DIVISION OF WATER QUALITY

Certification for the Submittal of a Comprehensive Site Assessment

Responsible Party: WETSIG YACHTS
Contact Person: PAUL WETSIG
Address: 4022 MARKET STREET
City: WILMINGTON **State:** NC **Zip Code:** 28405
Site Name: WETSIG YACHT FACILITY
Address: 4022 MARKET STREET
City: WILMINGTON **State:** NC **Zip Code:** 28405
Groundwater Incident Number: 32039 **Site Priority Ranking:** -

I, JOANNE M. SHADROUI, P.G., a ~~Professional Engineer~~/Licensed Geologist (circle one) for CLARK ENVIRONMENTAL SERVICES, P.C. (firm or company of employment) do hereby certify that the information indicated below is enclosed as part of the required Comprehensive Site Assessment (CSA) and that to the best of my knowledge the data, assessments, conclusions, recommendations and other associated materials are correct, complete and accurate.

(Each item must be initialed by the certifying licensed professional)

1. _____ The source of the contamination has been identified. A list of all potential sources of the contamination is attached.

2. _____ Imminent hazards to public health and safety have been identified.

3. _____ Potential receptors and significant exposure pathways have been identified.

4. _____ Geological and hydrogeological features influencing the movement of groundwater have been identified. The chemical and physical character of the contaminants have been identified.

5. _____ The CSA sufficiently characterizes the cause, significance and extent of groundwater and soil contamination such that a Corrective Action Plan can be developed.

If any of the above statements have been altered or items not initialed, provide a detailed explanation. Failure to initial any item or to provide written justification for the lack thereof will result in immediate return of the CSA to the responsible party.

(Please Affix Seal and Signature)

COMPREHENSIVE SITE ASSESSMENT REPORT

FOR THE

WETSIG YACHTS FACILITY
4022 MARKET STREET
WILMINGTON, NORTH CAROLINA
NEW HANOVER COUNTY

LATITUDE: 34° 14' 20" North, LONGITUDE: 77° 53' 36" West
FACILITY ID NO.: NA

CES PROJECT NO. 02106

NOVEMBER 15, 2004

PREVIOUS PROPERTY OWNER:
WETSIG YACHTS
4022 MARKET STREET
WILMINGTON, NC
(910) 762-9703

CURRENT PROPERTY OWNER:
BRANCH BANKING AND TRUST COMPANY
COLLEGE ROAD
WILMINGTON, NC
(910) 313-2040

CONSULTANT:
CLARK ENVIRONMENTAL SERVICES, P.C.
POST OFFICE BOX 10136
WILMINGTON, NORTH CAROLINA 28404
(910) 602-3900

RELEASE INFORMATION: ON THE BASIS OF AVAILABLE INFORMATION, IT APPEARS THAT THE RELEASE OF ARSENIC AND CHROMIUM OCCURRED AS A RESULT OF THE LONGTIME, PREVIOUS OPERATION OF A FERTILIZER BAGGING PLANT ON THE SUBJECT PROPERTY.

PREPARED BY:

CLARK ENVIRONMENTAL SERVICES, P.C.
POST OFFICE BOX 10136
WILMINGTON, NORTH CAROLINA 28404
(910) 602-3900

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EXECUTIVE SUMMARY

The purpose of this report is to transmit Comprehensive Site Assessment (CSA) information pursuant to Title 15A of the North Carolina Administrative Code, Chapter 2, Subchapter 2L (15A NCAC 2L), Section .0106. The dissemination of data in this report was authorized by Mr. Sonny Wall, of Branch Banking and Trust Company, Inc., lien holder of the property. The subject facility is located at 4022 Market Street, Wilmington, North Carolina in New Hanover County. From circa 1900 to 1980, the site operated as a fertilizer bagging plant. Thereafter, a garden center and numerous mechanical repair operations existed at the site, in addition to the primary occupant, Wetsig Yachts, a fiberglass boat building facility. On the basis of available information, the investigations have determined that the compounds detected in subsurface media at the site are in association with prior operations at the former fertilizer facility.

During the current study, one water supply well, utilized for irrigation, was observed approximately 500 feet upgradient of the site. The subject site, as well as the nearby surrounding properties, are serviced by the city of Wilmington municipal water and sanitary sewer. The nearest surface water is a stormwater retention pond, located approximately 200 feet upgradient, and shallow storm ditches, located about 100 feet southeast of the site. At the time of this investigation, a designated wellhead protection area, as defined in 42 USC 300h-7(e), reportedly, does not exist within 1,500 feet of the source area. Municipal water supplies are drawn from the Cape Fear River, at an intake point several miles upgradient of Wilmington. The subject facility, which itself could be classified as light industrial, is located in an area generally characterized as commercial.

Soil sampling activities performed to date document the presence of arsenic and chromium at levels which exceed regulatory thresholds. It is notable, however, that the chromium levels detected at several borings only slightly exceed the North Carolina Division of Water Quality (NCDWQ) Soil-to-Groundwater Cleanup Levels. In addition, the arsenic levels detected at several borings also only slightly exceed the NCDWM Inactive Hazardous Sites Branch (IHSB) Soil Remediation Goals (RGs).

In total, twelve shallow and two deep monitoring wells have been installed, surveyed and sampled at the site. Groundwater sampling activities performed to date document the presence of solute arsenic at levels which exceed the 15A NCAC 2L standards. The contamination appears to be isolated to an area just behind the former main fertilizer plant building, parallel to the loading ramp and railroad spur. On the basis of available information, it appears that both the horizontal and vertical extent of the arsenic contamination have been delineated.

Water level measurements indicate that the shallow groundwater at the site occurs between 3 and 12 feet below ground surface (BGS). Groundwater measurements taken during this assessment indicate that horizontal groundwater flow is to the southwest, and that there does not appear to be a significant head potential for downward plume migration. Data retrieved as a result of pumping tests performed in the surficial aquifer was used to calculate an average hydraulic conductivity of 0.0472 ft/day for the shallow zone and 3.658 ft/day for the deeper zone. In addition, the average velocity was calculated to be 8.77×10^{-4} ft/day for the shallow zone and 0.089 ft/day for the deeper zone.

In conclusion, the findings of this assessment suggest that, based on current site conditions, contamination appears to be of limited extent and likely poses no significant threats to nearby potential receptors. Specific factors supporting this conclusion include the fact that there are no nearby water supply wells and all surrounding areas are served by municipal water supplies, and there are no nearby utility lines or buried receptors believed to be at risk of impact. In addition, the nearby pond is upgradient and the nearby downgradient ditch is very shallow and likely does not intersect the static water table. Further, the soil and dissolved contaminant plumes are delineated on-site; the fertilizer bagging operation is no longer in operation; and, all remaining secondary source areas appear to be characterized by dilute contaminant concentrations.

Upon review of all available information, it is recommended that a *Corrective Action Plan* be submitted for this site which will outline leaving soils undisturbed to naturally bioremediate in-situ; and to allow natural dissolution and remediation of groundwater, to be monitored via periodic monitoring and receptor checks.

COMPREHENSIVE SITE ASSESSMENT REPORT

FOR THE

WETSIG YACHTS FACILITY
WILMINGTON, NORTH CAROLINA

CES PROJECT NO. 02106

NOVEMBER 15, 2004

Clark Environmental Services, P.C. (CES) prepared the following *Comprehensive Site Assessment* (CSA) Report on behalf of Branch Banking and Trust Company, Inc. (BB&T), lien holder of the property, and with authorization from Mr. Paul Wetsig, current business owner. This report has been prepared pursuant to applicable sections of Title 15A, North Carolina Administrative Code, Chapter 2, Subchapter 2L (15A NCAC 2L), and in accordance with the North Carolina Department of Environment and Natural Resources (NCDENR), Division of Water Quality (DWQ), *Groundwater Section Guidelines for the Investigation and Remediation of Soil and Groundwater, Volume I*, July 2000.

1.0 SITE HISTORY AND SOURCE CHARACTERIZATION:

1.1 SITE HISTORY:

The Wetsig Yachts facility is located at 4022 Market Street, Wilmington, North Carolina in New Hanover County. The facility has a long history of fertilizer manufacturing operations dating back to at least 1900 through the early 1980s. Subsequently, a garden center and a number of mechanical repair facilities and boat building facilities have operated at the site. **Figure 1** is a topographic vicinity map, **Figure 2** is a site map showing current structures, sampling locations and other pertinent features, and **Figure 3** is a tax map based on a recent aerial photograph (2002) which depicts approximate current information.

Several previous reports have been prepared and submitted to relevant regulatory agencies for review and technical oversight. These reports include:

A) *Phase I Environmental Site Assessment Report*, August 21, 2002 (CES). In summary, the three most significant findings warranting further inquiry were: the long-term operation of fertilizer manufacturing operations and the potential impacts caused by these operations; the prior operation of a small diesel underground storage tank (UST) and potential impacts caused by possible leakage of fuel; and, the localized presence of "oily stained soils", particularly in the area of the Marine Mechanix boat repair operation. It was recommended that a Phase II subsurface investigation be performed to address these three issues.

B) Phase II Environmental Site Assessment Report, December 2, 2002 (CES). The Phase II investigation consisted of the advancement and sampling of 16 soil borings and the installation, surveying and sampling of five monitoring wells. The soil and groundwater analyses varied so as to target select areas for the presence of suspect fugitive materials including volatile organic compounds, semi-volatile organic compounds, pesticides, herbicides, total petroleum hydrocarbons, eight metals, nitrates, and asbestos. The metals which were detected at trace amounts in soils appear to have a general site-wide distribution, and the concentrations for two of these metals, arsenic and chromium, exceed NCDENR, Division of Waste Management (DWM), Superfund Section, Inactive Hazardous Sites Branch (IHSB), Soil Remediation Goals for Unrestricted Land Use (arsenic), and NCDENR, DWQ, Soil-to-Groundwater Cleanup Levels (chromium). Minor concentrations of total petroleum hydrocarbon were present in the former UST area. Also, chrysotile asbestos was detected in soils at relatively low levels.

Arsenic was identified in the groundwater sample from one well (MW3) at a concentration which exceeds the 15A NCAC 2L standard. A copy of the Phase II report was submitted to the following regulatory agencies, and responses were received from each agency.

- Dr. Charles Stehman, P.G., Environmental Regional Supervisor I, NCDENR, DWQ, Groundwater Section, 127 Cardinal Drive Extension, Wilmington, North Carolina 28405; telephone (910) 395-3900.
- Ms. Charlotte Jesneck, Head, NCDENR, DWM, Superfund Section, Inactive Hazardous Sites Branch (IHSB), 401 Oberlin Road, Suite 150, Raleigh, North Carolina 27605; telephone (919) 733-2801, extension 284.
- Mr. David Holsinger, Regional Supervisor, NCDENR, DWM, Underground Storage Tank Section, 127 Cardinal Drive Extension, Wilmington, North Carolina 28405; telephone (910) 395-3900.

CES addressed all requests for further investigations as described below:

C) *Soils and Groundwater Issues*, dated June 17, 2003 (CES letter report submitted to Mr. John Powers, Superfund Section). The requested additional soil sampling for metals in multiple areas did not detect further exceedences of respective standards. The requested re-sampling of one monitoring well revealed the persistent presence of solute arsenic above 15A NCAC 2L standards.

D) *Phase I Limited Site Assessment Report*, July 31, 2003 (CES report submitted to Mr. David Holsinger, UST Section). This report, which was prepared to meet the requirements of the UST Section-issued Notice of Regulatory Requirements, documented that, in the former UST area, no target compounds were detected in soils above Soil-to-Groundwater Maximum Soil Contaminant Concentrations (MSCCs) for any compounds in soils, nor above the 15A NCAC 2L standards for groundwater.

E) *Asbestos Findings*, August 6, 2003 (CES letter report submitted to Ms. Pat Wylie, Division of Public Health, Health Hazards Control Unit, Section of Human Ecology and Epidemiology). On the basis of soil sampling and suspect material sampling performed by the certified asbestos inspector: a) asbestos was not confirmed to be present in the soil at the site; b) some non-friable particles (pieces of mastic), some of which contain chrysotile asbestos, were identified; and, c) the building does have, in some areas, transite roof and siding panels which contain chrysotile asbestos.

In the event that the soils at the site are to be disturbed, it appears that a minor amount of asbestos containing material (i.e., fragment construction debris) may be encountered; however, the identified substance is bound and is not friable. In the event that the main building is to be demolished, a competent contractor will need to address the proper removal and disposal of the transite building materials.

F) *Groundwater Issues*, dated October 20, 2003 (CES letter report submitted to Mr. John Powers, Superfund Section). At both newly installed monitoring wells, arsenic was detected at concentrations in excess of the 15A NCAC 2L standards. The horizontal and vertical extents remained undefined.

G) *Groundwater Issues*, dated December 5, 2003 (CES copy of above letter report submitted to Dr. Charles Stehman) at the Wilmington Regional Office, Groundwater Section).

The only documented, outstanding regulatory issue pertains to the presence of elevated levels of arsenic in groundwater and the presence of exceedences of regulatory thresholds for arsenic and chromium in soils. The site is being regulated by the NCDENR Wilmington Regional Office, Groundwater Section, as described in a letter from the Superfund Section, dated November 14, 2003 (**Appendix I**).

1.2 SOURCE CHARACTERIZATION:

On the basis of available information and the distribution of contaminants identified to date, it has been concluded that, whether by fertilizer products, railroad ties, or a combination thereof, the linear source pattern of contamination appears to be consistent with the physical location of the loading areas and rail spur.

2.0 METHODS OF INVESTIGATION:

The extent of soil and groundwater contamination has been assessed during various investigations performed at the site. In summary, the work performed to date includes the advancement and sampling of thirty soil borings (SB1-SB29, MW5), and the installation and sampling of twelve shallow monitoring wells (MW1- MW12) and two deep wells (DMW1 and DMW2). Aquifer properties were characterized through surveying, well measurements and short-term pumping tests. A preliminary exposure assessment was conducted utilizing existing field information, receptor and utility surveys, and laboratory analytical data.

Appendix I contains relevant regulatory correspondence. **Appendix II** contains Standard Methods. **Appendix III** contains boring logs, well construction records, and as-built well details. Laboratory results and chain of custody forms for soil samples are contained in **Appendix IV**. **Appendix V** contains sampling records, laboratory results and chain of custody forms for groundwater samples. Aquifer test evaluations are included in **Appendix VI**. Material Safety Data Sheets are found in **Appendix VII**, and references are included in **Appendix VIII**.

3.0 RECEPTOR INFORMATION:

3.1 WATER SUPPLY WELLS:

All potable water for the site and surrounding properties is supplied by the city of Wilmington Public Utilities Department. On the basis of a visual survey for water meters and pump houses, one private irrigation water supply well was identified to be present approximately 500 feet upgradient to the subject property (**Figure 3**).

3.2 PUBLIC WATER SUPPLIES:

The residences and businesses in proximity to the subject facility utilize municipal water supplies. The city of Wilmington obtains its public water supply from the Cape Fear River, at an intake located approximately 20 miles upstream from Wilmington.

3.3 WELLHEAD PROTECTION AREAS:

At the time of this assessment, a designated wellhead protection area, as defined in 42 USC 300h-7(e), is not reported to exist within 1,500 feet of the source area. According to municipal authorities, a wellhead protection area program is not planned for implementation by New Hanover County because the city intends to solely utilize surface water as its water source.

3.4 SURFACE WATER BODIES:

There are no surface water bodies at the subject property. A shallow storm ditch is positioned near the southeast corner of the subject property (**Figure 2**). The nearest surface water body is a stormwater retention pond, located approximately 200 feet upgradient with respect to the subject property (**Figure 3**).

3.5 SUBSURFACE STRUCTURES:

Currently, the site utilizes municipal water and sanitary sewer service. Reportedly, there are two water lines servicing the site. A 6-inch water line exists in front of the building, on the south side of the railroad track, that is connected to a water main along Kerr Avenue (**Figure 2**). In addition, reportedly, the site's main water line

extends from Market Street, along Wetsig's entrance road, and bifurcates near the entrance to the property. Other small, on-site lines are known to be present. It is known that subsurface power and telephone lines extend along the site's entrance road and are present in various locations at the site, particularly between the buildings.

A storm drain pipe was observed to extend under the northern railroad track near the northwest corner of the subject site, and to drain in a southeastward direction. In addition, a storm drain pipe was observed to extend under the northern railroad track in front of the main building. Off-site, the west side of Wetsig Road consists of a very swampy, wet area. Evidence of a possible outfall area, indicated by stained vegetation, was visible at the tracks, but no outfall pipe was observed. The pipe extends under the east edge of the Wetsig building, and drains southeastwardly under the southern railroad track. There are no known basins or water bodies at the site.

3.6 LAND USE:

The area within a 1,500-foot radius of the subject facility includes undeveloped, commercial and a few residential properties. The tax map depicted on **Figure 3** shows the subject property and properties in the immediate area of the site.

3.7 ADJACENT PROPERTY OWNERS AND OCCUPANTS:

The names and addresses of property owners adjacent to the source area have been tabulated and are presented in **Table 1**.

3.8 DEEP AQUIFERS IN THE ATLANTIC COASTAL PLAIN PROVINCE **(Appendix VIII):**

There are five deep aquifers in the New Hanover County region. They are the Lower Cape Fear, the Upper Cape Fear, the Black Creek, the Peedee, and the Castle Hayne Aquifers.

The Cretaceous Lower Cape Fear Formation consists of interlayered sandstone and sandy mudstone. The Lower Cape Fear Aquifer across New Hanover County is approximately 129 to 156 feet thick and the overlying confining unit consists of 57 to 68 feet of impermeable material. The top of the Lower Cape Fear Aquifer occurs at depths ranging between 930 to 1,015 feet deep in New Hanover County (Winner, M. D., and Coble, R. W., U.S. Geological Survey Professional Paper 1404-I, 1996).

The Cretaceous Upper Cape Fear Formation also consists of interlayered sandstone and sandy mudstone and is believed to be deltaic in origin. The Upper Cape Fear Aquifer across New Hanover County is approximately 151 to 155 feet thick and the overlying confining unit consists of 53 to 65 feet of impermeable material. The top of the Upper Cape Fear Aquifer occurs at depths of about 720 to 795 feet deep

(Winner and Coble, 1996). The depositional environment of the Late Cretaceous Black Creek Formation is interpreted to be lagoonal, to deltaic, to marine, and consists of thinly laminated gray to black sands, interlayered with gray to tan sands. The Black Creek Aquifer across New Hanover County is approximately 190 to 212 feet thick, and the overlying confining unit consists of 88 to 96 feet of clay, silty clay and sandy clay units. The top of the Black Creek Aquifer occurs at depths of about 455 to 540 feet (Winner and Coble, 1996).

The depositional environment of the disconformably overlying Late Cretaceous Peedee Formation is interpreted to be mostly cyclic marine shelf deposits, and it is composed of water-bearing beds of sand and massive black clay interbedded with consolidated calcareous sandstone and impure limestone. In some areas, the upper part of the Peedee Formation contains a fresh water aquifer, consisting chiefly of a quartz sand layer, indurated with calcareous cement, and in other areas of the county, this sand layer was eroded prior to deposition of the Castle Hayne Formation. The water in this zone is under artesian pressure throughout most of New Hanover County. The quality of water in this zone makes it acceptable for most uses (Bain, George L., Geology and Ground-Water Resources of New Hanover County, 1970). The Peedee Aquifer in New Hanover County ranges from about 239 to 304 feet thick. The overlying Peedee confining unit is about 14 feet thick and is composed of clay, silty clay and sandy clay. The top of the Peedee Aquifer occurs at depths of about 128 to 140 feet deep (Winner and Coble, 1996).

Overlying the Peedee Formation is the Eocene Castle Hayne Formation, which consists mostly of limestone, and is productive throughout most of New Hanover County. In most areas of the county, the limestone thickens in a southeasterly direction and is predominantly composed of sandy, shelly, fossiliferous limestone with a generally light color. In general, the limestone of the Castle Hayne Formation is permeable; however, it does contain beds of highly impermeable marl and dense limestone. In the southern part of the county, the Castle Hayne Limestone is overlain by a porous coquina sandstone that is probably of Miocene age. Some wells draw fresh water from within this sandstone layer (Bain, 1970). The Castle Hayne Aquifer in New Hanover County averages about 52 feet thick. The overlying Castle Hayne confining unit is about 12 feet thick. The top of the Castle Hayne Aquifer occurs at depths of about 62 feet deep (Winner and Coble, 1996).

According to LeGrande (1960), in areas west and northwest of Wilmington, the limestone is absent, but in most of the County, the limestone is present and thickens in a southeasterly direction, as stated above. The thickness of the Castle Hayne Limestone is variable and typically less than 50 feet; however, in some areas of southern New Hanover County, the limestone can be more than 100 feet thick.

Water level elevations in the Castle Hayne limestone are highest in interstream areas, and lowest in discharge areas along major stream valleys. This indicates that the aquifer is probably recharged locally. The surficial sands that overlie most of the

limestone readily allow the infiltration of precipitation. The water from the Castle Hayne Formation is generally acceptable for most uses (Bain, 1970).

No serious difficulty has been encountered in developing a water supply from wells in New Hanover County. The water table is generally within 20 feet of the surface, and the surficial sands are permeable enough to insure an adequate supply of water for general domestic use from well points. The surficial sands that cover most of New Hanover County typically contain water of a high enough quality to be used in many domestic applications (Bain, 1970). Many driven wells of less than 25 feet in depth exist throughout the county. Water from these sands is typically soft and low in mineral content. The water in the Peedee and Black Creek Formations is high in calcium bicarbonate and has a hardness of generally less than 150 ppm. The total iron content generally averages less than 0.3 ppm (Bain, 1970).

Analyses of water from the Castle Hayne limestone suggests that the water is similar in chemical character to that of the Peedee and Black Creek. Water in the surficial deposits contains free carbon dioxide, rendering it slightly corrosive. Water containing 250 ppm of chloride is not present at a depth of less than 230 feet anywhere in the county (Winner and Coble, 1996).

4.0 REGIONAL GEOLOGY AND HYDROGEOLOGY (Appendix VIII):

In general, the subsurface of the Atlantic Coastal Plain consists of a series of eastward dipping sedimentary beds ranging in age from Cretaceous to Tertiary (in ascending order). These series of sediments non-conformably overlay a Pre-Cambrian and Cambrian basement complex. The basement complex consists of metamorphic rocks (schist, gneiss, quartzite, etc.) and intrusive volcanic rocks (granites). These rocks are typical of those outcropping in the Piedmont province (Winner and Coble, 1996).

The Cretaceous age sediments of the Atlantic Coastal Plain province, overlying the basement complex, are comprised of the Cape Fear Formation, the Black Creek Formation, and the Peedee Formation, in ascending order, which are subsequently overlain by younger strata. The Cape Fear Formation generally consists of alternating beds of sand and clay and is unconformably overlain by the Black Creek Formation, which consists of carbonaceous, glauconitic sands interbedded with black plastic clays and thin impure limestone lenses (Winner and Coble, 1996). The conformably overlying Peedee Formation consists of dark clays interbedded with dark green and gray fine to medium sands with a few thin limestone beds (Bain, 1970).

The Upper Peedee Formation, marking the boundary for the Late Cretaceous, is unconformably overlain by the Castle Hayne Formation of Eocene age. The Castle Hayne Formation is composed primarily of limestone and sand with minor amounts of clay. Limestone is dominant in the upper one third to one half of the Castle Hayne Formation, and sand is the primary constituent of the lower half of the formation. In the southern part of New Hanover County, Oligocene or Miocene age sediments, including a sandy coquina,

overlie the Castle Hayne (Bain, 1970). Generally, undifferentiated sandy surficial deposits overlie the Castle Hayne Formation across the region (Winner and Coble, 1996).

The names of the North Carolina aquifers are generally taken from the predominant geologic formation with which the aquifer is associated. The lithology of each formation is significant with respect to the manner in which it will influence aquifer properties. Varying lithologies will have a direct affect on groundwater quality and movement (e.g., groundwater chemistry, recharge, groundwater velocity, hydraulic conductivity, transmissivity, storage capacity, vertical movement of groundwater, etc.) (Winner and Coble, 1996). Formations capable of yielding water of good quality (potable water) are those not older than the Late Cretaceous. The deeper, older formations generally contain water too salty for potable use (Bain, 1970).

The potable water aquifers lying within late Cretaceous and younger sediments, discussed herein in Section 3.8, are generally comprised of limestone (i.e., Castle Hayne Limestone) and imperfectly connected sand beds. Confining units are also present, which separate the major aquifers. These confining units consist of clay beds or groups of clay beds and silt with varying amounts of sand, which tend to retard the vertical movement of groundwater, thus separating the aquifers (Winner and Coble, 1996).

5.0 SITE GEOLOGY AND HYDROGEOLOGY:

5.1 PROJECT SPECIFIC SUBSURFACE CHARACTERISTICS:

5.1.1 Description of Shallow Subsurface Geology:

The site is located in the easternmost portion of the Atlantic Coastal Plain Physiographic Province. The Geologic Map of North Carolina shows that the site is underlain by the undivided Tertiary Eocene Comfort Member (fossiliferous limestone) or New Hanover Member (phosphate pebble conglomerate) of the Castle Hayne Formation. According to Map 15 of the 1977 "Soil Survey of New Hanover County", the property is located on Seagate Fine Sand. The Seagate soil is mostly level, and characterized as being somewhat poorly drained, rapidly permeable, and has a near surface seasonal high water table. The soil group does include small areas of Onslow or Leon Soil.

During drilling for the monitoring well installations, the subsurface soils were generally consistent across the site. The borings typically contained light brown, very fine sandy silt (0-5 feet); light grey fine sand (5-8 feet); and light grey slightly clayey fine sand (8-12 feet). In the two deeper wells, the fine sands extended to considerable depths: at DMW1, a layer of shell hash and sandy clay were encountered at 32 feet, and at DMW2, a layer of shell hash and clayey sand were encountered at about 42 feet. The boring logs for shallow wells and the two deep wells installed during the current investigation are enclosed in **Appendix III**.

On the basis of these lithologies and available information derived from published geologic literature (i.e., Winner and Coble, 1996 and Bain, 1970), the shelly material encountered at 30 to 40 feet is believed to represent the erosional surface of the Castle Hayne Limestone.

5.1.2 Groundwater Occurrence:

Depth to water measurements were collected on several occasions during the field assessment activities. Water levels in the shallow monitoring wells generally ranged from approximately 3 to 12 feet BGS. All water level elevations are relative to an assumed 100 foot benchmark. In the two deep wells (DMW1 and DMW2), the depth to groundwater was similarly shallow but slightly lower in elevation. A summary of well construction and water level data is presented in **Table 2**.

5.1.3 Groundwater Flow Direction:

The Wilmington Quadrangle map (7.5 minute series topographic map, U.S. Geological Survey (USGS) 1993) indicates the subject facility is located near a topographic high, upgradient to unnamed tributaries to Burnt Mill Creek, located to the south. The groundwater flow direction in the surficial aquifer is depicted on potentiometric surface elevation contour maps presented on **Figures 4** and **5**. Based on the information provided on **Figure 5**, the hydraulic gradient has been calculated to be approximately 0.0063 feet per feet (ft/ft) for the shallow zone and 0.0091 ft/ft for the deeper zone, dipping to the southwest **(Appendix VI)**.

5.1.4 Vertical Movement:

The most recent static water level elevations in paired shallow and deep wells were compared: shallow monitoring well MW7 and the adjacent deep monitoring well DMW1, and shallow monitoring wells MW12 and DMW2. The static water level elevation in the shallow wells were slightly higher than the water levels in the deeper wells. This data suggests that a slight head potential for downward flow exists between the shallow subsurface and deeper underlying strata. As no vertical hydraulic conductivity measurements were performed, no conclusions are drawn regarding vertical groundwater flow.

5.1.5 Effects of Subsurface Structures on Local Hydrogeology:

The effects of subsurface structures on the local hydrology are expected to be minimal. Particular site features include the shallow stormwater drainage lines which extend under the building and discharge into shallow swales along the south side of the railroad track, as discussed above in Section 3.5. Whereas these features appear to be too shallow to intersect the static water table, a review of the topographic map of the area does depict shallow

drainage features to the southwest, which ultimately flow into Burnt Mill Creek. Thus, it is believed that regional flow is to the southwest.

6.0 SOIL INVESTIGATION AND SAMPLING RESULTS:

6.1 HORIZONTAL EXTENT:

Borings were advanced using a hand auger or drill rig, continuously logged and screened for soil characteristics, and observed for evidence of visible impact. Soil samples were collected at target depths based on field observations of the composition and texture of the soil column. The soil samples were analyzed by various laboratory methods, as described below, based on the most likely suspect contaminants for each area. The target compounds generally include federally listed hazardous constituents. **Table 3** includes a summary of soil sampling results. Boring logs are enclosed in **Appendix III** and **Appendix IV** contains the laboratory results for those samples. **Figure 6** depicts the estimated horizontal extent of soil contamination in excess of applicable North Carolina standards based on the sampling results, and the respective source areas denoted with reference to the buildings.

Building D - Former Fuel Oil Tank/Boiler Building: The area was probed to search for evidence of petroleum and possible UST locations. CES personnel advanced several borings and procured one composite sample (SB10) from this area which was analyzed for total petroleum hydrocarbons (TPH). The soils were sampled at a depth of 4-5 feet. The laboratory results revealed high boiling point diesel range TPH at a level (13 mg/kg) which exceeds the NCDENR, DWM, UST Section regulatory Action Level (10 mg/kg). A UST Section mandated, follow-up LSA investigation was conducted and further sampling did not detect the presence of petroleum compounds in soils in that area, nor in groundwater.

Building F - Marine Mechanix Building: One boring was advanced and sampled in the immediate vicinity of the primary work area of the current operating business. The soil sample (SB12) was analyzed for TPH at a depth of 0-2 feet. The laboratory results revealed diesel range TPH; however, the detection (28 mg/kg) did not exceed the NCDENR, DWQ, Groundwater Section regulatory Action Level (40 mg/kg). The SB12 sample also contained the asbestos mineral chrysotile.

Inert Debris Landfill Area - Southwest Corner: The area consists of a hummocky ground surface, reportedly overlying multiple buried piles of concrete and brick debris. A total of six borings were sampled at various depths; SB13 (4-6 ft), SB14 (3-6 ft), SB15 (0-3 ft), SB23 (1-2.5 ft), SB26 (1-3 ft), and SB27 (2-4 ft). The samples were analyzed for eight RCRA metals plus copper, nickel and asbestos.

The laboratory results for each of the samples revealed detections of numerous target metals; however, only four borings contained levels of a metal which represent exceedences. Arsenic results for SB13 (6.48 mg/kg) and SB15 (5.4 mg/kg) revealed

slight exceedences of the NCDWM Soil RG (4.4 mg/kg). The results for chromium at SB13 (28.4 mg/kg), SB14 (27.6 mg/kg), SB15 (32.8 mg/kg) and SB26 (28.1 mg/kg) slightly exceeded the NCDENR, DWQ Soil-to-Groundwater Cleanup Level of 27 mg/kg (see **Figure 6**).

Building A - Loading Dock Areas: The areas parallel to the former fertilizer plant building are gently sloped toward the existing railroad track and it is known that a railroad spur previously existed immediately behind the loading docks and Building A. Multiple borings were advanced along this feature and these include: SB2 (1-2 ft), SB3 (1.5-3.5 ft), SB4 (2-3 ft), SB5 (1-3 ft), SB6 (1-2 ft), and SB25 (1-3 feet). Two samples were found to contain elevated levels of arsenic: SB2 arsenic, 5.51 mg/kg; SB25 arsenic, 4.79 mg/kg, both of which slightly exceed the arsenic Soil RG of 4.4 mg/kg. One boring in front of Building A contained a slight exceedence of the arsenic Soil RG: SB29 (3-5 ft), contained 4.49 mg/kg.

6.2 VERTICAL EXTENT:

The depth to groundwater exists at approximately 3-4 feet below ground level; thus the extent of soil contamination is physically defined by the elevation of the static water table.

7.0 GROUNDWATER SAMPLING RESULTS:

7.1 HORIZONTAL EXTENT:

Shallow monitoring wells (MW1-MW5) were initially installed to target potential source areas and subsequent wells were installed to delineate documented contaminants in groundwater. Initial laboratory analyses detected arsenic in samples from MW1, MW2 and MW3, at levels above groundwater standards. In order to evaluate possible falsely elevated concentrations due to turbidity, the three wells were re-sampled collecting filtered and non-filtered samples for comparison. The previously detected arsenic concentrations at MW1 and MW2 were not detected in the non-filtered or filtered samples. At MW3, arsenic (originally detected at 78.6 μg/L) was detected in both the non-filtered (34.4 μg/L) and filtered (37.9 μg/L) samples taken in November 2002, and in the April 2003 filtered sample (34.4 μg/L), at levels in excess of the 15A NCAC 2L standard (10 μg/L). Based on the results, it appears that the detected arsenic likely represents dissolved arsenic.

Additional shallow monitoring wells were installed in order to delineate the documented contaminants. Monitoring wells MW6 and MW7 were installed and sampled via field-filtering procedures and yielded elevated levels of arsenic; thus, additional wells MW8-10, and downgradient wells MW11 and MW12, were installed to complete delineation. The wells were sampled for metals using both field filtered and non-filtered protocols. None of the follow-up delineation well samples contained arsenic. **Table 4** summarizes the laboratory analyses for all groundwater samples, and **Table 5** contains the field parameter data which was measured at various times. **Figure 7** depicts the estimated horizontal extent of dissolved arsenic above 15A NCAC 2L standards.

7.2 VERTICAL EXTENT:

In order to determine whether the solute arsenic plume may have migrated off-site through advection within the surficial or deeper aquifer, two deep wells were installed and sampled using the field-filtered/non-filtered protocols. The source area deep well, DMW1 (paired with shallow well MW7), is screened from 22 to 32 feet. The off-site, downgradient deep well DMW2 (paired with shallow well MW12), is screened from 33.5 to 43.5 feet. The analytical results indicate that neither of the samples contained arsenic. **Figure 8** depicts the location of hydrogeologic cross-sections and **Figures 9** and **10** display the vertical and horizontal extents of soil and groundwater contamination.

8.0 FREE PRODUCT INVESTIGATION:

No free product was detected in any monitoring well.

9.0 HYDROGEOLOGIC EVALUATION AND AQUIFER PROPERTIES:

In order to characterize hydrogeologic properties of the shallow aquifer, short-term pumping and recovery tests were performed in shallow monitoring wells MW7 and MW9, and deeper well DMW1. Tests were conducted to obtain a reasonable estimate for hydraulic conductivity (using Bouwer and Rice Method) and groundwater velocity. The tests were performed by pumping water from each well for a period until drawdown stabilized. Drawdown was measured, as was the recovery period, after the pump was cut off, using a Hermit data logger. The data was downloaded and evaluated to obtain estimates for aquifer characteristics.

The average hydraulic conductivity for the shallow aquifer was calculated to be 0.0472 ft/day and 3.658 ft/day for the deeper zone. The average velocity was calculated to be 8.77×10^{-4} ft/day for the shallow zone and 0.089 ft/day for the deeper zone. An effective porosity of 0.40 was assumed for both zones based on a silty sand water zone. Aquifer test evaluations and calculations are included in **Appendix VI**.

10.0 DISCUSSION:

The following presents a discussion of the nature and extent of contamination, as well as the harmful effects to human life and other environmental receptors, based on information collected to date. The information presented is limited to findings made during this study and draws heavily upon extrapolations and assumptions which are based upon varying degrees of confidence. Therefore, while it is useful to employ such information for various purposes, it is not intended that this information be utilized to represent a complete knowledge of conditions or possible scenarios which may be best understood through long-term monitoring. Therefore, the scope of this exposure assessment is purposely narrow and summarized.

The findings of this investigation present a scenario where residual arsenic and chromium have apparently been released into the shallow soils of the site, and solute arsenic has been released into shallow groundwater in a Coastal Plain hydrogeological environment. These materials are believed to have been released on-site in association with past fertilizer bagging operations, and remain as remnant indicators of these past activities. "Arsenic is a semi-metallic element or metalloid that exists in several forms. Arsenic compounds, mainly As_2O_3, can be recovered as byproduct from the processing of complex ores. Arsenic occurs naturally in a wide variety of mineral forms, including arsenopyrite ($FeAsS_4$), which is the main commercial ore of As worldwide". "Chromium is a lustrous, silver-gray metal. It is one of the less common elements in the earth's crust and occurs only in compounds. It is mined as a primary product and generally not recovered as a byproduct." (Ma, Carl and John Kingscott, 1997).

The composition of the subject contamination consists of detectable levels of arsenic and chromium in soil, and arsenic in groundwater. These compounds have been the subject of toxicological studies. Arsenic and certain arsenic compounds, and chromium and certain chromium compounds, have both been identified by the United States Environmental Protection Agency (EPA) as carcinogens. **Appendix VII** contains published material safety data sheets for arsenic and chromium.

Arsenic: "Drinking water arsenic exposure is clearly linked to cancer occurrence in highly exposed populations; however, the effects at "environmental" levels remains unclear. The potential carcinogenic effects of arsenic levels between 1-50 μg/L remain controversial." (Karagas, Margaret R., 2001), and "concentrations are variable through time, thus complicating estimates of exposure. Studies examining single bedrock wells show varying concentrations, commonly less than 50 μg/L." (Ayotte, Joseph D., 2001).

"The chemical cycling and ultimate transport of arsenic within the groundwater aquifer is controlled by the biogeochemical cycling of iron, sulfur and carbon. Knowledge of the redox chemistry of these elements and application of appropriate site characterization methods are critical to understanding the fate of arsenic. Observation of arsenic cycling in natural systems suggests that partitioning to iron (hydr)oxide mineral may immobilize arsenic within soils and sediment. Previous research has shown that the mobility of arsenic is influenced by perturbations in pH and redox status in aqueous systems." (Ford, Robert, 2004). "Immobilization, the primary attenuation process operative for arsenic and metals, is not fully understood. Although a framework that addresses the natural attenuation of inorganics is urgently needed, the processes that affect speciation, fate and transport of arsenic and other metals are not sufficiently understood." (Ford, Robert, 2004).

Chromium: "This is the second most common metal at sites for which EPA has written Records of Decision (e.g., directives to clean up). Industrial applications most commonly use the oxidized hexavalent form, chromium VI, which is acutely toxic and very mobile in groundwater." (Grosse, Douglas, 2000). "Chromium VI is carcinogenic through inhalation and ingestion pathways, occurs in neutral to alkaline pH conditions, and is very soluble. By comparison, the other species, chromium III, is the reduced trivalent form and it is not a carcinogen and its toxicity is significantly less than chromium VI. It is stable over a wide range of neutral to acidic pH conditions, and in solid form can even persist in basic

environments. It is a nearly insoluble hydroxide. Attempts to remediate chromium in situ include using either chemical reduction or fixation via multiple physical or biological processes." (Yiannakekais, Alex, 1999).

In the current investigation, the species of chromium has not been identified but it is likely that the stable, chromium III species is present, as there was not industrial usage of chromium at the site. Additionally, there is no chromium present in groundwater, further supporting the conclusion that the chromium present is the stable, non-soluble species, chromium III. Given its low concentration and ubiquitous, equal distribution in soils site wide, it is feasible that the chromium represents background levels, given that there is no "concentrated" source area.

Soil contamination: Soil contamination, slightly in excess of the NCDWQ Soil-to-Groundwater Cleanup Level (for arsenic) and NCDWM Soil RG (for chromium), was discovered in areas generally characterized as former loading dock areas adjacent to a former railroad spur and rail line. The source of the arsenic contamination is believed to be in the immediate area of the former loading dock railroad ties or as particulate, remnant fertilizer material within the soils; thus, the site's prior usage as a fertilizer plant suggests that through time, trace amounts of natural elements known to be present within limestone and fertilizer additives are the likely sources of both contaminants.

It is notable that the concentrations for either contaminant, arsenic or chromium, are just over the IHSB Remedial Goal, and are at relatively low concentrations. Whereas the regulations state that these soils must be remediated to a condition of less than the Soil-to-Groundwater Cleanup Level (according to "Groundwater Section Guidelines for the Investigation and Remediation of Soils and Groundwater," Volume I, July 2000, NC DENR, DWQ, Groundwater Section, given the widespread, ubiquitous distribution and presumed particulate nature of the contaminants, the cost benefit analysis of removing these soils seems to support a more passive approach because it does not appear that the soil contamination represents a secondary source material: i.e., corollary groundwater contamination is not generally observed in the soil plume areas. Hydrogeologic cross-section A-A' (**Figure 9**) displays the vertical and horizontal extent of soil contamination, which extends to the depth of the shallow water table.

Groundwater contamination: Groundwater contamination, i.e., arsenic, in excess of 15A NCAC 2L standards, was identified at three monitoring wells at the site, MW3, MW6 and MW7 in areas formerly utilized as loading docks and adjacent to a former railroad spur and rail line. With respect to the analytical results, the horizontal and vertical extents of groundwater contamination exceeding 15A NCAC 2L standards appear to be delineated. **Table 4** summarizes the groundwater analytical data collected from the site in context with regulatory standards. Hydrogeologic cross-sections A-A' and B-B' (**Figures 9** and **10**) display the vertical and horizontal extents of groundwater contamination across the site.

Identified potential environmental pathways for human exposure at this site include: an upgradient irrigation well, an upgradient water line, an upgradient stormwater pond, the un-capped subsurface soil contamination and the potential downward migration into deeper aquifers, which are presently not known to be impacted.

10.1 POTENTIAL RECEPTORS:

10.1.1 Water Supply Wells:

The nearest supply well, which is used for irrigation, is 500 feet upgradient and outside the contaminant plume; thus, it is not believed to be at risk.

10.1.2 Public Water Lines:

Public water is supplied by the city of Wilmington municipal water system. Water lines are present upgradient to the loading dock area. These lines are buried at very shallow depths and, provided that the lines are intact, and given the available data documenting low levels of contamination in soil and groundwater, these features are not believed to be at risk.

10.1.3 Surface Water:

The nearby pond is located about 200 feet upgradient and outside the contaminant plume; thus, it is not believed to be at risk.

10.1.4 Subsurface Features-Uncapped Soil:

Soils behind Building A are uncapped, as are soils in the area of the inert debris landfill area. In the event of demolition of the current facility, workers who disturb these soils may become exposed to the arsenic and chromium soil contamination in these areas. Given that the detected levels are relatively low, it is not believed that these soils represent an environmental risk. In the event that the soils are to be disturbed, it remains unclear whether the soils containing these minimal exceedences represent a health risk to workers.

10.1.5 Deeper aquifers:

In this area of Wilmington, the Tertiary Eocene Castle Hayne limestone aquifer is believed to exist at >45 feet BGS. Two deep wells, installed to depths believed just above the Castle Hayne unit, did not contain arsenic contamination; thus, this potential receptor does not appear to be impacted and utilizing site specific hydrogeologic information, it does not appear to be significantly threatened. **Figure 10** displays lines of equipotential head between DMW1 and DMW2. This figure demonstrates that the downgradient well is screened at a depth that would likely detect the arsenic plume if the plume extended below the shallow aquifer. Neither well contained arsenic, further suggesting that the deeper zone is not imminently threatened.

11.0 CONCLUSIONS AND RECOMMENDATIONS FOR CORRECTIVE ACTION:

The following conclusions and recommendations are made based on readily available information and collected field data, as presented herein:

11.1 CONCLUSIONS:

Soil:

The majority of soils containing exceedences of arsenic and chromium appears to be located along the former loading dock areas behind Building A, and parallel to the former railroad spur line in the area of the inert debris landfill area.. Based on the results of soil sampling, elevated levels of arsenic and chromium are present; however, the levels only slightly exceed the respective state action levels, thus, it appears that the magnitude and extent of contamination are limited. Further, there is no general correlation between the locations of soil contamination and groundwater contamination, further suggesting that the soils do not represent a secondary source area for groundwater contamination.

Groundwater:

The source of groundwater contamination appears to be in the vicinity of monitoring wells MW3, MW6 and MW7, located adjacent to the loading dock area behind Building A and along the former railroad spur line. Groundwater analytical data shows that samples from these three wells exceed the 15A NCAC 2L groundwater standards for arsenic. Groundwater level measurements suggest that the solute arsenic is not likely migrating extensively into the deeper aquifer; however, there is a potential risk that downward flow is occurring and that impact may eventually occur. Periodic monitoring of the shallow and deep wells should be performed.

11.2 RECOMMENDATIONS:

CES has preliminarily reviewed the available corrective action options which seem most appropriate for the site.

Soil Contamination:

Because the fertilizer plant is no longer in operation, and all primary source materials have long since been removed, and the documented levels of contamination are minimal, the option of excavation and disposal of soils at an off-site facility is not considered a feasible approach because of the cost / benefit ratio of such action. It is recommended that the soils remain in place and be allowed to remediate in-situ.

Groundwater Contamination:

Based on the fact that the fertilizer site is closed and secondary source removal does not appear necessary, and because no impacts to receptors have been measured, a non-aggressive approach to groundwater remedial actions is being considered. This is also being considered because no water supply wells have been identified to be threatened by the release and because the site and surrounding areas are all served by public water supplies. A non-aggressive plan would provide for potential receptor monitoring and provisions for receptor protection, coupled with monitoring for contaminant dissolution and migration. It is anticipated than an application for corrective action under 15A NCAC 2L 0.106 (k) or (l) will be proposed. An institutional control should be emplaced to ensure that there will be no future usage of groundwater resources at the site.

12.0 LIMITATIONS:

Information obtained and presented as part of this investigation is based on available data in an effort to understand and/or correct an existing or potential problem. The validity of any resulting conclusions is limited by methodological constraints and by the lack of a statistically significant number of data points. There is no warranty, expressed or implied, that additional or new information and/or additional measures will not be required to ultimately solve the problem. Additionally, Clark Environmental Services, P. C. assumes no responsibility for the validity of subjective, interpolated interpretations, whether or not implied or indicated, although an attempt is made to qualify such.

TABLES

TABLE 1
ADJACENT PROPERTY DATA AND WATER SUPPLY WELLS WITHIN A 1,500 FT. RADIUS
WETSIG YACHTS FACILITY
INCIDENT NO. PENDING, CES PROJECT NO. 02106

TAX MAP NO.	OWNER'S NAME	PHYSICAL ADDRESS	MAILING ADDRESS	ADJACENT TO SITE (Y/N)	WELL ON SITE (Y/N)	USE OF WELL	WELL DEPTH (FT)	CASING DEPTH (FT)	SCREEN INTERVAL (FT)	APPROXIMATE DISTANCE FROM SOURCE
0376	PAUL J. WETSIG	4022 MARKET ST. WILMINGTON, NC	621 HADLEY CT. WILMINGTON, NC 28405	NA (site)	N	NA	NA	NA	NA	NA
6933	CAMERON AND BARKLEY COMPANY	4151 EMERSON ST. WILMINGTON, NC	P.O. BOX 118007 CHARLESTON, SC 29423	Y	N	NA	NA	NA	NA	NA
8869	LONGLEY SUPPLY COMPANY	316 MARLBORO ST. WILMINGTON, NC	2018 OLEANDER DR. WILMINGTON, NC 28403	Y	N	NA	NA	NA	NA	NA
2196	ABINTO CORPORATION	77 DARLINGTON AVE. WILMINGTON, NC	3205 RANDALL PKWY, #103 WILMINGTON, NC 28403	Y	N	NA	NA	NA	NA	NA
1790	SEAGATE INVESTMENTS, INC.	227 S. KERR AVE. WILMINGTON, NC	223 GREENVILLE AVE. WILMINGTON, NC 28403	Y	N	NA	NA	NA	NA	NA
0239	JOHN S. HUFFSTELLAR	3804 MARKET ST. WILMINGTON, NC	711 SANDRIDGE RD. CHARLOTTE, NC 28210	Y	N	NA	NA	NA	NA	NA
6148	JOHN S. HUFFSTELLAR	3804 MARKET ST. WILMINGTON, NC	711 SANDRIDGE RD. CHARLOTTE, NC 28210	Y	N	NA	NA	NA	NA	NA
2781	STORMWATER OWNERS ASSOCIATION, INC.	118 CINEMA DR. WILMINGTON, NC	c/o R. J. ANTHONY 12770 COIT RD., #1170 DALLAS, TX 75251	Y	N	NA	NA	NA	NA	NA
5751	SEA COMM, INC.	122 CINEMA DR. WILMINGTON, NC	122 CINEMA DR. WILMINGTON, NC 28403	Y	Y	Irrigation	100	UK	UK	500 FT. NORTHEAST

Notes:
1. Keyed to Figure 3
2. UK represents unknown
3. NA represents not applicable

TABLE 2
MONITORING WELL CONSTRUCTION DETAILS AND GROUNDWATER LEVEL DATA
WETSIG YACHTS FACILITY
INCIDENT NO. PENDING, CES PROJECT NO. 02106

WELL ID	DATE INSTALLED	DATE WATER LEVEL MEASURED	TOTAL DEPTH	SCREENED INTERVAL	TOP OF CASING ELEVATION	DEPTH TO WATER FROM TOP OF CASING	FREE PRODUCT THICKNESS	POTENTIOMETRIC HEAD ELEVATION
MW1	09/25/02	10/02/02	11.5	1.5 - 11.5	97.87	5.97	0	91.90
MW1	09/25/02	10/31/02	11.5	1.5 - 11.5	97.87	6.98	0	90.89
MW1	09/25/02	04/30/03	11.5	1.5 - 11.5	97.87	5.42	0	92.45
MW1	09/25/02	08/14/03	11.5	1.5 - 11.5	97.87	5.30	0	92.57
MW1	09/25/02	01/20/04	11.5	1.5 - 11.5	97.87	7.10	0	90.77
MW1	09/25/02	04/16/04	11.5	1.5 - 11.5	97.87	7.28	0	90.59
MW1	09/25/02	08/04/04	11.5	1.5 - 11.5	97.87	6.75	0	91.12
MW2	09/25/02	10/02/02	12	2 - 12	97.81	6.02	0	91.79
MW2	09/25/02	10/31/02	12	2 - 12	97.81	7.07	0	90.74
MW2	09/25/02	04/30/03	12	2 - 12	97.81	5.43	0	92.38
MW2	09/25/02	08/14/03	12	2 - 12	97.81	5.35	0	92.46
MW2	09/25/02	01/20/04	12	2 - 12	97.81	7.13	0	90.68
MW2	09/25/02	04/16/04	12	2 - 12	97.81	7.31	0	90.50
MW2	09/25/02	08/04/04	12	2 - 12	97.81	6.56	0	91.25
MW3	09/25/02	10/02/02	12	2 - 12	97.03	5.58	0	91.45
MW3	09/25/02	10/31/02	12	2 - 12	97.03	6.58	0	90.45
MW3	09/25/02	04/30/03	12	2 - 12	97.03	4.87	0	92.16
MW3	09/25/02	08/14/03	12	2 - 12	97.03	4.95	0	92.08
MW3	09/25/02	01/20/04	12	2 - 12	97.03	6.59	0	90.44
MW3	09/25/02	04/16/04	12	2 - 12	97.03	6.72	0	90.31
MW3	09/25/02	08/04/04	12	2 - 12	97.03	6.23	0	90.80
MW4	09/25/02	10/02/02	12	2 - 12	98.66	6.74	0	91.92
MW4	09/25/02	10/31/02	12	2 - 12	98.66	7.85	0	90.81
MW4	09/25/02	04/30/03	12	2 - 12	98.66	6.31	0	92.35
MW4	09/25/02	08/14/03	12	2 - 12	98.66	9.11	0	89.55
MW4	09/25/02	01/20/04	12	2 - 12	98.66	7.87	0	90.79
MW4	09/25/02	04/16/04	12	2 - 12	98.66	8.13	0	90.53
MW4	09/25/02	08/04/04	12	2 - 12	98.66	8.30	0	90.36
MW5	09/25/02	10/02/02	12	2 - 12	100.20	9.18	0	91.02
MW5	09/25/02	10/31/02	12	2 - 12	100.20	10.39	0	89.81
MW5	09/25/02	04/30/03	12	2 - 12	100.20	8.73	0	91.47
MW5	09/25/02	08/14/03	12	2 - 12	100.20	9.05	0	91.15
MW5	09/25/02	01/20/04	12	2 - 12	100.20	10.40	0	89.80
MW5	09/25/02	04/16/04	12	2 - 12	100.20	10.71	0	89.49
MW5	09/25/02	08/04/04	12	2 - 12	100.20	11.69	0	88.51
MW6	08/11/03	08/14/03	11.5	1.5 - 11.5	97.08	5.13	0	91.95
MW6	08/11/03	01/20/04	11.5	1.5 - 11.5	97.08	6.74	0	90.34
MW6	08/11/03	04/16/04	11.5	1.5 - 11.5	97.08	6.91	0	90.17
MW6	08/11/03	08/04/04	11.5	1.5 - 11.5	97.08	6.64	0	90.44
MW7	08/11/03	08/14/03	11.5	1.5 - 11.5	97.00	4.73	0	92.27
MW7	08/11/03	01/20/04	11.5	1.5 - 11.5	97.00	6.45	0	90.55
MW7	08/11/03	04/16/04	11.5	1.5 - 11.5	97.00	6.57	0	90.43
MW7	08/11/03	08/04/04	11.5	1.5 - 11.5	97.00	5.83	0	91.17
MW8	01/16/04	01/20/04	12	2 - 12	96.99	6.30	0	90.69
MW8	01/16/04	04/16/04	12	2 - 12	96.99	6.42	0	90.57
MW8	01/16/04	08/04/04	12	2 - 12	96.99	5.27	0	91.72
MW9	01/16/04	01/20/04	12	2 - 12	96.46	6.39	0	90.07
MW9	01/16/04	04/16/04	12	2 - 12	96.46	6.63	0	89.83
MW9	01/16/04	08/04/04	12	2 - 12	96.46	7.04	0	89.42

TABLE 2
MONITORING WELL CONSTRUCTION DETAILS AND GROUNDWATER LEVEL DATA
WETSIG YACHTS FACILITY
INCIDENT NO. PENDING, CES PROJECT NO. 02106

WELL ID	DATE INSTALLED	DATE WATER LEVEL MEASURED	TOTAL DEPTH	SCREENED INTERVAL	TOP OF CASING ELEVATION	DEPTH TO WATER FROM TOP OF CASING	FREE PRODUCT THICKNESS	POTENTIOMETRIC HEAD ELEVATION
MW10	01/16/04	01/20/04	12	2 - 12	99.27	10.29	0	88.98
MW10	01/16/04	04/16/04	12	2 - 12	99.27	10.65	0	88.62
MW10	01/16/04	08/04/04	12	2 - 12	99.27	11.68	0	87.59
MW11	04/13/04	04/16/04	11.5	1.5 - 11.5	94.80	4.76	0	90.04
MW11	04/13/04	08/04/04	11.5	1.5 - 11.5	94.80	4.61	0	90.19
MW12	04/14/04	04/16/04	1.5	1.5 - 11.5	93.15	3.40	0	89.75
MW12	04/14/04	08/04/04	1.5	1.5 - 11.5	93.15	3.74	0	89.41
DMW1	05/19/04	05/24/04	32	22 - 32	97.25	7.50	0	89.75
DMW1	05/19/04	08/04/04	32	22 - 32	97.25	6.21	0	91.04
DMW2	05/19/04	05/24/04	43.5	33.5 - 43.5	93.85	4.97	0	88.88
DMW2	05/19/04	08/04/04	43.5	33.5 - 43.5	93.85	4.53	0	89.32

Notes:

1. All elevations are based on an arbitrary assumed benchmark elevation of 100.00'
2. Depths are in feet below ground surface as measured from the top of casing
3. All units are in feet unless otherwise indicated

TABLE 3
SUMMARY OF SOIL SAMPLING RESULTS
WETSIG YACHTS FACILITY
INCIDENT NO. PENDING, CES PROJECT NO. 02106

ANALYTICAL METHOD			3550	5030	RCRA METALS										8151	8061		IC 300.0
SAMPLING INFORMATION AND REGULATORY PROGRAM REFERENCE																		
SAMPLE ID	DATE COLLECTED	SAMPLE DEPTH (ft BGS)	TOTAL PETROLEUM HYDROCRABONS (HIGH BOILING POINT)	TOTAL PETROLEUM HYDROCRBONS (LOW BOILING POINT)	ARSENIC	BARIUM	CADMIUM	CHROMIUM	COPPER	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	HERBICIDES, µg/kg	PESTICIDES, µg/kg	ASBESTOS, PERCENT	NITRATES
NC DWM ACTION LEVELS			10	10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NC DWQ ACTION LEVELS			40	10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS
NC DWQ SOIL TO GROUNDWATER CLEANUP LEVELS			NS	NS	NS	848	NS	27	NS	270	NS	NS	NS	0.23	NS	NS	NA	NS
NC DWM SOIL RGs			NS	NS	4.4	NS	7.4	24,000	620	400	4.6	320	78	78	VAR	VAR	NS	NS
FEDERAL LISTED HAZARDOUS CONSTITUENT (Y/N)			N	N	Y	Y	Y	Y	NS	Y	Y	Y	Y	Y	Y	Y	NA	N
SB1	09/09/02	0-2	NT	NT	<1.13	62.5	2.82	6.64	32.1	58.1	0.0456	<4.53	<1.13	<1.13	NT	NT	ND	1
SB2	09/09/02	1-2	NT	NT	**5.51**	32.9	1.19	23.5	8.01	26	0.0391	<4.32	<1.08	<1.08	NT	NT	CHRY	NT
SB3	09/09/02	1.5-3.5	NT	NT	2.76	18.3	<0.983	23.1	7.44	14.9	0.314	<3.93	<0.983	<0.983	BQL	BQL	CHRY	NT
SB4	09/09/02	2-3	NT	NT	2.02	16.1	1.64	22.5	5.77	8.88	0.139	<4.31	<1.08	<1.08	NT	NT	ND	NT
SB5	09/09/02	1-3	NT	NT	3.06	15.3	<1.16	20.5	3.73	7.46	0.0358	<4.62	<1.16	<1.16	NT	NT	ND	NT
SB6	09/09/02	1-2	NT	NT	3.55	24.5	<1.11	11.3	6.58	12.2	0.0716	<4.43	<1.11	<1.11	NT	NT	ND	NT
SB7	09/11/02	1-3	NT	NT	3.22	37.8	<1.07	15.5	9.5	19	0.204	<4.27	<1.07	<1.07	NT	NT	CHRY	NT
SB8	09/11/02	1-2	NT	NT	1.77	29.1	1.27	18.1	15.9	30.3	0.108	<4.39	<1.10	<1.10	NT	NT	CHRY	NT
SB9	09/11/02	0.5-2	NT	NT	1.46	<10.0	<1.00	8.38	2.12	4	0.0242	<4.00	<1.00	<1.00	NT	NT	ND	NT
SB10	09/11/02	4-5	**13**	<6.9	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
SB11	09/11/02	1-3	NT	NT	1.81	<10.5	<1.05	11	1.48	4.93	<0.0227	<4.22	<1.05	<1.05	BQL	BQL	ND	NT
SB12	09/11/02	0-2	28	<6.8	1.13	<10.8	2.77	5	17.1	14.4	<0.0208	<4.31	<1.08	<1.08	NT	NT	CHRY	NT
SB13	09/26/02	4-6	NT	NT	**6.48**	31.5	<1.11	**28.4**	85.3	20	0.183	<4.42	<1.11	<1.11	NT	NT	ND	NT
SB14	09/26/02	3-6	NT	NT	3.89	26.9	<1.11	**27.6**	8.33	18.9	0.0494	<4.43	<1.11	<1.11	NT	NT	ND	NT
SB15	09/26/02	0-3	NT	NT	**5.4**	27.7	1.22	**32.8**	16.3	10.8	0.207	<3.98	<0.995	<0.995	NT	NT	ND	NT
MW5	09/26/02	0-2	NT	NT	<1.11	<11.1	<1.11	8.25	2.1	5.1	0.024	<4.42	<1.11	<1.11	NT	NT	ND	NT
SB16ii	04/30/03	1-3	NT	NT	1.31	<10.8	<1.08	7.36	NT	5.77	0.0911	NT	<1.08	<1.08	NT	NT	NT	NT
SB17	04/30/03	1-3	NT	NT	1.56	<11.3	<1.13	11	NT	4.09	<0.0218	NT	1.29	<1.13	NT	NT	NT	NT
SB18	04/30/03	1-2	NT	NT	<1.13	<11.3	<1.13	4.82	NT	4.33	0.041	NT	<1.13	<1.13	NT	NT	NT	NT
SB19	04/30/03	1-2.5	NT	NT	1.92	17.8	<1.00	14.7	NT	5.46	0.0334	NT	1.64	<1.00	NT	NT	NT	NT
SB20	04/30/03	1-3	NT	NT	1.53	17	<1.19	12	NT	3.97	0.0393	NT	1.37	<1.19	NT	NT	NT	NT

THE CLARK GROUP

TABLE 3
SUMMARY OF SOIL SAMPLING RESULTS
WETSIG YACHTS FACILITY
INCIDENT NO. PENDING, CES PROJECT NO. 02106

ANALYTICAL METHOD			3550	5030	RCRA METALS										8151	8061		IC 300.0
SAMPLING INFORMATION AND REGULATORY PROGRAM REFERENCE																		
SAMPLE ID	DATE COLLECTED	SAMPLE DEPTH (ft BGS)	TOTAL PETROLEUM HYDROCRABONS (HIGH BOILING POINT)	TOTAL PETROLEUM HYDROCRBONS (LOW BOILING POINT)	ARSENIC	BARIUM	CADMIUM	CHROMIUM	COPPER	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	HERBICIDES, µg/kg	PESTICIDES, µg/kg	ASBESTOS, PERCENT	NITRATES
NC DWM ACTION LEVELS			10	10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NC DWQ ACTION LEVELS			40	10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS
NC DWQ SOIL TO GROUNDWATER CLEANUP LEVELS			NS	NS	NS	848	NS	27	NS	270	NS	NS	NS	0.23	NS	NS	NA	NS
NC DWM SOIL RGs			NS	NS	4.4	NS	7.4	24,000	620	400	4.6	320	78	78	VAR	VAR	NS	NS
FEDERAL LISTED HAZARDOUS CONSTITUENT (Y/N)			N	N	Y	Y	Y	Y	NS	Y	Y	Y	Y	Y	Y	Y	NA	N
SB21	04/30/03	1-2.5	NT	NT	<1.04	<10.4	<1.04	9.39	NT	3.92	0.0232	NT	<1.04	<1.04	NT	NT	NT	NT
SB22	04/30/03	1-3	NT	NT	<1.11	<11.1	<1.11	4.2	NT	3.31	0.0517	NT	<1.11	<1.11	NT	NT	NT	NT
SB23	04/30/03	1-2.5	NT	NT	<0.972	13.6	<0.972	5.97	NT	4.37	<0.0221	NT	<0.972	<0.972	NT	NT	NT	NT
SB24	04/30/03	1-2.5	NT	NT	<1.13	<11.3	<1.13	13.5	NT	4.5	0.0352	NT	<1.13	<1.13	NT	NT	NT	NT
SB25	01/16/04	1-3	NT	NT	**4.79**	NT	NT	10.1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
SB26	01/16/04	1-3	NT	NT	<1.16	NT	NT	**28.1**	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
SB27/MW10	01/16/04	2-4	NT	NT	1.40	NT	NT	11.2	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
SB28	01/16/04	5-7	NT	NT	<1.14	NT	NT	10.4	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
SB29	01/16/04	3-5	NT	NT	**4.49**	NT	NT	11.3	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT

Notes:

1. Abbreviations: NS represents no available action level, clean-up level, screening level or level listed in a referenced document; NT represents not tested; ft BGS represents feet below ground surface, CHRY represents presence of asbestos mineral chrysotile; BQL represents below quantitation level; ND represents not detected; VAR represents variable level.
2. Results reported in milligrams per kilogram (mg/kg), unless specified micrograms per kilogram (µg/kg).
3. Bold result represents concentrations in excess of actions levels, soil to groundwater cleanup level, or soil remediation goals; shaded result represents Federally listed hazardous constituent which also exceeds cited regulatory levels.
4. NC DWM Action Levels: North Carolina Department of Environment and Natural Resources (NCDENR) Division of Waste Management (DWM), Underground Storage Tank (UST) Section *Guidelines for Assessment and Corrective Action,* July 1, 2001
5. NC DWQ Action Levels and NC DWQ Soil to Groundwater Cleanup Levels, taken from the NCDENR, Division of Water Quality (DWQ) Groundwater Section *Guidelines for Investigation and Remediation of Soil and Groundwater* - July 2000.
6. NC DWM Soil RG's: NCDENR, DWM Superfund Section Inactive Hazardous Sites Branch, *Guidelines for Assessment and Cleanup*, Soil Remediation Goals - August 2004.
7. Listed hazardous constituent (Y/N): represents that the constituent is/is not contained in Appendix VIII of 40 CFR, Part 261.

THE CLARK GROUP

TABLE 4
SUMMARY OF GROUNDWATER SAMPLING RESULTS
WETSIG YACHTS FACILITY
INCIDENT NO. PENDING, CES PROJECT NO. 02106

		CONTAMINANTS OF CONCERN																		
ANALYTICAL METHOD		6210D/602								610	6010B							7470	353.3	
CONTAMINANT OF CONCERN ->		BENZENE	TOLUENE	ETHYLBENZENE	XYLENES	MTBE	DIPE	NAPHTHALENE	TRICHLOROFLUOROMETHAN	NAPHTHALENE	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	SELENIUM	SILVER	MERCURY	NITRATE (mg/L)	FIELD or LABORATORY pH
WELL ID	DATE COLLECTED																			
15A NCAC 2L STANDARD		1	1,000	29	530	200	70	21	2,100	21	10	2,000	5	50	15	50	18	1.1	10	6.5-8.5
MW1-unf	10/02/02	<1	<1	<1	<3	69	<1	<1	<1	<10	**11.1**	<100	<10	<10	<10	<10	<10	<0.3	2.72	8.2
MW1-unf	11/01/02	NT	NT	NT	NT	NT	NT	NT	NT	NT	<10	NT	NT	NT	NT	NT	NT	NT	NT	NT
MW1-f	11/01/02	NT	NT	NT	NT	NT	NT	NT	NT	NT	<10	NT	NT	NT	NT	NT	NT	NT	NT	NT
MW1-unf	04/30/03	<1	<1	<1	<4	7.8	<1	NT	NT	<10	NT	NT	NT	NT	<5	NT	NT	NT	NT	NT
MW2-unf	10/02/02	<0.5	<0.5	<0.5	<1.5	<0.5	<0.5	<0.5	0.5	NT	**13.4**	<100	<10	<10	<10	<10	<10	<0.3	6.18	7.4
MW2-unf	11/01/02	NT	NT	NT	NT	NT	NT	NT	NT	NT	<10	NT	NT	NT	NT	NT	NT	NT	NT	NT
MW2-f	11/01/02	NT	NT	NT	NT	NT	NT	NT	NT	NT	<10	NT	NT	NT	NT	NT	NT	NT	NT	NT
MW3-unf	10/02/02	<0.5	<0.5	<0.5	<1.5	<0.5	<0.5	<0.5	<0.5	NT	**78.6**	<100	<10	14.5	<10	<10	<10	<0.3	0.73	8.2
MW3-unf	11/01/02	NT	NT	NT	NT	NT	NT	NT	NT	NT	**34.4**	NT	NT	NT	NT	NT	NT	NT	NT	NT
MW3-f	11/01/02	NT	NT	NT	NT	NT	NT	NT	NT	NT	**37.9**	NT	NT	NT	NT	NT	NT	NT	NT	NT
MW3-f	04/30/03	NT	NT	NT	NT	NT	NT	NT	NT	NT	**34.4**	NT	NT	NT	NT	NT	NT	NT	NT	NT
MW4-unf	10/02/02	<0.5	<0.5	<0.5	<1.5	2	<0.5	<0.5	<0.5	<10	<10	<100	<10	<10	<10	<10	<10	<0.3	1.70	**9.1**
MW5-unf	10/02/02	<0.5	<0.5	<0.5	<1.5	<0.5	<0.5	<0.5	<0.5	NT	<10	<100	<10	<10	<10	<10	<10	<0.3	0.22	**9.5**
MW6-unf	08/14/03	NT	NT	NT	NT	NT	NT	NT	NT	NT	**50.2**	NT	NT	NT	NT	NT	NT	NT	NT	**5.8**
MW6-f	08/14/03	NT	NT	NT	NT	NT	NT	NT	NT	NT	**45.7**	NT	NT	NT	NT	NT	NT	NT	NT	**5.8**
MW7-unf	08/14/03	NT	NT	NT	NT	NT	NT	NT	NT	NT	**173**	NT	NT	NT	NT	NT	NT	NT	NT	**6.0**
MW7-f	08/14/03	NT	NT	NT	NT	NT	NT	NT	NT	NT	**140**	NT	NT	NT	NT	NT	NT	NT	NT	**6.0**
MW8-f	01/20/04	NT	NT	NT	NT	NT	NT	NT	NT	NT	<10	NT	NT	<10	NT	NT	NT	NT	NT	**6.27**
MW9-f	01/20/04	NT	NT	NT	NT	NT	NT	NT	NT	NT	<10	NT	NT	<10	NT	NT	NT	NT	NT	**4.23**
MW10-f	01/20/04	NT	NT	NT	NT	NT	NT	NT	NT	NT	<10	NT	NT	<10	NT	NT	NT	NT	NT	**5.46**
MW11-unf	04/16/04	NT	NT	NT	NT	NT	NT	NT	NT	NT	<10	NT	NT	5.54	NT	NT	NT	NT	NT	**3.9**
MW11-f	04/16/04	NT	NT	NT	NT	NT	NT	NT	NT	NT	<10	NT	NT	<10	NT	NT	NT	NT	NT	**3.9**

THE CLARK GROUP

TABLE 4
SUMMARY OF GROUNDWATER SAMPLING RESULTS
WETSIG YACHTS FACILITY
INCIDENT NO. PENDING, CES PROJECT NO. 02106

		CONTAMINANTS OF CONCERN																		
ANALYTICAL METHOD		6210D/602								610	6010B							7470	353.3	
CONTAMINANT OF CONCERN ->		BENZENE	TOLUENE	ETHYLBENZENE	XYLENES	MTBE	DIPE	NAPHTHALENE	TRICHLOROFLUOROMETHAN	NAPHTHALENE	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	SELENIUM	SILVER	MERCURY	NITRATE (mg/L)	FIELD or LABORATORY pH
WELL ID	DATE COLLECTED																			
15A NCAC 2L STANDARD		1	1,000	29	530	200	70	21	2,100	21	10	2,000	5	50	15	50	18	1.1	10	6.5-8.5
MW12-unf	04/16/04	NT	NT	NT	NT	NT	NT	NT	NT	NT	<10	NT	NT	1.96	NT	NT	NT	NT	NT	**3.8**
MW12-f	04/16/04	NT	NT	NT	NT	NT	NT	NT	NT	NT	<10	NT	NT	<10	NT	NT	NT	NT	NT	**3.8**
DMW1-unf	05/24/04	NT	NT	NT	NT	NT	NT	NT	NT	NT	<10	NT	NT	<10	NT	NT	NT	NT	NT	**6.8**
DMW1-f	05/24/04	NT	NT	NT	NT	NT	NT	NT	NT	NT	<10	NT	NT	<10	NT	NT	NT	NT	NT	**6.8**
DMW2-unf	05/24/04	NT	NT	NT	NT	NT	NT	NT	NT	NT	<10	NT	NT	<10	NT	NT	NT	NT	NT	**5.1**
DMW2-f	05/24/04	NT	NT	NT	NT	NT	NT	NT	NT	NT	<10	NT	NT	<10	NT	NT	NT	NT	NT	**5.1**

Notes:

1. Results reported in micrograms per liter (µg/L) unless otherwise noted
2. Unf/f represents unfiltered and filtered samples
3. 15A NCAC 2L standards includes interim groundwater standards
4. Bold represents an exceedance of 15A NCAC 2L standard
5. < represents below laboratory detection limit
6. NT represents not tested/not analyzed
7. MTBE represents methyl tertiary butyl ether
8. DIPE represents diisopropyl ether
9. pH - value measured in field using hand held meter

THE CLARK GROUP

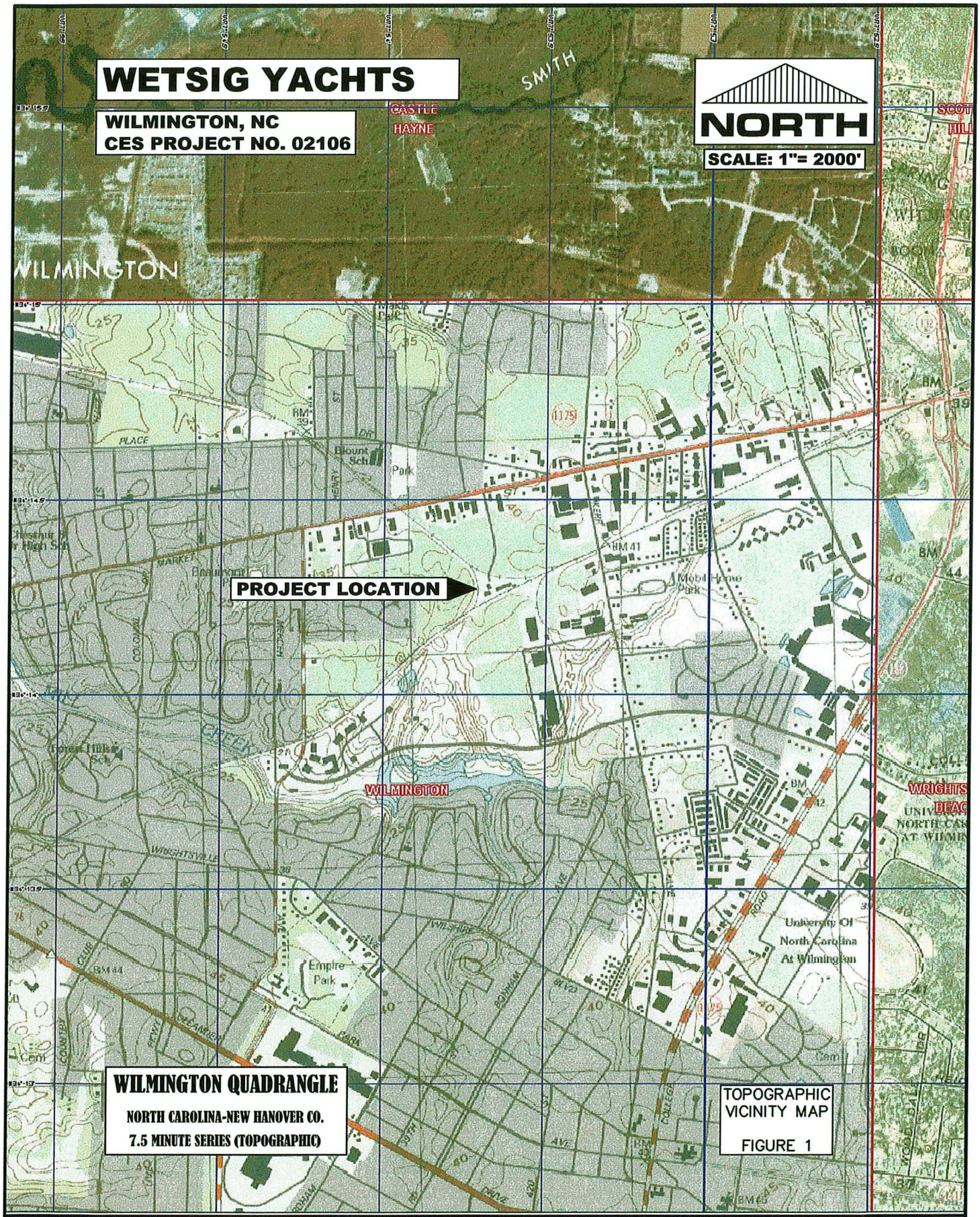
TABLE 5
SUMMARY OF NATURAL ATTENUATION FIELD PARAMETERS
WETSIG YACHTS FACILITY
INCIDENT NO. PENDING, CES PROJECT NO. 02106

WELL NO.	SAMPLE DATE	TURBIDITY (0-4)	REDOX POTENTIAL (mV)	SALINITY (‰)	CONDUCTIVITY (µmhos)	DISSOLVED OXYGEN (mg/L)	TOTAL IRON (ppm)	TEMPERATURE (°C)	pH (Std. Units)
MW1	10/02/02	NM	NM	NM	308	1.97	NM	24.3	8.2
MW1	04/16/04	1	152	0.2	215	1.01	1	17.0	NM
MW2	10/02/02	NM	NM	NM	283	1.06	NM	23.9	7.4
MW2	04/16/04	0	147	0.2	313	0.91	0	16.7	NM
MW3	10/02/02	NM	NM	NM	343	1.26	NM	25.2	8.2
MW3	04/16/04	0	122	0.2	186	1.18	2	18.8	5.1
MW4	10/02/02	NM	NM	NM	252	2.07	NM	24.5	9.1
MW4	04/16/04	0	202	0.3	191	2.35	10	16.9	NM
MW5	10/02/02	NM	NM	NM	161	3.13	NM	24.0	9.5
MW5	04/16/04	0	212	0.2	152	2.98	8	17.1	NM
MW6	08/14/03	NM	NM	NM	840	4.31	NM	30.0	5.8
MW6	04/16/04	0	152	0.2	178	1.35	4	18.0	4.7
MW7	08/14/03	NM	NM	NM	800	6.08	NM	25.5	6.0
MW7	04/16/04	3	121	0.5	580	1.20	4	19.9	5.3
MW8	04/16/04	0	96	0.4	265	4.03	>10	17.9	6.5
MW9	04/16/04	0	183	0.2	247	3.17	6	17.8	4.5
MW10	04/16/04	0	168	0.2	131	2.42	6	17.8	5.1
MW11	04/16/04	1	147	0.1	222	2.25	10	18.2	3.9
MW12	04/16/04	1	177	0.3	330	2.40	10	17.9	3.8
DMW1	05/24/04	23.1*	67	0	130	2.95	3	24.6	6.8
DMW2	05/24/04	15.7*	163	0	320	2.28	0.02	25.6	5.1

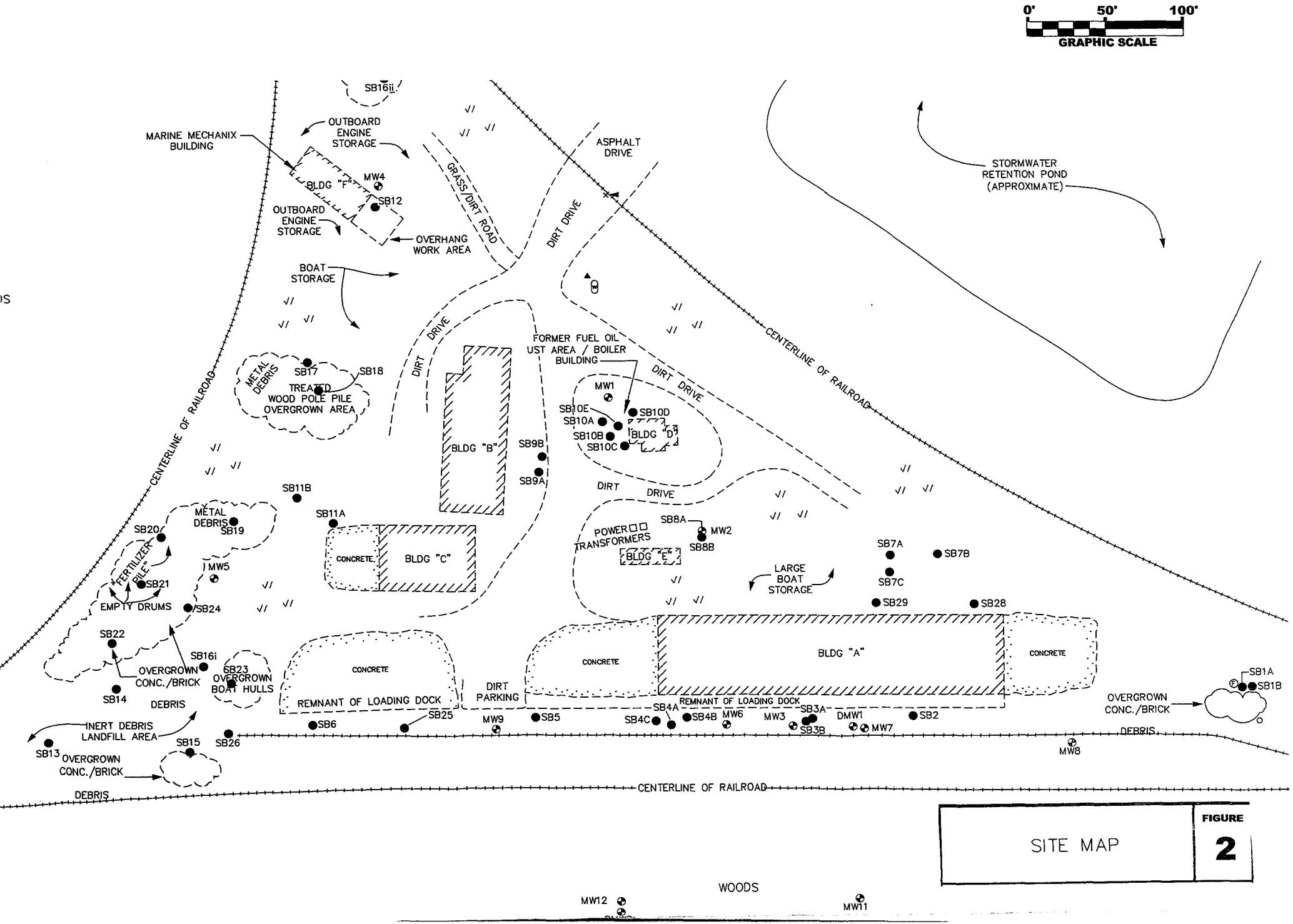
Notes:

1. Turbidity scale: 0-None, 1-Faint, 2-Moderate, 3-Moderately Strong, 4-Strong
2. Redox represents oxidation reduction
3. mV represents millivolts
4. ‰ represents parts per thousand
5. µmhos represents micromhos
6. mg/L represents milligrams per liter
7. ppm represents parts per million
8. °C represents degrees Celsius
9. Std. Units represents standard units
10. NM represents not measured
11. * measurements taken using a turbidity meter and reported in nephelometric turbidity units (NTUs)

FIGURES



Clark Environmental Services, P.C.



SITE MAP

FIGURE 2

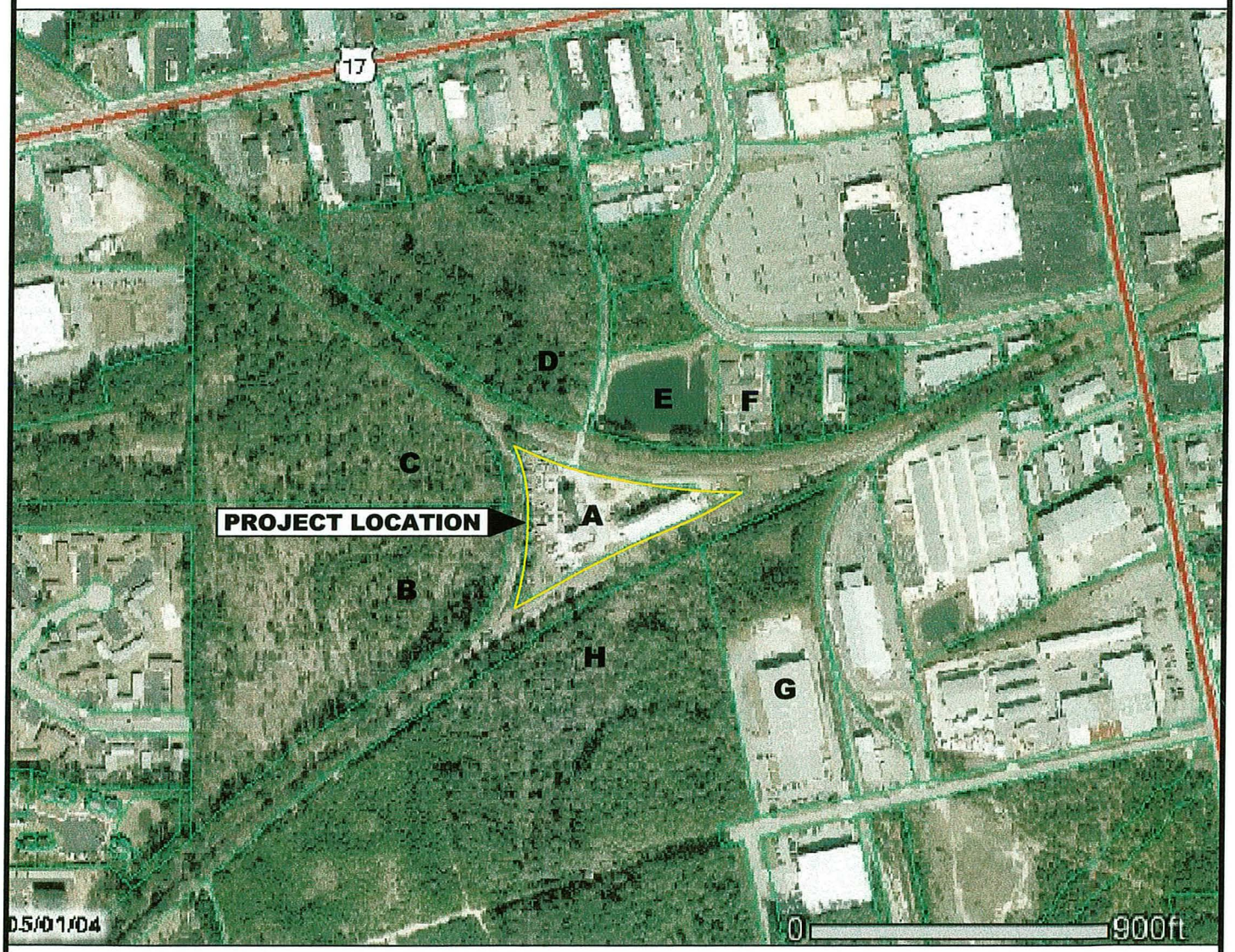
WETSIG YACHTS

WILMINGTON, NC

CES PROJECT NO. 02106

NORTH

SCALE: 1"= 500'



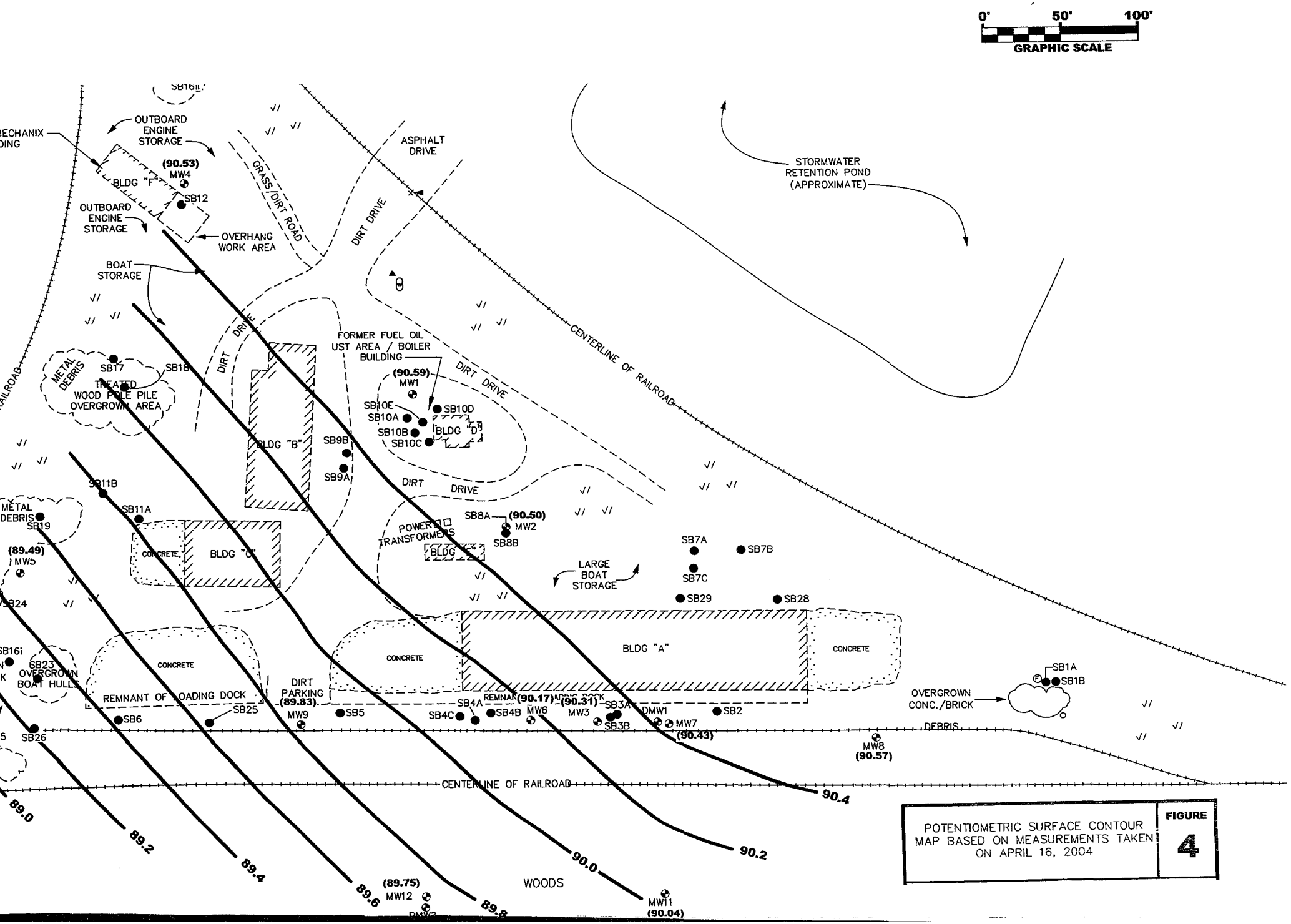
A	SUBJECT PROPERTY	E	POND
B	WOODS	F	SEA COMM. (COMMERCIAL USAGE)
C	WOODS	G	CAMERON PROPERTY / ELECTRIC SUPPLY
D	WOODS	H	LONGLEY PROPERTY / VACANT WOODS

NOTE:
AERIAL PHOTOGRAPH (2002) OBTAINED FROM NEW HANOVER COUNTY TAX OFFICE.

TAX MAP UTILIZING RECENT AERIAL PHOTOGRAPH (2002) DEPICTING NEARBY PROPERTY USES

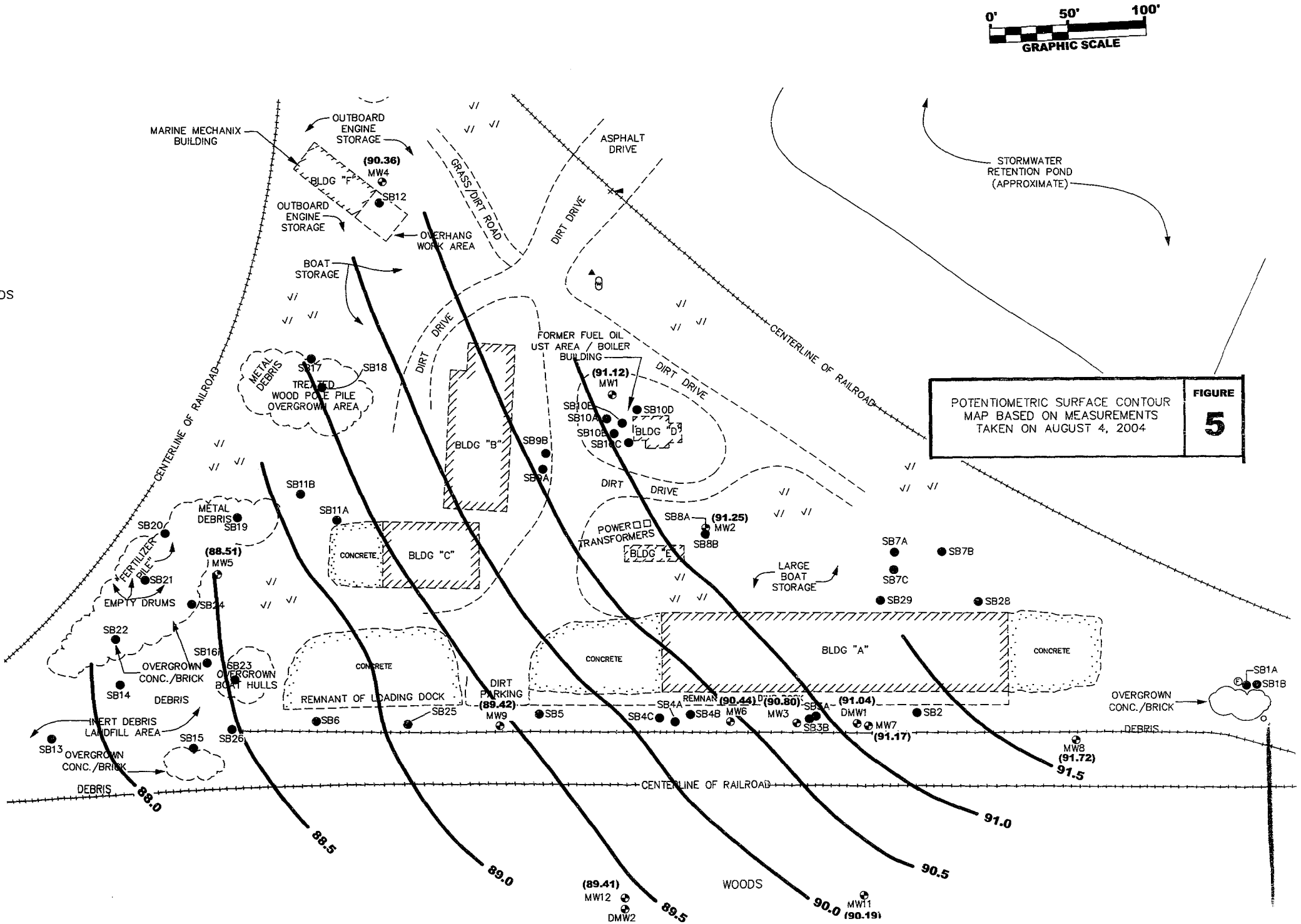
FIGURE 3

Clark Environmental Services, P.C.



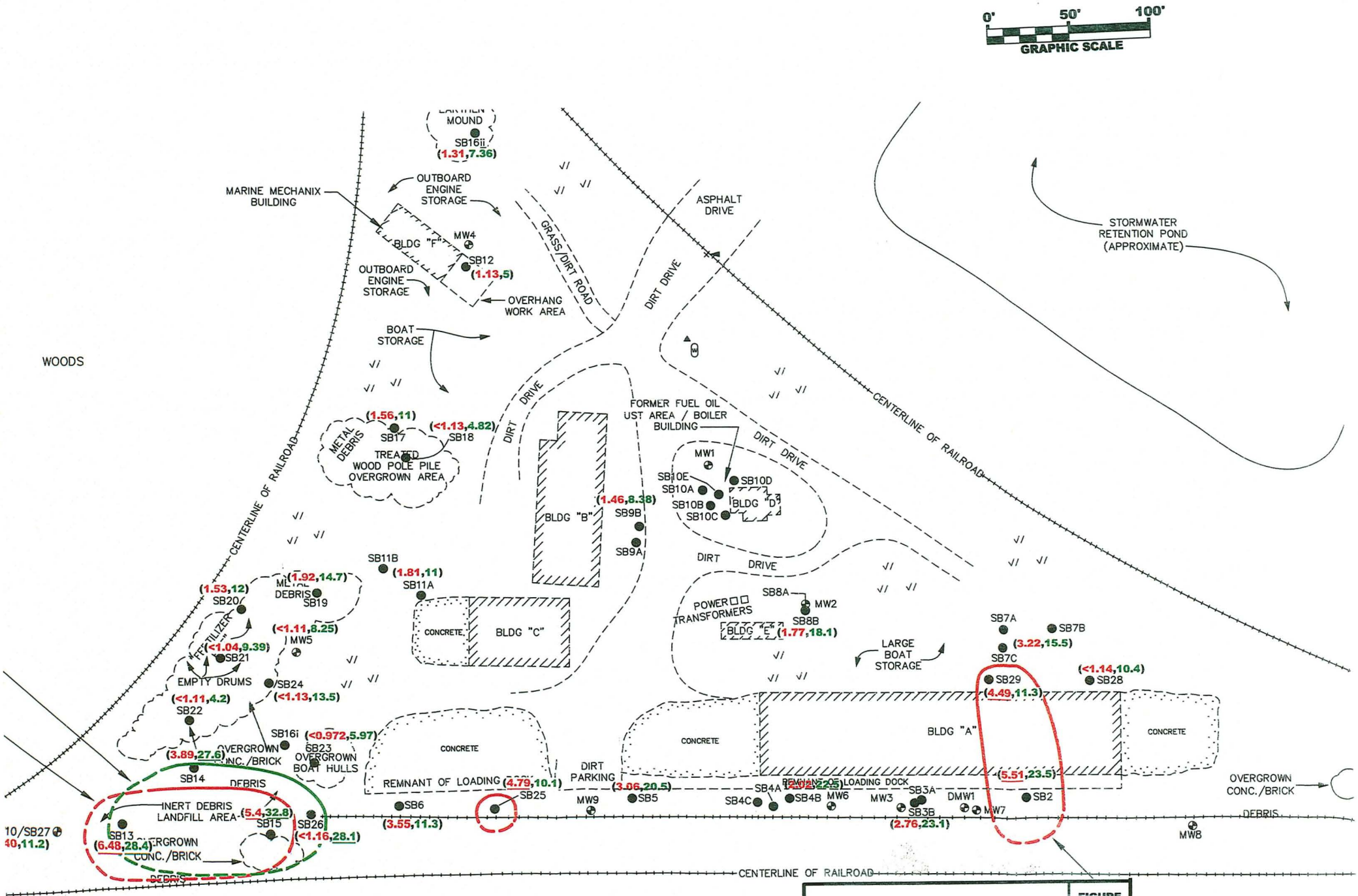
POTENTIOMETRIC SURFACE CONTOUR MAP BASED ON MEASUREMENTS TAKEN ON APRIL 16, 2004

FIGURE 4



POTENTIOMETRIC SURFACE CONTOUR MAP BASED ON MEASUREMENTS TAKEN ON AUGUST 4, 2004

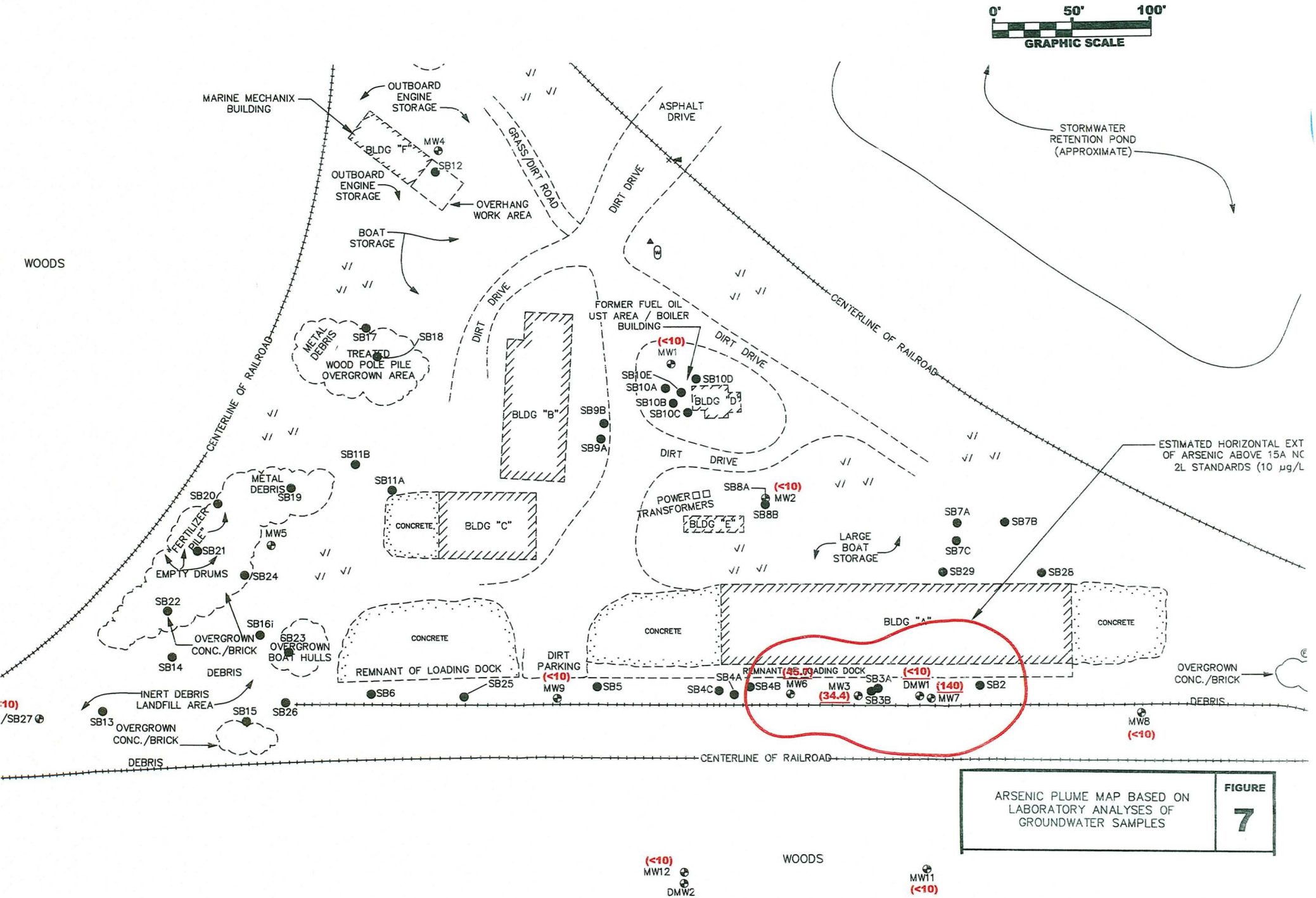
FIGURE 5



ESTIMATED HORIZONTAL EXTENT OF SOIL CONTAMINATION EXCEEDING APPLICABLE LEVELS

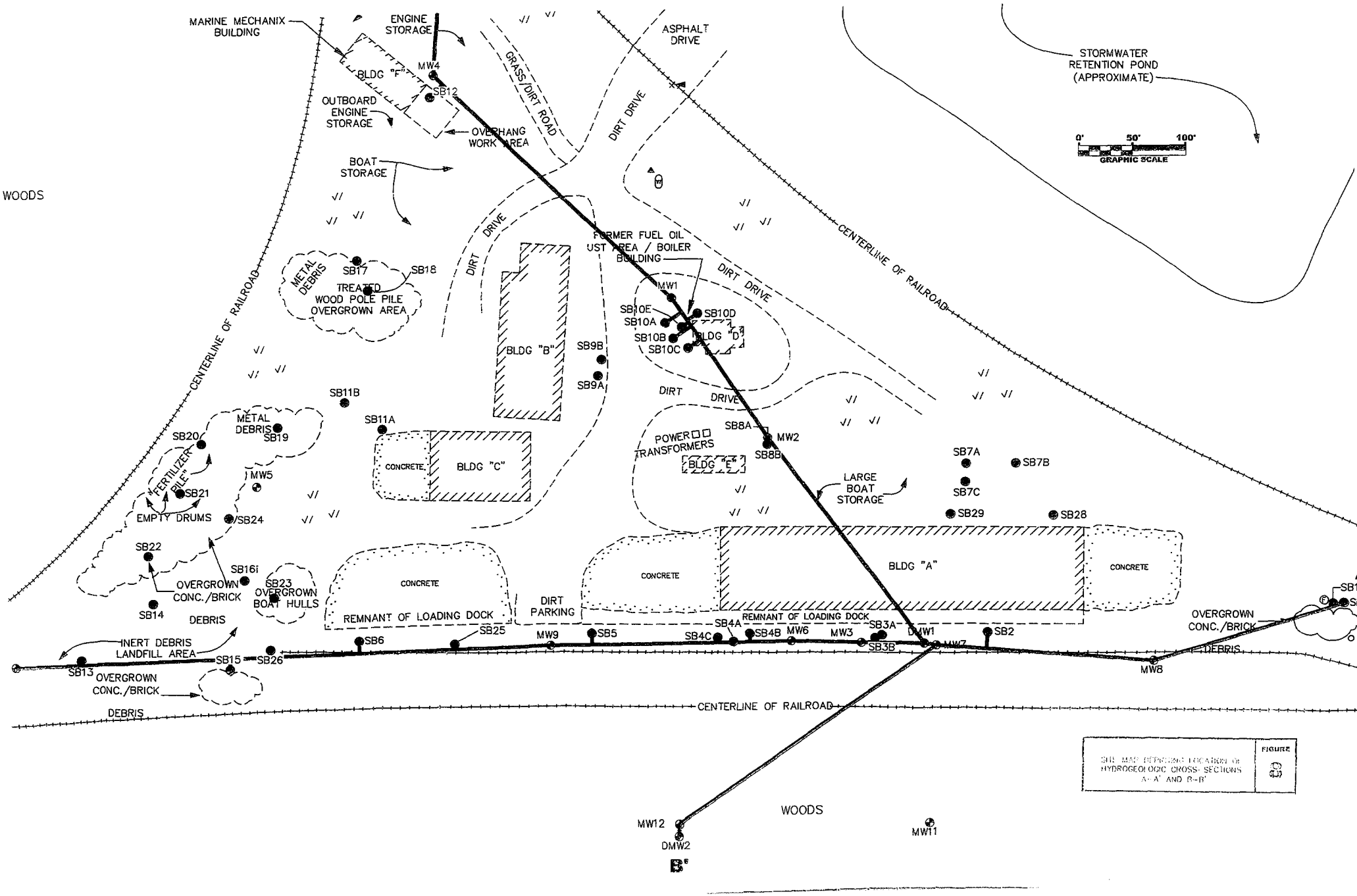
FIGURE 6

ESTIMATED HORIZONTAL EXTEN
CONTAMINATION EXCEEDING ARS
SOIL REMEDIATION GOAL (4.47



ARSENIC PLUME MAP BASED ON LABORATORY ANALYSES OF GROUNDWATER SAMPLES

FIGURE 7



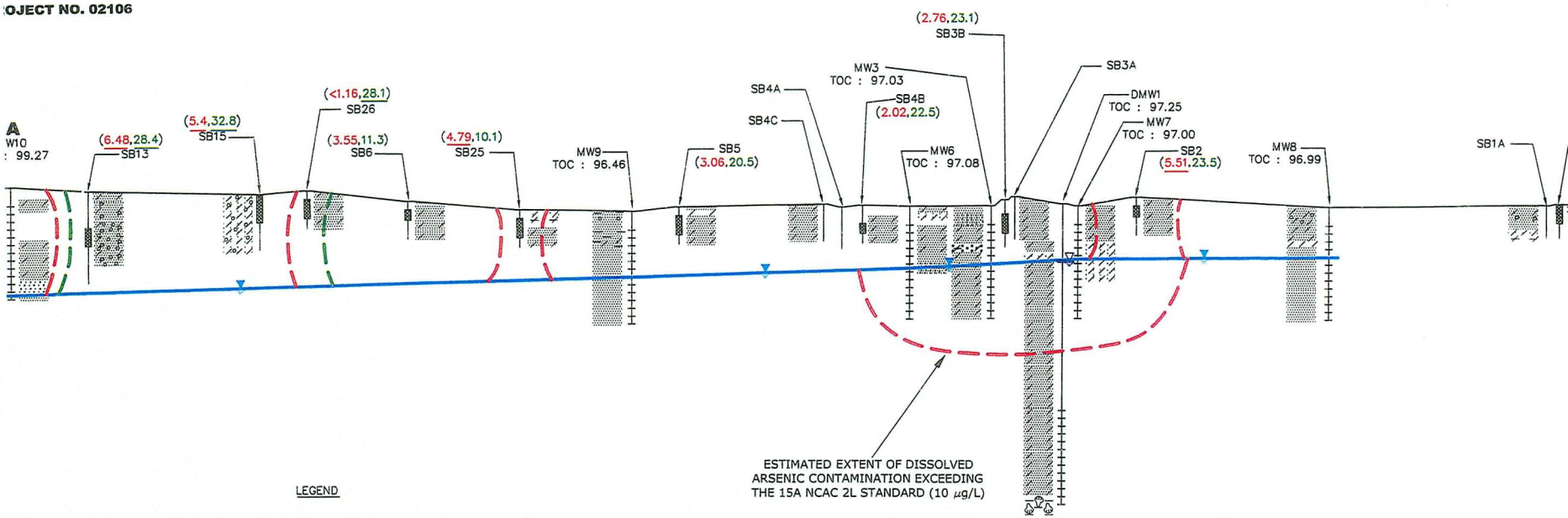
SITE MAP REFERENCING LOCATION OF HYDROGEOLOGIC CROSS-SECTIONS A-A' AND B-B'

FIGURE 3

'SIG YACHT FACILITY

IGTON, NC

OJECT NO. 02106



LEGEND

- FINE SAND
- MEDIUM SAND
- SILT
- CLAY
- PEATY SAND
- CLAYEY SAND
- SILTY SAND
- SANDY SILT
- PEBBLY CLAYEY SAND
- SANDY CLAY
- SANDY SILTY CLAY
- SANDY SILT
- PEBBLY CLAYEY SAND
- CLAY & SHELL HASH
- CLAYEY SILT
- SANDY CLAYEY SILT

(#.#) SOIL ARSENIC AND CHROMIUM CONCENTRATIONS IN MILLIGRAMS PER KILOGRAM (mg/kg)

(#.#) REPRESENTS EXCEEDENCE OF APPLICABLE STANDARD

ESTIMATED EXTENT OF SOIL CONTAMINATION EXCEEDING CHROMIUM NCDWQ SOIL-TO-GROUNDWATER CLEANUP LEVEL (27 mg/kg)

ESTIMATED EXTENT OF SOIL CONTAMINATION EXCEEDING ARSENIC NCDWM SOIL REMEDIATION GOAL (4.47 mg/kg)

POTENTIOMETRIC SURFACE LEVEL FOR SHALLOW ZONE

POTENTIOMETRIC SURFACE LEVEL FOR DEEP ZONE

HORIZONTAL SCALE 1"=50'

VERTICAL SCALE 1"=10'

VERTICAL EXAGGERATION = 5X

NOTE:
POTENTIOMETRIC SURFACE ELEVATIO
ARE BASED ON GROUNDWATER
MEASUREMENTS TAKEN ON 8/4/04

HYDROGEOLOGIC CROSS-SECTIO
DEPICTING THE ESTIMATED VERTICA
OF SOIL AND GROUNDWATER CONTA

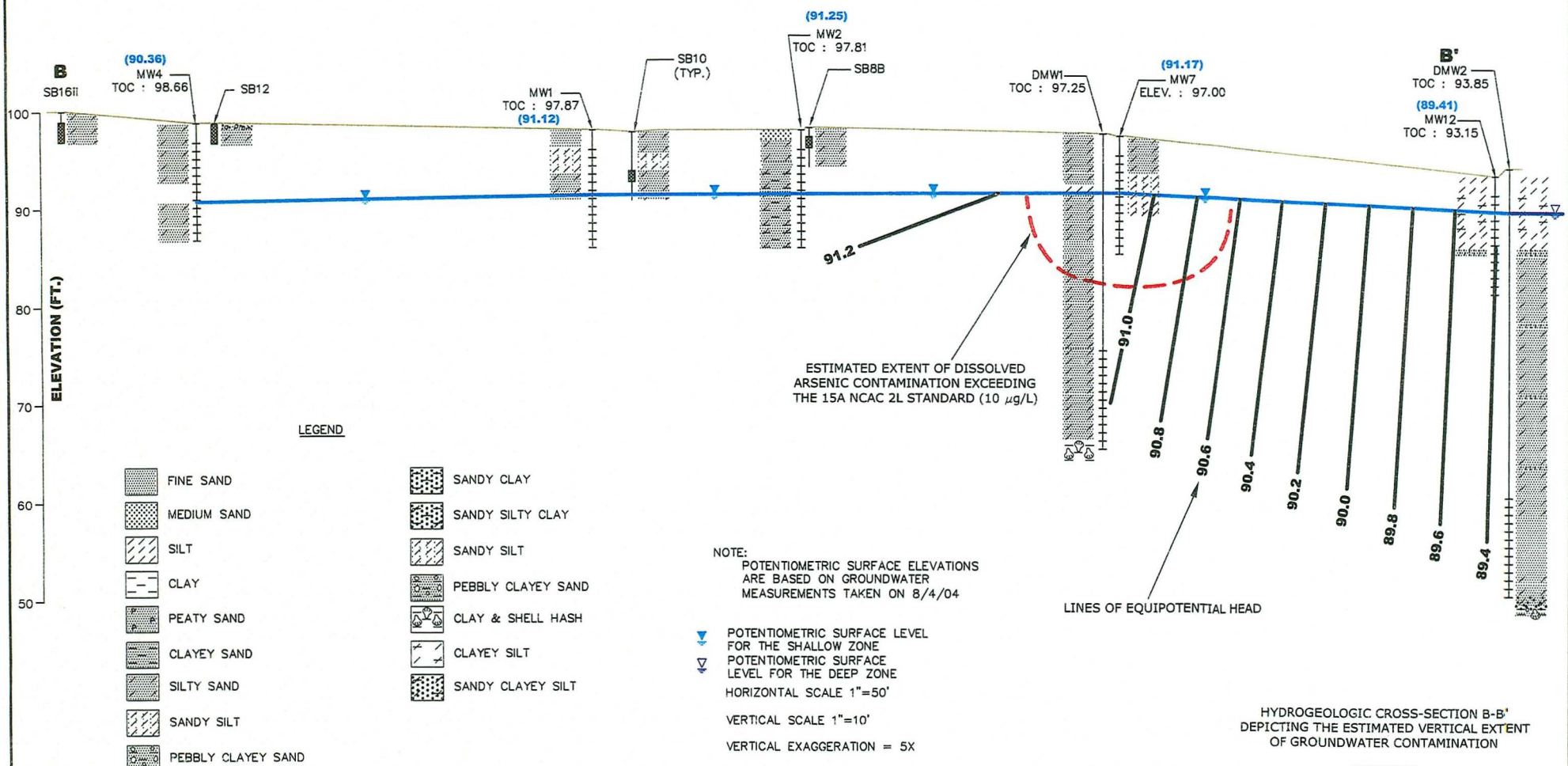
FIGURE 9

Clark Environmental Services, P.C.

WETSIG YACHT FACILITY

WILMINGTON, NC

CES PROJECT NO. 02106



HYDROGEOLOGIC CROSS-SECTION B-B' DEPICTING THE ESTIMATED VERTICAL EXTENT OF GROUNDWATER CONTAMINATION

FIGURE 10

Clark Environmental Services, P.C.

APPENDICES

APPENDIX I

RELEVANT REGULATORY CORRESPONDENCE

Paul Clark WET 6

From: "Paul Clark" <paulatclark@bizec.rr.com>
To: "Charlotte Jesneck" <charlotte.jesneck@ncmail.net>
Cc: "Charles Stehman" <CHARLES.STEHMAN@ncmail.net>; "Sonny Wall" <rwall@bbandt.com>; "John Rybak" <jrybak@bbandt.com>
Sent: Friday, November 14, 2003 12:01 PM
Subject: Wetsig Yacht Facility, New Hanover County

Dear Charlotte,

Thank you for discussing the environmental concerns of subject property with me on Wednesday, November 12. Following our conversation, I spoke with Charlie Stehman with respect to your offer that the jurisdictional authority of this facility could be maintained with the Groundwater Section of the Division of Water Quality, rather than the site being added to the Inactive Hazardous Sites Inventory. Dr. Stehman indicated that the Groundwater Section would actively regulate this incident. Mr. John Rybak, who is employed by BB&T as Commercial Real Estate Environmental Risk Manager, has indicated that BB&T, as a holder of a security interest in this property, will engage in assessment and corrective action activities.

Please also be advised that the work plan will address potential source media, including soils, as part of the investigation of groundwater contamination. We are currently assembling a package of historical and recent site information for Dr. Stehman's review. Please let me know if you want to receive copies of this and/or future site documents.

Your cooperation and assistance is much appreciated.

Sincerely,

Paul

R. Paul Clark, P.G.
Clark Environmental Services, P.C.
P.O. Box 10136
Wilmington, N.C., 28404
910-602-3900
910-602-3975(f)
paulatclark@bizec.rr.com
clarkenvironmental@bizec.rr.com

This transmission is intended to be viewed only by the addressee(s). Any dissemination of this transmission by someone other than the intended recipient(s) is prohibited. If you receive this message in error, please delete all copies and notify me at 910-602-3900, or respond to clarkenvironmental@bizec.rr.com.
Thank you.

Michael F. Easley, Governor
William G. Ross Jr., Secretary
North Carolina Department of Environment and Natural Resources

Alan W. Klimek, P.E. Director
Division of Water Quality

January 14, 2004

Branch Bank and Trust (BB&T)
Mr. John Rybak
Environmental Risk Manager
5130 Parkway Plaza Blvd.
Charlotte, NC 28217

Subject: Wetsig Yacht Site
Wilmington, New Hanover County

Dear Mr. Rybak:

On December 5, 2003, the Groundwater Section received a report documenting soil and groundwater sampling results performed at the subject site, submitted by Clark Environmental Services, P.C. on your behalf. This report indicated Arsenic contamination in groundwater at reported levels of up to 173 *ug*/L. These reported levels are above the state groundwater quality standard of 10 *ug*/L for Arsenic. We offer the following recommendations and comments in regards to the regulatory status and requirements for the site:

1. Arsenic contamination appears to have resulted from various historical activities at the site, however the responsible party is unknown at this time. In addition, the current owner of the property is likely deemed an "innocent landowner" as defined by NCAC 2L .0101. However, any future purchaser of the property that has prior knowledge of the existing contamination will assume regulatory responsibility for any assessment and cleanup of known contamination.
2. Due to the high levels of Arsenic present in the samples from the site monitoring wells, further assessment appears necessary to define the extent of the problem and, if deemed necessary source removal and cleanup to restore the natural groundwater resources.
3. The Division recommends additional soil assessment to look for a potential source, possibly in proximity to the building adjacent to site monitoring wells MW-6 and MW-7. In addition, further groundwater assessment is recommended to confirm if the contamination is limited in scope or has migrated off the site boundaries.

If you have questions regarding this letter, please call Geoff Kegley at the Groundwater Section of the Division of Water Quality at (910) 395-3900 ext. 240.

Yours very truly,

Charles F. Stehman Ph.D., P.G.
Environmental Regional Supervisor

CFS/GGK
cc: WiRO-GWS
BB&T, Mr. Sonny Wall, 115 N. 3rd Street, Wilmington, NC 28402
Clark Environmental Services, P.C., Joanne Shadroui

S:\GWS\Geoff\Letters\ Wetsig Yacht Facility Jan04

N. C. Division of Water Quality – Groundwater Section
127 Cardinal Drive Extension
Wilmington, North Carolina 28405
Phone: 910-395-3900 \ FAX: 910-350-2004 \ Internet: www.enr.state.nc.us

APPENDIX II

STANDARD METHODS FOR CONDUCTING SUBSURFACE INVESTIGATIONS

STANDARD METHODS FOR CONDUCTING

SUBSURFACE ENVIRONMENTAL INVESTIGATIONS

STANDARD METHODS FOR CONDUCTING

SUBSURFACE ENVIRONMENTAL INVESTIGATIONS

1.0 DATA COLLECTION:

1.1 PROJECT BACKGROUND:

Historical information relevant to comprehensive subsurface investigation is generated through a wide spectrum of potential sources. Those most often utilized as credible sources include, but are not limited to, the following:

1.1.1 Correspondence and/or conversations with clients, regulatory officials and attorneys;

1.1.2 Regulatory mandates;

1.1.3 Pre-existing reports and other technical data;

1.1.4 Public records;

1.1.5 Documented eyewitness accounts;

1.1.6 Site reconnaissance.

1.2 POTENTIAL RECEPTOR SURVEYS:

Potential plume receptor data is generated on a site-specific basis. The scope of information is based upon the intended level of investigation. The availability of data is dependent, to differing degrees, upon the existence and accuracy of public and private record keeping, and on property ingress and egress. Generally, an attempt is made to facilitate a reasonable determination of possible environmental impacts in the context of the investigation being conducted, with the goal of adequate and appropriate site assessment and corrective action planning. Potential receptors are identified and surveyed/evaluated in the context of individual relevance and/or regulatory mandate or guidance.

1.3 SITE SURVEYS:

Physical surveys are utilized in the development of a horizontal and vertical project database. The data is often used to construct maps, to assist in making hydrogeologic determinations, and to aid in corrective action planning.

1.3.1 Horizontal Control:

Horizontal survey data is compiled using a possible combination of methods. Usually standard field and computational methods are employed. However, existing survey maps and/or photogrammetric techniques may be utilized, or a combination of existing data and field generated information may be used.

1.3.2 Vertical Control:

Vertical survey data is utilized primarily for establishing hydrogeologic control, and for evaluating topographic characteristics when necessary. The datum plane is generally assumed, except as otherwise noted. Assumed benchmarks are generally chosen to correspond with the approximate ground level, and vertical control is generally carried to an accuracy of +/- 0.01'.

1.4 DRILLING/HAND AUGERING AND MONITORING WELL/RECOVERY WELL/PIEZOMETER INSTALLATION:

Drilling, hand augering and subsurface installations are accomplished in accordance with site-specific requirements, regulatory requirements and feasibility considerations. The method employed at a specific site is tailored to the situation. Prior to any drilling or well construction activities, all necessary permits are obtained in accordance with federal, state and local requirements. All applicable licensing and bonding requirements are also fulfilled prior to beginning any work. Any boreholes purposely conducted at off-site locations are previously permitted through ingress/egress agreements with affected property owners or their agents.

1.4.1 Drilling Methods:

The following drilling methods are utilized:

1.4.1.1 Hand Augering:

Hand augering is commonly employed where economically, scientifically and/or situationally feasible. Hand augers typically produce 3" to 5" holes.

1.4.1.2 Auger Drilling:

Auger drilling is most often utilized in subsurface investigations. A truck or trailer mounted rig is usually employed and continuous five foot auger flights of varying configurations are used to produce the borehole. Sampling is often accomplished through

hollow stem type augers. Auger selection is based on site-specific requirements.

1.4.1.3 Rotary Drilling:

Air or mud rotary drilling may be utilized for special applications where necessary or appropriate. Rotary drilling is usually preferred and often utilized for telescoping well installations.

1.4.1.4 Other Drilling Methods:

Other methods such as coring, cable tool, truck mounted bucket augering, hammer drilling, and reverse rotary are not commonly utilized except under special circumstances.

1.4.2 Decontamination:

Drilling tools are thoroughly cleaned between boreholes to prevent cross-contamination. Depending upon site-specific circumstances, cleaning methods may include steam cleaning, detergent wash, nitric acid rinsing and deionized water or analyte free water rinsing.

1.4.3 Soil Sample Collection/Borehole Monitoring:

Typically, soil samples are retrieved using a split-spoon device at five foot intervals. Cuttings and penetration rates are continuously monitored and additional samples are taken when appropriate. Grab samples may be obtained utilizing clean sampling equipment, new latex gloves, and are containerized in sealable plastic bags. The samples are then allowed to volatilize for approximately ten minutes prior to field screening. Composite samples may be obtained and a complete description of the collection procedure is recorded in the field book.

1.4.4 Well Installation:

Wells/piezometers are typically constructed utilizing threaded PVC casing and screen. Glues and cements are not used. Stainless steel or Teflon materials may also be used if site-specific conditions dictate.

Filter packs are selected to be compatible with screen slot characteristics. Bentonite is utilized to seal the borehole above the filter pack and grout is used to fill the remaining annulus. Well diameter and protective covers are chosen specific to site conditions. Well construction records are prepared from field notes. A well tag

is affixed to the well head and includes the project name, driller's license number, borehole number, date of installation, total depth, casing depth, well diameter, screened-, sand-, bentonite-, and grout-interval and static water level. The well is secured with a locking cap.

1.4.5 Well Development:

Under appropriate circumstances, wells are developed by overpumping, surging or bailing. Any contaminated development water is temporarily stored on-site for proper disposal. For large volumes of contaminated water, other site-specific arrangements may be made. Sampling is conducted a minimum of 24 hours following well installation and development.

1.4.6 Boring Logs:

All boreholes are logged for geological properties. Boring logs include the project name, hole number, date of boring and on-site geologist's name. Soil classification, soil description, relative wetness and photoionization detection readings are recorded for all split-spoon and grab samples obtained to total depth.

1.5 HYDROGEOLOGIC DATA:

Many methods are utilized for obtaining hydrogeologic data. Those methods most commonly utilized are as generally described below:

1.5.1 Regional Framework:

Information relating to the regional geological scope are generally compiled from existing published literature; however, previous technical reports, unpublished reports and personal communications with qualified Geologists may also be utilized.

1.5.2 Site Characteristics:

Most site information is generated through investigations on-site, although previous work proximal to the area of investigation may also be utilized. Borehole descriptions are important for making interpretations with respect to contacts, lithostratigraphic gradations, facies changes, fractures, faults, cleavage and diagenetic porosity and permeability modifications. Geophysical methods may also be employed.

1.5.3 Groundwater Measurements:

Groundwater measurements include physical and chemical qualitative and quantitative parameters. There are many procedures for making groundwater determinations in the field, including, but not limited to, those listed below:

1.5.3.1 Water Well Levels:

Water levels are primarily measured using pre-cleaned probes or tapes in conjunction with water and gas finding pastes. Measurements are usually made to an accuracy of +/- 0.01'. Floating products are measured and a specific gravity determination is made for each product type. A specific gravity adjustment is then used to calculate true hydraulic grade. Well measurements are combined with vertical survey data to calculate relative groundwater elevations. Transducers, bubbler lines or other methods may also be used under special circumstances to make water level measurements. All water level measuring equipment is decontaminated prior to measuring subsequent wells.

1.5.3.2 Aquifer Tests:

Various aquifer tests may be utilized to characterize aquifer parameters. These tests may include, but are not limited to, pumping tests, slug tests, recovery tests, tracer tests, specific capacity tests, laboratory permeability tests, sieve and pipette analyses and drawdown tests. Vertical gradients are usually characterized through nested well configurations. Other methods, including fracture tracing, geophysical logging and resistivity surveys may be utilized on a site-specific basis.

1.5.3.3 Chemical Data:

Chemical data may be field measured using organic analyzers, pH meters or litmus paper, specific conductance meters, thermometers or other equipment.

1.6 CONTAMINATION DATA:

1.6.1 Collection Methods:

Depending upon the nature of contamination, many methods are utilized to collect information. The following are the most commonly utilized methods; however, the list is not inclusive:

1.6.1.1 Direct thickness measurements of phase (gravity) separated components.

1.6.1.2 Laboratory analyses of free phase products.

1.6.1.3 Specific gravity measurements of free phase products.

1.6.1.4 Field vapor or headspace analysis.

1.6.1.5 Laboratory analysis of vapor, soil and groundwater.

1.6.1.6 Visual observations.

1.6.1.7 Field analytical procedures including: temperature, conductance, pH, etc.

1.6.1.8 Geophysical methods.

1.6.2 Field Screening:

Field screening of soil samples is performed to determine the extent of soil contamination and to help direct the placement of permanent monitoring wells by providing relative contamination levels. Freshly retrieved samples are containerized, sealed and allowed to volatilize for a brief period prior to monitoring. Vapor readings are obtained from headspace within the container. All field measurements are recorded and reported in relevant reports.

A photoionization detector (PID) is utilized to conduct field screening. The instrument is routinely calibrated for measuring the suspected contaminant by following the manufacturer's instructions to insure proper functioning of the PID. The calibration procedure involves utilizing a pressurized tank of a sample gas (benzene equivalent) of known concentration which should produce a projected reading at a given intake pressure. At the recommended pressure, the PID is adjusted to the manufacturer's specified reading.

1.6.3 Field Sampling for Laboratory Analyses:

Field sampling methods are generally in accordance with the 1986 EPA SOP and QA Manual and state guidance documents. Duplicate samples are obtained during all major site investigations. Rigorous cleaning procedures are adhered to and quality control blanks are utilized. All sampling equipment is thoroughly cleaned and rinsed between boreholes. Sample containers are new, laboratory-prepared and are never reused by field personnel. Chain of custody is documented throughout the sample handling process and included with all laboratory reports. State licensed laboratories will be utilized. Generally, sampling procedures are as follows:

1.6.3.1 Products:

Pure product samples are refrigerated and shipped to the analytical laboratory.

1.6.3.2 Soil:

Soil samples are obtained utilizing pre-cleaned equipment, and quickly containerized. Samples are then immediately refrigerated and shipped to the analytical laboratory.

1.6.3.3 Surface Water:

Grab samples are obtained with the sampler facing the upstream direction, if in a flowing body of water. Samples are refrigerated and shipped to the analytical laboratory.

1.6.3.4 Vapor:

Vapor samples are obtained utilizing either carbon tubes in conjunction with a calibrated pump, Tedlar bags, or by using a glass syringe. Samples are refrigerated and shipped to an analytical laboratory.

1.6.3.5 Water Supply Wells:

Water supply wells are difficult to properly purge and sample due to several factors including:

A) availability of accurate construction records;

B) inaccessibility;

C) attached appurtenances such as tanks, treatment systems, etc.;

D) agitation from pumping; and/or

E) analyte-incompatible construction materials.

Generally, an attempt is made to obtain samples from as close to the wellhead as possible, and to completely purge the well and any attached equipment such as holding or pressure tanks. Also, prior to actual sample collection, flow is slowed to a trickle to minimize agitation. If possible, the sample is taken directly from the well using a bailer.

1.6.3.6 Monitoring Wells:

Monitoring wells are sampled according to a standard procedure, as follows:

A) A total storage volume is calculated for each well.

B) Three volumes are removed using a bailer or purging pump. If the well dries up during bailing, a minimum of one volume is removed.

C) Samples are labeled.

D) Samples are refrigerated and immediately preserved and/or containerized in accordance with protocol.

E) Sampling records are completed.

F) Chain of custody records are completed.

G) A travel blank will be utilized. It will originate at the laboratory and will remain with all samples until returning to the laboratory.

H) Samples are promptly shipped to the analytical laboratory.

1.7 CONSTRUCTION DATA:

Site conditions may warrant additional intrusions, excavations or construction to evaluate or remediate known or potential hazards at the site. All construction work will be conducted under the direct supervision of a senior technician or project manager. An as-built system survey will depict site constructions.

1.7.1 Excavations:

Access to excavations will be limited by use of traffic cones, lighted barricades, caution tape or some other apparatus. Open excavations will be backfilled promptly.

1.7.2 Electrical Equipment:

Choice of electrical equipment will be dependent on intended use and site-specific characteristics. Access to such equipment will be limited by the construction of a barricade or fenced enclosure.

1.7.3 Health and Safety Plan:

Personnel will carry a site-specific Health and Safety Plan to the site during every site visit.

2.0 DATA COMPILATION/EVALUATION:

Data is compiled and evaluated in accordance with generally accepted industry standards, which are summarized as follows:

2.1 BACKGROUND DATA:

Background information is utilized to develop an historical perspective relating to the identification of all potential sources or contributors.

2.2 RECEPTOR DATA:

Receptor information is evaluated with regard to the potential for past, current and future environmental impact.

2.3 SURVEY DATA:

Horizontal survey data is reduced and utilized in the development of site maps for use as a framework to provide a spacial context. Vertical survey data is utilized to provide a vertical datum for hydrogeologic and topographic characterizations. A licensed surveyor may be utilized to conduct the initial comprehensive survey and subsequent surveys may be conducted by the contractor.

2.4 DRILLING DATA:

Drilling information is compiled and presented in boring logs. The information is utilized for hydrogeologic characterizations.

2.5 WELL CONSTRUCTION:

Well construction information is utilized in the development of as-built well details and/or other well construction records and evaluated in terms of depths and screen settings as they relate to hydrogeologic and contaminant characteristics.

2.6 CONTAMINATION/LABORATORY ANALYSES DATA:

Laboratory and other analyses data are utilized in the development of maps, calculations, models and other constructions and are used in developing and monitoring corrective actions.

2.7 GEOLOGICAL/HYDROGEOLOGICAL DATA:

Geological and hydrogeological data are used for developing maps, calculations and other constructions as they relate to making characterizations and developing and monitoring corrective actions.

APPENDIX III

BORING LOGS, WELL CONSTRUCTION RECORDS, AND AS-BUILT WELL DETAILS

CLARK ENVIRONMENTAL SERVICES, P.C.
BORING LOG

PROJECT NAME: Wetsig Yachts
LOCATION: Wilmington, NC
CES PROJECT NO: 02106

WELL NO: MW8
DATE: 01/16/04
LOGGED BY: J. Shadroui

DEPTH		DESCRIPTION	BLOW COUNT	PID VAPOR SURVEY	
FROM (ft BGS)	TO (ft BGS)			ODOR	READING (ppm)
0.0	1.0	Grassy roots, mixed yellow tan and light brown silty SAND (5 YR 3/2), slightly damp	-	None	-
1.0	2.0	Yellow tan silty SAND, few bits of limestone gravel, pieces of wood	-	None	-
2.0	3.0	Yellow tan silty SAND (10 YR 6/6), few bits of limestone gravel	-	None	-
3.0	5.0	Medium brown silty very fine SAND (4") grades abruptly to bright yellow orange fine SILT (18") which is mottled orange and tan (10 YR 6/6), split spoon	-	None	-
5.0	8.0	White and light tannish gray fine SAND (10 YR 8/2)	-	None	-
8.0	10.0	Light tan to light gray very fine SAND (10 YR 8/2 - 5 YR 7/2), wet, split spoon	-	None	-
10.0	12.0	Very light gray to light tan gray slightly clayey very fine SAND	-	None	-

NOTE: 1) ppm represents parts per million
2) ft BGS represents feet below ground surface
3) PID denotes photoionization detection

CLARK ENVIRONMENTAL SERVICES, P.C.
BORING LOG

PROJECT NAME: Wetsig Yachts
LOCATION: Wilmington, NC
CES PROJECT NO: 02106

WELL NO: MW9
DATE: 01/16/04
LOGGED BY: J. Shadroui

DEPTH		DESCRIPTION	BLOW COUNT	PID VAPOR SURVEY	
FROM (ft BGS)	TO (ft BGS)			ODOR	READING (ppm)
0.0	1.0	Grassy roots and medium brown (10 YR 4/2) silty SAND, grades to a very bright yellow orange fine SAND (10 YR 8/6), crumbly and dry	-	None	-
1.0	2.0	Bright yellow orange fine SAND with a few bits of brick and round pebbles (similar to what's in site's old coarse concrete)	-	None	-
2.0	3.0	Light colored brownish tan fine silty SAND (10 YR 7/4)	-	None	-
3.0	4.0	Light colored brownish tan fine silty SAND grades to a bright (5 YR 5/6) orange brown clayey sandy SILT (possibly degraded brick)	-	None	-
4.0	6.0	Bright yellow tan (10 YR 8/6) grades to very light white to light gray tan (10 YR 8/2) fine grained SAND, sugary, damp, split spoon	-	None	-
6.0	9.0	Light gray/tan gray fine SAND, wet	-	None	-
9.0	11.0	White to very light tan (10 YR 8/2) fine sugary SAND, well sorted, split spoon	-	None	-
11.0	12.0	Fine white SAND	-	None	-

NOTE: 1) ppm represents parts per million
2) ft BGS represents feet below ground surface
3) PID denotes photoionization detection

CLARK ENVIRONMENTAL SERVICES, P.C.
BORING LOG

PROJECT NAME: Wetsig Yachts
LOCATION: Wilmington, NC
CES PROJECT NO: 02106

WELL NO: MW10/SB27
DATE: 01/16/04
LOGGED BY: J. Shadroui

DEPTH		DESCRIPTION	BLOW COUNT	PID VAPOR SURVEY	
FROM (ft BGS)	TO (ft BGS)			ODOR	READING (ppm)
0.0	1.0	Grassy roots, soil	-	-	-
1.0	2.0	Medium brown silty SAND	-	-	-
2.0	3.0	Light yellowish tan (10 YR 8/6) silty fine SAND, damp	-	-	-
3.0	4.0	White and light yellow silty fine SAND (sample 2-4 ft.)	-	-	-
4.0	5.0	Tan very fine SAND (10 YR 8/2) and (10 YR 8/6)	-	-	-
5.0	9.0	Orange brown, bright fine silty SAND	-	-	-
9.0	11.0	Orange tan silty SAND grades to fine to medium white and orange SAND, wet, split spoon	-	-	-
11.0	12.0	Light yellow brown SAND, wet	-	-	-

NOTE: 1) ppm represents parts per million
2) ft BGS represents feet below ground surface
3) PID denotes photoionization detection

CLARK ENVIRONMENTAL SERVICES, P.C.
BORING LOG

PROJECT NAME: Wetsig Yachts
LOCATION: Wilmington, NC
CES PROJECT NO: 02106

WELL NO: MW11
DATE: 04/13/04
LOGGED BY: J. Blanke

DEPTH		DESCRIPTION	PID VAPOR SURVEY	
FROM (ft BGS)	TO (ft BGS)		ODOR	READING (ppm)
0	1	Top soil/dark brown SILT; into pale brown slightly sandy SILT	-	-
1	2	Gray SILT, slightly moist at approximately 2 ft.	-	-
2	3	Gray SILT with minor clay and very fine SAND grains	-	-
3	4	Gray SILT with minor clay and some fine sand grains, very moist to wet at approximately 3.5 ft.	-	-
4	5	Gray clayey SILT with some very fine sand grains	Sulfur Odor	-
5	6	Pale gray clayey SAND	-	-
6	7	Pale gray very clayey SAND	-	-
7	8	Pale gray fine SAND with minor clay; into pale yellow fine SAND	-	-
8	11.5	SAND	-	-

NOTE: 1) ppm represents parts per million
2) ft BGS represents feet below ground surface
3) PID denotes photoionization detection
d. Concrete vibrator used to advance well from 8 ft. to 11.5 ft. in depth

CLARK ENVIRONMENTAL SERVICES, P.C.
BORING LOG

PROJECT NAME: Wetsig Yachts
LOCATION: Wilmington, NC
CES PROJECT NO: 02106

WELL NO: MW12
DATE: 04/14/04
LOGGED BY: J. Blanke

DEPTH		DESCRIPTION	PID VAPOR SURVEY	
FROM (ft BGS)	TO (ft BGS)		ODOR	READING (ppm)
0	1	Top soil/dark brown organic SILT	-	-
1	2	Gray SILT	-	-
2	3	Pale brown/gray slightly clayey SILT	-	-
3	4	Gray clayey SILT	-	-
4	5.5	Gray clayey SILT with silty clay lenses	-	-
5.5	6	Gray to very pale brown SILT	-	-
6	7	Pale brown SILT, wet at approximately 7 ft.	-	-
7	8	Pale brown SILT; into gray very fine SAND at approximately 7.5 ft.	-	-
8	11.5	SAND	-	-

NOTE:
1) ppm represents parts per million
2) ft BGS represents feet below ground surface
3) PID denotes photoionization detection
4) Concrete vibrator used to advance well from 8 ft. to 11.5 ft. in depth

CLARK ENVIRONMENTAL SERVICES, P.C.
BORING LOG

PROJECT NAME: Wetsig Yachts
LOCATION: Wilmington, NC
CES PROJECT NO: 02106

WELL NO: DMW1
DATE: 05/19/04
LOGGED BY: J. Blanke

DEPTH		DESCRIPTION	PID VAPOR SURVEY	
FROM (ft BGS)	TO (ft BGS)		ODOR	READING (ppm)
0.0	1.0	Topsoil/tannish brown silty fine SAND	-	-
1.0	3.0	Dark brown silty fine SAND	-	-
3.0	5.0	Tannish brown silty SAND	-	-
5.0	6.0	Dark gray sandy SILT	-	-
6.0	8.0	Gray silty very fine SAND	-	-
8.0	9.0	Gray silty very fine SAND	-	-
9.0	11.0	Gray silty very fine SAND	-	-
11.0	13.0	Gray fine SAND into beige to white silty very fine SAND at 11/5'	-	-
13.0	15.0	Beige to white silty very fine SAND	-	-
15.0	17.0	Beige to white silty very fine SAND	-	-
17.0	19.0	Beige to white silty very fine SAND	-	-
19.0	21.0	Beige to white silty very fine SAND	-	-
21.0	23.0	Beige to white silty very fine SAND	-	-
23.0	25.0	Beige to white silty very fine SAND	-	-
25.0	27.0	Beige to white silty very fine SAND	-	-
27.0	29.0	Beige to white silty very fine SAND	-	-
29.0	31.0	Beige to white silty very fine SAND	-	-
31.0	33.0	Tannish brown/orange silty fine to coarse SAND into tannish brown silty fine to medium SAND @31.5' with few pebbles @~32' where sharp contact with slightly greenish dark gray CLAY (thin sand lense @ 32.2'; greenish gray CLAY to ~32.9, last ~2' has shell hash inclusive and tannish brown coarse SAND @ ~32.9' (below clay with shell hash)	-	-

NOTE: 1) ppm represents parts per million
2) ft BGS represents feet below ground surface
3) PID denotes photoionization detection

CLARK ENVIRONMENTAL SERVICES, P.C.
BORING LOG

PROJECT NAME: Wetsig Yachts
LOCATION: Wilmington, NC
CES PROJECT NO: 02106

WELL NO: DMW2
DATE: 05/31/04
LOGGED BY: J. Blanke

DEPTH		DESCRIPTION	PID VAPOR SURVEY	
FROM (ft BGS)	TO (ft BGS)		ODOR	READING (ppm)
0.0	1.0	Topsoil/root organic dark brown SILT	-	-
1.0	2.0	Gray SILT	-	-
2.0	3.0	Gray slightly clayey SILT	-	-
3.0	4.0	Gray clayey SILT	-	-
4.0	5.5	Gray clayey SILT with silty clay in lenses	-	-
5.5	7.0	Pale brown SILT	-	-
7.0	8.0	Pale brown SILT into gray very fine SAND	-	-
8.0	27.0	Very light gray to white silty very fine SAND	-	-
27.0	29.0	White/beige silty very fine SAND	-	-
29.0	31.0	White/beige silty very fine SAND	-	-
31.0	33.0	White/beige silty very fine SAND	-	-
33.0	35.0	White/beige silty very fine SAND	-	-
35.0	37.0	Very light tan fine SAND with slightly clayey SAND lense @~36.75 (~.2')	-	-
37.0	39.0	Light tan/beige fine SAND rods sinking in hole	-	-
39.0	41.0	Light tan/beige fine SAND, rods can be hand pushed	-	-
41.0	43.0	Light tan/beige silty very fine SAND	-	-

NOTE: 1) ppm represents parts per million
2) ft BGS represents feet below ground surface
3) PID denotes photoionization detection

CLARK ENVIRONMENTAL SERVICES, P.C.
BORING LOG

PROJECT NAME: Wetsig Yachts
LOCATION: Wilmington, NC
CES PROJECT NO: 02106

BORING NO: SB24
DATE: 04/30/03
LOGGED BY: J. Shadroui

DEPTH		DESCRIPTION	PID VAPOR SURVEY	
FROM (ft BGS)	TO (ft BGS)		ODOR	READING (ppm)
0.0	1.0	Roots, dark yellow orange (10 YR 6/6) silty fine SAND	-	-
1.0	2.0	Grayish orange (10 YR 7/4) silty fine SAND grades to reddish orange (5 YR 5/6)	-	-
2.0	2.5	Same reddish orange (5 YR 5/6) very fine SAND, slightly clayey SILT, sampled 1 - 2.5 ft.	-	-

NOTE: 1) ppm represents parts per million
2) ft BGS represents feet below ground surface
3) PID denotes photoionization detection

BORING NO: SB25B
LOGGED BY: J. Shadroui

DATE: 01/16/04

DEPTH		DESCRIPTION	PID VAPOR SURVEY	
FROM (ft BGS)	TO (ft BGS)		ODOR	READING (ppm)
0.0	1.0	Grassy, roots, dark brown black brown soil, tan sandy SILT (10 YR 6/2)	-	-
1.0	2.0	Red brown brick colored clayey SILT, large pebbles and dark brown tan SILT (10 YR 6/2 and 10 YR 4/2), a few quartz small pebbles, sampled	-	-
2.0	3.0	Tannish brown fine silty SAND (10 YR 5/4), damp, sampled	Creosote odor	-
3.0	4.0	Tannish brown fine silty SAND, damp	Creosote odor	-

NOTE: 1) ppm represents parts per million
2) ft BGS represents feet below ground surface
3) PID denotes photoionization detection

CLARK ENVIRONMENTAL SERVICES, P.C.
BORING LOG

PROJECT NAME: Wetsig Yachts
LOCATION: Wilmington, NC
CES PROJECT NO: 02106

BORING NO: SB26
DATE: 01/16/04
LOGGED BY: J. Shadroui

DEPTH		DESCRIPTION	PID VAPOR SURVEY	
FROM (ft BGS)	TO (ft BGS)		ODOR	READING (ppm)
0.0	1.0	Grassy, tan and medium brown silty SAND, roots grades to light yellow tan silty very fine SAND	-	-
1.0	2.0	Grayish brown silty SAND with pieces of old brick bits, quartz grains, dark reddish brown, old pieces of coal and tan silty SAND	-	-
2.0	3.0	Yellowish brown silty fine SAND, bright (10 YR 7/4), sampled	Creosote odor	-
3.0	4.0	Yellowish brown silty fine SAND	-	-

NOTE: 1) ppm represents parts per million
2) ft BGS represents feet below ground surface
3) PID denotes photoionization detection

BORING NO: SB27/MW10
LOGGED BY: J. Shadroui

DATE: 01/16/04

DEPTH		DESCRIPTION	PID VAPOR SURVEY	
FROM (ft BGS)	TO (ft BGS)		ODOR	READING (ppm)
0.0	1.0	Grassy roots, soil	-	-
1.0	2.0	Medium brown silty SAND	-	-
2.0	3.0	Light yellowish tan silty fine SAND (10 YR 8/2), damp, sampled	-	-
3.0	4.0	Light yellowish tan silty fine SAND	-	-

NOTE: 1) ppm represents parts per million
2) ft BGS represents feet below ground surface
3) PID denotes photoionization detection

CLARK ENVIRONMENTAL SERVICES, P.C.
BORING LOG

PROJECT NAME: Wetsig Yachts
LOCATION: Wilmington, NC
CES PROJECT NO: 02106

BORING NO: SB28
DATE: 01/15/04
LOGGED BY: J. Shadroui

DEPTH		DESCRIPTION	PID VAPOR SURVEY	
FROM (ft BGS)	TO (ft BGS)		ODOR	READING (ppm)
0.0	2.0	Concrete at 1.5 ft, orange brown silty SAND to 1.5, 0.25 red brick bits and grades directly into concrete which is white sandy grit (not very hard)	-	-
2.0	3.0	Bricks ground up, very weathered, try for 3-5 ft sample	-	-
2.0	4.0	All brick, base is brick and SAND, split spoon	-	-
4.0	6.0	Brick to 5.25', medium gray NS	-	-
6.0	7.0	Silty clayey damp CLAY, gray brown medium gray NS, sampled	No	-

NOTE: 1) ppm represents parts per million
2) ft BGS represents feet below ground surface
3) PID denotes photoionization detection

BORING NO: SB29
LOGGED BY: J. Shadroui

DATE: 01/15/04

DEPTH		DESCRIPTION	PID VAPOR SURVEY	
FROM (ft BGS)	TO (ft BGS)		ODOR	READING (ppm)
0.0	1.0	Grassy gravel	-	-
1.0	2.0	Concrete	-	-
2.0	3.0	Concrete and brick with some coarse sandy pebbles	-	-
3.0	5.0	4" tan yellow brown silty pebbly SAND (10 YR 7/4), 3" dark brown black peaty SAND, SILT (5 YR 3/2), 6" very fine dark black brown SAND (5 YR 2/1), 2" red brown silty very fine SAND (5 YR 3/4), 6" grayish tan brown sandy CLAY (5 YR 5/2)	-	-

NOTE: 1) ppm represents parts per million
2) ft BGS represents feet below ground surface
3) PID denotes photoionization detection

MW8

WELL CONSTRUCTION RECORD

CES Project No. 02106

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print) Paul Richter CERTIFICATION # 2070

WELL CONTRACTOR COMPANY NAME Clark Environmental Services, PC PHONE # (910) 602-3900

STATE WELL CONSTRUCTION PERMIT# _____ (if applicable) ASSOCIATED WQ PERMIT# _____ (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐ Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use _____

2. WELL LOCATION:
Nearest Town: Wilmington County New Hanover
4022 Market Street
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐Ridge ☐Slope ☐Valley ☒Flat
(check appropriate box)
Latitude/longitude of well location
34°14'16" N; 77° 53'41" W
(degrees/minutes/seconds)
Latitude/longitude source: ☐GPS ☒Topographic map
(check box)

3. OWNER: Paul J. Wetsig
Address 621 Hadley Court
(Street or Route No.)
Wilmington, NC 28405
City or Town State Zip Code
(910) - 392-7158
Area code- Phone number

4. DATE DRILLED 1-16-04
5. TOTAL DEPTH: 12 FT.
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 6.30 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS ~0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.
9. YIELD (gpm): NA METHOD OF TEST NA
10. WATER ZONES (depth): Surficial (2-12 Ft.)

DEPTH From	DEPTH To	DRILLING LOG Formation Description
		See Attached

11. DISINFECTION: Type NA Amount NA
12. CASING:

	Depth From	Depth To	Diameter Ft.	Wall Thickness or Weight/Ft.	Material
	0	2	2 in.	SCH 40	PVC

13. GROUT:

Depth From	Depth To	Material	Method
0	0.5	Gravel cement grout	In-place
0.5	1	Bentonite	In-place

14. SCREEN:

Depth From	Depth To	Diameter Ft.	Slot Size	Material
0.5	1	2 in.	0.010 in.	PVC
		in.	in.	

15. SAND/GRAVEL PACK:

Depth From	Depth To	Size Ft.	Material
2	12	Coarse	Sand

LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common road names.

See Attached

16. REMARKS: _____

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER

SIGNATURE OF PERSON CONSTRUCTING THE WELL — DATE 1/26/04

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

MW9

WELL CONSTRUCTION RECORD

CES Project No. 02106

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print) Paul Richter CERTIFICATION # 2070

WELL CONTRACTOR COMPANY NAME Clark Environmental Services, PC PHONE # (910) 602-3900

STATE WELL CONSTRUCTION PERMIT# _____ (if applicable) ASSOCIATED WQ PERMIT# _____ (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐ Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use _____

2. WELL LOCATION:
Nearest Town: Wilmington County New Hanover
4022 Market Street
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐Ridge ☐Slope ☐Valley ☒Flat
(check appropriate box)
Latitude/longitude of well location
34°14'16" N; 77° 53'41" W
(degrees/minutes/seconds)
Latitude/longitude source: ☐GPS ☒Topographic map
(check box)

3. OWNER: Paul J. Wetsig
Address 621 Hadley Court
(Street or Route No.)
Wilmington, NC 28405
City or Town State Zip Code
(910) - 392-7158
Area code- Phone number

4. DATE DRILLED 1-16-04
5. TOTAL DEPTH: 12 FT.
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 6.39 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS ~0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.
9. YIELD (gpm): NA METHOD OF TEST NA
10. WATER ZONES (depth): Surficial (2-12 Ft.)

DEPTH From	DEPTH To	DRILLING LOG Formation Description
		See Attached

11. DISINFECTION: Type NA Amount NA
12. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From 0	To 2	Ft.	2 in.	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

13. GROUT:

	Depth		Material	Method
From 0	To 0.5	Ft.	Gravel cement grout	In-place
From 0.5	To 1	Ft.	Bentonite	In-place

14. SCREEN:

	Depth		Diameter	Slot Size	Material
From 0.5	To 1	Ft.	2 in.	0.010 in.	PVC
From	To	Ft.	in.	in.	

15. SAND/GRAVEL PACK:

	Depth		Size	Material
From 2	To 12	Ft.	Coarse	Sand
From	To	Ft.		

LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common road names.

See Attached

16. REMARKS: _____

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER

Paul Richter 1/26/04
SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

MW10

WELL CONSTRUCTION RECORD

CES Project No. 02106

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print) Paul Richter CERTIFICATION # 2070

WELL CONTRACTOR COMPANY NAME Clark Environmental Services, PC PHONE # (910) 602-3900

STATE WELL CONSTRUCTION PERMIT# _____ (if applicable) ASSOCIATED WQ PERMIT# _____ (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐ Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use _____

2. WELL LOCATION:
Nearest Town: Wilmington County New Hanover
4022 Market Street
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐Ridge ☐Slope ☐Valley ☒Flat
(check appropriate box)
Latitude/longitude of well location
34°14'16" N; 77° 53'41" W
(degrees/minutes/seconds)
Latitude/longitude source: ☐GPS ☒Topographic map
(check box)

3. OWNER: Paul J. Wetsig
Address 621 Hadley Court
(Street or Route No.)
Wilmington, NC 28405
City or Town State Zip Code
(910) - 392-7158
Area code- Phone number

4. DATE DRILLED 1-16-04
5. TOTAL DEPTH: 12 FT.
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 10.29 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS ~0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.
9. YIELD (gpm): NA METHOD OF TEST NA
10. WATER ZONES (depth): Surficial (2-12 Ft.)

DEPTH From	DEPTH To	DRILLING LOG Formation Description
		See Attached

11. DISINFECTION: Type NA Amount NA
12. CASING:

	Depth From	Depth To	Diameter	Wall Thickness or Weight/Ft.	Material
	0	2	2 in.	SCH 40	PVC

13. GROUT:

Depth From	Depth To	Material	Method
0	0.5	Gravel cement grout	In-place
0.5	1	Bentonite	In-place

14. SCREEN:

Depth From	Depth To	Diameter	Slot Size	Material
0.5	1	2 in.	0.010 in.	PVC
		in.	in.	

15. SAND/GRAVEL PACK:

Depth From	Depth To	Size	Material
2	12	Coarse	Sand

LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common road names.

See Attached

16. REMARKS: _____

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER

SIGNATURE OF PERSON CONSTRUCTING THE WELL — DATE 1/26/04

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

MW11

WELL CONSTRUCTION RECORD

CES Project No. 02106

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print) Paul Richter CERTIFICATION # 2070

WELL CONTRACTOR COMPANY NAME Clark Environmental Services, P.C. PHONE # (910)602-3900

STATE WELL CONSTRUCTION PERMIT# USTM0800653 (if applicable) ASSOCIATED WQ PERMIT# _____ (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐ Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use _____

2. WELL LOCATION:
Nearest Town: Wilmington County New Hanover
4022 Market St.
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐Ridge ☐Slope ☐Valley ☒Flat
(check appropriate box)
Latitude/longitude of well location
34°14'16"N; 77°53'41"W
(degrees/minutes/seconds)
Latitude/longitude source: ☐GPS ☒Topographic map
(check box)

3. OWNER: Branch Banking & Trust
Address 5130 Parkway Plaza Blvd.
(Street or Route No.)
Charlotte, NC 28217
City or Town State Zip Code
(704)-954-1718
Area code- Phone number

4. DATE DRILLED 04/13/04
5. TOTAL DEPTH: 11.5 Ft.
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 4.76 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS ~0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.
9. YIELD (gpm): NA METHOD OF TEST NA
10. WATER ZONES (depth): Surficial (1.5-11.5 Ft.)

DEPTH From	DEPTH To	DRILLING LOG Formation Description
		See Attached

11. DISINFECTION: Type NA Amount NA
12. CASING:

	Depth From	Depth To	Diameter	Wall Thickness or Weight/Ft.	Material
	0	1.5	2 in.	SCH 40	PVC

13. GROUT:

	Depth From	Depth To	Material	Method
	0	0.4	gravel cement grout	In-place

14. SCREEN:

	Depth From	Depth To	Diameter	Slot Size	Material
	1.5	11.5	2 in.	0.010 in.	PVC
			in.	in.	

15. SAND/GRAVEL PACK:

	Depth From	Depth To	Size	Material
	0.75	11.5	Coarse	Sand

LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common road names.

See Attached

16. REMARKS: _____

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER

SIGNATURE OF PERSON CONSTRUCTING THE WELL — DATE 4/16/04

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

MW12

WELL CONSTRUCTION RECORD

CES Project No. 02106

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print) Paul Richter CERTIFICATION # 2070

WELL CONTRACTOR COMPANY NAME Clark Environmental Services, P.C. PHONE # (910) 602-3900

STATE WELL CONSTRUCTION PERMIT# (if applicable) VSTM0800653 ASSOCIATED WQ PERMIT# (if applicable) _____

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐ Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use _____

2. WELL LOCATION:
Nearest Town: Wilmington County New Hanover
4022 Market St.
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐Ridge ☐Slope ☐Valley ☒Flat
(check appropriate box)
Latitude/longitude of well location
34°14'16"N; 77°53'41" W
(degrees/minutes/seconds)
Latitude/longitude source: ☐GPS ☒Topographic map
(check box)

3. OWNER: Branch Banking & Trust
Address 5130 Parkway Plaza Blvd.
(Street or Route No.)
Charlotte, NC 28217
City or Town State Zip Code
(704)- 954-1718
Area code- Phone number

4. DATE DRILLED 04/14/04
5. TOTAL DEPTH: 11.5 Ft.
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 3.40 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS ~0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.
9. YIELD (gpm): NA METHOD OF TEST NA
10. WATER ZONES (depth): Surficial (1.5 - 11.5 Ft.)

DEPTH From	DEPTH To	DRILLING LOG Formation Description
		See Attached

11. DISINFECTION: Type NA Amount NA
12. CASING:

	Depth From	Depth To	Diameter	Wall Thickness or Weight/Ft.	Material
	0	1.5	2 in.	SCH 40	PVC

13. GROUT:

	Depth From	Depth To	Material	Method
	0	0.4	gravel cement grout	In-place

14. SCREEN:

	Depth From	Depth To	Diameter	Slot Size	Material
	1.5	11.5	2 in.	0.010 in.	PVC
			in.	in.	

15. SAND/GRAVEL PACK:

	Depth From	Depth To	Size	Material
	0.75	11.5	Coarse	Sand

LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common road names.

See Attached

16. REMARKS: _____

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER

SIGNATURE OF PERSON CONSTRUCTING THE WELL 4/16/04 DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

WELL CONSTRUCTION RECORD DMW1

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print) FRANK BEECHER CERTIFICATION # 3225

WELL CONTRACTOR COMPANY NAME CLARK ENVIRONMENTAL SERVICES, P.C. PHONE # (910) 602-3900

STATE WELL CONSTRUCTION PERMIT# _____ (if applicable) ASSOCIATED WQ PERMIT# _____ (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐ Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use _____

2. WELL LOCATION:
Nearest Town: WILMINGTON County NEW HANOVER
4022 MARKET STREET
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐Ridge ☐Slope ☐Valley ☒Flat
(check appropriate box)
Latitude/longitude of well location
34°14'20"N / 77°53'36"W
(degrees/minutes/seconds)
Latitude/longitude source: ☐GPS ☐Topographic map (check box) OTHER ✓

3. OWNER: WETSIG YACHTS
Address 4022 MARKET ST.
(Street or Route No.)
WILMINGTON NC
City or Town State Zip Code
(910)-762-9702
Area code- Phone number

4. DATE DRILLED 5/19/04
5. TOTAL DEPTH: 32'
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 7.50 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS 0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.
9. YIELD (gpm): NA METHOD OF TEST NA
10. WATER ZONES (depth): SURFICIAL AQUIFER

DEPTH From	To	DRILLING LOG Formation Description
ATTACHED		

11. DISINFECTION Type NA Amount NA
12. CASING:

	Depth From	To	Diameter	Wall Thickness or Weight/Ft	Material
	0	22	2"	SCH 40	PVC

13. GROUT:

	Depth From	To	Material	Method
	0	18.5	BENTONITE CEMENT GROUT	TREMMIE

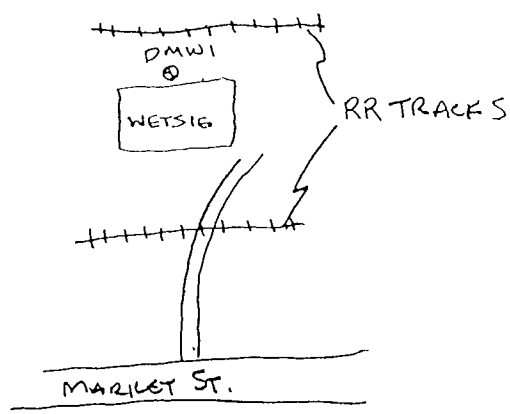
14. SCREEN:

	Depth From	To	Diameter	Slot Size	Material
	22	32	2 in.	.010 in.	PVC
			in.	in.	

15. SAND/GRAVEL PACK:

	Depth From	To	Size	Material
	20.5	32	CRS	SAND

LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common road names



16. REMARKS: _____

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER

(2066) 7/28/04
SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

WELL CONSTRUCTION RECORD DMW2

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print) PAUL RICHTER CERTIFICATION # 2070

WELL CONTRACTOR COMPANY NAME CLARK ENVIRONMENTAL SERVICES, PC PHONE # (910) 602-3900

STATE WELL CONSTRUCTION PERMIT# _____ (if applicable) ASSOCIATED WQ PERMIT# _____ (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐ Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use _____

2. WELL LOCATION:
Nearest Town: WILMINGTON County NEW HANOVER
4022 MARKET ST.
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting ☐Ridge ☐Slope ☐Valley ☒Flat (check appropriate box)

Latitude/longitude of well location 34°14'20"N/77°53'36"W (degrees/minutes/seconds) OTHER ✓

Latitude/longitude source: ☐GPS ☐Topographic map (check box)

3. OWNER: WETSIG YACHTS
Address 4022 MARKET ST. (Street or Route No.)
WILMINGTON NC (City or Town, State, Zip Code)
(910)-762-9702 (Area code- Phone number)

4. DATE DRILLED 5/21/04
5. TOTAL DEPTH: 43.5
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 4.97 FT. (Use "+" if Above Top of Casing)
8. TOP OF CASING IS 0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.
9. YIELD (gpm): NA METHOD OF TEST NA
10. WATER ZONES (depth): SURFICIAL AQUIFER
11. DISINFECTION Type NA Amount NA

DEPTH From	To	DRILLING LOG Formation Description
ATTACHED		

12. CASING:

	Depth From	To	Ft	Diameter	Wall Thickness or Weight/Ft	Material
	0	33.5		2"	SC40	PVC

13. GROUT:

	Depth From	To	Ft	Material	Method
	0	29.5		BENTONITE CEMENT GROUT	TREMMIE

14. SCREEN:

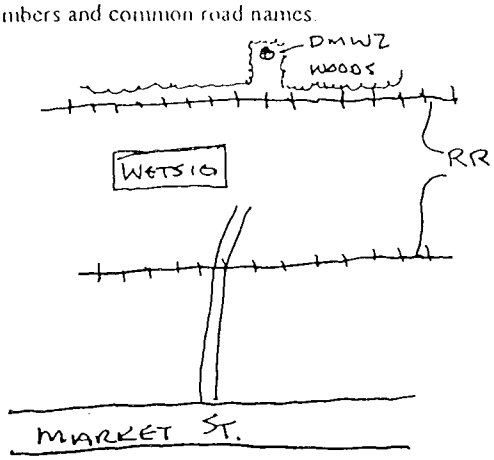
	Depth From	To	Ft	Diameter	Slot Size	Material
	33.5	43.5		2 in.	.010 in.	PVC
				in.	in.	

15. SAND/GRAVEL PACK:

	Depth From	To	Ft	Size	Material
	30.5	43.5		CRS	SAND

LOCATION SKETCH

Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common road names.



16. REMARKS: _____

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER

(2066) 7/28/04

SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

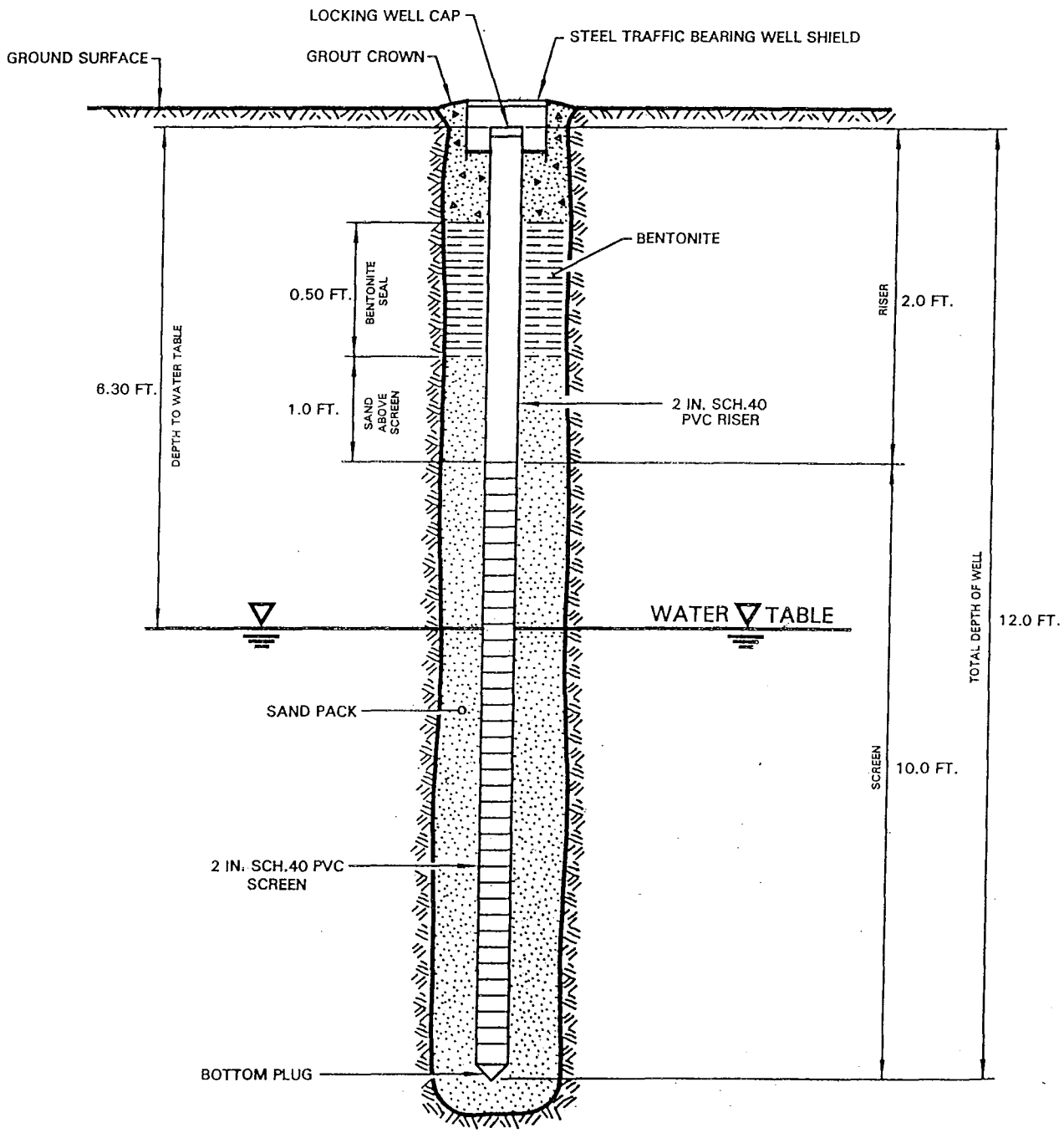
Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV 07/2001

WETSIG YACHTS FACILITY

WILMINGTON, NC
CES PROJECT NO. 02106

MW8



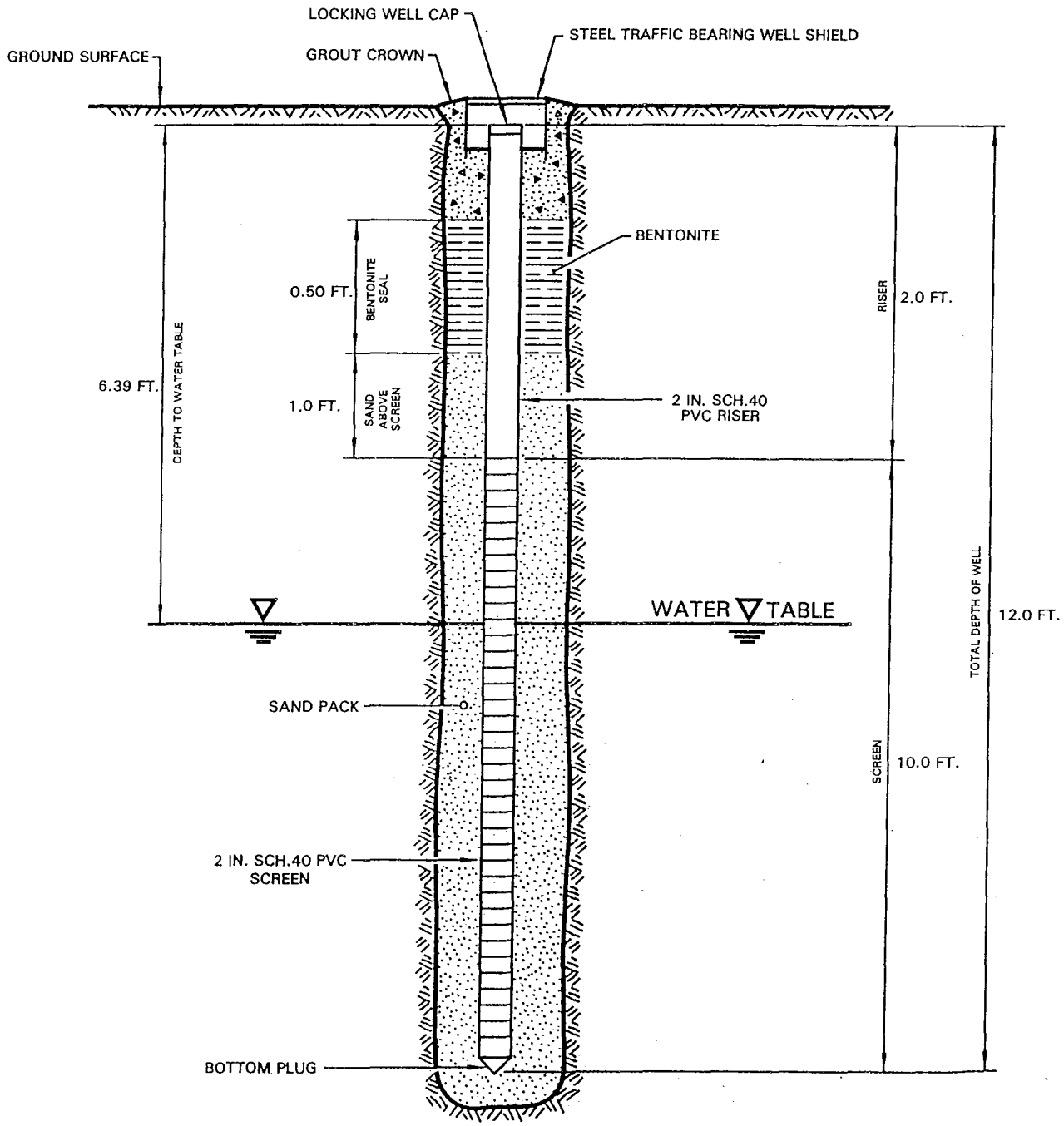
AS-BUILT MONITORING WELL DETAIL

NOT TO SCALE

WETSIG YACHTS FACILITY

WILMINGTON, NC
CES PROJECT NO. 02106

MW9



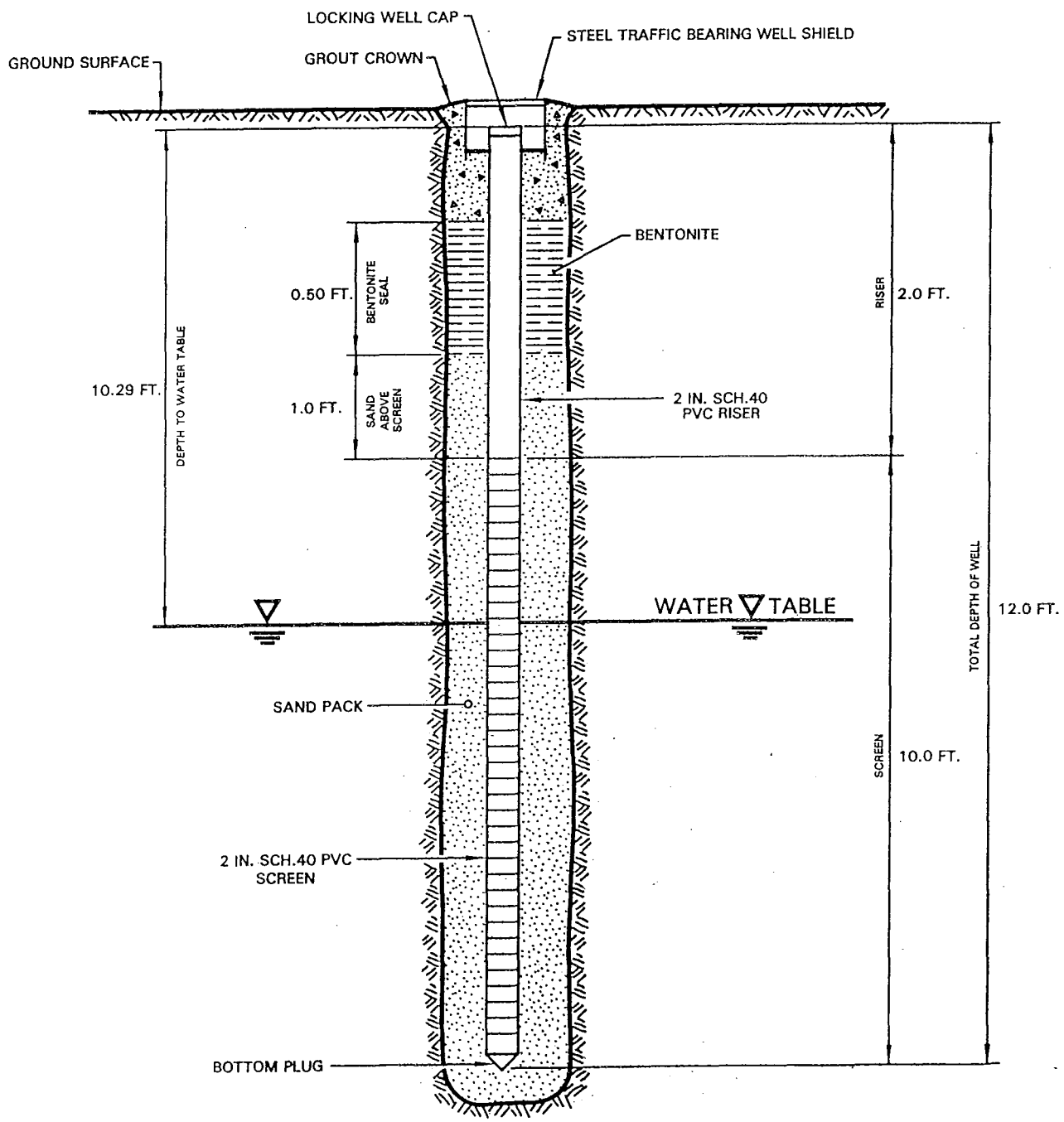
AS-BUILT MONITORING WELL DETAIL

NOT TO SCALE

WETSIG YACHTS FACILITY

WILMINGTON, NC
CES PROJECT NO. 02106

MW10



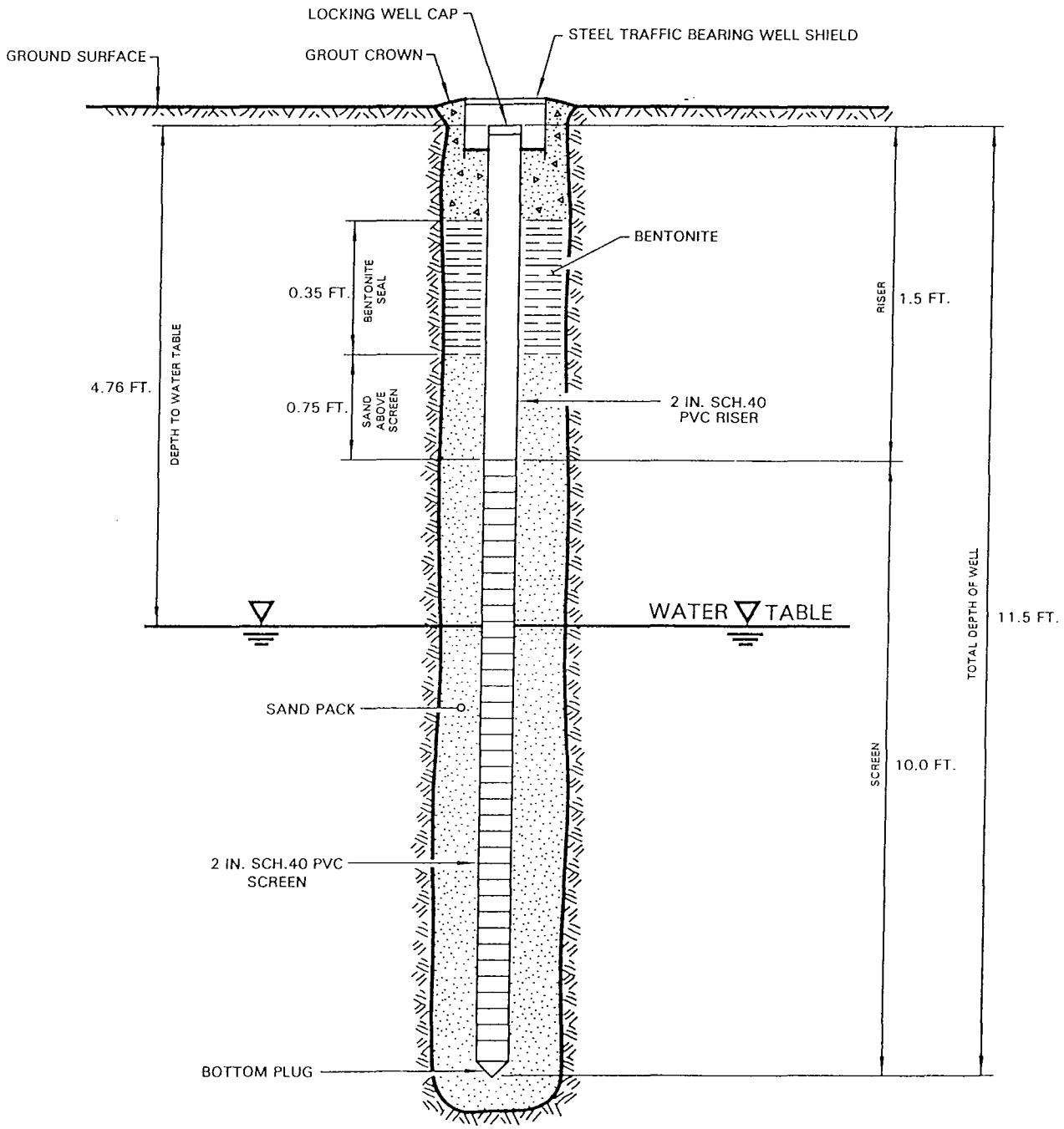
AS-BUILT MONITORING WELL DETAIL

NOT TO SCALE

WETSIG YACHTS

WILMINGTON, NC
CES PROJECT NO. 02106

MW11



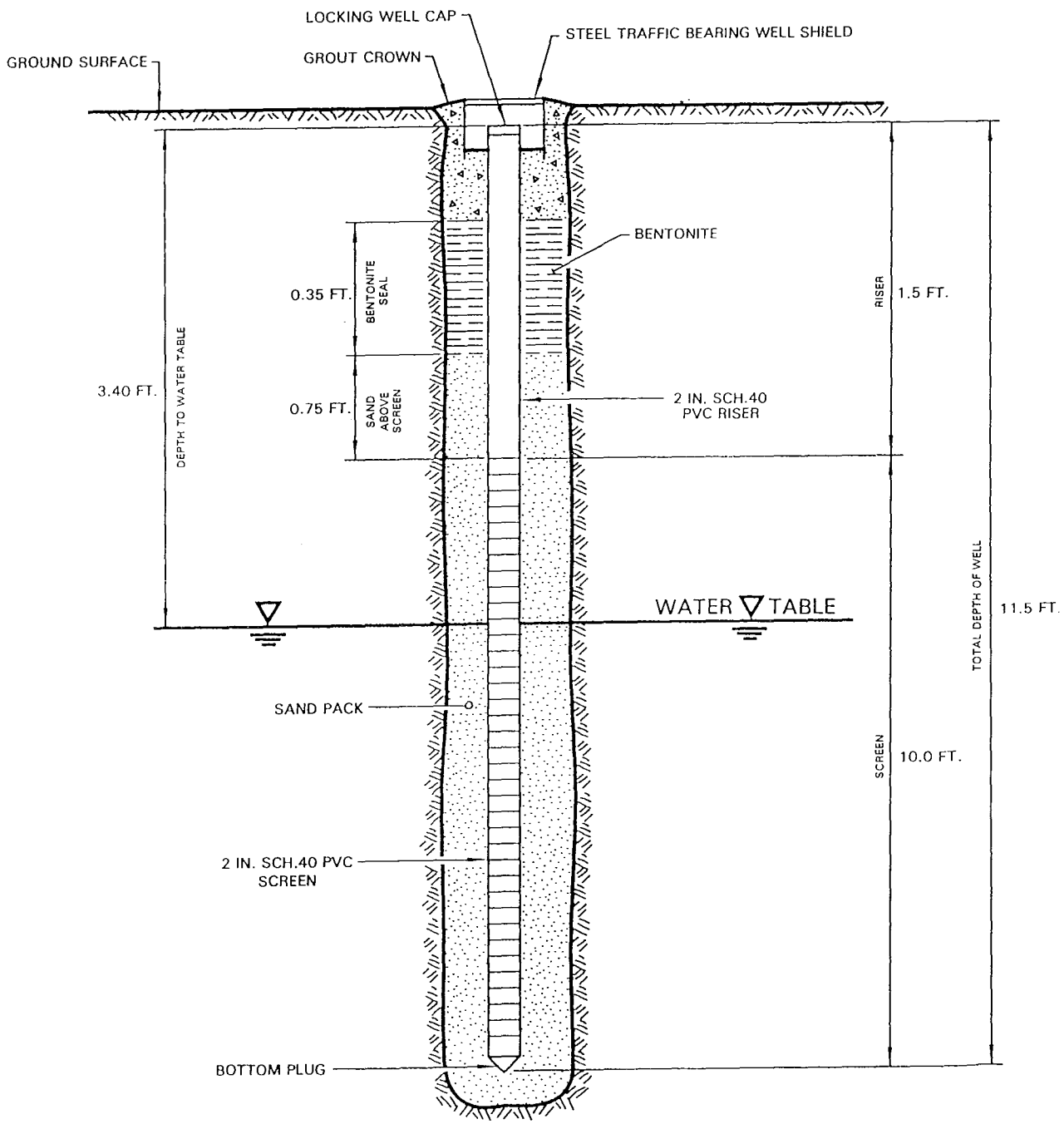
AS-BUILT MONITORING WELL DETAIL

NOT TO SCALE

WETSIG YACHTS

WILMINGTON, NC
CES PROJECT NO. 02106

MW12



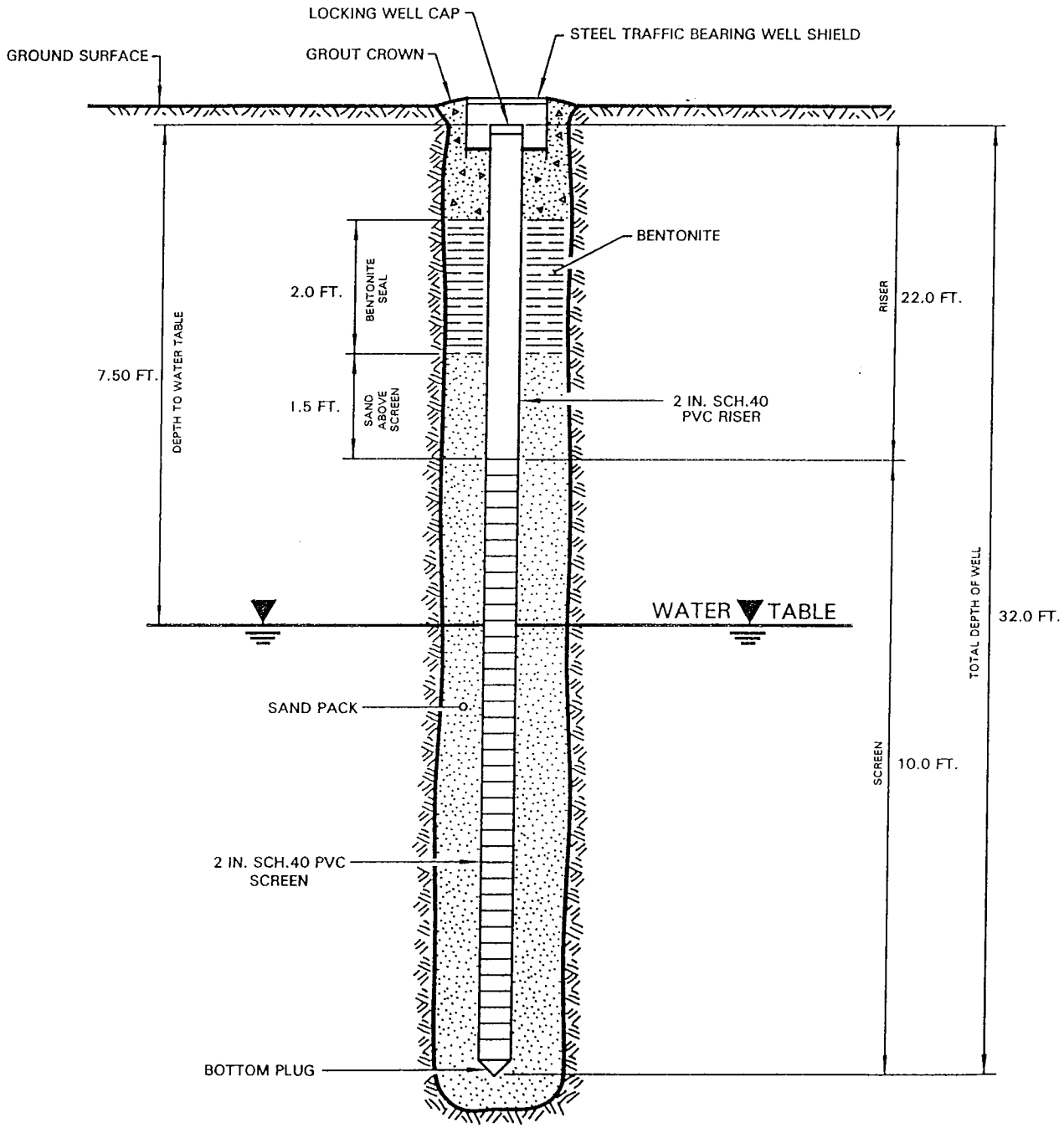
AS-BUILT MONITORING WELL DETAIL

NOT TO SCALE

WETSIG YACHTS FACILITY

WILMINGTON, NC
CES PROJECT NO. 02106

DMW1



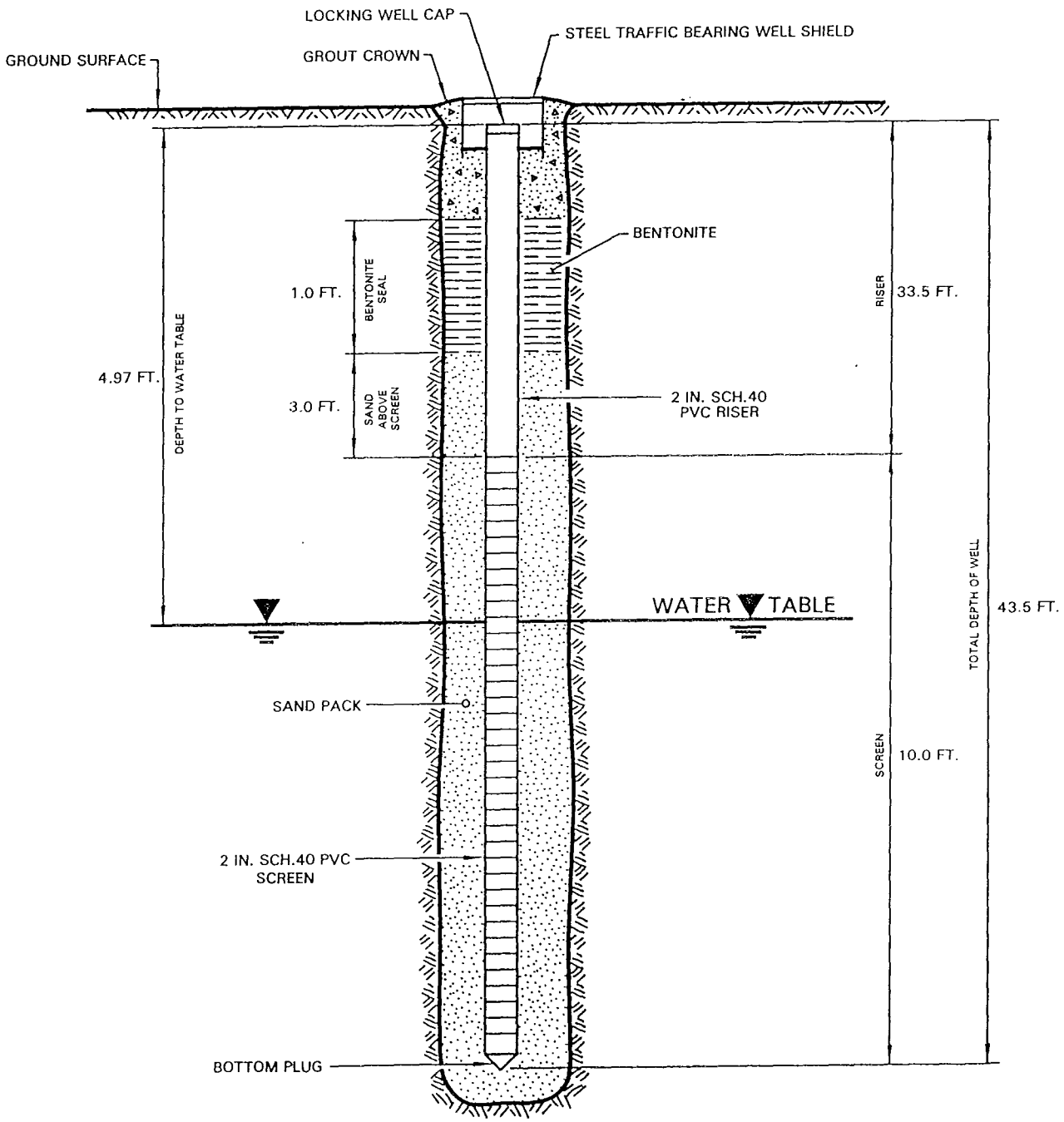
AS-BUILT MONITORING WELL DETAIL

NOT TO SCALE

WETSIG YACHTS FACILITY

WILMINGTON, NC
CES PROJECT NO. 02106

DMW2



AS-BUILT MONITORING WELL DETAIL

NOT TO SCALE

APPENDIX IV

LABORATORY RESULTS AND CHAIN OF CUSTODY FORMS FOR SOIL SAMPLES

PARADIGM ANALYTICAL LABORATORIES, INC.
5500 Business Drive
Wilmington, North Carolina 28405
(910) 350-1903
Fax (910) 350-1557

Mr. Steve Clark
Clark Environmental Services
PO Box 10136
Wilmington, NC 28405

January 28, 2004

Report Number: G211-1666

Client Project ID: 02106

Dear Mr. Clark,

Enclosed are the results of the analytical services performed under the referenced project. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or the services performed during this project, please call Paradigm at (910) 350-1903. We will be happy to answer any questions or concerns which you may have.

Thank you for using Paradigm Analytical Labs for your analytical services. We look forward to working with you again on any additional analytical needs which you may have.

Sincerely,

Paradigm Analytical Laboratories, Inc.

Laboratory Director
J. Patrick Weaver

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Metals

Client Sample ID:	SB25	Analyzed By:	PSW
Client Project ID:	02106	Date Collected:	1/16/04
Lab Sample ID:	86528	Date Received:	1/20/04
Lab Project ID:	G211-1666	Matrix:	Soil
Batch ID:	3127	Solids	83.96
Report Basis:	Dry		

Metals	Result	RL	DF	Units	Method	Date Analyzed
Arsenic	**4.79**	1.10	1	MG/KG	6010B	1/26/04
Chromium	**10.1**	1.10	1	MG/KG	6010B	1/26/04

Comments

BQL = Below Quantitation Limits
DF = Dilution Factor
J = Between MDL and RL

Reviewed By: phil

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Metals

Client Sample ID:	SB26	Analyzed By:	PSW
Client Project ID:	02106	Date Collected:	1/16/04
Lab Sample ID:	86529	Date Received:	1/20/04
Lab Project ID:	G211-1666	Matrix:	Soil
Batch ID:	3127	Solids	84.82
Report Basis:	Dry		

Metals	Result	RL	DF	Units	Method	Date Analyzed
Arsenic	BQL	1.16	1	MG/KG	6010B	1/26/04
Chromium	**28.1**	1.16	1	MG/KG	6010B	1/26/04

Comments

BQL = Below Quantitation Limits

DF = Dilution Factor

J = Between MDL and RL

Reviewed By: mc

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Metals

Client Sample ID:	SB27	Analyzed By:	PSW
Client Project ID:	02106	Date Collected:	1/16/04
Lab Sample ID:	86530	Date Received:	1/20/04
Lab Project ID:	G211-1666	Matrix:	Soil
Batch ID:	3127	Solids	83.99
Report Basis:	Dry		

Metals	Result	RL	DF	Units	Method	Date Analyzed
Arsenic	**1.40**	1.14	1	MG/KG	6010B	1/26/04
Chromium	**11.2**	1.14	1	MG/KG	6010B	1/26/04

Comments

BQL = Below Quantitation Limits

DF = Dilution Factor

J = Between MDL and RL

Reviewed By: mc

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Metals

Client Sample ID:	SB28	Analyzed By:	PSW
Client Project ID:	02106	Date Collected:	1/16/04
Lab Sample ID:	86531	Date Received:	1/20/04
Lab Project ID:	G211-1666	Matrix:	Soil
Batch ID:	3127	Solids	85.68
Report Basis:	Dry		

Metals	Result	RL	DF	Units	Method	Date Analyzed
Arsenic	BQL	1.14	1	MG/KG	6010B	1/26/04
Chromium	**10.4**	1.14	1	MG/KG	6010B	1/26/04

Comments

BQL = Below Quantitation Limits

DF = Dilution Factor

J = Between MDL and RL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Metals

Client Sample ID:	SB29	Analyzed By:	PSW
Client Project ID:	02106	Date Collected:	1/16/04
Lab Sample ID:	86532	Date Received:	1/20/04
Lab Project ID:	G211-1666	Matrix:	Soil
Batch ID:	3127	Solids	81.50
Report Basis:	Dry		

Metals	Result	RL	DF	Units	Method	Date Analyzed
Arsenic	**4.49**	1.10	1	MG/KG	6010B	1/26/04
Chromium	**11.3**	1.10	1	MG/KG	6010B	1/26/04

Comments

BQL = Below Quantitation Limits

DF = Dilution Factor

J = Between MDL and RL

Reviewed By: MC

List of Reporting Abbreviations and Data Qualifiers

B = Compound also detected in batch blank

BQL = Below Quantitation Limit

DF = Dilution Factor

Dup = Duplicate

E = Estimated concentration, exceeds calibration range.

J = Estimated concentration, below calibration range and above MDL

LCS(D) = Laboratory Control Spike (Duplicate)

MDL = Method Detection Limit

MS(D) = Matrix Spike (Duplicate)

PQL = Practical Quantitation Limit

RL = Reporting Limit

RPD = Relative Percent Difference

mg/kg = milligram per kilogram, ppm, parts per million

ug/kg = micrograms per kilogram, ppb, parts per billion

mg/L = milligram per liter, ppm, parts per million

ug/L = micrograms per liter, ppb, parts per billion

% Rec = Percent Recovery

% soilds = Percent Solids

Special Notes:

1) Metals and mercury samples are digested with a hot block, see the standard operating procedure document for details.

2) Uncertainty for all reported data is less than or equal to 30 percent.

PARADIGM ANALYTICAL LABORATORIES, INC.
5500 Business Drive, Wilmington, NC 28405
Phone: (910)-350-1903 FAX: (910)-350-1557

Chain-of Custody Record & Analytical Request

COC# 41111

Page 1 of 1

Client: Clark Environmental Services PC
Address: PO Box 10136
Address: Wilmington NC
Quote #:

Project ID: 02106
Contact: JoAnne
Phone: 602-3900
Fax: 602-3975

Date: 01/16/04
Turnaround: standard
Job Number: Weitsig Yachts
P.O. Number: 02106011604

Report To: JoAnne
Invoice To: CES

Sample ID	Date	Time	Matrix	Preservatives: Ice				Analyses: Arsenic	Chromium									Comments: Please specify any special reporting requirements
SB 25	01/16/04	2:00	soil					✓	✓									
SB 26	01/16/04	2:45	soil					✓	✓									G211-1666
SB 27	01/16/04	3:15	soil					✓	✓									
SB 28	01/16/04	3:35	soil					✓	✓									
SB 29	01/16/04	4:00	soil					✓	✓									

Relinquished By	Date	Time	Received By	Date	Time	Temperature
[signature]	01/20/04	5:15	Paul Waters	1/20/04	5:30	4.1°C

State Certification Requested
NC ____ SC ____ Other ____

SEE REVERSE FOR TERMS AND CONDITIONS

APPENDIX V

SAMPLING RECORDS, LABORATORY REPORTS, AND CHAIN OF CUSTODY FORMS FOR GROUNDWATER SAMPLES

CLARK ENVIRONMENTAL SERVICES, P.C.
GROUNDWATER WELL SAMPLING RECORD

PROJECT NAME:	Wetsig Yachts	WELL NO.:	MW8
LOCATION:	4022 Market St., Wilmington, NC	DATE:	01/20/04
CES PROJECT NO.:	02106	TIME:	14:30
PERSONNEL:	J. Shadroui, M. Tate	WEATHER:	Windy, 40°

A	WELL DIAMETER (INCHES MEASURED)	2
B	GALLONS/FOOT	0.163
C	TOTAL WELL DEPTH (MEASURED FEET)	12.00
D	DEPTH TO LIQUID (MEASURED FEET)	6.30
E	TOTAL LIQUID FEET IN WELL (C-D)	5.70
F	NO. WELL VOLUMES DESIRED (SITE SPECIFIC, USUALLY 3)	3
G	TOTAL GALLONS TO PURGE (B x E x F)	2.79
H	PURGING METHOD (BAILER OR PUMP TYPE)	BAILER
I	BAILER VOLUME (MEASURED/CALCULATED)	0.24
J	NO. BAILS REQUIRED (G ÷ I,IF BAILED)	11.61
K	NO. BAILS TAKEN (COUNTED)	25
L	GALLONS PURGED (MEASURED/CALCULATED)	6.00

PER FOOT WELL VOLUMES	
WELL DIAMETER (IN INCHES)	GALLONS (PER FOOT)
1.00	0.041
1.25	0.064
1.50	0.092
2.00	0.163
4.00	0.653
6.00	1.469
8.00	2.611
10.00	4.080
12.00	5.876
18.00	13.220
24.00	23.502
36.00	52.880

COMMENTS: None

CLARK ENVIRONMENTAL SERVICES, P.C.
GROUNDWATER WELL SAMPLING RECORD

PROJECT NAME:	Wetsig Yachts	WELL NO.:	MW9
LOCATION:	4022 Market St., Wilmington, NC	DATE:	01/20/04
CES PROJECT NO.:	02106	TIME:	14:00
PERSONNEL:	J. Shadroui, M. Tate	WEATHER:	Windy, 40°

A	WELL DIAMETER (INCHES MEASURED)	2
B	GALLONS/FOOT	0.163
C	TOTAL WELL DEPTH (MEASURED FEET)	12.00
D	DEPTH TO LIQUID (MEASURED FEET)	6.39
E	TOTAL LIQUID FEET IN WELL (C-D)	5.61
F	NO. WELL VOLUMES DESIRED (SITE SPECIFIC, USUALLY 3)	3
G	TOTAL GALLONS TO PURGE (B x E x F)	2.74
H	PURGING METHOD (BAILER OR PUMP TYPE)	BAILER
I	BAILER VOLUME (MEASURED/CALCULATED)	0.24
J	NO. BAILS REQUIRED (G ÷ I,IF BAILED)	11.43
K	NO. BAILS TAKEN (COUNTED)	25
L	GALLONS PURGED (MEASURED/CALCULATED)	6.00

PER FOOT WELL VOLUMES	
WELL DIAMETER (IN INCHES)	GALLONS (PER FOOT)
1.00	0.041
1.25	0.064
1.50	0.092
2.00	0.163
4.00	0.653
6.00	1.469
8.00	2.611
10.00	4.080
12.00	5.876
18.00	13.220
24.00	23.502
36.00	52.880

COMMENTS: None

CLARK ENVIRONMENTAL SERVICES, P.C.
GROUNDWATER WELL SAMPLING RECORD

PROJECT NAME:	Wetsig Yachts	WELL NO.:	MW10
LOCATION:	4022 Market St., Wilmington, NC	DATE:	01/20/04
CES PROJECT NO.:	02106	TIME:	13:30
PERSONNEL:	J. Shadroui, M. Tate	WEATHER:	Windy, 40°

A	WELL DIAMETER (INCHES MEASURED)	2
B	GALLONS/FOOT	0.163
C	TOTAL WELL DEPTH (MEASURED FEET)	12.00
D	DEPTH TO LIQUID (MEASURED FEET)	10.29
E	TOTAL LIQUID FEET IN WELL (C-D)	1.71
F	NO. WELL VOLUMES DESIRED (SITE SPECIFIC, USUALLY 3)	3
G	TOTAL GALLONS TO PURGE (B x E x F)	0.84
H	PURGING METHOD (BAILER OR PUMP TYPE)	BAILER
I	BAILER VOLUME (MEASURED/CALCULATED)	0.24
J	NO. BAILS REQUIRED (G ÷ I,IF BAILED)	3.48
K	NO. BAILS TAKEN (COUNTED)	4
L	GALLONS PURGED (MEASURED/CALCULATED)	0.96

PER FOOT WELL VOLUMES	
WELL DIAMETER (IN INCHES)	GALLONS (PER FOOT)
1.00	0.041
1.25	0.064
1.50	0.092
2.00	0.163
4.00	0.653
6.00	1.469
8.00	2.611
10.00	4.080
12.00	5.876
18.00	13.220
24.00	23.502
36.00	52.880

COMMENTS: None

CLARK ENVIRONMENTAL SERVICES, P.C.
GROUNDWATER WELL SAMPLING RECORD

PROJECT NAME:	Wetsig Yachts	WELL NO.:	MW11
LOCATION:	4022 Market St., Wilmington, NC	DATE:	04/16/04
CES PROJECT NO.:	02106	TIME:	13:29
PERSONNEL:	G. Henderson	WEATHER:	Clear, 70°

A	WELL DIAMETER (INCHES MEASURED)	2
B	GALLONS/FOOT	0.163
C	TOTAL WELL DEPTH (MEASURED FEET)	11.50
D	DEPTH TO LIQUID (MEASURED FEET)	4.76
E	TOTAL LIQUID FEET IN WELL (C-D)	6.74
F	NO. WELL VOLUMES DESIRED (SITE SPECIFIC, USUALLY 3)	3
G	TOTAL GALLONS TO PURGE (B x E x F)	3.30
H	PURGING METHOD (BAILER OR PUMP TYPE)	BAILER
I	BAILER VOLUME (MEASURED/CALCULATED)	0.24
J	NO. BAILS REQUIRED (G ÷ I,IF BAILED)	13.73
K	NO. BAILS TAKEN (COUNTED)	14
L	GALLONS PURGED (MEASURED/CALCULATED)	3.36

PARAMETER	READING
pH	3.9
SALINITY (‰)	0.1
IRON (mg/L)	10
SPECIFIC CONDUCTIVITY (mS)	222
WATER TEMPERATURE (°C)	18.2
DISSOLVED OXYGEN (mg/L)	2.25
REDOX POTENTIAL (mV)	147

PER FOOT WELL VOLUMES	
WELL DIAMETER (IN INCHES)	GALLONS (PER FOOT)
1.00	0.041
1.25	0.064
1.50	0.092
2.00	0.163
4.00	0.653
6.00	1.469
8.00	2.611
10.00	4.080

COMMENTS: None

CLARK ENVIRONMENTAL SERVICES, P.C.
GROUNDWATER WELL SAMPLING RECORD

PROJECT NAME:	Wetsig Yachts	WELL NO.:	MW12
LOCATION:	4022 Market St., Wilmington, NC	DATE:	04/16/04
CES PROJECT NO.:	02106	TIME:	12:48
PERSONNEL:	G. Henderson	WEATHER:	Clear, 70°

A	WELL DIAMETER (INCHES MEASURED)	2
B	GALLONS/FOOT	0.163
C	TOTAL WELL DEPTH (MEASURED FEET)	11.50
D	DEPTH TO LIQUID (MEASURED FEET)	3.40
E	TOTAL LIQUID FEET IN WELL (C-D)	8.10
F	NO. WELL VOLUMES DESIRED (SITE SPECIFIC, USUALLY 3)	3
G	TOTAL GALLONS TO PURGE (B x E x F)	3.96
H	PURGING METHOD (BAILER OR PUMP TYPE)	BAILER
I	BAILER VOLUME (MEASURED/CALCULATED)	0.24
J	NO. BAILS REQUIRED (G ÷ I,IF BAILED)	16.50
K	NO. BAILS TAKEN (COUNTED)	17
L	GALLONS PURGED (MEASURED/CALCULATED)	4.08

PARAMETER	READING
pH	3.8
SALINITY (‰)	0.3
IRON (mg/L)	10
SPECIFIC CONDUCTIVITY (mS)	330
WATER TEMPERATURE (°C)	17.9
DISSOLVED OXYGEN (mg/L)	2.4
REDOX POTENTIAL (mV)	177

PER FOOT WELL VOLUMES	
WELL DIAMETER (IN INCHES)	GALLONS (PER FOOT)
1.00	0.041
1.25	0.064
1.50	0.092
2.00	0.163
4.00	0.653
6.00	1.469
8.00	2.611
10.00	4.080

COMMENTS: None

CLARK ENVIRONMENTAL SERVICES, P.C.
GROUNDWATER WELL SAMPLING RECORD

PROJECT NAME:	Wetsig Yachts	WELL NO.:	DMW1
LOCATION:	4022 Market St., Wilmington, NC	DATE:	05/24/04
CES PROJECT NO.:	02106	TIME:	15:17
PERSONNEL:	P. Richter	WEATHER:	Clear, 85°

A	WELL DIAMETER (INCHES MEASURED)	2
B	GALLONS/FOOT	0.163
C	TOTAL WELL DEPTH (MEASURED FEET)	32.00
D	DEPTH TO LIQUID (MEASURED FEET)	7.50
E	TOTAL LIQUID FEET IN WELL (C-D)	24.50
F	NO. WELL VOLUMES DESIRED (SITE SPECIFIC, USUALLY 3)	3
G	TOTAL GALLONS TO PURGE (B x E x F)	11.98
H	PURGING METHOD (BAILER OR PUMP TYPE)	BAILER
I	BAILER VOLUME (MEASURED/CALCULATED)	0.24
J	NO. BAILS REQUIRED (G ÷ I,IF BAILED)	49.92
K	NO. BAILS TAKEN (COUNTED)	50
L	GALLONS PURGED (MEASURED/CALCULATED)	12.00

PARAMETER	READING
pH	6.8
SALINITY (‰)	0
IRON (mg/L)	3
TURBIDITY (Ntu)	23.1
SPECIFIC CONDUCTIVITY (mS)	130
WATER TEMPERATURE (°C)	24.6
DISSOLVED OXYGEN (mg/L)	2.95
REDOX POTENTIAL (mV)	67

PER FOOT WELL VOLUMES	
WELL DIAMETER (IN INCHES)	GALLONS (PER FOOT)
1.00	0.041
1.25	0.064
1.50	0.092
2.00	0.163
4.00	0.653
6.00	1.469
8.00	2.611

COMMENTS: None

CLARK ENVIRONMENTAL SERVICES, P.C.
GROUNDWATER WELL SAMPLING RECORD

PROJECT NAME:	Wetsig Yachts	WELL NO.:	DMW2
LOCATION:	4022 Market St., Wilmington, NC	DATE:	05/24/04
CES PROJECT NO.:	02106	TIME:	16:46
PERSONNEL:	P. Richter	WEATHER:	Clear, 85°

A	WELL DIAMETER (INCHES MEASURED)	2
B	GALLONS/FOOT	0.163
C	TOTAL WELL DEPTH (MEASURED FEET)	43.50
D	DEPTH TO LIQUID (MEASURED FEET)	4.97
E	TOTAL LIQUID FEET IN WELL (C-D)	38.53
F	NO. WELL VOLUMES DESIRED (SITE SPECIFIC, USUALLY 3)	3
G	TOTAL GALLONS TO PURGE (B x E x F)	18.84
H	PURGING METHOD (BAILER OR PUMP TYPE)	BAILER
I	BAILER VOLUME (MEASURED/CALCULATED)	0.24
J	NO. BAILS REQUIRED (G ÷ I,IF BAILED)	78.50
K	NO. BAILS TAKEN (COUNTED)	79
L	GALLONS PURGED (MEASURED/CALCULATED)	18.96

PARAMETER	READING
pH	5.1
SALINITY (‰)	0
IRON (mg/L)	0.02
TURBIDITY (Ntu)	15.7
SPECIFIC CONDUCTIVITY (mS)	370
WATER TEMPERATURE (°C)	25.6
DISSOLVED OXYGEN (mg/L)	2.28
REDOX POTENTIAL (mV)	163

PER FOOT WELL VOLUMES	
WELL DIAMETER (IN INCHES)	GALLONS (PER FOOT)
1.00	0.041
1.25	0.064
1.50	0.092
2.00	0.163
4.00	0.653
6.00	1.469
8.00	2.611

COMMENTS: None

PARADIGM ANALYTICAL LABORATORIES, INC.
5500 Business Drive
Wilmington, North Carolina 28405
(910) 350-1903
Fax (910) 350-1557

Mr. Steve Clark
Clark Environmental Services
PO Box 10136
Wilmington, NC 28405

January 28, 2004

Report Number: G211-1667

Client Project ID: 02106

Dear Mr. Clark,

Enclosed are the results of the analytical services performed under the referenced project. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or the services performed during this project, please call Paradigm at (910) 350-1903. We will be happy to answer any questions or concerns which you may have.

Thank you for using Paradigm Analytical Labs for your analytical services. We look forward to working with you again on any additional analytical needs which you may have.

Sincerely,

Paradigm Analytical Laboratories, Inc.

Laboratory Director
J. Patrick Weaver

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Metals

Client Sample ID:	MW8 f	Analyzed By:	PSW
Client Project ID:	02106	Date Collected:	1/20/04
Lab Sample ID:	86533	Date Received:	1/20/04
Lab Project ID:	G211-1667	Matrix:	Water
Batch ID:	3126		

Metals	Result	RL	DF	Units	Method	Date Analyzed
Arsenic	BQL	0.0100	1	MG/L	6010B	1/26/04
Chromium	BQL	0.0100	1	MG/L	6010B	1/26/04

Comments

BQL = Below Quantitation Limits
DF = Dilution Factor
J = Between MDL and RL

Reviewed By: mc

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Metals

Client Sample ID:	MW9 f	Analyzed By:	PSW
Client Project ID:	02106	Date Collected:	1/20/04
Lab Sample ID:	86534	Date Received:	1/20/04
Lab Project ID:	G211-1667	Matrix:	Water
Batch ID:	3126		

Metals	Result	RL	DF	Units	Method	Date Analyzed
Arsenic	BQL	0.0100	1	MG/L	6010B	1/26/04
Chromium	BQL	0.0100	1	MG/L	6010B	1/26/04

Comments

BQL = Below Quantitation Limits
DF = Dilution Factor
J = Between MDL and RL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Metals

Client Sample ID:	MW10 f	Analyzed By:	PSW
Client Project ID:	02106	Date Collected:	1/20/04
Lab Sample ID:	86535	Date Received:	1/20/04
Lab Project ID:	G211-1667	Matrix:	Water
Batch ID:	3126		

Metals	Result	RL	DF	Units	Method	Date Analyzed
Arsenic	BQL	0.0100	1	MG/L	6010B	1/26/04
Chromium	BQL	0.0100	1	MG/L	6010B	1/26/04

Comments

BQL = Below Quantitation Limits
DF = Dilution Factor
J = Between MDL and RL

Reviewed By: MAC

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Inorganics

Client Sample ID: MW8 f
Client Project ID: 02106
Lab Sample ID: 86533
Lab Project ID: G211-1667

Analyzed By: PSW
Date Collected: 1/20/04
Date Received: 1/20/04
Matrix: Water

Parameter	Result	Units	Procedure	Date Analyzed
pH	**6.27**	S.U.	150.1	1/20/04
Temperature	**9.9**	°C		

Comments:
Samples analyzed out of 15 minute hold time.

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Inorganics

Client Sample ID: MW9 f
Client Project ID: 02106
Lab Sample ID: 86534
Lab Project ID: G211-1667

Analyzed By: PSW
Date Collected: 1/20/04
Date Received: 1/20/04
Matrix: Water

Parameter	Result	Units	Procedure	Date Analyzed
pH	**4.23**	S.U.	150.1	1/20/04
Temperature	**7.2**	°C		

Comments:
Samples analyzed out of 15 minute hold time.

Reviewed By: _____

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Inorganics

Client Sample ID: MW10 f
Client Project ID: 02106
Lab Sample ID: 86535
Lab Project ID: G211-1667

Analyzed By: PSW
Date Collected: 1/20/04
Date Received: 1/20/04
Matrix: Water

Parameter	Result	Units	Procedure	Date Analyzed
pH	**5.46**	S.U.	150.1	1/20/04
Temperature	**6.6**	°C		

Comments:
Samples analyzed out of 15 minute hold time.

Reviewed By: MT

List of Reporting Abbreviations and Data Qualifiers

B = Compound also detected in batch blank

BQL = Below Quantitation Limit

DF = Dilution Factor

Dup = Duplicate

E = Estimated concentration, exceeds calibration range.

J = Estimated concentration, below calibration range and above MDL

LCS(D) = Laboratory Control Spike (Duplicate)

MDL = Method Detection Limit

MS(D) = Matrix Spike (Duplicate)

PQL = Practical Quantitation Limit

RL = Reporting Limit

RPD = Relative Percent Difference

mg/kg = milligram per kilogram, ppm, parts per million

ug/kg = micrograms per kilogram, ppb, parts per billion

mg/L = milligram per liter, ppm, parts per million

ug/L = micrograms per liter, ppb, parts per billion

% Rec = Percent Recovery

% soilds = Percent Solids

Special Notes:

1) Metals and mercury samples are digested with a hot block, see the standard operating procedure document for details.

2) Uncertainty for all reported data is less than or equal to 30 percent.

PARADIGM ANALYTICAL LABORATORIES, INC.
5500 Business Drive, Wilmington, NC 28405
Phone: (910)-350-1903 FAX: (910)-350-1557

Chain-of Custody Record & Analytical Request

COC# 41110

Page 1 of 1

Client: Clark Environmental Services
Address: PO Box 10136
Address: Wilmington NC 28404
Quote #:

Project ID: 02106
Contact: JoAnne
Phone: 602-3900
Fax: 602-3975

Date: 01/20/04
Turnaround: standard
Job Number: Wetsis Yachts
P.O. Number: 02106012004008

Report To: JoAnne
Invoice To: CES

Sample ID	Date	Time	Matrix	Preservatives: HNO3	Preservatives: ice	Preservatives: pH		Analyses: As, Cr										Comments: Please specify any special reporting requirements
MW8 f	01/20/04	2:30	water	✓	✓	✓		✓										
MW9 f	01/20/04	2:00	water	✓	✓	✓		✓										G211-1667
MW10 f	01/20/04	1:30	water	✓	✓	✓		✓										
																		As & Cr per JoAnne [illegible] 1/21/04

Relinquished By	Date	Time	Received By	Date	Time	Temperature	State Certification Requested
[illegible]	01/20/04	5:15	[illegible]	1/20/04	5:30	4.1°C	NC ____ SC ____ Other ____
							SEE REVERSE FOR TERMS AND CONDITIONS

PARADIGM ANALYTICAL LABORATORIES, INC.
5500 Business Drive
Wilmington, North Carolina 28405
(910) 350-1903
Fax (910) 350-1557

Ms. JoAnne Shadroui
Clark Environmental
PO Box 10136
Wilmington NC 28405

Report Number: G211-1689

Client Project: Wetsig 02106

Dear Ms. Shadroui:

Enclosed are the results of the analytical services performed under the referenced project. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or the services performed during this project, please call Paradigm at (910) 350-1903. We will be happy to answer any questions or concerns which you may have.

Thank you for using Paradigm Analytical Labs for your analytical services. We look forward to working with you again on any additional analytical needs which you may have.

Sincerely,
Paradigm Analytical Laboratories, Inc.

4/28/04

Laboratory Directory Date
J. Patrick Weaver

N.C. Certification #481 S.C. Certification #99029

CASE NARRATIVE

Date: April 28, 2004

Clark Environmental project ID: Wetsig 02106
Paradigm Analytical ID: G211-1689

Four water samples were received at the laboratory April 16 for analysis of arsenic and chromium. The samples were received in good condition, within temperature and holding time limits.

The analyses were completed within holding time and without quality control exception. Data summary reports are enclosed.

Results for Metals

Client Sample ID:	MW11-unf	Analyzed By:	RML
Client Project ID:	Wetsig 02106	Date Collected:	4/16/2004 13:29
Lab Sample ID:	G211-1689-1A	Date Received:	4/16/04
Lab Project ID:	G211-1689	Matrix:	Water
Batch ID:	3200		

Metals	Result	RL	DF	Units	Method	Date Analyzed
Arsenic	BQL	0.0100	1	MG/L	6010B	4/26/04
Chromium	**0.0554**	0.0100	1	MG/L	6010B	4/26/04

Comments
BQL = Below Quantitation Limits
DF = Dilution Factor
J = Between MDL and RL

Reviewed By:

Results for Metals

Client Sample ID:	MW11-f	Analyzed By:	RML
Client Project ID:	Wetsig 02106	Date Collected:	4/16/2004 13:29
Lab Sample ID:	G211-1689-2A	Date Received:	4/16/04
Lab Project ID:	G211-1689	Matrix:	Water
Batch ID:	3200		

Metals	Result	RL	DF	Units	Method	Date Analyzed
Arsenic	BQL	0.0100	1	MG/L	6010B	4/26/04
Chromium	BQL	0.0100	1	MG/L	6010B	4/26/04

Comments
BQL = Below Quantitation Limits
DF = Dilution Factor
J = Between MDL and RL

Reviewed By: _____

Results for Metals

Client Sample ID:	MW12-unf	Analyzed By:	RML
Client Project ID:	Wetsig 02106	Date Collected:	4/16/2004 12:48
Lab Sample ID:	G211-1689-3A	Date Received:	4/16/04
Lab Project ID:	G211-1689	Matrix:	Water
Batch ID:	3200		

Metals	Result	RL	DF	Units	Method	Date Analyzed
Arsenic	BQL	0.0100	1	MG/L	6010B	4/26/04
Chromium	**0.0196**	0.0100	1	MG/L	6010B	4/26/04

Comments
BQL = Below Quantitation Limits
DF = Dilution Factor
J = Between MDL and RL

Reviewed By: _____

Results for Metals

Client Sample ID:	MW12-f	Analyzed By:	RML
Client Project ID:	Wetsig 02106	Date Collected:	4/16/2004 12:48
Lab Sample ID:	G211-1689-4A	Date Received:	4/16/04
Lab Project ID:	G211-1689	Matrix:	Water
Batch ID:	3200		

Metals	Result	RL	DF	Units	Method	Date Analyzed
Arsenic	BQL	0.0100	1	MG/L	6010B	4/26/04
Chromium	BQL	0.0100	1	MG/L	6010B	4/26/04

Comments
BQL = Below Quantitation Limits
DF = Dilution Factor
J = Between MDL and RL

Reviewed By: _____

List of Reporting Abbreviations and Data Qualifiers

B = Compound also detected in batch blank

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MDL = Method Detection Limit

MS(D) = Matrix Spike (Duplicate)

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RL = Reporting Limit

RPD = Relative Percent Difference

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ug/kg = micrograms per kilogram, ppb, parts per billion

mg/L = milligram per liter, ppm, parts per million

ug/L = micrograms per liter, ppb, parts per billion

% Rec = Percent Recovery

% soilds = Percent Solids

Special Notes:

1) Metals and mercury samples are digested with a hot block, see the standard operating procedure document for details.

2) Uncertainty for all reported data is less than or equal to 30 percent.

MI34.011404.1

PARADIGM ANALYTICAL LABORATORIES, INC.
2627 Northchase Parkway SE, Wilmington, NC 28405
Phone: (910)-350-1903 FAX: (910)-350-1557

Chain-of Custody Record & Analytical Request

COC# 36885

Page 1 **of** 1

8 of 8

Client: CES
Address: Wilmington, NC
Address:
Quote #:

Project ID: Wetsig 02106
Contact: JoAnne
Phone: 602-3900
Fax: 602-3975

Date: 4-16-04
Turnaround: Standard
Job Number:
P.O. Number: 021060417040 71

Report To:
Invoice To:

				HNO_3	Ice			As/Cr											
MW11-unf	4-16-04	13:29	Water	X	X			X											Please include narrative
MW11-f	↓	13:29	↓		↓			↓											
MW12-unf	↓	12:48	↓	X	↓			↓											G211-1689
MW12-f	↓	12:48	↓		↓			↓											

[signature]	4-16-04	16:05	[signature]	4/16/04	1605	on ice 8.6°C coming down in temp	NC ____ SC ____ Other ____

SEE REVERSE FOR TERMS AND CONDITIONS

ORIGINAL

PARADIGM ANALYTICAL LABOR

N.C. Certification #481 S.C. Certification #99029

PARADIGM ANALYTICAL LABORATORIES, INC.
5500 Business Drive
Wilmington, North Carolina 28405
(910) 350-1903
Fax (910) 350-1557

Clark Environmental
PO Box 10136
Wilmington NC 28405

Report Number: G211-1704

Client Project: 02106 Wetzig

Dear Clark Environmental:

Enclosed are the results of the analytical services performed under the referenced project. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or the services performed during this project, please call Paradigm at (910) 350-1903. We will be happy to answer any questions or concerns which you may have.

Thank you for using Paradigm Analytical Labs for your analytical services. We look forward to working with you again on any additional analytical needs which you may have.

Sincerely,
Paradigm Analytical Laboratories, Inc.

Laboratory Director 6/2/04 Date
J. Patrick Weaver

N.C. Certification #481 S.C. Certification #99029

Results for Metals

Client Sample ID:	DMW-1 Filtered	Analyzed By:	PSW
Client Project ID:	02106 Wetzig	Date Collected:	5/24/2004 15:17
Lab Sample ID:	G211-1704-1A	Date Received:	5/25/04
Lab Project ID:	G211-1704	Matrix:	Water
Batch ID:	3232		

Metals	Result	RL	DF	Units	Method	Date Analyzed
Arsenic	BQL	0.010	10	MG/L	6020	5/28/04
Chromium	BQL	0.0100	1	MG/L	6010B	5/27/04

Comments
BQL = Below Quantitation Limits
DF = Dilution Factor
J = Between MDL and RL

Reviewed By: ECW

Results for Metals

Client Sample ID:	DMW-1 Unfiltered	Analyzed By:	PSW
Client Project ID:	02106 Wetzig	Date Collected:	5/24/2004 15:17
Lab Sample ID:	G211-1704-2A	Date Received:	5/25/04
Lab Project ID:	G211-1704	Matrix:	Water
Batch ID:	3232		

Metals	Result	RL	DF	Units	Method	Date Analyzed
Arsenic	BQL	0.0100	10	MG/L	6020	5/28/04
Chromium	BQL	0.0100	1	MG/L	6010B	5/27/04

Comments
BQL = Below Quantitation Limits
DF = Dilution Factor
J = Between MDL and RL

Reviewed By: ELR

Results for Metals

Client Sample ID:	DMW-2 Filtered	Analyzed By:	PSW
Client Project ID:	02106 Wetzig	Date Collected:	5/24/2004 16:46
Lab Sample ID:	G211-1704-3A	Date Received:	5/25/04
Lab Project ID:	G211-1704	Matrix:	Water
Batch ID:	3232		

Metals	Result	RL	DF	Units	Method	Date Analyzed
Arsenic	BQL	0.0100	10	MG/L	6020	5/28/04
Chromium	BQL	0.0100	1	MG/L	6010B	5/27/04

Comments
BQL = Below Quantitation Limits
DF = Dilution Factor
J = Between MDL and RL

Reviewed By: ELW

Results for Metals

Client Sample ID:	DMW-2 Unfiltered	Analyzed By:	PSW
Client Project ID:	02106 Wetzig	Date Collected:	5/24/2004 16:46
Lab Sample ID:	G211-1704-4A	Date Received:	5/25/04
Lab Project ID:	G211-1704	Matrix:	Water
Batch ID:	3233		

Metals	Result	RL	DF	Units	Method	Date Analyzed
Arsenic	BQL	0.0100	10	MG/L	6020	5/28/04
Chromium	BQL	0.0100	1	MG/L	6010B	5/27/04

Comments
BQL = Below Quantitation Limits
DF = Dilution Factor
J = Between MDL and RL

Reviewed By: EDW

List of Reporting Abbreviations and Data Qualifiers

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BQL = Below Quantitation Limit

DF = Dilution Factor

Dup = Duplicate

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J = Estimated concentration, below calibration range and above MDL

LCS(D) = Laboratory Control Spike (Duplicate)

MDL = Method Detection Limit

MS(D) = Matrix Spike (Duplicate)

PQL = Practical Quantitation Limit

RL = Reporting Limit

RPD = Relative Percent Difference

mg/kg = milligram per kilogram, ppm, parts per million

ug/kg = micrograms per kilogram, ppb, parts per billion

mg/L = milligram per liter, ppm, parts per million

ug/L = micrograms per liter, ppb, parts per billion

% Rec = Percent Recovery

% soilds = Percent Solids

Special Notes:

1) Metals and mercury samples are digested with a hot block, see the standard operating procedure document for details.

2) Uncertainty for all reported data is less than or equal to 30 percent.

PARADIGM ANALYTICAL LABORATORIES, INC.
5500 Business Drive, Wilmington, NC 28405
Phone: (910)-350-1903 FAX: (910)-350-1557

Chain-of Custody Record & Analytical Request

COC# 44265

Page _____ of _____

Client: CLARK ENV.
Address:
Address:
Quote #:

Project ID: 02106 metzing
Contact:
Phone:
Fax:

Date: 5/24/04
Turnaround:
Job Number: 02106
P.O. Number: 052404 02106

Report To:
Invoice To:

Sample ID	Date	Time	Matrix	Preservative: HNO3				Analyses: Ar Cr Filter	Ar Cr Non Filter								Comments: Please specify any special reporting requirements
DMW-1	5/24	3:17	H2O	X				X	X								
DMW-2	5/24	4:46	H2O	X				X	X								G211-1704

Relinquished By	Date	Time	Received By	Date	Time	Temperature
[signature]	5/25/04	9:00				
[signature]	5-25-04	10:00	[signature]	5/25/04	10:00	on ice OAC

State Certification Requested
NC _____ SC _____ Other _____

SEE REVERSE FOR TERMS AND CONDITIONS

ORIGINAL

PARADIGM ANALYTICAL LABORATORIES, INC.

N.C. Certification #481 S.C. Certification #99029

APPENDIX VI

AQUIFER TEST CALCULATIONS

PROJECT: WETSIG YACHTS COMPUTED BY: WMT DATE:

SHEET 1 OF 2 CHECKED BY: S. CLARK DATE: 10/19/04

DESCRIPTION: HORIZONTAL GROUNDWATER FLOW VELOCITY CALCULATION – SHALLOW ZONE

CALCULATE GROUNDWATER VELOCITY (V)

$$V = \frac{K\,(dh/dl)}{\eta\, d}$$

where: K = Hydraulic Conductivity

WELL	AVG. K
MW7	0.56×10^{-5} ft/min
MW8	2.12×10^{-5} ft/min
MW9	1.15×10^{-5} ft/min
AVERAGE	3.28×10^{-5} ft/min

dh/dl = Gradient of Groundwater (ft/ft) = 0.0063 ft/ft

η = Porosity (0.40)

d = Darcian Pore Factor (0.85)

$$V = \frac{(3.28 \times 10^{-5}\ \text{ft/min})(0.0063\ \text{ft/ft})}{(0.40)(0.85)}$$

$$V = \frac{2.07 \times 10^{-7}\ \text{ft/min}}{0.34}$$

$V =$ $\boxed{6.09 \times 10^{-7}\ \text{ft/min}}$ or $\boxed{8.77 \times 10^{-4}\ \text{ft/day}}$ or $\boxed{0.32\ \text{ft/year}}$

PROJECT: WETSIG YACHTS COMPUTED BY: WMT DATE:

SHEET 2 OF 2 CHECKED BY: S. CLARK DATE: 10/19/04

DESCRIPTION: HORIZONTAL GROUNDWATER FLOW VELOCITY CALCULATION - DEEP WELL

CALCULATE GROUNDWATER VELOCITY (V)

$$V = \frac{K\,(dh/dl)}{\eta\, d}$$

where: K = Hydraulic Conductivity

DWI DATA SET	K
EARLY	7.51×10^{-3} FT/min
MIDDLE	8.84×10^{-5} FT/min
LATE	8.08×10^{-6} FT/min
AVERAGE	2.54×10^{-3} FT/min

dh/dl = GRADIENT OF GROUNDWATER (FT/FT) = (0.0091)

η = POROSITY = (0.40)

d = DARCIAN PORE FACTOR (0.93)

$$V = \frac{(2.54 \times 10^{-3}\ \text{FT/min})(0.0091)}{(0.40)(0.93)}$$

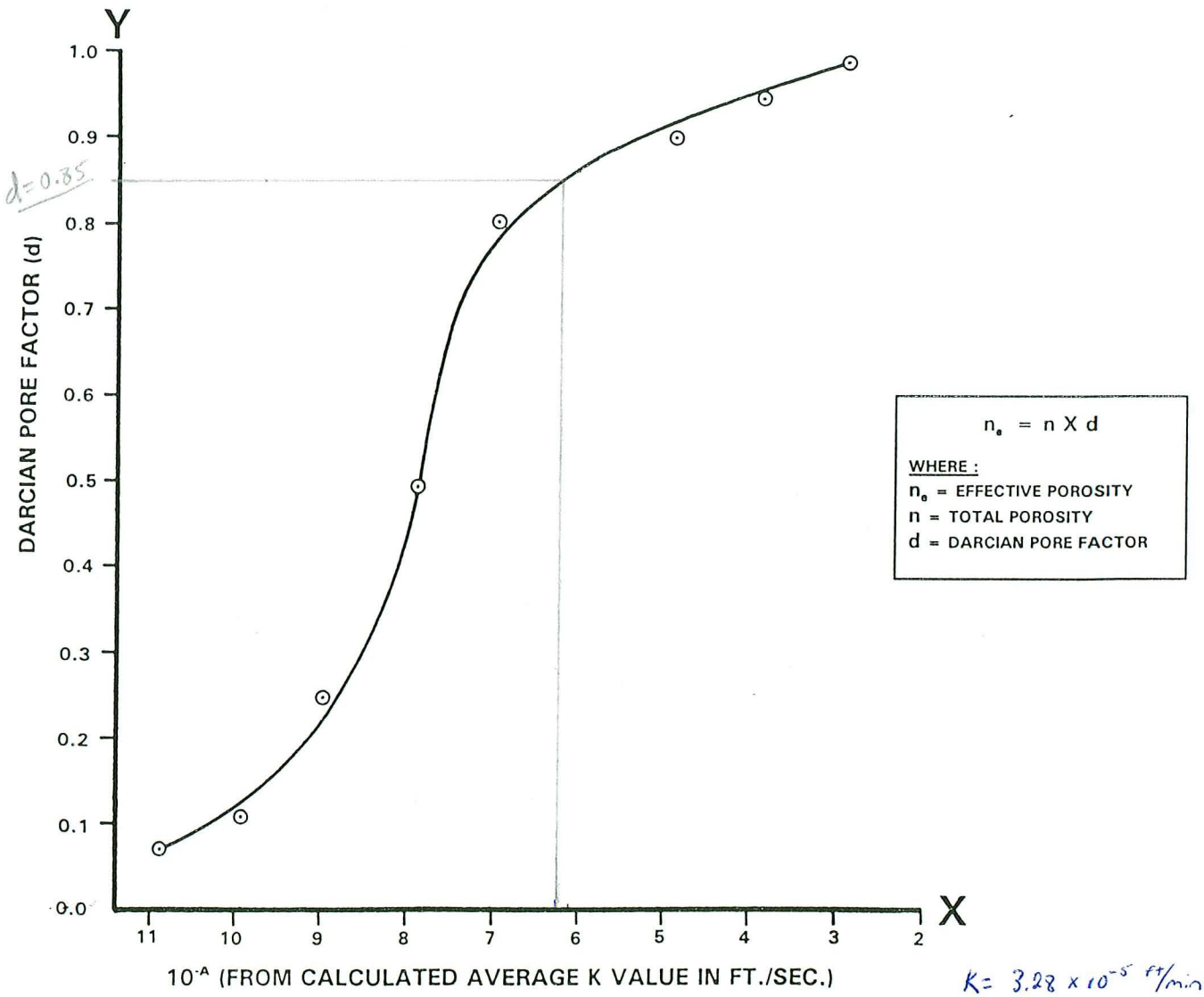
$$V = \frac{2.31 \times 10^{-5}\ \text{FT/min}}{0.372}$$

$V =$ $\boxed{6.2 \times 10^{-5}\ \text{FT/min}}$ or $\boxed{0.089\ \text{FT/day}}$ or $\boxed{32.61\ \text{FT/year}}$

TOTAL POROSITIES AND DARCIAN PORE FACTORS USED TO CALCULATE EFFECTIVE POROSITIES FOR CALCULATING GROUNDWATER VELOCITIES

WETSIG YACHTS (SHALLOW ZONE)

UNCONSOLIDATED SEDIMENTS	n (%)	CONSOLIDATED ROCKS	n (%)
CLAY	45-50	SANDSTONE	5-30
SILT	35-50	LIMESTONE/DOLOMITE	1-20
SAND	25-40	SHALE	0-10
GRAVEL	25-40	FRACTURED CRYSTALLINE ROCK	0-10
SAND & GRAVEL MIXES	10-35	VESICULAR BASALT	10-50
GLACIAL TILL	10-25	DENSE, SOLID ROCK	<1



10^{-A} (FROM CALCULATED AVERAGE K VALUE IN FT./SEC.)

$K = 3.28 \times 10^{-5}$ ft/min

$-A = 6.26$

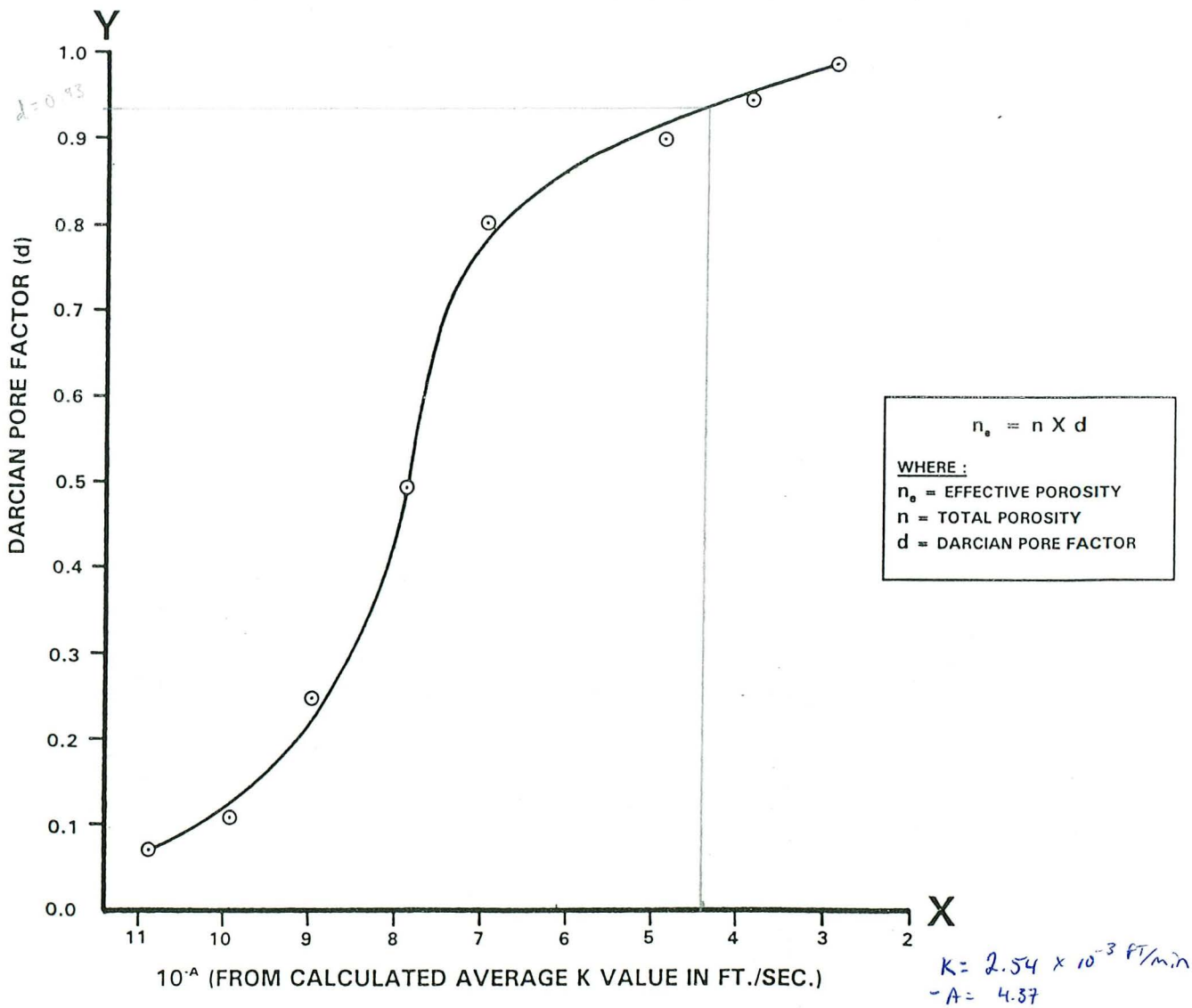
LET "A" = THE # ON THE X AXIS. THEN, POINT OF INTERSECTION ON CURVE = Y AXIS = VALUE FOR d.

REV. 10/99

TOTAL POROSITIES AND DARCIAN PORE FACTORS USED TO CALCULATE EFFECTIVE POROSITIES FOR CALCULATING GROUNDWATER VELOCITIES

WETSIG YACHTS (DEEPER ZONE)

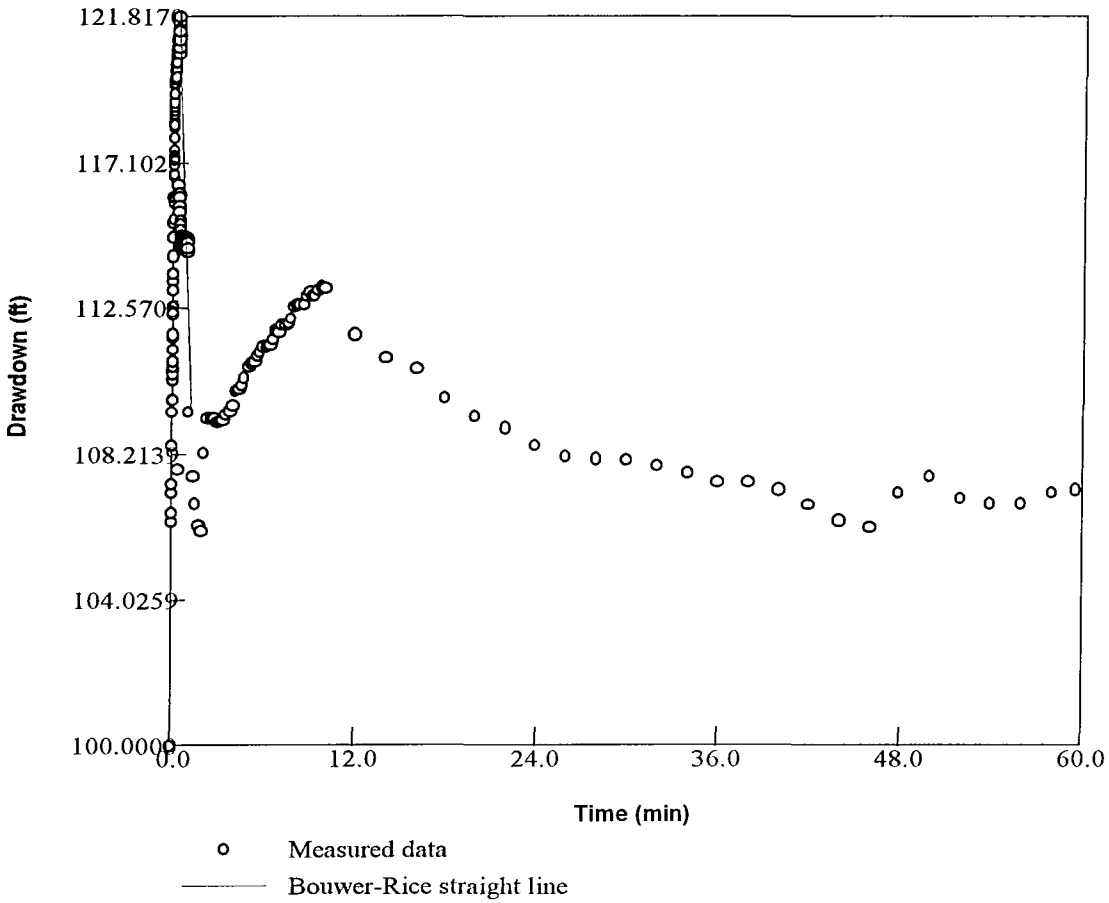
UNCONSOLIDATED SEDIMENTS	n (%)	CONSOLIDATED ROCKS	n (%)
CLAY	45-50	SANDSTONE	5-30
SILT	35-50	LIMESTONE/DOLOMITE	1-20
SAND	25-40	SHALE	0-10
GRAVEL	25-40	FRACTURED CRYSTALLINE ROCK	0-10
SAND & GRAVEL MIXES	10-35	VESICULAR BASALT	10-50
GLACIAL TILL	10-25	DENSE, SOLID ROCK	<1



K= 2.54 x 10^{-3} FT/min
-A= 4.37

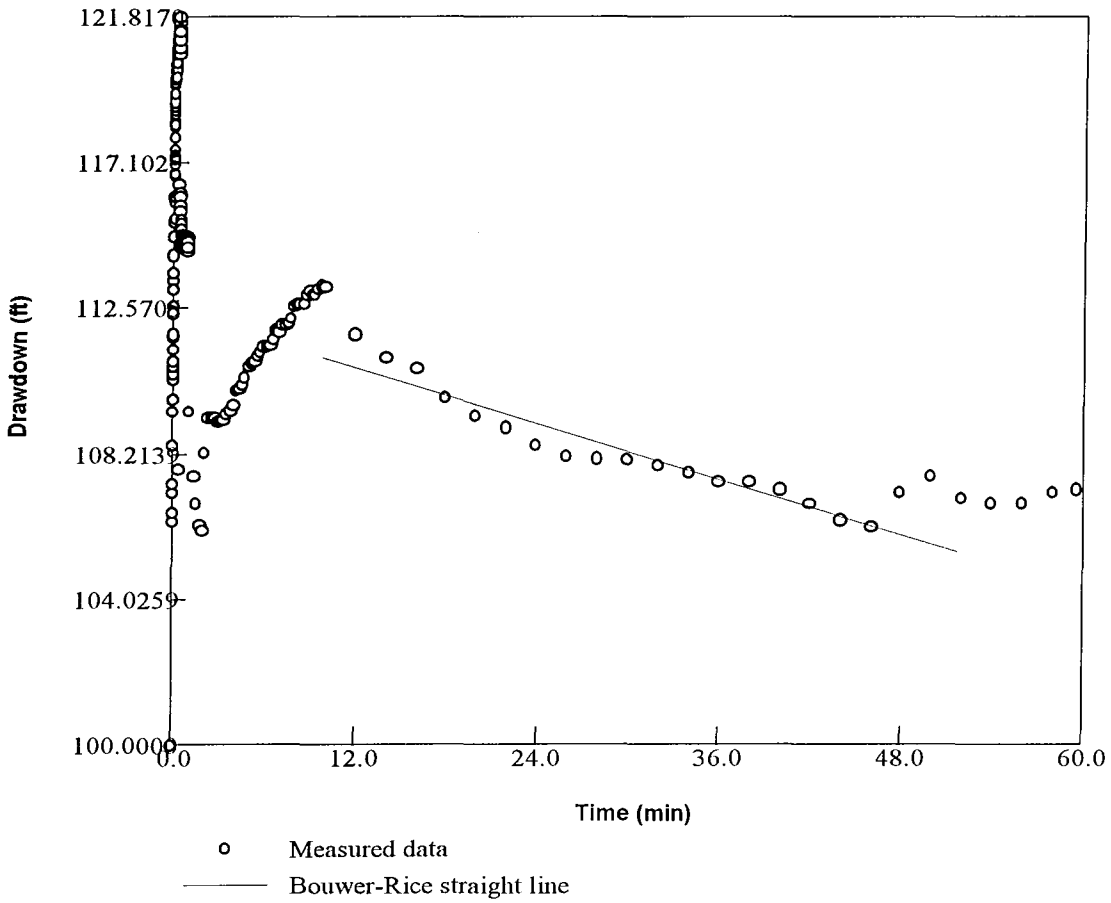
LET "A" = THE # ON THE X AXIS. THEN, POINT OF INTERSECTION ON CURVE = Y AXIS = VALUE FOR d.

REV. 10/99



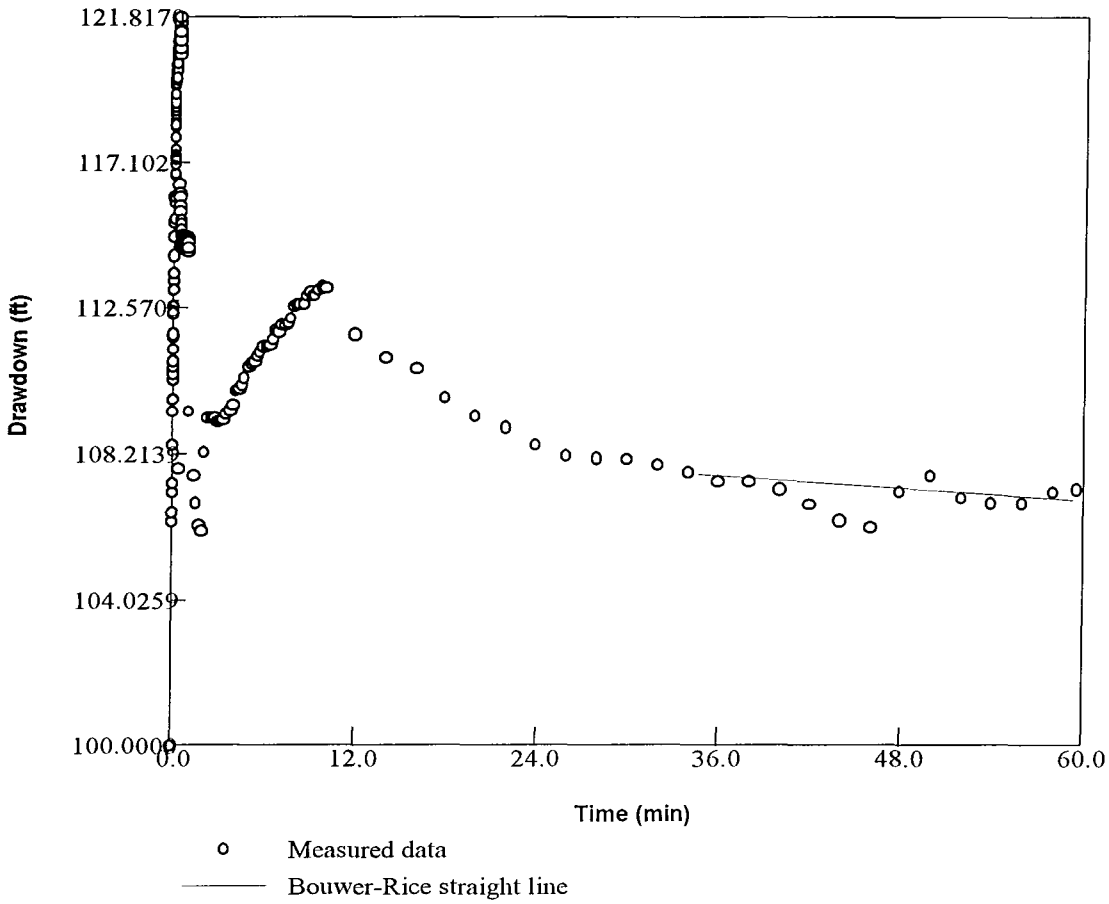
Aquifer Parameters by the Bouwer and Rice Slug Test	
Hydraulic Conductivity (ft/min):	1.94e-004
Transmissivity (sq ft/min):	5.82e-003

WETSIG YACHTS MW7 RECOVERY TEST(EARLY DATA)



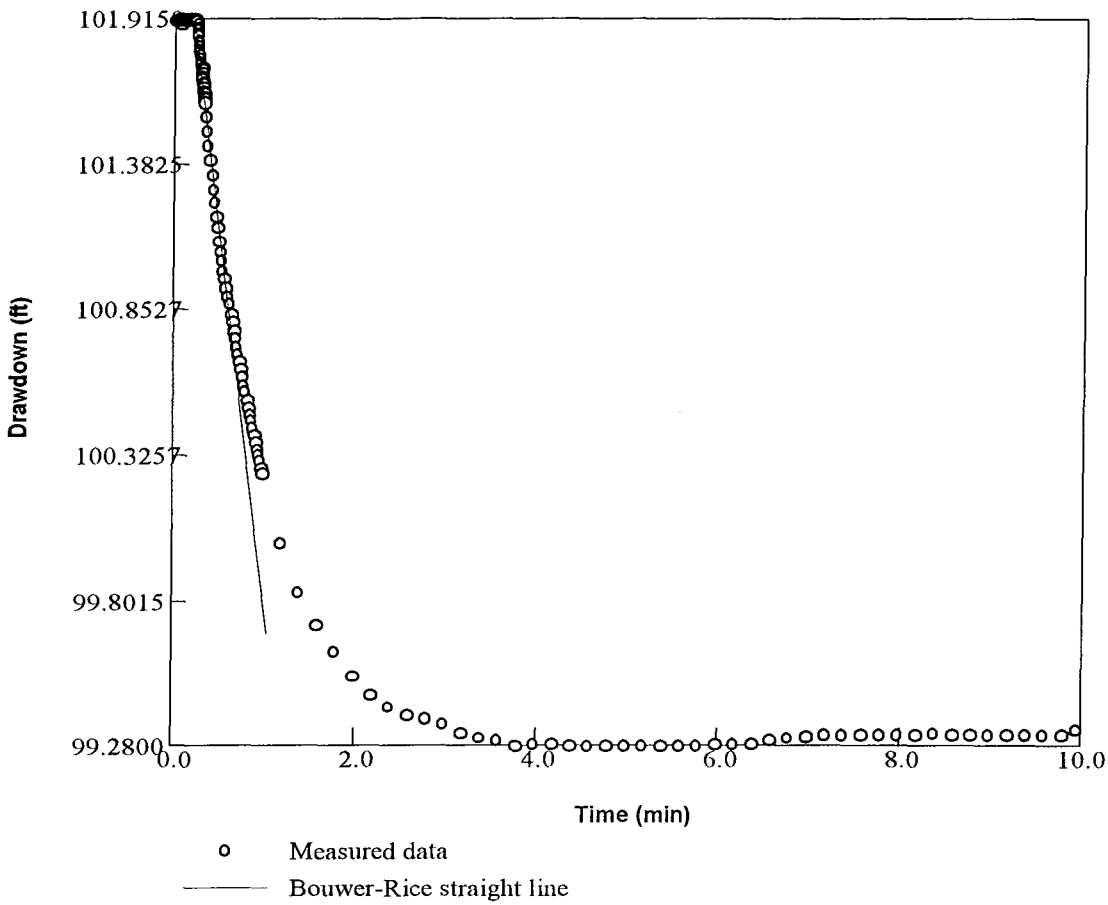
Aquifer Parameters by the Bouwer and Rice Slug Test	
Hydraulic Conductivity (ft/min):	2.18e-006
Transmissivity (sq ft/min):	6.54e-005

WETSIG YACHTS MW7 RECOVERY TEST(MIDDLE DATA)



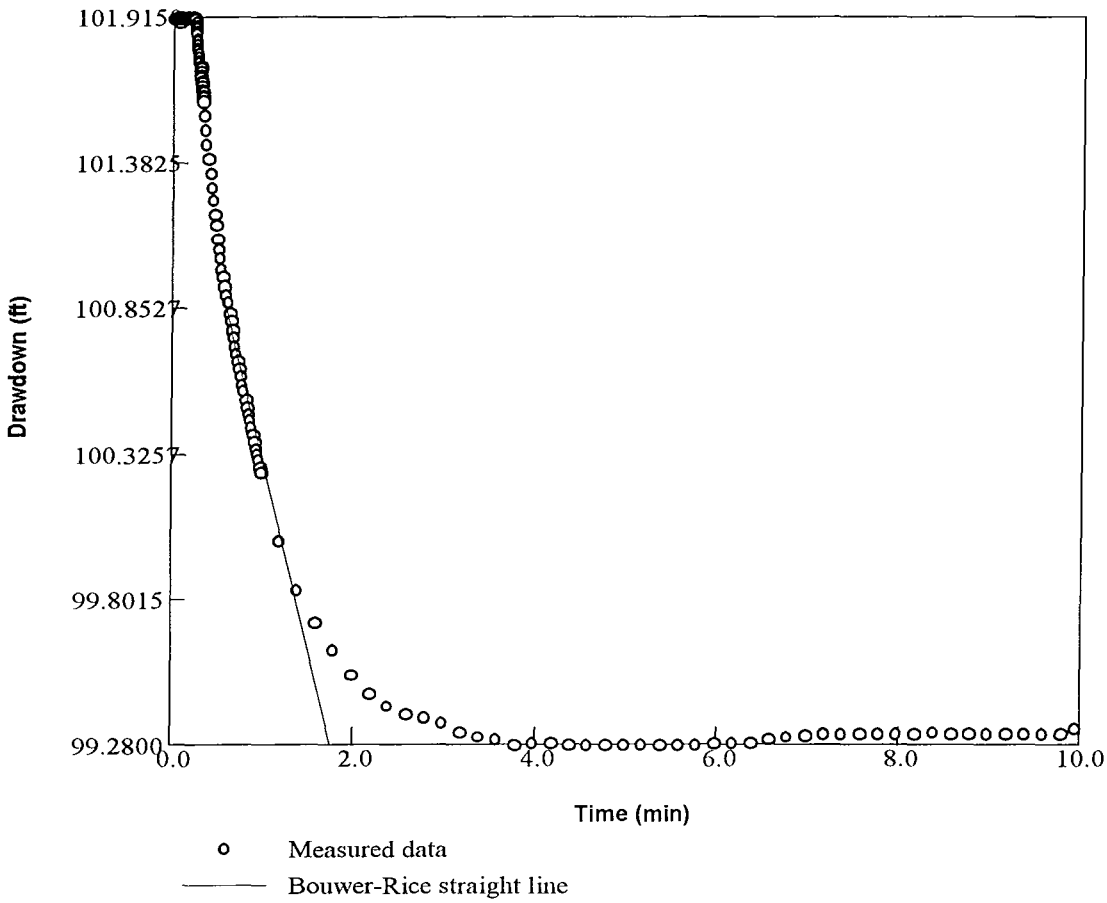
Aquifer Parameters by the Bouwer and Rice Slug Test	
Hydraulic Conductivity (ft/min):	4.75e-007
Transmissivity (sq ft/min):	1.43e-005

WETSIG YACHTS MW7 RECOVERY TEST(LATE DATA)



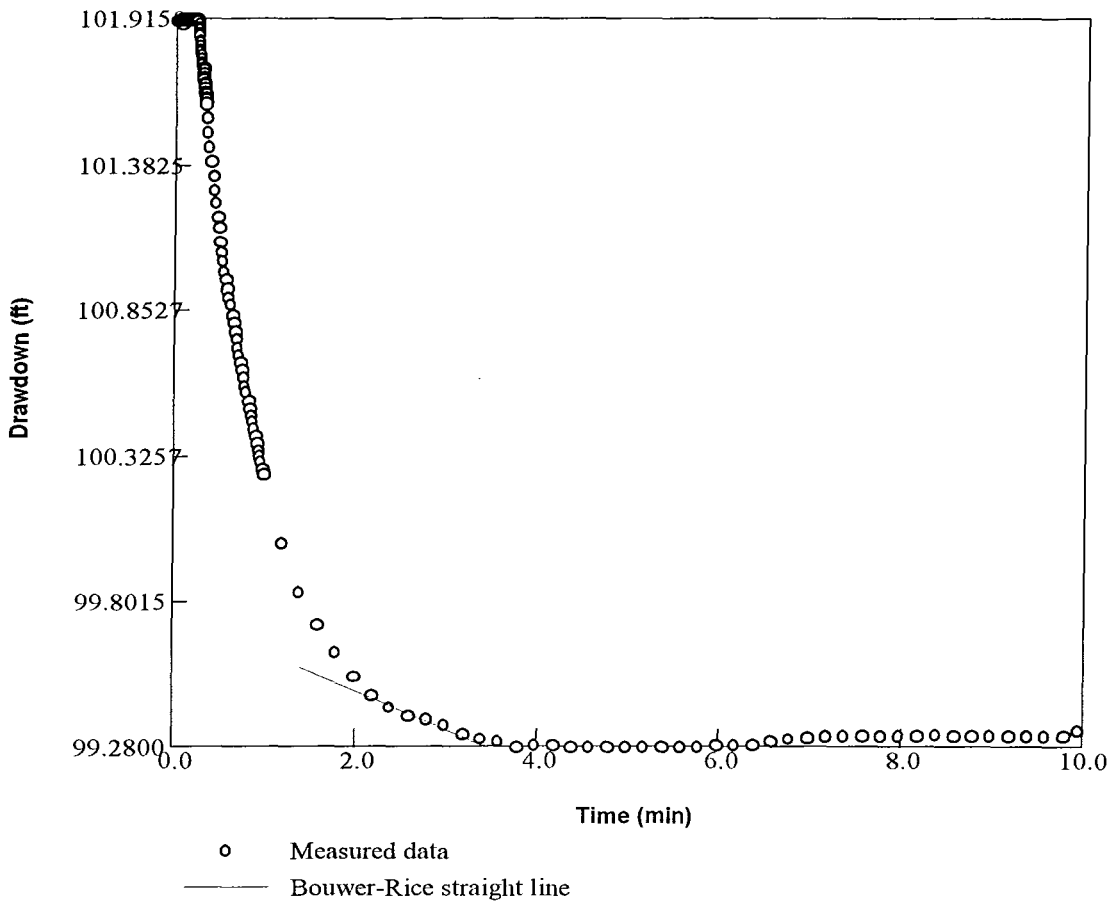
Aquifer Parameters by the Bouwer and Rice Slug Test	
Hydraulic Conductivity (ft/min):	4.08e-005
Transmissivity (sq ft/min):	1.63e-003

WETSIG YACHTS MW8 RECOVERY TEST (EARLY DATA)



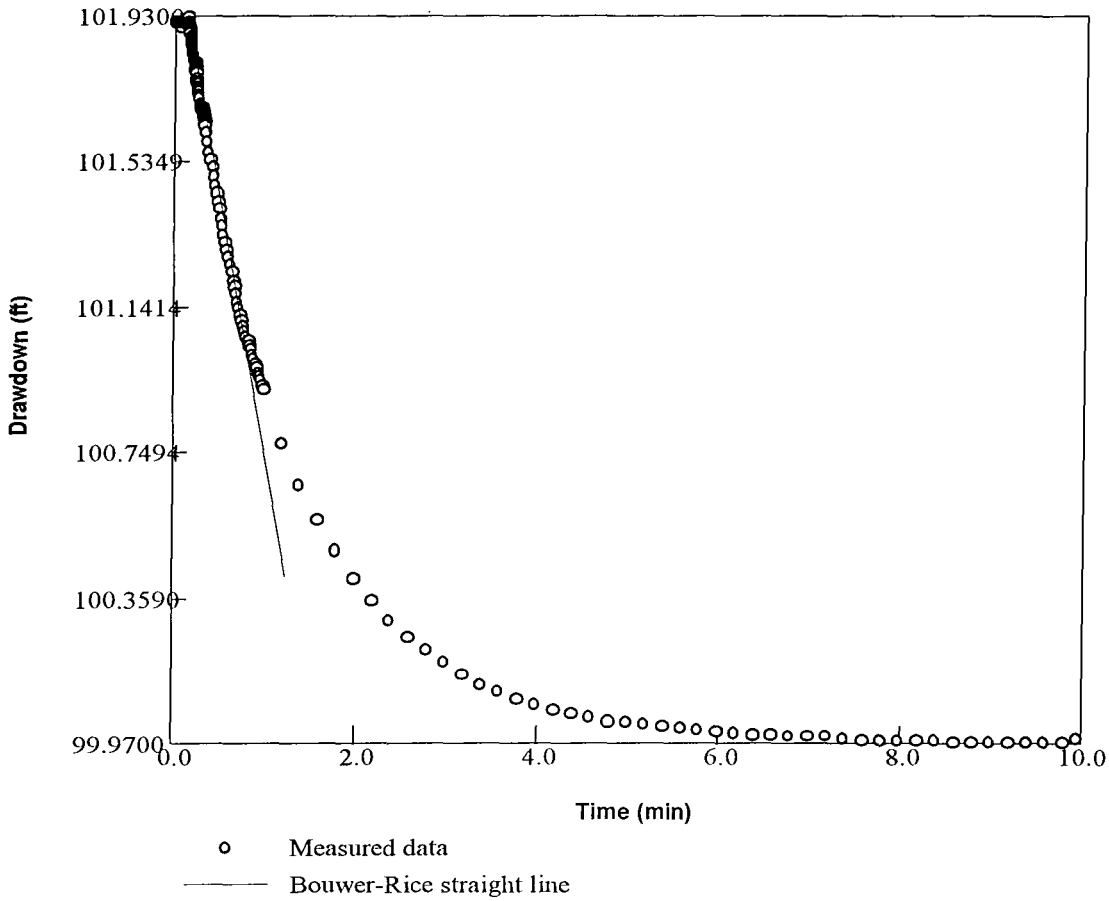
Aquifer Parameters by the Bouwer and Rice Slug Test	
Hydraulic Conductivity (ft/min):	2.06e-005
Transmissivity (sq ft/min):	8.23e-004

WETSIG YACHTS MW8 RECOVERY TEST (MIDDLE DATA)



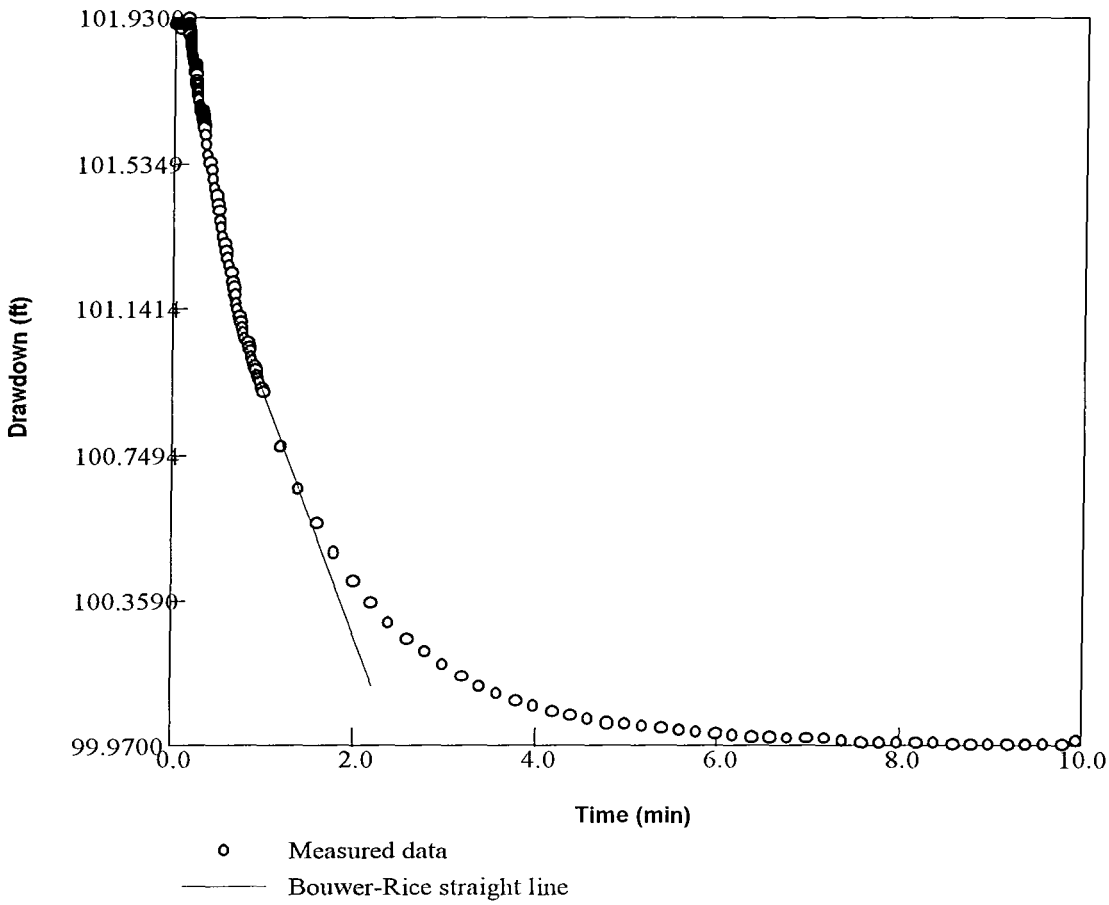
Aquifer Parameters by the Bouwer and Rice Slug Test	
Hydraulic Conductivity (ft/min):	2.11e-006
Transmissivity (sq ft/min):	8.44e-005

WETSIG YACHTS MW8 RECOVERY TEST (LATE DATA)



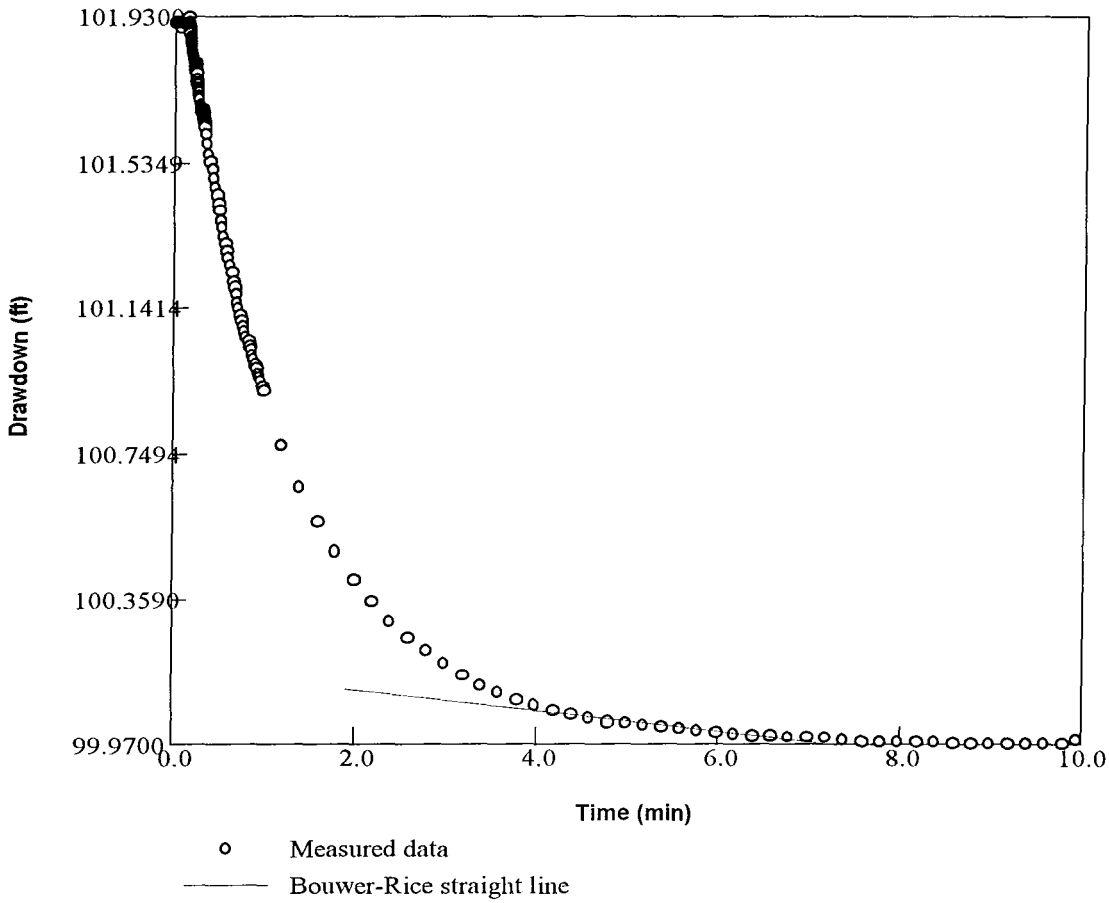
Aquifer Parameters by the Bouwer and Rice Slug Test	
Hydraulic Conductivity (ft/min):	2.29e-005
Transmissivity (sq ft/min):	6.88e-004

WETSIG YACHTS MW9 RECOVERY TEST (EARLY DATA)



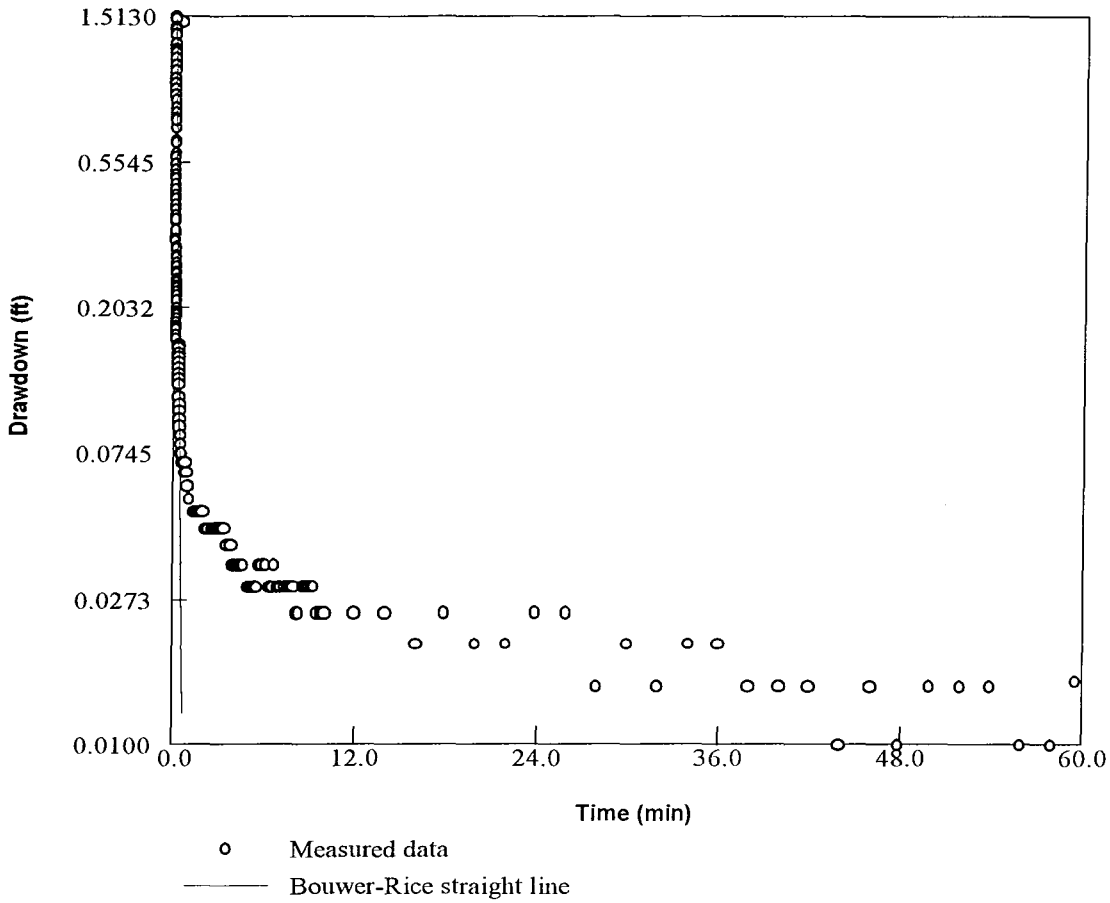
Aquifer Parameters by the Bouwer and Rice Slug Test	
Hydraulic Conductivity (ft/min):	1.11e-005
Transmissivity (sq ft/min):	3.32e-004

WETSIG YACHTS MW9 RECOVERY TEST (MIDDLE DATA)



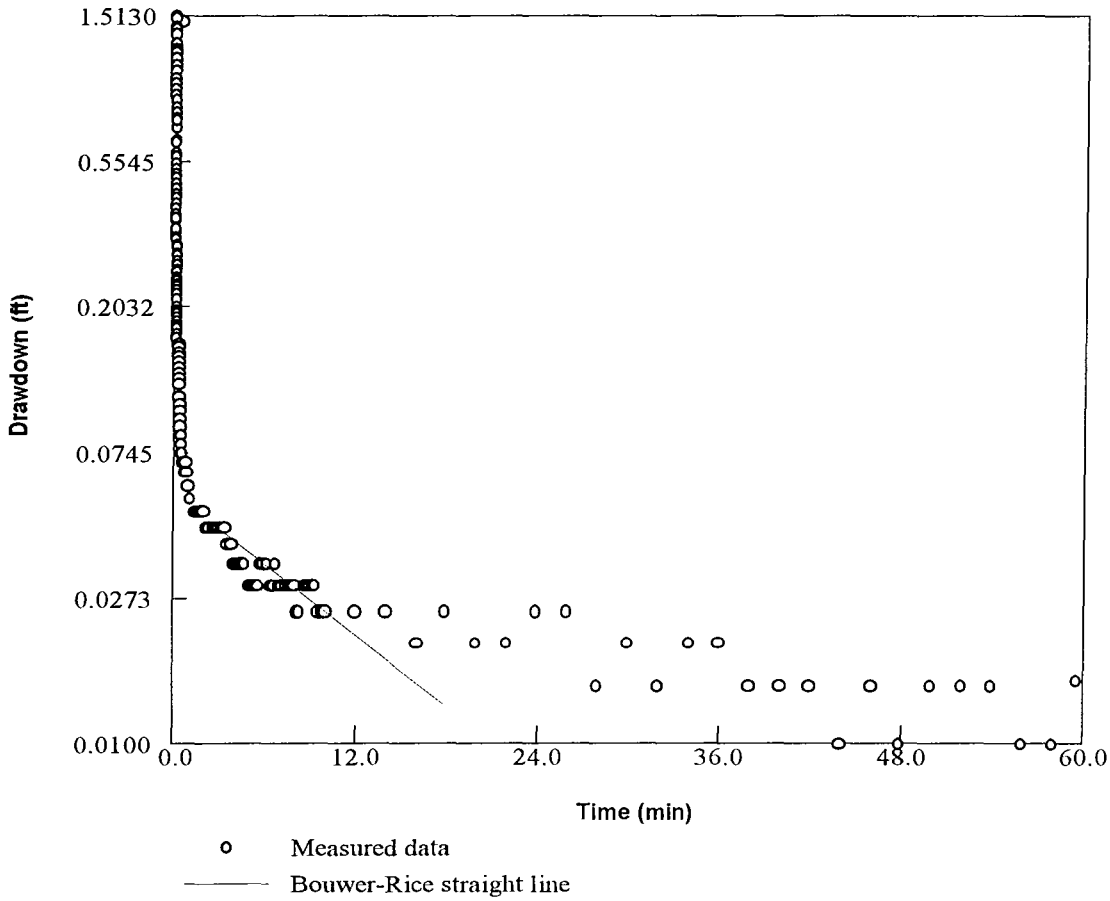
Aquifer Parameters by the Bouwer and Rice Slug Test	
Hydraulic Conductivity (ft/min):	4.66e-007
Transmissivity (sq ft/min):	1.40e-005

WETSIG YACHTS MW9 RECOVERY TEST (LATE DATA)



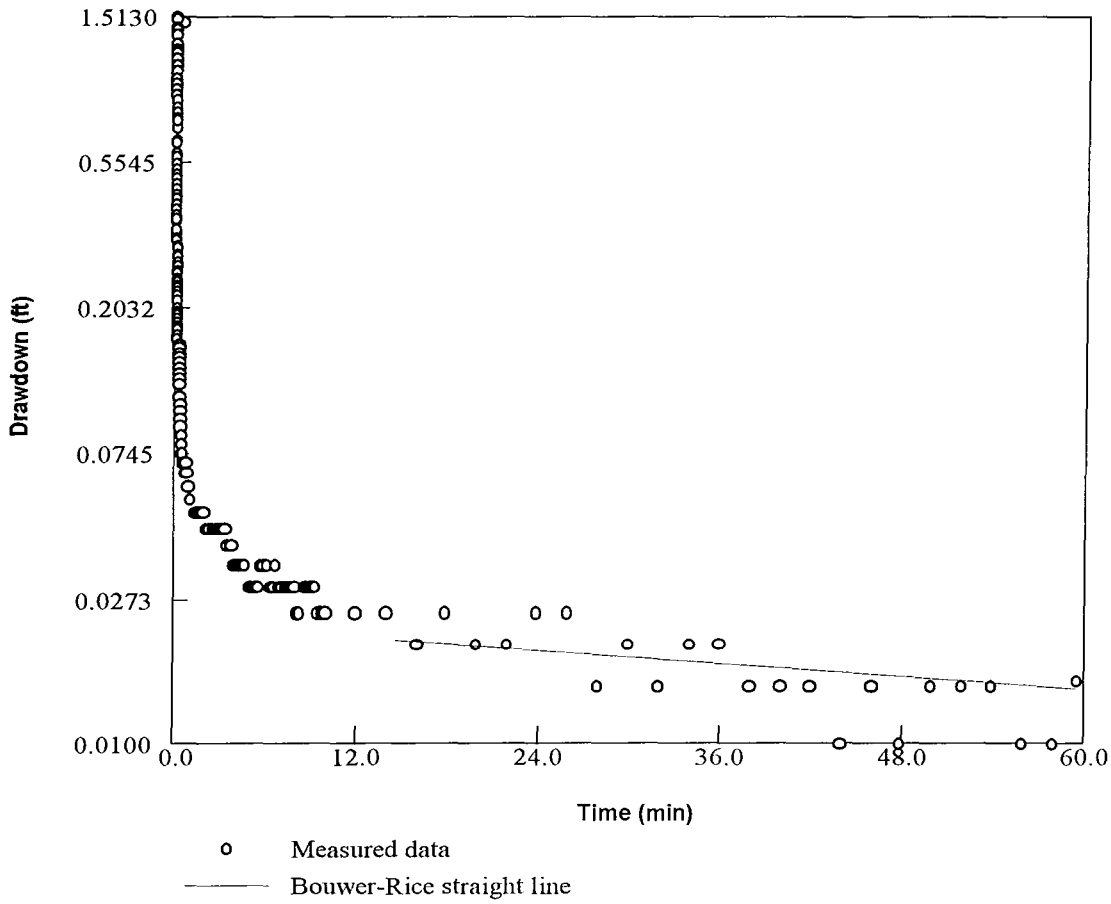
Aquifer Parameters by the Bouwer and Rice Slug Test	
Hydraulic Conductivity (ft/min):	7.51e-003
Transmissivity (sq ft/min):	2.25e-001

WETSIG YACHTS DMW1 RECOVERY TEST (EARLY DATA)



Aquifer Parameters by the Bouwer and Rice Slug Test	
Hydraulic Conductivity (ft/min):	8.84e-005
Transmissivity (sq ft/min):	2.65e-003

WETSIG YACHTS DMW1 RECOVERY TEST (MIDDLE DATA)



Aquifer Parameters by the Bouwer and Rice Slug Test	
Hydraulic Conductivity (ft/min):	8.08e-006
Transmissivity (sq ft/min):	2.42e-004

WETSIG YACHTS DMW1 RECOVERY TEST (LATE DATA)

WETSIG YACHT COMPANY
WILMINGTON, NC
CES PROJECT NO. 02106
RECOVERY TEST RAW DATA FOR MW8

SE1000C
Environmental Logger
07/23 14:14

Unit# 80000 Test 12

Setups: INPUT 1
--- ---
Type Level (F)
Mode TOC
I.D. 02106

Reference 100.000
Linearity 0.070
Scale factor 15.700
Offset 0.080
Delay mSEC 50.000

Step 0 07/21 15:38:27

Elapsed Time	INPUT 1
0.0000	101.915
0.0033	101.910
0.0066	101.910
0.0100	101.910
0.0133	101.910
0.0166	101.910
0.0200	101.910
0.0233	101.910
0.0266	101.910
0.0300	101.910
0.0333	101.910
0.0366	101.910
0.0400	101.910
0.0433	101.910
0.0466	101.910
0.0500	101.910
0.0533	101.915
0.0566	101.910
0.0600	101.910
0.0633	101.910
0.0666	101.915
0.0700	101.910
0.0733	101.910
0.0766	101.910

0.0800	101.910
0.0833	101.915
0.0866	101.915
0.0900	101.915
0.0933	101.915
0.0966	101.915
0.1000	101.915
0.1033	101.915
0.1066	101.915
0.1100	101.915
0.1133	101.915
0.1166	101.915
0.1200	101.915
0.1233	101.915
0.1266	101.915
0.1300	101.910
0.1333	101.910
0.1366	101.915
0.1400	101.915
0.1433	101.915
0.1466	101.915
0.1500	101.915
0.1533	101.915
0.1566	101.915
0.1600	101.915
0.1633	101.915
0.1666	101.915
0.1700	101.915
0.1733	101.915
0.1766	101.915
0.1800	101.915
0.1833	101.915
0.1866	101.915
0.1900	101.915
0.1933	101.915
0.1966	101.915
0.2000	101.915
0.2033	101.915
0.2066	101.915
0.2100	101.915
0.2133	101.915
0.2166	101.915
0.2200	101.915
0.2233	101.915
0.2266	101.910
0.2300	101.910
0.2333	101.910

0.2366	101.905
0.2400	101.905
0.2433	101.910
0.2466	101.900
0.2500	101.885
0.2533	101.875
0.2566	101.865
0.2600	101.855
0.2633	101.840
0.2666	101.831
0.2700	101.821
0.2733	101.806
0.2766	101.796
0.2800	101.786
0.2833	101.771
0.2866	101.761
0.2900	101.751
0.2933	101.741
0.2966	101.731
0.3000	101.716
0.3033	101.707
0.3066	101.697
0.3100	101.687
0.3133	101.677
0.3166	101.667
0.3200	101.652
0.3233	101.642
0.3266	101.632
0.3300	101.622
0.3333	101.612
0.3500	101.558
0.3666	101.503
0.3833	101.449
0.4000	101.399
0.4166	101.344
0.4333	101.295
0.4500	101.245
0.4666	101.196
0.4833	101.151
0.5000	101.101
0.5166	101.067
0.5333	101.032
0.5500	100.997
0.5666	100.967
0.5833	100.933
0.6000	100.903
0.6166	100.873

0.6333	100.838
0.6500	100.809
0.6666	100.779
0.6833	100.749
0.7000	100.719
0.7166	100.690
0.7333	100.665
0.7500	100.635
0.7666	100.610
0.7833	100.581
0.8000	100.556
0.8166	100.526
0.8333	100.501
0.8500	100.476
0.8666	100.452
0.8833	100.427
0.9000	100.402
0.9166	100.377
0.9333	100.352
0.9500	100.332
0.9666	100.308
0.9833	100.283
1.0000	100.263
1.2000	100.015
1.4000	99.836
1.6000	99.717
1.8000	99.622
2.0000	99.533
2.2000	99.464
2.4000	99.419
2.6000	99.394
2.8000	99.379
3.0000	99.364
3.2000	99.330
3.4000	99.310
3.6000	99.300
3.8000	99.285
4.0000	99.290
4.2000	99.290
4.4000	99.285
4.6000	99.285
4.8000	99.285
5.0000	99.285
5.2000	99.280
5.4000	99.280
5.6000	99.280
5.8000	99.285

WETSIG YACHT COMPANY
WILMINGTON, NC
CES PROJECT NO. 02106
RECOVERY TEST RAW DATA FOR MW8

6.0000	99.290
6.2000	99.290
6.4000	99.290
6.6000	99.300
6.8000	99.310
7.0000	99.315
7.2000	99.320
7.4000	99.325
7.6000	99.325
7.8000	99.325
8.0000	99.325
8.2000	99.325
8.4000	99.330
8.6000	99.325
8.8000	99.325
9.0000	99.325
9.2000	99.325
9.4000	99.325
9.6000	99.325
9.8000	99.325
10.0000	99.325

WETSIG YACHT COMPANY
WILMINGTON, NC
CES PROJECT NO. 02106
RECOVERY TEST RAW DATA FOR MW9

SE1000C
Environmental Logger
07/23 14:11

Unit# 80000 Test 11

Setups: INPUT 1
--- ---
Type Level (F)
Mode TOC
I.D. 02106

Reference 100.000
Linearity 0.070
Scale factor 15.700
Offset 0.080
Delay mSEC 50.000

Step 0 07/21 14:57:19

Elapsed Time	INPUT 1
0.0000	101.920
0.0033	101.915
0.0066	101.915
0.0100	101.920
0.0133	101.915
0.0166	101.920
0.0200	101.920
0.0233	101.920
0.0266	101.920
0.0300	101.920
0.0333	101.920
0.0366	101.920
0.0400	101.920
0.0433	101.920
0.0466	101.920
0.0500	101.920
0.0533	101.920
0.0566	101.920
0.0600	101.920
0.0633	101.920
0.0666	101.920
0.0700	101.920
0.0733	101.920
0.0766	101.920
0.0800	101.920

0.0833	101.920
0.0866	101.920
0.0900	101.920
0.0933	101.920
0.0966	101.920
0.1000	101.920
0.1033	101.920
0.1066	101.920
0.1100	101.920
0.1133	101.920
0.1166	101.920
0.1200	101.920
0.1233	101.920
0.1266	101.920
0.1300	101.920
0.1333	101.920
0.1366	101.920
0.1400	101.930
0.1433	101.920
0.1466	101.920
0.1500	101.915
0.1533	101.910
0.1566	101.905
0.1600	101.900
0.1633	101.895
0.1666	101.890
0.1700	101.880
0.1733	101.875
0.1766	101.870
0.1800	101.865
0.1833	101.860
0.1866	101.855
0.1900	101.850
0.1933	101.845
0.1966	101.840
0.2000	101.835
0.2033	101.831
0.2066	101.826
0.2100	101.821
0.2133	101.816
0.2166	101.811
0.2200	101.806
0.2233	101.801
0.2266	101.796
0.2300	101.791
0.2333	101.786
0.2366	101.781
0.2400	101.766

0.2433	101.756
0.2466	101.751
0.2500	101.741
0.2533	101.736
0.2566	101.731
0.2600	101.726
0.2633	101.731
0.2666	101.736
0.2700	101.731
0.2733	101.721
0.2766	101.711
0.2800	101.697
0.2833	101.692
0.2866	101.687
0.2900	101.682
0.2933	101.677
0.2966	101.677
0.3000	101.687
0.3033	101.682
0.3066	101.677
0.3100	101.672
0.3133	101.667
0.3166	101.662
0.3200	101.657
0.3233	101.652
0.3266	101.647
0.3300	101.642
0.3333	101.637
0.3500	101.617
0.3666	101.592
0.3833	101.563
0.4000	101.543
0.4166	101.523
0.4333	101.498
0.4500	101.473
0.4666	101.454
0.4833	101.429
0.5000	101.409
0.5166	101.384
0.5333	101.364
0.5500	101.339
0.5666	101.320
0.5833	101.300
0.6000	101.280
0.6166	101.260
0.6333	101.240
0.6500	101.220
0.6666	101.201

0.6833	101.181
0.7000	101.161
0.7166	101.146
0.7333	101.126
0.7500	101.111
0.7666	101.096
0.7833	101.082
0.8000	101.067
0.8166	101.057
0.8333	101.042
0.8500	101.032
0.8666	101.017
0.8833	101.007
0.9000	100.992
0.9166	100.982
0.9333	100.967
0.9500	100.958
0.9666	100.948
0.9833	100.933
1.0000	100.923
1.2000	100.774
1.4000	100.665
1.6000	100.571
1.8000	100.491
2.0000	100.417
2.2000	100.357
2.4000	100.303
2.6000	100.258
2.8000	100.223
3.0000	100.189
3.2000	100.159
3.4000	100.134
3.6000	100.114
3.8000	100.094
4.0000	100.079
4.2000	100.065
4.4000	100.055
4.6000	100.045
4.8000	100.035
5.0000	100.030
5.2000	100.025
5.4000	100.020
5.6000	100.015
5.8000	100.010
6.0000	100.005
6.2000	100.000
6.4000	99.995
6.6000	99.995

WETSIG YACHT COMPANY
WILMINGTON, NC
CES PROJECT NO. 02106
RECOVERY TEST RAW DATA FOR MW9

6.8000	99.990
7.0000	99.990
7.2000	99.990
7.4000	99.985
7.6000	99.980
7.8000	99.980
8.0000	99.980
8.2000	99.980
8.4000	99.980
8.6000	99.975
8.8000	99.975
9.0000	99.975
9.2000	99.975
9.4000	99.975
9.6000	99.975
9.8000	99.975
10.0000	99.970

WETSIG YACHT COMPANY
WILMINGTON, NC
CES PROJECT NO. 02106
DRAWDOWN TEST RAW DATA FOR MW7 AND DW1

SE1000C
Environmental Logger
07/23 14:01

Unit# 80000 Test 8

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	TOC	Surface
I.D.	02106	99130
Reference	100.000	100.000
Linearity	0.060	0.070
Scale factor	15.080	15.680
Offset	0.150	0.080
Delay mSEC	50.000	50.000

Step 0 07/21 11:07:54

Elapsed Time	INPUT 1	INPUT 2
0.0000	110.910	99.781
0.0033	111.020	99.766
0.0066	111.111	99.756
0.0100	110.483	99.746
0.0133	111.921	99.741
0.0166	111.940	99.731
0.0200	112.007	99.721
0.0233	112.400	99.716
0.0266	112.826	99.711
0.0300	113.042	99.711
0.0333	113.114	99.706
0.0366	113.290	99.701
0.0400	113.904	99.696
0.0433	113.928	99.686
0.0466	114.129	99.681
0.0500	113.980	99.676
0.0533	114.105	99.666
0.0566	114.315	99.666
0.0600	114.565	99.661
0.0633	114.828	99.656
0.0666	114.952	99.651
0.0700	115.259	99.651
0.0733	115.560	99.646
0.0766	115.723	99.641

INPUT1 = MW7
INPUT2 = DW1

0.0800	116.206	99.636
0.0833	116.838	99.631
0.0866	117.183	99.626
0.0900	117.493	99.626
0.0933	117.828	99.621
0.0966	118.269	99.621
0.1000	118.517	99.616
0.1033	119.000	99.611
0.1066	119.039	99.611
0.1100	119.383	99.607
0.1133	119.574	99.602
0.1166	119.718	99.602
0.1200	120.019	99.602
0.1233	120.010	99.602
0.1266	120.158	99.597
0.1300	120.263	99.592
0.1333	120.622	99.592
0.1366	120.755	99.592
0.1400	120.918	99.587
0.1433	120.985	99.587
0.1466	121.262	99.587
0.1500	121.434	99.587
0.1533	121.678	99.587
0.1566	121.678	99.587
0.1600	122.070	99.582
0.1633	122.061	99.582
0.1666	122.462	99.582
0.1700	122.524	99.582
0.1733	122.859	99.582
0.1766	122.830	99.582
0.1800	122.935	99.582
0.1833	123.007	99.582
0.1866	123.298	99.582
0.1900	123.083	99.582
0.1933	123.408	99.577
0.1966	123.207	99.582
0.2000	123.580	99.582
0.2033	123.485	99.582
0.2066	123.733	99.587
0.2100	124.096	99.592
0.2133	124.149	99.592
0.2166	124.101	99.592
0.2200	124.345	99.592
0.2233	124.445	99.587
0.2266	124.450	99.592
0.2300	124.278	99.597
0.2333	124.497	99.592

INPUT1 = MW7
INPUT2 = DW1

0.2366	124.598	99.592
0.2400	124.779	99.592
0.2433	124.970	99.597
0.2466	125.142	99.597
0.2500	125.118	99.597
0.2533	125.157	99.602
0.2566	125.052	99.597
0.2600	125.142	99.602
0.2633	125.023	99.602
0.2666	125.267	99.602
0.2700	125.300	99.607
0.2733	125.453	99.607
0.2766	125.405	99.602
0.2800	125.481	99.607
0.2833	125.505	99.602
0.2866	125.692	99.607
0.2900	125.801	99.607
0.2933	125.935	99.607
0.2966	125.973	99.607
0.3000	126.222	99.611
0.3033	126.083	99.611
0.3066	126.293	99.611
0.3100	126.260	99.611
0.3133	126.456	99.611
0.3166	126.351	99.611
0.3200	126.585	99.611
0.3233	126.389	99.611
0.3266	126.570	99.611
0.3300	126.317	99.611
0.3333	126.594	99.611
0.3500	123.470	99.616
0.3666	123.098	99.621
0.3833	122.801	99.621
0.4000	122.567	99.626
0.4166	122.247	99.626
0.4333	121.917	99.626
0.4500	121.458	99.626
0.4666	121.143	99.626
0.4833	120.990	99.626
0.5000	120.755	99.626
0.5166	120.454	99.626
0.5333	120.206	99.621
0.5500	119.947	99.621
0.5666	119.660	99.621
0.5833	119.431	99.621
0.6000	119.144	99.621
0.6166	118.890	99.621

INPUT1 = MW7
INPUT2 = DW1

0.6333	118.843	99.616
0.6500	118.646	99.616
0.6666	118.541	99.621
0.6833	118.426	99.616
0.7000	118.331	99.616
0.7166	118.139	99.611
0.7333	118.010	99.611
0.7500	117.891	99.587
0.7666	117.747	99.557
0.7833	117.618	99.527
0.8000	117.441	99.482
0.8166	117.321	99.447
0.8333	117.288	99.413
0.8500	117.249	99.388
0.8666	117.178	99.358
0.8833	117.073	99.343
0.9000	116.948	99.328
0.9166	116.785	99.313
0.9333	116.814	99.303
0.9500	116.800	99.293
0.9666	116.852	99.288
0.9833	116.943	99.283
1.0000	117.015	99.278
1.2000	112.764	99.258
1.4000	111.456	99.278
1.6000	110.905	99.263
1.8000	110.689	99.273
2.0000	110.651	99.268
2.2000	110.665	99.044
2.4000	110.752	98.985
2.6000	110.915	98.980
2.8000	111.025	98.995
3.0000	111.130	99.005
3.2000	111.216	99.025
3.4000	111.638	99.030
3.6000	111.906	99.034
3.8000	111.935	99.039
4.0000	112.012	99.034
4.2000	112.064	99.044
4.4000	112.160	99.044
4.6000	112.433	99.049
4.8000	112.797	99.044
5.0000	112.908	99.044
5.2000	113.185	99.044
5.4000	113.267	99.044
5.6000	113.425	99.044
5.8000	113.262	99.049

INPUT1 = MW7
INPUT2 = DW1

WETSIG YACHT COMPANY
WILMINGTON, NC
CES PROJECT NO. 02106
DRAWDOWN TEST RAW DATA FOR MW7 AND DW1

6.0000	113.358	99.044
6.2000	113.659	99.044
6.4000	113.736	99.049
6.6000	113.726	99.044
6.8000	113.717	99.049
7.0000	113.765	99.049
7.2000	114.119	99.049
7.4000	114.210	99.044
7.6000	114.244	99.044
7.8000	114.378	99.044
8.0000	114.325	99.049
8.2000	114.450	99.049
8.4000	114.579	99.049
8.6000	114.588	99.044
8.8000	114.617	99.044
9.0000	114.756	99.049
9.2000	114.655	99.049
9.4000	114.684	99.049
9.6000	114.928	99.049
9.8000	114.938	99.044
10.0000	114.856	99.049
12.0000	113.832	98.567
14.0000	112.994	98.562
16.0000	112.764	98.552
18.0000	111.974	98.552
20.0000	109.477	98.547
22.0000	110.646	98.542
24.0000	110.134	98.552
26.0000	110.234	98.527
28.0000	109.913	98.517
30.0000	110.488	98.517
32.0000	110.852	98.522
34.0000	110.339	98.517
36.0000	110.177	98.502
38.0000	109.803	98.507
40.0000	109.463	98.502
42.0000	109.055	98.502
44.0000	108.753	98.497
46.0000	109.093	98.502
48.0000	109.199	98.497
50.0000	109.165	98.507
52.0000	108.988	98.497

INPUT1 = MW7
INPUT2 = DW1

WETSIG YACHT COMPANY
WILMINGTON, NC
CES PROJECT NO. 02106
RECOVERY TEST RAW DATA FOR MW7 AND DW1

SE1000C
Environmental Logger
07/23 14:06

Unit# 80000 Test 9

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	TOC	Surface
I.D.	02106	99130
Reference	100.000	100.000
Linearity	0.060	0.070
Scale factor	15.080	15.680
Offset	0.150	0.080
Delay mSEC	50.000	50.000

Step 0 07/21 12:04:59

Elapsed Time	INPUT 1	INPUT 2
0.0000	107.957	98.487
0.0033	100.000	98.497
0.0066	100.000	98.492
0.0100	106.288	98.497
0.0133	106.547	98.492
0.0166	107.108	98.492
0.0200	107.410	98.487
0.0233	108.484	98.492
0.0266	109.458	98.497
0.0300	109.860	98.492
0.0333	110.479	98.502
0.0366	110.742	98.502
0.0400	110.594	98.870
0.0433	110.833	98.592
0.0466	110.847	98.761
0.0500	111.327	98.612
0.0533	111.001	98.950
0.0566	111.724	98.661
0.0600	111.844	98.736
0.0633	112.663	98.786
0.0666	112.433	98.821
0.0700	113.444	98.865
0.0733	113.147	98.910
0.0766	114.244	98.955

INPUT1=MW7
INPUT2=DW1

0.0800	113.645	99.000
0.0833	115.244	99.039
0.0866	114.813	99.079
0.0900	116.063	99.109
0.0933	115.359	99.149
0.0966	116.713	99.184
0.1000	115.895	99.214
0.1033	116.771	99.248
0.1066	116.067	99.288
0.1100	117.273	99.403
0.1133	117.053	99.258
0.1166	117.537	99.348
0.1200	117.341	99.358
0.1233	118.297	99.408
0.1266	117.249	99.418
0.1300	118.455	99.452
0.1333	117.958	99.467
0.1366	118.737	99.487
0.1400	118.345	99.502
0.1433	118.713	99.522
0.1466	118.819	99.537
0.1500	118.981	99.557
0.1533	118.962	99.567
0.1566	119.134	99.582
0.1600	119.627	99.597
0.1633	119.120	99.611
0.1666	119.689	99.626
0.1700	119.680	99.621
0.1733	119.809	99.656
0.1766	119.359	99.651
0.1800	120.124	99.671
0.1833	120.320	99.676
0.1866	120.072	99.686
0.1900	120.421	99.691
0.1933	119.794	99.706
0.1966	120.588	99.711
0.2000	120.316	99.721
0.2033	120.521	99.726
0.2066	119.866	99.736
0.2100	120.564	99.741
0.2133	120.253	99.751
0.2166	120.435	99.756
0.2200	120.311	99.761
0.2233	120.449	99.766
0.2266	120.411	99.771
0.2300	120.540	99.776
0.2333	120.488	99.786

INPUT1=MW7
INPUT2=DW1

0.2366	120.110	99.786
0.2400	120.583	99.796
0.2433	120.631	99.801
0.2466	120.373	99.801
0.2500	120.459	99.805
0.2533	120.139	99.810
0.2566	120.378	99.815
0.2600	119.885	99.820
0.2633	120.727	99.820
0.2666	120.579	99.825
0.2700	120.832	99.830
0.2733	120.808	99.830
0.2766	121.095	99.835
0.2800	120.712	99.840
0.2833	121.286	99.840
0.2866	120.904	99.845
0.2900	121.238	99.845
0.2933	120.612	99.850
0.2966	121.081	99.850
0.3000	120.875	99.850
0.3033	121.128	99.855
0.3066	120.851	99.855
0.3100	121.363	99.860
0.3133	121.214	99.860
0.3166	121.415	99.865
0.3200	121.128	99.865
0.3233	121.664	99.870
0.3266	121.410	99.870
0.3300	121.817	99.870
0.3333	121.344	99.875
0.3500	116.441	99.880
0.3666	116.168	99.890
0.3833	116.067	99.895
0.4000	116.139	99.900
0.4166	116.020	99.905
0.4333	115.756	99.910
0.4500	115.565	99.910
0.4666	115.325	99.915
0.4833	115.182	99.915
0.5000	114.991	99.920
0.5166	114.833	99.920
0.5333	114.612	99.920
0.5500	114.426	99.925
0.5666	114.473	99.925
0.5833	114.574	99.925
0.6000	114.531	99.925
0.6166	114.608	99.925

INPUT1=MW7
INPUT2=DW1

0.6333	114.679	99.930
0.6500	114.598	99.930
0.6666	114.516	99.930
0.6833	114.718	99.930
0.7000	114.828	99.930
0.7166	114.555	99.930
0.7333	114.608	99.930
0.7500	114.694	99.930
0.7666	114.531	99.935
0.7833	114.655	99.935
0.8000	114.406	99.935
0.8166	114.627	99.935
0.8333	114.636	99.935
0.8500	114.684	99.935
0.8666	114.502	99.935
0.8833	114.761	99.935
0.9000	114.746	99.935
0.9166	114.713	99.935
0.9333	114.722	99.940
0.9500	114.354	99.940
0.9666	114.684	99.940
0.9833	114.627	99.940
1.0000	114.430	99.940
1.2000	109.467	99.945
1.4000	107.626	99.950
1.6000	106.782	99.950
1.8000	106.173	99.950
2.0000	106.029	99.950
2.2000	108.288	99.955
2.4000	109.314	99.955
2.6000	109.338	99.955
2.8000	109.319	99.955
3.0000	109.209	99.955
3.2000	109.184	99.955
3.4000	109.266	99.955
3.6000	109.433	99.960
3.8000	109.544	99.960
4.0000	109.707	99.965
4.2000	110.100	99.965
4.4000	110.191	99.965
4.6000	110.263	99.965
4.8000	110.526	99.965
5.0000	110.857	99.970
5.2000	110.948	99.970
5.4000	110.972	99.970
5.6000	111.173	99.970
5.8000	111.288	99.965

INPUT1=MW7
INPUT2=DW1

6.0000	111.446	99.965
6.2000	111.427	99.965
6.4000	111.485	99.970
6.6000	111.681	99.970
6.8000	111.940	99.965
7.0000	111.897	99.970
7.2000	112.074	99.970
7.4000	112.084	99.970
7.6000	112.180	99.970
7.8000	112.270	99.970
8.0000	112.630	99.970
8.2000	112.721	99.975
8.4000	112.711	99.975
8.6000	112.726	99.970
8.8000	112.994	99.970
9.0000	113.104	99.970
9.2000	112.999	99.970
9.4000	113.008	99.970
9.6000	113.152	99.975
9.8000	113.281	99.975
10.0000	113.219	99.975
12.0000	111.806	99.975
14.0000	111.121	99.975
16.0000	110.785	99.980
18.0000	109.913	99.975
20.0000	109.367	99.980
22.0000	109.036	99.980
24.0000	108.513	99.975
26.0000	108.173	99.975
28.0000	108.130	99.985
30.0000	108.063	99.980
32.0000	107.909	99.985
34.0000	107.732	99.980
36.0000	107.439	99.980
38.0000	107.454	99.985
40.0000	107.209	99.985
42.0000	106.772	99.985
44.0000	106.327	99.990
46.0000	106.149	99.985
48.0000	107.113	99.990
50.0000	107.578	99.985
52.0000	106.988	99.985
54.0000	106.801	99.985
56.0000	106.816	99.990
58.0000	107.132	99.990
60.0000	107.055	99.985

INPUT1=MW7
INPUT2=DW1

APPENDIX VII

MATERIAL SAFETY DATA SHEETS

International Chemical Safety Cards

ARSENIC

ICSC: 0013

ARSENIC
Grey arsenic
Metallic arsenic
As
Atomic mass: 74.9

CAS # 7440-38-2
RTECS # CG0525000
ICSC # 0013
UN # 1558
EC # 033-001-00-X

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames. NO contact with strong oxidizers. NO contact with hot surfaces.	Powder, water spray, foam, carbon dioxide.
EXPLOSION	Risk of fire and explosion is slight if in the form of fine powder or dust when exposed to hot surfaces or flames.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		AVOID ALL CONTACT!	IN ALL CASES CONSULT A DOCTOR!
• **INHALATION**	Cough. Diarrhoea. Shortness of breath. Sore throat. Vomiting. Weakness. Grey skin.	Closed system and ventilation.	Fresh air, rest. Artificial respiration if indicated. Refer for medical attention.
• **SKIN**	Redness.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse skin with plenty of water or shower.
• **EYES**	Redness.	or eye protection in combination with breathing protection if powder.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• **INGESTION**	Diarrhoea. Nausea. Sore throat. Unconsciousness. Vomiting (further see Inhalation).	Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth. Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Evacuate danger area! Sweep spilled substance into sealable containers. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment (extra personal protection: complete protective clothing including self-contained breathing apparatus).	Provision to contain effluent from fire extinguishing. Separated from strong oxidants, acids, halogens, food and feedstuffs. Well closed. Keep in a well-ventilated room.	Do not transport with food and feedstuffs. T symbol R: 23/25 S: (1/2-)20/21-28-45 UN Hazard Class: 6.1 UN Packing Group: II Marine pollutant.

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0013

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities © IPCS CEC 1993

International Chemical Safety Cards

ARSENIC

ICSC: 0013

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
ODOURLESS, BRITTLE, GREY, METALLIC-LOOKING CRYSTALS.

PHYSICAL DANGERS:

CHEMICAL DANGERS:
Upon heating, toxic fumes are formed. Reacts violently with strong oxidants and halogens causing fire and explosion hazard. Reacts with nitric acid, hot sulfuric acid. Toxic arsine gas may be formed in contact with acid or acidic substances and certain metals, such as galvanized or light metals.

OCCUPATIONAL EXPOSURE LIMITS (OELs):
TLV: ppm; 0.01 mg/m^3 (as TWA) A1 (ACGIH 1994-1995).

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation of its aerosol, through the skin and by ingestion.

INHALATION RISK:
Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly.

EFFECTS OF SHORT-TERM EXPOSURE:
The substance irritates the eyes, the skin and the respiratory tract. The substance may cause effects on the circulatory system, nervous system, kidneys and gastrointestinal tract , resulting in convulsions, kidney impairment, severe hemorrhage, losses of fluids, and electrolytes, shock and death. Exposure may result in death. The effects may be delayed. Medical observation is indicated.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
Repeated or prolonged contact with skin may cause dermatitis. Repeated or prolonged contact may cause skin sensitization. The substance may have effects on the mucous membranes, skin, kidneys, liver , resulting in neuropathy, pigmentation disorders, perforation of nasal septum and tissue lesions. This substance is carcinogenic to humans.

PHYSICAL PROPERTIES

Sublimation point: 613°C
Relative density (water = 1): 5.7
Solubility in water: none

ENVIRONMENTAL DATA

The substance is toxic to aquatic organisms. It is strongly advised not to let the chemical enter into the environment because it persists in the environment.

NOTES

The substance is combustible but no flash point is available in literature. Depending on the degree of exposure, periodic medical examination is indicated. Do NOT take working clothes home. Refer also to cards for specific arsenic compounds, e.g., Arsenic pentoxide (ICSC # 0377), Arsenic trichloride (ICSC # 0221), Arsenic trioxide (ICSC # 0378), Arsine (ICSC # 0222).

ADDITIONAL INFORMATION

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International Chemical Safety Cards

CHROMIUM

ICSC: 0029

CHROMIUM
Chrome
(powder)
Cr (metal)
Atomic mass: 52.0

CAS # 7440-47-3
RTECS # GB4200000
ICSC # 0029

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible if in very fine powder. Gives off irritating or toxic fumes (or gases) in a fire.	No open flames if in powder form.	In case of fire in the surroundings: all extinguishing agents allowed.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		PREVENT DISPERSION OF DUST! STRICT HYGIENE!	
• **INHALATION**	Cough.	Local exhaust or breathing protection.	Fresh air, rest.
• **SKIN**	Redness.	Protective gloves.	Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention.
• **EYES**	Redness.	Face shield.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• **INGESTION**		Do not eat, drink, or smoke during work.	Rinse mouth.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Vacuum spilled material. Carefully collect remainder, then remove to safe place (extra personal protection: P2 filter respirator for harmful particles).	Fireproof. Separated from strong oxidants.	

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0029

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International Chemical Safety Cards

CHROMIUM

ICSC: 0029

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
STEEL GREY LUTROUS METAL.

PHYSICAL DANGERS:
Dust explosion possible if in powder or granular form, mixed with air.

CHEMICAL DANGERS:
Reacts violently with strong oxidants such as hydrogen peroxide, causing fire and explosion hazard. Reacts with diluted hydrochloric and sulfuric acids. Incompatible with alkalis and alkali carbonates.

OCCUPATIONAL EXPOSURE LIMITS (OELs):
TLV: ppm; 0.5 mg/m^3 (as TWA) (ACGIH 1994-1995).

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation of its aerosol and by ingestion.

INHALATION RISK:
Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed.

EFFECTS OF SHORT-TERM EXPOSURE:

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
Repeated or prolonged contact may cause skin sensitization.

PHYSICAL PROPERTIES

Boiling point: 2642°C
Melting point: 1900°C
Relative density (water = 1): 7.14
Solubility in water: none

ENVIRONMENTAL DATA

NOTES

Explosive limits are unknown in literature. Depending on the degree of exposure, periodic medical examination is indicated.

ADDITIONAL INFORMATION

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APPENDIX VIII

REFERENCES

REFERENCES

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