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REVISED SITE PLAN APPLICATION REPORT

Highway 55 C&D Landfill and Recycling Center
Wake County, North Carolina

Re-SCANNED 3/13/14 Carmen Johnson

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1.0 PROJECT INFORMATION

The Highway 55 C&D Landfill & Recycling Center site consists of approximately 88.6 acres of undeveloped land located 0.5 mile west of the intersection of Old Smithfield Road and Highway 55 in the Southwest portion of Wake County, North Carolina (Figures 1 and 2). A total of 43.6 acres will be utilized for actual landfilling operations (Figure 6). The Recycling Center will consist of a one acre paved drop-off area located adjacent to the Scale House and a 5.1 acre area for land clearing, inert debris, and curb-side product recycling (see Figure 2).

The C&D Landfill will be developed in three phases. Phase I involves 17.8 acres and is located in the western section of the property. Remaining Phases II and III include 14.6 and 11.2 acres, respectively. The Scale House and office area will be located in the easternmost section of the property. The access entrance road to the landfill will extend from Highway 55 Bypass to our paved access road located just north of Old Smithfield Road. The paved access road will extend beyond the Scale House and into the Phase I landfill area as a dust control measure. Figure 12 indicates the proposed site construction layout.

The information provided in this report is intended to address the geologic and hydrogeologic siting requirements specified in Section .0504 of the North Carolina DENR-Solid Waste Management Rules.

2.0 AREA RECONNAISSANCE

As required by the DENR-Soil Waste Management Rules, a Quarter-Mile Radius Aerial Photograph with a scale of 1"= 400' has been included for review (Figure 3). This photograph indicates the following: 1) locations of all homes; 2) land use; 3) zoning districts; 4) industrial buildings; 5) public and private utilities; 6) roads; 7) creeks; 8) general topography; and 9) flood plain areas.

The Quarter-Mile Radius Survey Map (included as Figure 4) with a scale of 1"=400' identifies all private drinking water wells and properties being served by the Apex/Holly Springs Water and Sewer Authority. Based on our Quarter-Mile survey is appears that no private drinking water wells are located within 0.25 mile of the subject property. This figure also indicates topography for your review. The three residences identified within

a Quarter-Mile radius located along Old Smithfield Road east of our area of study are all connected to municipal water and sewer provided by the Town of Apex. A copy of the FEMA Map for this area showing the 100-year flood plain has been included as Figure 4A.

The Two-Mile Radius Map, with a scale of 1"-1000', is included as Figure 5, and identifies local topography, schools, residential areas, public utilities, industrial sites, creeks, and flood plain areas. No schools, airports or runways were identified within two miles of the subject site. The only potential source of surface and/or groundwater contamination in the vicinity of the subject site is the South Wake MSW Feltonville Landfill situated immediately south as indicated on Figure 5. Groundwater contamination has been documented at this MSW facility, but not in the monitor wells along the northern perimeter of the site closest to the proposed landfilling area. No significant groundwater users such as industrial or large irrigation wells were identified during our survey. According to the Town of Apex and the Town of Holly Springs, there are no water intakes on either Falls Branch, or Little Branch within two miles of the proposed landfill site.

In order to provide further characterization of the surrounding vicinity, a Two-Mile Radius Aerial Photograph is provided as Figure 5A.

3.0 SITING REQUIREMENTS

The subject property and its proposed use as a C&D landfill and recycling center received unanimous approval from the Wake County Board of Adjustment on August 14, 2001. The Notice of Special Use Approval is attached in Appendix A. The Wake County Board of Commissioners granted Franchise Agreement approval (first vote) on November 19, 2001. The final vote for Franchise approval was granted by the Board on December 3, 2001. The executed Application for Construction and Demolition Debris (C&D) Landfill Franchise is included in Appendix A for your review.

A copy of the Wetland Determination and Request for Concurrence prepared by The Brigman Company, Inc. is attached in Appendix A. The 401 Certification Approval received by the North Carolina Division of Water Quality and the General Permit Verification received by the U.S. Army Corps of Engineers has also been included for your review.

4.0 REGIONAL HYDROGEOLOGY

4.1 Geology

The subject site is underlain by Triassic age fanglomerates of the Chatham Group deposited near the southeastern edge of the Durham Triassic Basin. These deposits represent alluvial fan materials deposited within the basin from the surrounding upland areas in response to displacement along the Jonesboro Fault, which delineates the southeastern margin of the Basin. Bedrock in this area consists of poorly sorted mixtures of metamorphic and igneous rock fragments within a matrix of reddish brown clayey, sandy siltstone with occasional mudstone or clayey sandstone interbedding. These deposits are generally weakly indurated and dip gently to the southeast. The total thickness of these conglomeratic deposits is unknown, but has been reported to exceed 10,000 feet near the eastern edge of the Basin. The Jonesboro Fault is located off site to the east.

Since a diabase dike was identified on the South Wake MSW Landfill to the south, a geophysical survey was conducted as part of the subsurface investigation for the proposed landfill site. A copy of the Geophysical Survey Report by Geophex Services, Ltd. in Raleigh, North Carolina is attached as Appendix F. No diabase dikes were identified on the subject site as a result of this study.

4.2 Hydrogeology

The proposed landfill site consists primarily of Piedmont type topography, which exhibits gentle to moderate slopes. In this area the water table is an undulating surface that generally reflects the topographic irregularities in a more subdued manner. Depth to the water table in this region is a function of the climate, lithology, and most importantly, topography. Extensive studies of the adjacent South Wake MSW Feltonville Landfill indicate that groundwater discharge patterns are similar to surface water discharge patterns in the Little Branch drainage basin.

Seasonal fluctuations of the water table may be considerable during wet or dry seasons. However, the net change in water level elevation is generally small on average, indicating that the average annual discharge of groundwater is approximately equal to the average annual recharge.

Regional groundwater flow appears to be to the west with localized flow patterns to the streams, which border the subject site to the north, south, and west. These streams generally appear to serve as discharge points for the groundwater from the shallow aquifer. The onsite groundwater flow characteristics are discussed in Section 5.6.

The resource value of the aquifer underlying and adjacent to this proposed landfill property is rated low, as the surrounding residences are served by either the Town of Apex or the Town of Holly Springs public water distribution systems.

5.0 GEOTECHNICAL AND HYDROGEOLOGICAL EVALUATION

5.1 Soil Borings

A total of 49 soil test borings were drilled at the subject site to evaluate the subsurface lithology and geotechnical characteristics (Figure 6). Monitor wells were installed in all the borings upon their completion except for SB-1 through SB-6. Boring locations were positioned both within the planned area of landfilling and within the buffer zones around the perimeter of the site in various topographic settings. Horizontal and vertical control for these borings/monitor wells was determined by Patterson, Brewer & Associates, P.A. located in Greensboro, North Carolina.

Standard penetration tests were performed at 5-foot intervals in the soil test borings in general accordance with ASTM D1586-84 to obtain information characterizing soil strength and relative density. Lithologic logs constructed from the soil test borings are included as Appendix B. Hollow stem augers were used to advance the soil borings to either refusal or to their termination depth. Approximately 40 feet of HX-size bedrock core was obtained from MW-1 (35-75 feet), 23 feet from MW-15 (35-58 feet), and 30 feet from MW-18 (20-50 feet). All coring was performed using a Canterra CT-450 drill rig. The percent recovery and RQD values for the core recovered are recorded on the Lithologic Logs for MW-1, MW-15, and MW-18 in Appendix B.

Attempts were made at numerous boring locations to obtain split-spoon samples of the subsurface material after PWR material with blow counts of 50/6 inches or greater was encountered. In all cases, no material was recovered in the spoon.

5.2 Monitor Well Installation

Well Completion Logs characterizing the 43 monitor wells installed on site are included as Appendix C. Each well was constructed of 2-inch diameter PVC screen and riser, with a washed sand filter pack installed to approximately 2 feet above the top of the well screen, followed by a bentonite seal approximately 2 feet thick, and grout to the ground surface. The monitor wells were used to determine groundwater elevations and to establish groundwater flow directions and gradients across the site. Wells were situated to characterize the various topographic settings present at the site, including flood plain, upland knolls, and slopes. Time of boring (TOB), 24-hour, and 7-day water levels for the wells are presented in Table 1. Summaries of monthly groundwater depths and elevations collected to date are provided in Table 2 and Table 2A, respectively.

5.3 Field Testing

In order to evaluate hydraulic conductivity characteristics of the subsurface lithologies present at the site, in-situ field permeability ("slug") testing was performed in monitor wells MW-4, MW-10, MW-13, MW-13D, MW-15, MW-29, MW-31, MW-36 and MW-37. The tests were conducted using the rising head technique, with the test data analyzed by the Bouwer and Rice Method. Test data sheets and calculations are included in Appendix D, with a summary of calculated field permeability test results presented in Table 3.

Based on the field permeability tests performed in the monitor wells screened primarily in the PWR (MW-10, MW-15, MW-29 and MW-37), the hydraulic conductivity of the PWR material averages 1.6 X 10-6 cm/sec. The average hydraulic conductivity of the bedrock material as calculated from testing in MW-4, MW-13, MW-13D, MW-31 and MW-36 is 1.8 X 10-6 cm/sec.

5.4 Laboratory Testing

Representative samples of on-site soils obtained during the field exploration were tested in Shield Engineering's soil testing laboratory. Soil classification tests including natural moisture content, unit weight, grain size distribution with hydrometers, Atterberg limits effective porosity and specific gravity were performed. In addition, standard Proctor compaction tests were performed on potential structural fills or cover soil samples.

USCS soil classifications from the laboratory test results are presented on the representative boring logs in Appendix B. Results of the geotechnical laboratory

classification tests are presented in Table 4. Laboratory test data sheets are included in Appendix E.

In general, the saprolitic soil is classified primarily as a clayey silt, with lesser amounts of slightly clayey silty fine sand and slightly sandy silty clay. The underlying PWR zone generally contained slightly more silt and less clay with increasing depth.

Undisturbed (UD) soil samples were obtained with Shelby tubes on November 6, 2001 from soil borings MW-26, MW-29, SB-1 and SB-3. Several attempts were made to obtain UD samples of the PWR material at various on-site locations, but were unsuccessful, as the tubes buckled before a sufficient sample of the material could be collected. Laboratory permeability results, as shown in Table 4, indicate that the vertical permeability of the UD soil samples ranges from 3.65 X 10-8 cm/sec to 9.29 X 10-7 cm/sec. Additional laboratory tests conducted on the UD samples include Atterburg limits, grain size distribution, specific gravity, effective porosity, dry density, and moisture content. However, flexible wall permeability and effective porosity were not performed on sample SB-3 (5'-6') because the sample broke into pieces during removal from the Shelby tube. This may have been due to the dryness of the sample. Additional soil samples were obtained from MW-25, SB-1, SB-2 and SB-4 for laboratory analysis. Potential cover soil samples (SS-1, SS-2 and SS-3) were also sampled. All test results are summarized in Table 4, with laboratory data included in Appendix E.

Effective porosities were estimated for all the soil samples collected in Table 4 utilizing their grain size distribution and the textural classification triangle from Fetter (1988). These values ranged from 0.01 to 0.07 percent, which were much lower than laboratory generated porosities for some of the samples. The textural classification triangles used in deriving these estimated values are included in Appendix E.

Table 4A contains a summary of hydrogeologic data (including average values) characterizing the three lithologic units identified on this site.

5.5 Subsurface Conditions

Native soils in this area are saprolitic, representing the major product of weathering of bedrock. Saprolite consists of rock that has been subjected to in-situ chemical weathering, resulting in the removal of up to 60% of the rock mass by solution without affecting volume (Horton and others 1991). These residual soils grade with depth into zones of partially weathered rock (PWR) that overlie the bedrock. Similar soils were grouped according to lithologies on the soil test boring logs to construct the hydrogeologic cross sections (Figures 8, 8A, 8B, 8C, and 8D). These cross sections have

been generalized and may not depict the actual subsurface conditions that exist between the boring locations. The transition between lithologies is typically gradual (both horizontally and vertically) and actual lithologic changes may be more gradational than depicted on Cross Sections A-A', B-B', C-C', D-D' or on the soil test boring logs. The attached Lithologic Logs (Appendix B) contain more specific descriptions of the material encountered at each boring location.

As indicated on the cross sections in Figures 8, 8A, 8B, 8C, and 8D, saprolitic soils consist primarily of clayey silt. The depths of these residual soils range from approximately 4 feet below ground surface (bgs) to 9 feet bgs. PWR, sampled primarily as slightly clayey sandy silt with rock fragments, was encountered beneath the saprolitic soils in every boring. The base of the PWR ranged from approximately 12 feet bgs to 30 feet bgs. PWR classifications were based on soils exhibiting hardness greater than 50 blows per 6 inches (or 100 blows per foot). Attempts were made at several locations to obtain a split-spoon sample at the next 5-foot depth increment. However, no material was recovered in any of these spoons.

In order to characterize bedrock at the site, approximately 40 feet of HX-size rock coring was obtained from MW-1, 23 feet from MW-15, and 30 feet from MW-18. Bedrock at all three locations was very similar, consisting of a massive reddish-brown fanglomerate. Only a few small weathered zones and fractures were evident in these cores, as evidenced by the high percent recovery and RQD values recorded on the Lithologic Logs for MW-1, MW-15, and MW-18 (Appendix B).

The estimated configuration of the top of competent, relatively unweathered bedrock is presented on Figure 11, Top of Bedrock Contour Map. Bedrock contours indicated on this map are based on the auger refusal depths and topography. The top of bedrock depths and elevations are summarized in Table 5.

The configuration of the top of competent bedrock is generally similar to the surface topography of the site, with the higher bedrock elevations occurring beneath the areas of highest topographic elevation. The bedrock surface elevation ranges from approximately 258.22 feet above MSL at MW-9 to 342.50 feet above MSL at SB-5.

5.6 Site Hydrogeology

Water levels have been measured on a monthly basis in the 43 monitor wells installed on the proposed landfill site. Groundwater depths recorded from October 2001 through March 2002 are presented in Table 2, with corresponding groundwater elevations presented in Table 2A. The January 10, 2002 elevations were used to construct the

Groundwater Contour Map (Figure 9). This map indicates the strong correlation between topography and groundwater flow at this site. The average hydraulic gradient calculated across the site from east to west using the January 10, 2002 data was approximately 0.019.

Vertical gradients were evaluated in two pairs of shallow and deep nested monitor wells by dividing the difference in the shallow/deep well groundwater elevations by the difference in the midpoint elevations of the saturated portion of each well's sandpack. The January 10, 2002 data indicated an upward vertical gradient of 0.0309 in the MW-13/MW-13D well pair and an upward vertical gradient of 0.0183 in the MW-35/MW-35D well pair. Both sets of data are characteristic of groundwater discharge conditions, which corresponds to their position near drainage features.

As indicated on the cross sections on Figures 8, 8A, 8B, 8C, and 8D, the water table primarily occurs within the fanglomerate bedrock material throughout this study area, except in the very western area of the site. Groundwater flow rates within this material are very slow – less than 10 feet per year based on the calculated hydraulic conductivities (from in-situ permeability tests), estimated effective porosities, and the horizontal hydraulic gradients measured from the Groundwater Contour Map (Figure 9). No groundwater seeps or springs have been identified within the area of proposed landfilling operations.

No long-term historical water level data is currently available for our specific site. However, water levels in 13 groundwater monitor wells on the adjacent South Wake MSW (Feltonsville) Landfill facility have been recorded at least twice a year since January 12, 1995. This data has been summarized in Table 6. Only the 12 monitor wells having over five years of water level data were considered since this data recording began prior to the current drought period beginning in 1988. Well MW-6 records were not used since the water level increased 15.91 feet during the past 5 years, which is not representative of typical groundwater conditions during this time. In fact, the highest water levels recorded for 10 of the 12 wells utilized occurred between January 1966 and May 1998, while the lowest water levels for all 12 wells were recorded after May 1998, indicating the effects of the drought (Table 6A). The difference between the highest and lowest water level elevation was obtained for each of these wells (i.e., maximum fluctuation from 1995 to 2001) and is indicated in Table 6A. Based on the depth to the water table, monitor wells were classified as shallow (water table less than 10 feet bgs), intermediate (water table from 10-25 feet bgs), or deep (water table greater than 25 feet bgs). The wells were classified based on which depth interval the measured water levels occurred in the majority of the time during the 5 years of recorded data. The resulting maximum fluctuation for the shallow wells (MW-9) is 3.10 feet, for the intermediate wells (MW-15) is 5.09 feet, and for the deep wells (MW-2) is 6.79 feet.

In order to calculate more conservative seasonal high groundwater elevations for the proposed landfill area, the appropriate maximum fluctuation numbers calculated above were increased to the next 0.5-foot and added to the highest water levels measured in the on-site monitor wells during the past 6 months. Wells with water levels less than 10 feet bgs were increased by 3.5 feet, wells with water levels from 10 to 25 feet were increased by 5.5 feet, and wells with water levels greater than 25 feet were increased by 7 feet. The resulting projected seasonal high groundwater depths and corresponding elevations are summarized in Table 7. This data was used to construct the attached Seasonal High Groundwater Contour Map (Figure 10).

6.0 WATER QUALITY MONITORING PLAN

In order to gain a better understanding of groundwater flow within the conglomeritic bedrock occurring in this area of the Triassic Basin, a meeting with Mr. Rick Wooten and Mr. Tyler Clark of the North Carolina Geological Survey (NCGS) was conducted on March 7, 2002. Based on their extensive field work within the Triassic Basin, NCGS personnel reported that the massive conglomerate (or fanglomerate) unit encountered throughout our study area contained very few fractures and virtually no bedding planes. They concurred with our observations that groundwater movement is extremely slow within this unit, as there appears to be a limited occurrence of preferential flow pathways. However, their findings have indicated a general correlation between the orientation of first order tributaries and preferred fracture orientations in this area. The most prevalent trend encountered appears to be northwest to southeast (NW-SE).

An examination of topography in the proposed Phase I of landfilling operations indicated no first order drainage features with a NW-SE orientation. Any such features will be further evaluated for groundwater monitoring prior to initiating landfilling in proposed Phases II and III.

Bedrock was observed in the walls of an access road on the southeastern portion of the subject site, in a sewer line trench along the eastern property line to a depth of 10-15 feet, and in a weathered outcrop within the steep northwest area of the site. All bedrock consisted of a massive conglomerate with no visible fractures or bedding planes that would indicate structural control of groundwater.

This Plan for the proposed Highway 55 C&D Landfill and Recycling Center was developed to meet the requirement of the NCDENR Solid Waste Section. The purpose of this Plan is to identify the methods and procedures to be used to effectively monitor

groundwater quality in the uppermost aquifer present at the subject site downgradient of proposed landfilling operations. This Plan includes sections describing: 1) monitor well locations, installation procedures, and construction details; 2) well purging and sampling procedures; 3) analytical methods; and 4) data evaluation and reporting requirements set forth by the NCDENR.

6.1 Surface Water Monitoring Plan

Two surface water monitor stations will be established along both Falls Branch and Little Branch at the approximate locations indicated on Figure 12, in order to evaluate potential impact to surface water quality from surface runoff or groundwater discharge from the proposed area of landfilling. The upstream locations (SW-1 and SW-3) will be situated just above the property lines, while stations SW-2 and SW-4 will be located downstream of the landfilling areas.

The actual sampling points within Falls Branch and Little Branch will be in areas of minimum turbulence and aeration. A single grab sample will be obtained by dipping a laboratory-supplied sample container into the creek. The sample container will be rinsed with the water to be sampled prior to filling the container. Care will be exercised so as not to allow sediment or other debris to enter the sample container. Samples will be obtained at mid-depth near the landfill side of the creek, and in an area that is characterized by cross-sectional homogeneity. Sample containers will be properly labeled, placed on ice in a portable cooler, and transported to Shealy Environmental Services, Inc., in Cayse, South Carolina or to another North Carolina certified laboratory. About one-half inch of airspace will be left in the plastic bottles for metals analysis. The containers for volatile organic compound analysis will be filled to the top with no air bubbles or headspace.

One of the primary concerns during the collection of surface water samples is to insure that they are not altered or contaminated by sediment or other debris that may affect the analytical results. This is especially true in the case of metals analysis. A 500mL sample bottle that has been pre-cleaned in the laboratory will be removed from the portable cooler and the surface water sample will be collected from the creek using this container. At this time, the sample will be immediately transferred into the laboratory prepared bottles containing required preservatives.

Field parameters (pH, temperature, and specific conductance) will be measured and recorded for both the upstream and downstream samples on Falls Branch and Little Branch utilizing a YSI-85 meter. The initial surface water sampling event will be conducted during construction of the landfill and prior to initial waste placement. Unless

otherwise directed by the NCDENR Solid Waste Section, subsequent surface water sampling will be performed on a semi-annual basis.

6.2 Groundwater Monitoring Plan

Proposed permanent monitor well locations for the Highway 55 C&D Landfill and Recycling Center are indicated on Figure 12, Water Quality Monitoring Map. Proposed monitor well MW-1 is located upgradient from all proposed areas of landfilling. The proposed Phase I compliance wells (MW-2 through MW-7) are all located downgradient of the proposed area of landfilling. These compliance wells were selected to provide characterization of downgradient groundwater quality and detection of changes in this quality in the Phase I area of the landfilling during and after its operation. Well locations were selected on the basis of existing groundwater flow directions, drainage features, and planned sump locations.

All borings/monitor wells that have been completed for the purpose of this study that have not been or will not be converted to permanent monitor wells will be properly abandoned in accordance with procedures specified by the NCDENR. Each of the monitor wells proposed for permanent use at the site will be constructed using 2-inch diameter Schedule 40 PVC, flush-joint casing and 0.01-inch slotted screen. The annular space between the borehole wall (approximately 8-inch diameter) and the well casing will be backfilled with a washed, medium-grained sand to a level approximately 2 feet above the top of the screen. Upon completion of the filter pack installation, pelletized bentonite will be placed in the annular space to a thickness of 2 feet and water added to allow hydration. The remainder of the annular space will then be filled with a cement/bentonite grout mix. Steel protective casings with locking caps will be placed over each monitor well's riser pipe. A concrete pad will be installed around the outside of each casing. Each lockable protective casing will be painted and identified with a nameplate detailing well construction information. A vented well cap will be placed on top of each PVC well casing to allow equilibration with atmospheric pressures. The top of casing (TOC) and ground surface elevations for proposed wells MW-1 through MW-7 will be surveyed and indicated on a Site Plan, and Well Completion Logs for these wells will be included in an Appendix to the first semi-annual sampling report submitted to the DENR. The boring logs and well completion logs for the new monitoring wells to be installed will be submitted to the Solid Waste Section within 30 days of well installation. Groundwater levels for each of the wells will also be provided.

Proposed upgradient well MW-1 will be completed to a depth of approximately 55 feet below ground surface (bgs) with 20 feet of screen to allow for seasonal fluctuation. Proposed downgradient monitor wells MW-2 through MW-7 will all be constructed with

15-foot screens and will be completed to approximate depths of 20 to 30 feet bgs. An attempt will be made to keep the top of screen elevation higher than the projected seasonal high groundwater elevation at each well location.

The monitor wells proposed for permanent use will be developed to remove suspended solids and reduce turbidity. Prior to sampling, each well will be purged using a disposable teflon bailer. The protective casing will be unlocked and opened, and the monitor well cap will be removed. An electronic water level indicator will be used to record the depth to groundwater from the top of casing reference point to the nearest 0.01 foot. The resulting measurement will be subtracted from the total well depth to determine the height of the water column (h) in feet. For a two-inch diameter monitor well, the volume of water present will be determined using the following equation:

$$\text{Well Volume (Gallons)} = 0.163h$$

Field parameters (pH, temperature, and specific conductance) will be measured and recorded at the initiation of purging and upon the removal of each well volume, and will be incorporated into the Water Quality Monitoring Report. Purging may need to be extended beyond three well volumes if field parameters have not stabilized.

Wells that demonstrate sufficient recharge will be purged of a least three volumes of standing water in the well. Some wells may be bailed dry. In this case the well will be allowed to recharge a minimum of 60 percent of its static water level prior to collecting the sample. Purging will be conducted using disposable teflon bailers. These bailers contain a bottom metal weight encased in teflon. Bailers will not be field cleaned and reused in other wells, but will be discarded after sampling each well. Therefore, no decontamination procedures will be necessary. One rinse blank will be collected for analysis per each sampling event. Samples will be collected within 24 hours of the completion of well purging.

Samples will be collected by lowering a bailer gently into the water column and allowing the weighted bailer to sink until full. The bailer will be retrieved slowly and the groundwater sample will be poured into clean, laboratory supplied sample bottles in a manner that will limit aeration and the potential loss of volatile organic compounds (VOCs). For samples to be analyzed for VOCs, the sample jars will be filled to the top with no air bubbles or headspace. The glass VOC containers will contain hydrochloric acid as a preservative, while the plastic RCRA metal containers will be preserved with nitric acid.

Groundwater samples will be placed into clean, laboratory-supplied containers, labeled, packed on ice in a portable cooler, and transported to Shealy Environmental Services, Inc., in Cayse, South Carolina or to another approved North Carolina laboratory. One trip blank will be analyzed for volatile organic compounds (VOCs) for each sampling event. The equipment rinse blank will be analyzed for VOCs and the 8 RCRA metals.

Proper chain of custody documentation will be maintained from field sample collection through laboratory analysis. After sample collection, each well will be capped and the steel protective casing will be secured with a lock.

An initial sampling event for the 7 proposed monitor wells (MW-1 through MW-7) will be conducted prior to any waste placement within Phase I of the landfill. Unless otherwise directed by the NCDENR Solid Waste Section, subsequent sampling will be performed on a semi-annual basis.

Analytical testing of the groundwater samples will consist of EPA Method 8260 for VOCs and the 8 RCRA metals. The laboratory method for arsenic, selenium, cadmium, chromium, lead, silver, and barium will be SW-846-6010B. The laboratory method for mercury total and digestion will be SW-846-7470. A dual view trace ICP instrument will be used to provide detection limits of 1 ppb for all metals except mercury, which will have a detection limit of 0.2 ppb. Sample analyses will be performed by a North Carolina "certified" laboratory. All laboratory data will be subjected to strict laboratory quality assurance/quality control (QA/QC) protocol.

As described in this Plan, groundwater sampling and analysis will be used to detect any releases from the proposed landfill area. Well gauging data will be included for each sampling event, along with a summary of all analytical results. The results of each semi-annual sampling event will be submitted to the North Carolina DENR within 45 days after the date of sample collection.

7.0 REFERENCES

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TABLE 3
HYDRAULIC DATA FOR HYDROGEOLOGIC UNITS
HIGHWAY 55 C&D LANDFILL, LLC.

NO.	WELL ID	HYDROGEOLOGIC UNIT	DEPTH (FT.)	HYDRALIC CONDUCTIVITY (CM/SEC)
4	MW-4	BEDROCK	20-35'	3.89X10-6
10	MW-10	BEDROCK	10-25'	3.06X10-7
13	MW-13	BEDROCK	15-30'	8.50X10-7
14	MW-13D	BEDROCK	45-50'	1.08X10-6
16	MW-15	PWR	9-24'	1.98X10-6
27	MW-26	SAPROLITE	3-5'	7.42X10-8
30	MW-29	SAPROLITE	3-4'	3.65X10-8
31	MW-29	PWR	5-20'	2.96X10-7
32	MW-31	BEDROCK	30-45'	<3.0X10-7
38	MW-36	BEDROCK	12-27'	2.87X10-6
39	MW-37	BEDROCK	7-22'	3.83X10-6
	SB-1	SAPROLITE	3-5'	9.29X10-7

NOTES:
Effective porosity values estimated from grain size analysis (Fetter 1998).
PWR-Partially Weathered Rock

TABLE 4

GEOTECHNICAL DATA
HIGHWAY 55 C&D LANDFILL, LLC.

SUMMARY OF LABORATORY TEST DATA
Highway 55 C&D Landfill
Wake County, North Carolina
SHIELD Engineering, Inc.

Boring No./ Sample Depth	USCS Classification	% Gravel	% Sand	% Silt	% Clay	Atterburg Limits		Proctor Data		In Situ Conditions				Hydraulic Conductivity k (cm/sec)
						Liquid Limit %	Plasticity Index %	Max Dry Density (pcf)	Optimum Moisture Content (%)	Specific Gravity	Porosity	Dry Density (pcf)	Moisture Content (%)	
MW-25 (5'-7')	SC	10.6	53.5	21.1	14.8	25	10	N/A	N/A	2.681	N/A	N/A	4.3	N/A
MW-25 (16'-17')	CL	3.1	22.7	55.1	19.1	29	9	N/A	N/A	2.691	N/A	N/A	3.8	N/A
MW-26 (3'-5')	CL	0.0	5.4	48.5	46.1	45	21	N/A	N/A	2.618	0.3775	101.7	22.1	7.42E-08
MW-29 (3'-4')	CL	0.3	25.6	49.4	24.7	28	11	N/A	N/A	2.727	0.2595	126	10.1	3.65E-08
SB-1 (3'-5')	SC	5.2	48.1	25.3	21.4	31	9	N/A	N/A	2.608	0.2755	117.9	9.7	9.29E-07
SB-1 (14'-15')	CL	0.1	22.7	54.3	22.9	25	9	N/A	N/A	2.662	N/A	N/A	3.5	N/A
SB-2 (3'-4')	CH	0.2	7.4	36.5	55.9	69	47	N/A	N/A	2.611	N/A	N/A	19.8	N/A
SB-2 (13'-14')	CL	1.2	22.9	45.4	30.5	30	15	N/A	N/A	2.662	N/A	N/A	5.3	N/A
SB-3 (5'-6')	CL	1.3	16.8	38.2	43.7	42	23	N/A	N/A	2.697	*	*	5.9	*
SB-4 (4'-5')	CL	0.1	10.0	47.0	42.9	44	25	N/A	N/A	2.672	N/A	N/A	15.9	N/A
SB-4 (8'-9')	CL	0.5	18.2	45.8	35.5	32	18	N/A	N/A	2.711	N/A	N/A	7.7	N/A
SS-1	SM	1.6	67.4	10.2	20.8	32	8	112.8	14.7	2.571	0.3292	107.6	16.6	2.94E-08
SS-2	SM	0.0	51.7	14.2	34.1	51	19	98.4	20.3	2.620	0.4238	94.2	24.3	2.59E-07
SS-3	SM	9.4	76.2	9.2	5.2	32	8	119.1	11.9	2.653	0.3199	112.6	14.9	1.34E-07
SS-4	SC	2.1	59.6	15.7	22.6	36	14	107.6	14.3	2.579	0.3414	106.0	18.4	3.14E-07

* Sample SB-3 (5-6') too dry to run permeability test.

TABLE 5

TOP OF BEDROCK ELEVATIONS

HIGHWAY 55 C&D LANDFILL, LLC.

WELL ID	GROUND SURFACE ELEVATION	DEPTH OF ROCK (FT.)	BEDROCK ELEVATION
MW-1	352.85	20.5	332.35
MW-2	328.14	17	311.14
MW-3	318.49	14	304.49
MW-4	344.25	18	326.25
MW-5	330.92	15.5	315.42
MW-6	325.87	16	309.87
MW-7	353.23	18	335.23
MW-8	343.11	19	324.11
MW-9	358.35	17.5	340.85
MW-10	348.87	17	331.87
MW-11	332.38	18	314.38
MW-12	307.59	16	291.59
MW-13	310.99	15	295.99
MW-13D	310.51	15	295.51
MW-14	314.06	16	298.06
MW-15	292.25	30	262.25
MW-16	311.84	27	284.84
MW-17	336.43	18	318.43
MW-18	335.09	17	318.09
MW-19	326.20	18	308.20
MW-20	330.10	17	313.10
MW-21	351.07	19	332.07
MW-22	304.09	23	281.09
MW-23	339.63	18	321.63
MW-24	343.55	21.5	322.05
MW-25	290.32	25	265.32
MW-26	289.89	30	259.89
MW-27	328.50	15	313.50
MW-28	348.20	17.5	330.70
MW-29	332.14	12	320.14
MW-30	297.82	12.5	285.32
MW-31	313.35	20	293.35
MW-32	306.50	18	288.50
MW-33	316.47	18.5	297.97
MW-34	293.47	12	281.47
MW-35	283.22	25	258.22
MW-35D	283.37	25	258.37
MW-36	292.24	12.5	279.74
MW-37	320.27	15	305.27
MW-38	326.79	15	311.79
MW-39	317.81	14.5	303.31
MW-40	319.34	12	307.34
MW-41	326.82	12.5	314.32
SB-1	325.98	16	309.98
SB-2	348.78	22	326.78
SB-3	334.80	20	314.80
SB-4	347.77	17	330.77
SB-5	362.50	20	342.50
SB-6	348.00	18	330.00

NOTE: All elevations are presented in feet above mean sea level.

TABLE 4A
LITHOLOGIC UNIT DATA CHARACTERIZATION
HIGHWAY 55 C&D LANDFILL, LLC.

SAMPLE ID	HYDROGEOLOGIC UNIT	DEPTH (FT.)	HYDRAULIC CONDUCTIVITY (CM/SEC)	POROSITY (1)	EFFECTIVE POROSITY (2)
SS-1	SAPROLITE	0-2'	2.60X10-8	0.3748	0.017
SS-2	SAPROLITE	0-2'	1.35X10-8	0.3332	0.041
SS-3	SAPROLITE	0-2'	2.27X10-8	0.3735	0.028
SB-1	SAPROLITE	3-5'	9.29X10-7	0.2755	0.053
SB-2	SAPROLITE	3-4'	*		<0.01
SB-3	SAPROLITE	5-6'	*		0.018
MW-26	SAPROLITE	3-5'	7.42X10-8	0.3775	0.014
MW-29	SAPROLITE	3-4'	3.65X10-8	0.2595	0.048
AVERAGE VALUE			**1.84X10-7**	**0.3323**	**0.029**
SB-1	PWR	14-15'	*		0.052
SB-2	PWR	13-14'	*		0.042
SB-4	PWR	8-9'	*		0.030
MW-15	PWR	9-24'	1.98X10-6		**
MW-25	PWR	5-7'	*		0.110
MW-25	PWR	16-17'	*		0.050
MW-29	PWR	5-20'	2.96X10-7		**
AVERAGE VALUE			**1.14X10-6**		**0.057**
MW-4	BEDROCK	20-35'	3.89X10-6		
MW-10	BEDROCK	10-25'	3.06X10-7		
MW-13	BEDROCK	15-30'	8.50X10-7		
MW-13D	BEDROCK	45-50'	1.08X10-6		
MW-31	BEDROCK	30-45'	<3.0X10-7		
MW-36	BEDROCK	12-27'	2.87X10-6		
MW-37	BEDROCK	7-22'	3.83X10-6		
AVERAGE VALUE			**1.88X10-6**		

NOTES:
1- CALCULATED IN LAB BY SHIELD ENGINEERING, INC.
2- ESTIMATED USING GRAIN SIZE ANALYSIS AND TEXTURAL CLASSIFICATION TRIANGLE.
PWR- PARTIALLY WEATHERED ROCK.
*- HYDRAULIC CONDUCTIVITY WAS NOT CALCULATED.
**- GRAIN SIZE WAS NOT PERFORMED.

MW-25 (5-7')

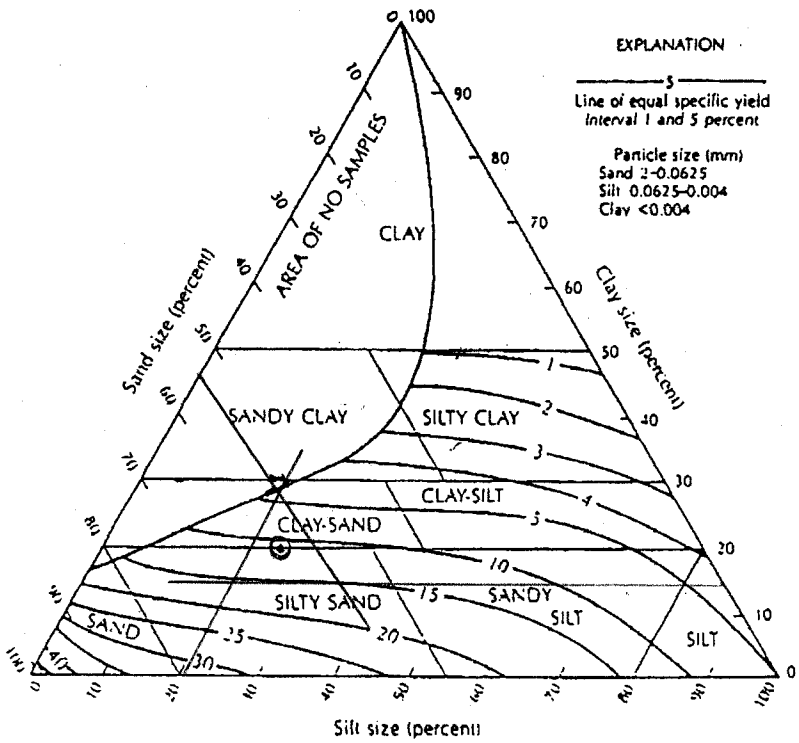


FIGURE 4.11 Textural classification triangle for unconsolidated materials showing the relation between particle size and specific yield. Source: A.I. Johnson, U.S. Geological Survey Water-Supply Paper 1662-D, 1967.

SS-3

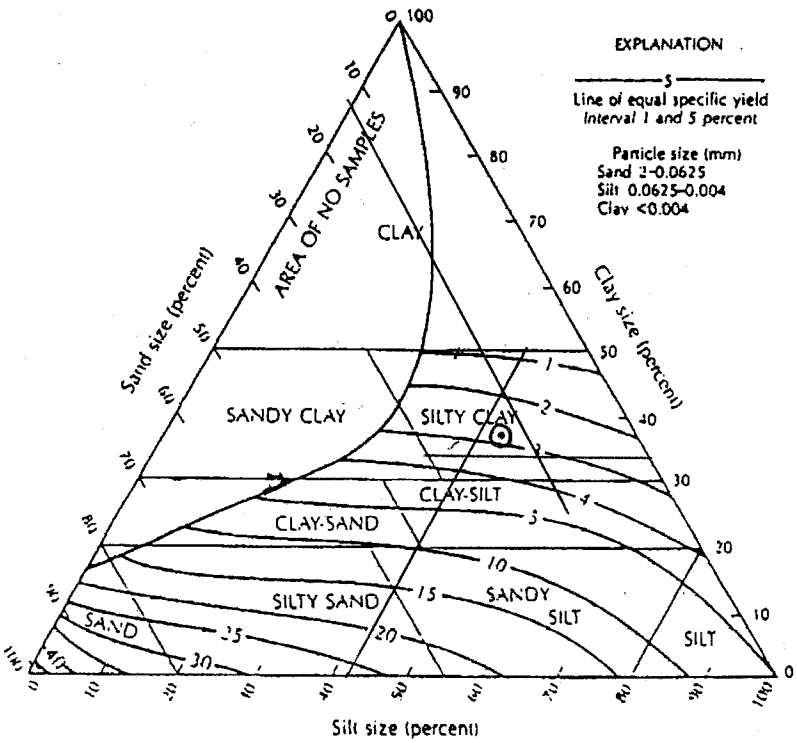


FIGURE 4.11 Textural classification triangle for unconsolidated materials showing the relation between particle size and specific yield. Source: A.I. Johnson, U.S. Geological Survey Water-Supply Paper 1662-D, 1967.

SHIELD
ENGINEERING, INC.

December 19, 2001

Mr. Ronald Gilkerson
Griffin Brothers
19109-118 West Catawba Avenue
Cornelius, NC 28031-5613

Subject: **Laboratory Test Results**
Highway 55 C&D Landfill
Wake County, North Carolina
Shield Job Number 1012081-01

Dear Mr. Gilkerson:

As requested Shield Engineering Inc., has completed the laboratory testing on the samples labeled MW-25 (5'-7'), MW-25 (16'-17'), MW-26 (3'-5'), MW-29 (3'-4'), SB-1 (3'-5'), SB-1 (14'-15'), SB-2 (3'-4'), SB-2 (13'-14'), SB-3 (5'-6'), SB-4 (4'-5'), and SB-4 (8'-9') for the above referenced project. Attached to this letter are the laboratory test results for Flexible Wall Permeability, Specific Gravity, Atterberg Limits, Hydrometer, Effective Porosity, and Moisture Content. However, Flexible Wall Permeability and Effective Porosity was not performed on sample SB-3 (5'-6') because the sample broke into pieces during the removal from the Shelby tube. This may be due to the dryness of the sample.

The laboratory testings were provided in accordance with the applicable ASTM Standards. The test samples were obtained by a representative of Griffin Brothers and then delivered to Shield's Charlotte, North Carolina laboratory for testing.

If you have any questions concerning our test results, please do not hesitate to call our office at (704) 394-6913.

Sincerely,

Shield Engineering, Inc.

Christina R. Raymer
Lab Manager

Thomas M. Vick, P.E.
Senior Engineer

Attachment

4301 Taggart Creek Road
Charlotte, NC 28208

www.shieldengineering.com

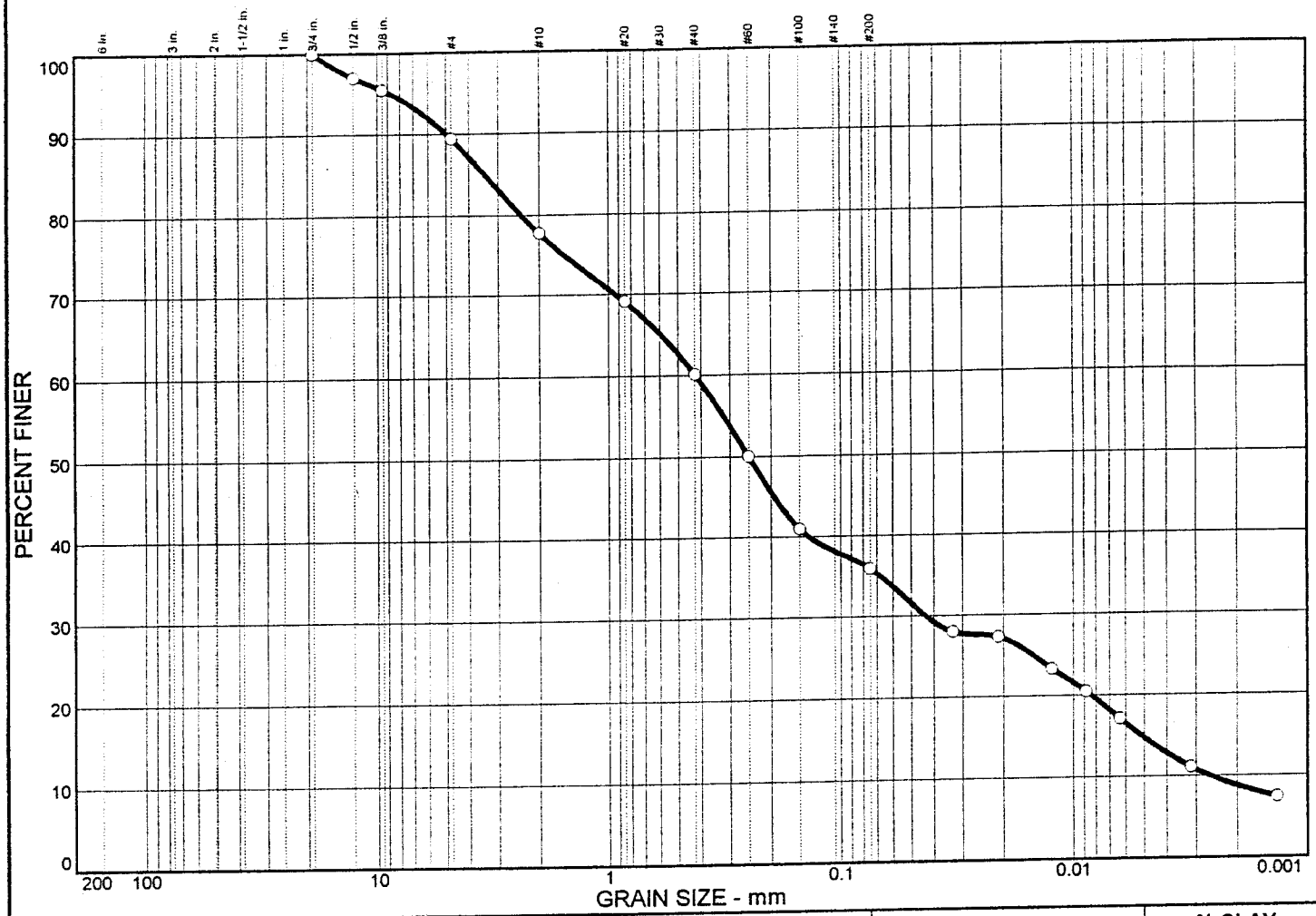
Telephone 704.394.6913
Fax 704.394.6968

SUMMARY OF LABORATORY TEST DATA
Highway 55 C&D Landfill
Wake County, North Carolina
SHIELD Engineering, Inc.

Boring No./ Sample Depth	USCS Classification	% Gravel	% Sand	% Silt	% Clay	Atterburg Limits		Proctor Data		In Situ Conditions				Hydraulic Conductivity k (cm/sec)
						Liquid Limit %	Plasticity Index %	Max Dry Density (pcf)	Optimum Moisture Content (%)	Specific Gravity	Effective Porosity	Dry Density (pcf)	Moisture Content (%)	
MW-25 (5'-7')	SC	10.6	53.5	21.1	14.8	25	10	N/A	N/A	2.681	N/A	N/A	4.3	N/A
MW-25 (16'-17')	CL	3.1	22.7	55.1	19.1	29	9	N/A	N/A	2.691	N/A	N/A	3.8	N/A
MW-26 (3'-5')	CL	0.0	5.4	48.5	46.1	45	21	N/A	N/A	2.618	0.3775	101.7	22.1	7.42E-08
MW-29 (3'-4')	CL	0.3	25.6	49.4	24.7	28	11	N/A	N/A	2.727	0.2595	126	10.1	3.65E-08
SB-1 (3'-5')	SC	5.2	48.1	25.3	21.4	31	9	N/A	N/A	2.608	0.2755	117.9	9.7	9.29E-07
SB-1 (14'-15')	CL	0.1	22.7	54.3	22.9	25	9	N/A	N/A	2.662	N/A	N/A	3.5	N/A
SB-2 (3'-4')	CH	0.2	7.4	36.5	55.9	69	47	N/A	N/A	2.611	N/A	N/A	19.8	N/A
SB-2 (13'-14')	CL	1.2	22.9	45.4	30.5	30	15	N/A	N/A	2.662	N/A	N/A	5.3	N/A
SB-3 (5'-6')	CL	1.3	16.8	38.2	43.7	42	23	N/A	N/A	2.697	*	*	5.9	*
SB-4 (4'-5')	CL	0.1	10.0	47.0	42.9	44	25	N/A	N/A	2.672	N/A	N/A	15.9	N/A
SB-4 (8'-9')	CL	0.5	18.2	45.8	35.5	32	18	N/A	N/A	2.711	N/A	N/A	7.7	N/A

* Sample SB-3 (5-6') too dry to run permeability test.

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	10.6	53.5	21.1	14.8

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	25	15	3.41	0.422	0.250	0.0433	0.0051	0.0026	1.70	161.97

MATERIAL DESCRIPTION	USCS	AASHTO
○ Red Clayey sand	SC	

Project No. 1012081-01 **Client:** Griffin Brothers

Project: HWY. 55 C&D Landfill, LLC.

○ **Source:** HWY. 55 C&D Landfill **Sample No.:** MW-25 (5-7')

Remarks:

○ Natural Moisture Content: 4.3%

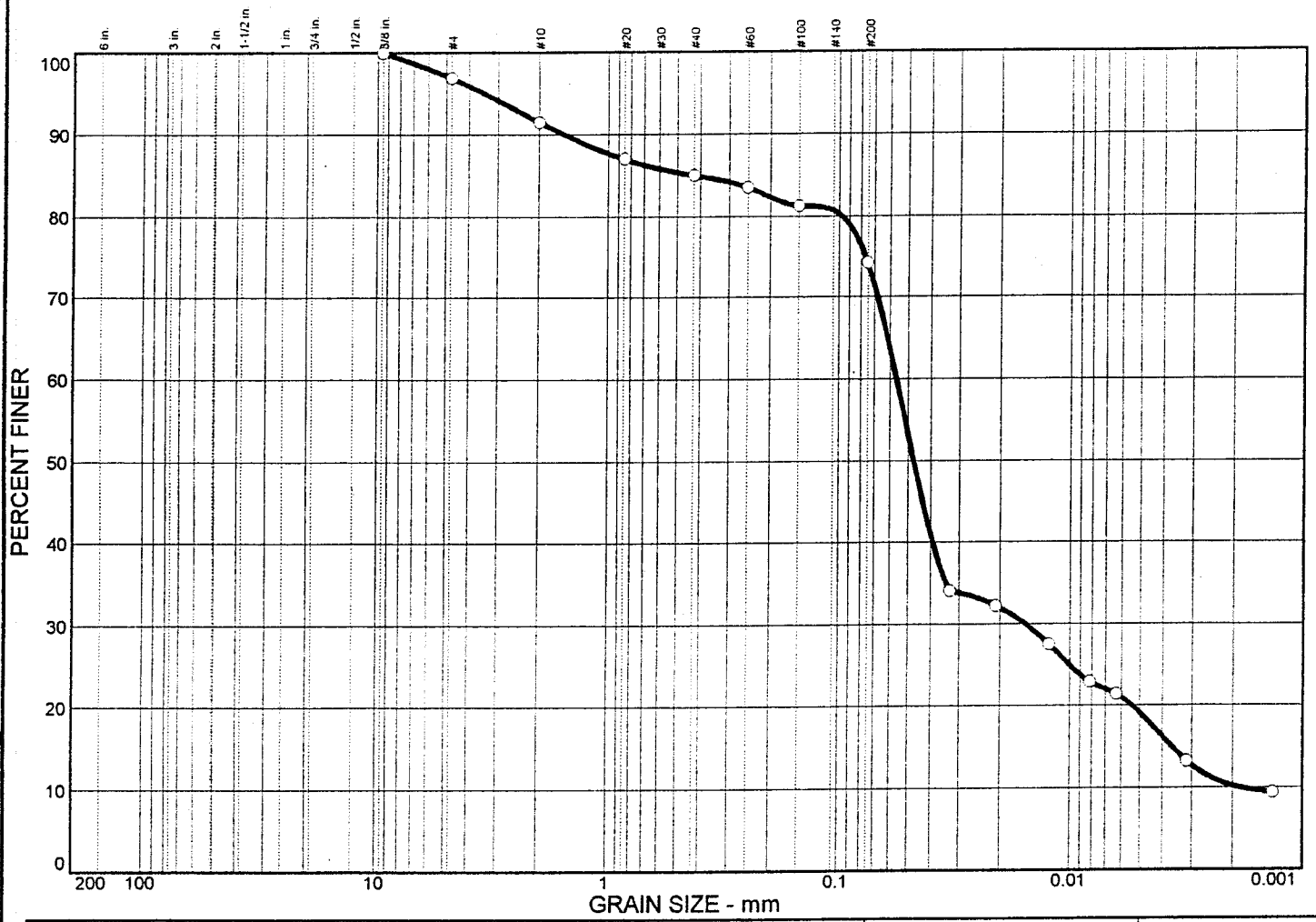
Specific Gravity: 2.681

Particle Size Distribution Report

SHIELD ENGINEERING

Figure MW-25 (5-7')

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	3.1	22.7	55.1	19.1

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	29	20	0.425	0.0561	0.0473	0.0156	0.0037	0.0019	2.33	30.21

MATERIAL DESCRIPTION	USCS	AASHTO
○ Dark Red Lean clay with sand	CL	

Project No. 1012081-01 **Client:** Griffin Brothers

Project: HWY. 55 C&D Landfill, LLC.

○ **Source:** HWY. 55 C&D Landfill **Sample No.:** MW-25 (16-17')

Remarks:

○ Natural Moisture Content: 3.8%

Specific Gravity: 2.691

Particle Size Distribution Report

SHIELD ENGINEERING

Figure MW-25 (16-

Shield Engineering, Inc.

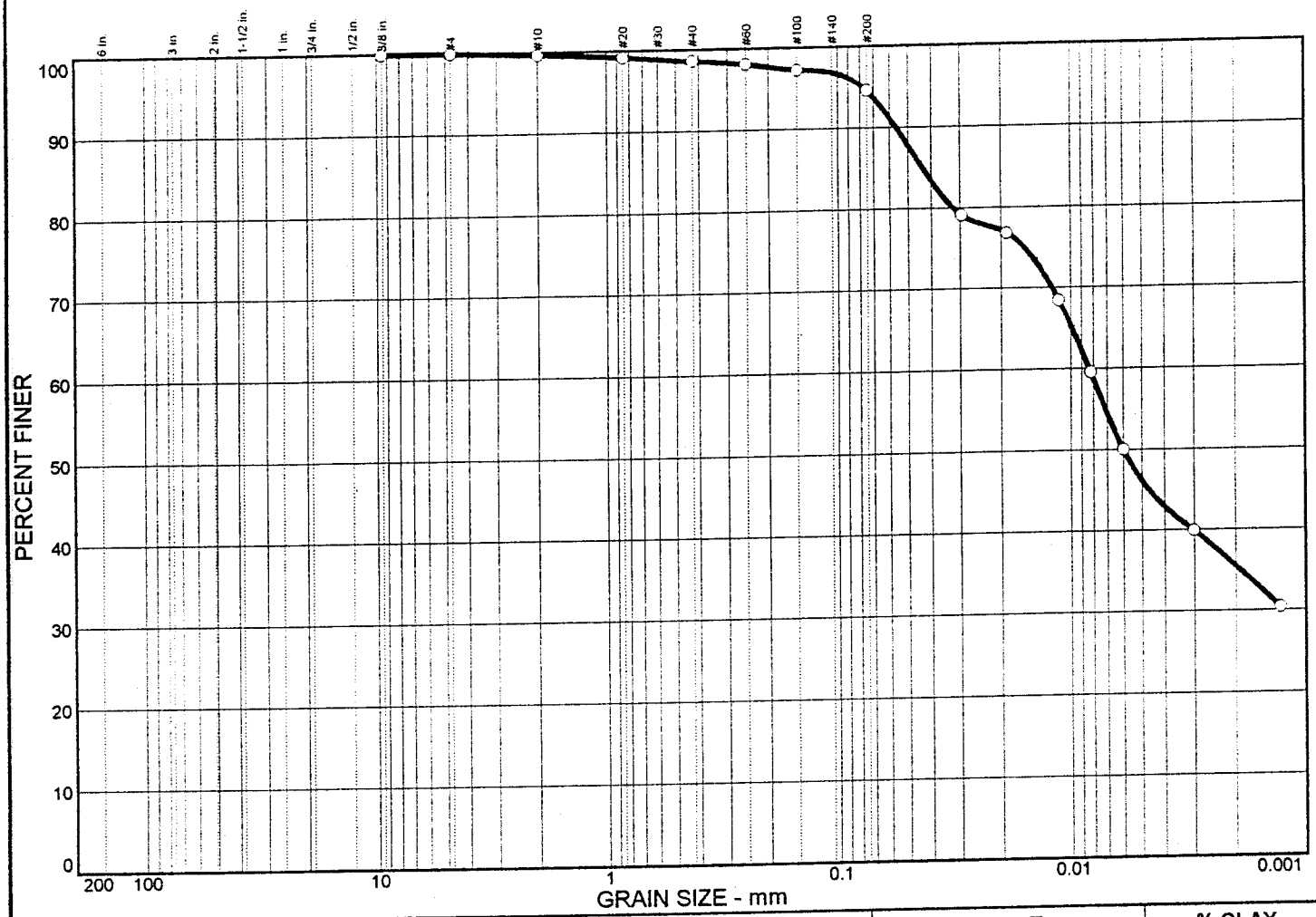
SUMMARY OF LABORATORY TESTING

Flexible Wall Permeability Test
ASTM D 5084

Project Name:	HWY. 55 C&D Landfill
Project No:	1012081-01
Date:	12/3/01
Sample ID:	MW-26 (3-5')
Material Description:	Light Brown Lean Clay
Sample Condition:	Undisturbed Sample

Proctor Data:	
Maximum Dry Density (pcf) :	NA
Optimum Moisture Content (%) :	NA
Test Data:	
Initial Dry Density (pcf) :	101.7
Initial Moisture Content (%) :	22.1
Sample Length (cm) :	11.8
Sample Area (cm^2) :	39.7
Effective Porosity:	0.378
Average Temperature (^oC) :	21.6
Hydraulic Conductivity K (cm/sec) @ 20^oC:	**7.42E-08**
Saturated:	Yes

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	0.0	5.4	48.5	46.1

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	45	24	0.0436	0.0084	0.0060					

MATERIAL DESCRIPTION	USCS	AASHTO
○ Light Brown Lean clay	CL	

Project No. 1012081-01 **Client:** Griffin Brothers

Project: HWY. 55 C&D Landfill, LLC.

○ **Source:** HWY. 55 C&D Landfill **Sample No.:** MW-26 (3-5')

Remarks:

○ Natural Moisture Content: 22.1%

Specific Gravity:2.618

Porosity (n):0.3775

Particle Size Distribution Report

SHIELD ENGINEERING

Figure MW-26 (3-5')

Shield Engineering, Inc.

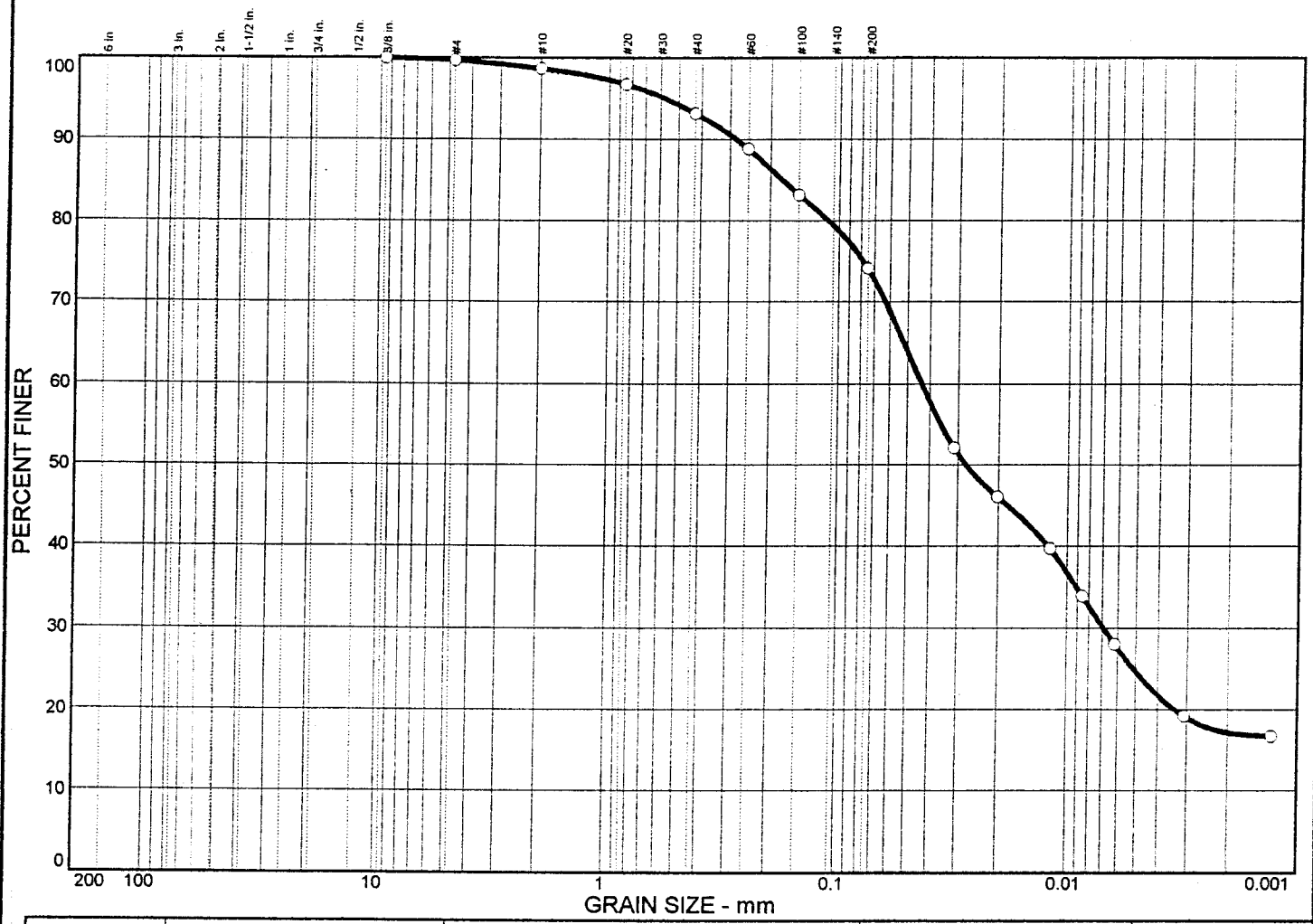
SUMMARY OF LABORATORY TESTING

Flexible Wall Permeability Test
ASTM D 5084

Project Name:	HWY. 55 C&D Landfill
Project No:	1012081-01
Date:	12/3/01
Sample ID:	MW-29 (3-4')
Material Description:	Reddish-Brown Lean Clay With Sand
Sample Condition:	Undisturbed Sample

Proctor Data:	
Maximum Dry Density (pcf) :	NA
Optimum Moisture Content (%) :	NA
Test Data:	
Initial Dry Density (pcf) :	126.0
Initial Moisture Content (%) :	10.1
Sample Length (cm) :	10.5
Sample Area (cm^2) :	41.3
Effective Porosity:	0.259
Average Temperature (^oC) :	21.6
Hydraulic Conductivity K (cm/sec) @ 20^oC:	**3.65E-08**
Saturated:	Yes

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	0.3	25.6	49.4	24.7

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	28	17	0.178	0.0433	0.0277	0.0069				

MATERIAL DESCRIPTION	USCS	AASHTO
○ Reddish-Brown Lean clay with sand	CL	

Project No. 1012081-01 **Client:** Griffin Brothers

Project: HWY. 55 C&D Landfill, LLC.

○ **Source:** HWY. 55 C&D Landfill **Sample No.:** MW-29 (3-4')

Remarks:

○ Natural Moisture Content: 10.1%

Specific Gravity: 2.727

Porosity (n): 0.2595

Particle Size Distribution Report

SHIELD ENGINEERING

Figure MW-29 (3-4)

Shield Engineering, Inc.

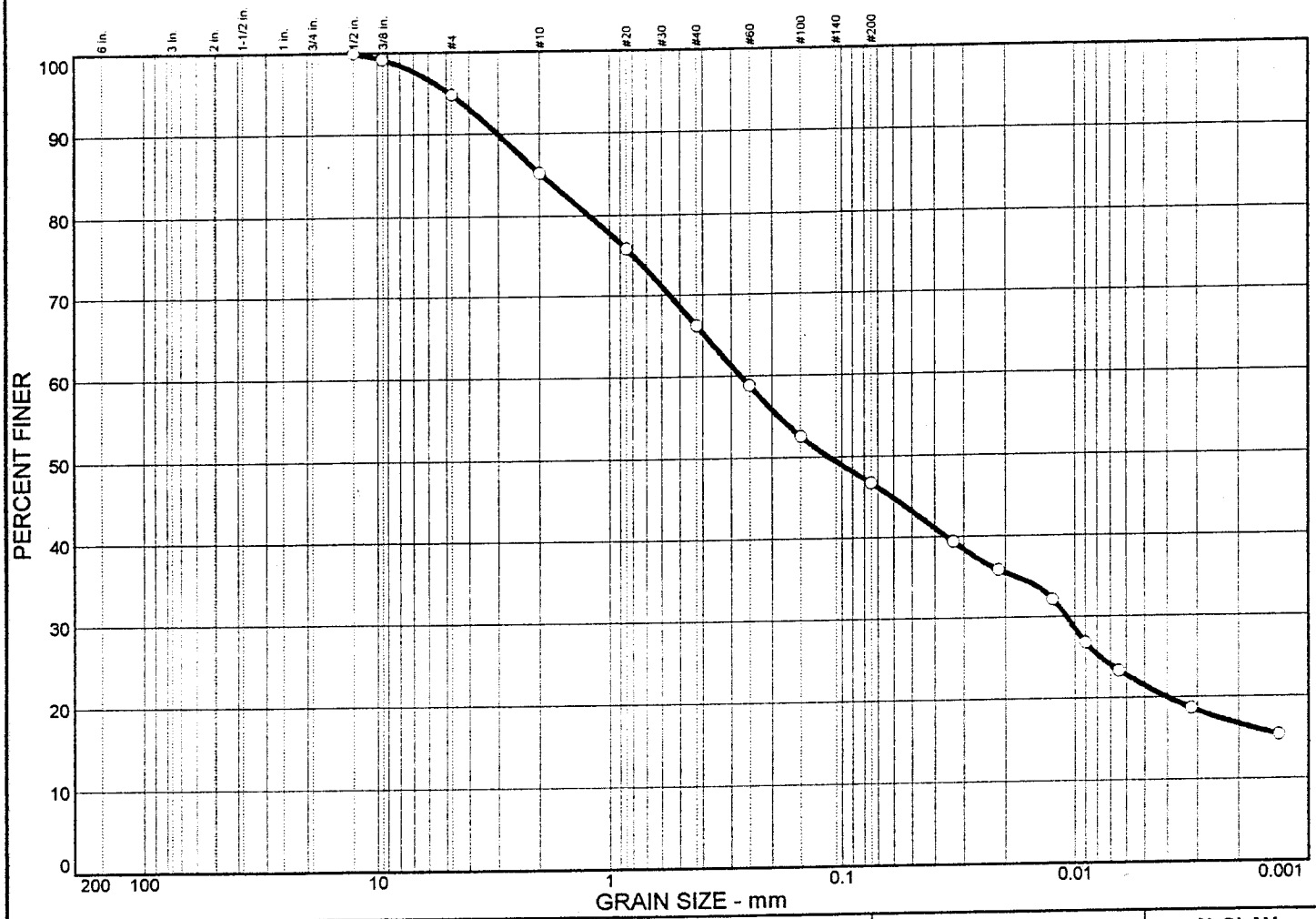
SUMMARY OF LABORATORY TESTING

Flexible Wall Permeability Test
ASTM D 5084

Project Name:	HWY. 55 C&D Landfill
Project No:	1012081-01
Date:	12/3/01
Sample ID:	SB-1 (3-5')
Material Description:	Brown Clayey Sand
Sample Condition:	Undisturbed Sample

Proctor Data:	
Maximum Dry Density (pcf) :	NA
Optimum Moisture Content (%) :	NA
Test Data:	
Initial Dry Density (pcf) :	117.9
Initial Moisture Content (%) :	9.7
Sample Length (cm) :	11.5
Sample Area (cm^2) :	42.2
Effective Porosity:	0.275
Average Temperature (^oC) :	21.6
Hydraulic Conductivity K (cm/sec) @ 20^oC:	**9.29E-07**
Saturated:	Yes

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	5.2	48.1	25.3	21.4

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	31	22	1.96	0.273	0.114	0.0109				

MATERIAL DESCRIPTION	USCS	AASHTO
○ Brown Clayey sand	SC	

Project No. 1012081-01 **Client:** Griffin Brothers

Project: HWY. 55 C&D Landfill, LLC.

○ **Source:** HWY. 55 C&D Landfill **Sample No.:** SB-1 (3-5')

Remarks:

○ Natural Moisture Content: 9.7%

Specific Gravity: 2.608

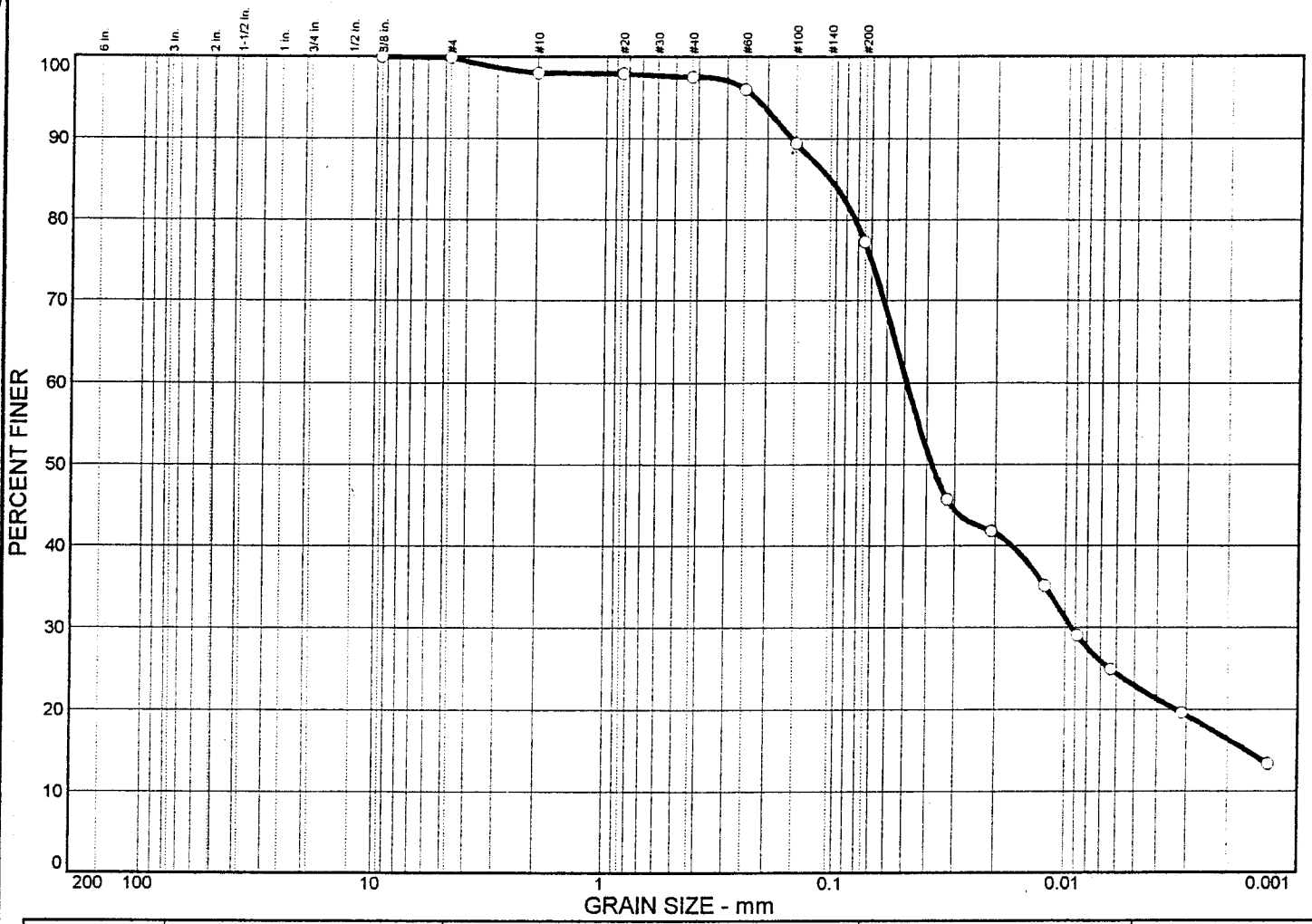
Porosity (n): 0.2755

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SB-1 (3-5')

Particle Size Distribution Report



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.1	22.7	54.3	22.9

LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
25	16	0.107	0.0489	0.0378	0.0094	0.0017			

MATERIAL DESCRIPTION	USCS	AASHTO
Dark Reddish-Brown Lean clay with sand	CL	

Project No. 1012081-01 **Client:** Griffin Brothers

Project: HWY. 55 C&D Landfill, LLC.

Source: HWY. 55 C&D Landfill **Sample No.:** SB-1 (14-15')

Remarks:

Natural Moisture Content: 3.5%

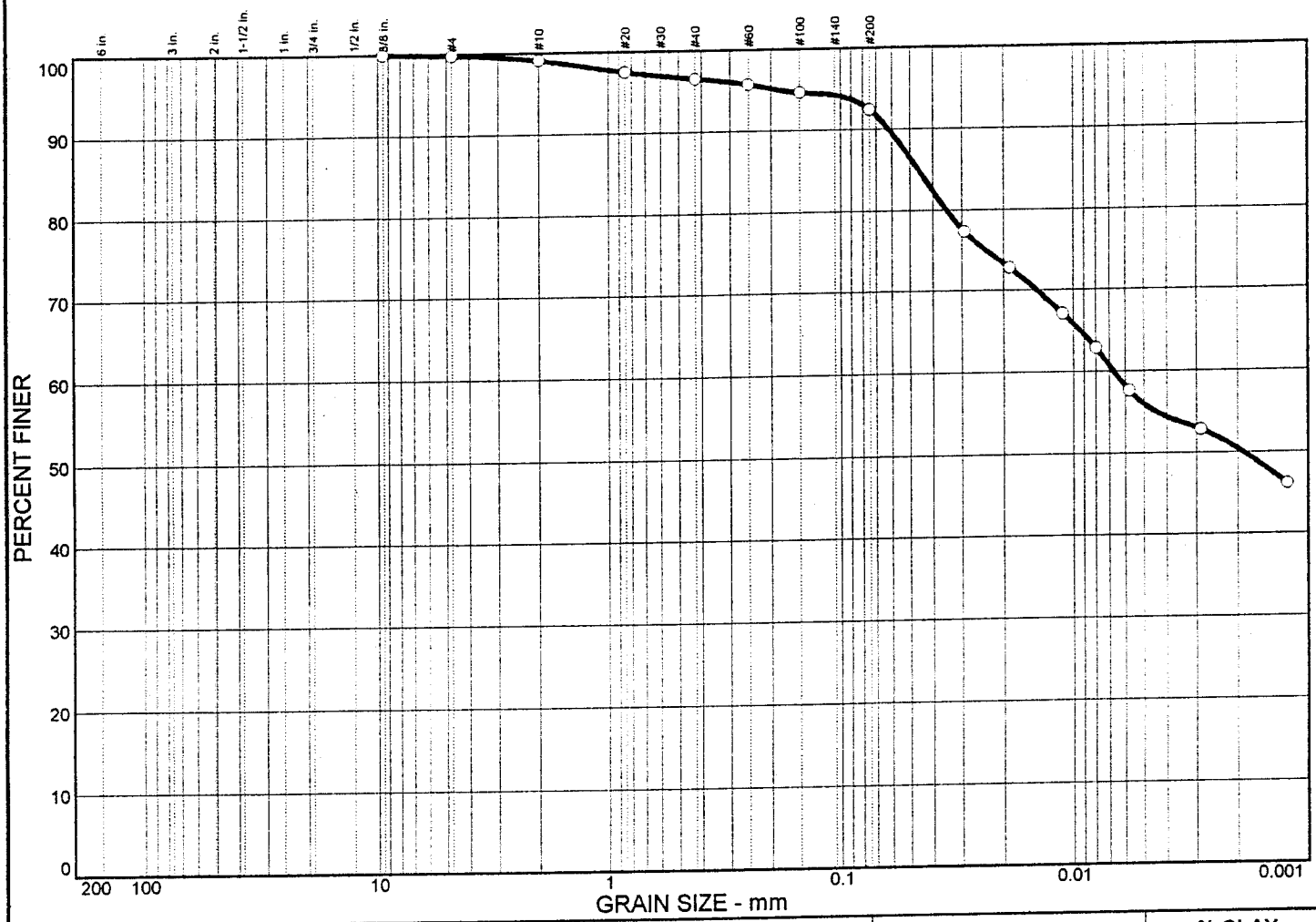
Specific Gravity: 2.662

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SB-1 (14-15')

Particle Size Distribution Report



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.2	7.4	36.5	55.9

LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
69	22	0.0461	0.0067	0.0019					

MATERIAL DESCRIPTION	USCS	AASHTO
Brown Fat clay	CH	

Project No. 1012081-01 **Client:** Griffin Brothers

Project: HWY. 55 C&D Landfill, LLC.

Source: HWY. 55 C&D Landfill **Sample No.:** SB-2 (3-4')

Remarks:

Natural Moisture Content: 19.8%

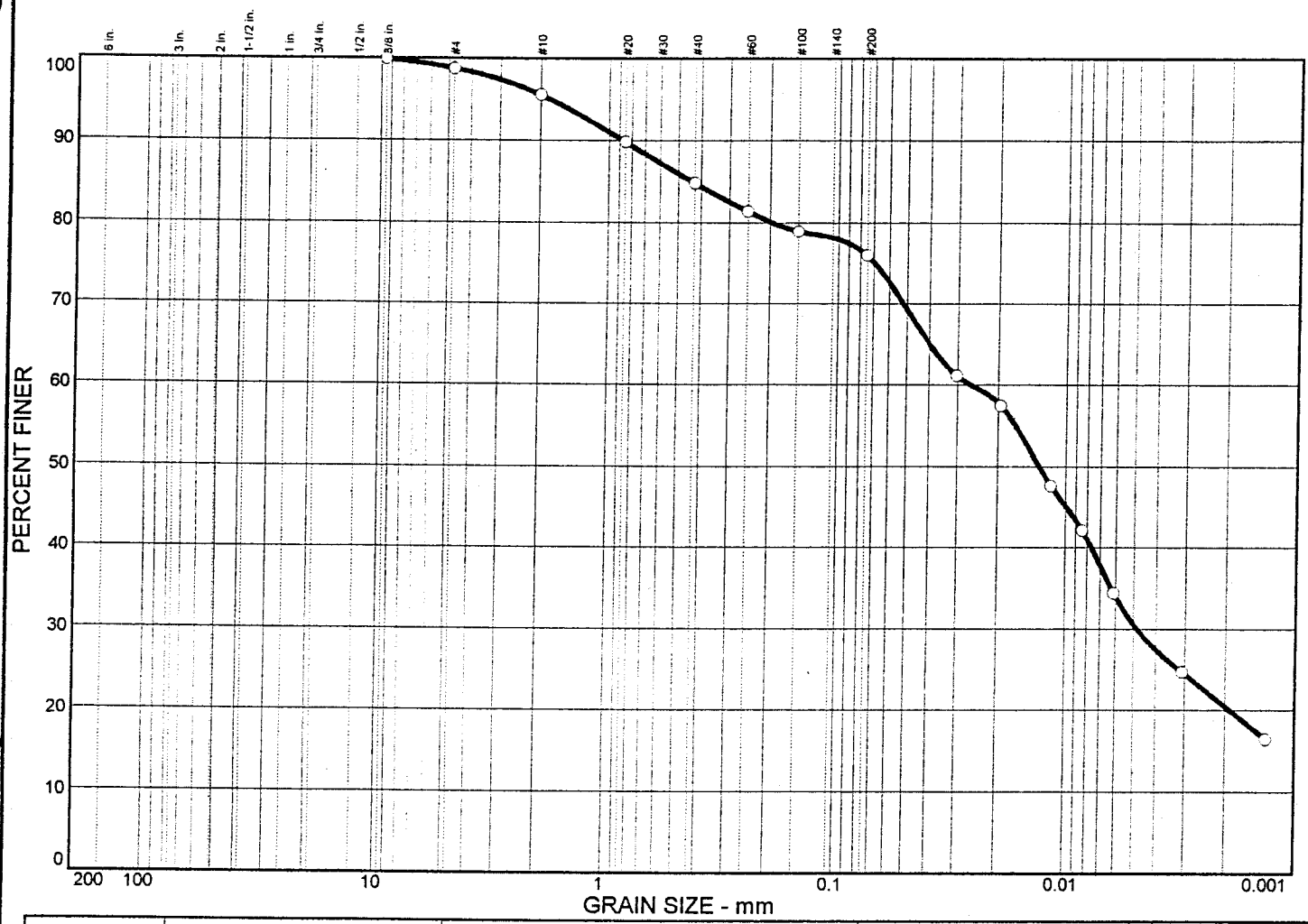
Specific Gravity: 2.611

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SB-2 (3-4')

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	1.2	22.9	45.4	30.5

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	30	15	0.438	0.0264	0.0132	0.0048				

MATERIAL DESCRIPTION	USCS	AASHTO
○ Dark Reddish-Brown Lean clay with sand	CL	

Project No. 1012081-01 **Client:** Griffin Brothers

Project: HWY. 55 C&D Landfill, LLC.

○ **Source:** HWY. 55 C&D Landfill **Sample No.:** SB-2 (13-14')

Remarks:

○ Natural Moisture Content: 5.3%

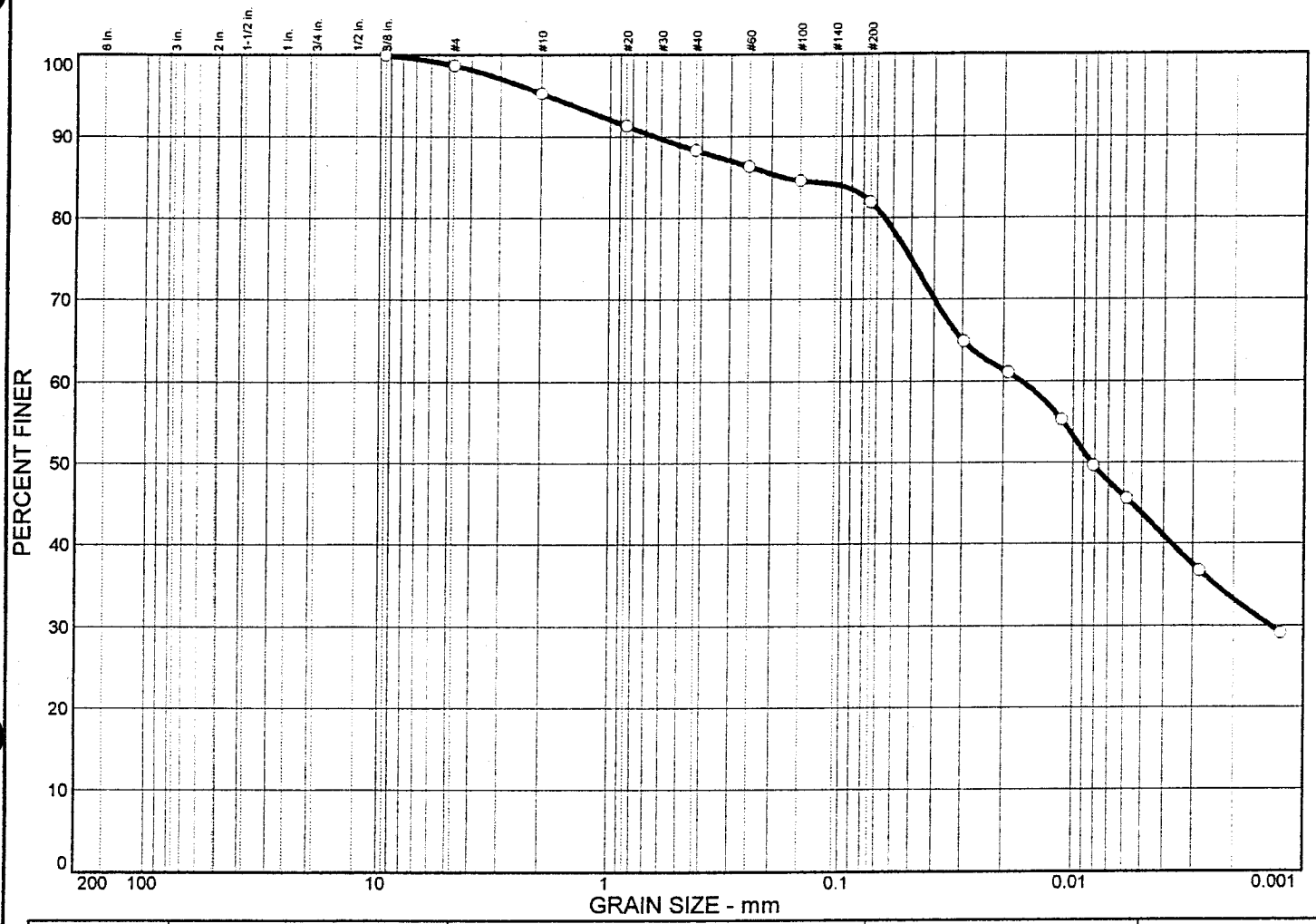
Specific Gravity: 2.662

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SB-2 (13-14')

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	1.3	16.8	38.2	43.7

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	42	19	0.181	0.0167	0.0083	0.0014				

MATERIAL DESCRIPTION	USCS	AASHTO
○ Reddish-Brown Lean clay with sand	CL	

Project No. 1012081-01 **Client:** Griffin Brothers

Project: HWY. 55 C&D Landfill, LLC.

○ **Source:** HWY. 55 C&D Landfill **Sample No.:** SB-3 (5-6')

Remarks:

○ Natural Moisture Content: 5.9%

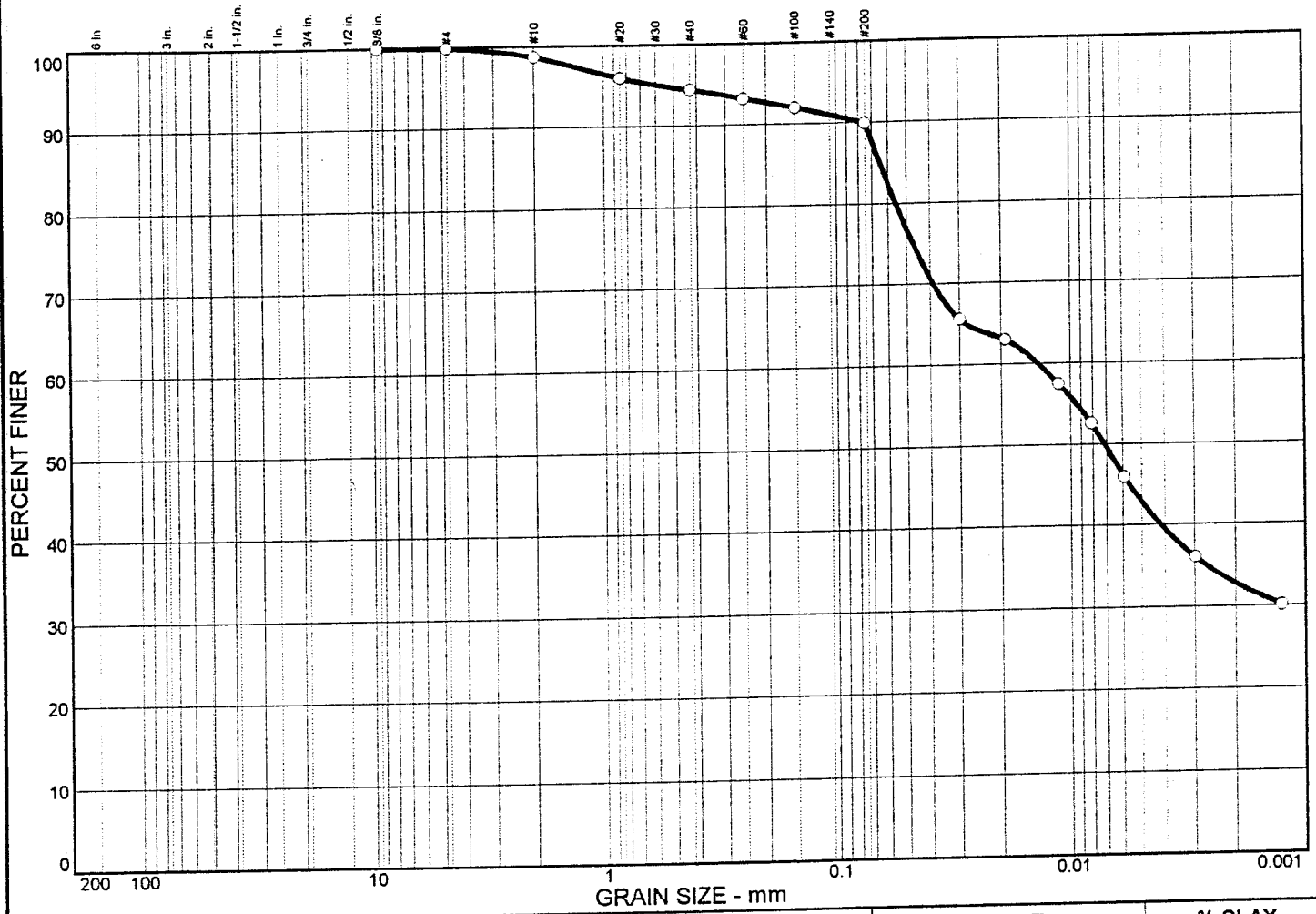
Specific Gravity: 2.697

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SB-3 (5-6')

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	0.1	10.0	47.0	42.9

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	44	19	0.0648	0.0139	0.0072					

MATERIAL DESCRIPTION	USCS	AASHTO
○ Dark Reddish-Brown Lean clay	CL	

Project No. 1012081-01 **Client:** Griffin Brothers

Project: HWY. 55 C&D Landfill, LLC.

○ **Source:** HWY. 55 C&D Landfill **Sample No.:** SB-4 (4-5')

Remarks:

○ Natural Moisture Content: 15.9%

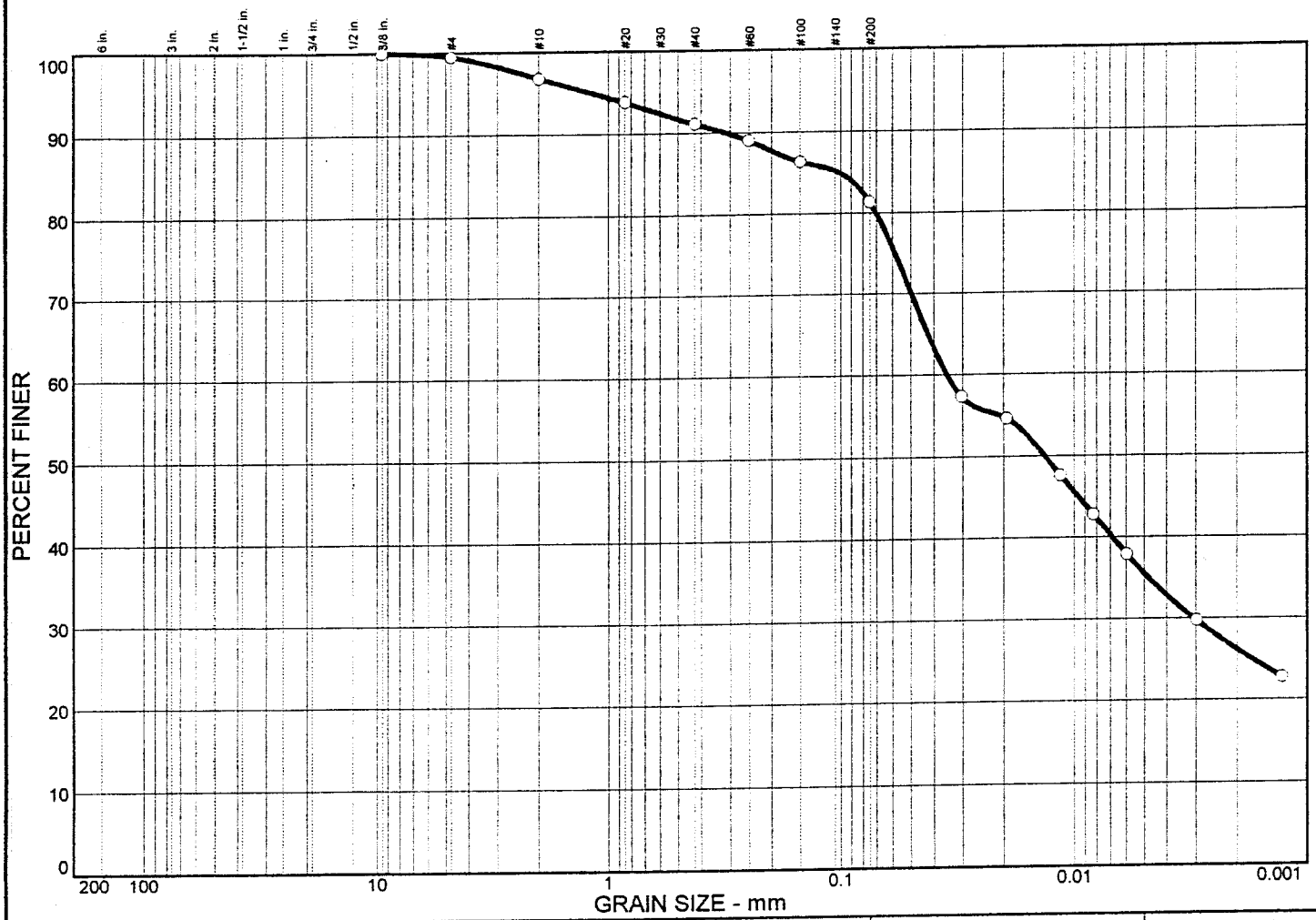
Specific Gravity: 2.672

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SB-4 (4-5')

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	0.5	18.2	45.8	35.5

X	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	32	14	0.103	0.0351	0.0134	0.0031				

MATERIAL DESCRIPTION	USCS	AASHTO
○ Brownish-Red Lean clay with sand	CL	

Project No. 1012081-01 **Client:** Griffin Brothers

Project: HWY. 55 C&D Landfill, LLC.

○ **Source:** HWY. 55 C&D Landfill **Sample No.:** SB-4 (8-9')

Remarks:

○ Natural Moisture Content: 7.7%

Specific Gravity: 2.711

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SB-4 (8-9')

POROSITY

$\boxed{\text{MW-26 (3'-5')}}$

$G_s = 2.618$
$\omega = 22.1\ \%$
$\gamma_{dry} = 101.7$

$W_s = G_s \gamma_w = (2.618)(62.4\ pcf) = 163.363\ pcf$

$W_w = \omega G_s \gamma_w = (0.221)(2.618)(62.4) = 36.103\ pcf.$

$W_A = 0\ pcf$

$V_s = 1\ ft^3$

$V_v = \frac{W_s}{\gamma_d} - V_s = \frac{163.363}{101.7} - 1 = 0.606\ ft^3$

$V_w = \omega G_s = (0.221)(2.618) = 0.579\ ft^3$

$V_A = V_v - V_w = 0.606 - 0.579 = 0.028\ ft^3$

$V_{TOT} = V_s + V_v = 1 + 0.606 = 1.606\ ft^3$

$\eta = \frac{V_v}{V_{TOT}} = \frac{0.606}{1.606}$

$\boxed{\eta = 0.3775}$

MW-29 (3'-4')

$G_s = 2.727$
$\omega = 10.1\%$
$\gamma_{dry} = 126$

$W_s = G_s \gamma_w = (2.727)(62.4) = 170.165$ pcf.

$W_w = \omega G_s \gamma_w = (0.101)(2.727)(62.4) = 17.187$ pcf.

$W_A = 0$ pcf

$V_s = 1$ ft^3

$V_v = \frac{W_s}{\gamma_d} - V_s = \frac{170.165}{126} - 1 = 0.351$ ft^3

$V_w = \omega G_s = (0.101)(2.727) = 0.275$ ft^3

$V_A = V_v - V_w = 0.351 - 0.275 = 0.075$

$V_{TOT} = V_s + V_v = 1 + 0.351 = 1.351$ ft^3

$n = \frac{V_v}{V_{TOT}} = \frac{0.351}{1.351}$

$n = 0.2595$

SB-1

$G_s = 2.608$
$\omega = 9.7\%$
$\gamma_{dry} = 117.9$

$W_S = G_s \gamma_w = (2.608)(62.4) = 162.739$ pcf.

$W_W = \omega G_s \gamma_w = (0.097)(2.608)(62.4) = 15.786$ pcf.

$W_A = 0$ pcf.

$V_S = 1\ ft^3$

$V_V = \frac{W_S}{\gamma_d} - V_S = \frac{162.739}{117.9} - 1 = 0.380\ ft^3$

$V_W = \omega G_s = (0.097)(2.608) = 0.253\ ft^3$

$V_A = V_V - V_W = 0.380 - 0.253 = 0.127\ ft^3$

$V_{TOT} = V_S + V_V = 1 + 0.380 = 1.380\ ft^3$

$\eta = \frac{V_V}{V_{TOT}} = \frac{0.380}{1.380} =$

$\boxed{\eta = 0.2755}$

SS-1

$G_s = 2.606$
$\omega = 18.9\%$
$\gamma_{dry} = 101.7$ pcf

$W_S = G_s \gamma_w = (2.606)(62.4 \text{ pcf}) = 162.614$ pcf
$W_W = \omega G_s \gamma_w = (0.189)(2.606)(62.4 \text{ pcf}) = 30.734$ pcf
$W_A = 0$ pcf
$V_S = 1 \text{ ft}^3$
$V_V = \frac{W_S}{\gamma_d} - V_S = \frac{162.614 \text{ pcf}}{101.7 \text{ pcf}} - 1 = 0.599 \text{ ft}^3$
$V_W = \omega G_S = (0.189)(2.606) = 0.493 \text{ ft}^3$
$V_A = V_V - V_W = 0.599 - 0.493 = 0.106 \text{ ft}^3$
$V_{TOT} = V_S + V_V = 1 + 0.599 = 1.599 \text{ ft}^3$

$$n = \frac{V_V}{V_{TOT}} = \frac{0.599}{1.599} = 0.3748$$

$$\boxed{n = 0.3748}$$

SS-2

$G_S = 2.608$
$\omega = 16.5\%$
$\gamma_{dry} = 108.5$ pcf

$W_S = G_S \gamma_w = (2.608)(62.4 \text{ pcf}) = 162.739$ pcf
$W_W = \omega G_S \gamma_w = (0.165)(2.608)(62.4 \text{ pcf}) = 26.852$ pcf
$W_A = 0$ pcf
$V_S = 1 \text{ ft}^3$
$V_V = \frac{W_S}{\gamma_d} - V_S = \frac{162.739}{108.5} - 1 = 0.500 \text{ ft}^3$
$V_W = \omega G_S = (0.165)(2.608) = 0.430 \text{ ft}^3$
$V_A = V_V - V_W = 0.500 - 0.430 = 0.07 \text{ ft}^3$
$V_{TOT} = V_S + V_V = 1 + 0.500 = 1.500 \text{ ft}^3$

$$n = \frac{V_V}{V_{TOT}} = \frac{0.500}{1.500} = 0.3332$$

$$\boxed{n = 0.3332}$$

HWY. 55 (E'D) LT 1012087-01 | POROSITY

SS-3

$G_s = 2.642$
$\omega = 19.6\%$
$\gamma_{dry} = 103.3$ pcf

$W_s = G_s \gamma_w = (2.642)(62.4\text{ pcf}) = 164.861$ pcf
$W_w = \omega G_s \gamma_w = (0.196)(2.642)(62.4\text{ pcf}) = 32.313$ pcf
$W_A = 0$ pcf
$V_s = 1\ ft^3$
$V_v = \frac{W_s}{\gamma_d} - V_s = \frac{164.861\text{ pcf}}{103.3\text{ pcf}} - 1 = 0.596\ ft^3$
$V_w = \omega G_s = (0.196)(2.642) = 0.518\ ft^3$
$V_A = V_v - V_w = 0.596 - 0.518 = 0.078\ ft^3$
$V_{TOT} = V_s + V_v = 1 + 0.596 = 1.596\ ft^3$

$$n = \frac{V_v}{V_{TOT}} = \frac{0.596\ ft^3}{1.596\ ft^3} = 0.3735$$

$$\boxed{n = 0.3735}$$

Yellow probate sheet is a vital part of your recorded document.
Please retain with original document and submit for rerecording.

WAKE COUNTY NORTH CAROLINA

Wake County Register of Deeds
Laura M. Riddick
Register of Deeds

North Carolina - Wake County

The foregoing certificate___ of Sara J. Perry

_____ Notary(ies) Public is (are) certified to be correct. This instrument and this certificate are duly registered at the date and time and in the book and page shown on the first page hereof.

Laura M. Riddick, Register of Deeds

By: Barbara Elliott
Assistant/~~Deputy~~ Register of Deeds

This Customer Group
_____ # of Time Stamps Needed

This Document
_____ New Time Stamp
6 # of Pages

North Carolina
Department of Environment and Natural Resources

Division of Waste Management

Michael F. Easley, Governor
William G. Ross Jr., Secretary
Dexter R. Matthews, Director

NCDENR

July 22, 2002

MEMORANDUM

TO: Jim Barber

FROM: Bobby Lutfy BL

RE: Site Plan Application & Construction Plan Application
Highway 55 C&D Landfill and Recycling Center
Wake County

With the additional revisions received today, the Site Plan Application and Construction Plan Application for the Highway 55 C&D Landfill and Recycling Center meet the hydrogeologic requirements in the Solid Waste Management Rules. It is still not clear to me how we should handle the Property Survey since the survey plot includes acreage in addition to that evaluated for the Facility applications.

CC: Jim Coffey

1646 Mail Service Center, Raleigh, North Carolina 27699-1646
Phone: 919-733-4996 \ FAX: 919-715-3605 \ Internet: www.enr.state.nc.us

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WAKE COUNTY
Department of Environmental Services
Erosion, Flood and Stormwater Services
(919) 856-7449 FAX: (919) 856-5855 PO Box 550, Raleigh, NC 27602

FAX COVER SHEET

DATE: 7/25/02

TO: Jim Barror FAX NUMBER: 733-4810

NUMBER OF PAGES (including cover): 3

FAX IS SENT BY: Byron Brady

IF YOU DO NOT RECEIVE ALL PAGES CLEARLY, CALL BACK AS SOON AS POSSIBLE

REMARKS:

To protect and improve the quality of Wake County's environment and ensure a healthy future for its citizens through cooperation, education, management and enforcement

- Printed on Recycled Paper -

Form 105

WAKE COUNTY
DEPARTMENT OF ENVIRONMENTAL SERVICES
EROSION, FLOOD AND STORMWATER DIVISION
PO BOX 550
WAKE COUNTY OFFICE BUILDING
RALEIGH, NORTH CAROLINA 27602
(919) 856-7449

CERTIFICATE OF COMPLIANCE FOR PRELIMINARY SOIL EROSION AND SEDIMENTATION CONTROL

THIS IS TO CERTIFY that the approved Soil Erosion and Sedimentation Control measures have been installed in accordance with the approved plan at the project site of Highway 55 C+D Land Fill

located at PIN # 0740.02-55-8687

and in accordance with the provisions of Land Disturbing Permit No. S000004. Verification of the above facts has been ascertained by Byron E. Brady, PE, Environmental Engineer, through the means of an on-site inspection on 7/15/02.

With this compliance, the project is now released for any required Building or Land Use Permits with the understanding that final stabilization or cover of the remaining denuded portions of the site will occur within the time limits as prescribed by the Soil Erosion and Sedimentation Control Ordinance of the County of Wake, or the applicant will be subject to appropriate legal action by the County of Wake to the limits prescribed by the Ordinance.

Byron E. Brady
Environmental Engineer

FOR OFFICIAL USE ONLY

DATE 7/16/02 NO. _____

WHITE — APPLICANT
YELLOW — SEDIMENT CONTROL
PINK — ZONING/SUBDIVISION

11.074–4/3/00

Brenda F Coats
06/19/02 11:53 AM

To: Byron E Brady/Wake County@Wake County
cc:
Subject: Hwy 55 landfill

Byron,

The Board of Adjustment approved the Hwy 55 C&D landfill August 14, 2001 (BA SU 1923-01).

Brenda

PATTERSON, BREWER & ASSOCIATES, P.A.

ENGINEERING * SURVEYING * PLANNING
P.O. BOX 1387
MOORESVILLE, NC 28115

(704) 662-0100 * (704) 662-0101

FAX COVER SHEET

TIME SENT:

TO: Jim Barbour

DATE SENT: 7/25/02

COMPANY NAME: NCDENR - DWM

FAX NUMBER:

FROM: Dan Brewer

RE: NOI for Hwy 55 C&D

Pls call if any questions.

NUMBER OF PAGES SENT (INCLUDING COVER): 5
IF THERE IS A PROBLEM RECEIVING THIS TRANSMISSION PLEASE CONTACT:

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Date Received		
Year	Month	Day
Certificate of Coverage		
Check #	Amount	
Permit Assigned to		

NCDENR
North Carolina Department of Environment and Natural Resources

Division of Water Quality / Water Quality Section

National Pollutant Discharge Elimination System

NCG120000

NOTICE OF INTENT

National Pollutant Discharge Elimination System application for coverage under General Permit NCG120000:

STORMWATER DISCHARGES associated with activities classified as:

Landfills that are permitted by the North Carolina Division of Waste Management under the provisions and requirements of North Carolina General Statute 130A - 294

The following activities are specifically excluded from coverage under this General Permit:

- Stormwater discharges from open dumps, hazardous waste disposal sites, or discharge of waste (including leachate) to the waters of the state.

(Please print or type)

1) Mailing address* of owner/operator:

Name: Hwy 55 C&D Landfill, LLC
Street Address: 19709 - 118 West Catawba Ave.
City: Cornelius State: NC ZIP Code: 28031-5613
Telephone No.: 704-895-0323 Fax: 704 896-2960

* Address to which all permit correspondence will be mailed

2) Location of facility producing discharge:

Facility Name: Hwy 55 C&D Landfill
Facility Contact: Ron Gilkerson
Street Address: Old Smithfield Road
City: Apex State: NC ZIP Code:
County: Wake
Telephone No.: (none) Fax:

3) Physical Location Information:

Please provide a narrative description of how to get to the facility (use street names, state road numbers, and distance and direction from a roadway intersection). West of Hwy 55 Bypass off Old Smithfield Road (see attached USGS)

(A copy of a county map or USGS quad sheet with facility clearly located on the map is required to be submitted with this application)

4) This NPDES Permit Application applies to which of the following :

☒ New or Proposed Facility Date operation is to begin Oct 1, 2002
☐ Existing

5) Standard Industrial Classification:

Provide the 4 digit Standard Industrial Classification Code (SIC Code) that describes the primary industrial activity at this facility

SIC Code: 4 2 5 3

SWU-227-101701

NCG120000 N.O.I.

6) **Provide a brief narrative description of the types of industrial activities and products manufactured at this facility:** C&D Landfill receiving waste resulting from clearing, construction, reno , and demolition of pavement, buildings, or other structures. Recycling center to include chipping and mulch production.

7) **Discharge points / Receiving waters:**

How many discharge points (ditches, pipes, channels, etc.) convey stormwater from the property? 7
What is the name of the body or bodies of water (creek, stream, river, lake, etc.) that the facility stormwater discharges end up in? Tributary to Little Branch
If the site stormwater discharges to a separate storm sewer system, name the operator of the separate storm sewer system (e.g. City of Raleigh municipal storm sewer). _____

8) **Does this facility have any other NPDES permits?**

☒ No
☐ Yes
If yes, list the permit numbers for all current NPDES permits for this facility: _____

9) **Does this facility have any Non-Discharge permits (ex: recycle permits)?**

☐ No
☒ Yes
If yes, list the permit numbers for all current Non-Discharge permits for this facility: Permit Pending

10) **Does this facility employ any best management practices for stormwater control?**

☐ No
☒ Yes
If yes, please briefly describe: Diversion ditches route all storm water to erosion + sediment control devices which include sediment traps, rock dams, and sediment basins.

11) **Does this facility have a Stormwater Pollution Prevention Plan?**

☒ No
☐ Yes
If yes, when was it implemented? _____

12) **Are vehicle maintenance activities occurring at this facility?**

☒ No ☐ Yes

13) **Hazardous Waste:**

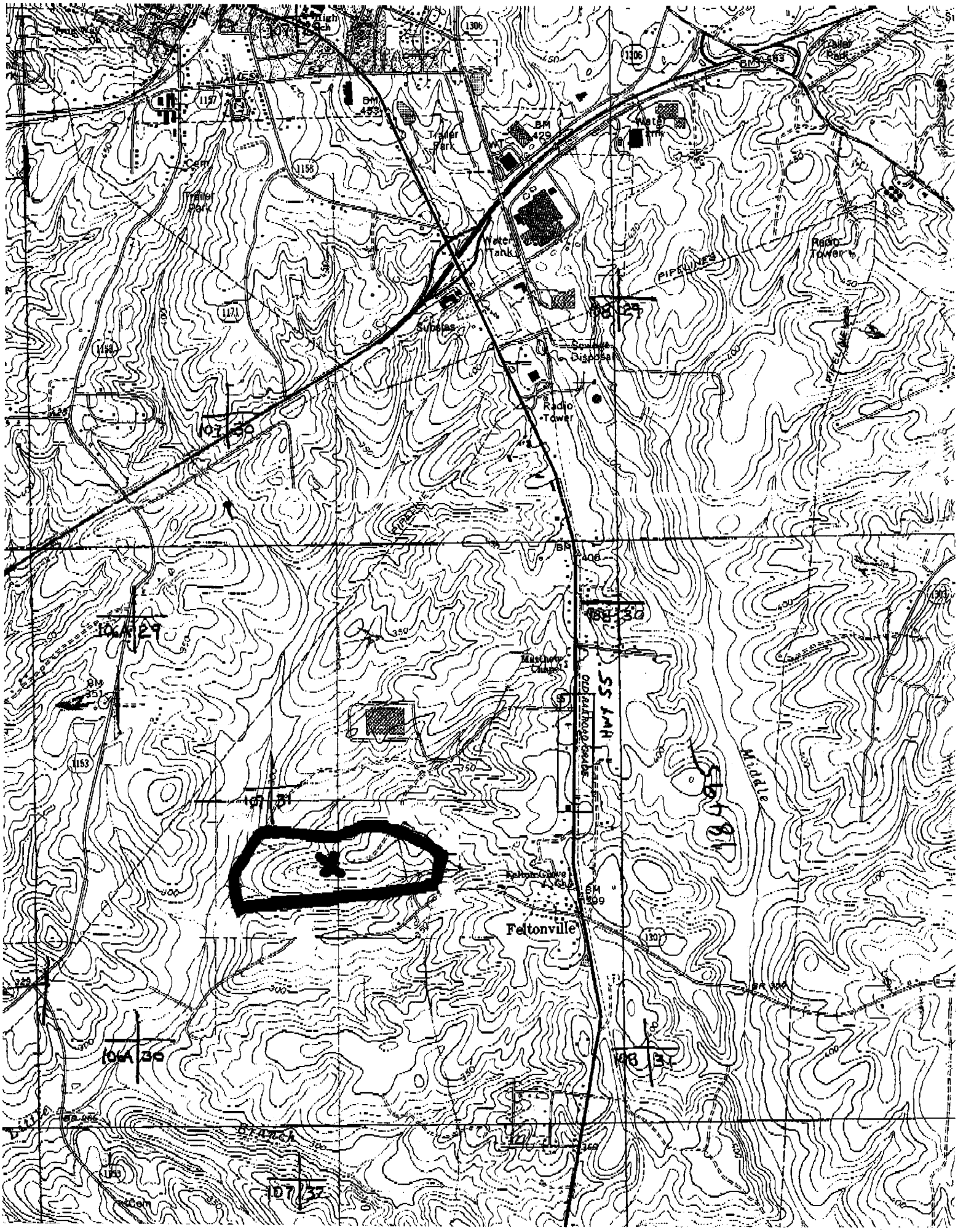
a) Is this facility a Hazardous Waste Treatment, Storage, or Disposal Facility?
☒ No ☐ Yes

b) Is this facility a Small Quantity Generator (less than 1000 kg. of hazardous waste generated per month) of hazardous waste?
☒ No ☐ Yes

c) Is this facility a Large Quantity Generator (1000 kg. or more of hazardous waste generated per month) of hazardous waste?
☒ No ☐ Yes

d) If you answered yes to questions b. or c., please provide the following information:

Type(s) of waste: _____
How is material stored: _____


Trailer Park
Water Tank
Radio Tower
PIPELINES
Substas
Sewage Disposal
Radio Tower
Mt Shiloh Church
OLD RAILROAD GRADE
Middle
Feltonville
Branch
107 30
106A 29
107 31
106A 30
106 31
107 32

WAKE COUNTY DEPARTMENT OF ENVIRONMENTAL SERVICES WELL AND SEWAGE SITE LOCATION PERMIT

11X

TEL 919 856 7449
FAX 919 856 5855

WAKE COUNTY NORTH CAROLINA

Environmental Services

Erosion, Flood and Stormwater
336 Fayetteville St. • P.O. Box 550 • Raleigh, NC 27602

Mike L Griffin
19109-118 W Catawba Avenue
Cornelius North Carolina 28031
Phone #: 704/895-0329
Fax #: 704/896-2960
ATTN: Mr Mike L Griffin

BYROU CERT. OF COMPLIANCE

RE: Sedimentation & Erosion Control Letter of Approval, 06/26/02

Project Name: Hwy 55 C&D Landfill, LLC	Submitted By: Patterson, Brewer & Associates, P.A.
Project #: 02-04-10	128 Overhill Road Suite 105
Date Received: 04/12/02	Morrisville North Carolina 28115
Date Processing Initiated: 04/16/02	Phone #: 919/662-0100 Fax #: 919/662-0101
Disturbed Acres: 18	Submittal ☒ Revision ☐
Plan Review Fee: $2,500.00	
Land Disturbance Fee: $2,500.00	Watershed: : Neuse River Basin-1, 03-04-01

Dear Mr Mike L. Griffin:

This office has reviewed the subject Erosion and Sedimentation Control Plan. We find the plan to be acceptable and hereby issue this letter or approval. If any modifications, performance reservations, or recommendation are applicable, a list is enclosed and is incorporated as a part of this letter of approval. If any modifications are not incorporated into the plan and implemented in the field, the site will be in violation of the Erosion and Sedimentation Control Ordinance of Wake County. ***In addition, Effective July 1, 2000 all projects issued Land-Disturbing Permits will have Article II Section 5(2) 5 (3), (4),(5) and (6) of the Ordinance applied. It should be noted that this plan approval shall expire two (2) years following the date of approval in accordance with Section 5.PERMITS, of the Ordinance. In summary permits over 2 years old may need to be renewed to avoid substantial civil penalties. For details consult the Erosion & Sedimentation Control Ordinance.***

Plan Approval is limited to construction, maintenance and stabilization of both temporary and permanent sedimentation and erosion control devices only. Wake County Erosion, Flood and Stormwater Section is not responsible for subject approvals of other Local, State or Federal Agencies. The subject approvals are (but not limited to) Federal Emergency Management Area Flood regulations/requirements, Division of Water Quality under stormwater or other water quality regulations/requirements, U.S. Army Corps of Engineers under Article 404 (Wetlands) jurisdiction/requirements, and/or any Federal, State, County and Local municipal regulations or permit requirements. The approval issued in this letter cannot supersede any other required permit or approval.

Project Modifications Include:

1. See, Follow and Address the Attached NPDES Permit for Projects with Over 5 Acres of Disturbed Area.
2. Riser Removal Proceedure's Must Be Submitted to this Office Prior to Issuance of Certificate of Compliance for this Project.
3. Project Modifications Include the Attached Riser Basins Weir Lengths on Sheet C3.

Since this project disturbs five or more acres, one such approval relates to the Stormwater that will discharge from your project. This runoff is permitted pursuant to the National Pollutant Discharge Elimination

System (NPDES) administered in North Carolina by the Division of Water Quality (DWQ). Attached is the General Stormwater NPDES Permit, NCG01000, as revised October 1, 2001, covering your activity. You are responsible for complying with the General Permit requirements and are subject to enforcement by DWQ for any violations of the General Permit.

Wake County's sedimentation pollution control program is performance oriented, requiring protection of the natural resources and adjoining properties. If at any time during this project it is determined that the Erosion and Sedimentation Control Plan is inadequate to meet the requirements of the Erosion and Sedimentation Control Ordinance of Wake County , this office may require revisions in the plan and its implementation to ensure compliance with the Ordinance. Also, please consider this letter as notice in accordance with the requirements for Approval of Plans, Section 4(8), this office may require revisions in the plan and its implementation to ensure compliance with the Ordinance.

Please note that this approval is based in part on the accuracy of the information provided concerning financial responsibility. You are requested to file an amended Financial Responsibility Form if any changes become necessary.

Your cooperation is appreciated and we look forward to working with you on this project. If there are any questions, please do not hesitate to contact this office.

Sincerely,

Lee R. Squires, P.E., 856-6199
Environmental Engineer/Planner I

cc:Patterson, Brewer & Associates
Mr. John Dorney, P.E.
Mr. Ken Schuster, P.E.

Permit No. NCG010000

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT, HEALTH, AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL MANAGEMENT

GENERAL PERMIT

TO DISCHARGE STORMWATER UNDER THE

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provision of North Carolina General Statute 143-215.1, other lawful standards and regulations promulgated and adopted by North Carolina Environmental Management Commission and the Federal Water Pollution Control Act as amended,

---

All owners or operators of stormwater point source discharges associated with construction activities including clearing, grading and excavation activities resulting in the disturbance of land are hereby authorized to discharge stormwater to the surface waters of North Carolina or to a separate storm sewer system conveying stormwater to the surface waters.

The General Permit shall become effective on July 1, 1995.

The General Permit shall expire at midnight on June 30, 2000.

Signed this day June 30, 1995.

A. Preston Howard, Jr., P.E., Director
Division of Environmental Management
By the Authority of the Environmental Management Commission

PART I

MONITORING, CONTROLS, AND LIMITATIONS FOR PERMITTED DISCHARGES

SECTION A: FINAL LIMITATIONS AND CONTROLS FOR STORMWATER DISCHARGES

During the period beginning on the effective date of the permit and lasting until expiration, the Permittee is authorized to discharge stormwater associated with industrial activity. Such discharges shall be controlled, limited and monitored as specified below.

1. Prior to the commencement of construction, the permittee shall submit for approval a Sedimentation and Erosion Control Plan (plan) to the Department of Environment, Health, and Natural Resources, Division of Land Resources, Land Quality Section, (or an approved local program) pursuant to the requirements of NC G.S. 113A-54.1 and in conformity with rules adopted by the Sedimentation and Erosion Control Commission.

2. The Permittee shall implement the plan, which has been approved by the approval authority. The approved plan is considered a requirement or condition of this general permit. Deviation from the approved plan, or approved amendment to the plan, shall constitute a violation of the terms and conditions of this general permit except that deviation from the approved plan will be allowed to correct an emergency situation where sediments are being discharged off the site, even though the approved plan is in effect. Such a deviation from the approved plan shall be noted on the approved plan maintained at the job site. A signed copy of the approved plan shall be maintained on the site at all times.

3. Equipment utilized during the construction activity on a site must be operated and maintained in such a manner as to prevent the potential or actual pollution of the surface or ground waters of the state. Fuels, lubricants, coolants, and hydraulic fluids, or any other petroleum products, shall not be discharged onto the ground or into surface waters. Spent fluids shall be disposed of in a manner so as not to enter the waters, surface or ground, of the state and in accordance with applicable state and federal disposal regulations. Any spilled fluids shall be cleaned up to the extent practicable and disposed of in a manner so as not to allow their entry into the waters, surface or ground, of the state.

4. Herbicide, pesticide, and fertilizer usage during the construction activity shall be restricted to those materials approved by EPA and shall be in accordance with label restrictions.

5. All wastes composed of building materials shall be disposed of in accordance with North Carolina General Statutes, Chapter 130A, Article 9 - Solid Waste Management, and rules governing the disposal of solid waste (North Carolina Administrative Code Section 15A NCAC 13B).

PART II
STANDARD CONDITIONS FOR NPDES STORMWATER GENERAL PERMITS

SECTION A: DEFINITIONS

1. Act or "the Act" or CWA

The Federal Water Pollution Control Act, also known as the Clean Water Act, as amended, 33 USC 1251, et. seq.

2. Best Management Practices (BMPs)

Schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operation procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

3. DEM or Division

The Division of Environmental Management, Department of Environment, Health and Natural Resources.

4. Director

The Director of the Division of Environmental Management, the permit issuing authority.

5. EMC

The North Carolina Environmental Management Commission.

6. Landfill

A disposal facility or part of a disposal facility where waste is placed in or on land and which is not a land treatment facility, a surface impoundment, an injection well, a hazardous waste long-term storage facility or a surface storage facility.

7. Overburden

Any material of any nature, consolidated or unconsolidated, that overlies a mineral deposit, excluding topsoil or similar naturally-occurring surface materials that are not disturbed by mining operations.

8. Permittee

The person who signed as the financially responsible party on the Sedimentation and Erosion Control Plan.

which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.

2. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this general permit which has a reasonable likelihood of adversely affecting human health or the environment.

3. Civil and Criminal Liability

Except as provided in general permit conditions on "Bypassing" (Part II, C.3.), nothing in this general permit shall be construed to relieve the permittee from any responsibilities, liabilities, or penalties for noncompliance pursuant to NCGS 143-215.3, 143-215.6A, 143-215.6B, 143-215.6C or Section 309 of the Federal Act, 33 USC 1319. Furthermore, the permittee is responsible for consequential damages, such as fish kills, even though the responsibility for effective compliance may be temporarily suspended.

4. Oil and Hazardous Substance Liability

Nothing in this general permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject to under NCGS 143-215.75 et seq. or Section 311 of the Federal Act, 33 USC 1321. Furthermore, the permittee is responsible for consequential damages, such as fish kills, even though the responsibility for effective compliance may be temporarily suspended.

5. Property Rights

The issuance of this general permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

6. Severability

The provisions of this general permit are severable, and if any provision of this general permit, or the application of any provision of this general permit to any circumstances, is held invalid, the application of such provision to other circumstances, and the remainder of this general permit, shall not be affected thereby.

7. Duty to Provide Information

The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating the certificate of coverage issued pursuant to this general permit or to determine compliance with this general permit. The permittee shall also furnish to the Director upon request, copies of records required to be kept by this general permit.

8. Continuation of the Expired General Permit

An expired general permit continues in force and effect until the general permit is reissued or a new general permit is issued. Only those facilities authorized to discharge under the expiring general permit are covered by the continued general permit.

to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

(2) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

(3) For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official.

b. All reports required by the general permit and other information requested by the Director shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

(1) The authorization is made in writing by a person described above;

(2) The authorization specified either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or well field, superintendent, a position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.); and

(3) The written authorization is submitted to the Director.

c. Any person signing a document under paragraphs a. or b. of this section shall make the following certification:

"I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations."

13. General Permit Modification, Revocation and Reissuance, or Termination

The issuance of this general permit does not prohibit the Director from reopening and modifying the general permit, revoking and reissuing the general permit, or terminating the general permit as allowed by the laws, rules, and regulations contained in Title 40, Code of Federal Regulations, Parts 122 and 123; Title 15A of the North Carolina Administrative Code, Subchapter 2H .0100; and North Carolina General Statute 143-215.1 et. al.

(1) Bypass was unavoidable to prevent loss of life, personal injury or severe property damage;

(2) There were no feasible alternatives to the bypass, such as the use of auxiliary control facilities, retention of stormwater or maintenance during normal periods of equipment downtime or dry weather. This condition is not satisfied if adequate backup controls should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

(3) The permittee submitted notices as required under Paragraph c. of this section.

The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed above in Paragraph d. of this section.

4. Upsets

a. Definition

"Upset " means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment or control facilities, inadequate treatment or control facilities, lack of preventive maintenance, or careless or improper operation.

b. Effect of an Upset.

An upset constitutes an affirmative defense to an action brought for noncompliance with technology based permit effluent limitations if the requirements of paragraph c. of this condition are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

c. Conditions Necessary for a Demonstration of Upset

A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) An upset occurred and that the permittee can identify the cause(s) of the upset;

2) The permitted facility was at the time being properly operated; and

(3) The permittee submitted notice of the upset as required in Part II, E. 5. (b) (B) of this general permit.

(4) The permittee complied with any remedial measures required under Part II, A. 2. of this general permit.

d. Burden of Proof

In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

6. Records Retention

The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this general permit, for a period of at least 5 years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.

7. Recording Results

For each measurement, sample, inspection or maintenance activity performed or taken pursuant to the requirements of this general permit, the permittee shall record the following information:

a. The date, exact place, and time of sampling, measurements, inspection or maintenance activity;

b. The individual(s) who performed the sampling, measurements, inspection or maintenance activity;

c. The date(s) analyses were performed;

d. The individual(s) who performed the analyses;

e. The analytical techniques or methods used; and

f. The results of such analyses.

8. Inspection and Entry

The permittee shall allow the Director, or an authorized representative (including an authorized contractor acting as a representative of the Director), or in the case of a facility which discharges through a municipal separate storm sewer system, an authorized representative of a municipal operator or the separate storm sewer system receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to;

a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this general permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this general permit;

c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this general permit; and

d. Sample or monitor at reasonable times, for the purposes of assuring general permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

GRIFFIN BROTHERS COMPANIES

LANDFILL DEVELOPMENT

•• FAX TRANSMITTAL ••

Date: 7/23/02

To: JIM BARBER **Fax Number::** 919-733-4810

From:

- [ ] LARRY GRIFFIN, SR. • 704.896.6650 Fax 896.2960
- [ ] MIRIAM MOORE • 704.896.6650 Fax 896.2960
- [ ] CINDY SOLIDAY • 704.896.6650 Fax 896.2960
- [x] RON GILKERSON • 704.895.0329 Fax 896.2960
- [ ] MIKE GRIFFIN • 704.895.4506 Fax 896.2960

MESSAGE

JIM,

ATTACHED IS A COPY OF THE SEDIMENTATION & EROSION CONTROL APPROVAL FROM WAKE COUNTY. DAN WILL BE SENDING YOU A COPY OF THE NOI FORM YOU REQUESTED. GIVE ME A CALL WHEN YOU CAN.

THANKS, Ron.

This facsimile transmission consist of _____ pages, including this cover page.

19109 W Catawba Ave • Suite 118 • Cornelius, North Carolina 28031-5613

GRIFFIN BROTHERS COMPANIES

LANDFILL DEVELOPMENT

•• FAX TRANSMITTAL ••

Date: 7/26/02

To: Jim Barber **Fax Number::** 919-733-4810 ✓

From:

- ☐ LARRY GRIFFIN, SR. • 704.896.6650 Fax 896.2960
- ☐ MIRIAM MOORE • 704.896.6650 Fax 896.2960
- ☐ CINDY SOLIDAY • 704.896.6650 Fax 896.2960
- ☑ RON GILKERSON • 704.895.0329 Fax 896.2960
- ☐ MIKE GRIFFIN • 704.895.4506 Fax 896.2960

MESSAGE

Jim,

ATTACHED IS GENERAL PERMIT NO. NCG010000 WHICH WAS ATTACHED TO OUR EROSION AND SEDIMENTATION CONTROL PERMIT FROM WAKE COUNTY. CALL IF YOU NEED ANYTHING ELSE!

THANKS,

Ron.

This facsimile transmission consist of 16 pages, including this cover page.

19109 W Catawba Ave • Suite 118 • Cornelius, North Carolina 28031-5613

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT, HEALTH, AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL MANAGEMENT

GENERAL PERMIT

TO DISCHARGE STORMWATER UNDER THE

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provision of North Carolina General Statute 143-215.1, other lawful standards and regulations promulgated and adopted by North Carolina Environmental Management Commission and the Federal Water Pollution Control Act as amended,

---

All owners or operators of stormwater point source discharges associated with construction activities including clearing, grading and excavation activities resulting in the disturbance of land are hereby authorized to discharge stormwater to the surface waters of North Carolina or to a separate storm sewer system conveying stormwater to the surface waters.

The General Permit shall become effective on July 1, 1995.

The General Permit shall expire at midnight on June 30, 2000.

Signed this day June 30, 1995.

A. Preston Howard, Jr., P.E., Director
Division of Environmental Management
By the Authority of the Environmental Management Commission

PERMITTED ACTIVITIES

Until this permit expires or is modified or revoked, the permittee is authorized to discharge stormwater which has been adequately treated and managed in accordance with an approved Sedimentation and Erosion Control Plan by the North Carolina Division of Land Resources, Land Quality Section, or a delegated local program under the provisions and requirements of North Carolina General Statute 113A - 54.1 to the surface waters of North Carolina or to a separate storm sewer system. All discharges shall be in accordance with the attached schedules as follows:

Part I: Monitoring, Controls, and Limitations for Permitted Discharges

Part II: Standard Conditions for NPDES Stormwater General Permits

Any other point source discharge to surface waters of the state is prohibited unless covered by another permit, authorization or approval.

This permit does not relieve the permittee from responsibility for compliance with any other applicable federal, state, or local law, rule, standard, ordinance, order, judgment, or decree.

General Permit Coverage

Coverage under this General Permit shall become effective upon issuance of an approval for the Sedimentation and Erosion Control Plan by the Land Quality Section of the Division of Land Resources or delegated local program. Prior to the commencement of construction and land disturbing activities approval of the Sedimentation and Erosion Control Plan shall be obtained.

Any owner or operator not wishing to be covered or limited by this General Permit may make application for an individual NPDES permit in accordance with NPDES procedures in 15A NCAC 2H .0100, stating the reasons supporting the request. Any application for an individual permit should be made at least 180 days prior to the time the permit is needed.

This General Permit does not cover activities or discharges covered by an individual NPDES permit until the individual permit has expired or has been rescinded. Any person conducting an activity covered by an individual permit but which could be covered by this General Permit may request that the individual permit be rescinded and coverage under this General Permit be provided.

PART I

MONITORING, CONTROLS, AND LIMITATIONS FOR PERMITTED DISCHARGES

SECTION A: FINAL LIMITATIONS AND CONTROLS FOR STORMWATER DISCHARGES

During the period beginning on the effective date of the permit and lasting until expiration, the Permittee is authorized to discharge stormwater associated with industrial activity. Such discharges shall be controlled, limited and monitored as specified below.

1. Prior to the commencement of construction, the permittee shall submit for approval a Sedimentation and Erosion Control Plan (plan) to the Department of Environment, Health, and Natural Resources, Division of Land Resources, Land Quality Section, (or an approved local program) pursuant to the requirements of NC G.S. 113A-54.1 and in conformity with rules adopted by the Sedimentation and Erosion Control Commission.

2. The Permittee shall implement the plan, which has been approved by the approval authority. The approved plan is considered a requirement or condition of this general permit. Deviation from the approved plan, or approved amendment to the plan, shall constitute a violation of the terms and conditions of this general permit except that deviation from the approved plan will be allowed to correct an emergency situation where sediments are being discharged off the site, even though the approved plan is in effect. Such a deviation from the approved plan shall be noted on the approved plan maintained at the job site. A signed copy of the approved plan shall be maintained on the site at all times.

3. Equipment utilized during the construction activity on a site must be operated and maintained in such a manner as to prevent the potential or actual pollution of the surface or ground waters of the state. Fuels, lubricants, coolants, and hydraulic fluids, or any other petroleum products, shall not be discharged onto the ground or into surface waters. Spent fluids shall be disposed of in a manner so as not to enter the waters, surface or ground, of the state and in accordance with applicable state and federal disposal regulations. Any spilled fluids shall be cleaned up to the extent practicable and disposed of in a manner so as not to allow their entry into the waters, surface or ground, of the state.

4. Herbicide, pesticide, and fertilizer usage during the construction activity shall be restricted to those materials approved by EPA and shall be in accordance with label restrictions.

5. All wastes composed of building materials shall be disposed of in accordance with North Carolina General Statutes, Chapter 130A, Article 9 - Solid Waste Management, and rules governing the disposal of solid waste (North Carolina Administrative Code Section 15A NCAC 13B).

SECTION B: MINIMUM MONITORING AND REPORTING REQUIREMENTS

Minimum monitoring and reporting requirements are as follows unless otherwise approved in writing by the Director of the Division of Environmental Management.

1. All sedimentation and erosion control facilities shall be inspected by or under the direction of the permittee at least once every seven calendar days and within 24 hours after any storm event of greater that 0.5 inches of rain per 24 hour period.

2. Stormwater runoff discharges shall be inspected by observation for stormwater discharge characteristics as defined below at the above frequency to evaluate the effectiveness of the pollution control facilities or practices. If any visible off-site sedimentation is leaving the site, corrective action shall be taken to reduce the discharge of sediments.

Stormwater Discharge Characteristics	Monitoring Type[1]	Monitoring Location[2]
Color		SDO
Odor		SDO
Clarity		SDO
Floating Solids		SDO
Suspended Solids		SDO
Foam		SDO
Oil Sheen		SDO
Other obvious indicators of stormwater pollution		SDO

Footnotes:

1 Monitoring Type: The monitoring requires a qualitative observation of each stormwater outfall. No analytical testing or sampling is required.

2 Sample Location: Stormwater Discharge Outfall (SDO)

3. The operator shall keep a record of inspections. Visible sedimentation found off the site shall be recorded with a brief explanation as to the measures taken to prevent future releases as well as any measures taken to clean up the sediment that has left the site. This record shall be made available to DEM or authorized agent upon request.

SECTION C: SCHEDULE OF COMPLIANCE

1. The permittee shall comply with Final Limitations and Controls specified for stormwater discharges by the effective date of the permit unless specified below.

2. Permittee shall at all times provide the operation and maintenance necessary to operate the permitted stormwater controls at optimum efficiency.

PART II
STANDARD CONDITIONS FOR NPDES STORMWATER GENERAL PERMITS

SECTION A: DEFINITIONS

1. Act or "the Act" or CWA

The Federal Water Pollution Control Act, also known as the Clean Water Act, as amended, 33 USC 1251, et. seq.

2. Best Management Practices (BMPs)

Schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operation procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

3. DEM or Division

The Division of Environmental Management, Department of Environment, Health and Natural Resources.

4. Director

The Director of the Division of Environmental Management, the permit issuing authority.

5. EMC

The North Carolina Environmental Management Commission.

6. Landfill

A disposal facility or part of a disposal facility where waste is placed in or on land and which is not a land treatment facility, a surface impoundment, an injection well, a hazardous waste long-term storage facility or a surface storage facility.

7. Overburden

Any material of any nature, consolidated or unconsolidated, that overlies a mineral deposit, excluding topsoil or similar naturally-occurring surface materials that are not disturbed by mining operations.

8. Permittee

The person who signed as the financially responsible party on the Sedimentation and Erosion Control Plan.

9. Point Source Discharge

Any discernible, confined and discrete conveyance, including but specifically not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, or concentrated animal feeding operation from which pollutants are or may be discharged to waters of the state.

10. Representative Storm Event

A storm event that measures greater than 0.1 inches of rainfall and that is preceded by at least 72 hours during which no storm event measuring greater than 0.1 inches has occurred. A single storm event may contain intervals of up to 10 consecutive hours of no precipitation. For example, if it rains for 2 hours without producing any collectable discharge, and then stops, a sample may be collected if a rain producing a discharge begins again with the next 10 hours.

SECTION B: GENERAL CONDITIONS

1. Duty to Comply

The permittee must comply with all conditions of this general permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for certificate of coverage termination, revocation and reissuance, or modification; or denial of a certificate of coverage renewal application.

a. The permittee shall comply with effluent standards or prohibitions established under section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

b. The Clean Water Act provides that any person who violates a permit condition is subject to a civil penalty not to exceed $25,000 per day for each violation. Any person who negligently violates any permit condition is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment for not more than 1 year, or both. Any person who knowingly violates permit conditions is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. Also, any person who violates a permit condition may be assessed an administrative penalty not to exceed $10,000 per violation with the maximum amount not to exceed $125,000. [Ref: Section 309 of the Federal Act 33 USC 1319 and 40 CFR 122.41(a).]

c. Under state law, a daily civil penalty of not more than ten thousand dollars ($10,000) per violation may be assessed against any person who violates or fails to act in accordance with the terms, conditions, or requirements of a permit. [Ref: North Carolina General Statutes 143-215.6A]

d. Any person may be assessed an administrative penalty by the Administrator for violating section 301, 302, 306, 307, 308, 318, or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of the Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during

which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.

2. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this general permit which has a reasonable likelihood of adversely affecting human health or the environment.

3. Civil and Criminal Liability

Except as provided in general permit conditions on "Bypassing" (Part II, C.3.), nothing in this general permit shall be construed to relieve the permittee from any responsibilities, liabilities, or penalties for noncompliance pursuant to NCGS 143-215.3, 143-215.6A, 143-215.6B, 143-215.6C or Section 309 of the Federal Act, 33 USC 1319. Furthermore, the permittee is responsible for consequential damages, such as fish kills, even though the responsibility for effective compliance may be temporarily suspended.

4. Oil and Hazardous Substance Liability

Nothing in this general permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject to under NCGS 143-215.75 et seq. or Section 311 of the Federal Act, 33 USC 1321. Furthermore, the permittee is responsible for consequential damages, such as fish kills, even though the responsibility for effective compliance may be temporarily suspended.

5. Property Rights

The issuance of this general permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

6. Severability

The provisions of this general permit are severable, and if any provision of this general permit, or the application of any provision of this general permit to any circumstances, is held invalid, the application of such provision to other circumstances, and the remainder of this general permit, shall not be affected thereby.

7. Duty to Provide Information

The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating the certificate of coverage issued pursuant to this general permit or to determine compliance with this general permit. The permittee shall also furnish to the Director upon request, copies of records required to be kept by this general permit.

8. Continuation of the Expired General Permit

An expired general permit continues in force and effect until the general permit is reissued or a new general permit is issued. Only those facilities authorized to discharge under the expiring general permit are covered by the continued general permit.

9. General Permit Termination

After public notice and opportunity for a hearing, the general permit may be terminated for cause. The filing of a request for a general permit modification, revocation and reissuance, or termination does not stay any general permit condition. The certificate of coverage shall expire when the general permit is terminated.

10. When an Individual Permit may be Required

The Director may require any owner/operator authorized to discharge under a certificate of coverage issued pursuant to this general permit to apply for and obtain an individual permit or an alternative general permit. Any interested person may petition the Director to take action under this paragraph. Cases where an individual permit may be required include, but are not limited to, the following:

a. The discharger is a significant contributor of pollutants;

b. Conditions at the permitted site change, altering the constituents and/or characteristics of the discharge such that the discharge no longer qualifies for a General Permit;

c. The discharge violates the terms or conditions of this general permit;

d. A change has occurred in the availability of demonstrated technology or practices for the control or abatement of pollutants applicable to the point source;

e. Effluent limitations are promulgated for the point sources covered by this general permit;

f. A water quality management plan containing requirements applicable to such point sources is approved after the issuance of this general permit.

g. The Director determines at his own discretion that an individual permit is required.

11. When an Individual Permit may be Requested

Any permittee operating under this general permit may request to be excluded from the coverage of this general permit by applying for an individual permit. When an individual permit is issued to an owner/operator the applicability of this general permit is automatically terminated on the effective date of the individual permit.

12. Signatory Requirements

a. All applications, reports, or information submitted to the Director shall be signed and certified as follows:

(1) For a corporation: by a responsible corporate officer. For the purpose of this Section, a responsible corporate officer means: (a) a president, secretary, treasurer or vice president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions for the corporation, or (b) the manager of one or more manufacturing production or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding 25 million (in second quarter 1980 dollars), if authority

to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

(2) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

(3) For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official.

b. All reports required by the general permit and other information requested by the Director shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

(1) The authorization is made in writing by a person described above;

(2) The authorization specified either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or well field, superintendent, a position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.); and

(3) The written authorization is submitted to the Director.

c. Any person signing a document under paragraphs a. or b. of this section shall make the following certification:

"I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations."

13. General Permit Modification, Revocation and Reissuance, or Termination

The issuance of this general permit does not prohibit the Director from reopening and modifying the general permit, revoking and reissuing the general permit, or terminating the general permit as allowed by the laws, rules, and regulations contained in Title 40, Code of Federal Regulations, Parts 122 and 123; Title 15A of the North Carolina Administrative Code, Subchapter 2H .0100; and North Carolina General Statute 143-215.1 et. al.

SECTION C: OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this general permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the general permit.

2. Need to Halt or Reduce not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the condition of this general permit.

3. Bypassing of Stormwater Control Facilities

a. Definitions

(1) "Bypass" means the known diversion of stormwater from any portion of a stormwater control facility including the collection system, which is not a designed or established or operating mode for the facility.

(2) "Severe property damage" means substantial physical damage to property, damage to the control facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. Bypass Not Exceeding Limitations.

The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Paragraphs c. and d. of this section.

c. Notice

(1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass; including an evaluation of the anticipated quality and affect of the bypass.

(2) Unanticipated bypass. The permittee shall submit notice within 24 hours of an unanticipated bypass as required in Part II, E. 5. of this general permit. (24-hour notice).

d. Prohibition of Bypass

Bypass is prohibited and the Director may take enforcement action against a permittee for bypass, unless:

(1) Bypass was unavoidable to prevent loss of life, personal injury or severe property damage;

(2) There were no feasible alternatives to the bypass, such as the use of auxiliary control facilities, retention of stormwater or maintenance during normal periods of equipment downtime or dry weather. This condition is not satisfied if adequate backup controls should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

(3) The permittee submitted notices as required under Paragraph c. of this section.

The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed above in Paragraph d. of this section.

4. Upsets

a. Definition

"Upset " means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment or control facilities, inadequate treatment or control facilities, lack of preventive maintenance, or careless or improper operation.

b. Effect of an Upset.

An upset constitutes an affirmative defense to an action brought for noncompliance with technology based permit effluent limitations if the requirements of paragraph c. of this condition are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

c. Conditions Necessary for a Demonstration of Upset

A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) An upset occurred and that the permittee can identify the cause(s) of the upset;

2) The permitted facility was at the time being properly operated; and

(3) The permittee submitted notice of the upset as required in Part II, E. 5. (b) (B) of this general permit.

(4) The permittee complied with any remedial measures required under Part II, A. 2. of this general permit.

d. Burden of Proof

In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

SECTION D: MONITORING AND RECORDS

1. **Representative Sampling**

Samples collected and measurements taken, as required herein, shall be characteristic of the volume and nature of the permitted discharge. Samples shall be taken on a day and time that is characteristic of the discharge. All samples shall be taken before the discharge joins or is diluted by any other waste stream, body of water, or substance. Monitoring points shall not be changed without notification to and approval of the Director.

2. **Reporting**

Duplicate signed copies of all reports required herein, shall be submitted to the following address:

Division of Environmental Management
Water Quality Section
ATTENTION: Central Files
Post Office Box 29535
Raleigh, North Carolina 27626-0535

3. **Flow Measurements**

Where required, appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges.

4. **Test Procedures**

Test procedures for the analysis of pollutants shall conform to the EMC regulations published pursuant to NCGS 143-215.63 et. seq., the Water and Air Quality Reporting Acts, and to regulations published pursuant to Section 304(g), 33 USC 1314, of the Federal Water Pollution Control Act, as Amended, and Regulation 40 CFR 136.

To meet the intent of the monitoring required by this general permit, all test procedures must produce minimum detection and reporting levels that are below the general permit discharge requirements and all data generated must be reported down to the minimum detection or lower reporting level of the procedure. If no approved methods are determined capable of achieving minimum detection and reporting levels below general permit discharge requirements, then the most sensitive (method with the lowest possible detection and reporting level) approved method must be used.

5. **Penalties for Tampering**

The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this general permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than two years per violation, or by both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more that $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

6. Records Retention

The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this general permit, for a period of at least 5 years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.

7. Recording Results

For each measurement, sample, inspection or maintenance activity performed or taken pursuant to the requirements of this general permit, the permittee shall record the following information:

a. The date, exact place, and time of sampling, measurements, inspection or maintenance activity;

b. The individual(s) who performed the sampling, measurements, inspection or maintenance activity;

c. The date(s) analyses were performed;

d. The individual(s) who performed the analyses;

e. The analytical techniques or methods used; and

f. The results of such analyses.

8. Inspection and Entry

The permittee shall allow the Director, or an authorized representative (including an authorized contractor acting as a representative of the Director), or in the case of a facility which discharges through a municipal separate storm sewer system, an authorized representative of a municipal operator or the separate storm sewer system receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to;

a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this general permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this general permit;

c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this general permit; and

d. Sample or monitor at reasonable times, for the purposes of assuring general permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

SECTION E: REPORTING REQUIREMENTS

1. Planned Changes

The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

a. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR Part 122.29 (b); or

b. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the general permit, nor to notification requirements under 40 CFR Part 122.42 (a) (1).

2. Anticipated Noncompliance

The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with the general permit requirements.

3. Transfers

The certificate of coverage issued pursuant to this general permit is not transferable to any person except after notice to and approval by the Director. The Director may require modification or revocation and reissuance of the certificate of coverage to change the name and incorporate such other requirements as may be necessary under the Clean Water Act.

4. Monitoring Reports

Monitoring results shall be reported at the intervals specified in Part I of this general permit.

5. Twenty-four Hour Reporting

a. The permittee shall report to the central office or the appropriate regional office any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee became aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances.

The written submission shall contain a description of the noncompliance, and its causes; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

b. The following shall be included as information which must be reported within 24 hours under this paragraph:

(1) Any unanticipated bypass which exceeds any effluent limitation in the general permit.

(2) Any upset which exceeds any effluent limitation in the general permit.

(3) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in the general permit to be reported within 24 hours.

c. The Director may waive the written report on a case-by-case basis for reports under paragraph b. above of this condition if the oral report has been received within 24 hours.

6. Other Noncompliance

The permittee shall report all instances of noncompliance not reported under Part II. E. 4. and 5. of this general permit at the time monitoring reports are submitted. The reports shall contain the information listed in Part II. E. 5. of this general permit.

7. Other Information

Where the permittee becomes aware that it failed to submit any relevant facts in a notice of intent to be covered under this general permit or in any report to the Director, it shall promptly submit such facts or information.

8. Availability of Reports

Except for data determined to be confidential under NCGS 143-215.3(a)(2) or Section 308 of the Federal Act, 33 USC 1318, all reports prepared in accordance with the terms shall be available for public inspection at the offices of the Division of Environmental Management. As required by the Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in NCGS 143-215.6B or in Section 309 of the Federal Act.

9. Penalties for Falsification of Reports

The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this general permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than two years per violation, or by both.

SECTION F: LIMITATIONS REOPENER

This general permit shall be modified or alternatively, revoked and reissued, to comply with any applicable effluent guideline or water quality standard issued or approved under Sections 302(b)(2)(c), and (d), 304(b)(2) and 307(a) of the Clean Water Act, if the effluent guideline or water quality standard so issued or approved:

a. contains different conditions or is otherwise more stringent than any effluent limitation in the general permit; or

b. controls any pollutant not limited in the general permit.

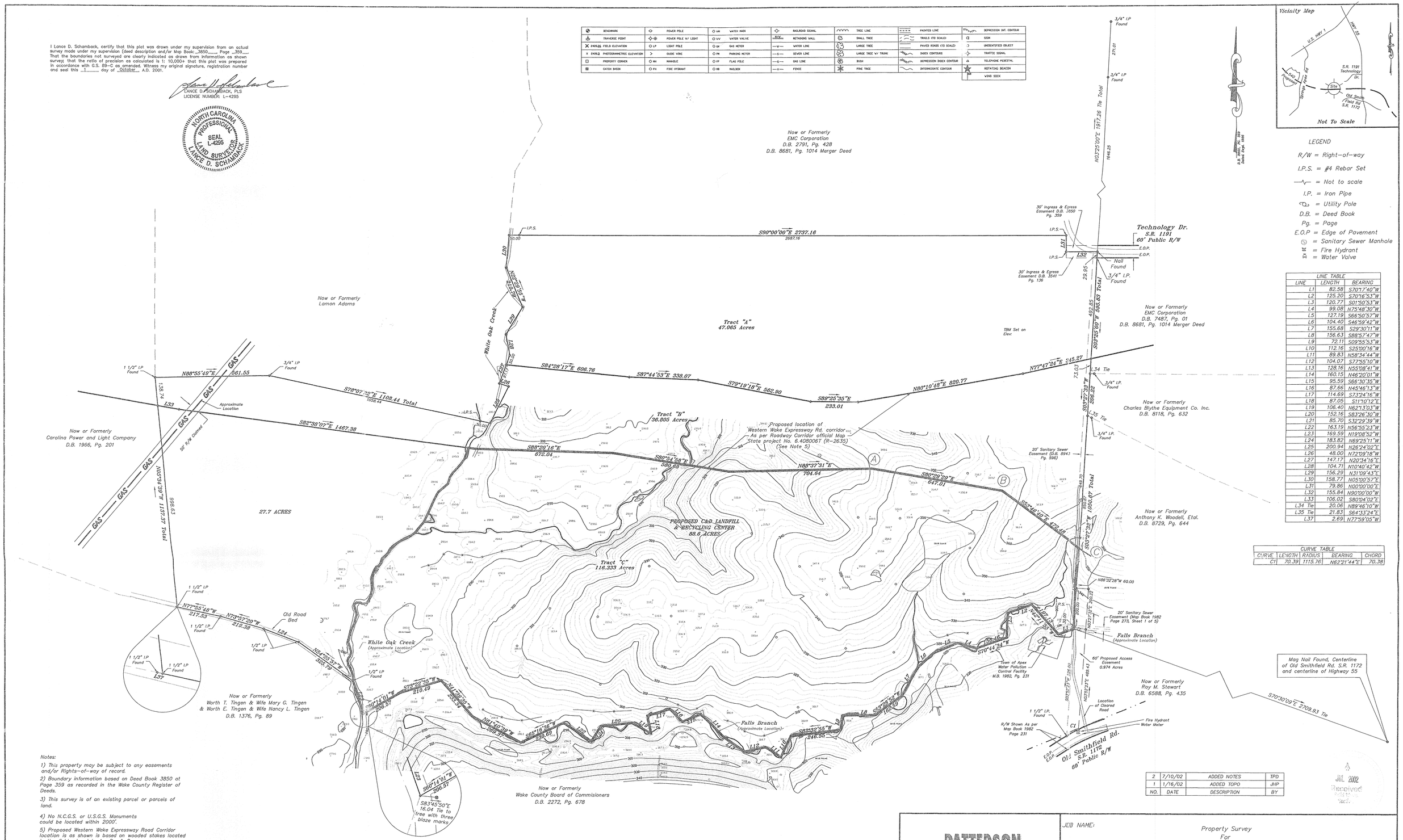
The general permit as modified or reissued under this paragraph shall also contain any other requirements in the Act then applicable.

I Lance D. Schamback, certify that this plat was drawn under my supervision from an actual survey made under my supervision (deed description and/or Map Book: 3850, Page 359). That the boundaries not surveyed are clearly indicated as drawn from information as shown survey; that the ratio of precision as calculated is 1: 10,000+ that this plat was prepared in accordance with G.S. 89-C as amended. Witness my original signature, registration number and seal this 1 day of October, A.D. 2001.

LANCE D. SCHAMBACK, PLS
LICENSE NUMBER: L-4295

NORTH CAROLINA PROFESSIONAL SEAL L-4295 LAND SURVEYOR LANCE D. SCHAMBACK

BENCHMARK	POWER POLE	WATER MAIN	RAILROAD SIGNAL	TREE LINE	PAINTED LINE	DEPRESSION INT. CONTOUR
TRAVERSE POINT	POWER POLE W/ LIGHT	WATER VALVE	RETAINING WALL	SMALL TREE	TRAILS (TO SCALE)	SIGN
2425.2 FIELD ELEVATION	LIGHT POLE	GAS METER	WATER LINE	LARGE TREE	PAVED ROADS (TO SCALE)	UNIDENTIFIED OBJECT
2425.2 PHOTOGRAMMETRIC ELEVATION	GUIDE WIRE	PARKING METER	SEWER LINE	LARGE TREE W/ TRUNK	INDEX CONTOURS	TRAFFIC SIGNAL
PROPERTY CORNER	MANHOLE	FLAG POLE	GAS LINE	BUSH	DEPRESSION INDEX CONTOUR	TELEPHONE PEDESTAL
CATCH BASIN	FIRE HYDRANT	MAILBOX	FENCE	PINE TREE	INTERMEDIATE CONTOUR	ROTATING BEACON
						WIND SOCK



LEGEND

R/W = Right-of-way
I.P.S. = #4 Rebar Set
= Not to scale
I.P. = Iron Pipe
= Utility Pole
D.B. = Deed Book
Pg. = Page
E.O.P = Edge of Pavement
= Sanitary Sewer Manhole
= Fire Hydrant
= Water Valve

LINE TABLE

LINE	LENGTH	BEARING
L1	82.58	S70°17'40"W
L2	125.20	S70°16'53"W
L3	120.77	S01°50'53"W
L4	99.08	N75°48'30"W
L5	127.19	S66°50'57"W
L6	104.40	S46°59'42"W
L7	155.68	S29°30'11"W
L8	156.63	S88°57'47"W
L9	72.11	S09°55'53"W
L10	112.16	S25°00'16"W
L11	89.83	N58°34'44"W
L12	104.07	S77°55'10"W
L13	128.16	N55°08'41"W
L14	160.15	N46°00'01"W
L15	95.59	S88°30'35"W
L16	87.66	N45°46'13"W
L17	114.69	S73°24'16"W
L18	87.05	S11°10'12"E
L19	106.40	N62°13'03"W
L20	152.16	S83°26'30"W
L21	85.70	S32°29'39"W
L22	163.19	N56°55'23"W
L23	169.59	N19°08'52"W
L24	183.82	N69°25'11"W
L25	200.94	N26°24'02"E
L26	48.00	N72°09'18"W
L27	147.17	N20°34'16"E
L28	104.71	N10°40'42"W
L29	156.29	N31°09'43"E
L30	158.77	N05°00'57"E
L31	79.86	N00°00'00"E
L32	155.84	N90°00'00"W
L33	106.02	S80°04'02"E
L34 Tie	20.06	N89°46'10"W
L35 Tie	21.83	S64°33'24"E
L37	2.69	N77°59'05"W

CURVE TABLE

CURVE	LENGTH	RADIUS	BEARING	CHORD
C1	70.39	1115.76	N62°21'44"E	70.38

Notes:

1) This property may be subject to any easements and/or Rights-of-way of record.

2) Boundary information based on Deed Book 3850 at Page 359 as recorded in the Wake County Register of Deeds.

3) This survey is of an existing parcel or parcels of land.

4) No N.C.G.S. or U.S.G.S. Monuments could be located within 2000'.

5) Proposed Western Wake Expressway Road Corridor location is as shown is based on wooded stakes located in the field, at points A , B , & C

6) Points not labeled found or set are computed points only

7) Interior creeks & streams not located.

8) Areas labeled denise foliage may not meet accuracy standards.

9) Aerial topographical survey prepared by Aero-Dynamics, Corp using photogrammetic methods of aerial photography dated: December 1, 2001. Ground control by Patterson, Brewer and Associates, PA.

NO.	DATE	DESCRIPTION	BY
2	7/10/02	ADDED NOTES	TPD
1	1/16/02	ADDED TOPO	JHP

JUL 2002 Received Solid Wst. Sect.

GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)
1 inch = 200 ft.

PATTERSON BREWER & Associates
Engineering * Surveying * Planning
7355-D W. Friendly Avenue, Greensboro, NC 27410
(336) 294-8322 * Fax (336) 294-8323

JOB NAME:
Property Survey
For
Highway 55 C & D Landfill, LLC.
Holly Springs Township, Wake County, N.C.

LOCATION: Tax Map 740-02-55-8687
Holly Springs Township, Wake County, N.C.

DRAWN BY: LDS
CHECKED BY:
SCALE: 1" = 200'

OWNERS:
HWY 55 C&D LANDFILL, LLC
19109-118 WEST CATAWBA AVENUE
CORNELIUS, NC 28031-5613

DATE OF FIELD SURVEY: 9-22-01
DATE OF MAP: 10-01-01
JOB NUMBER M01117
FIGURE 2

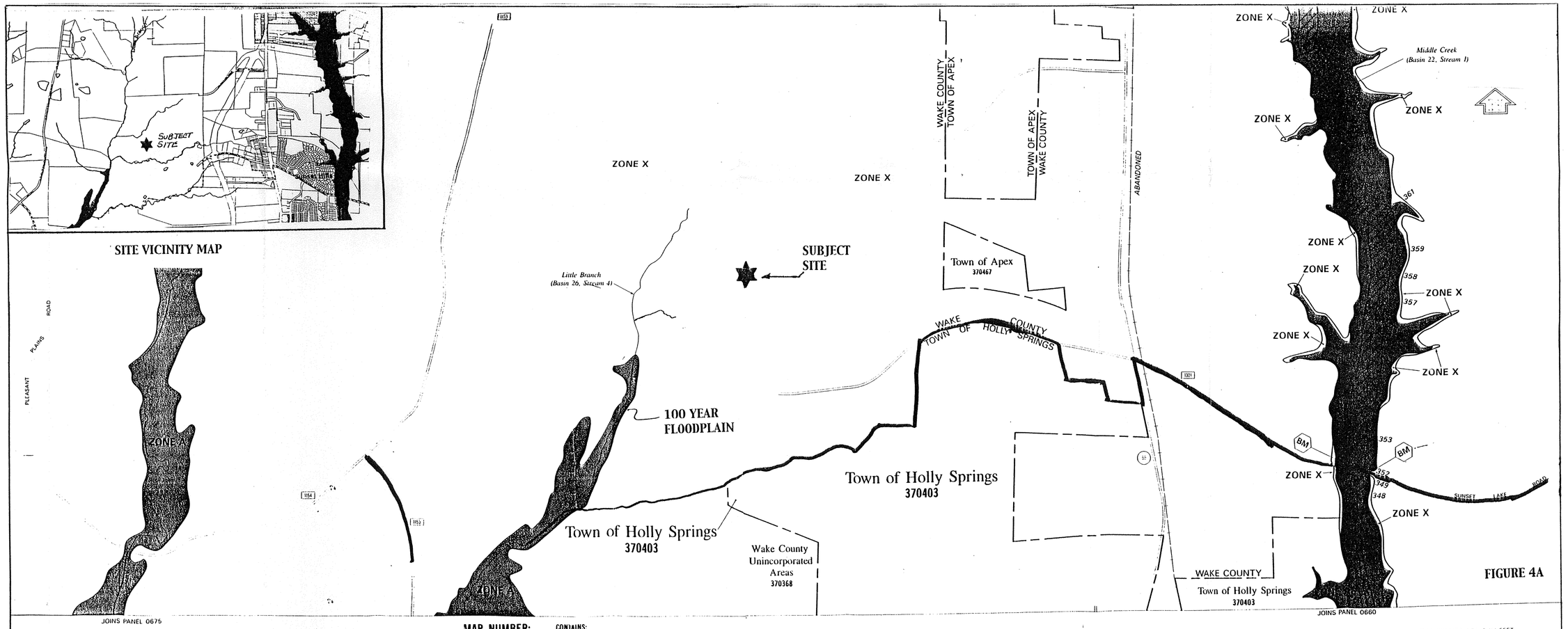


FIGURE 4A

FIRM
FLOOD INSURANCE RATE MAP

WAKE COUNTY,
NORTH CAROLINA AND
INCORPORATED AREAS

PANEL 490 OF 810

MAP NUMBER:
37183C0490 E

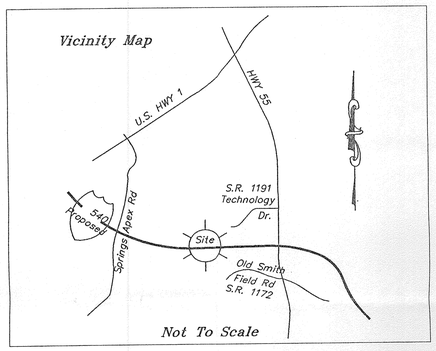
EFFECTIVE DATE:
MARCH 3, 1992

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
APEX, TOWN OF	370467	0490	E
HOLLY SPRINGS, TOWN OF	370403	0490	E
UNINCORPORATED AREAS	370368	0490	E

PANEL 495 OF 810

JUL 2002
Received
Solid Waste
Sect.

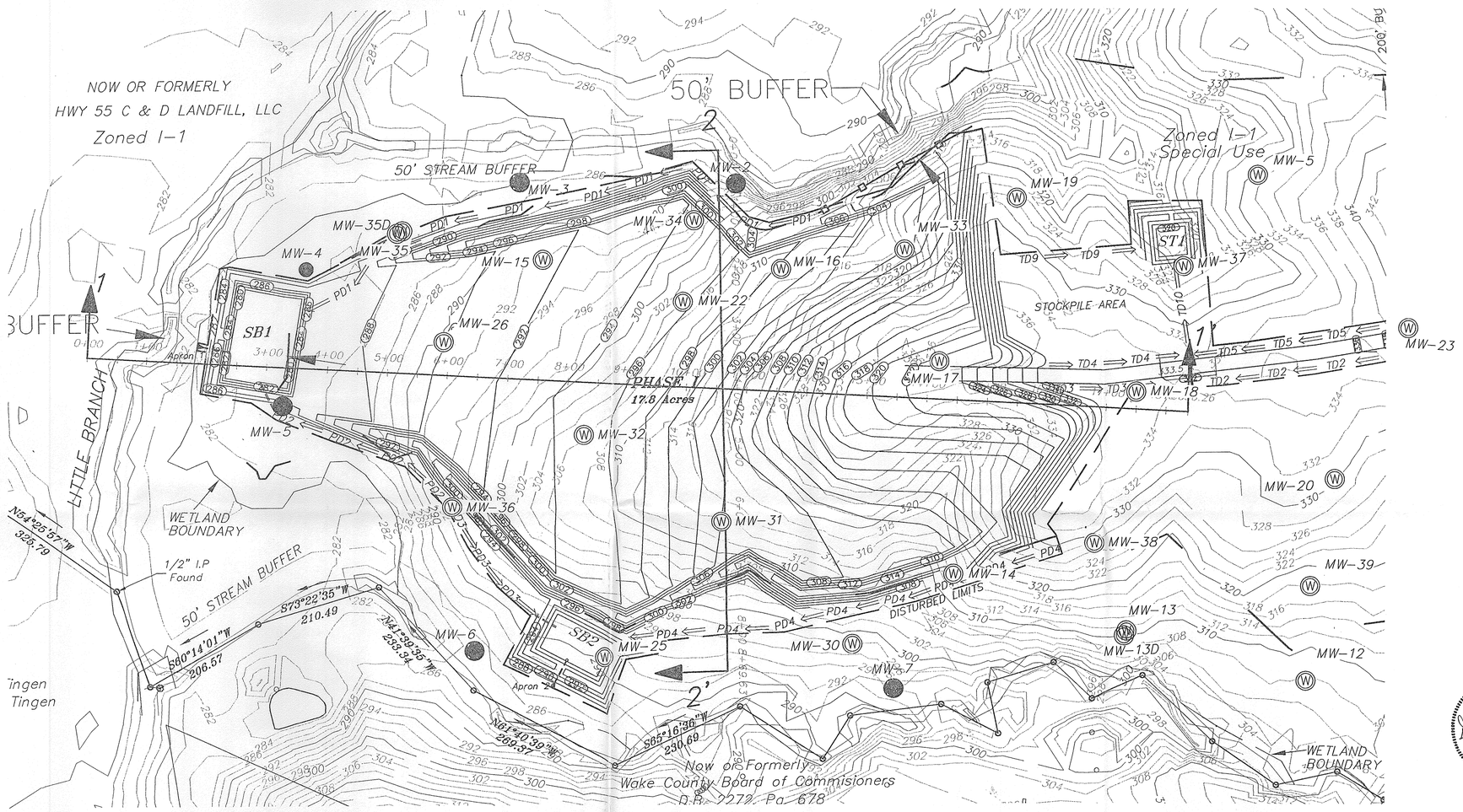


GENERAL CONSTRUCTION NOTES:

1. ALL EARTH FILL TO BE COMPACTED TO MINIMUM 95% OF STANDARD PROCTOR MAXIMUM DRY DENSITY.
2. CONTRACTOR SHALL WORK WITH CAUTION DURING EARTHWORK ACTIVITIES NEAR EXISTING UTILITIES. CONTRACTOR IS RESPONSIBLE FOR CONTACTING APPROPRIATE AGENCY FOR FIELD LOCATIONS OF ALL UNDERGROUND UTILITIES BEFORE STARTING CONSTRUCTION.

NOTE:

THE PARCEL IS NOT LOCATED IN THE 100-YEAR FLOODWAY OR FLOODWAY FRINGE. (REFERENCE USACOE/FEMA RESTUDY WORKSHEETS (NUMBERS 296, 297, 317 & 318) AND FEMA FIRM PANELS (NUMBERS 0490, 0495, 0675 & 0660).



PROPOSED CONSTRUCTION AND DEMOLITION LANDFILL SITE
USEABLE ACRES 42.9
TOTAL ACRES 88.6

Legend

- = Wetland Boundary
- = 50' Stream Buffer
- = Total Landfill Boundary
- = Usable Landfill Boundary
- = Drainage Area
- 318 = Existing Grade Contour
- 320 = Proposed Subgrade Contour
- = Stream
- ST = Sediment Trap
- SB = Sediment Basin
- = Siltfence
- A1 = Apron
- PD ⟹ = Permenant Ditch
- TD ⟹ = Temporary Ditch

NORTH CAROLINA PROFESSIONAL SEAL 17582 ENGINEER DAN E. BREWER
5/6/02

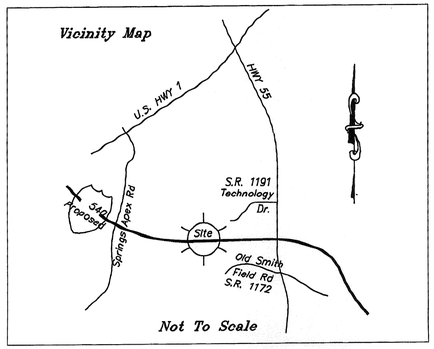
GRAPHIC SCALE

100 0 50 100 200 400

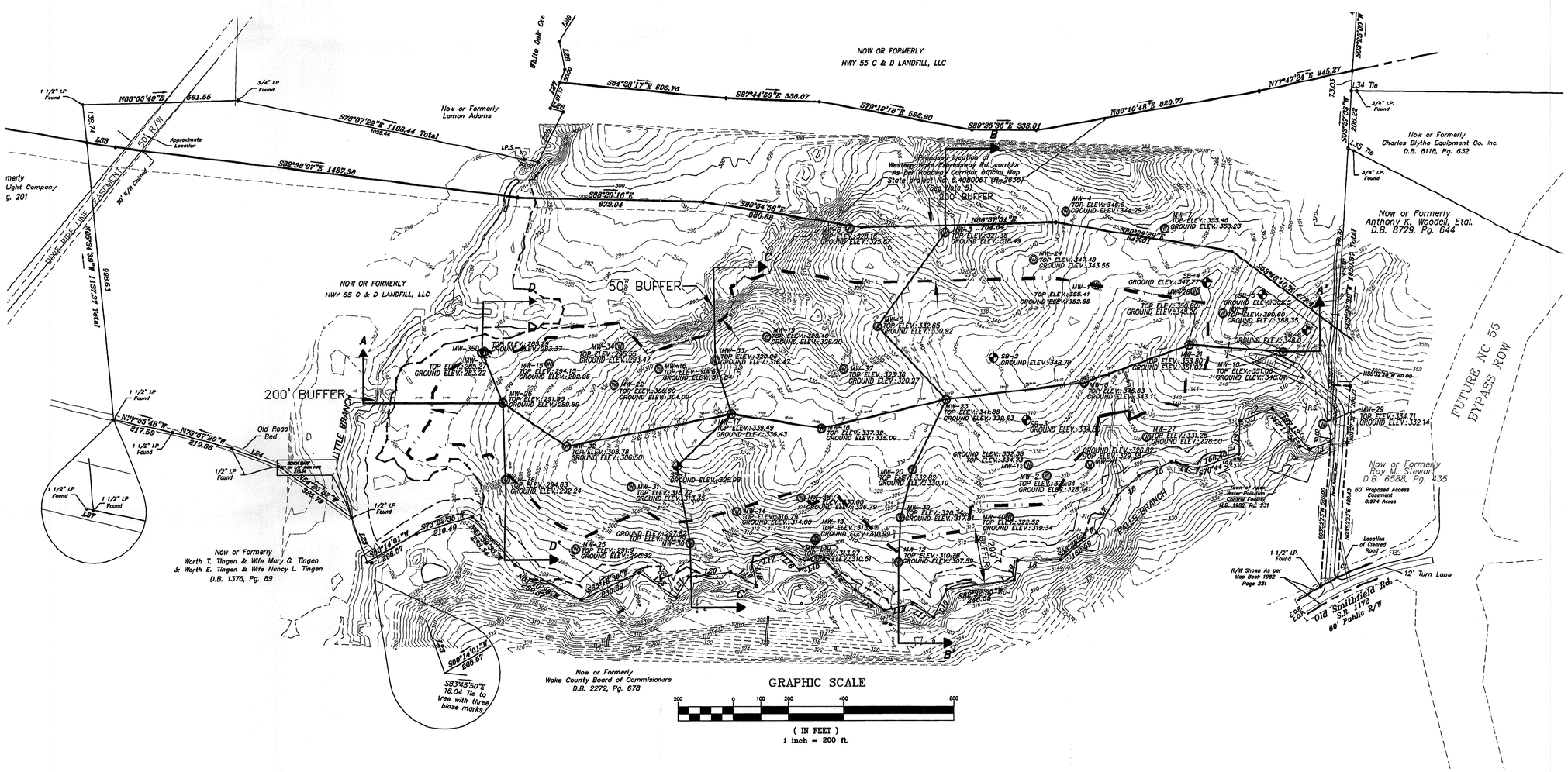
(IN FEET)
1 inch = 100 ft.

PATTERSON BREWER & Associates
Engineering * Surveying * Planning
Post Office Box 1387 * Mooresville, NC 28115
704/662-0100 * Fax 704/662-0101

JOB NAME: HWY 55 C&D LANDFILL AND RECYCLING CENTER PHASE I GRADING PLAN		
LOCATION: WAKE COUNTY, NC	DRAWN BY: TPD	CHECKED BY: DEB
	SCALE: 1" = 100'	
OWNERS: HWY 55 C & D LANDFILL, LLC 19109-118 WEST CATAWBA AVENUE CORNELIUS, NC 28031-5613	DATE OF FIELD SURVEY: 1/1/00	
	DATE OF MAP: 1/1/00	
	JOB NUMBER M01117	SHEET NUMBER C 3



BENCHMARK	POWER POLE	WM	WATER MAIN	RAILROAD SIGNAL	TREE LINE	PAINTED LINE	DEPRESSION INT. CONTOUR
TRAVERSE POINT	POWER POLE W/ LIGHT	WV	WATER VALVE	RETAINING WALL	SMALL TREE	TRAILS (TO SCALE)	SIGN
2426.26 FIELD ELEVATION	LIGHT POLE	GM	GAS METER	WATER LINE	LARGE TREE	PAVED ROADS (TO SCALE)	UNIDENTIFIED OBJECT
2426.3 PHOTOGRAMMETRIC ELEVATION	GUIDE WIRE	PM	PARKING METER	SEWER LINE	LARGE TREE W/ TRUNK	INDEX CONTOURS	TRAFFIC SIGNAL
PROPERTY CORNER	MANHOLE	FP	FLAG POLE	GAS LINE	BUSH	DEPRESSION INDEX CONTOUR	TELEPHONE PEDESTAL
CATCH BASIN	FIRE HYDRANT	MB	MAILBOX	FENCE	PINE TREE	INTERMEDIATE CONTOUR	ROTATING BEACON
						MONITORING WELL	WIND SOCK



PROPOSED CONSTRUCTION AND
DEMOLITION LANDFILL SITE
USEABLE ACRES 43.6
TOTAL ACRES 88.6

Legend

- MW-18 = Monitoring Well Location
- SB-3 = Soil Boring Location
- = Wetland Boundary
- = 50' Stream Buffer
- = Total Landfill Boundary
- = Usable Landfill Boundary

JUL 2002
Received

ENVIRO-PRO, P.C.
15101 REGENA LANE, CHARLOTTE, NC 28278
(704) 583-0075 * Fax (704) 583-2673

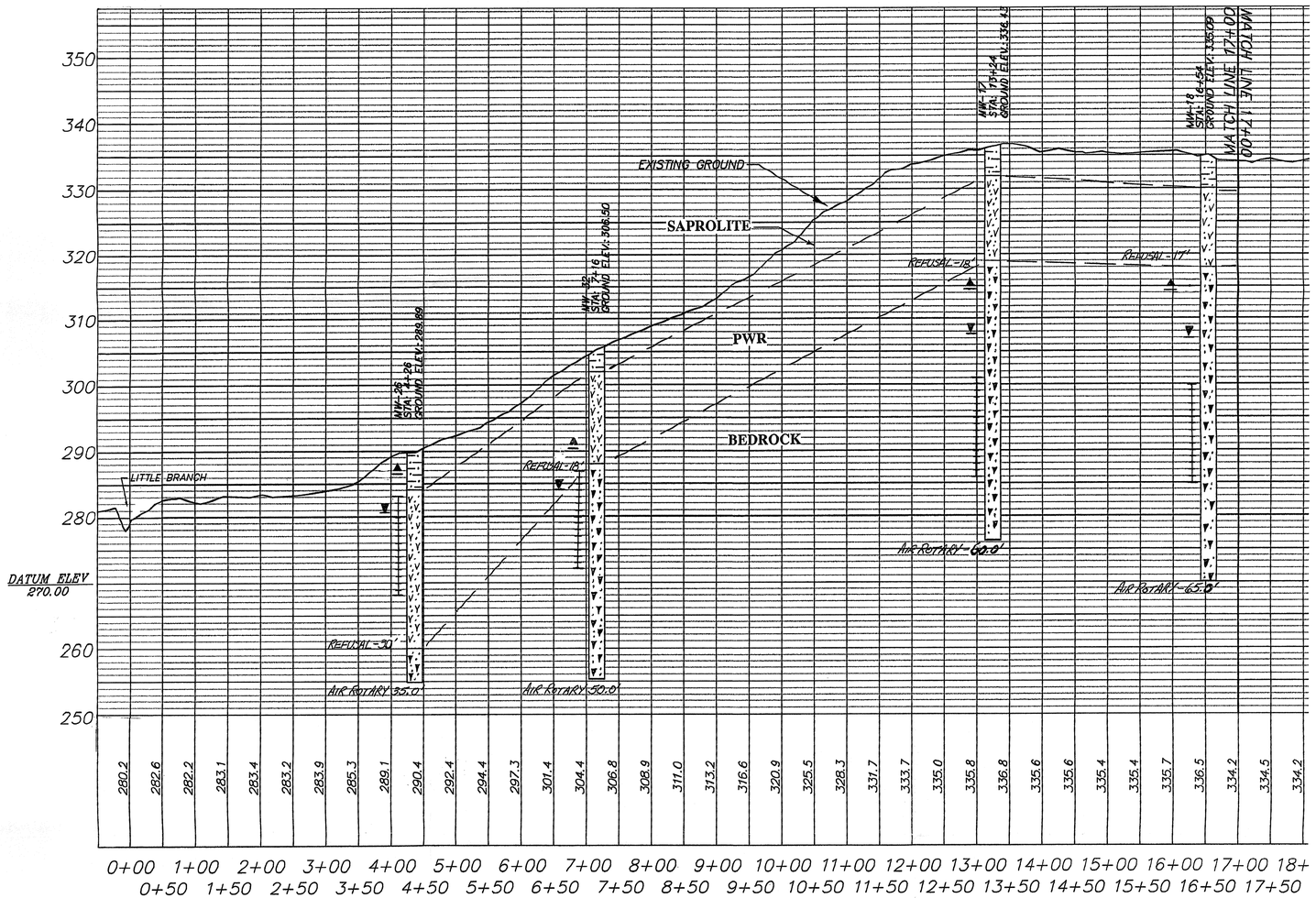
PATTERSON BREWER & Associates
Engineering * Surveying * Planning
Post Office Box 1387 * Mooresville, NC 28115
704/662-0100 * Fax 704/662-0101

JOB NAME:

HWY 55 C&D LANDFILL AND RECYCLING CENTER

HYDROGEOLOGIC CROSS-SECTION PROFILE MAP

LOCATION: WAKE COUNTY, NC	DRAWN BY: TPD / CHECKED BY: DEB
	SCALE: 1" = 200'
OWNERS: GRIFFIN BROTHERS COMPANIES, 19109 WEST CATAWBA COUNTY, CORNELIUS, NC 28031	DATE OF FIELD SURVEY: 1/1/00
	DATE OF MAP: 1/1/00
	JOB NUMBER: MO1117 / SHEET NUMBER: FIGURE 7



VERTICAL
GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

PROFILE A–A'
0+00 – 17+00

HORIZONTAL
GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

SEE FIGURE 7
HYDROGEOLOGIC CROSS–SECTION
PROFILE MAP

JUL 2002
Received

LITHOLOGY

- ▲ SEASONAL HIGH GROUNDWATER ELEVATION
- ▼ GROUNDWATER ELEVATION
- SCREEN INTERVAL
- CLAYEY SILT
- PARTIALLY WEATHERED ROCK (PWR) SAMPLED AS SLIGHTLY CLAYEY SANDY SILT WITH ROCK FRAGMENTS
- BEDROCK – FANGLOMERATE

ENVIRO–PRO, P.C.
15101 REGENA LANE, CHARLOTTE, NC 28278
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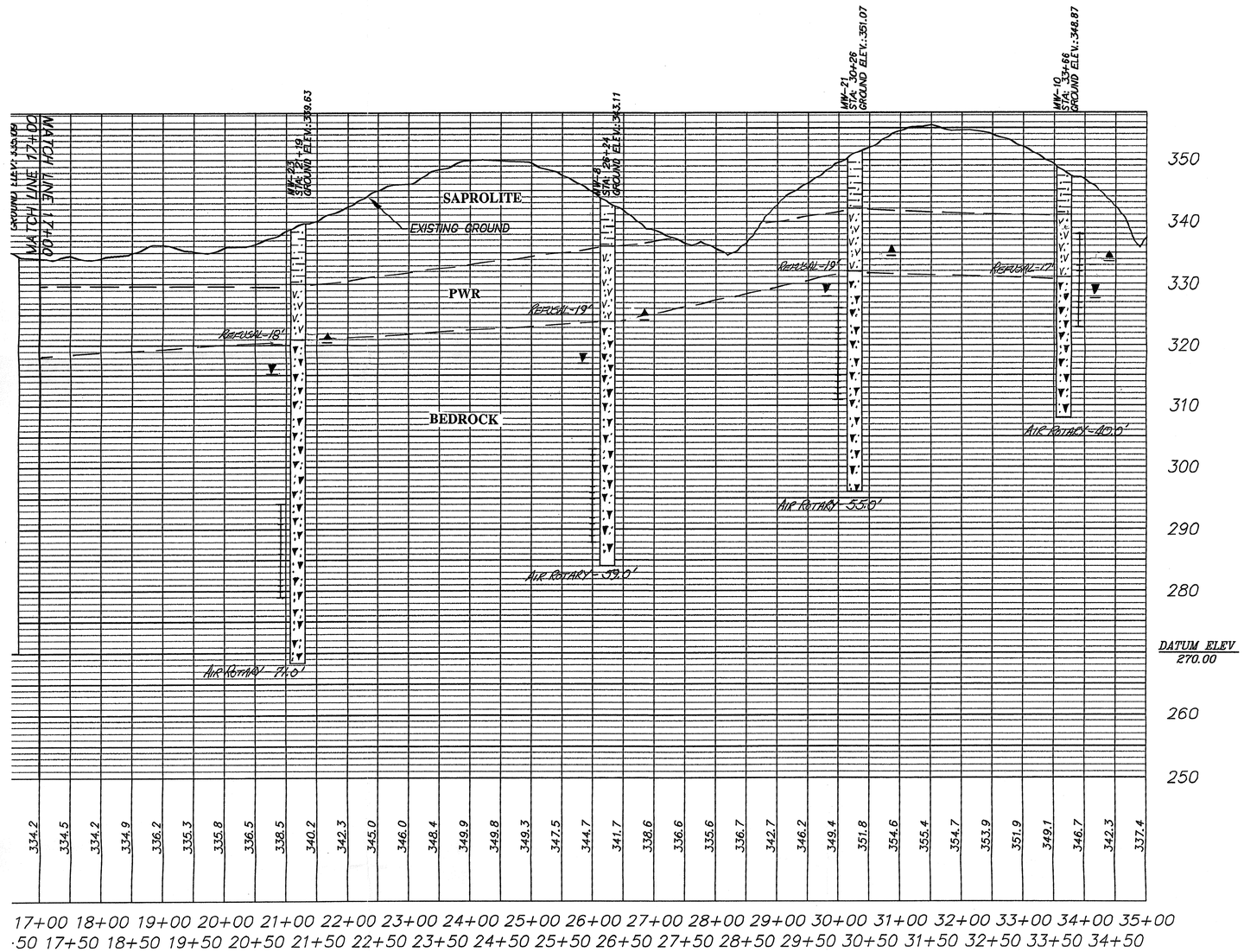
PATTERSON BREWER & Associates
Engineering * Surveying * Planning
Post Office Box 1387 * Mooresville, NC 28115
704/662–0100 * Fax 704/662–0101

JOB NAME:

HWY 55 C&D LANDFILL AND RECYCLING CENTER

HYDROGEOLOGIC CROSS–SECTION PROFILE A–A' (0+00–17+00)

LOCATION: WAKE COUNTY, NC	DRAWN BY: TPD	CHECKED BY: DEB
	SCALE: 1" = 100'	
OWNERS: GRIFFIN BROTHERS COMPANIES, 19109 WEST CATAWBA COUNTY, CORNELIUS, NC 28031	DATE OF FIELD SURVEY: 1/1/00	
	DATE OF MAP: 1/1/00	
	JOB NUMBER MO1117	SHEET NUMBER FIGURE 8



VERTICAL
GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

PROFILE A–A'
17+00 – 35+00

HORIZONTAL
GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

SEE FIGURE 7
HYDROGEOLOGIC CROSS–SECTION
PROFILE MAP

JUL 2002
Received

ENVIRO–PRO, P.C.
15101 REGENA LANE, CHARLOTTE, NC 28278
(704) 583–0075 * Fax (704) 583–2673

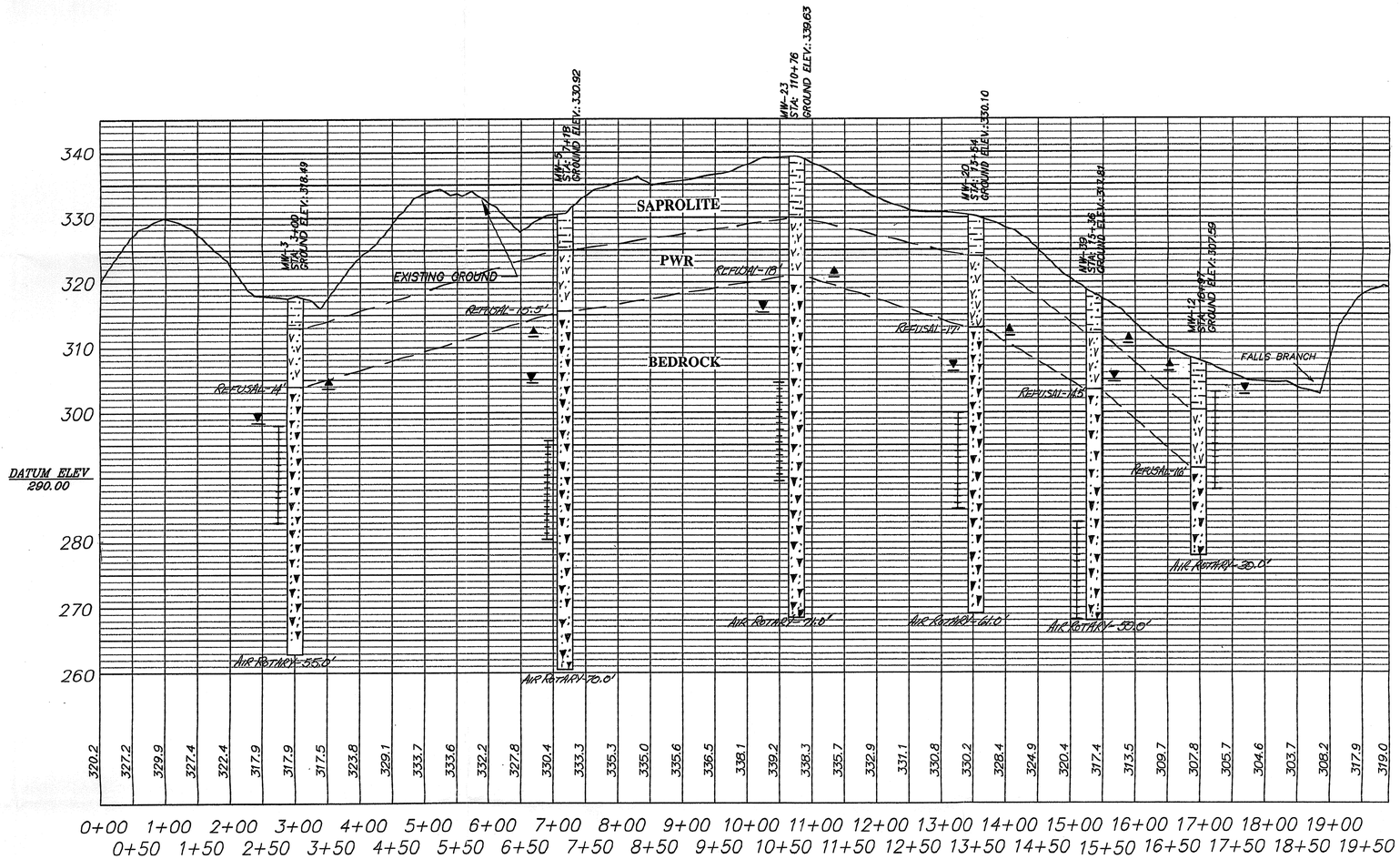
PATTERSON
BREWER
& Associates
Engineering * Surveying * Planning
Post Office Box 1387 * Mooresville, NC 28115
704/662–0100 * Fax 704/662–0101

JOB NAME:

HWY 55 C&D LANDFILL AND RECYCLING CENTER

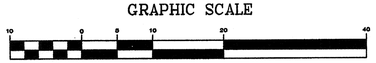
HYDROGEOLOGIC CROSS–SECTION PROFILE A–A' (17+00–35+00)

LOCATION: WAKE COUNTY, NC	DRAWN BY: TPD / CHECKED BY: DEB
	SCALE: 1" = 100'
OWNERS: GRIFFIN BROTHERS COMPANIES, 19109 WEST CATAWBA COUNTY, CORNELIUS, NC 28031	DATE OF FIELD SURVEY: 1/1/00
	DATE OF MAP: 1/1/00
	JOB NUMBER MO1117 / SHEET NUMBER FIGURE 8a



SEE FIGURE 7
HYDROGEOLOGIC CROSS-SECTION
PROFILE MAP

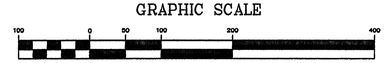
VERTICAL
GRAPHIC SCALE



(IN FEET)
1 inch = 10 ft.

0+00 – 19+50±

HORIZONTAL
GRAPHIC SCALE



(IN FEET)
1 inch = 100 ft.

LITHOLOGY

- SEASONAL HIGH GROUNDWATER ELEVATION
- GROUNDWATER ELEVATION
- SCREEN INTERVAL
- CLAYEY SILT
- PARTIALLY WEATHERED ROCK (PWR) SAMPLED AS SLIGHTLY CLAYEY SANDY SILT WITH ROCK FRAGMENTS
- BEDROCK – FANGLOMERATE

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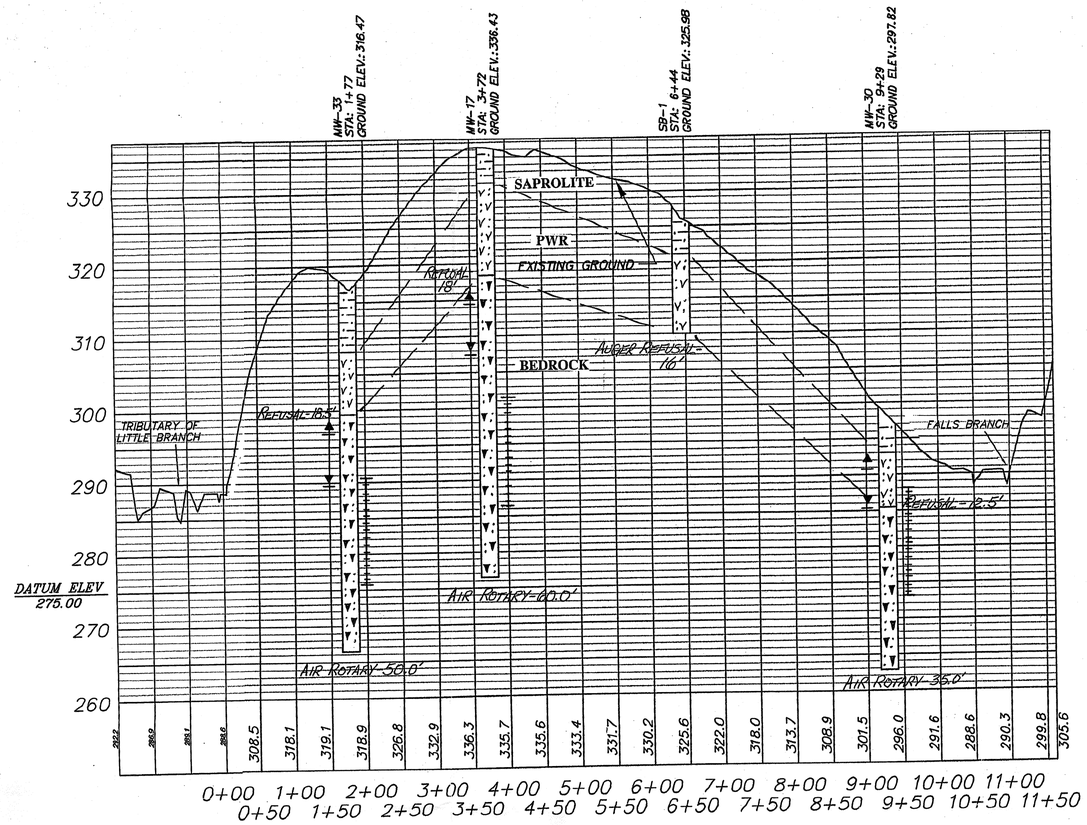
JOB NAME:

HWY 55 C&D LANDFILL AND RECYCLING CENTER

HYDROGEOLOGIC CROSS-SECTION PROFILE B-B'

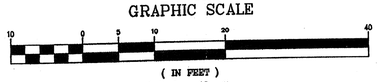
LOCATION: WAKE COUNTY, NC	DRAWN BY: TPD	CHECKED BY: DEB
	SCALE: 1" = 100'	
OWNERS: GRIFFIN BROTHERS COMPANIES 19109 WEST CATAWBA COUNTY CORNELIUS, NC 28031	DATE OF FIELD SURVEY: 1/1/00	
	DATE OF MAP: 1/1/00	
	JOB NUMBER MO1117	SHEET NUMBER FIGURE 8b



PROFILE C–C'

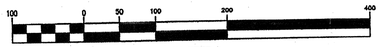
SEE FIGURE 7
HYDROGEOLOGIC CROSS–SECTION
PROFILE MAP

VERTICAL GRAPHIC SCALE



(IN FEET)
1 inch = 10 ft.

HORIZONTAL GRAPHIC SCALE



(IN FEET)
1 inch = 100 ft.

LITHOLOGY

- ▲ SEASONAL HIGH GROUNDWATER ELEVATION
- ▼ GROUNDWATER ELEVATION
- SCREEN INTERVAL
- CLAYEY SILT
- PARTIALLY WEATHERED ROCK (PWR) SAMPLED AS SLIGHTLY CLAYEY SANDY SILT WITH ROCK FRAGMENTS
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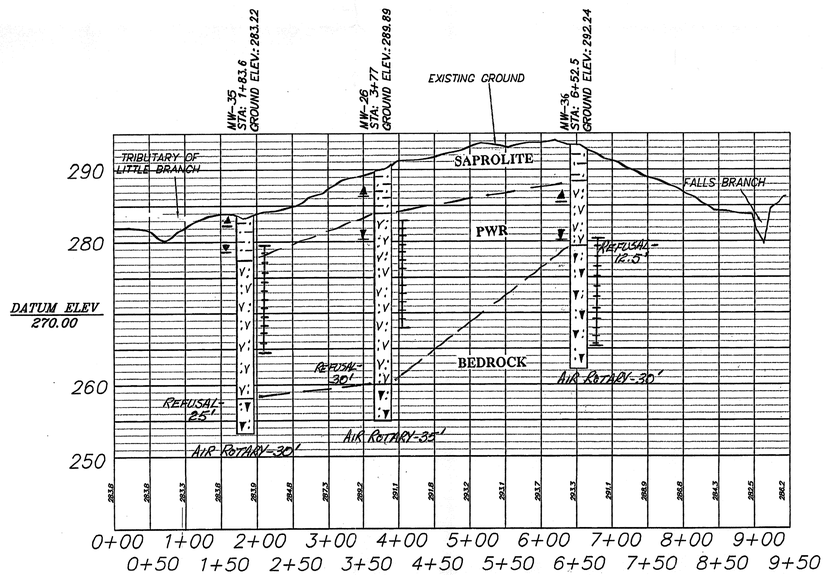
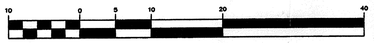
JOB NAME: HWY 55 C&D LANDFILL AND RECYCLING CENTER
HYDROGEOLOGIC CROSS–SECTION PROFILE C–C'

LOCATION: WAKE COUNTY, NC	DRAWN BY: TPD	CHECKED BY: DEB
	SCALE: 1" = 100'	
OWNERS: GRIFFIN BROTHERS COMPANIES 19109 WEST CATAWBA COUNTY CORNELIUS, NC 28031	DATE OF FIELD SURVEY: 1/1/00	
	DATE OF MAP: 1/1/00	
	JOB NUMBER MO1117	SHEET NUMBER FIGURE 8c



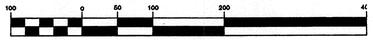
PROFILE D-D'

VERTICAL GRAPHIC SCALE



(IN FEET)
1 inch = 10 ft.

HORIZONTAL GRAPHIC SCALE



(IN FEET)
1 inch = 100 ft.

SEE FIGURE 7
HYDROGEOLOGIC CROSS-SECTION
PROFILE MAP

JUL 2002
Received

LITHOLOGY

- ▲ SEASONAL HIGH GROUNDWATER ELEVATION
- ▼ GROUNDWATER ELEVATION
- SCREEN INTERVAL
- CLAYEY SILT
- PARTIALLY WEATHERED ROCK (PWR) SAMPLED AS SLIGHTLY CLAYEY SANDY SILT WITH ROCK FRAGMENTS
- BEDROCK - FANGLOMERATE

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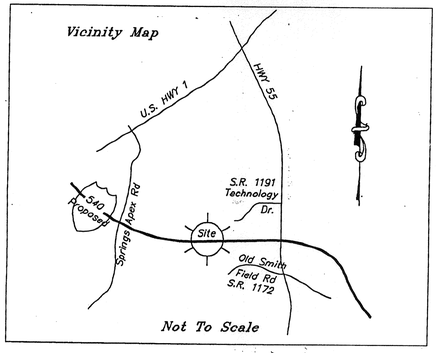
JOB NAME:

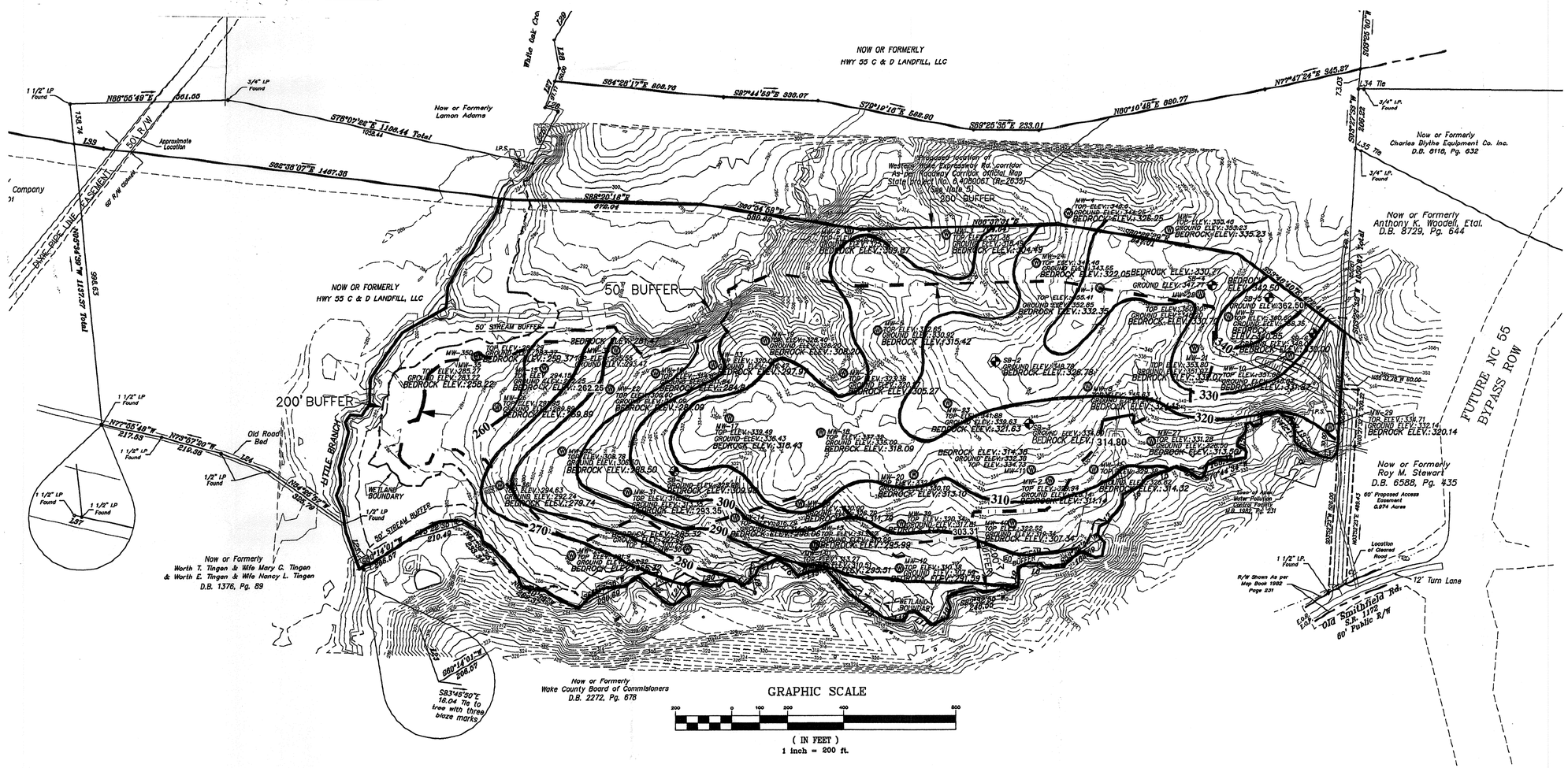
HWY 55 C&D LANDFILL AND RECYCLING CENTER

HYDROGEOLOGIC CROSS-SECTION PROFILE D-D'

LOCATION: WAKE COUNTY, NC	DRAWN BY: TPD / CHECKED BY: DEB
	SCALE: 1" = 100'
OWNERS: GRIFFIN BROTHERS COMPANIES, 19109 WEST CATAWBA COUNTY, CORNELIUS, NC 28031	DATE OF FIELD SURVEY: 1/1/00
	DATE OF MAP: 1/1/00
	JOB NUMBER M01117 / SHEET NUMBER FIGURE 8d



BENCHMARK	POWER POLE	WM	WATER MAIN	RAILROAD SIGNAL	TREE LINE	PAINTED LINE	DEPRESSION INT. CONTOUR
TRAVERSE POINT	POWER POLE W/ LIGHT	WV	WATER VALVE	RETAINING WALL	SMALL TREE	TRAILS (TO SCALE)	SIGN
2426.28 FIELD ELEVATION	LP LIGHT POLE	GM	GAS METER	WATER LINE	LARGE TREE	PAVED ROADS (TO SCALE)	UNIDENTIFIED OBJECT
2428.3 PHOTOGRAMMETRIC ELEVATION	GUIDE WIRE	PM	PARKING METER	SEWER LINE	LARGE TREE W/ TRUNK	INDEX CONTOURS	TRAFFIC SIGNAL
PROPERTY CORNER	MH MANHOLE	FP	FLAG POLE	GAS LINE	BUSH	DEPRESSION INDEX CONTOUR	TELEPHONE PEDESTAL
CATCH BASIN	FH FIRE HYDRANT	MB	MAILBOX	FENCE	PINE TREE	INTERMEDIATE CONTOUR	ROTATING BEACON
						MONITORING WELL	WIND SOCK



PROPOSED CONSTRUCTION AND
DEMOLITION LANDFILL SITE
USEABLE ACRES 42.9
TOTAL ACRES 88.6

Legend

- MW-18 = Monitoring Well Location
- SB-3 = Soil Boring Location
- = Wetland Boundary
- = 50' Stream Buffer
- = Total Landfill Boundary
- = Usable Landfill Boundary

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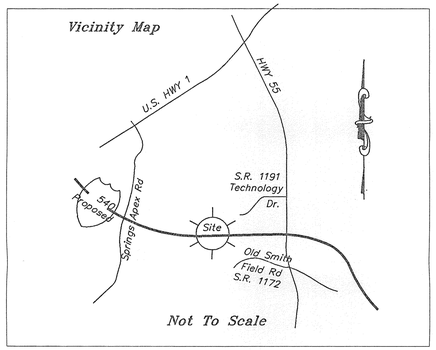
JOB NAME:

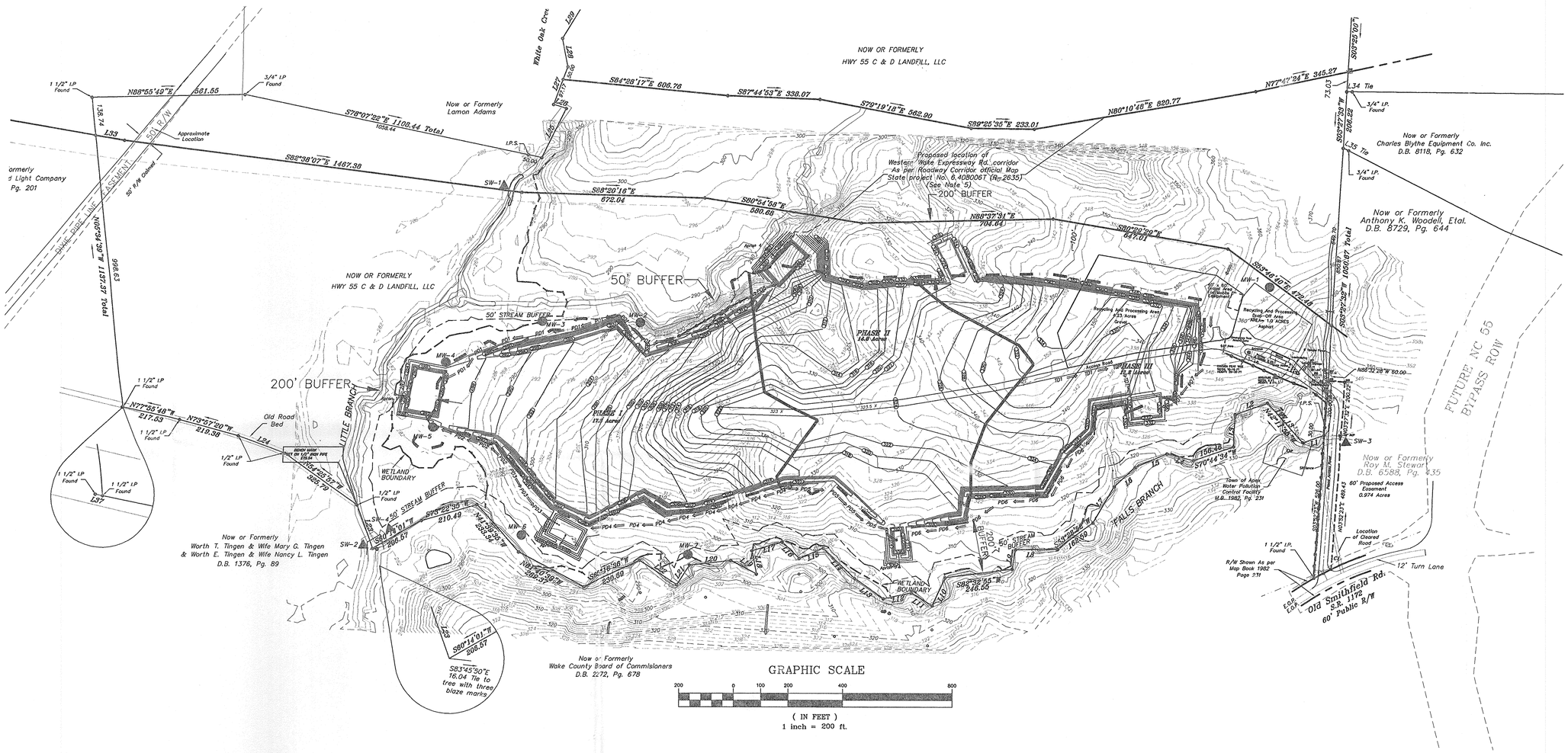
HWY 55 C&D LANDFILL AND RECYCLING CENTER

TOP OF BEDROCK CONTOUR MAP

LOCATION: WAKE COUNTY, NC	DRAWN BY: TPD	CHECKED BY: DEB
	SCALE: 1" = 200'	
OWNERS: HWY 55 C & D LANDFILL, LLC 19109-118 WEST CATAWBA AVENUE CORNELIUS, NC 28031-5613	DATE OF FIELD SURVEY: 1/1/00	
	DATE OF MAP: 1/1/00	
	JOB NUMBER M01117	SHEET NUMBER FIGURE 11



	BENCHMARK		POWER POLE	WM	WATER MAIN		RAILROAD SIGNAL		TREE LINE		PAINTED LINE		DEPRESSION INT. CONTOUR
	TRAVERSE POINT		POWER POLE W/ LIGHT	WV	WATER VALVE		RETAINING WALL		SMALL TREE		TRAILS (TO SCALE)		SIGN
× 2426.26	FIELD ELEVATION	LP	LIGHT POLE	GM	GAS METER		WATER LINE		LARGE TREE		PAVED ROADS (TO SCALE)		UNIDENTIFIED OBJECT
x 2426.3	PHOTOGRAMMETRIC ELEVATION		GUIDE WIRE	PM	PARKING METER		SEWER LINE		LARGE TREE W/ TRUNK		INDEX CONTOURS		TRAFFIC SIGNAL
	PROPERTY CORNER	MH	MANHOLE	FP	FLAG POLE		GAS LINE		BUSH		DEPRESSION INDEX CONTOUR		TELEPHONE PEDESTAL
	CATCH BASIN	FH	FIRE HYDRANT	MB	MAILBOX		FENCE		PINE TREE		INTERMEDIATE CONTOUR		ROTATING BEACON
											MONITORING WELL		WIND SOCK



PROPOSED CONSTRUCTION AND
DEMOLITION LANDFILL SITE
USEABLE ACRES 43.6
TOTAL ACRES 88.6

Legend

- MW-18 = Monitoring Well Location
- SB-3 = Soil Boring Location
- = Wetland Boundary
- = 50' Stream Buffer
- = Total Landfill Boundary
- = Usable Landfill Boundary
- MW-1 = Proposed Monitoring Well Location
- SW-1 = Proposed Surface Water Well Location

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JOB NAME:

HWY 55 C&D LANDFILL AND RECYCLING CENTER

WATER QUALITY MONITORING MAP

LOCATION: WAKE COUNTY, NC	DRAWN BY: TPD / CHECKED BY: DEB
	SCALE: 1" = 200'
OWNERS: GRIFFIN BROTHERS COMPANIES, 19109 WEST CATAWBA COUNTY, CORNELIUS, NC 28031	DATE OF FIELD SURVEY: 1/1/00
	DATE OF MAP: 1/1/00
	JOB NUMBER: M01117 / SHEET NUMBER: FIGURE 12