125.000	3.00	0.043	0.193	0.479
88.388	3.50	0.088	0.394	0.873
74.325	3.75	0.036	0.161	1.034
62.500	4.00	0.027	0.121	1.155
31.250	5.00	0.649	2.906	4.062
15.625	6.00	1.177	5.268	9.330
7.813	7.00	2.799	12.534	21.863
3.906	8.00	6.045	27.066	48.930
1.953	9.00	3.489	15.622	64.552
0.977	> 9.0	7.917	35.448	100.000

% < 4 phi = 98.845
% > 1 phi = 0.054
% gravel = 0.000
% sand = 1.155
% silt = 47.774
% clay = 51.070

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
8.069	3.73	8.389	2.98	1.856	0.172

*** 84th percentile extrapolated ***
*** 95th percentile not reached ***

5th percentile = 5.178
16th percentile = 6.532
50th percentile = 8.069
84th percentile = 10.245
95th percentile = .

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VC-12-12

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704237
Station = VC-12
Depth (ft) = 15

Total sample weight = 32.226 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.005	0.016	0.016
707.107	0.50	0.038	0.118	0.133
500.000	1.00	0.259	0.804	0.937
353.553	1.50	1.188	3.686	4.624
250.000	2.00	4.758	14.765	19.388
176.777	2.50	7.383	22.910	42.298
125.000	3.00	6.917	21.464	63.762
88.388	3.50	3.710	11.513	75.275
74.325	3.75	1.241	3.851	79.126
62.500	4.00	0.676	2.098	81.224
31.250	5.00	0.852	2.644	83.867
15.625	6.00	1.339	4.154	88.022
7.813	7.00	1.217	3.777	91.799
3.906	8.00	0.609	1.888	93.687
1.953	9.00	0.487	1.511	95.198
0.977	> 9.0	1.548	4.802	100.000

% < 4 phi = 18.776
% > 1 phi = 0.133
% gravel = 0.000
% sand = 81.224
% silt = 12.463
% clay = 6.313

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.679	156.11	3.459	90.96	1.573	0.495

5th percentile = 1.513
16th percentile = 1.885
50th percentile = 2.679
84th percentile = 5.032
95th percentile = 8.869

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VC-12-15

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704211
Station = VC-13
Depth (ft) = 0

Total sample weight = 30.929 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.538	1.739	1.739
2000.000	-1.00	0.508	1.642	3.382
1414.214	-0.50	0.467	1.510	4.892
1000.000	0.00	0.408	1.319	6.211
707.107	0.50	0.280	0.905	7.116
500.000	1.00	0.192	0.621	7.737
353.553	1.50	0.842	2.722	10.459
250.000	2.00	1.027	3.320	13.780
176.777	2.50	3.243	10.485	24.265
125.000	3.00	5.265	17.023	41.288
88.388	3.50	6.955	22.487	63.775
74.325	3.75	4.255	13.757	77.532
62.500	4.00	2.547	8.235	85.767
31.250	5.00	2.195	7.098	92.865
15.625	6.00	0.651	2.103	94.968
7.813	7.00	0.325	1.052	96.020
3.906	8.00	0.122	0.394	96.414
1.953	9.00	0.122	0.394	96.808
0.977	> 9.0	0.987	3.192	100.000

% < 4 phi = 14.233
% > 1 phi = 7.116
% gravel = 3.382
% sand = 82.385
% silt = 10.647
% clay = 3.586

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.194	109.29	3.026	122.76	0.920	-0.182

5th percentile = -0.459
16th percentile = 2.106
50th percentile = 3.194
84th percentile = 3.946
95th percentile = 6.030

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VC-13-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704212
Station = VC-13
Depth (ft) = 3

Total sample weight = 30.689 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.008	0.026	0.026
1414.214	-0.50	0.025	0.081	0.108
1000.000	0.00	0.005	0.016	0.124
707.107	0.50	0.016	0.052	0.176
500.000	1.00	0.019	0.062	0.238
353.553	1.50	0.021	0.068	0.306
250.000	2.00	0.096	0.313	0.619
176.777	2.50	0.353	1.150	1.769
125.000	3.00	1.431	4.663	6.432
88.388	3.50	4.536	14.780	21.213
74.325	3.75	4.040	13.164	34.377
62.500	4.00	4.272	13.920	48.297
31.250	5.00	10.489	34.179	82.476
15.625	6.00	2.399	7.816	90.292
7.813	7.00	1.016	3.312	93.604
3.906	8.00	0.203	0.662	94.266
1.953	9.00	0.772	2.517	96.784
0.977	> 9.0	0.987	3.216	100.000

% < 4 phi = 51.703
% > 1 phi = 0.176
% gravel = 0.026
% sand = 48.271
% silt = 45.970
% clay = 5.734

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
4.050	60.38	4.259	52.22	0.936	0.224

5th percentile = 2.846
16th percentile = 3.324
50th percentile = 4.050
84th percentile = 5.195
95th percentile = 8.291

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VC-13-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704213
Station = VC-13
Depth (ft) = 6

Total sample weight = 10.685 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.003	0.028	0.028
707.107	0.50	0.003	0.028	0.056
500.000	1.00	0.004	0.037	0.094
353.553	1.50	0.006	0.056	0.150
250.000	2.00	0.012	0.112	0.262
176.777	2.50	0.114	1.067	1.329
125.000	3.00	0.253	2.368	3.697
88.388	3.50	0.772	7.225	10.922
74.325	3.75	0.448	4.193	15.115
62.500	4.00	0.724	6.776	21.891
31.250	5.00	4.472	41.855	63.746
15.625	6.00	2.277	21.308	85.054
7.813	7.00	0.935	8.752	93.806
3.906	8.00	0.163	1.522	95.328
1.953	9.00	0.163	1.522	96.850
0.977	> 9.0	0.337	3.150	100.000

% < 4 phi = 78.109
% > 1 phi = 0.056
% gravel = 0.000
% sand = 21.891
% silt = 73.437
% clay = 4.672

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
4.672	39.24	4.867	34.28	1.084	0.180

5th percentile = 3.090
16th percentile = 3.783
50th percentile = 4.672
84th percentile = 5.951
95th percentile = 7.785

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VC-13-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704214
Station = VC-13
Depth (ft) = 9

Total sample weight = 28.378 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.002	0.007	0.007
1414.214	-0.50	0.007	0.025	0.032
1000.000	0.00	0.002	0.007	0.039
707.107	0.50	0.002	0.007	0.046
500.000	1.00	0.001	0.004	0.049
353.553	1.50	0.006	0.021	0.070
250.000	2.00	0.016	0.056	0.127
176.777	2.50	0.068	0.240	0.366
125.000	3.00	0.218	0.768	1.135
88.388	3.50	0.644	2.269	3.404
74.325	3.75	0.399	1.406	4.810
62.500	4.00	0.981	3.457	8.267
31.250	5.00	6.017	21.204	29.471
15.625	6.00	9.107	32.093	61.564
7.813	7.00	4.554	16.046	77.610
3.906	8.00	2.846	10.029	87.639
1.953	9.00	1.016	3.582	91.220
0.977	> 9.0	2.491	8.780	100.000

% < 4 phi = 91.733
% > 1 phi = 0.046
% gravel = 0.007
% sand = 8.260
% silt = 79.372
% clay = 12.361

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
5.640	20.06	6.001	15.61	1.636	0.221

*** 95th percentile not reached ***

5th percentile = 3.764
16th percentile = 4.365
50th percentile = 5.640
84th percentile = 7.637
95th percentile = .

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VC-13-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704215
Station = VC-13
Depth (ft) = 12

Total sample weight = 31.098 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.007	0.023	0.023
707.107	0.50	0.007	0.023	0.045
500.000	1.00	0.010	0.032	0.077
353.553	1.50	0.124	0.399	0.476
250.000	2.00	0.333	1.071	1.547
176.777	2.50	2.150	6.914	8.460
125.000	3.00	4.053	13.033	21.494
88.388	3.50	5.211	16.757	38.251
74.325	3.75	2.029	6.525	44.775
62.500	4.00	2.038	6.554	51.329
31.250	5.00	6.952	22.356	73.685
15.625	6.00	4.310	13.858	87.543
7.813	7.00	1.789	5.752	93.296
3.906	8.00	0.569	1.830	95.126
1.953	9.00	0.447	1.438	96.564
0.977	> 9.0	1.068	3.436	100.000

% < 4 phi = 48.671
% > 1 phi = 0.045
% gravel = 0.000
% sand = 51.329
% silt = 43.797
% clay = 4.874

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.949	64.73	4.267	51.95	1.478	0.215

5th percentile = 2.250
16th percentile = 2.789
50th percentile = 3.949
84th percentile = 5.744
95th percentile = 7.931

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VC-13-12

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704200A
Station = VC-14
Depth (ft) = 0

Total sample weight = 30.632 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	2.258	7.371	7.371
2000.000	-1.00	0.737	2.406	9.777
1414.214	-0.50	0.504	1.645	11.423
1000.000	0.00	0.413	1.348	12.771
707.107	0.50	0.206	0.673	13.444
500.000	1.00	0.133	0.434	13.878
353.553	1.50	0.218	0.712	14.589
250.000	2.00	1.149	3.751	18.341
176.777	2.50	2.096	6.843	25.183
125.000	3.00	4.791	15.641	40.824
88.388	3.50	7.399	24.155	64.979
74.325	3.75	4.875	15.915	80.893
62.500	4.00	2.236	7.300	88.193
31.250	5.00	2.556	8.344	96.537
15.625	6.00	0.365	1.192	97.729
7.813	7.00	0.041	0.132	97.862
3.906	8.00	0.203	0.662	98.524
1.953	9.00	0.041	0.132	98.656
0.977	> 9.0	0.412	1.344	100.000

% < 4 phi = 11.807
% > 1 phi = 13.444
% gravel = 9.777
% sand = 78.416
% silt = 10.331
% clay = 1.476

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.190	109.58	2.772	146.38	1.084	-0.385

*** 5th percentile not obtainable ***

5th percentile = .
16th percentile = 1.688
50th percentile = 3.190
84th percentile = 3.856
95th percentile = 4.816

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VC-14-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704200B
Station = VC-14
Depth (ft) = 0

Total sample weight = 30.825 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	2.419	7.847	7.847
2000.000	-1.00	0.768	2.491	10.339
1414.214	-0.50	0.613	1.989	12.327
1000.000	0.00	0.415	1.346	13.674
707.107	0.50	0.260	0.843	14.517
500.000	1.00	0.152	0.493	15.010
353.553	1.50	0.412	1.337	16.347
250.000	2.00	1.041	3.377	19.724
176.777	2.50	2.746	8.908	28.632
125.000	3.00	4.180	13.560	42.192
88.388	3.50	7.695	24.963	67.155
74.325	3.75	3.303	10.715	77.871
62.500	4.00	3.002	9.739	87.609
31.250	5.00	2.556	8.292	95.901
15.625	6.00	0.406	1.316	97.217
7.813	7.00	0.203	0.658	97.875
3.906	8.00	0.162	0.526	98.401
1.953	9.00	0.081	0.263	98.665
0.977	> 9.0	0.412	1.335	100.000

% < 4 phi = 12.391
% > 1 phi = 14.517
% gravel = 10.339
% sand = 77.270
% silt = 10.792
% clay = 1.599

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.156	112.16	2.639	160.56	1.269	-0.408

*** 5th percentile not obtainable ***

5th percentile = .
16th percentile = 1.370
50th percentile = 3.156
84th percentile = 3.907
95th percentile = 4.891

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VC-14-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704201
Station = VC-14
Depth (ft) = 3

Total sample weight = 26.655 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.005	0.019	0.019
1414.214	-0.50	0.019	0.071	0.090
1000.000	0.00	0.020	0.075	0.165
707.107	0.50	0.048	0.180	0.345
500.000	1.00	0.054	0.203	0.548
353.553	1.50	0.085	0.319	0.867
250.000	2.00	0.229	0.859	1.726
176.777	2.50	0.616	2.311	4.037
125.000	3.00	1.369	5.136	9.173
88.388	3.50	3.081	11.559	20.732
74.325	3.75	1.442	5.410	26.141
62.500	4.00	3.088	11.585	37.726
31.250	5.00	9.088	34.094	71.820
15.625	6.00	3.408	12.785	84.605
7.813	7.00	1.420	5.327	89.932
3.906	8.00	0.771	2.892	92.824
1.953	9.00	0.487	1.826	94.651
0.977	> 9.0	1.426	5.349	100.000

% < 4 phi = 62.274
% > 1 phi = 0.345
% gravel = 0.019
% sand = 37.708
% silt = 55.098
% clay = 7.176

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
4.360	48.70	4.624	40.55	1.329	0.199

*** 95th percentile not reached ***

5th percentile = 2.594
16th percentile = 3.295
50th percentile = 4.360
84th percentile = 5.953
95th percentile = .

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VC-14-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704202
Station = VC-14
Depth (ft) = 6

Total sample weight = 26.526 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.017	0.064	0.064
1000.000	0.00	0.012	0.045	0.109
707.107	0.50	0.015	0.057	0.166
500.000	1.00	0.012	0.045	0.211
353.553	1.50	0.029	0.109	0.320
250.000	2.00	0.024	0.090	0.411
176.777	2.50	0.083	0.313	0.724
125.000	3.00	0.065	0.245	0.969
88.388	3.50	0.088	0.332	1.301
74.325	3.75	0.088	0.332	1.632
62.500	4.00	0.082	0.309	1.941
31.250	5.00	3.530	13.306	15.247
15.625	6.00	7.505	28.294	43.542
7.813	7.00	6.045	22.788	66.330
3.906	8.00	3.367	12.694	79.025
1.953	9.00	1.785	6.729	85.754
0.977	> 9.0	3.779	14.246	100.000

% < 4 phi = 98.059
% > 1 phi = 0.166
% gravel = 0.000
% sand = 1.941
% silt = 77.083
% clay = 20.975

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
6.283	12.84	6.883	8.47	1.856	0.323

*** 95th percentile not reached ***

5th percentile = 4.230
16th percentile = 5.027
50th percentile = 6.283
84th percentile = 8.739
95th percentile = .

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VC-14-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704203
Station = VC-14
Depth (ft) = 9

Total sample weight = 23.829 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.003	0.013	0.013
1414.214	-0.50	0.009	0.038	0.050
1000.000	0.00	0.007	0.029	0.080
707.107	0.50	0.004	0.017	0.097
500.000	1.00	0.006	0.025	0.122
353.553	1.50	0.016	0.067	0.189
250.000	2.00	0.047	0.197	0.386
176.777	2.50	0.119	0.499	0.885
125.000	3.00	0.287	1.204	2.090
88.388	3.50	0.450	1.888	3.978
74.325	3.75	0.231	0.969	4.948
62.500	4.00	0.209	0.877	5.825
31.250	5.00	0.893	3.746	9.570
15.625	6.00	2.150	9.023	18.594
7.813	7.00	3.448	14.472	33.065
3.906	8.00	3.976	16.685	49.750
1.953	9.00	2.921	12.258	62.009
0.977	> 9.0	9.053	37.991	100.000

% < 4 phi = 94.175
% > 1 phi = 0.097
% gravel = 0.013
% sand = 5.812
% silt = 43.925
% clay = 50.250

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
8.020	3.85	8.253	3.28	2.541	0.092

*** 84th percentile extrapolated ***
*** 95th percentile not reached ***

5th percentile = 3.765
16th percentile = 5.713
50th percentile = 8.020
84th percentile = 10.794
95th percentile = .

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VC-14-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704204
Station = VC-14
Depth (ft) = 12

Total sample weight = 29.208 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.005	0.017	0.017
1414.214	-0.50	0.001	0.003	0.021
1000.000	0.00	0.002	0.007	0.027
707.107	0.50	0.009	0.031	0.058
500.000	1.00	0.021	0.072	0.130
353.553	1.50	0.139	0.476	0.606
250.000	2.00	0.224	0.767	1.373
176.777	2.50	2.328	7.970	9.343
125.000	3.00	3.029	10.370	19.713
88.388	3.50	5.821	19.929	39.643
74.325	3.75	3.206	10.976	50.619
62.500	4.00	2.490	8.525	59.144
31.250	5.00	6.126	20.974	80.117
15.625	6.00	2.840	9.723	89.840
7.813	7.00	1.258	4.306	94.146
3.906	8.00	0.284	0.972	95.118
1.953	9.00	0.487	1.667	96.785
0.977	> 9.0	0.939	3.215	100.000

% < 4 phi = 40.856
% > 1 phi = 0.058
% gravel = 0.017
% sand = 59.127
% silt = 35.975
% clay = 4.882

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.736	75.06	4.110	57.91	1.289	0.290

5th percentile = 2.228
16th percentile = 2.821
50th percentile = 3.736
84th percentile = 5.399
95th percentile = 7.878

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VC-14-12

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704205
Station = VC-14
Depth (ft) = 15

Total sample weight = 31.707 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.040	0.126	0.126
1414.214	-0.50	0.050	0.158	0.284
1000.000	0.00	0.065	0.205	0.489
707.107	0.50	0.127	0.401	0.889
500.000	1.00	0.432	1.362	2.252
353.553	1.50	1.739	5.485	7.736
250.000	2.00	5.933	18.712	26.448
176.777	2.50	7.860	24.789	51.237
125.000	3.00	6.265	19.759	70.996
88.388	3.50	2.869	9.048	80.045
74.325	3.75	1.105	3.485	83.530
62.500	4.00	0.632	1.993	85.523
31.250	5.00	1.988	6.270	91.792
15.625	6.00	0.852	2.687	94.479
7.813	7.00	0.284	0.896	95.375
3.906	8.00	0.649	2.047	97.422
1.953	9.00	0.081	0.256	97.678
0.977	> 9.0	0.736	2.322	100.000

% < 4 phi = 14.477
% > 1 phi = 0.889
% gravel = 0.126
% sand = 85.397
% silt = 11.899
% clay = 2.578

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.475	179.86	2.765	147.12	1.044	0.278

5th percentile = 1.251
16th percentile = 1.721
50th percentile = 2.475
84th percentile = 3.809
95th percentile = 6.581

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VC-14-15

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704183A
Station = VC-15
Depth (ft) = 0

Total sample weight = 30.915 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.267	0.864	0.864
2000.000	-1.00	0.053	0.171	1.035
1414.214	-0.50	0.151	0.488	1.524
1000.000	0.00	0.069	0.223	1.747
707.107	0.50	0.069	0.223	1.970
500.000	1.00	0.420	1.359	3.328
353.553	1.50	0.803	2.597	5.926
250.000	2.00	3.237	10.471	16.397
176.777	2.50	4.248	13.741	30.138
125.000	3.00	7.256	23.471	53.608
88.388	3.50	5.107	16.520	70.128
74.325	3.75	3.818	12.350	82.478
62.500	4.00	0.512	1.656	84.134
31.250	5.00	3.447	11.150	95.284
15.625	6.00	0.401	1.296	96.580
7.813	7.00	0.040	0.130	96.710
3.906	8.00	0.040	0.130	96.840
1.953	9.00	0.281	0.908	97.747
0.977	> 9.0	0.696	2.253	100.000

% < 4 phi = 15.866
% > 1 phi = 1.970
% gravel = 1.035
% sand = 83.099
% silt = 12.705
% clay = 3.160

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.923	131.84	2.980	126.71	0.999	0.057

5th percentile = 1.322
16th percentile = 1.981
50th percentile = 2.923
84th percentile = 3.980
95th percentile = 4.975

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VC-15-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704184
Station = VC-15
Depth (ft) = 3

Total sample weight = 29.648 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.323	1.089	1.089
2000.000	-1.00	0.110	0.371	1.460
1414.214	-0.50	0.126	0.425	1.885
1000.000	0.00	0.096	0.324	2.209
707.107	0.50	0.065	0.219	2.429
500.000	1.00	0.050	0.169	2.597
353.553	1.50	0.641	2.162	4.759
250.000	2.00	1.133	3.822	8.581
176.777	2.50	2.722	9.181	17.762
125.000	3.00	2.826	9.532	27.294
88.388	3.50	5.958	20.096	47.390
74.325	3.75	3.688	12.439	59.829
62.500	4.00	2.735	9.225	69.054
31.250	5.00	6.410	21.621	90.675
15.625	6.00	0.811	2.737	93.412
7.813	7.00	0.527	1.779	95.191
3.906	8.00	0.162	0.547	95.738
1.953	9.00	0.041	0.137	95.875
0.977	> 9.0	1.223	4.125	100.000

% < 4 phi = 30.946
% > 1 phi = 2.429
% gravel = 1.460
% sand = 67.594
% silt = 26.684
% clay = 4.262

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.552	85.23	3.548	85.52	1.144	-0.004

5th percentile = 1.532
16th percentile = 2.404
50th percentile = 3.552
84th percentile = 4.691
95th percentile = 6.893

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F-66
VC-15-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704185
Station = VC-15
Depth (ft) = 6

Total sample weight = 10.137 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.007	0.069	0.069
1000.000	0.00	0.006	0.059	0.128
707.107	0.50	0.002	0.020	0.148
500.000	1.00	0.003	0.030	0.178
353.553	1.50	0.005	0.049	0.227
250.000	2.00	0.032	0.316	0.543
176.777	2.50	0.091	0.898	1.440
125.000	3.00	0.256	2.525	3.966
88.388	3.50	0.800	7.892	11.857
74.325	3.75	0.644	6.353	18.210
62.500	4.00	1.632	16.099	34.309
31.250	5.00	3.448	34.017	68.326
15.625	6.00	0.243	2.401	70.727
7.813	7.00	0.446	4.402	75.129
3.906	8.00	0.406	4.002	79.131
1.953	9.00	0.203	2.001	81.132
0.977	> 9.0	1.913	18.868	100.000

% < 4 phi = 65.691
% > 1 phi = 0.148
% gravel = 0.000
% sand = 34.309
% silt = 44.823
% clay = 20.869

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
4.461	45.40	6.541	10.74	2.878	0.723

*** 84th percentile extrapolated ***
*** 95th percentile not reached ***

5th percentile = 3.066
16th percentile = 3.663
50th percentile = 4.461
84th percentile = 9.418
95th percentile = .

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F-67

VC-15-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704186
Station = VC-15
Depth (ft) = 9

Total sample weight = 15.003 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.003	0.020	0.020
1000.000	0.00	0.013	0.087	0.107
707.107	0.50	0.010	0.067	0.173
500.000	1.00	0.015	0.100	0.273
353.553	1.50	0.031	0.207	0.480
250.000	2.00	0.020	0.133	0.613
176.777	2.50	0.065	0.433	1.046
125.000	3.00	0.137	0.913	1.960
88.388	3.50	0.327	2.180	4.139
74.325	3.75	0.173	1.153	5.292
62.500	4.00	0.450	2.999	8.292
31.250	5.00	2.231	14.873	23.164
15.625	6.00	3.002	20.010	43.174
7.813	7.00	2.191	14.602	57.777
3.906	8.00	2.272	15.143	72.920
1.953	9.00	0.122	0.811	73.731
0.977	> 9.0	3.941	26.269	100.000

% < 4 phi = 91.708
% > 1 phi = 0.173
% gravel = 0.000
% sand = 8.292
% silt = 64.628
% clay = 27.080

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
6.467	11.30	7.307	6.31	2.789	0.301

*** 84th percentile extrapolated ***
*** 95th percentile not reached ***

5th percentile = 3.687
16th percentile = 4.518
50th percentile = 6.467
84th percentile = 10.096
95th percentile = .

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F-68

VC-15-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704187
Station = VC-15
Depth (ft) = 12

Total sample weight = 11.261 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.009	0.080	0.080
1414.214	-0.50	0.022	0.195	0.275
1000.000	0.00	0.024	0.213	0.488
707.107	0.50	0.005	0.044	0.533
500.000	1.00	0.016	0.142	0.675
353.553	1.50	0.039	0.346	1.021
250.000	2.00	0.108	0.959	1.980
176.777	2.50	0.222	1.971	3.952
125.000	3.00	0.493	4.378	8.329
88.388	3.50	0.568	5.044	13.373
74.325	3.75	0.297	2.637	16.011
62.500	4.00	0.243	2.158	18.168
31.250	5.00	0.243	2.162	20.330
15.625	6.00	0.325	2.882	23.212
7.813	7.00	0.690	6.124	29.336
3.906	8.00	0.771	6.845	36.181
1.953	9.00	1.177	10.448	46.629
0.977	> 9.0	6.010	53.371	100.000

% < 4 phi = 81.832
% > 1 phi = 0.533
% gravel = 0.080
% sand = 18.088
% silt = 18.013
% clay = 63.819

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
9.063	1.87	.	.	.	.

*** 84th percentile not reached ***
*** 84th percentile extrapolated ***
*** 95th percentile not reached ***

5th percentile = 2.620
16th percentile = 3.749
50th percentile = 9.063
84th percentile = .
95th percentile = .

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F-69
VC-15-12

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704188
Station = VC-15
Depth (ft) = 15

Total sample weight = 31.628 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.003	0.009	0.009
1000.000	0.00	0.004	0.013	0.022
707.107	0.50	0.004	0.013	0.035
500.000	1.00	0.049	0.155	0.190
353.553	1.50	0.330	1.043	1.233
250.000	2.00	1.146	3.623	4.856
176.777	2.50	2.088	6.602	11.458
125.000	3.00	5.451	17.234	28.693
88.388	3.50	7.181	22.704	51.397
74.325	3.75	3.987	12.606	64.003
62.500	4.00	2.089	6.605	70.607
31.250	5.00	5.842	18.471	89.078
15.625	6.00	1.055	3.335	92.413
7.813	7.00	0.690	2.181	94.594
3.906	8.00	0.203	0.641	95.235
1.953	9.00	0.243	0.770	96.005
0.977	> 9.0	1.264	3.995	100.000

% < 4 phi = 29.393
% > 1 phi = 0.035
% gravel = 0.000
% sand = 70.607
% silt = 24.628
% clay = 4.765

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.469	90.29	3.678	78.11	1.047	0.200

5th percentile = 2.011
16th percentile = 2.632
50th percentile = 3.469
84th percentile = 4.725
95th percentile = 7.633

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F-70
VC-15-15

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704222
Station = VC-16
Depth (ft) = 0

Total sample weight = 30.134 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.061	0.202	0.202
2000.000	-1.00	0.075	0.249	0.451
1414.214	-0.50	0.068	0.226	0.677
1000.000	0.00	0.066	0.219	0.896
707.107	0.50	0.039	0.129	1.025
500.000	1.00	0.055	0.183	1.208
353.553	1.50	0.130	0.431	1.639
250.000	2.00	0.556	1.845	3.484
176.777	2.50	1.418	4.706	8.190
125.000	3.00	4.429	14.698	22.888
88.388	3.50	8.689	28.835	51.723
74.325	3.75	5.191	17.227	68.950
62.500	4.00	4.320	14.336	83.286
31.250	5.00	3.164	10.501	93.787
15.625	6.00	0.041	0.135	93.922
7.813	7.00	0.527	1.750	95.672
3.906	8.00	0.041	0.135	95.807
1.953	9.00	0.243	0.808	96.615
0.977	> 9.0	1.020	3.385	100.000

% < 4 phi = 16.714
% > 1 phi = 1.025
% gravel = 0.451
% sand = 82.834
% silt = 12.521
% clay = 4.193

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.470	90.24	3.417	93.63	0.651	-0.082

5th percentile = 2.161
16th percentile = 2.766
50th percentile = 3.470
84th percentile = 4.068
95th percentile = 6.616

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VC-16-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704223
Station = VC-16
Depth (ft) = 3

Total sample weight = 32.093 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.040	0.125	0.125
2000.000	-1.00	0.031	0.097	0.221
1414.214	-0.50	0.021	0.065	0.287
1000.000	0.00	0.044	0.137	0.424
707.107	0.50	0.065	0.203	0.626
500.000	1.00	0.257	0.801	1.427
353.553	1.50	3.062	9.541	10.968
250.000	2.00	3.166	9.865	20.833
176.777	2.50	5.886	18.341	39.174
125.000	3.00	4.703	14.654	53.828
88.388	3.50	5.913	18.425	72.253
74.325	3.75	2.038	6.350	78.603
62.500	4.00	1.749	5.450	84.053
31.250	5.00	3.327	10.366	94.419
15.625	6.00	0.730	2.275	96.695
7.813	7.00	0.041	0.126	96.821
3.906	8.00	0.122	0.379	97.200
1.953	9.00	0.122	0.379	97.580
0.977	> 9.0	0.777	2.420	100.000

% < 4 phi = 15.947
% > 1 phi = 0.626
% gravel = 0.221
% sand = 83.832
% silt = 13.147
% clay = 2.800

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.869	136.85	2.876	136.19	1.121	0.006

5th percentile = 1.187
16th percentile = 1.755
50th percentile = 2.869
84th percentile = 3.998
95th percentile = 5.255

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F-72
VC-16-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704224
Station = VC-16
Depth (ft) = 6

Total sample weight = 27.505 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.000	0.000	0.000
707.107	0.50	0.016	0.058	0.058
500.000	1.00	0.009	0.033	0.091
353.553	1.50	0.012	0.044	0.135
250.000	2.00	0.030	0.109	0.244
176.777	2.50	0.085	0.309	0.553
125.000	3.00	0.253	0.920	1.472
88.388	3.50	0.727	2.643	4.116
74.325	3.75	0.509	1.851	5.966
62.500	4.00	1.394	5.068	11.035
31.250	5.00	6.694	24.338	35.372
15.625	6.00	5.964	21.683	57.055
7.813	7.00	4.544	16.520	73.576
3.906	8.00	2.678	9.735	83.311
1.953	9.00	0.811	2.950	86.261
0.977	> 9.0	3.779	13.739	100.000

% < 4 phi = 88.965
% > 1 phi = 0.058
% gravel = 0.000
% sand = 11.035
% silt = 72.276
% clay = 16.689

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
5.675	19.58	6.219	13.43	2.015	0.270

*** 95th percentile not reached ***

5th percentile = 3.619
16th percentile = 4.204
50th percentile = 5.675
84th percentile = 8.234
95th percentile = .

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VC-16-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704225
Station = VC-16
Depth (ft) = 9

Total sample weight = 29.629 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.002	0.007	0.007
707.107	0.50	0.008	0.027	0.034
500.000	1.00	0.030	0.101	0.135
353.553	1.50	0.230	0.776	0.911
250.000	2.00	0.287	0.969	1.880
176.777	2.50	1.493	5.039	6.919
125.000	3.00	2.775	9.366	16.285
88.388	3.50	5.825	19.660	35.945
74.325	3.75	3.881	13.099	49.044
62.500	4.00	3.002	10.132	59.176
31.250	5.00	8.276	27.933	87.109
15.625	6.00	2.434	8.216	95.325
7.813	7.00	0.609	2.054	97.378
3.906	8.00	0.081	0.274	97.652
1.953	9.00	0.365	1.232	98.885
0.977	> 9.0	0.330	1.115	100.000

% < 4 phi = 40.824
% > 1 phi = 0.034
% gravel = 0.000
% sand = 59.176
% silt = 38.477
% clay = 2.348

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.774	73.12	3.937	65.30	0.952	0.171

5th percentile = 2.310
16th percentile = 2.985
50th percentile = 3.774
84th percentile = 4.889
95th percentile = 5.961

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F-74
VC-16-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704238
Station = VC-17
Depth (ft) = 0

Total sample weight = 30.667 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.009	0.029	0.029
2000.000	-1.00	0.030	0.098	0.127
1414.214	-0.50	0.009	0.029	0.157
1000.000	0.00	0.020	0.065	0.222
707.107	0.50	0.018	0.059	0.280
500.000	1.00	0.012	0.039	0.320
353.553	1.50	0.183	0.597	0.916
250.000	2.00	0.608	1.983	2.899
176.777	2.50	3.278	10.689	13.588
125.000	3.00	4.446	14.498	28.086
88.388	3.50	8.784	28.643	56.729
74.325	3.75	5.785	18.864	75.593
62.500	4.00	3.787	12.349	87.942
31.250	5.00	2.718	8.864	96.806
15.625	6.00	0.081	0.265	97.070
7.813	7.00	0.041	0.132	97.203
3.906	8.00	0.081	0.265	97.467
1.953	9.00	0.081	0.265	97.732
0.977	> 9.0	0.696	2.268	100.000

% < 4 phi = 12.058
% > 1 phi = 0.280
% gravel = 0.127
% sand = 87.815
% silt = 9.525
% clay = 2.533

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.383	95.89	3.252	104.99	0.669	-0.196

5th percentile = 2.098
16th percentile = 2.583
50th percentile = 3.383
84th percentile = 3.920
95th percentile = 4.796

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VC-17-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704239
Station = VC-17
Depth (ft) = 3

Total sample weight = 31.306 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	2.782	8.887	8.887
2000.000	-1.00	0.644	2.057	10.944
1414.214	-0.50	0.509	1.626	12.570
1000.000	0.00	0.472	1.508	14.077
707.107	0.50	0.202	0.645	14.723
500.000	1.00	0.171	0.546	15.269
353.553	1.50	0.294	0.939	16.208
250.000	2.00	1.816	5.801	22.009
176.777	2.50	2.510	8.018	30.026
125.000	3.00	4.066	12.988	43.014
88.388	3.50	9.458	30.212	73.226
74.325	3.75	3.399	10.857	84.083
62.500	4.00	1.853	5.919	90.002
31.250	5.00	1.826	5.832	95.834
15.625	6.00	0.649	2.073	97.908
7.813	7.00	0.122	0.389	98.296
3.906	8.00	0.041	0.130	98.426
1.953	9.00	0.041	0.130	98.556
0.977	> 9.0	0.452	1.444	100.000

% < 4 phi = 9.998
% > 1 phi = 14.723
% gravel = 10.944
% sand = 79.059
% silt = 8.424
% clay = 1.574

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.116	115.37	2.569	168.56	1.179	-0.464

*** 5th percentile not obtainable ***

5th percentile = .
16th percentile = 1.389
50th percentile = 3.116
84th percentile = 3.748
95th percentile = 4.857

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VC-17-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704240A
Station = VC-17
Depth (ft) = 6

Total sample weight = 27.519 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.121	0.440	0.440
2000.000	-1.00	0.000	0.000	0.440
1414.214	-0.50	0.008	0.029	0.469
1000.000	0.00	0.023	0.084	0.552
707.107	0.50	0.024	0.087	0.640
500.000	1.00	0.024	0.087	0.727
353.553	1.50	0.014	0.051	0.778
250.000	2.00	0.022	0.080	0.858
176.777	2.50	0.033	0.120	0.978
125.000	3.00	0.124	0.451	1.428
88.388	3.50	0.242	0.879	2.308
74.325	3.75	0.350	1.272	3.579
62.500	4.00	0.563	2.046	5.625
31.250	5.00	8.763	31.844	37.469
15.625	6.00	9.575	34.793	72.262
7.813	7.00	3.002	10.910	83.172
3.906	8.00	1.663	6.045	89.216
1.953	9.00	1.014	3.686	92.902
0.977	> 9.0	1.953	7.098	100.000

% < 4 phi = 94.375
% > 1 phi = 0.640
% gravel = 0.440
% sand = 5.186
% silt = 83.591
% clay = 10.784

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
5.360	24.35	5.731	18.82	1.406	0.264

*** 95th percentile not reached ***

5th percentile = 3.924
16th percentile = 4.326
50th percentile = 5.360
84th percentile = 7.137
95th percentile = .

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VC-17-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704240B
Station = VC-17
Depth (ft) = 6

Total sample weight = 27.652 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.000	0.000	0.000
707.107	0.50	0.000	0.000	0.000
500.000	1.00	0.002	0.007	0.007
353.553	1.50	0.008	0.029	0.036
250.000	2.00	0.002	0.007	0.043
176.777	2.50	0.419	1.515	1.559
125.000	3.00	0.123	0.445	2.004
88.388	3.50	0.264	0.955	2.958
74.325	3.75	0.277	1.002	3.960
62.500	4.00	0.383	1.385	5.345
31.250	5.00	10.426	37.707	43.052
15.625	6.00	9.412	34.039	77.091
7.813	7.00	2.678	9.683	86.774
3.906	8.00	1.258	4.548	91.322
1.953	9.00	0.771	2.788	94.110
0.977	> 9.0	1.629	5.890	100.000

% < 4 phi = 94.655
% > 1 phi = 0.000
% gravel = 0.000
% sand = 5.345
% silt = 85.977
% clay = 8.678

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
5.204	27.13	5.498	22.13	1.215	0.242

*** 95th percentile not reached ***

5th percentile = 3.938
16th percentile = 4.283
50th percentile = 5.204
84th percentile = 6.714
95th percentile = .

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F-78

VC-17-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704241
Station = VC-17
Depth (ft) = 9

Total sample weight = 27.035 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.007	0.026	0.026
1000.000	0.00	0.006	0.022	0.048
707.107	0.50	0.027	0.100	0.148
500.000	1.00	0.024	0.089	0.237
353.553	1.50	0.028	0.104	0.340
250.000	2.00	0.017	0.063	0.403
176.777	2.50	0.019	0.070	0.473
125.000	3.00	0.028	0.104	0.577
88.388	3.50	0.018	0.067	0.644
74.325	3.75	0.024	0.089	0.732
62.500	4.00	0.033	0.122	0.854
31.250	5.00	2.195	8.121	8.975
15.625	6.00	0.285	1.053	10.028
7.813	7.00	6.505	24.062	34.089
3.906	8.00	8.294	30.678	64.768
1.953	9.00	2.439	9.023	73.791
0.977	> 9.0	7.086	26.209	100.000

% < 4 phi = 99.146
% > 1 phi = 0.148
% gravel = 0.000
% sand = 0.854
% silt = 63.914
% clay = 35.232

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
7.519	5.45	7.942	4.07	1.694	0.250

*** 84th percentile extrapolated ***
*** 95th percentile not reached ***

5th percentile = 4.510
16th percentile = 6.248
50th percentile = 7.519
84th percentile = 9.636
95th percentile = .

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VC-17-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704242
Station = VC-17
Depth (ft) = 12

Total sample weight = 29.796 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.002	0.007	0.007
1000.000	0.00	0.002	0.007	0.013
707.107	0.50	0.005	0.017	0.030
500.000	1.00	0.022	0.074	0.104
353.553	1.50	0.096	0.322	0.426
250.000	2.00	0.558	1.873	2.299
176.777	2.50	1.798	6.034	8.333
125.000	3.00	5.942	19.943	28.276
88.388	3.50	7.347	24.658	52.934
74.325	3.75	3.567	11.972	64.906
62.500	4.00	0.403	1.353	66.258
31.250	5.00	3.537	11.871	78.130
15.625	6.00	2.073	6.959	85.089
7.813	7.00	1.342	4.503	89.592
3.906	8.00	0.732	2.456	92.048
1.953	9.00	0.447	1.501	93.549
0.977	> 9.0	1.922	6.451	100.000

% < 4 phi = 33.742
% > 1 phi = 0.030
% gravel = 0.000
% sand = 66.258
% silt = 25.789
% clay = 7.952

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.441	92.11	4.268	51.91	1.576	0.525

*** 95th percentile not reached ***

5th percentile = 2.224
16th percentile = 2.692
50th percentile = 3.441
84th percentile = 5.844
95th percentile = .

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F-80
VC-17-12

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704248
Station = VC-18
Depth (ft) = 0

Total sample weight = 30.854 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.013	0.042	0.042
1000.000	0.00	0.033	0.107	0.149
707.107	0.50	0.031	0.100	0.250
500.000	1.00	0.043	0.139	0.389
353.553	1.50	0.105	0.340	0.729
250.000	2.00	0.540	1.750	2.479
176.777	2.50	1.958	6.346	8.825
125.000	3.00	7.377	23.909	32.735
88.388	3.50	8.923	28.920	61.655
74.325	3.75	4.384	14.209	75.863
62.500	4.00	2.435	7.892	83.755
31.250	5.00	1.098	3.558	87.313
15.625	6.00	1.382	4.480	91.793
7.813	7.00	0.041	0.132	91.925
3.906	8.00	0.203	0.659	92.584
1.953	9.00	0.407	1.318	93.902
0.977	> 9.0	1.882	6.098	100.000

% < 4 phi = 16.245
% > 1 phi = 0.250
% gravel = 0.000
% sand = 83.755
% silt = 8.829
% clay = 7.416

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.299	101.64	3.359	97.44	0.709	0.086

*** 95th percentile not reached ***

5th percentile = 2.199
16th percentile = 2.650
50th percentile = 3.299
84th percentile = 4.069
95th percentile = .

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VC-18-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704249
Station = VC-18
Depth (ft) = 3

Total sample weight = 30.977 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	1.944	6.276	6.276
2000.000	-1.00	0.344	1.111	7.386
1414.214	-0.50	0.262	0.846	8.232
1000.000	0.00	0.139	0.449	8.681
707.107	0.50	0.072	0.232	8.913
500.000	1.00	0.074	0.239	9.152
353.553	1.50	2.224	7.180	16.332
250.000	2.00	0.163	0.526	16.858
176.777	2.50	15.295	49.376	66.233
125.000	3.00	1.484	4.791	71.024
88.388	3.50	3.504	11.312	82.336
74.325	3.75	1.179	3.806	86.142
62.500	4.00	0.663	2.140	88.282
31.250	5.00	1.952	6.300	94.582
15.625	6.00	0.366	1.181	95.763
7.813	7.00	0.122	0.394	96.157
3.906	8.00	0.041	0.131	96.288
1.953	9.00	0.041	0.131	96.420
0.977	> 9.0	1.109	3.580	100.000

% < 4 phi = 11.718
% > 1 phi = 8.913
% gravel = 7.386
% sand = 80.896
% silt = 8.006
% clay = 3.712

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.336	198.11	2.543	171.57	1.066	0.195

*** 5th percentile not obtainable ***

5th percentile = .
16th percentile = 1.477
50th percentile = 2.336
84th percentile = 3.609
95th percentile = 5.354

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F-82
VC-18-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704250A
Station = VC-18
Depth (ft) = 6

Total sample weight = 27.332 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.918	3.359	3.359
2000.000	-1.00	0.155	0.567	3.926
1414.214	-0.50	0.037	0.135	4.061
1000.000	0.00	0.118	0.432	4.493
707.107	0.50	0.023	0.084	4.577
500.000	1.00	0.019	0.070	4.647
353.553	1.50	0.008	0.029	4.676
250.000	2.00	0.014	0.051	4.727
176.777	2.50	0.038	0.139	4.866
125.000	3.00	0.244	0.893	5.759
88.388	3.50	1.021	3.736	9.494
74.325	3.75	1.050	3.842	13.336
62.500	4.00	1.976	7.230	20.566
31.250	5.00	11.725	42.898	63.463
15.625	6.00	6.410	23.453	86.916
7.813	7.00	1.907	6.976	93.893
3.906	8.00	0.690	2.523	96.416
1.953	9.00	0.041	0.148	96.564
0.977	> 9.0	0.939	3.436	100.000

% < 4 phi = 79.434
% > 1 phi = 4.577
% gravel = 3.926
% sand = 16.640
% silt = 75.850
% clay = 3.584

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
4.686	38.84	4.859	34.46	1.017	0.170

5th percentile = 2.575
16th percentile = 3.842
50th percentile = 4.686
84th percentile = 5.876
95th percentile = 7.439

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VC-18-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704250B
Station = VC-18
Depth (ft) = 6

Total sample weight = 27.187 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.310	1.140	1.140
2000.000	-1.00	0.108	0.397	1.538
1414.214	-0.50	0.044	0.162	1.699
1000.000	0.00	0.067	0.246	1.946
707.107	0.50	0.049	0.180	2.126
500.000	1.00	0.037	0.136	2.262
353.553	1.50	0.030	0.110	2.372
250.000	2.00	0.105	0.386	2.759
176.777	2.50	0.089	0.327	3.086
125.000	3.00	0.431	1.585	4.671
88.388	3.50	1.398	5.142	9.814
74.325	3.75	1.795	6.602	16.416
62.500	4.00	1.865	6.860	23.276
31.250	5.00	10.873	39.993	63.269
15.625	6.00	6.532	24.025	87.294
7.813	7.00	1.461	5.372	92.666
3.906	8.00	0.487	1.791	94.457
1.953	9.00	0.406	1.492	95.949
0.977	> 9.0	1.101	4.051	100.000

% < 4 phi = 76.724
% > 1 phi = 2.126
% gravel = 1.538
% sand = 21.738
% silt = 71.181
% clay = 5.543

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
4.668	39.33	4.799	35.93	1.064	0.122

5th percentile = 3.032
16th percentile = 3.734
50th percentile = 4.668
84th percentile = 5.863
95th percentile = 8.364

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F-84
VC-18-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704251
Station = VC-18
Depth (ft) = 9

Total sample weight = 29.509 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.000	0.000	0.000
707.107	0.50	0.000	0.000	0.000
500.000	1.00	0.000	0.000	0.000
353.553	1.50	0.120	0.407	0.407
250.000	2.00	0.331	1.122	1.528
176.777	2.50	3.167	10.732	12.261
125.000	3.00	5.926	20.082	32.342
88.388	3.50	8.781	29.757	62.099
74.325	3.75	4.740	16.063	78.162
62.500	4.00	2.138	7.245	85.407
31.250	5.00	3.043	10.311	95.718
15.625	6.00	0.446	1.512	97.230
7.813	7.00	0.203	0.687	97.918
3.906	8.00	0.081	0.275	98.193
1.953	9.00	0.041	0.137	98.330
0.977	> 9.0	0.493	1.670	100.000

% < 4 phi = 14.593
% > 1 phi = 0.000
% gravel = 0.000
% sand = 85.407
% silt = 12.786
% clay = 1.807

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.297	101.76	3.272	103.50	0.679	-0.036

5th percentile = 2.162
16th percentile = 2.593
50th percentile = 3.297
84th percentile = 3.951
95th percentile = 4.930

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VC-18-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704251
Station = VC-18
Depth (ft) = 9

Total sample weight = 29.509 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.000	0.000	0.000
707.107	0.50	0.000	0.000	0.000
500.000	1.00	0.000	0.000	0.000
353.553	1.50	0.120	0.407	0.407
250.000	2.00	0.331	1.122	1.528
176.777	2.50	3.167	10.732	12.261
125.000	3.00	5.926	20.082	32.342
88.388	3.50	8.781	29.757	62.099
74.325	3.75	4.740	16.063	78.162
62.500	4.00	2.138	7.245	85.407
31.250	5.00	3.043	10.311	95.718
15.625	6.00	0.446	1.512	97.230
7.813	7.00	0.203	0.687	97.918
3.906	8.00	0.081	0.275	98.193
1.953	9.00	0.041	0.137	98.330
0.977	> 9.0	0.493	1.670	100.000

% < 4 phi = 14.593
% > 1 phi = 0.000
% gravel = 0.000
% sand = 85.407
% silt = 12.786
% clay = 1.807

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.297	101.76	3.272	103.50	0.679	-0.036

5th percentile = 2.162
16th percentile = 2.593
50th percentile = 3.297
84th percentile = 3.951
95th percentile = 4.930

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VC-18-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704252
Station = VC-18
Depth (ft) = 12

Total sample weight = 32.159 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.006	0.019	0.019
1000.000	0.00	0.009	0.028	0.047
707.107	0.50	0.018	0.056	0.103
500.000	1.00	0.169	0.526	0.628
353.553	1.50	0.734	2.282	2.911
250.000	2.00	4.151	12.908	15.818
176.777	2.50	8.070	25.094	40.912
125.000	3.00	10.879	33.829	74.741
88.388	3.50	5.736	17.836	92.578
74.325	3.75	1.195	3.716	96.294
62.500	4.00	0.334	1.039	97.332
31.250	5.00	0.122	0.378	97.711
15.625	6.00	0.162	0.505	98.215
7.813	7.00	0.203	0.631	98.846
3.906	8.00	0.122	0.378	99.225
1.953	9.00	0.041	0.126	99.351
0.977	> 9.0	0.209	0.649	100.000

% < 4 phi = 2.668
% > 1 phi = 0.103
% gravel = 0.000
% sand = 97.332
% silt = 1.892
% clay = 0.775

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.634	161.06	2.632	161.37	0.628	-0.004

5th percentile = 1.581
16th percentile = 2.004
50th percentile = 2.634
84th percentile = 3.260
95th percentile = 3.663

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VC-18-12

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704206
Station = VC-19
Depth (ft) = 0

Total sample weight = 31.108 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.383	1.231	1.231
2000.000	-1.00	0.157	0.505	1.736
1414.214	-0.50	0.090	0.289	2.025
1000.000	0.00	0.079	0.254	2.279
707.107	0.50	0.073	0.235	2.514
500.000	1.00	0.050	0.161	2.675
353.553	1.50	0.361	1.160	3.835
250.000	2.00	0.827	2.658	6.493
176.777	2.50	4.525	14.546	21.040
125.000	3.00	7.027	22.589	43.629
88.388	3.50	8.378	26.932	70.560
74.325	3.75	4.272	13.733	84.293
62.500	4.00	1.878	6.037	90.330
31.250	5.00	1.461	4.695	95.025
15.625	6.00	0.203	0.652	95.677
7.813	7.00	0.284	0.913	96.590
3.906	8.00	0.081	0.261	96.851
1.953	9.00	0.203	0.652	97.503
0.977	> 9.0	0.777	2.497	100.000

% < 4 phi = 9.670
% > 1 phi = 2.514
% gravel = 1.736
% sand = 88.594
% silt = 6.521
% clay = 3.149

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.118	115.16	3.036	121.94	0.709	-0.116

5th percentile = 1.719
16th percentile = 2.327
50th percentile = 3.118
84th percentile = 3.745
95th percentile = 4.995

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VC-19-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704207
Station = VC-19
Depth (ft) = 3

Total sample weight = 30.689 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.245	0.798	0.798
2000.000	-1.00	0.011	0.036	0.834
1414.214	-0.50	0.017	0.055	0.890
1000.000	0.00	0.024	0.078	0.968
707.107	0.50	0.025	0.081	1.049
500.000	1.00	0.089	0.290	1.339
353.553	1.50	0.446	1.453	2.793
250.000	2.00	2.518	8.205	10.997
176.777	2.50	3.560	11.600	22.598
125.000	3.00	4.501	14.666	37.264
88.388	3.50	6.517	21.236	58.500
74.325	3.75	2.904	9.463	67.962
62.500	4.00	2.767	9.016	76.978
31.250	5.00	4.625	15.070	92.049
15.625	6.00	0.974	3.173	95.222
7.813	7.00	0.041	0.132	95.354
3.906	8.00	0.568	1.851	97.205
1.953	9.00	0.325	1.058	98.262
0.977	> 9.0	0.533	1.738	100.000

% < 4 phi = 23.022
% > 1 phi = 1.049
% gravel = 0.834
% sand = 76.144
% silt = 20.226
% clay = 2.795

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.300	101.54	3.341	98.70	1.125	0.036

5th percentile = 1.635
16th percentile = 2.216
50th percentile = 3.300
84th percentile = 4.466
95th percentile = 5.930

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VC-19-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704208
Station = VC-19
Depth (ft) = 6

Total sample weight = 29.927 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.010	0.033	0.033
1414.214	-0.50	0.006	0.020	0.053
1000.000	0.00	0.006	0.020	0.074
707.107	0.50	0.012	0.040	0.114
500.000	1.00	0.022	0.074	0.187
353.553	1.50	0.189	0.632	0.819
250.000	2.00	0.335	1.119	1.938
176.777	2.50	3.308	11.054	12.992
125.000	3.00	4.528	15.130	28.122
88.388	3.50	7.064	23.604	51.726
74.325	3.75	2.767	9.246	60.972
62.500	4.00	2.140	7.151	68.123
31.250	5.00	5.964	19.928	88.051
15.625	6.00	1.704	5.694	93.744
7.813	7.00	0.446	1.491	95.236
3.906	8.00	0.284	0.949	96.184
1.953	9.00	0.446	1.491	97.676
0.977	> 9.0	0.696	2.324	100.000

% < 4 phi = 31.877
% > 1 phi = 0.114
% gravel = 0.033
% sand = 68.089
% silt = 28.062
% clay = 3.816

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.463	90.66	3.698	77.05	1.099	0.214

5th percentile = 2.139
16th percentile = 2.599
50th percentile = 3.463
84th percentile = 4.797
95th percentile = 6.842

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F-90

VC-19-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704209
Station = VC-19
Depth (ft) = 9

Total sample weight = 29.089 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.012	0.041	0.041
707.107	0.50	0.002	0.007	0.048
500.000	1.00	0.006	0.021	0.069
353.553	1.50	0.009	0.031	0.100
250.000	2.00	0.012	0.041	0.141
176.777	2.50	0.023	0.079	0.220
125.000	3.00	0.070	0.241	0.461
88.388	3.50	0.132	0.454	0.914
74.325	3.75	0.083	0.285	1.200
62.500	4.00	0.066	0.227	1.427
31.250	5.00	1.545	5.311	6.738
15.625	6.00	10.367	35.640	42.378
7.813	7.00	9.066	31.168	73.545
3.906	8.00	3.171	10.902	84.447
1.953	9.00	1.464	5.032	89.479
0.977	> 9.0	3.061	10.521	100.000

% < 4 phi = 98.573
% > 1 phi = 0.048
% gravel = 0.000
% sand = 1.427
% silt = 83.020
% clay = 15.553

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
6.245	13.19	6.609	10.24	1.350	0.270

*** 95th percentile not reached ***

5th percentile = 4.673
16th percentile = 5.260
50th percentile = 6.245
84th percentile = 7.959
95th percentile = .

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F-91

VC-19-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704210A
Station = VC-19
Depth (ft) = 12

Total sample weight = 30.223 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.001	0.003	0.003
1000.000	0.00	0.004	0.013	0.017
707.107	0.50	0.016	0.053	0.069
500.000	1.00	0.015	0.050	0.119
353.553	1.50	0.071	0.235	0.354
250.000	2.00	0.564	1.866	2.220
176.777	2.50	2.299	7.607	9.827
125.000	3.00	10.045	33.237	43.064
88.388	3.50	10.327	34.170	77.234
74.325	3.75	2.577	8.527	85.761
62.500	4.00	1.082	3.580	89.341
31.250	5.00	1.323	4.376	93.717
15.625	6.00	0.401	1.326	95.043
7.813	7.00	0.521	1.724	96.767
3.906	8.00	0.200	0.663	97.430
1.953	9.00	0.200	0.663	98.093
0.977	> 9.0	0.576	1.907	100.000

% < 4 phi = 10.659
% > 1 phi = 0.069
% gravel = 0.000
% sand = 89.341
% silt = 8.090
% clay = 2.570

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.101	116.51	3.146	113.00	0.553	0.080

5th percentile = 2.183
16th percentile = 2.593
50th percentile = 3.101
84th percentile = 3.698
95th percentile = 5.967

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VC-19-12A

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704210B
Station = VC-19
Depth (ft) = 12

Total sample weight = 30.582 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.001	0.003	0.003
707.107	0.50	0.008	0.026	0.029
500.000	1.00	0.031	0.101	0.131
353.553	1.50	0.206	0.674	0.804
250.000	2.00	0.381	1.246	2.050
176.777	2.50	2.626	8.587	10.637
125.000	3.00	9.400	30.737	41.374
88.388	3.50	10.194	33.334	74.708
74.325	3.75	2.474	8.090	82.798
62.500	4.00	1.563	5.111	87.909
31.250	5.00	1.298	4.245	92.154
15.625	6.00	0.893	2.919	95.072
7.813	7.00	0.325	1.061	96.134
3.906	8.00	0.325	1.061	97.195
1.953	9.00	0.041	0.133	97.327
0.977	> 9.0	0.817	2.673	100.000

% < 4 phi = 12.091
% > 1 phi = 0.029
% gravel = 0.000
% sand = 87.909
% silt = 9.286
% clay = 2.805

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.129	114.28	3.198	108.97	0.611	0.112

5th percentile = 2.172
16th percentile = 2.587
50th percentile = 3.129
84th percentile = 3.809
95th percentile = 5.975

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F-93

VC-19-12B

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704173
Station = VC-20
Depth (ft) = 0

Total sample weight = 30.326 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.012	0.040	0.040
1414.214	-0.50	0.013	0.043	0.082
1000.000	0.00	0.022	0.073	0.155
707.107	0.50	0.027	0.089	0.244
500.000	1.00	0.026	0.086	0.330
353.553	1.50	0.210	0.692	1.022
250.000	2.00	0.578	1.906	2.928
176.777	2.50	2.555	8.425	11.353
125.000	3.00	3.756	12.385	23.739
88.388	3.50	9.790	32.283	56.021
74.325	3.75	4.801	15.831	71.852
62.500	4.00	3.540	11.673	83.526
31.250	5.00	3.124	10.301	93.827
15.625	6.00	0.893	2.943	96.770
7.813	7.00	0.041	0.134	96.904
3.906	8.00	0.041	0.134	97.037
1.953	9.00	0.041	0.134	97.171
0.977	> 9.0	0.858	2.829	100.000

% < 4 phi = 16.474
% > 1 phi = 0.244
% gravel = 0.040
% sand = 83.486
% silt = 13.512
% clay = 2.963

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.407	94.29	3.367	96.94	0.679	-0.059

5th percentile = 2.123
16th percentile = 2.688
50th percentile = 3.407
84th percentile = 4.046
95th percentile = 5.399

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F-94
VC-20-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704174
Station = VC-20
Depth (ft) = 3

Total sample weight = 25.471 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.503	1.975	1.975
2000.000	-1.00	0.128	0.503	2.477
1414.214	-0.50	0.149	0.585	3.062
1000.000	0.00	0.131	0.514	3.577
707.107	0.50	0.079	0.310	3.887
500.000	1.00	0.122	0.479	4.366
353.553	1.50	0.494	1.939	6.305
250.000	2.00	1.537	6.034	12.340
176.777	2.50	1.491	5.854	18.193
125.000	3.00	1.443	5.665	23.859
88.388	3.50	3.260	12.799	36.658
74.325	3.75	2.420	9.501	46.159
62.500	4.00	1.537	6.034	52.193
31.250	5.00	3.489	13.698	65.891
15.625	6.00	1.095	4.301	70.191
7.813	7.00	1.420	5.575	75.766
3.906	8.00	1.501	5.893	81.660
1.953	9.00	1.014	3.982	85.642
0.977	> 9.0	3.657	14.358	100.000

% < 4 phi = 47.807
% > 1 phi = 3.887
% gravel = 2.477
% sand = 49.716
% silt = 29.467
% clay = 18.340

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.909	66.56	5.450	22.87	3.138	0.491

*** 95th percentile not reached ***

5th percentile = 1.164
16th percentile = 2.313
50th percentile = 3.909
84th percentile = 8.588
95th percentile = .

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F-95
VC-20-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704175
Station = VC-20
Depth (ft) = 6

Total sample weight = 10.949 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.013	0.119	0.119
1000.000	0.00	0.018	0.164	0.283
707.107	0.50	0.016	0.146	0.429
500.000	1.00	0.008	0.073	0.502
353.553	1.50	0.038	0.347	0.849
250.000	2.00	0.059	0.539	1.388
176.777	2.50	0.070	0.639	2.028
125.000	3.00	0.159	1.452	3.480
88.388	3.50	0.210	1.918	5.398
74.325	3.75	0.149	1.361	6.759
62.500	4.00	0.101	0.922	7.681
31.250	5.00	0.081	0.741	8.422
15.625	6.00	0.649	5.929	14.351
7.813	7.00	0.811	7.411	21.762
3.906	8.00	1.663	15.192	36.954
1.953	9.00	1.542	14.081	51.035
0.977	> 9.0	5.361	48.965	100.000

% < 4 phi = 92.319
% > 1 phi = 0.429
% gravel = 0.000
% sand = 7.681
% silt = 29.273
% clay = 63.046

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
8.927	2.06	8.782	2.27	2.559	-0.057

*** 84th percentile extrapolated ***
*** 95th percentile not reached ***

5th percentile = 3.396
16th percentile = 6.223
50th percentile = 8.927
84th percentile = 11.341
95th percentile = .

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F-96
VC-20-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704176
Station = VC-20
Depth (ft) = 9

Total sample weight = 27.690 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.003	0.011	0.011
707.107	0.50	0.001	0.004	0.014
500.000	1.00	0.005	0.018	0.033
353.553	1.50	0.007	0.025	0.058
250.000	2.00	0.040	0.144	0.202
176.777	2.50	0.046	0.166	0.368
125.000	3.00	0.114	0.412	0.780
88.388	3.50	0.181	0.654	1.434
74.325	3.75	0.138	0.498	1.932
62.500	4.00	0.170	0.614	2.546
31.250	5.00	4.260	15.384	17.930
15.625	6.00	12.577	45.420	63.350
7.813	7.00	5.436	19.633	82.983
3.906	8.00	1.988	7.179	90.162
1.953	9.00	0.730	2.637	92.799
0.977	> 9.0	1.994	7.201	100.000

% < 4 phi = 97.454
% > 1 phi = 0.014
% gravel = 0.000
% sand = 2.546
% silt = 87.616
% clay = 9.838

Graphic Moments

Median phi	Median microns	Mean phi	Mean microns	Dispersion	Skewness
5.706	19.16	6.008	15.54	1.134	0.266

*** 95th percentile not reached ***

5th percentile = 4.160
16th percentile = 4.875
50th percentile = 5.706
84th percentile = 7.142
95th percentile = .

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VC-20-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704169
Station = VC-21
Depth (ft) = 0

Total sample weight = 30.931 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.008	0.026	0.026
1000.000	0.00	0.020	0.065	0.091
707.107	0.50	0.038	0.123	0.213
500.000	1.00	0.061	0.197	0.411
353.553	1.50	0.185	0.598	1.009
250.000	2.00	0.965	3.120	4.129
176.777	2.50	2.371	7.665	11.794
125.000	3.00	6.389	20.656	32.450
88.388	3.50	8.503	27.490	59.940
74.325	3.75	5.168	16.708	76.648
62.500	4.00	2.024	6.544	83.192
31.250	5.00	2.596	8.394	91.586
15.625	6.00	0.365	1.180	92.767
7.813	7.00	0.609	1.967	94.734
3.906	8.00	0.041	0.131	94.866
1.953	9.00	0.365	1.180	96.046
0.977	> 9.0	1.223	3.954	100.000

% < 4 phi = 16.808
% > 1 phi = 0.213
% gravel = 0.000
% sand = 83.192
% silt = 11.674
% clay = 5.134

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.319	100.19	3.349	98.14	0.747	0.040

5th percentile = 2.057
16th percentile = 2.602
50th percentile = 3.319
84th percentile = 4.096
95th percentile = 8.114

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F-98
VC-21-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704170A
Station = VC-21
Depth (ft) = 3

Total sample weight = 30.932 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.884	2.858	2.858
2000.000	-1.00	0.425	1.374	4.232
1414.214	-0.50	0.454	1.468	5.700
1000.000	0.00	0.350	1.132	6.831
707.107	0.50	0.241	0.779	7.610
500.000	1.00	0.186	0.601	8.212
353.553	1.50	0.555	1.794	10.006
250.000	2.00	0.551	1.781	11.787
176.777	2.50	1.633	5.279	17.067
125.000	3.00	3.271	10.575	27.642
88.388	3.50	9.430	30.487	58.128
74.325	3.75	5.002	16.171	74.299
62.500	4.00	2.629	8.499	82.799
31.250	5.00	3.448	11.149	93.948
15.625	6.00	0.568	1.836	95.784
7.813	7.00	0.162	0.525	96.308
3.906	8.00	0.162	0.525	96.833
1.953	9.00	0.041	0.131	96.964
0.977	> 9.0	0.939	3.036	100.000

% < 4 phi = 17.201
% > 1 phi = 7.610
% gravel = 4.232
% sand = 78.567
% silt = 14.034
% clay = 3.167

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.367	96.94	3.253	104.87	0.854	-0.133

5th percentile = -0.738
16th percentile = 2.399
50th percentile = 3.367
84th percentile = 4.108
95th percentile = 5.573

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VC-21-3A

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704170B
Station = VC-21
Depth (ft) = 3

Total sample weight = 30.704 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.926	3.016	3.016
2000.000	-1.00	0.460	1.498	4.514
1414.214	-0.50	0.443	1.443	5.957
1000.000	0.00	0.338	1.101	7.058
707.107	0.50	0.261	0.850	7.908
500.000	1.00	0.205	0.668	8.575
353.553	1.50	0.284	0.925	9.500
250.000	2.00	0.801	2.609	12.109
176.777	2.50	1.444	4.703	16.812
125.000	3.00	3.819	12.438	29.250
88.388	3.50	9.659	31.458	60.708
74.325	3.75	5.352	17.431	78.139
62.500	4.00	1.554	5.061	83.200
31.250	5.00	3.448	11.231	94.431
15.625	6.00	0.446	1.453	95.885
7.813	7.00	0.162	0.529	96.413
3.906	8.00	0.122	0.396	96.810
1.953	9.00	0.162	0.529	97.338
0.977	> 9.0	0.817	2.662	100.000

% < 4 phi = 16.800
% > 1 phi = 7.908
% gravel = 4.514
% sand = 78.686
% silt = 13.610
% clay = 3.190

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.330	99.46	3.242	105.66	0.829	-0.105

5th percentile = -0.832
16th percentile = 2.414
50th percentile = 3.330
84th percentile = 4.071
95th percentile = 5.391

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F-100
VC-21-3B

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704171
Station = VC-21
Depth (ft) = 6

Total sample weight = 31.236 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.002	0.006	0.006
1000.000	0.00	0.005	0.016	0.022
707.107	0.50	0.018	0.058	0.080
500.000	1.00	0.100	0.320	0.400
353.553	1.50	1.410	4.514	4.914
250.000	2.00	1.538	4.924	9.838
176.777	2.50	5.691	18.219	28.057
125.000	3.00	6.401	20.492	48.550
88.388	3.50	6.568	21.027	69.577
74.325	3.75	2.413	7.725	77.302
62.500	4.00	1.242	3.976	81.278
31.250	5.00	3.570	11.430	92.708
15.625	6.00	1.055	3.377	96.085
7.813	7.00	0.041	0.130	96.214
3.906	8.00	0.162	0.520	96.734
1.953	9.00	0.365	1.169	97.903
0.977	> 9.0	0.655	2.097	100.000

% < 4 phi = 18.722
% > 1 phi = 0.080
% gravel = 0.000
% sand = 81.278
% silt = 15.456
% clay = 3.266

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.034	122.05	3.204	108.55	1.035	0.163

5th percentile = 1.509
16th percentile = 2.169
50th percentile = 3.034
84th percentile = 4.238
95th percentile = 5.679

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F-101
VC-21-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704172
Station = VC-21
Depth (ft) = 9

Total sample weight = 33.691 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.030	0.089	0.089
1414.214	-0.50	0.018	0.053	0.142
1000.000	0.00	0.149	0.442	0.585
707.107	0.50	0.378	1.122	1.707
500.000	1.00	1.525	4.526	6.233
353.553	1.50	4.466	13.256	19.489
250.000	2.00	7.539	22.377	41.866
176.777	2.50	4.783	14.197	56.062
125.000	3.00	3.401	10.095	66.157
88.388	3.50	1.568	4.654	70.811
74.325	3.75	0.614	1.822	72.634
62.500	4.00	0.451	1.339	73.972
31.250	5.00	1.704	5.058	79.030
15.625	6.00	1.055	3.131	82.161
7.813	7.00	1.217	3.613	85.773
3.906	8.00	1.258	3.733	89.506
1.953	9.00	0.852	2.529	92.035
0.977	> 9.0	2.684	7.965	100.000

% < 4 phi = 26.028
% > 1 phi = 1.707
% gravel = 0.089
% sand = 73.883
% silt = 15.534
% clay = 10.494

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.286	204.97	3.939	65.21	2.570	0.643

*** 95th percentile not reached ***

5th percentile = 0.864
16th percentile = 1.368
50th percentile = 2.286
84th percentile = 6.509
95th percentile = .

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2433 Impala Drive
Carlsbad, CA 92008

F-102
VC-21-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704189
Station = VC-22
Depth (ft) = 0

Total sample weight = 28.559 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.024	0.084	0.084
2000.000	-1.00	0.049	0.172	0.256
1414.214	-0.50	0.043	0.151	0.406
1000.000	0.00	0.069	0.242	0.648
707.107	0.50	0.089	0.312	0.959
500.000	1.00	0.078	0.273	1.233
353.553	1.50	0.662	2.318	3.550
250.000	2.00	1.475	5.165	8.715
176.777	2.50	4.049	14.177	22.893
125.000	3.00	4.421	15.480	38.373
88.388	3.50	4.933	17.273	55.645
74.325	3.75	4.342	15.203	70.849
62.500	4.00	1.950	6.828	77.677
31.250	5.00	2.028	7.103	84.779
15.625	6.00	1.298	4.546	89.325
7.813	7.00	0.852	2.983	92.308
3.906	8.00	0.284	0.994	93.303
1.953	9.00	0.365	1.278	94.581
0.977	> 9.0	1.548	5.419	100.000

% < 4 phi = 22.323
% > 1 phi = 0.959
% gravel = 0.256
% sand = 77.421
% silt = 15.626
% clay = 6.697

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.337	98.99	3.574	83.99	1.317	0.180

*** 95th percentile not reached ***

5th percentile = 1.640
16th percentile = 2.257
50th percentile = 3.337
84th percentile = 4.890
95th percentile = .

MEC Analytical Systems, Inc.
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Carlsbad, CA 92008

F-103
VC-22-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704190A
Station = VC-22
Depth (ft) = 3

Total sample weight = 31.217 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	2.260	7.240	7.240
2000.000	-1.00	0.572	1.832	9.072
1414.214	-0.50	0.460	1.474	10.546
1000.000	0.00	0.304	0.974	11.520
707.107	0.50	0.204	0.653	12.173
500.000	1.00	0.115	0.368	12.541
353.553	1.50	0.718	2.300	14.841
250.000	2.00	1.074	3.440	18.282
176.777	2.50	3.229	10.344	28.626
125.000	3.00	3.919	12.554	41.180
88.388	3.50	8.724	27.947	69.127
74.325	3.75	4.070	13.038	82.165
62.500	4.00	1.667	5.340	87.505
31.250	5.00	2.231	7.148	94.653
15.625	6.00	0.041	0.130	94.783
7.813	7.00	0.162	0.520	95.302
3.906	8.00	0.041	0.130	95.432
1.953	9.00	0.041	0.130	95.562
0.977	> 9.0	1.385	4.438	100.000

% < 4 phi = 12.495
% > 1 phi = 12.173
% gravel = 9.072
% sand = 78.433
% silt = 7.928
% clay = 4.568

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.158	112.05	2.752	148.43	1.084	-0.374

*** 5th percentile not obtainable ***

5th percentile = .
16th percentile = 1.668
50th percentile = 3.158
84th percentile = 3.836
95th percentile = 6.418

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F-104
VC-22-3A

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704190B
Station = VC-22
Depth (ft) = 3

Total sample weight = 30.942 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	2.268	7.330	7.330
2000.000	-1.00	0.619	2.001	9.331
1414.214	-0.50	0.490	1.584	10.914
1000.000	0.00	0.377	1.218	12.133
707.107	0.50	0.191	0.617	12.750
500.000	1.00	0.126	0.407	13.157
353.553	1.50	0.250	0.808	13.965
250.000	2.00	1.582	5.113	19.078
176.777	2.50	2.462	7.957	27.035
125.000	3.00	4.519	14.605	41.640
88.388	3.50	8.148	26.334	67.973
74.325	3.75	4.571	14.773	82.746
62.500	4.00	2.087	6.745	89.491
31.250	5.00	2.028	6.556	96.047
15.625	6.00	0.243	0.787	96.834
7.813	7.00	0.203	0.656	97.490
3.906	8.00	0.081	0.262	97.752
1.953	9.00	0.041	0.131	97.883
0.977	> 9.0	0.655	2.117	100.000

% < 4 phi = 10.509
% > 1 phi = 12.750
% gravel = 9.331
% sand = 80.161
% silt = 8.260
% clay = 2.248

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.159	111.98	2.748	148.88	1.049	-0.392

*** 5th percentile not obtainable ***

5th percentile = .
16th percentile = 1.699
50th percentile = 3.159
84th percentile = 3.796
95th percentile = 4.840

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F-105
VC-22-3B

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704191
Station = VC-22
Depth (ft) = 6

Total sample weight = 27.316 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.007	0.026	0.026
707.107	0.50	0.009	0.033	0.059
500.000	1.00	0.013	0.048	0.106
353.553	1.50	0.048	0.176	0.282
250.000	2.00	0.044	0.161	0.443
176.777	2.50	0.894	3.273	3.716
125.000	3.00	0.443	1.622	5.337
88.388	3.50	1.330	4.869	10.206
74.325	3.75	0.783	2.866	13.073
62.500	4.00	2.643	9.676	22.748
31.250	5.00	9.412	34.456	57.205
15.625	6.00	5.720	20.941	78.146
7.813	7.00	1.582	5.792	83.938
3.906	8.00	0.811	2.970	86.909
1.953	9.00	0.893	3.267	90.176
0.977	> 9.0	2.684	9.824	100.000

% < 4 phi = 77.252
% > 1 phi = 0.059
% gravel = 0.000
% sand = 22.748
% silt = 64.160
% clay = 13.091

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
4.791	36.12	5.423	23.31	1.598	0.396

*** 95th percentile not reached ***

5th percentile = 2.896
16th percentile = 3.826
50th percentile = 4.791
84th percentile = 7.021
95th percentile = .

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F-106
VC-22-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704192
Station = VC-22
Depth (ft) = 9

Total sample weight = 29.640 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.003	0.010	0.010
707.107	0.50	0.009	0.030	0.040
500.000	1.00	0.040	0.135	0.175
353.553	1.50	0.204	0.688	0.864
250.000	2.00	0.222	0.749	1.613
176.777	2.50	0.919	3.101	4.713
125.000	3.00	1.418	4.784	9.497
88.388	3.50	3.130	10.560	20.058
74.325	3.75	2.341	7.898	27.956
62.500	4.00	2.726	9.197	37.153
31.250	5.00	8.357	28.197	65.350
15.625	6.00	5.720	19.300	84.650
7.813	7.00	1.582	5.338	89.988
3.906	8.00	0.446	1.506	91.494
1.953	9.00	1.095	3.696	95.189
0.977	> 9.0	1.426	4.811	100.000

% < 4 phi = 62.847
% > 1 phi = 0.040
% gravel = 0.000
% sand = 37.153
% silt = 54.341
% clay = 8.506

Graphic Moments

Median phi	Median microns	Mean phi	Mean microns	Dispersion	Skewness
4.456	45.57	4.637	40.19	1.329	0.137

5th percentile = 2.530
16th percentile = 3.308
50th percentile = 4.456
84th percentile = 5.966
95th percentile = 8.949

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F-107
VC-22-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704193
Station = VC-22
Depth (ft) = 12

Total sample weight = 32.151 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.003	0.009	0.009
1414.214	-0.50	0.002	0.006	0.016
1000.000	0.00	0.008	0.025	0.040
707.107	0.50	0.009	0.028	0.068
500.000	1.00	0.065	0.202	0.271
353.553	1.50	0.914	2.843	3.113
250.000	2.00	0.943	2.933	6.046
176.777	2.50	6.388	19.868	25.915
125.000	3.00	8.546	26.580	52.495
88.388	3.50	6.261	19.473	71.969
74.325	3.75	1.416	4.404	76.373
62.500	4.00	2.073	6.448	82.821
31.250	5.00	3.043	9.464	92.284
15.625	6.00	0.811	2.524	94.808
7.813	7.00	0.203	0.631	95.439
3.906	8.00	0.284	0.883	96.322
1.953	9.00	0.041	0.126	96.448
0.977	> 9.0	1.142	3.552	100.000

% < 4 phi = 17.179
% > 1 phi = 0.068
% gravel = 0.009
% sand = 82.811
% silt = 13.502
% clay = 3.678

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.953	129.13	3.188	109.76	0.937	0.250

5th percentile = 1.822
16th percentile = 2.250
50th percentile = 2.953
84th percentile = 4.125
95th percentile = 6.304

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F-108
VC-22-12

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704194
Station = VC-22
Depth (ft) = 15

Total sample weight = 32.568 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.022	0.068	0.068
2000.000	-1.00	0.048	0.147	0.215
1414.214	-0.50	0.010	0.031	0.246
1000.000	0.00	0.098	0.301	0.547
707.107	0.50	0.311	0.955	1.501
500.000	1.00	1.524	4.679	6.181
353.553	1.50	3.878	11.907	18.088
250.000	2.00	6.660	20.450	38.538
176.777	2.50	6.502	19.964	58.502
125.000	3.00	4.921	15.110	73.612
88.388	3.50	2.178	6.688	80.300
74.325	3.75	0.658	2.020	82.320
62.500	4.00	0.478	1.468	83.788
31.250	5.00	1.095	3.363	87.151
15.625	6.00	0.487	1.495	88.646
7.813	7.00	0.893	2.741	91.387
3.906	8.00	0.811	2.491	93.878
1.953	9.00	0.487	1.495	95.373
0.977	> 9.0	1.507	4.627	100.000

% < 4 phi = 16.212
% > 1 phi = 1.501
% gravel = 0.215
% sand = 83.573
% silt = 10.090
% clay = 6.122

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.287	204.89	2.738	149.92	1.325	0.340

5th percentile = 0.874
16th percentile = 1.412
50th percentile = 2.287
84th percentile = 4.063
95th percentile = 8.751

MEC Analytical Systems, Inc.
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F-109
VC-22-15

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704195
Station = VC-23
Depth (ft) = 0

Total sample weight = 30.124 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.017	0.056	0.056
1414.214	-0.50	0.021	0.070	0.126
1000.000	0.00	0.018	0.060	0.186
707.107	0.50	0.021	0.070	0.256
500.000	1.00	0.075	0.249	0.505
353.553	1.50	0.216	0.717	1.222
250.000	2.00	0.326	1.082	2.304
176.777	2.50	3.175	10.540	12.844
125.000	3.00	6.857	22.763	35.606
88.388	3.50	8.431	27.988	63.594
74.325	3.75	4.762	15.808	79.402
62.500	4.00	1.858	6.168	85.570
31.250	5.00	1.785	5.926	91.496
15.625	6.00	0.609	2.020	93.516
7.813	7.00	0.041	0.135	93.651
3.906	8.00	0.771	2.559	96.209
1.953	9.00	0.041	0.135	96.344
0.977	> 9.0	1.101	3.656	100.000

% < 4 phi = 14.430
% > 1 phi = 0.256
% gravel = 0.056
% sand = 85.513
% silt = 10.639
% clay = 3.791

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.257	104.59	3.253	104.90	0.684	-0.006

5th percentile = 2.128
16th percentile = 2.569
50th percentile = 3.257
84th percentile = 3.936
95th percentile = 7.527

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F-110
VC-23-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704196
Station = VC-23
Depth (ft) = 3

Total sample weight = 30.386 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	2.539	8.356	8.356
2000.000	-1.00	0.590	1.942	10.298
1414.214	-0.50	0.568	1.869	12.167
1000.000	0.00	0.532	1.751	13.918
707.107	0.50	0.191	0.629	14.546
500.000	1.00	0.156	0.513	15.060
353.553	1.50	0.198	0.652	15.711
250.000	2.00	0.729	2.399	18.111
176.777	2.50	1.885	6.204	24.314
125.000	3.00	5.037	16.577	40.891
88.388	3.50	7.561	24.883	65.775
74.325	3.75	4.090	13.460	79.235
62.500	4.00	2.409	7.928	87.163
31.250	5.00	2.637	8.679	95.842
15.625	6.00	0.122	0.401	96.242
7.813	7.00	0.365	1.202	97.444
3.906	8.00	0.162	0.534	97.978
1.953	9.00	0.041	0.134	98.111
0.977	> 9.0	0.574	1.889	100.000

% < 4 phi = 12.837
% > 1 phi = 14.546
% gravel = 10.298
% sand = 76.865
% silt = 10.815
% clay = 2.022

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.183	110.11	2.730	150.70	1.170	-0.387

*** 5th percentile not obtainable ***

5th percentile = .
16th percentile = 1.560
50th percentile = 3.183
84th percentile = 3.900
95th percentile = 4.903

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F-111
VC-23-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704197
Station = VC-23
Depth (ft) = 6

Total sample weight = 27.991 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.088	0.314	0.314
2000.000	-1.00	0.000	0.000	0.314
1414.214	-0.50	0.073	0.261	0.575
1000.000	0.00	0.060	0.214	0.790
707.107	0.50	0.044	0.157	0.947
500.000	1.00	0.041	0.146	1.093
353.553	1.50	0.068	0.243	1.336
250.000	2.00	0.058	0.207	1.543
176.777	2.50	0.304	1.086	2.629
125.000	3.00	0.243	0.868	3.498
88.388	3.50	0.325	1.161	4.659
74.325	3.75	0.221	0.790	5.448
62.500	4.00	0.455	1.626	7.074
31.250	5.00	4.747	16.958	24.031
15.625	6.00	9.453	33.771	57.802
7.813	7.00	5.477	19.567	77.369
3.906	8.00	1.907	6.812	84.181
1.953	9.00	1.095	3.913	88.094
0.977	> 9.0	3.333	11.906	100.000

% < 4 phi = 92.926
% > 1 phi = 0.947
% gravel = 0.314
% sand = 6.759
% silt = 77.107
% clay = 15.819

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
5.769	18.34	6.250	13.14	1.724	0.279

*** 95th percentile not reached ***

5th percentile = 3.608
16th percentile = 4.526
50th percentile = 5.769
84th percentile = 7.973
95th percentile = .

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F-112
VC-23-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704198
Station = VC-23
Depth (ft) = 9

Total sample weight = 28.248 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.006	0.021	0.021
1414.214	-0.50	0.011	0.039	0.060
1000.000	0.00	0.083	0.294	0.354
707.107	0.50	0.207	0.733	1.087
500.000	1.00	0.636	2.252	3.338
353.553	1.50	1.451	5.137	8.475
250.000	2.00	3.070	10.868	19.343
176.777	2.50	3.068	10.861	30.204
125.000	3.00	4.692	16.610	46.815
88.388	3.50	3.970	14.054	60.869
74.325	3.75	2.317	8.202	69.072
62.500	4.00	1.144	4.050	73.122
31.250	5.00	1.704	6.032	79.154
15.625	6.00	1.623	5.745	84.899
7.813	7.00	0.730	2.585	87.484
3.906	8.00	0.771	2.729	90.213
1.953	9.00	0.325	1.149	91.362
0.977	> 9.0	2.440	8.638	100.000

% < 4 phi = 26.878
% > 1 phi = 1.087
% gravel = 0.021
% sand = 73.100
% silt = 17.091
% clay = 9.787

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.113	115.56	3.845	69.59	1.999	0.366

*** 95th percentile not reached ***

5th percentile = 1.162
16th percentile = 1.846
50th percentile = 3.113
84th percentile = 5.844
95th percentile = .

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F-113
VC-23-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704199
Station = VC-23
Depth (ft) = 12

Total sample weight = 33.272 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.009	0.027	0.027
1000.000	0.00	0.111	0.334	0.361
707.107	0.50	0.489	1.470	1.830
500.000	1.00	1.838	5.524	7.354
353.553	1.50	10.352	31.113	38.468
250.000	2.00	6.520	19.596	58.064
176.777	2.50	8.694	26.130	84.193
125.000	3.00	3.348	10.062	94.256
88.388	3.50	1.091	3.279	97.535
74.325	3.75	0.273	0.821	98.355
62.500	4.00	0.095	0.286	98.641
31.250	5.00	0.041	0.122	98.763
15.625	6.00	0.162	0.488	99.251
7.813	7.00	0.041	0.122	99.373
3.906	8.00	0.041	0.122	99.495
1.953	9.00	0.041	0.122	99.616
0.977	> 9.0	0.128	0.384	100.000

% < 4 phi = 1.359
% > 1 phi = 1.830
% gravel = 0.000
% sand = 98.641
% silt = 0.854
% clay = 0.505

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
1.794	288.32	1.818	283.69	0.679	0.034

5th percentile = 0.787
16th percentile = 1.139
50th percentile = 1.794
84th percentile = 2.496
95th percentile = 3.113

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F-114
VC-23-12

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704155
Station = VC-24
Depth (ft) = 0

Total sample weight = 50.524 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.001	0.002	0.002
1000.000	0.00	0.007	0.014	0.016
707.107	0.50	0.026	0.051	0.067
500.000	1.00	0.231	0.457	0.524
353.553	1.50	7.048	13.950	14.474
250.000	2.00	8.553	16.928	31.403
176.777	2.50	10.983	21.738	53.141
125.000	3.00	2.781	5.504	58.645
88.388	3.50	0.885	1.752	60.397
74.325	3.75	0.180	0.356	60.753
62.500	4.00	0.147	0.291	61.044
31.250	5.00	6.045	11.964	73.008
15.625	6.00	7.384	14.614	87.622
7.813	7.00	2.029	4.015	91.637
3.906	8.00	1.258	2.489	94.127
1.953	9.00	0.730	1.445	95.572
0.977	> 9.0	2.237	4.428	100.000

% < 4 phi = 38.956
% > 1 phi = 0.067
% gravel = 0.000
% sand = 61.044
% silt = 33.083
% clay = 5.873

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.428	185.85	3.649	79.74	2.104	0.580

5th percentile = 1.160
16th percentile = 1.545
50th percentile = 2.428
84th percentile = 5.752
95th percentile = 8.604

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F-115

VC-24-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704156
Station = VC-24
Depth (ft) = 3

Total sample weight = 30.081 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.087	0.289	0.289
1414.214	-0.50	0.053	0.176	0.465
1000.000	0.00	0.072	0.239	0.705
707.107	0.50	0.121	0.402	1.107
500.000	1.00	0.433	1.439	2.546
353.553	1.50	2.694	8.956	11.502
250.000	2.00	1.881	6.253	17.755
176.777	2.50	2.544	8.457	26.212
125.000	3.00	1.865	6.200	32.412
88.388	3.50	1.502	4.993	37.405
74.325	3.75	0.704	2.340	39.746
62.500	4.00	0.512	1.702	41.448
31.250	5.00	3.611	12.003	53.451
15.625	6.00	4.706	15.645	69.096
7.813	7.00	3.408	11.329	80.425
3.906	8.00	1.866	6.204	86.628
1.953	9.00	1.339	4.451	91.079
0.977	> 9.0	2.684	8.921	100.000

% < 4 phi = 58.552
% > 1 phi = 1.107
% gravel = 0.289
% sand = 41.158
% silt = 45.181
% clay = 13.372

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
4.712	38.14	4.718	38.00	2.858	0.002

*** 95th percentile not reached ***

5th percentile = 1.137
16th percentile = 1.860
50th percentile = 4.712
84th percentile = 7.576
95th percentile = .

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F-116
VC-24-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704157
Station = VC-24
Depth (ft) = 6

Total sample weight = 31.408 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.012	0.038	0.038
1414.214	-0.50	0.018	0.057	0.096
1000.000	0.00	0.032	0.102	0.197
707.107	0.50	0.049	0.156	0.353
500.000	1.00	0.144	0.458	0.812
353.553	1.50	1.160	3.693	4.505
250.000	2.00	1.080	3.439	7.944
176.777	2.50	2.350	7.482	15.426
125.000	3.00	5.059	16.107	31.533
88.388	3.50	8.512	27.101	58.635
74.325	3.75	4.040	12.863	71.498
62.500	4.00	1.684	5.362	76.860
31.250	5.00	3.895	12.400	89.260
15.625	6.00	1.217	3.875	93.135
7.813	7.00	0.487	1.550	94.685
3.906	8.00	0.325	1.033	95.719
1.953	9.00	0.325	1.033	96.752
0.977	> 9.0	1.020	3.248	100.000

% < 4 phi = 23.140
% > 1 phi = 0.353
% gravel = 0.038
% sand = 76.821
% silt = 18.859
% clay = 4.281

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.341	98.71	3.547	85.57	1.029	0.200

5th percentile = 1.572
16th percentile = 2.518
50th percentile = 3.341
84th percentile = 4.576
95th percentile = 7.305

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F-117
VC-24-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704158
Station = VC-24
Depth (ft) = 9

Total sample weight = 31.367 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.929	2.962	2.962
2000.000	-1.00	0.175	0.558	3.520
1414.214	-0.50	0.224	0.714	4.234
1000.000	0.00	0.132	0.421	4.655
707.107	0.50	0.105	0.335	4.989
500.000	1.00	0.134	0.427	5.417
353.553	1.50	1.361	4.339	9.756
250.000	2.00	1.902	6.064	15.819
176.777	2.50	4.331	13.808	29.627
125.000	3.00	4.521	14.413	44.040
88.388	3.50	8.019	25.565	69.606
74.325	3.75	3.707	11.818	81.424
62.500	4.00	1.845	5.882	87.306
31.250	5.00	2.637	8.407	95.713
15.625	6.00	0.325	1.035	96.748
7.813	7.00	0.122	0.388	97.136
3.906	8.00	0.122	0.388	97.524
1.953	9.00	0.203	0.647	98.170
0.977	> 9.0	0.574	1.830	100.000

% < 4 phi = 12.694
% > 1 phi = 4.989
% gravel = 3.520
% sand = 83.786
% silt = 10.218
% clay = 2.476

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.117	115.30	2.933	130.94	0.926	-0.198

5th percentile = 0.512
16th percentile = 2.007
50th percentile = 3.117
84th percentile = 3.859
95th percentile = 4.915

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F-118
VC-24-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704159
Station = VC-24
Depth (ft) = 12

Total sample weight = 29.828 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.012	0.040	0.040
1414.214	-0.50	0.045	0.151	0.191
1000.000	0.00	0.035	0.117	0.308
707.107	0.50	0.029	0.097	0.406
500.000	1.00	0.031	0.104	0.510
353.553	1.50	0.081	0.272	0.781
250.000	2.00	0.589	1.975	2.756
176.777	2.50	1.884	6.316	9.072
125.000	3.00	4.400	14.751	23.823
88.388	3.50	7.964	26.700	50.523
74.325	3.75	4.623	15.499	66.022
62.500	4.00	3.354	11.244	77.266
31.250	5.00	3.327	11.153	88.419
15.625	6.00	0.852	2.856	91.275
7.813	7.00	0.690	2.312	93.588
3.906	8.00	0.041	0.136	93.724
1.953	9.00	0.811	2.720	96.444
0.977	> 9.0	1.061	3.556	100.000

% < 4 phi = 22.734
% > 1 phi = 0.406
% gravel = 0.040
% sand = 77.226
% silt = 16.458
% clay = 6.276

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.490	88.99	3.669	78.60	0.934	0.192

5th percentile = 2.178
16th percentile = 2.735
50th percentile = 3.490
84th percentile = 4.604
95th percentile = 8.469

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F-119
VC-24-12

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704165
Station = VC-25
Depth (ft) = 0

Total sample weight = 30.333 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.018	0.059	0.059
707.107	0.50	0.017	0.056	0.115
500.000	1.00	0.030	0.099	0.214
353.553	1.50	0.167	0.551	0.765
250.000	2.00	0.681	2.245	3.010
176.777	2.50	1.657	5.463	8.473
125.000	3.00	4.415	14.555	23.028
88.388	3.50	8.637	28.474	51.502
74.325	3.75	5.717	18.848	70.349
62.500	4.00	3.227	10.639	80.988
31.250	5.00	3.530	11.636	92.624
15.625	6.00	0.609	2.006	94.631
7.813	7.00	0.122	0.401	95.032
3.906	8.00	0.649	2.140	97.172
1.953	9.00	0.041	0.134	97.306
0.977	> 9.0	0.817	2.694	100.000

% < 4 phi = 19.012
% > 1 phi = 0.115
% gravel = 0.000
% sand = 80.988
% silt = 16.184
% clay = 2.828

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.474	90.02	3.509	87.86	0.750	0.047

5th percentile = 2.182
16th percentile = 2.759
50th percentile = 3.474
84th percentile = 4.259
95th percentile = 6.921

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F-120
VC-25-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704166
Station = VC-25
Depth (ft) = 3

Total sample weight = 31.293 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	2.068	6.609	6.609
2000.000	-1.00	0.394	1.259	7.868
1414.214	-0.50	0.282	0.901	8.769
1000.000	0.00	0.149	0.476	9.245
707.107	0.50	0.159	0.508	9.753
500.000	1.00	0.510	1.630	11.383
353.553	1.50	1.089	3.480	14.863
250.000	2.00	3.558	11.370	26.233
176.777	2.50	4.691	14.991	41.224
125.000	3.00	7.325	23.408	64.632
88.388	3.50	3.944	12.604	77.235
74.325	3.75	0.502	1.604	78.840
62.500	4.00	2.437	7.788	86.627
31.250	5.00	3.164	10.112	96.740
15.625	6.00	0.284	0.908	97.647
7.813	7.00	0.325	1.037	98.685
3.906	8.00	0.041	0.130	98.814
1.953	9.00	0.041	0.130	98.944
0.977	> 9.0	0.330	1.056	100.000

% < 4 phi = 13.373
% > 1 phi = 9.753
% gravel = 7.868
% sand = 78.760
% silt = 12.187
% clay = 1.186

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.687	155.24	2.733	150.43	1.183	0.038

*** 5th percentile not obtainable ***

5th percentile = .
16th percentile = 1.550
50th percentile = 2.687
84th percentile = 3.916
95th percentile = 4.828

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F-121
VC-25-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704167
Station = VC-25
Depth (ft) = 6

Total sample weight = 26.749 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.009	0.034	0.034
1414.214	-0.50	0.010	0.037	0.071
1000.000	0.00	0.013	0.049	0.120
707.107	0.50	0.010	0.037	0.157
500.000	1.00	0.028	0.105	0.262
353.553	1.50	0.035	0.131	0.393
250.000	2.00	0.083	0.310	0.703
176.777	2.50	0.079	0.295	0.998
125.000	3.00	0.132	0.493	1.492
88.388	3.50	0.299	1.118	2.609
74.325	3.75	0.354	1.323	3.933
62.500	4.00	0.538	2.011	5.944
31.250	5.00	3.530	13.195	19.139
15.625	6.00	5.680	21.233	40.373
7.813	7.00	5.923	22.143	62.516
3.906	8.00	3.489	13.043	75.559
1.953	9.00	1.826	6.825	82.384
0.977	> 9.0	4.712	17.616	100.000

% < 4 phi = 94.056
% > 1 phi = 0.157
% gravel = 0.034
% sand = 5.910
% silt = 69.615
% clay = 24.441

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
6.435	11.56	6.945	8.12	2.183	0.234

*** 84th percentile extrapolated ***
*** 95th percentile not reached ***

5th percentile = 3.883
16th percentile = 4.762
50th percentile = 6.435
84th percentile = 9.128
95th percentile = .

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F-122
VC-25-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704168
Station = VC-25
Depth (ft) = 9

Total sample weight = 28.260 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.081	0.287	0.287
2000.000	-1.00	0.000	0.000	0.287
1414.214	-0.50	0.017	0.060	0.347
1000.000	0.00	0.010	0.035	0.382
707.107	0.50	0.006	0.021	0.403
500.000	1.00	0.007	0.025	0.428
353.553	1.50	0.031	0.110	0.538
250.000	2.00	0.036	0.127	0.665
176.777	2.50	0.260	0.920	1.585
125.000	3.00	0.806	2.852	4.437
88.388	3.50	1.461	5.170	9.607
74.325	3.75	0.408	1.444	11.051
62.500	4.00	1.966	6.957	18.008
31.250	5.00	8.885	31.439	49.447
15.625	6.00	6.126	21.677	71.124
7.813	7.00	3.002	10.623	81.747
3.906	8.00	1.379	4.881	86.628
1.953	9.00	1.055	3.733	90.361
0.977	> 9.0	2.724	9.639	100.000

% < 4 phi = 81.992
% > 1 phi = 0.403
% gravel = 0.287
% sand = 17.721
% silt = 68.621
% clay = 13.372

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
5.026	30.70	5.695	19.31	1.767	0.379

*** 95th percentile not reached ***

5th percentile = 3.054
16th percentile = 3.928
50th percentile = 5.026
84th percentile = 7.462
95th percentile = .

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F-123
VC-25-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704160A
Station = VC-26
Depth (ft) = 0

Total sample weight = 30.387 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.008	0.026	0.026
1000.000	0.00	0.019	0.063	0.089
707.107	0.50	0.034	0.112	0.201
500.000	1.00	0.034	0.112	0.313
353.553	1.50	0.435	1.432	1.744
250.000	2.00	1.069	3.518	5.262
176.777	2.50	4.166	13.710	18.972
125.000	3.00	4.797	15.786	34.758
88.388	3.50	6.648	21.878	56.635
74.325	3.75	3.627	11.936	68.571
62.500	4.00	2.607	8.579	77.150
31.250	5.00	3.611	11.882	89.033
15.625	6.00	0.487	1.602	90.635
7.813	7.00	0.568	1.869	92.504
3.906	8.00	0.487	1.602	94.106
1.953	9.00	0.446	1.469	95.575
0.977	> 9.0	1.345	4.425	100.000

% < 4 phi = 22.850
% > 1 phi = 0.201
% gravel = 0.000
% sand = 77.150
% silt = 16.956
% clay = 5.894

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.348	98.19	3.484	89.37	1.092	0.124

5th percentile = 1.963
16th percentile = 2.392
50th percentile = 3.348
84th percentile = 4.576
95th percentile = 8.609

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F-124
VC-26-0A

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704160B
Station = VC-26
Depth (ft) = 0

Total sample weight = 30.182 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.024	0.080	0.080
1414.214	-0.50	0.029	0.096	0.176
1000.000	0.00	0.021	0.070	0.245
707.107	0.50	0.026	0.086	0.331
500.000	1.00	0.054	0.179	0.510
353.553	1.50	0.449	1.488	1.998
250.000	2.00	1.093	3.621	5.619
176.777	2.50	3.707	12.282	17.902
125.000	3.00	4.682	15.513	33.414
88.388	3.50	6.712	22.239	55.653
74.325	3.75	3.707	12.282	67.935
62.500	4.00	3.140	10.404	78.339
31.250	5.00	3.124	10.350	88.689
15.625	6.00	0.933	3.092	91.781
7.813	7.00	0.446	1.479	93.259
3.906	8.00	0.081	0.269	93.528
1.953	9.00	0.609	2.016	95.545
0.977	> 9.0	1.345	4.455	100.000

% < 4 phi = 21.661
% > 1 phi = 0.331
% gravel = 0.080
% sand = 78.259
% silt = 15.189
% clay = 6.472

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.373	96.53	3.485	89.33	1.062	0.105

5th percentile = 1.914
16th percentile = 2.423
50th percentile = 3.373
84th percentile = 4.547
95th percentile = 8.730

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F-125
VC-26-0B

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704161
Station = VC-26
Depth (ft) = 3

Total sample weight = 30.684 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	3.668	11.954	11.954
2000.000	-1.00	1.186	3.865	15.819
1414.214	-0.50	0.613	1.998	17.817
1000.000	0.00	0.429	1.398	19.215
707.107	0.50	0.166	0.541	19.756
500.000	1.00	0.130	0.424	20.180
353.553	1.50	0.306	0.997	21.177
250.000	2.00	2.471	8.053	29.230
176.777	2.50	3.823	12.459	41.689
125.000	3.00	5.190	16.914	58.603
88.388	3.50	6.106	19.899	78.503
74.325	3.75	3.296	10.742	89.244
62.500	4.00	1.631	5.315	94.560
31.250	5.00	0.487	1.587	96.146
15.625	6.00	0.325	1.058	97.204
7.813	7.00	0.041	0.132	97.336
3.906	8.00	0.122	0.397	97.733
1.953	9.00	0.081	0.264	97.997
0.977	> 9.0	0.614	2.003	100.000

% < 4 phi = 5.440
% > 1 phi = 19.756
% gravel = 15.819
% sand = 78.741
% silt = 3.173
% clay = 2.267

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.746	149.10	1.337	395.95	2.291	-0.615

*** 5th percentile not obtainable ***

5th percentile = .
16th percentile = -0.955
50th percentile = 2.746
84th percentile = 3.628
95th percentile = 4.277

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2433 Impala Drive
Carlsbad, CA 92008

F-126
VC-26-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704162
Station = VC-26
Depth (ft) = 6

Total sample weight = 29.776 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.010	0.034	0.034
1414.214	-0.50	0.014	0.047	0.081
1000.000	0.00	0.033	0.111	0.191
707.107	0.50	0.058	0.195	0.386
500.000	1.00	0.089	0.299	0.685
353.553	1.50	0.385	1.293	1.978
250.000	2.00	2.728	9.162	11.140
176.777	2.50	5.388	18.095	29.235
125.000	3.00	5.654	18.988	48.224
88.388	3.50	2.626	8.819	57.043
74.325	3.75	0.857	2.878	59.921
62.500	4.00	0.325	1.091	61.012
31.250	5.00	1.014	3.406	64.419
15.625	6.00	3.367	11.309	75.727
7.813	7.00	3.651	12.263	87.990
3.906	8.00	1.420	4.769	92.759
1.953	9.00	0.811	2.725	95.484
0.977	> 9.0	1.345	4.516	100.000

% < 4 phi = 38.988
% > 1 phi = 0.386
% gravel = 0.034
% sand = 60.979
% silt = 31.746
% clay = 7.241

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.101	116.57	4.404	47.22	2.270	0.574

5th percentile = 1.665
16th percentile = 2.134
50th percentile = 3.101
84th percentile = 6.675
95th percentile = 8.822

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F-127
VC-26-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704163
Station = VC-26
Depth (ft) = 9

Total sample weight = 30.945 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.008	0.026	0.026
707.107	0.50	0.001	0.003	0.029
500.000	1.00	0.001	0.003	0.032
353.553	1.50	0.025	0.081	0.113
250.000	2.00	0.537	1.735	1.848
176.777	2.50	7.528	24.327	26.176
125.000	3.00	13.400	43.303	69.479
88.388	3.50	6.296	20.346	89.825
74.325	3.75	1.572	5.080	94.905
62.500	4.00	0.313	1.011	95.917
31.250	5.00	0.406	1.311	97.228
15.625	6.00	0.487	1.573	98.801
7.813	7.00	0.041	0.131	98.932
3.906	8.00	0.041	0.131	99.063
1.953	9.00	0.041	0.131	99.194
0.977	> 9.0	0.249	0.806	100.000

% < 4 phi = 4.083
% > 1 phi = 0.029
% gravel = 0.000
% sand = 95.917
% silt = 3.147
% clay = 0.937

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.775	146.09	2.824	141.23	0.533	0.091

5th percentile = 2.065
16th percentile = 2.291
50th percentile = 2.775
84th percentile = 3.357
95th percentile = 3.773

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F-128
VC-26-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704164
Station = VC-26
Depth (ft) = 12

Total sample weight = 26.774 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.249	0.930	0.930
2000.000	-1.00	0.087	0.325	1.255
1414.214	-0.50	0.024	0.090	1.345
1000.000	0.00	0.018	0.067	1.412
707.107	0.50	0.022	0.082	1.494
500.000	1.00	0.035	0.131	1.625
353.553	1.50	0.177	0.661	2.286
250.000	2.00	0.249	0.930	3.216
176.777	2.50	0.956	3.571	6.786
125.000	3.00	2.263	8.452	15.239
88.388	3.50	3.659	13.666	28.905
74.325	3.75	1.725	6.443	35.348
62.500	4.00	0.995	3.716	39.064
31.250	5.00	4.544	16.971	56.035
15.625	6.00	3.083	11.516	67.551
7.813	7.00	2.962	11.061	78.613
3.906	8.00	1.907	7.122	85.734
1.953	9.00	0.852	3.182	88.916
0.977	> 9.0	2.968	11.084	100.000

% < 4 phi = 60.936
% > 1 phi = 1.494
% gravel = 1.255
% sand = 37.809
% silt = 46.670
% clay = 14.266

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
4.644	39.99	5.392	23.81	2.364	0.316

*** 95th percentile not reached ***

5th percentile = 2.250
16th percentile = 3.028
50th percentile = 4.644
84th percentile = 7.756
95th percentile = .

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F-129
VC-26-12

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704177
Station = VC-27
Depth (ft) = 0

Total sample weight = 29.170 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.008	0.027	0.027
707.107	0.50	0.009	0.031	0.058
500.000	1.00	0.017	0.058	0.117
353.553	1.50	0.157	0.538	0.655
250.000	2.00	0.334	1.145	1.800
176.777	2.50	2.154	7.384	9.184
125.000	3.00	5.201	17.830	27.014
88.388	3.50	7.282	24.964	51.979
74.325	3.75	5.447	18.674	70.652
62.500	4.00	2.672	9.160	79.813
31.250	5.00	3.002	10.292	90.105
15.625	6.00	0.365	1.252	91.357
7.813	7.00	0.730	2.504	93.860
3.906	8.00	0.325	1.113	94.973
1.953	9.00	0.041	0.139	95.112
0.977	> 9.0	1.426	4.888	100.000

% < 4 phi = 20.187
% > 1 phi = 0.058
% gravel = 0.000
% sand = 79.813
% silt = 15.160
% clay = 5.027

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.460	90.85	3.549	85.44	0.858	0.103

5th percentile = 2.217
16th percentile = 2.691
50th percentile = 3.460
84th percentile = 4.407
95th percentile = 8.196

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F-130
VC-27-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704178
Station = VC-27
Depth (ft) = 3

Total sample weight = 30.193 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	2.224	7.366	7.366
2000.000	-1.00	0.785	2.600	9.966
1414.214	-0.50	0.342	1.133	11.098
1000.000	0.00	0.281	0.931	12.029
707.107	0.50	0.125	0.414	12.443
500.000	1.00	0.081	0.268	12.711
353.553	1.50	0.119	0.394	13.106
250.000	2.00	0.741	2.454	15.560
176.777	2.50	2.017	6.680	22.240
125.000	3.00	4.936	16.348	38.588
88.388	3.50	6.476	21.448	60.036
74.325	3.75	5.102	16.898	76.934
62.500	4.00	2.658	8.803	85.737
31.250	5.00	2.921	9.674	95.412
15.625	6.00	0.446	1.478	96.890
7.813	7.00	0.162	0.537	97.427
3.906	8.00	0.041	0.134	97.562
1.953	9.00	0.041	0.134	97.696
0.977	> 9.0	0.696	2.304	100.000

% < 4 phi = 14.263
% > 1 phi = 12.443
% gravel = 9.966
% sand = 75.772
% silt = 11.824
% clay = 2.438

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.266	103.95	2.992	125.71	0.959	-0.286

*** 5th percentile not obtainable ***

5th percentile = .
16th percentile = 2.033
50th percentile = 3.266
84th percentile = 3.951
95th percentile = 4.957

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F-131
VC-27-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704179
Station = VC-27
Depth (ft) = 6

Total sample weight = 13.961 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.127	0.910	0.910
1414.214	-0.50	0.029	0.208	1.117
1000.000	0.00	0.035	0.251	1.368
707.107	0.50	0.032	0.229	1.597
500.000	1.00	0.024	0.172	1.769
353.553	1.50	0.128	0.917	2.686
250.000	2.00	0.125	0.895	3.581
176.777	2.50	0.332	2.378	5.960
125.000	3.00	0.636	4.556	10.515
88.388	3.50	1.364	9.770	20.286
74.325	3.75	0.763	5.465	25.751
62.500	4.00	0.623	4.463	30.213
31.250	5.00	0.933	6.684	36.897
15.625	6.00	2.069	14.821	51.718
7.813	7.00	1.866	13.368	65.086
3.906	8.00	1.866	13.368	78.453
1.953	9.00	0.893	6.393	84.846
0.977	> 9.0	2.116	15.154	100.000

% < 4 phi = 69.787
% > 1 phi = 1.597
% gravel = 0.910
% sand = 29.304
% silt = 48.240
% clay = 21.547

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
5.884	16.93	6.074	14.84	2.793	0.068

*** 95th percentile not reached ***

5th percentile = 2.298
16th percentile = 3.281
50th percentile = 5.884
84th percentile = 8.868
95th percentile = .

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F-132
VC-27-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704180
Station = VC-27
Depth (ft) = 9

Total sample weight = 30.411 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.001	0.003	0.003
707.107	0.50	0.001	0.003	0.007
500.000	1.00	0.004	0.013	0.020
353.553	1.50	0.032	0.105	0.125
250.000	2.00	0.477	1.569	1.693
176.777	2.50	3.298	10.845	12.538
125.000	3.00	8.230	27.063	39.601
88.388	3.50	8.891	29.236	68.837
74.325	3.75	4.014	13.199	82.036
62.500	4.00	1.319	4.337	86.373
31.250	5.00	1.947	6.403	92.777
15.625	6.00	0.811	2.668	95.445
7.813	7.00	0.527	1.734	97.179
3.906	8.00	0.162	0.534	97.713
1.953	9.00	0.122	0.400	98.113
0.977	> 9.0	0.574	1.887	100.000

% < 4 phi = 13.627
% > 1 phi = 0.007
% gravel = 0.000
% sand = 86.373
% silt = 11.339
% clay = 2.287

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.178	110.50	3.214	107.80	0.650	0.055

5th percentile = 2.152
16th percentile = 2.564
50th percentile = 3.178
84th percentile = 3.863
95th percentile = 5.833

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F-133
VC-27-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704122
Station = VC-28
Depth (ft) = 0

Total sample weight = 29.583 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.014	0.047	0.047
1000.000	0.00	0.008	0.027	0.074
707.107	0.50	0.036	0.122	0.196
500.000	1.00	0.060	0.203	0.399
353.553	1.50	0.171	0.578	0.977
250.000	2.00	0.321	1.085	2.062
176.777	2.50	2.058	6.957	9.019
125.000	3.00	4.447	15.032	24.051
88.388	3.50	9.374	31.687	55.738
74.325	3.75	2.337	7.900	63.638
62.500	4.00	4.706	15.908	79.546
31.250	5.00	3.448	11.657	91.203
15.625	6.00	0.568	1.920	93.123
7.813	7.00	0.365	1.234	94.357
3.906	8.00	0.284	0.960	95.317
1.953	9.00	0.081	0.274	95.592
0.977	> 9.0	1.304	4.408	100.000

% < 4 phi = 20.454
% > 1 phi = 0.196
% gravel = 0.000
% sand = 79.546
% silt = 15.771
% clay = 4.683

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.409	94.11	3.557	84.96	0.825	0.179

5th percentile = 2.211
16th percentile = 2.732
50th percentile = 3.409
84th percentile = 4.382
95th percentile = 7.670

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F-134
VC-28-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704123
Station = VC-28
Depth (ft) = 3

Total sample weight = 32.010 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	3.312	10.347	10.347
2000.000	-1.00	0.738	2.306	12.652
1414.214	-0.50	0.432	1.350	14.002
1000.000	0.00	0.451	1.409	15.411
707.107	0.50	0.205	0.640	16.051
500.000	1.00	0.137	0.428	16.479
353.553	1.50	0.322	1.006	17.485
250.000	2.00	5.903	18.441	35.926
176.777	2.50	5.833	18.222	54.148
125.000	3.00	5.741	17.935	72.083
88.388	3.50	5.757	17.985	90.068
74.325	3.75	0.005	0.016	90.083
62.500	4.00	0.004	0.012	90.096
31.250	5.00	2.029	6.337	96.433
15.625	6.00	0.203	0.634	97.067
7.813	7.00	0.122	0.380	97.447
3.906	8.00	0.122	0.380	97.827
1.953	9.00	0.041	0.127	97.954
0.977	> 9.0	0.655	2.046	100.000

% < 4 phi = 9.904
% > 1 phi = 16.051
% gravel = 12.652
% sand = 77.444
% silt = 7.731
% clay = 2.173

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.386	191.29	1.896	268.74	1.436	-0.342

*** 5th percentile not obtainable ***

5th percentile = .
16th percentile = 0.460
50th percentile = 2.386
84th percentile = 3.331
95th percentile = 4.774

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F-135
VC-28-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704124
Station = VC-28
Depth (ft) = 6

Total sample weight = 25.881 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.005	0.019	0.019
707.107	0.50	0.027	0.104	0.124
500.000	1.00	0.016	0.062	0.185
353.553	1.50	0.039	0.151	0.336
250.000	2.00	0.043	0.166	0.502
176.777	2.50	0.062	0.240	0.742
125.000	3.00	0.097	0.375	1.117
88.388	3.50	0.131	0.506	1.623
74.325	3.75	0.069	0.267	1.889
62.500	4.00	0.070	0.270	2.160
31.250	5.00	0.243	0.941	3.100
15.625	6.00	4.341	16.773	19.874
7.813	7.00	8.682	33.546	53.420
3.906	8.00	4.828	18.654	72.074
1.953	9.00	2.678	10.346	82.420
0.977	> 9.0	4.550	17.580	100.000

% < 4 phi = 97.840
% > 1 phi = 0.124
% gravel = 0.000
% sand = 2.160
% silt = 69.914
% clay = 27.926

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
6.898	8.38	7.436	5.78	1.667	0.323

*** 84th percentile extrapolated ***
*** 95th percentile not reached ***

5th percentile = 5.113
16th percentile = 5.769
50th percentile = 6.898
84th percentile = 9.102
95th percentile = .

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F-136
VC-28-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704125
Station = VC-28
Depth (ft) = 9

Total sample weight = 31.182 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.003	0.010	0.010
1000.000	0.00	0.009	0.029	0.038
707.107	0.50	0.006	0.019	0.058
500.000	1.00	0.016	0.051	0.109
353.553	1.50	0.126	0.404	0.513
250.000	2.00	2.031	6.513	7.026
176.777	2.50	9.696	31.095	38.121
125.000	3.00	10.812	34.674	72.795
88.388	3.50	5.072	16.266	89.061
74.325	3.75	1.002	3.213	92.274
62.500	4.00	0.537	1.722	93.996
31.250	5.00	0.933	2.992	96.989
15.625	6.00	0.243	0.781	97.769
7.813	7.00	0.081	0.260	98.029
3.906	8.00	0.122	0.390	98.420
1.953	9.00	0.081	0.260	98.680
0.977	> 9.0	0.412	1.320	100.000

% < 4 phi = 6.004
% > 1 phi = 0.058
% gravel = 0.000
% sand = 93.996
% silt = 4.424
% clay = 1.580

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.671	156.99	2.744	149.23	0.600	0.122

5th percentile = 1.844
16th percentile = 2.144
50th percentile = 2.671
84th percentile = 3.344
95th percentile = 4.335

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F-137
VC-28-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704275
Station = VC-29
Depth (ft) = 0

Total sample weight = 32.306 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	1.312	4.061	4.061
2000.000	-1.00	0.221	0.684	4.745
1414.214	-0.50	0.172	0.532	5.278
1000.000	0.00	0.131	0.405	5.683
707.107	0.50	0.066	0.204	5.887
500.000	1.00	0.066	0.204	6.092
353.553	1.50	0.641	1.984	8.076
250.000	2.00	3.582	11.088	19.163
176.777	2.50	3.991	12.354	31.517
125.000	3.00	6.063	18.767	50.284
88.388	3.50	7.363	22.791	73.075
74.325	3.75	2.937	9.091	82.167
62.500	4.00	1.455	4.504	86.670
31.250	5.00	3.124	9.670	96.340
15.625	6.00	0.203	0.628	96.968
7.813	7.00	0.325	1.005	97.972
3.906	8.00	0.041	0.126	98.098
1.953	9.00	0.041	0.126	98.224
0.977	> 9.0	0.574	1.776	100.000

% < 4 phi = 13.330
% > 1 phi = 5.887
% gravel = 4.745
% sand = 81.925
% silt = 11.428
% clay = 1.902

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.992	125.66	2.855	138.26	0.997	-0.138

5th percentile = -0.761
16th percentile = 1.857
50th percentile = 2.992
84th percentile = 3.852
95th percentile = 4.861

MEC Analytical Systems, Inc.
2433 Impala Drive
Carlsbad, CA 92008

F-138
VC-29-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704276
Station = VC-29
Depth (ft) = 3

Total sample weight = 30.914 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.000	0.000	0.000
707.107	0.50	0.007	0.023	0.023
500.000	1.00	0.001	0.003	0.026
353.553	1.50	0.016	0.052	0.078
250.000	2.00	0.053	0.171	0.249
176.777	2.50	1.304	4.218	4.467
125.000	3.00	8.540	27.625	32.093
88.388	3.50	10.604	34.302	66.395
74.325	3.75	4.657	15.065	81.460
62.500	4.00	2.196	7.104	88.563
31.250	5.00	2.515	8.137	96.700
15.625	6.00	0.122	0.394	97.094
7.813	7.00	0.203	0.656	97.750
3.906	8.00	0.081	0.262	98.012
1.953	9.00	0.041	0.131	98.144
0.977	> 9.0	0.574	1.856	100.000

% < 4 phi = 11.437
% > 1 phi = 0.023
% gravel = 0.000
% sand = 88.563
% silt = 9.449
% clay = 1.988

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.261	104.31	3.274	103.37	0.565	0.023

5th percentile = 2.510
16th percentile = 2.709
50th percentile = 3.261
84th percentile = 3.839
95th percentile = 4.791

MEC Analytical Systems, Inc.
2433 Impala Drive
Carlsbad, CA 92008

F-139
VC-29-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704277
Station = VC-29
Depth (ft) = 6

Total sample weight = 31.667 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.000	0.000	0.000
707.107	0.50	0.009	0.028	0.028
500.000	1.00	0.028	0.088	0.117
353.553	1.50	0.205	0.647	0.764
250.000	2.00	2.183	6.894	7.658
176.777	2.50	8.693	27.451	35.109
125.000	3.00	12.448	39.309	74.418
88.388	3.50	5.129	16.197	90.615
74.325	3.75	1.000	3.158	93.773
62.500	4.00	0.465	1.468	95.241
31.250	5.00	0.446	1.409	96.650
15.625	6.00	0.203	0.641	97.291
7.813	7.00	0.041	0.128	97.419
3.906	8.00	0.041	0.128	97.547
1.953	9.00	0.041	0.128	97.675
0.977	> 9.0	0.736	2.325	100.000

% < 4 phi = 4.759
% > 1 phi = 0.028
% gravel = 0.000
% sand = 95.241
% silt = 2.306
% clay = 2.453

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.689	155.03	2.724	151.37	0.572	0.060

5th percentile = 1.807
16th percentile = 2.152
50th percentile = 2.689
84th percentile = 3.296
95th percentile = 3.959

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F-140
VC-29-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704278
Station = VC-29
Depth (ft) = 9

Total sample weight = 33.678 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.003	0.009	0.009
707.107	0.50	0.172	0.511	0.520
500.000	1.00	1.980	5.879	6.399
353.553	1.50	2.493	7.402	13.801
250.000	2.00	6.099	18.110	31.911
176.777	2.50	5.278	15.672	47.583
125.000	3.00	3.987	11.839	59.422
88.388	3.50	0.496	1.473	60.894
74.325	3.75	1.010	2.999	63.893
62.500	4.00	1.119	3.323	67.216
31.250	5.00	5.599	16.624	83.840
15.625	6.00	1.907	5.662	89.502
7.813	7.00	1.420	4.216	93.718
3.906	8.00	0.609	1.807	95.525
1.953	9.00	0.284	0.843	96.369
0.977	> 9.0	1.223	3.631	100.000

% < 4 phi = 32.784
% > 1 phi = 0.520
% gravel = 0.000
% sand = 67.216
% silt = 28.309
% clay = 4.475

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.602	164.70	3.294	101.92	1.734	0.399

5th percentile = 0.881
16th percentile = 1.561
50th percentile = 2.602
84th percentile = 5.028
95th percentile = 7.709

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F-141
VC-29-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704126
Station = VC-30
Depth (ft) = 0

Total sample weight = 31.244 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.013	0.042	0.042
1000.000	0.00	0.006	0.019	0.061
707.107	0.50	0.029	0.093	0.154
500.000	1.00	0.044	0.141	0.294
353.553	1.50	0.113	0.362	0.656
250.000	2.00	0.939	3.005	3.662
176.777	2.50	2.847	9.112	12.774
125.000	3.00	6.478	20.734	33.507
88.388	3.50	6.273	20.078	53.585
74.325	3.75	3.744	11.983	65.568
62.500	4.00	3.003	9.612	75.180
31.250	5.00	3.570	11.427	86.607
15.625	6.00	0.811	2.597	89.204
7.813	7.00	0.649	2.078	91.281
3.906	8.00	0.649	2.078	93.359
1.953	9.00	0.487	1.558	94.917
0.977	> 9.0	1.588	5.083	100.000

% < 4 phi = 24.820
% > 1 phi = 0.154
% gravel = 0.000
% sand = 75.180
% silt = 18.179
% clay = 6.641

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.411	94.03	3.675	78.30	1.097	0.241

*** 95th percentile not reached ***

5th percentile = 2.073
16th percentile = 2.578
50th percentile = 3.411
84th percentile = 4.772
95th percentile = .

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F-142
VC-30-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704127
Station = VC-30
Depth (ft) = 3

Total sample weight = 31.924 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	2.577	8.072	8.072
2000.000	-1.00	0.969	3.035	11.108
1414.214	-0.50	0.505	1.582	12.690
1000.000	0.00	0.258	0.808	13.498
707.107	0.50	0.158	0.495	13.993
500.000	1.00	0.090	0.282	14.275
353.553	1.50	0.491	1.538	15.813
250.000	2.00	0.801	2.509	18.322
176.777	2.50	3.428	10.738	29.060
125.000	3.00	5.773	18.084	47.143
88.388	3.50	5.720	17.918	65.061
74.325	3.75	3.949	12.370	77.431
62.500	4.00	2.006	6.284	83.715
31.250	5.00	2.475	7.752	91.467
15.625	6.00	0.325	1.017	92.484
7.813	7.00	0.243	0.763	93.246
3.906	8.00	0.243	0.763	94.009
1.953	9.00	0.203	0.635	94.644
0.977	> 9.0	1.710	5.356	100.000

% < 4 phi = 16.285
% > 1 phi = 13.993
% gravel = 11.108
% sand = 72.607
% silt = 10.294
% clay = 5.991

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.080	118.28	2.787	144.88	1.250	-0.234

*** 5th percentile not obtainable ***
*** 95th percentile not reached ***

5th percentile = .
16th percentile = 1.537
50th percentile = 3.080
84th percentile = 4.037
95th percentile = .

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F-143
VC-30-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704128
Station = VC-30
Depth (ft) = 6

Total sample weight = 29.356 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.003	0.010	0.010
1000.000	0.00	0.009	0.031	0.041
707.107	0.50	0.015	0.051	0.092
500.000	1.00	0.035	0.119	0.211
353.553	1.50	0.107	0.364	0.576
250.000	2.00	0.210	0.715	1.291
176.777	2.50	0.457	1.557	2.848
125.000	3.00	1.477	5.031	7.879
88.388	3.50	2.505	8.533	16.412
74.325	3.75	1.081	3.682	20.095
62.500	4.00	1.300	4.428	24.523
31.250	5.00	4.950	16.860	41.383
15.625	6.00	4.382	14.926	56.309
7.813	7.00	5.396	18.381	74.689
3.906	8.00	2.353	8.016	82.705
1.953	9.00	1.136	3.870	86.575
0.977	> 9.0	3.941	13.425	100.000

% < 4 phi = 75.477
% > 1 phi = 0.092
% gravel = 0.000
% sand = 24.523
% silt = 58.182
% clay = 17.295

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
5.577	20.94	5.905	16.69	2.429	0.135

*** 95th percentile not reached ***

5th percentile = 2.714
16th percentile = 3.476
50th percentile = 5.577
84th percentile = 8.335
95th percentile = .

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F-144
VC-30-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704129
Station = VC-30
Depth (ft) = 9

Total sample weight = 28.849 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.242	0.839	0.839
2000.000	-1.00	0.000	0.000	0.839
1414.214	-0.50	0.003	0.010	0.849
1000.000	0.00	0.019	0.066	0.915
707.107	0.50	0.006	0.021	0.936
500.000	1.00	0.015	0.052	0.988
353.553	1.50	0.030	0.104	1.092
250.000	2.00	0.071	0.246	1.338
176.777	2.50	3.043	10.548	11.886
125.000	3.00	1.560	5.408	17.294
88.388	3.50	2.906	10.073	27.367
74.325	3.75	0.524	1.816	29.183
62.500	4.00	2.005	6.950	36.133
31.250	5.00	6.288	21.798	57.931
15.625	6.00	5.031	17.438	75.369
7.813	7.00	2.678	9.282	84.651
3.906	8.00	1.095	3.797	88.448
1.953	9.00	0.974	3.375	91.823
0.977	> 9.0	2.359	8.177	100.000

% < 4 phi = 63.867
% > 1 phi = 0.936
% gravel = 0.839
% sand = 35.294
% silt = 52.314
% clay = 11.552

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
4.636	40.21	4.905	33.37	2.025	0.133

*** 95th percentile not reached ***

5th percentile = 2.174
16th percentile = 2.880
50th percentile = 4.636
84th percentile = 6.930
95th percentile = .

MEC Analytical Systems, Inc.
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F-145
VC-30-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704130A
Station = VC-31
Depth (ft) = 0

Total sample weight = 30.514 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.027	0.088	0.088
1414.214	-0.50	0.011	0.036	0.125
1000.000	0.00	0.020	0.066	0.190
707.107	0.50	0.026	0.085	0.275
500.000	1.00	0.040	0.131	0.406
353.553	1.50	0.254	0.832	1.239
250.000	2.00	1.424	4.667	5.905
176.777	2.50	2.848	9.333	15.239
125.000	3.00	5.210	17.074	32.313
88.388	3.50	7.006	22.960	55.273
74.325	3.75	3.860	12.650	67.923
62.500	4.00	3.007	9.854	77.777
31.250	5.00	3.408	11.168	88.945
15.625	6.00	1.217	3.989	92.934
7.813	7.00	0.162	0.532	93.466
3.906	8.00	0.122	0.399	93.865
1.953	9.00	0.122	0.399	94.264
0.977	> 9.0	1.750	5.736	100.000

% < 4 phi = 22.223
% > 1 phi = 0.275
% gravel = 0.088
% sand = 77.689
% silt = 16.088
% clay = 6.135

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.385	95.71	3.540	85.99	1.017	0.152

*** 95th percentile not reached ***

5th percentile = 1.903
16th percentile = 2.522
50th percentile = 3.385
84th percentile = 4.557
95th percentile = .

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F-146
VC-31-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704130B
Station = VC-31
Depth (ft) = 0

Total sample weight = 29.853 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.003	0.010	0.010
2000.000	-1.00	0.019	0.064	0.074
1414.214	-0.50	0.019	0.064	0.137
1000.000	0.00	0.030	0.100	0.238
707.107	0.50	0.017	0.057	0.295
500.000	1.00	0.047	0.157	0.452
353.553	1.50	0.790	2.646	3.099
250.000	2.00	0.811	2.717	5.815
176.777	2.50	3.389	11.352	17.167
125.000	3.00	5.049	16.913	34.080
88.388	3.50	6.396	21.425	55.505
74.325	3.75	3.865	12.947	68.452
62.500	4.00	3.002	10.056	78.508
31.250	5.00	3.489	11.687	90.195
15.625	6.00	0.527	1.767	91.962
7.813	7.00	0.609	2.038	94.001
3.906	8.00	0.243	0.815	94.816
1.953	9.00	0.243	0.815	95.631
0.977	> 9.0	1.304	4.369	100.000

% < 4 phi = 21.492
% > 1 phi = 0.295
% gravel = 0.074
% sand = 78.434
% silt = 16.308
% clay = 5.184

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.372	96.62	3.459	90.92	1.011	0.087

5th percentile = 1.850
16th percentile = 2.449
50th percentile = 3.372
84th percentile = 4.470
95th percentile = 8.226

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F-147
VC-31-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704131
Station = VC-31
Depth (ft) = 3

Total sample weight = 31.048 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.355	1.143	1.143
2000.000	-1.00	0.126	0.406	1.549
1414.214	-0.50	0.052	0.167	1.717
1000.000	0.00	0.037	0.119	1.836
707.107	0.50	0.030	0.097	1.933
500.000	1.00	0.036	0.116	2.048
353.553	1.50	0.231	0.744	2.792
250.000	2.00	1.121	3.611	6.403
176.777	2.50	2.507	8.075	14.478
125.000	3.00	6.051	19.489	33.967
88.388	3.50	11.219	36.135	70.102
74.325	3.75	3.745	12.062	82.164
62.500	4.00	2.002	6.448	88.613
31.250	5.00	2.150	6.926	95.538
15.625	6.00	0.122	0.392	95.930
7.813	7.00	0.365	1.176	97.106
3.906	8.00	0.243	0.784	97.890
1.953	9.00	0.081	0.261	98.152
0.977	> 9.0	0.574	1.848	100.000

% < 4 phi = 11.387
% > 1 phi = 1.933
% gravel = 1.549
% sand = 87.063
% silt = 9.278
% clay = 2.110

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.222	107.18	3.180	110.33	0.641	-0.065

5th percentile = 1.806
16th percentile = 2.539
50th percentile = 3.222
84th percentile = 3.821
95th percentile = 4.922

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F-148
VC-31-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704132
Station = VC-31
Depth (ft) = 6

Total sample weight = 30.080 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.074	0.246	0.246
2000.000	-1.00	0.074	0.246	0.492
1414.214	-0.50	0.058	0.193	0.685
1000.000	0.00	0.046	0.153	0.838
707.107	0.50	0.083	0.276	1.114
500.000	1.00	0.105	0.349	1.463
353.553	1.50	0.668	2.221	3.683
250.000	2.00	0.785	2.610	6.293
176.777	2.50	3.901	12.969	19.262
125.000	3.00	2.799	9.305	28.567
88.388	3.50	3.620	12.034	40.601
74.325	3.75	0.819	2.723	43.324
62.500	4.00	1.423	4.731	48.055
31.250	5.00	4.666	15.510	63.565
15.625	6.00	4.098	13.622	77.187
7.813	7.00	2.556	8.497	85.684
3.906	8.00	1.298	4.316	90.000
1.953	9.00	0.690	2.293	92.293
0.977	> 9.0	2.318	7.707	100.000

% < 4 phi = 51.945
% > 1 phi = 1.114
% gravel = 0.492
% sand = 47.563
% silt = 41.945
% clay = 10.000

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
4.125	57.30	4.588	41.58	2.214	0.209

*** 95th percentile not reached ***

5th percentile = 1.752
16th percentile = 2.374
50th percentile = 4.125
84th percentile = 6.802
95th percentile = .

MEC Analytical Systems, Inc.
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F-149
VC-31-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704133
Station = VC-31
Depth (ft) = 9

Total sample weight = 29.099 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.010	0.034	0.034
707.107	0.50	0.017	0.058	0.093
500.000	1.00	0.017	0.058	0.151
353.553	1.50	0.032	0.110	0.261
250.000	2.00	0.272	0.935	1.196
176.777	2.50	1.323	4.547	5.742
125.000	3.00	4.186	14.385	20.128
88.388	3.50	5.206	17.890	38.018
74.325	3.75	2.181	7.495	45.513
62.500	4.00	2.015	6.925	52.438
31.250	5.00	6.248	21.471	73.908
15.625	6.00	2.718	9.341	83.249
7.813	7.00	1.461	5.019	88.268
3.906	8.00	1.217	4.183	92.451
1.953	9.00	0.771	2.649	95.100
0.977	> 9.0	1.426	4.900	100.000

% < 4 phi = 47.562
% > 1 phi = 0.093
% gravel = 0.000
% sand = 52.438
% silt = 40.013
% clay = 7.549

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.912	66.43	4.503	44.10	1.647	0.359

5th percentile = 2.418
16th percentile = 2.857
50th percentile = 3.912
84th percentile = 6.150
95th percentile = 8.962

MEC Analytical Systems, Inc.
2433 Impala Drive
Carlsbad, CA 92008

F-150

VC-31-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704134
Station = VC-31
Depth (ft) = 12

Total sample weight = 29.454 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.021	0.071	0.071
707.107	0.50	0.035	0.119	0.190
500.000	1.00	0.076	0.258	0.448
353.553	1.50	0.289	0.981	1.429
250.000	2.00	1.337	4.539	5.969
176.777	2.50	2.546	8.644	14.613
125.000	3.00	3.354	11.387	26.000
88.388	3.50	2.133	7.242	33.242
74.325	3.75	0.860	2.920	36.161
62.500	4.00	0.500	1.698	37.859
31.250	5.00	2.110	7.162	45.022
15.625	6.00	4.138	14.050	59.071
7.813	7.00	4.787	16.253	75.324
3.906	8.00	2.921	9.917	85.242
1.953	9.00	1.623	5.510	90.751
0.977	> 9.0	2.724	9.249	100.000

% < 4 phi = 62.141
% > 1 phi = 0.190
% gravel = 0.000
% sand = 37.859
% silt = 47.383
% clay = 14.758

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
5.354	24.44	5.218	26.87	2.657	-0.051

*** 95th percentile not reached ***

5th percentile = 1.893
16th percentile = 2.561
50th percentile = 5.354
84th percentile = 7.875
95th percentile = .

MEC Analytical Systems, Inc.
2433 Impala Drive
Carlsbad, CA 92008

F-151
VC-31-12

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704147
Station = VC-32
Depth (ft) = 0

Total sample weight = 29.762 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.013	0.044	0.044
1000.000	0.00	0.014	0.047	0.091
707.107	0.50	0.015	0.050	0.141
500.000	1.00	0.029	0.097	0.239
353.553	1.50	0.591	1.986	2.224
250.000	2.00	0.807	2.712	4.936
176.777	2.50	2.851	9.579	14.515
125.000	3.00	5.164	17.351	31.867
88.388	3.50	5.346	17.963	49.829
74.325	3.75	4.839	16.259	66.088
62.500	4.00	2.987	10.036	76.125
31.250	5.00	4.260	14.313	90.438
15.625	6.00	0.974	3.272	93.710
7.813	7.00	0.527	1.772	95.482
3.906	8.00	0.081	0.273	95.754
1.953	9.00	0.122	0.409	96.163
0.977	> 9.0	1.142	3.837	100.000

% < 4 phi = 23.875
% > 1 phi = 0.141
% gravel = 0.000
% sand = 76.125
% silt = 19.630
% clay = 4.246

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.503	88.23	3.546	85.59	1.004	0.044

5th percentile = 2.003
16th percentile = 2.543
50th percentile = 3.503
84th percentile = 4.550
95th percentile = 6.728

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F-152
VC-32-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704148
Station = VC-32
Depth (ft) = 3

Total sample weight = 31.811 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	3.545	11.144	11.144
2000.000	-1.00	0.265	0.833	11.977
1414.214	-0.50	0.276	0.868	12.845
1000.000	0.00	0.110	0.346	13.190
707.107	0.50	0.091	0.286	13.477
500.000	1.00	0.228	0.717	14.193
353.553	1.50	2.585	8.126	22.319
250.000	2.00	2.231	7.013	29.333
176.777	2.50	5.093	16.010	45.343
125.000	3.00	5.958	18.729	64.072
88.388	3.50	3.904	12.273	76.345
74.325	3.75	2.390	7.513	83.858
62.500	4.00	1.640	5.155	89.013
31.250	5.00	2.231	7.014	96.028
15.625	6.00	0.365	1.148	97.176
7.813	7.00	0.041	0.128	97.303
3.906	8.00	0.243	0.765	98.068
1.953	9.00	0.081	0.255	98.323
0.977	> 9.0	0.533	1.677	100.000

% < 4 phi = 10.987
% > 1 phi = 13.477
% gravel = 11.977
% sand = 77.036
% silt = 9.055
% clay = 1.932

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.624	162.18	2.434	185.05	1.323	-0.144

*** 5th percentile not obtainable ***

5th percentile = .
16th percentile = 1.111
50th percentile = 2.624
84th percentile = 3.757
95th percentile = 4.853

MEC Analytical Systems, Inc.
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Carlsbad, CA 92008

F-153
VC-32-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704149
Station = VC-32
Depth (ft) = 6

Total sample weight = 31.044 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.003	0.010	0.010
2000.000	-1.00	0.003	0.010	0.019
1414.214	-0.50	0.022	0.071	0.090
1000.000	0.00	0.023	0.074	0.164
707.107	0.50	0.003	0.010	0.174
500.000	1.00	0.037	0.119	0.293
353.553	1.50	0.238	0.767	1.060
250.000	2.00	1.371	4.416	5.476
176.777	2.50	3.512	11.313	16.789
125.000	3.00	4.535	14.608	31.397
88.388	3.50	2.028	6.533	37.930
74.325	3.75	1.020	3.286	41.215
62.500	4.00	0.920	2.964	44.179
31.250	5.00	5.071	16.336	60.514
15.625	6.00	4.584	14.767	75.282
7.813	7.00	2.353	7.580	82.861
3.906	8.00	1.623	5.227	88.089
1.953	9.00	1.014	3.267	91.356
0.977	> 9.0	2.684	8.644	100.000

% < 4 phi = 55.821
% > 1 phi = 0.174
% gravel = 0.019
% sand = 44.159
% silt = 43.910
% clay = 11.911

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
4.356	48.82	4.841	34.88	2.376	0.204

*** 95th percentile not reached ***

5th percentile = 1.946
16th percentile = 2.465
50th percentile = 4.356
84th percentile = 7.218
95th percentile = .

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F-154
VC-32-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704150A
Station = VC-32
Depth (ft) = 9

Total sample weight = 34.347 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.065	0.189	0.189
2000.000	-1.00	0.010	0.029	0.218
1414.214	-0.50	0.029	0.084	0.303
1000.000	0.00	0.066	0.192	0.495
707.107	0.50	0.115	0.335	0.830
500.000	1.00	0.414	1.205	2.035
353.553	1.50	1.478	4.303	6.338
250.000	2.00	5.613	16.342	22.680
176.777	2.50	7.867	22.904	45.584
125.000	3.00	7.583	22.077	67.662
88.388	3.50	2.797	8.143	75.805
74.325	3.75	0.154	0.448	76.253
62.500	4.00	1.497	4.358	80.612
31.250	5.00	2.799	8.150	88.762
15.625	6.00	1.055	3.071	91.833
7.813	7.00	0.649	1.890	93.723
3.906	8.00	0.568	1.654	95.376
1.953	9.00	0.487	1.417	96.794
0.977	> 9.0	1.101	3.206	100.000

% < 4 phi = 19.388
% > 1 phi = 0.830
% gravel = 0.218
% sand = 80.393
% silt = 14.765
% clay = 4.624

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.600	164.94	3.106	116.17	1.310	0.386

5th percentile = 1.345
16th percentile = 1.796
50th percentile = 2.600
84th percentile = 4.416
95th percentile = 7.772

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F-155
VC-32-9A

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704150B
Station = VC-32
Depth (ft) = 9

Total sample weight = 32.844 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.036	0.110	0.110
2000.000	-1.00	0.013	0.040	0.149
1414.214	-0.50	0.010	0.030	0.180
1000.000	0.00	0.044	0.134	0.314
707.107	0.50	0.098	0.298	0.612
500.000	1.00	0.344	1.047	1.659
353.553	1.50	2.992	9.110	10.769
250.000	2.00	3.772	11.484	22.253
176.777	2.50	9.156	27.877	50.130
125.000	3.00	6.768	20.606	70.736
88.388	3.50	3.136	9.548	80.284
74.325	3.75	1.119	3.407	83.691
62.500	4.00	0.401	1.221	84.912
31.250	5.00	1.623	4.941	89.853
15.625	6.00	0.771	2.347	92.200
7.813	7.00	0.771	2.347	94.547
3.906	8.00	0.568	1.729	96.276
1.953	9.00	0.284	0.865	97.141
0.977	> 9.0	0.939	2.859	100.000

% < 4 phi = 15.088
% > 1 phi = 0.612
% gravel = 0.149
% sand = 84.763
% silt = 11.364
% clay = 3.724

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.498	177.06	2.770	146.56	1.043	0.262

5th percentile = 1.183
16th percentile = 1.728
50th percentile = 2.498
84th percentile = 3.813
95th percentile = 7.262

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F-156
VC-32-9B

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704151
Station = VC-33
Depth (ft) = 0

Total sample weight = 30.005 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.035	0.117	0.117
2000.000	-1.00	0.010	0.033	0.150
1414.214	-0.50	0.020	0.067	0.217
1000.000	0.00	0.032	0.107	0.323
707.107	0.50	0.043	0.143	0.467
500.000	1.00	0.073	0.243	0.710
353.553	1.50	0.383	1.276	1.986
250.000	2.00	1.863	6.209	8.195
176.777	2.50	4.131	13.768	21.963
125.000	3.00	9.824	32.741	54.704
88.388	3.50	5.358	17.857	72.561
74.325	3.75	2.658	8.858	81.419
62.500	4.00	2.202	7.339	88.758
31.250	5.00	2.029	6.760	95.518
15.625	6.00	0.284	0.946	96.465
7.813	7.00	0.041	0.135	96.600
3.906	8.00	0.243	0.811	97.411
1.953	9.00	0.081	0.270	97.682
0.977	> 9.0	0.696	2.318	100.000

% < 4 phi = 11.242
% > 1 phi = 0.467
% gravel = 0.150
% sand = 88.608
% silt = 8.653
% clay = 2.589

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.928	131.38	3.061	119.85	0.777	0.170

5th percentile = 1.743
16th percentile = 2.283
50th percentile = 2.928
84th percentile = 3.838
95th percentile = 4.923

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F-157
VC-33-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704152
Station = VC-33
Depth (ft) = 3

Total sample weight = 31.125 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.047	0.151	0.151
2000.000	-1.00	0.027	0.087	0.238
1414.214	-0.50	0.027	0.087	0.324
1000.000	0.00	0.038	0.122	0.447
707.107	0.50	0.036	0.116	0.562
500.000	1.00	0.129	0.414	0.977
353.553	1.50	0.787	2.528	3.505
250.000	2.00	3.605	11.582	15.087
176.777	2.50	5.828	18.724	33.812
125.000	3.00	8.926	28.678	62.489
88.388	3.50	5.611	18.027	80.516
74.325	3.75	1.975	6.345	86.862
62.500	4.00	1.203	3.865	90.727
31.250	5.00	1.663	5.344	96.071
15.625	6.00	0.487	1.564	97.635
7.813	7.00	0.162	0.521	98.156
3.906	8.00	0.041	0.130	98.287
1.953	9.00	0.041	0.130	98.417
0.977	> 9.0	0.493	1.583	100.000

% < 4 phi = 9.273
% > 1 phi = 0.562
% gravel = 0.238
% sand = 90.489
% silt = 7.560
% clay = 1.713

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.782	145.37	2.831	140.55	0.806	0.060

5th percentile = 1.565
16th percentile = 2.024
50th percentile = 2.782
84th percentile = 3.637
95th percentile = 4.800

MEC Analytical Systems, Inc.
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F-158

VC-33-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704153
Station = VC-33
Depth (ft) = 6

Total sample weight = 6.232 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.004	0.064	0.064
1414.214	-0.50	0.018	0.289	0.353
1000.000	0.00	0.017	0.273	0.626
707.107	0.50	0.031	0.497	1.123
500.000	1.00	0.032	0.513	1.637
353.553	1.50	0.051	0.818	2.455
250.000	2.00	0.100	1.605	4.060
176.777	2.50	0.227	3.642	7.702
125.000	3.00	0.596	9.563	17.265
88.388	3.50	1.040	16.687	33.952
74.325	3.75	0.441	7.076	41.028
62.500	4.00	1.438	23.073	64.102
31.250	5.00	1.217	19.529	83.631
15.625	6.00	0.365	5.859	89.490
7.813	7.00	0.122	1.953	91.443
3.906	8.00	0.041	0.651	92.094
1.953	9.00	0.081	1.302	93.395
0.977	> 9.0	0.412	6.605	100.000

% < 4 phi = 35.898
% > 1 phi = 1.123
% gravel = 0.064
% sand = 64.038
% silt = 27.992
% clay = 7.906

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.847	69.48	3.998	62.57	1.065	0.142

*** 95th percentile not reached ***

5th percentile = 2.129
16th percentile = 2.934
50th percentile = 3.847
84th percentile = 5.063
95th percentile = .

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F-159
VC-33-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704154
Station = VC-33
Depth (ft) = 9

Total sample weight = 32.701 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.015	0.046	0.046
2000.000	-1.00	0.000	0.000	0.046
1414.214	-0.50	0.008	0.024	0.070
1000.000	0.00	0.022	0.067	0.138
707.107	0.50	0.018	0.055	0.193
500.000	1.00	0.198	0.605	0.798
353.553	1.50	1.771	5.416	6.214
250.000	2.00	6.843	20.926	27.139
176.777	2.50	6.748	20.635	47.775
125.000	3.00	6.842	20.923	68.697
88.388	3.50	2.840	8.685	77.382
74.325	3.75	1.232	3.767	81.149
62.500	4.00	0.641	1.960	83.110
31.250	5.00	2.110	6.451	89.561
15.625	6.00	1.014	3.102	92.662
7.813	7.00	0.852	2.605	95.268
3.906	8.00	0.122	0.372	95.640
1.953	9.00	0.487	1.489	97.129
0.977	> 9.0	0.939	2.871	100.000

% < 4 phi = 16.890
% > 1 phi = 0.193
% gravel = 0.046
% sand = 83.064
% silt = 12.530
% clay = 4.360

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.553	170.38	2.936	130.68	1.202	0.318

5th percentile = 1.388
16th percentile = 1.734
50th percentile = 2.553
84th percentile = 4.138
95th percentile = 6.897

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F-160
VC-33-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704119
Station = VC-34
Depth (ft) = 0

Total sample weight = 30.512 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.579	1.898	1.898
2000.000	-1.00	0.236	0.773	2.671
1414.214	-0.50	0.169	0.554	3.225
1000.000	0.00	0.113	0.370	3.595
707.107	0.50	0.058	0.190	3.785
500.000	1.00	0.067	0.220	4.005
353.553	1.50	0.560	1.835	5.840
250.000	2.00	3.452	11.314	17.154
176.777	2.50	4.084	13.385	30.539
125.000	3.00	5.949	19.497	50.037
88.388	3.50	4.842	15.869	65.906
74.325	3.75	3.566	11.687	77.593
62.500	4.00	2.652	8.692	86.285
31.250	5.00	2.799	9.175	95.460
15.625	6.00	0.203	0.665	96.125
7.813	7.00	0.243	0.798	96.922
3.906	8.00	0.203	0.665	97.587
1.953	9.00	0.122	0.399	97.986
0.977	> 9.0	0.614	2.014	100.000

% < 4 phi = 13.715
% > 1 phi = 3.785
% gravel = 2.671
% sand = 83.614
% silt = 11.302
% clay = 2.413

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.999	125.08	2.942	130.16	0.993	-0.058

5th percentile = 1.271
16th percentile = 1.949
50th percentile = 2.999
84th percentile = 3.934
95th percentile = 4.950

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F-161
VC-34-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704120A
Station = VC-34
Depth (ft) = 3

Total sample weight = 31.295 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.000	0.000	0.000
1000.000	0.00	0.000	0.000	0.000
707.107	0.50	0.008	0.026	0.026
500.000	1.00	0.001	0.003	0.029
353.553	1.50	0.349	1.115	1.144
250.000	2.00	1.435	4.585	5.729
176.777	2.50	9.092	29.053	34.782
125.000	3.00	9.109	29.107	63.890
88.388	3.50	7.171	22.915	86.804
74.325	3.75	1.288	4.116	90.920
62.500	4.00	1.010	3.227	94.147
31.250	5.00	0.893	2.852	96.999
15.625	6.00	0.122	0.389	97.388
7.813	7.00	0.325	1.037	98.425
3.906	8.00	0.122	0.389	98.814
1.953	9.00	0.122	0.389	99.203
0.977	> 9.0	0.249	0.797	100.000

% < 4 phi = 5.853
% > 1 phi = 0.026
% gravel = 0.000
% sand = 94.147
% silt = 4.667
% clay = 1.186

Graphic Moments

Median phi	Median microns	Mean phi	Mean microns	Dispersion	Skewness
2.761	147.48	2.808	142.81	0.631	0.073

5th percentile = 1.920
16th percentile = 2.177
50th percentile = 2.761
84th percentile = 3.439
95th percentile = 4.299

MEC Analytical Systems, Inc.
2433 Impala Drive
Carlsbad, CA 92008

F-162
VC-34-3A

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704120B
Station = VC-34
Depth (ft) = 3

Total sample weight = 31.845 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.023	0.072	0.072
1414.214	-0.50	0.002	0.006	0.079
1000.000	0.00	0.005	0.016	0.094
707.107	0.50	0.018	0.057	0.151
500.000	1.00	0.001	0.003	0.154
353.553	1.50	0.072	0.226	0.380
250.000	2.00	1.490	4.679	5.059
176.777	2.50	5.828	18.301	23.360
125.000	3.00	11.237	35.286	58.646
88.388	3.50	7.205	22.625	81.272
74.325	3.75	2.390	7.505	88.777
62.500	4.00	1.134	3.561	92.338
31.250	5.00	1.461	4.586	96.924
15.625	6.00	0.203	0.637	97.561
7.813	7.00	0.284	0.892	98.453
3.906	8.00	0.122	0.382	98.835
1.953	9.00	0.081	0.255	99.090
0.977	> 9.0	0.290	0.910	100.000

% < 4 phi = 7.662
% > 1 phi = 0.151
% gravel = 0.072
% sand = 92.265
% silt = 6.497
% clay = 1.165

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.877	136.08	2.945	129.87	0.646	0.104

5th percentile = 1.994
16th percentile = 2.299
50th percentile = 2.877
84th percentile = 3.591
95th percentile = 4.581

MEC Analytical Systems, Inc.
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F-163
VC-34-3B

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704121
Station = VC-34
Depth (ft) = 6

Total sample weight = 31.551 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.001	0.003	0.003
1000.000	0.00	0.000	0.000	0.003
707.107	0.50	0.004	0.013	0.016
500.000	1.00	0.009	0.029	0.044
353.553	1.50	0.120	0.380	0.425
250.000	2.00	1.543	4.890	5.315
176.777	2.50	6.032	19.118	24.433
125.000	3.00	9.966	31.587	56.020
88.388	3.50	5.086	16.120	72.140
74.325	3.75	1.890	5.990	78.130
62.500	4.00	0.606	1.921	80.051
31.250	5.00	1.907	6.043	86.094
15.625	6.00	1.258	3.986	90.080
7.813	7.00	1.014	3.215	93.295
3.906	8.00	0.446	1.414	94.709
1.953	9.00	0.446	1.414	96.124
0.977	> 9.0	1.223	3.876	100.000

% < 4 phi = 19.949
% > 1 phi = 0.016
% gravel = 0.000
% sand = 80.051
% silt = 14.659
% clay = 5.291

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.905	133.54	3.466	90.47	1.187	0.473

5th percentile = 1.968
16th percentile = 2.279
50th percentile = 2.905
84th percentile = 4.653
95th percentile = 8.206

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F-164
VC-34-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704135
Station = VC-34
Depth (ft) = 0

Total sample weight = 30.300 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.005	0.017	0.017
1414.214	-0.50	0.008	0.026	0.043
1000.000	0.00	0.012	0.040	0.083
707.107	0.50	0.010	0.033	0.116
500.000	1.00	0.030	0.099	0.215
353.553	1.50	0.259	0.855	1.069
250.000	2.00	1.849	6.102	7.172
176.777	2.50	3.853	12.716	19.888
125.000	3.00	7.560	24.950	44.838
88.388	3.50	4.685	15.462	60.300
74.325	3.75	4.856	16.026	76.327
62.500	4.00	2.461	8.122	84.449
31.250	5.00	3.205	10.578	95.026
15.625	6.00	0.771	2.544	97.570
7.813	7.00	0.406	1.339	98.909
3.906	8.00	0.081	0.268	99.177
1.953	9.00	0.081	0.268	99.445
0.977	> 9.0	0.168	0.555	100.000

% < 4 phi = 15.551
% > 1 phi = 0.116
% gravel = 0.017
% sand = 84.432
% silt = 14.728
% clay = 0.823

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.167	111.34	3.167	111.36	0.820	-0.000

5th percentile = 1.822
16th percentile = 2.347
50th percentile = 3.167
84th percentile = 3.986
95th percentile = 4.998

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F-165
VC-34B-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704136
Station = VC-34
Depth (ft) = 3

Total sample weight = 24.823 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.016	0.064	0.064
1000.000	0.00	0.012	0.048	0.113
707.107	0.50	0.024	0.097	0.209
500.000	1.00	0.020	0.081	0.290
353.553	1.50	0.058	0.234	0.524
250.000	2.00	0.090	0.363	0.886
176.777	2.50	0.182	0.733	1.619
125.000	3.00	0.209	0.842	2.461
88.388	3.50	0.347	1.398	3.859
74.325	3.75	0.001	0.004	3.863
62.500	4.00	0.003	0.012	3.875
31.250	5.00	4.463	17.978	21.853
15.625	6.00	4.990	20.103	41.956
7.813	7.00	5.923	23.862	65.818
3.906	8.00	3.408	13.729	79.547
1.953	9.00	1.785	7.191	86.738
0.977	> 9.0	3.292	13.262	100.000

% < 4 phi = 96.125
% > 1 phi = 0.209
% gravel = 0.000
% sand = 3.875
% silt = 75.671
% clay = 20.453

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
6.337	12.37	6.647	9.98	1.972	0.157

*** 95th percentile not reached ***

5th percentile = 4.063
16th percentile = 4.674
50th percentile = 6.337
84th percentile = 8.619
95th percentile = .

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F-166

VC-34B-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704137
Station = VC-34
Depth (ft) = 6

Total sample weight = 36.278 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.001	0.003	0.003
1414.214	-0.50	0.012	0.033	0.036
1000.000	0.00	0.003	0.008	0.044
707.107	0.50	0.011	0.030	0.074
500.000	1.00	0.245	0.675	0.750
353.553	1.50	6.937	19.122	19.872
250.000	2.00	5.815	16.029	35.901
176.777	2.50	7.806	21.517	57.418
125.000	3.00	4.850	13.369	70.787
88.388	3.50	3.216	8.865	79.652
74.325	3.75	0.591	1.629	81.281
62.500	4.00	0.740	2.040	83.321
31.250	5.00	5.112	14.091	97.412
15.625	6.00	0.487	1.342	98.754
7.813	7.00	0.162	0.447	99.201
3.906	8.00	0.081	0.224	99.425
1.953	9.00	0.081	0.224	99.648
0.977	> 9.0	0.128	0.352	100.000

% < 4 phi = 16.679
% > 1 phi = 0.074
% gravel = 0.003
% sand = 83.318
% silt = 16.104
% clay = 0.575

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.328	199.21	2.723	151.41	1.325	0.299

5th percentile = 1.111
16th percentile = 1.399
50th percentile = 2.328
84th percentile = 4.048
95th percentile = 4.829

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GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704138
Station = VC-34
Depth (ft) = 9

Total sample weight = 25.631 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.001	0.004	0.004
1000.000	0.00	0.003	0.012	0.016
707.107	0.50	0.045	0.176	0.191
500.000	1.00	0.036	0.140	0.332
353.553	1.50	0.154	0.601	0.932
250.000	2.00	0.101	0.394	1.326
176.777	2.50	0.188	0.733	2.060
125.000	3.00	0.334	1.303	3.363
88.388	3.50	0.935	3.648	7.011
74.325	3.75	0.582	2.271	9.282
62.500	4.00	1.501	5.856	15.138
31.250	5.00	5.071	19.785	34.923
15.625	6.00	4.219	16.461	51.384
7.813	7.00	3.448	13.454	64.838
3.906	8.00	3.002	11.713	76.551
1.953	9.00	1.542	6.015	82.566
0.977	> 9.0	4.469	17.434	100.000

% < 4 phi = 84.862
% > 1 phi = 0.191
% gravel = 0.000
% sand = 15.138
% silt = 61.414
% clay = 23.449

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
5.916	16.56	6.590	10.38	2.546	0.265

*** 84th percentile extrapolated ***
*** 95th percentile not reached ***

5th percentile = 3.224
16th percentile = 4.044
50th percentile = 5.916
84th percentile = 9.136
95th percentile = .

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F-168

VC-34B-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704139
Station = VC-35
Depth (ft) = 0

Total sample weight = 29.639 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.003	0.010	0.010
1000.000	0.00	0.013	0.044	0.054
707.107	0.50	0.018	0.061	0.115
500.000	1.00	0.057	0.192	0.307
353.553	1.50	0.351	1.184	1.491
250.000	2.00	2.121	7.156	8.648
176.777	2.50	4.006	13.516	22.164
125.000	3.00	6.236	21.040	43.204
88.388	3.50	4.955	16.718	59.922
74.325	3.75	4.600	15.520	75.442
62.500	4.00	2.810	9.481	84.923
31.250	5.00	3.246	10.951	95.874
15.625	6.00	0.649	2.190	98.064
7.813	7.00	0.284	0.958	99.022
3.906	8.00	0.081	0.274	99.296
1.953	9.00	0.041	0.137	99.433
0.977	> 9.0	0.168	0.567	100.000

% < 4 phi = 15.077
% > 1 phi = 0.115
% gravel = 0.000
% sand = 84.923
% silt = 14.373
% clay = 0.704

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.203	108.57	3.124	114.72	0.852	-0.093

5th percentile = 1.745
16th percentile = 2.272
50th percentile = 3.203
84th percentile = 3.976
95th percentile = 4.920

MEC Analytical Systems, Inc.
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F-169
VC-35-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704140A
Station = VC-35
Depth (ft) = 3

Total sample weight = 31.494 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	1.919	6.093	6.093
2000.000	-1.00	0.459	1.457	7.551
1414.214	-0.50	0.279	0.886	8.436
1000.000	0.00	0.223	0.708	9.145
707.107	0.50	0.157	0.499	9.643
500.000	1.00	0.275	0.873	10.516
353.553	1.50	3.251	10.323	20.839
250.000	2.00	3.066	9.735	30.574
176.777	2.50	7.101	22.547	53.121
125.000	3.00	6.869	21.810	74.931
88.388	3.50	3.695	11.732	86.663
74.325	3.75	1.375	4.366	91.029
62.500	4.00	1.156	3.671	94.700
31.250	5.00	1.177	3.736	98.435
15.625	6.00	0.122	0.386	98.822
7.813	7.00	0.122	0.386	99.208
3.906	8.00	0.041	0.129	99.337
1.953	9.00	0.081	0.258	99.595
0.977	> 9.0	0.128	0.405	100.000

% < 4 phi = 5.300
% > 1 phi = 9.643
% gravel = 7.551
% sand = 87.149
% silt = 4.637
% clay = 0.663

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.431	185.46	2.326	199.43	1.060	-0.099

*** 5th percentile not obtainable ***

5th percentile = .
16th percentile = 1.266
50th percentile = 2.431
84th percentile = 3.386
95th percentile = 4.080

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VC-35-3A

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704140B
Station = VC-35
Depth (ft) = 3

Total sample weight = 30.974 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	2.258	7.290	7.290
2000.000	-1.00	0.476	1.537	8.827
1414.214	-0.50	0.255	0.823	9.650
1000.000	0.00	0.194	0.626	10.276
707.107	0.50	0.237	0.765	11.042
500.000	1.00	0.233	0.752	11.794
353.553	1.50	1.476	4.765	16.559
250.000	2.00	5.270	17.014	33.573
176.777	2.50	6.904	22.290	55.863
125.000	3.00	6.766	21.844	77.707
88.388	3.50	2.989	9.650	87.358
74.325	3.75	1.472	4.752	92.110
62.500	4.00	1.302	4.204	96.313
31.250	5.00	0.690	2.227	98.540
15.625	6.00	0.162	0.524	99.064
7.813	7.00	0.041	0.131	99.195
3.906	8.00	0.041	0.131	99.326
1.953	9.00	0.081	0.262	99.588
0.977	> 9.0	0.128	0.412	100.000

% < 4 phi = 3.687
% > 1 phi = 11.042
% gravel = 8.827
% sand = 87.487
% silt = 3.013
% clay = 0.674

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.368	193.65	2.384	191.62	0.942	0.016

*** 5th percentile not obtainable ***

5th percentile = .
16th percentile = 1.441
50th percentile = 2.368
84th percentile = 3.326
95th percentile = 3.922

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F-171
VC-35-3B

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704141
Station = VC-35
Depth (ft) = 6

Total sample weight = 30.849 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.004	0.013	0.013
1414.214	-0.50	0.000	0.000	0.013
1000.000	0.00	0.013	0.042	0.055
707.107	0.50	0.043	0.139	0.194
500.000	1.00	0.095	0.308	0.502
353.553	1.50	1.098	3.559	4.062
250.000	2.00	1.335	4.328	8.389
176.777	2.50	3.783	12.263	20.652
125.000	3.00	3.899	12.639	33.291
88.388	3.50	3.661	11.867	45.159
74.325	3.75	1.095	3.550	48.708
62.500	4.00	1.009	3.271	51.979
31.250	5.00	3.692	11.968	63.947
15.625	6.00	3.611	11.705	75.651
7.813	7.00	2.556	8.285	83.936
3.906	8.00	1.582	5.129	89.065
1.953	9.00	1.177	3.814	92.879
0.977	> 9.0	2.197	7.121	100.000

% < 4 phi = 48.021
% > 1 phi = 0.194
% gravel = 0.013
% sand = 51.966
% silt = 37.086
% clay = 10.935

Graphic Moments

Median phi	Median microns	Mean phi	Mean microns	Dispersion	Skewness
3.849	69.41	4.661	39.52	2.351	0.346

*** 95th percentile not reached ***

5th percentile = 1.608
16th percentile = 2.310
50th percentile = 3.849
84th percentile = 7.012
95th percentile = .

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F-172
VC-35-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704142
Station = VC-35
Depth (ft) = 9

Total sample weight = 31.834 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.006	0.019	0.019
2000.000	-1.00	0.004	0.013	0.031
1414.214	-0.50	0.003	0.009	0.041
1000.000	0.00	0.016	0.050	0.091
707.107	0.50	0.001	0.003	0.094
500.000	1.00	0.091	0.286	0.380
353.553	1.50	3.925	12.329	12.710
250.000	2.00	5.907	18.555	31.265
176.777	2.50	10.687	33.571	64.835
125.000	3.00	6.365	19.994	84.830
88.388	3.50	2.576	8.092	92.921
74.325	3.75	0.747	2.347	95.268
62.500	4.00	0.324	1.018	96.286
31.250	5.00	0.649	2.039	98.325
15.625	6.00	0.122	0.382	98.707
7.813	7.00	0.081	0.255	98.962
3.906	8.00	0.041	0.127	99.089
1.953	9.00	0.081	0.255	99.344
0.977	> 9.0	0.209	0.656	100.000

% < 4 phi = 3.714
% > 1 phi = 0.094
% gravel = 0.031
% sand = 96.254
% silt = 2.804
% clay = 0.911

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.279	206.03	2.284	205.33	0.695	0.007

5th percentile = 1.187
16th percentile = 1.589
50th percentile = 2.279
84th percentile = 2.979
95th percentile = 3.721

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F-173
VC-35-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704143
Station = VC-36
Depth (ft) = 0

Total sample weight = 30.849 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.003	0.010	0.010
2000.000	-1.00	0.006	0.019	0.029
1414.214	-0.50	0.029	0.094	0.123
1000.000	0.00	0.022	0.071	0.194
707.107	0.50	0.033	0.107	0.301
500.000	1.00	0.064	0.207	0.509
353.553	1.50	1.525	4.943	5.452
250.000	2.00	1.785	5.786	11.238
176.777	2.50	6.770	21.945	33.184
125.000	3.00	8.271	26.811	59.995
88.388	3.50	4.440	14.393	74.387
74.325	3.75	2.124	6.885	81.272
62.500	4.00	1.187	3.848	85.120
31.250	5.00	1.745	5.655	90.775
15.625	6.00	0.811	2.630	93.405
7.813	7.00	0.406	1.315	94.720
3.906	8.00	0.325	1.052	95.773
1.953	9.00	0.325	1.052	96.825
0.977	> 9.0	0.980	3.175	100.000

% < 4 phi = 14.880
% > 1 phi = 0.301
% gravel = 0.029
% sand = 85.091
% silt = 10.652
% clay = 4.227

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.814	142.24	3.018	123.46	0.909	0.225

5th percentile = 1.454
16th percentile = 2.108
50th percentile = 2.814
84th percentile = 3,927
95th percentile = 7.266

MEC Analytical Systems, Inc.
2433 Impala Drive
Carlsbad, CA 92008

F-174

VC-36-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704144
Station = VC-36
Depth (ft) = 3

Total sample weight = 28.487 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.026	0.091	0.091
1414.214	-0.50	0.012	0.042	0.133
1000.000	0.00	0.026	0.091	0.225
707.107	0.50	0.022	0.077	0.302
500.000	1.00	0.024	0.084	0.386
353.553	1.50	0.048	0.168	0.555
250.000	2.00	0.155	0.544	1.099
176.777	2.50	0.348	1.222	2.320
125.000	3.00	0.746	2.619	4.939
88.388	3.50	1.224	4.297	9.236
74.325	3.75	1.131	3.970	13.206
62.500	4.00	0.864	3.033	16.239
31.250	5.00	4.503	15.808	32.047
15.625	6.00	9.047	31.759	63.806
7.813	7.00	4.016	14.099	77.905
3.906	8.00	2.312	8.118	86.023
1.953	9.00	1.095	3.845	89.868
0.977	> 9.0	2.886	10.132	100.000

% < 4 phi = 83.761
% > 1 phi = 0.302
% gravel = 0.091
% sand = 16.148
% silt = 69.784
% clay = 13.977

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
5.565	21.12	5.866	17.15	1.885	0.159

*** 95th percentile not reached ***

5th percentile = 3.007
16th percentile = 3.980
50th percentile = 5.565
84th percentile = 7.751
95th percentile = .

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Carlsbad, CA 92008

F-175
VC-36-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704145
Station = VC-36
Depth (ft) = 6

Total sample weight = 30.066 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.011	0.037	0.037
1414.214	-0.50	0.018	0.060	0.096
1000.000	0.00	0.022	0.073	0.170
707.107	0.50	0.020	0.067	0.236
500.000	1.00	0.016	0.053	0.289
353.553	1.50	0.070	0.233	0.522
250.000	2.00	0.121	0.402	0.925
176.777	2.50	1.038	3.452	4.377
125.000	3.00	3.303	10.986	15.363
88.388	3.50	4.443	14.778	30.141
74.325	3.75	1.869	6.216	36.357
62.500	4.00	1.278	4.251	40.608
31.250	5.00	3.246	10.795	51.403
15.625	6.00	2.840	9.446	60.848
7.813	7.00	3.246	10.795	71.643
3.906	8.00	2.556	8.501	80.144
1.953	9.00	1.542	5.128	85.272
0.977	> 9.0	4.428	14.728	100.000

% < 4 phi = 59.392
% > 1 phi = 0.236
% gravel = 0.037
% sand = 40.571
% silt = 39.537
% clay = 19.856

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
4.870	34.20	5.887	16.90	2.865	0.355

*** 95th percentile not reached ***

5th percentile = 2.528
16th percentile = 3.022
50th percentile = 4.870
84th percentile = 8.752
95th percentile = .

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F-176

VC-36-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704146
Station = VC-36
Depth (ft) = 9

Total sample weight = 29.679 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.007	0.024	0.024
1000.000	0.00	0.026	0.088	0.111
707.107	0.50	0.006	0.020	0.131
500.000	1.00	0.018	0.061	0.192
353.553	1.50	0.030	0.101	0.293
250.000	2.00	0.130	0.438	0.731
176.777	2.50	0.639	2.153	2.884
125.000	3.00	1.933	6.513	9.397
88.388	3.50	1.864	6.281	15.678
74.325	3.75	1.203	4.053	19.731
62.500	4.00	0.895	3.016	22.747
31.250	5.00	4.950	16.677	39.424
15.625	6.00	7.911	26.656	66.079
7.813	7.00	3.611	12.166	78.245
3.906	8.00	2.272	7.655	85.900
1.953	9.00	0.852	2.871	88.771
0.977	> 9.0	3.333	11.229	100.000

% < 4 phi = 77.253
% > 1 phi = 0.131
% gravel = 0.000
% sand = 22.747
% silt = 63.154
% clay = 14.100

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
5.397	23.74	5.636	20.11	2.116	0.113

*** 95th percentile not reached ***

5th percentile = 2.662
16th percentile = 3.520
50th percentile = 5.397
84th percentile = 7.752
95th percentile = .

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F-177
VC-36-9

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704116
Station = VC-37
Depth (ft) = 0

Total sample weight = 23.372 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.021	0.090	0.090
2000.000	-1.00	0.000	0.000	0.090
1414.214	-0.50	0.021	0.090	0.180
1000.000	0.00	0.036	0.154	0.334
707.107	0.50	0.034	0.145	0.479
500.000	1.00	0.043	0.184	0.663
353.553	1.50	0.085	0.364	1.027
250.000	2.00	0.281	1.202	2.229
176.777	2.50	0.404	1.729	3.958
125.000	3.00	0.406	1.737	5.695
88.388	3.50	0.320	1.369	7.064
74.325	3.75	0.297	1.271	8.335
62.500	4.00	0.200	0.856	9.190
31.250	5.00	1.988	8.506	17.696
15.625	6.00	2.394	10.241	27.938
7.813	7.00	4.300	18.400	46.337
3.906	8.00	4.544	19.441	65.779
1.953	9.00	2.191	9.374	75.152
0.977	> 9.0	5.807	24.848	100.000

% < 4 phi = 90.810
% > 1 phi = 0.479
% gravel = 0.090
% sand = 9.101
% silt = 56.588
% clay = 34.221

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
7.188	6.86	7.219	6.71	2.418	0.013

*** 84th percentile extrapolated ***
*** 95th percentile not reached ***

5th percentile = 2.800
16th percentile = 4.801
50th percentile = 7.188
84th percentile = 9.637
95th percentile = .

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F-178
VC-37-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704117
Station = VC-37
Depth (ft) = 3

Total sample weight = 30.158 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.000	0.000	0.000
1414.214	-0.50	0.001	0.003	0.003
1000.000	0.00	0.022	0.073	0.076
707.107	0.50	0.038	0.126	0.202
500.000	1.00	0.046	0.153	0.355
353.553	1.50	0.099	0.328	0.683
250.000	2.00	0.107	0.355	1.038
176.777	2.50	0.803	2.663	3.700
125.000	3.00	2.339	7.756	11.456
88.388	3.50	7.684	25.479	36.935
74.325	3.75	4.250	14.092	51.027
62.500	4.00	1.416	4.695	55.722
31.250	5.00	4.625	15.336	71.058
15.625	6.00	1.866	6.188	77.246
7.813	7.00	2.272	7.533	84.779
3.906	8.00	1.136	3.767	88.546
1.953	9.00	1.014	3.363	91.909
0.977	> 9.0	2.440	8.091	100.000

% < 4 phi = 44.278
% > 1 phi = 0.202
% gravel = 0.000
% sand = 55.722
% silt = 32.824
% clay = 11.454

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.732	75.27	4.993	31.41	1.904	0.662

*** 95th percentile not reached ***

5th percentile = 2.584
16th percentile = 3.089
50th percentile = 3.732
84th percentile = 6.897
95th percentile = .

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F-179
VC-37-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704118
Station = VC-37
Depth (ft) = 6

Total sample weight = 30.595 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.001	0.003	0.003
2000.000	-1.00	0.000	0.000	0.003
1414.214	-0.50	0.000	0.000	0.003
1000.000	0.00	0.001	0.003	0.007
707.107	0.50	0.018	0.059	0.065
500.000	1.00	0.030	0.098	0.163
353.553	1.50	0.300	0.981	1.144
250.000	2.00	0.634	2.072	3.216
176.777	2.50	4.956	16.199	19.415
125.000	3.00	6.637	21.693	41.108
88.388	3.50	5.029	16.437	57.546
74.325	3.75	1.512	4.942	62.488
62.500	4.00	1.653	5.403	67.891
31.250	5.00	2.799	9.150	77.040
15.625	6.00	1.704	5.569	82.610
7.813	7.00	1.420	4.641	87.251
3.906	8.00	1.014	3.315	90.566
1.953	9.00	0.893	2.917	93.483
0.977	> 9.0	1.994	6.517	100.000

% < 4 phi = 32.109
% > 1 phi = 0.065
% gravel = 0.003
% sand = 67.887
% silt = 22.675
% clay = 9.434

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.270	103.63	4.347	49.14	1.953	0.551

*** 95th percentile not reached ***

5th percentile = 2.055
16th percentile = 2.395
50th percentile = 3.270
84th percentile = 6.300
95th percentile = .

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F-180

VC-37-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704113
Station = VC-38
Depth (ft) = 0

Total sample weight = 31.137 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.005	0.016	0.016
2000.000	-1.00	0.056	0.180	0.196
1414.214	-0.50	0.004	0.013	0.209
1000.000	0.00	0.010	0.032	0.241
707.107	0.50	0.035	0.112	0.353
500.000	1.00	0.109	0.350	0.703
353.553	1.50	2.279	7.319	8.023
250.000	2.00	2.538	8.151	16.174
176.777	2.50	6.555	21.052	37.226
125.000	3.00	6.859	22.028	59.254
88.388	3.50	4.026	12.930	72.184
74.325	3.75	1.861	5.977	78.161
62.500	4.00	2.007	6.446	84.606
31.250	5.00	2.272	7.296	91.903
15.625	6.00	0.933	2.997	94.900
7.813	7.00	0.243	0.782	95.681
3.906	8.00	0.243	0.782	96.463
1.953	9.00	0.203	0.651	97.115
0.977	> 9.0	0.898	2.885	100.000

% < 4 phi = 15.394
% > 1 phi = 0.353
% gravel = 0.196
% sand = 84.410
% silt = 11.857
% clay = 3.537

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.790	144.59	2.983	126.49	0.994	0.194

5th percentile = 1.294
16th percentile = 1.989
50th percentile = 2.790
84th percentile = 3.976
95th percentile = 6.129

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F-181
VC-38

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704114
Station = VC-38
Depth (ft) = 3

Total sample weight = 23.519 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.004	0.017	0.017
1414.214	-0.50	0.036	0.153	0.170
1000.000	0.00	0.080	0.340	0.510
707.107	0.50	0.071	0.302	0.812
500.000	1.00	0.053	0.225	1.037
353.553	1.50	0.081	0.344	1.382
250.000	2.00	0.181	0.770	2.151
176.777	2.50	0.241	1.025	3.176
125.000	3.00	0.300	1.276	4.452
88.388	3.50	0.266	1.131	5.583
74.325	3.75	0.146	0.621	6.204
62.500	4.00	0.146	0.621	6.824
31.250	5.00	0.811	3.450	10.274
15.625	6.00	2.434	10.350	20.624
7.813	7.00	4.625	19.665	40.290
3.906	8.00	3.246	13.800	54.090
1.953	9.00	3.327	14.145	68.235
0.977	> 9.0	7.471	31.765	100.000

% < 4 phi = 93.176
% > 1 phi = 0.812
% gravel = 0.017
% sand = 6.807
% silt = 47.265
% clay = 45.910

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
7.704	4.80	7.837	4.37	2.284	0.058

*** 84th percentile extrapolated ***
*** 95th percentile not reached ***

5th percentile = 3.242
16th percentile = 5.553
50th percentile = 7.704
84th percentile = 10.121
95th percentile = .

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F-18Z
VC-38-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704115
Station = VC-38
Depth (ft) = 6

Total sample weight = 26.473 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.042	0.159	0.159
2000.000	-1.00	0.024	0.091	0.249
1414.214	-0.50	0.008	0.030	0.280
1000.000	0.00	0.014	0.053	0.332
707.107	0.50	0.007	0.026	0.359
500.000	1.00	0.009	0.034	0.393
353.553	1.50	0.025	0.094	0.487
250.000	2.00	0.029	0.110	0.597
176.777	2.50	0.046	0.174	0.771
125.000	3.00	0.061	0.230	1.001
88.388	3.50	0.131	0.495	1.496
74.325	3.75	0.074	0.280	1.775
62.500	4.00	0.073	0.276	2.051
31.250	5.00	1.298	4.904	6.955
15.625	6.00	7.952	30.037	36.992
7.813	7.00	7.221	27.278	64.271
3.906	8.00	3.895	14.712	78.982
1.953	9.00	1.379	5.210	84.193
0.977	> 9.0	4.185	15.807	100.000

% < 4 phi = 97.949
% > 1 phi = 0.359
% gravel = 0.249
% sand = 1.802
% silt = 76.931
% clay = 21.018

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
6.477	11.23	7.132	7.13	1.831	0.358

*** 95th percentile not reached ***

5th percentile = 4.601
16th percentile = 5.301
50th percentile = 6.477
84th percentile = 8.963
95th percentile = .

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F-183
VC-38-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704110
Station = VC-39
Depth (ft) = 0

Total sample weight = 30.086 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.078	0.259	0.259
2000.000	-1.00	0.022	0.073	0.332
1414.214	-0.50	0.034	0.113	0.445
1000.000	0.00	0.043	0.143	0.588
707.107	0.50	0.060	0.199	0.788
500.000	1.00	0.221	0.735	1.522
353.553	1.50	1.059	3.520	5.042
250.000	2.00	4.277	14.216	19.258
176.777	2.50	5.953	19.787	39.045
125.000	3.00	8.366	27.807	66.852
88.388	3.50	2.894	9.619	76.471
74.325	3.75	0.833	2.769	79.239
62.500	4.00	1.250	4.155	83.394
31.250	5.00	1.095	3.641	87.035
15.625	6.00	1.014	3.371	90.406
7.813	7.00	0.690	2.292	92.699
3.906	8.00	0.446	1.483	94.182
1.953	9.00	0.122	0.405	94.586
0.977	> 9.0	1.629	5.414	100.000

% < 4 phi = 16.606
% > 1 phi = 0.788
% gravel = 0.332
% sand = 83.062
% silt = 10.788
% clay = 5.818

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.697	154.21	3.026	122.78	1.140	0.288

*** 95th percentile not reached ***

5th percentile = 1.494
16th percentile = 1.885
50th percentile = 2.697
84th percentile = 4.166
95th percentile = .

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F-184
VC-39-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704111
Station = VC-39
Depth (ft) = 3

Total sample weight = 28.737 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.075	0.261	0.261
2000.000	-1.00	0.059	0.205	0.466
1414.214	-0.50	0.043	0.150	0.616
1000.000	0.00	0.028	0.097	0.713
707.107	0.50	0.098	0.341	1.054
500.000	1.00	0.178	0.619	1.674
353.553	1.50	0.576	2.004	3.678
250.000	2.00	0.973	3.386	7.064
176.777	2.50	3.185	11.083	18.147
125.000	3.00	5.104	17.761	35.908
88.388	3.50	1.657	5.766	41.674
74.325	3.75	0.443	1.542	43.216
62.500	4.00	0.774	2.693	45.909
31.250	5.00	3.570	12.423	58.333
15.625	6.00	2.191	7.623	65.956
7.813	7.00	2.678	9.318	75.274
3.906	8.00	2.150	7.482	82.756
1.953	9.00	1.379	4.800	87.556
0.977	> 9.0	3.576	12.444	100.000

% < 4 phi = 54.091
% > 1 phi = 1.054
% gravel = 0.466
% sand = 45.443
% silt = 36.847
% clay = 17.244

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
4.329	49.75	5.331	24.84	2.928	0.342

*** 95th percentile not reached ***

5th percentile = 1.695
16th percentile = 2.403
50th percentile = 4.329
84th percentile = 8.259
95th percentile = .

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F-185
VC-39-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704112
Station = VC-39
Depth (ft) = 6

Total sample weight = 30.189 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.000	0.000	0.000
2000.000	-1.00	0.006	0.020	0.020
1414.214	-0.50	0.005	0.017	0.036
1000.000	0.00	0.045	0.149	0.185
707.107	0.50	0.087	0.288	0.474
500.000	1.00	0.134	0.444	0.918
353.553	1.50	0.650	2.153	3.071
250.000	2.00	0.728	2.411	5.482
176.777	2.50	3.718	12.316	17.798
125.000	3.00	3.947	13.074	30.872
88.388	3.50	2.764	9.156	40.027
74.325	3.75	0.909	3.011	43.038
62.500	4.00	0.638	2.113	45.152
31.250	5.00	2.921	9.676	54.827
15.625	6.00	3.611	11.960	66.787
7.813	7.00	2.921	9.676	76.463
3.906	8.00	2.434	8.063	84.526
1.953	9.00	1.826	6.047	90.574
0.977	> 9.0	2.846	9.426	100.000

% < 4 phi = 54.848
% > 1 phi = 0.474
% gravel = 0.020
% sand = 45.132
% silt = 39.375
% clay = 15.474

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
4.501	44.16	5.181	27.57	2.754	0.247

*** 95th percentile not reached ***

5th percentile = 1.900
16th percentile = 2.427
50th percentile = 4.501
84th percentile = 7.935
95th percentile = .

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Carlsbad, CA 92008

F-186
VC-39-6

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704106A
Station = VC-40
Depth (ft) = 0

Total sample weight = 31.054 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.022	0.071	0.071
2000.000	-1.00	0.001	0.003	0.074
1414.214	-0.50	0.010	0.032	0.106
1000.000	0.00	0.012	0.039	0.145
707.107	0.50	0.013	0.042	0.187
500.000	1.00	0.157	0.506	0.692
353.553	1.50	0.141	0.454	1.146
250.000	2.00	5.115	16.471	17.617
176.777	2.50	7.263	23.388	41.005
125.000	3.00	11.040	35.551	76.556
88.388	3.50	3.174	10.221	86.777
74.325	3.75	1.123	3.616	90.393
62.500	4.00	0.381	1.227	91.620
31.250	5.00	0.771	2.482	94.102
15.625	6.00	0.568	1.829	95.931
7.813	7.00	0.325	1.045	96.976
3.906	8.00	0.243	0.784	97.760
1.953	9.00	0.162	0.523	98.283
0.977	> 9.0	0.533	1.717	100.000

% < 4 phi = 8.380
% > 1 phi = 0.187
% gravel = 0.074
% sand = 91.546
% silt = 6.140
% clay = 2.240

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.627	161.94	2.658	158.49	0.707	0.044

5th percentile = 1.617
16th percentile = 1.951
50th percentile = 2.627
84th percentile = 3.364
95th percentile = 5.491

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F-187
VC-40-0A

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704106B
Station = VC-40
Depth (ft) = 0

Total sample weight = 31.186 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.006	0.019	0.019
2000.000	-1.00	0.005	0.016	0.035
1414.214	-0.50	0.002	0.006	0.042
1000.000	0.00	0.008	0.026	0.067
707.107	0.50	0.013	0.042	0.109
500.000	1.00	0.135	0.433	0.542
353.553	1.50	2.708	8.683	9.225
250.000	2.00	2.877	9.225	18.450
176.777	2.50	10.366	33.239	51.689
125.000	3.00	8.830	28.314	80.003
88.388	3.50	2.870	9.203	89.206
74.325	3.75	1.130	3.623	92.829
62.500	4.00	0.202	0.648	93.477
31.250	5.00	0.284	0.911	94.387
15.625	6.00	0.730	2.342	96.729
7.813	7.00	0.162	0.520	97.249
3.906	8.00	0.081	0.260	97.509
1.953	9.00	0.162	0.520	98.030
0.977	> 9.0	0.614	1.970	100.000

% < 4 phi = 6.523
% > 1 phi = 0.109
% gravel = 0.035
% sand = 93.441
% silt = 4.033
% clay = 2.491

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.475	179.92	2.542	171.68	0.675	0.100

5th percentile = 1.257
16th percentile = 1.867
50th percentile = 2.475
84th percentile = 3.217
95th percentile = 5.262

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F-188
VC-40-0B

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704107
Station = VC-40
Depth (ft) = 3

Total sample weight = 24.794 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.006	0.024	0.024
2000.000	-1.00	0.211	0.851	0.875
1414.214	-0.50	0.026	0.105	0.980
1000.000	0.00	0.009	0.036	1.016
707.107	0.50	0.022	0.089	1.105
500.000	1.00	0.010	0.040	1.145
353.553	1.50	0.017	0.069	1.214
250.000	2.00	0.024	0.097	1.311
176.777	2.50	0.017	0.069	1.379
125.000	3.00	0.028	0.113	1.492
88.388	3.50	0.015	0.060	1.553
74.325	3.75	0.011	0.044	1.597
62.500	4.00	0.010	0.040	1.637
31.250	5.00	0.203	0.818	2.456
15.625	6.00	2.840	11.454	13.909
7.813	7.00	6.735	27.162	41.071
3.906	8.00	4.950	19.962	61.033
1.953	9.00	3.083	12.436	73.469
0.977	> 9.0	6.578	26.531	100.000

% < 4 phi = 98.363
% > 1 phi = 1.105
% gravel = 0.875
% sand = 0.762
% silt = 59.396
% clay = 38.967

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
7.447	5.73	7.887	4.22	1.810	0.243

*** 84th percentile extrapolated ***
*** 95th percentile not reached ***

5th percentile = 5.222
16th percentile = 6.077
50th percentile = 7.447
84th percentile = 9.697
95th percentile = .

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F-189
VC-40-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704109
Station = VC-41
Depth (ft) = 3

Total sample weight = 32.131 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.094	0.293	0.293
2000.000	-1.00	0.000	0.000	0.293
1414.214	-0.50	0.002	0.006	0.299
1000.000	0.00	0.001	0.003	0.302
707.107	0.50	0.029	0.090	0.392
500.000	1.00	0.213	0.663	1.055
353.553	1.50	2.392	7.444	8.500
250.000	2.00	4.399	13.691	22.190
176.777	2.50	14.993	46.662	68.852
125.000	3.00	6.749	21.004	89.856
88.388	3.50	1.852	5.764	95.620
74.325	3.75	0.106	0.330	95.950
62.500	4.00	0.200	0.622	96.573
31.250	5.00	0.446	1.389	97.961
15.625	6.00	0.081	0.253	98.214
7.813	7.00	0.041	0.126	98.340
3.906	8.00	0.081	0.253	98.593
1.953	9.00	0.122	0.379	98.972
0.977	> 9.0	0.330	1.028	100.000

% < 4 phi = 3.427
% > 1 phi = 0.392
% gravel = 0.293
% sand = 96.280
% silt = 2.020
% clay = 1.407

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.298	203.35	2.317	200.65	0.543	0.035

5th percentile = 1.265
16th percentile = 1.774
50th percentile = 2.298
84th percentile = 2.861
95th percentile = 3.446

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F-190
VC-41-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704105
Station = VC-42
Depth (ft) = 0

Total sample weight = 31.588 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.012	0.038	0.038
2000.000	-1.00	0.003	0.009	0.047
1414.214	-0.50	0.002	0.006	0.054
1000.000	0.00	0.022	0.070	0.123
707.107	0.50	0.051	0.161	0.285
500.000	1.00	0.187	0.592	0.877
353.553	1.50	2.496	7.902	8.779
250.000	2.00	2.241	7.095	15.873
176.777	2.50	7.472	23.655	39.528
125.000	3.00	11.474	36.324	75.852
88.388	3.50	3.465	10.969	86.822
74.325	3.75	0.941	2.979	89.801
62.500	4.00	0.173	0.548	90.349
31.250	5.00	1.055	3.339	93.688
15.625	6.00	0.325	1.027	94.715
7.813	7.00	0.325	1.027	95.743
3.906	8.00	0.081	0.257	96.000
1.953	9.00	0.162	0.514	96.514
0.977	> 9.0	1.101	3.486	100.000

% < 4 phi = 9.651
% > 1 phi = 0.285
% gravel = 0.047
% sand = 90.301
% silt = 5.651
% clay = 4.000

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.644	159.97	2.687	155.28	0.684	0.063

5th percentile = 1.261
16th percentile = 2.003
50th percentile = 2.644
84th percentile = 3.371
95th percentile = 6.277

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F-191
VC-42-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704103
Station = VC-43
Depth (ft) = 0

Total sample weight = 30.999 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.052	0.168	0.168
2000.000	-1.00	0.007	0.023	0.190
1414.214	-0.50	0.022	0.071	0.261
1000.000	0.00	0.017	0.055	0.316
707.107	0.50	0.049	0.158	0.474
500.000	1.00	0.248	0.800	1.274
353.553	1.50	2.955	9.532	10.807
250.000	2.00	2.405	7.758	18.565
176.777	2.50	5.776	18.633	37.197
125.000	3.00	9.687	31.249	68.446
88.388	3.50	4.033	13.010	81.456
74.325	3.75	0.416	1.342	82.798
62.500	4.00	1.229	3.965	86.763
31.250	5.00	0.933	3.010	89.773
15.625	6.00	0.893	2.879	92.652
7.813	7.00	0.527	1.701	94.353
3.906	8.00	0.284	0.916	95.270
1.953	9.00	0.081	0.262	95.531
0.977	> 9.0	1.385	4.469	100.000

% < 4 phi = 13.237
% > 1 phi = 0.474
% gravel = 0.190
% sand = 86.572
% silt = 8.507
% clay = 4.730

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.705	153.38	2.830	140.61	0.996	0.126

5th percentile = 1.195
16th percentile = 1.835
50th percentile = 2.705
84th percentile = 3.826
95th percentile = 7.706

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VC-43-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704104
Station = VC-43
Depth (ft) = 3

Total sample weight = 30.714 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.004	0.013	0.013
2000.000	-1.00	0.001	0.003	0.016
1414.214	-0.50	0.005	0.016	0.033
1000.000	0.00	0.004	0.013	0.046
707.107	0.50	0.005	0.016	0.062
500.000	1.00	0.006	0.020	0.081
353.553	1.50	0.042	0.137	0.218
250.000	2.00	0.389	1.267	1.485
176.777	2.50	2.721	8.859	10.344
125.000	3.00	9.659	31.448	41.791
88.388	3.50	9.996	32.545	74.336
74.325	3.75	2.864	9.325	83.661
62.500	4.00	2.700	8.791	92.452
31.250	5.00	1.136	3.698	96.150
15.625	6.00	0.162	0.528	96.679
7.813	7.00	0.243	0.793	97.471
3.906	8.00	0.325	1.057	98.528
1.953	9.00	0.122	0.396	98.924
0.977	> 9.0	0.330	1.076	100.000

% < 4 phi = 7.548
% > 1 phi = 0.062
% gravel = 0.016
% sand = 92.435
% silt = 6.076
% clay = 1.472

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
3.126	114.54	3.175	110.74	0.585	0.083

5th percentile = 2.198
16th percentile = 2.590
50th percentile = 3.126
84th percentile = 3.760
95th percentile = 4.689

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VC-43-3

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704102
Station = VC-44
Depth (ft) = 0

Total sample weight = 31.869 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.062	0.195	0.195
2000.000	-1.00	0.059	0.185	0.380
1414.214	-0.50	0.062	0.195	0.574
1000.000	0.00	0.062	0.195	0.769
707.107	0.50	0.053	0.166	0.935
500.000	1.00	0.232	0.728	1.663
353.553	1.50	1.492	4.682	6.345
250.000	2.00	4.927	15.460	21.805
176.777	2.50	6.683	20.970	42.775
125.000	3.00	11.262	35.339	78.114
88.388	3.50	3.845	12.065	90.179
74.325	3.75	0.527	1.654	91.833
62.500	4.00	0.325	1.020	92.852
31.250	5.00	0.527	1.655	94.507
15.625	6.00	0.162	0.509	95.017
7.813	7.00	0.081	0.255	95.271
3.906	8.00	0.284	0.891	96.162
1.953	9.00	0.446	1.400	97.563
0.977	> 9.0	0.777	2.437	100.000

% < 4 phi = 7.148
% > 1 phi = 0.935
% gravel = 0.380
% sand = 92.473
% silt = 3.310
% clay = 3.838

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.602	164.68	2.528	173.37	0.716	-0.104

5th percentile = 1.356
16th percentile = 1.812
50th percentile = 2.602
84th percentile = 3.244
95th percentile = 5.967

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F-194
VC-44-0

GRAIN SIZE DATA

Project: Queensgate (0704-003)

Sample Identification = 0704101
Station = VC-45
Depth (ft) = 0

Total sample weight = 31.414 grams

Microns	Phi	Weight	Percent	Cum. percent
2828.427	-1.50	0.046	0.146	0.146
2000.000	-1.00	0.026	0.083	0.229
1414.214	-0.50	0.027	0.086	0.315
1000.000	0.00	0.025	0.080	0.395
707.107	0.50	0.032	0.102	0.497
500.000	1.00	0.075	0.239	0.735
353.553	1.50	1.761	5.606	6.341
250.000	2.00	2.372	7.551	13.892
176.777	2.50	7.425	23.636	37.528
125.000	3.00	10.521	33.491	71.019
88.388	3.50	4.745	15.105	86.124
74.325	3.75	0.701	2.231	88.355
62.500	4.00	0.366	1.165	89.520
31.250	5.00	0.852	2.712	92.232
15.625	6.00	0.406	1.291	93.524
7.813	7.00	0.162	0.517	94.040
3.906	8.00	0.284	0.904	94.944
1.953	9.00	0.609	1.937	96.882
0.977	> 9.0	0.980	3.118	100.000

% < 4 phi = 10.480
% > 1 phi = 0.497
% gravel = 0.229
% sand = 89.291
% silt = 5.424
% clay = 5.056

Graphic Moments

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.686	155.37	2.737	149.98	0.693	0.074

5th percentile = 1.380
16th percentile = 2.045
50th percentile = 2.686
84th percentile = 3.430
95th percentile = 8.029

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VC-45-0