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January 14, 2004

HAI #99.0331.007
Phase 5
File 12.0

Via Hand Delivery

Ms. Susan Pelz, P.E.
Florida Department of Environmental Protection
Southwest District
3804 Coconut Palm Drive
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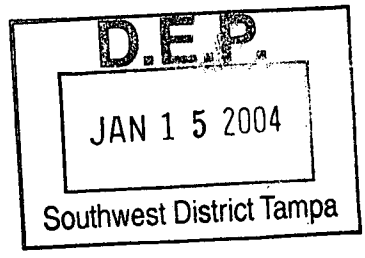


Subject: **Cell 1 and Landfill Site Certification Addendum 2 and Responses to Department Certification Comments**
Enterprise Recycling & Disposal Facility
Angelo's Aggregate Materials, Ltd.
FDEP Permit Nos. 177982-001-SC, 177982-002-SO
Pasco County, Florida

Dear Ms. Pelz:

On behalf of Angelo's Aggregate Materials, Ltd. (Angelo's), Hartman & Associates, Inc. (HAI) is submitting responses to the Department's comments, dated December 8, 2003, regarding the certification submittals for the above referenced facility. Our responses are based on the discussion from our meeting with the Department on January 5, 2004. For your convenience, your comments are stated first with our responses, when applicable, following.

Comments from Kim Ford's Letter:

1) **Document entitled Cell 1 Certification dated October 8, 2003:**

a) **The cover letter page 1 -** HAI states that "the attached document indicates that Cell 1 has a continuous confining layer, at least 36-inches thick, with a permeability value no greater than 1x10-6cm/sec, and is prepared to accept waste". *[The Department has not reached this same conclusion at this time as described below. This comment does not require a response.]*

b) **The cover letter page 2 -** HAI states that "The confining unit may be at the cell base, under the cell base, or a combination of both, as long as it is at least 36-inches thick and continuous with a maximum permeability of 1x10-6cm/sec". *[The Department agrees that this is the approved design criteria.]* HAI states that "All borings used to verify the confining unit are shown on Figure 1 in Appendix A." *[Figure 1 in Appendix A was resubmitted as part of the addendum. Confirmation that Figure 1 (for both documents) includes the locations for all borings and all failing test locations should be provided.]*

Response: Figure 1 has been revised to include all borings and failing test locations, and is attached in Appendix A.

c) **The cover letter page 3 -** HAI states that "Based on this correlation, a sample with at least 31% passing the #200 sieve was considered acceptable as confining material." *[Related comments (memorandum dated December 4, 2003, by Mr. John Morris) are provided as an attachment to this letter.]* HAI states that "The Confining Layer Contour Map for Cell 1 (Figure 38) is in Appendix C." *[Figure 38 in Appendix C was resubmitted as part of the addendum. Confirmation that Figure 38 (for both documents) includes the locations for all borings and all failing test locations should be provided.]*

Response: The purpose of Figure 38 is to show the continuity of confining material throughout Cell 1 and part of Cell 15 in the areas it was proven to exist. We believe that including the requested information creates unnecessary clutter on the map and is not needed since previous submittals provide evidence that these areas were over-excavated and properly patched. The revised Figure 38 is attached in Appendix B.

d) **The cover letter page 4 -** HAI states that a benchmark is installed in a cell corner post. *[A description of the benchmark should be provided with its elevation (NGVD).]*

Response: The benchmark is included on Figure 1 with its elevation (NGVD). The benchmark is a PVC pipe in the southeast corner of Cell 1. The benchmark elevation and ground elevation are provided on Figure 1.

e) **The cover letter page 5 -** *[no comments]*

f) **The cover letter page 6 -** HAI states that "As shown on the Confining Layer Contour Map for the temporary pond area, the continuous confining unit extends from the north end of Cell 1 through Cell 16. This map is provided as Figure 39 in Appendix C. Therefore, no additional quality assurance testing or construction will be required for certification of the confining unit in Cell 15 and in Cell 16." *[The Department has not*

reached this same conclusion at this time. This comment does not require a response. Related comments are provided in item 1)m) of this letter.]

g) **The cover letter page 7 -** HAI states that a stormwater permit modification is currently under review for changes, and a copy the approval for the construction will be provided. *[A stormwater permit must be issued prior to acceptance of waste. This may be resolved as a condition of approval for Cell 1. This comment does not require a response.]*

Response: A stormwater permit was issued for this facility in February 2001. A modification to this permit is pending and is expected by February 16, 2004. The stormwater management system, as modified, has been constructed. The system will be certified, based on the as-built survey provided by Foresight Surveyors, once the modification is issued. Since the system is constructed, and essentially approved by the FDEP, Angelo's requests approval for operation prior to the issuance of the modification to the permit.

h) **The cover letter page 8 -** HAI states that Pond 2 may need to be redesigned and Appendix D includes revised entrance plan details. *[Record drawings should be provided to show all changes. This may be resolved as a condition of approval for Cell 1. This comment does not require a response.]*

i) **Certification of Construction Completion (DEP Form #62-701.900(2)) -** *[This form includes the certification for all of Cells 1, 15, and 16. A new certification (on DEP Form #62-701.900(2) as a replacement) should be provided to include only those areas that have been completely excavated and confirmed to have the specified clay layer/confining unit.]*

Response: A replacement certification form (DEP Form #62-701.900(2)) is attached in Appendix C.

j) **Summary of Deviations (attached to certification form) -** HAI states: the as-built survey for Cell 1 is provided in Appendix D and that Cell 1 was not entirely excavated *[The as-built topographic survey by Foresight shows that only parts of Cells 1, 15, 16 have been excavated. Related comments are provided in item 1)p) of this letter.],* swales were not constructed to drain Cell 1 or the west slope to the temporary pond, a berm was constructed with an open channel *[Related comments are provided in item 2)d) of this letter.];* the side slopes of Cell 1 were not constructed as designed and the north-central boundary of Cell 1 was over-excavated *[The "north-central boundary of Cell 1" appears to be adjacent to Cell 15 and would require no redesign. Clarification should be provided.]*; Pond 1 was modified, the location of the entrance, scalehouse, scales, and

maintenance area have changed. *[Record drawings should be provided to show all changes from the approved plans.]*

Response: HAI acknowledges that the stormwater conveyance located in the west of Cell 1 is a berm and open channel, rather than a swale as previously stated. This change will not affect the operation of the conveyance. The above statement regarding over-excavation of the Cell 1 side slope should reference the north and central portions of the eastern cell boundary. Therefore, Pond 2 will be redesigned after operation begins, as agreed between HAI and the Department. Record drawings have been prepared and are attached along with the as-built survey information in Appendix D.

k) **Appendix A, Figure 1 (map of borings) -** *[There are very few borings shown on this figure that include the boundaries of the cells, and there are no borings located on any the part of the selected cross-sections shown on this figure that include the boundaries of any of the cells. Only those areas that have been completely excavated and confirmed to have the specified clay layer/confining unit should be certified. All cross-sections must include borings shown for the certified area in order to include the entire certified waste disposal area for approval. All borings that represent the lithology in the vicinity of each cross-section, and the lithology for each of the detection well locations in the vicinity of the cross-section, should be included on the selected cross-section to show the continuity of the clay layer/confining unit. The degree of accuracy (for example: +/- 20 feet) must be provided for the boring locations. Related comments are provided in items 1)l), 1)m), and 1)n) of this letter.]*

Response: Figure 1 has been revised to include a line connecting the cell markers that indicate the areas to be certified at this time. Any changes to the cross-sections that were necessary to intersect this line have been made. The revised cross-sections are attached in Appendix A. A note referencing the signed and sealed survey sheets, provided by Foresight Surveyors, for the boring locations has been added to the Figure 1.

l) **Appendix B (soil test results, tables of values, and correlation) -** *[All borings must have an elevation (referred to the NGVD, rather than "MSL" referred to for the "AS" borings) at surface to be useful, especially for the shallower borings at surface. All other elevations below surface should be calculated from the surface elevation minus the depth. ("The elevations that are normally used in topographic mapping, geodetic surveys, engineering studies, and engineering construction surveys are referred to the NGVD. The NGVD should not be confused with local mean sea level datums." - from textbook entitled Surveying, by Davis, Foote, Anderson, and Mikhail.) The tables of values for the borings should provide the date of each boring, elevation (NGVD) at surface, elevation (NGVD) at the top of the clay layer/confining unit (that may be at the cell base/floor,*

under the cell base/floor, or a combination of both, as long as it is at least 36-inches thick and continuous with a maximum permeability of 1x10-6cm/sec), clay layer/confining unit thickness, elevation (NGVD) for each sieve sample, % passing the #200 sieve, elevation (NGVD) for each permeability sample, and permeability test results in cm/sec. A separate table for each type of boring (such as for "B", "AS", "SSA", "ST", etc.), with each boring listed sequentially by the boring #, would be very helpful. The actual elevations (NGVD) at surface at the time of each boring must be provided. Related comments are provided in items 1)k), 1)m), and 1)n) of this letter.]

Response: The boring logs have been revised to reference the surface elevations as NGVD, rather than MSL, and to include the surface elevations as provided by Foresight Surveyors. The detailed tables requested for the borings have been developed and include the name of each boring location, date, elevation of the boring, elevation of the top of the confining material, thickness of the confining material, elevations for any sieve samples and corresponding results, elevations for any permeability samples and corresponding results. Separate tables are provided for: standard penetration test (SPT) borings, bucket auger (AS) borings, and solid stem auger (SSA) borings. The logs and tables are attached in Appendix E.

m) **Appendix C, clay layer/confining unit contour maps:** *A topographic survey provided or referenced for the at surface elevations for each boring (at the time of each boring) would be very helpful. The actual elevations (NGVD) at surface at the time for each boring are essential to the success of this certification and should be provided either on the topographic survey or listed separately. In either case, the list and the survey must be signed, dated, and sealed by a registered professional surveyor and mapper (F.S. 472.003(2)). For the clay layer/confining unit contour maps, a registered professional geologist may interpret the topographic survey/data and prepare the Figures 38 and 39, however, the professional surveyor must either cosign, date, and seal the figures or the referenced topographic survey/data (FAC 61G16-2.005, FS 492.102(7), F.S. 472.003(2)). Each figure should reference the topographic survey/data. With the topographic survey/data, the professional surveyor should provide the horizontal degree of accuracy (for example: +/- 20 feet) for the boring locations and the degree of accuracy (for example: +/- 6 inches) vertically for the elevations (NGVD) at surface at the time of each boring. The clay layer/confining unit contour maps show the clay layer/confining unit beyond the last boring along the cell boundaries and must be revised to limit the contours to the areas where supporting data is available. Related comments are provided in items 1)k), 1)l), and 1)n) of this letter.]*

Response: As discussed via e-mail with the Department and during the January 5 meeting, it is not appropriate for the surveyor to co-sign HAI's maps. In order to resolve this comment, it was agreed that HAI would add any necessary notes to the figures referencing the signed and

sealed survey documents. In addition, HAI is requesting that Foresight Surveyors add the boring elevations and degree of accuracy to the as-built survey. The confining unit contour maps are generated by a computer model using site-specific geologic data obtained from the site. This results in extrapolation of some of the contours beyond the limits of the area to be certified. It was agreed in the January 5 meeting that the extrapolated contours would be appropriately indicated, and that a line connecting the cell markers would be added to confirm the certified area has the required confining material.

At the request of the Department, HAI is providing copies of the input parameters for the computer model used to develop the confining unit maps. This data is attached in Appendix B.

> **Figure 38 (Cell 1 clay layer/confining unit contour map)** - *[This figure/map is based on a topographic survey (with both horizontal and vertical control) and is intended to show both the Cell 1 clay layer/confining unit contours and the locations of specific features (borings, the limits of the excavated cells, and test pits/excavated areas). This figure/map shows that portions of the top of the clay layer/confining unit is at elevation +85 (3 feet above the surface) and higher, the cells (sideslopes) are not completely excavated, and no corner posts are shown for the limits of waste disposal. Boring B-18 is missing from this drawing. All borings must be shown on all top of clay layer/confining unit contour maps, or a specific reason provided for each excluded boring. This figure shows the excavated area for "AS-10" to be extremely small in comparison to the size of other excavated areas, and the location of boring "AS-42" is not shown within the excavated area. Additional borings should be provided in the vicinity of these two areas to confirm the presence of the clay layer/confining unit. The corner posts appear to be located at the cell boundaries and in areas along the toe of slope that have not been confirmed to have the specified clay layer/confining unit. The certified area should be provided on one drawing (drawn to scale) and limited to the area completely excavated and prepared for waste disposal, and the limits of waste disposal/certified area must be marked by corner posts. The scale of 1"=100' appears to be incorrect and must be corrected. This drawing must be corrected prior to the approval for Cell 1. A scale of 1"=60' is suggested, the same as for the cross-sections. Related comments are provided in items 1)k), 1)l), and 1)n) of this letter.]*

Response: Figure 38 has been revised as discussed during the January 5 meeting to demonstrate the presence of the required confining material within the designated area to be certified. The limits of certification are included in this figure as a dashed line in Cells 1 and 15. The excavated area for "AS-10" was excavated to the extent that confining unit material was identified on each wall and suitable as tie-in material. The location for "AS-42" was confirmed to be within the excavation area. The contractor surveyed many of the excavation areas as simple geometric shapes to facilitate the excavation volume calculations. The scale of 1"=100'

has been replaced with a scale of 1"=80'. The scale used for this figure was chosen to display the area of interest in a standard 11" x 17" format

> **Figure 39 (Cells 15 and 16 clay layer/confining unit contour map)** - *[This figure/map is based on a topographic survey (with both horizontal and vertical control) and is intended to show both the Cells 15 and 16 clay layer/confining unit contours and the locations of specific features (borings and the limits of the excavated cells). This figure/map shows that Cell 15 and Cell 16 are not completely excavated and there are no corner posts shown at the cell boundaries. The top of clay layer/confining unit contours dramatically change near the center of Cell 16, and the clay layer/confining unit thickness of at least 3 feet is not confirmed by an adequate number of borings. A top of the clay layer/confining unit drop of five feet between two borings spaced 100 feet apart is significant but acceptable when adequate thickness and permeability are confirmed. However, the top of the clay layer/confining unit drop of 30 feet in 100 feet (from B-33 to B-22) is dramatic and must be confirmed by additional borings and permeability tests. Therefore, the clay layer/confining unit thickness of 3 feet at the bottom of B-22 is of concern, and reasonable assurance of at least 3 feet of thickness must be provided by more closely spaced borings and/or greater than 3 feet of thickness. More continuity between borings allows for more widely spaced borings. Less continuity and dramatic changes requires more closely spaced borings. For areas with dramatic changes (such as those shown for Cell 16), additional borings on a grid of 50 feet are suggested. The certified area should be provided on one drawing (drawn to scale) and limited to the area completely excavated and prepared for waste disposal, and the limits of waste disposal/certified area must be marked by corner posts. All borings must be shown on all top of clay layer/confining unit contour maps. The scale of 1"=100' appears to be incorrect and must be corrected. A scale of 1"=60' is suggested, same as for the cross-sections. Related comments are provided in items 1)k), 1)l), and 1)n) of this letter.]*

Response: Figure 39 has been revised as discussed during the January 5 meeting to demonstrate the presence of the required confining material within the designated area to be certified at this time (Cell 15) and is attached in Appendix B. Also as discussed in the meeting, a temporary two-foot berm has been constructed along the cell boundary of Cell 15/Cell 16. The limits of certification are included in this figure as a dashed line in Cell 15. This will allow for the appropriate confining unit patching to be completed for later certification of Cell 16. The scale of 1"=100' has been changed to 1"=80. The scale used for this figure was chosen to display the area of interest in a standard 11" x 17" format.

n) **Appendix C, cross-sections (Figures 1 through 7):** *[The cross-sections show clay below borings with no supporting data and must be revised to show all the lithologies on cross-sections end at the lower tip of the deepest representative boring, and at the last*

included boring, unless other deeper borings are shown to provide supporting data. All scales on each cross-section should be the same (1"=60'H, 1"=20'V suggested). More E-W cross-sections would be very helpful. More specific comments are provided for each cross-section. Related comments are provided in item 1)k) of this letter.]

Response: It is common in geologic practice to continue cross-sections for a limited depth beyond the extent of borings to represent the likely soil conditions of a site. However, the cross-sections have been revised to include notation (question marks) where appropriate to demonstrate that no deeper borings were completed to confirm the presence of the indicated soil types. The cross-sections do not end at the last included borings since soil types and extents are generally extrapolated in both directions from each boring to the midpoint of the distance to the next. This is done based on knowledge of the site characteristics and available site data. Additional boring locations have been included as discussed during the January 5 meeting, to extend the cross-sections and maximize the areas to be certified. Some AS and SSA borings were added to the cross-sections as deemed necessary by HAI. Each cross-section is shown to depict the geology through a horizontal distance and a vertical elevation. The horizontal distances vary and therefore different scales are required to provide magnification and clarity for ease of evaluation. It was agreed between HAI and the Department through e-mail correspondence that the scales would not be revised. This response is intended to address the entire 1)n) comment, and therefore, each individual component will not have an individual response.

Figure 1, cross-section A-A' (Scale: 1"=100'H, 1"=10'V) - *[This cross-section shows only one permeability test for 6 deeper borings. This cross-section shows silty clay on the southeast slope with no borings and no borings on the cell base/floor along the west side for 350 feet from ST-2. This cross-section should show many of the "AS" borings and others (B-17 and SSA-11), and should be extended to the east to include SSA-20 and SSA-37.]*

Figure 2, cross-section B-B' (Scale: 1"=100'H, 1"=10'V) - *[This cross-section shows no boring for the south edge of Cell 1, or for the north edge. This cross-section provides more information, permeability tests, more borings, and is more helpful, and shows more clay layer/confining unit continuity. This cross-section should show many more of the "AS" borings and others (such as SSA-24).]*

Figure 3, cross-section C-C' (Scale: 1"=60'H, 1"=30'V) - *[Shows no borings for the east and west edges of Cell 15, and only one permeability test. This cross-section should be extended to the east to include MW-7A and MW-7B, and to the west to include DCL01-8.]*

Figure 4, cross-section D-D' (Scale: 1"=50'H, 1"=25'V) - *[This cross-section shows no boring for the north edge of Cell 16, and no permeability test for Cells 15 and 16. This cross-section should be extended to the north to include more borings (ST-7, B-22, B-26, B-31, DCL01-14, B-32, B-20, SSA-26, SSA-28, SSA-29). All of Cell 16 could be included.]*

Figure 5, cross-section E-E' (Scale: 1"=60'H, 1"-=30'V) - *[This cross-section shows no borings for west edge of Cell 15 and the east edge of Cell 16. The top of the clay layer/confining unit drop of 30 feet in 100 feet (from B-33 to B-22) is dramatic and should be confirmed by additional borings and permeability tests, therefore the clay layer/confining unit thickness of 3 feet at B-22 is of concern. This cross-section should be extended to the northeast to include B-6, MW-5A and MW-5B, and to the southwest to include DCL01-8.]*

Figure 6, cross-section F-F' (Scale: 1"=40'H, 1"=20'V) - *[This cross-section shows no borings for the east and west edges of Cell 15. This cross-section should be extended to the east to include B-8, and on the west to include DCL01-8.]*

Figure 7, cross-section G-G' (Scale: 1"=60'H, 1"=30'V) - *[This cross-section shows no borings for the east and west edges of Cell 16. This cross-section should include more borings (B-5, SSA-27), and should be extended to the northwest to include MW-4 and to the southeast to include MW-6.]*

o) **Appendix C, boring logs (B-15 -B-34, SSA-1 -SSA-37, AS-1 -AS-47):** *[Related comments are provided in item 1)l) of this letter.]*

Response: Please see the response to comment 1)l).

p) **Appendix D (as-built surveys)** - *[All as-built topographic surveys by Foresight must signed, dated, and sealed by a professional surveyor. The elevations on Sheet 1 of 2 are difficult to read due to the scale. A scale of 1"=60' is suggested, same as for the cross-sections, and for the top of clay layer/confining unit contour maps. The cell corner posts, and the posts for the certification limits/disposal limits should be shown on each drawing, with the benchmarks described and shown with elevations (NGVD). The Plan & Profile Entrance Road drawing PP-1 (Sheet 1 of 4) appears to be part of another set of drawings that were not reviewed or approved by the Department. A complete set of these drawings should be provided. The As-Built Drainage Plan is not legible and should be provided as a record drawing. All drawings provided as record drawings must be signed, dated, and sealed by the professional engineer of record.]*

Response: The as-built surveys were revised to include the cell corner posts and cell certification markers, and the descriptions of the benchmarks. Signed and sealed surveys are attached in Appendix D. The Plan & Profile Entrance Road drawing (PP-1, Sheet 1 of 4) was included to show the entrance plan changes approved through Pasco County. Sheets 2, 3, and 4 of the set provide details and general notes, and are attached in Appendix F. The As-Built Drainage Plan has been reprinted and has been renamed as a Record Drawing, and is signed and sealed by a registered civil engineer for stormwater, and a registered environmental engineer for solid waste. Notes regarding the source of the as-built survey data are included.

q) **Appendix E (soil stockpile test results) -** *[no comments]*

r) **Appendix F (photos of tie-ins) -** *[no comments]*

s) **Appendix G (field test results for tie-ins) -** *[no comments]*

t) **Appendix H (test results) -** *[The note "For information purposes only" appears to indicate that these test reports are not the official final reports. The official final reports should be provided.]*

Response: The reports provided were copies of the official final reports provided to HAI by Universal Engineering Sciences.

u) **Appendix I (water table elevations) -** *[An evaluation of the water elevations should be provided to demonstrate that there is not a direct connection to the deeper Floridan LS aquifer and that the wells are adequately placed to monitor the groundwater (both the surficial and the deeper Floridan LS aquifer), and that the base/floor of each cell will remain at least 5 feet above the SHWT. Additionally, the location for a piezometer along the west side of the temporary pond to measure the groundwater fluctuations should be provided.]*

Response: Florida Administrative Code Chapter 40C-42 states that the "Seasonal high groundwater table elevation" means "the highest level of the saturated zone in the soil in a year with normal rainfall." HAI's estimate of the seasonal high groundwater elevation was based on historical groundwater elevations for the area during the wet and dry seasons. Rainfall in 2003 was above the normal level and therefore caused the groundwater elevations to rise above the estimated high levels. Additionally, while drilling in the temporary pond, stormwater was pumped from the temporary pond, causing standing water around several of the monitor wells. As a result of the standing water, groundwater elevations in these wells appeared unusually high. The maximum elevation of water in nearby wells was lower than the base of Cell 1, except for water in monitor well MW-8. MW-8 is located in an area that conveys stormwater collected east

of Cell 1 to lower areas east of Cell 16. During high rainfall periods, that area is subjected to additional infiltration from overland flow. Under normal operations a stormwater pond (Pond 2) will intercept stormwater and hold it in a lower elevation. Therefore, groundwater levels should not exceed the elevation of the base of Cell 1. We believe that the hydrographs of those wells demonstrate that under high rainfall the water table will be below the base of the adjacent cells. It is only when additional stormwater is routed to surface depressions, rather than correctly designed stormwater ponds, that the water table exceeded the elevation of the base of Cell 1.

Hydrographs for all current wells and piezometers have been generated and are attached in Appendix G. During the January 5 meeting, the Department acknowledged that 2003 rainfall was greater than normal. Based on discussion during the meeting, it appears the landfill base grades are adequate. Monitor well MW-1B is to the west of the temporary pond and is adequate to monitor water levels. An additional piezometer is not intended to be installed in Cell 5 due to likely construction of the landfill cell and operational necessities in the near future.

2) **Document entitled Cell 1 and Landfill Site Certification Addendum dated November 13, 2003:**

a) **The cover letter page 1** - HAI states that "The boring logs for AS-1 through AS-47 describe the depth from surface of each boring in NGVD." *[Related comments are provided in item 1)l) of this letter.]*

Response: Please see the response to comment 1)l).

b) **The cover letter page 2** - HAI states that "borings confirmed areas as limestone surface lenses underlain by clay and not connected to the limestone aquifer. *[The Department has not reached this same conclusion at this time. This comment does not require a response. Related comments are provided in items 1)k), 1)l), 1)m), and 1)n) of this letter.]* HAI states that FDEP did not stipulate additional borings in Cell 16 *[Related comments are provided in item 1)m) of this letter.]*. HAI states that "The data collected from Cells 15 and 16 provide reasonable assurance of a confining layer below the temporary pond" *[The Department has not reached this same conclusion at this time. This comment does not require a response. Related comments are provided in items 1)k), 1)l), 1)m), and 1)n) of this letter.]*, and "water level observations in the temporary pond show very little percolation, a direct test of confinement" *[The basis for this conclusion should be provided. Related comments are provided in item 1)u) of this letter.]*, and the dilution calculation predicts that only iron will exceed DEP groundwater quality criteria *[Related comments are provided in item 4)b) of this letter.]* HAI states that "AS-10 and AS-42 were located in sandy areas that were excavated and replaced with confining unit material." *[Related comments are provided in item 1)m) of this letter.]*

Response: The statement that "water level observations in the temporary pond show very little percolation, a direct test of confinement", applies to the situation where water stands in the pond without significant change in level in the absence of additional inflow. Because of the uncertainty of inflows and outflows of water to the pond, that statement was not quantified. Please see the responses for the other related comments as stated in the body of this comment.

c) **The cover letter page 3 -** HAI states that "Any intervals that did not meet the minimum of 31% fines passing, were either identified as non-conforming material in the boring logs, or located in areas not specified for certification, or had boring intervals below the failed interval." *[Related comments (memorandum dated December 4, 2003, by Mr. John Morris) are provided as an attachment to this letter.]* HAI states that "the locations of the corner posts that define the area of waste disposal on the floor of Cell 1 were included in Appendix D, Figures 1 and 38." *[Related comments are provided in items 1)k), 1)m), and 1)p) of this letter]*

Response: A revised correlation was discussed during the January 5 meeting that indicated a requirement of 30% fines passing the No. 200 sieve for appropriate permeability. The same data were used to develop the previously submitted correlation, however, on the revised graph permeability was plotted as the dependent variable (on the y-axis), and this changed the resulting fines content requirement since the standard deviation was based on a different variable. HAI explained that R^2 values for these types of trend lines are generally low due to the use of a log scale (dependent variable varies by orders of magnitude), and that the best visible fit line should be used to determine the correlation. HAI faxed reference information to the Department prior to submittal of this addendum for review; however, an additional copy is attached in Appendix H.

d) **The cover letter page 4 -** HAI states that approval of the ERP is expected. *[The ERP must be issued prior to acceptance of waste. This may be resolved as a condition of approval for Cell 1.]* HAI states that a swale was constructed in the west portion of Cell 1, and a survey of the swale is included in Appendix C. *[This survey shows a berm (not a swale) that appears to divert the stormwater (from beyond the excavated portion of Cell 1) into the temporary pond away from the waste. This design does not appear to be compatible with the intended function of the temporary pond. The temporary pond was/is designed to contain the contact water that drains from the partially filled waste disposal areas only (not to collect stormwater from beyond the excavated disposal areas). Therefore, capacity calculations should be provided to demonstrate that the temporary pond will have the capacity to contain both the stormwater from beyond the excavated disposal areas and the contact water that drains from the partially filled waste disposal areas. Drainage from Cell 1 must be allowed to flow freely from the cell. Clarification should be provided.]*

Response: The intent of the temporary pond was discussed during the January 5 meeting. The purpose of the pond is to collect runoff from the excavated areas, and also from other unexcavated portions of the property. Angelo's has been informed that the modification to the stormwater permit will be issued on February 16, 2004. Capacity calculations for the temporary pond are on file with the Department.

e) **The cover letter pages 4 and 5** - HAI describes several items not yet completed: the fence, signs, special non-conforming waste containers for batteries and paint, video camera, perimeter road, containers for Class I waste, and financial assurance. *[These items must be completed prior to acceptance of waste. This may be resolved as a condition of approval for Cell 1.]*

Response: All of the items listed in the above comment have been completed since submittal of the Cell 1 Certification package. Approval of the financial assurance mechanism has been received from the FDEP Tallahassee office.

f) **Figures 1 and 38** - *[Related comments are provided in items 1)k) and 1)m) of this letter.]*

Response: Please see the referenced related responses.

g) **Appendix A (estimated effluent concentration)** - *[Related comments are provided in item 4)b) of this letter.]*

Response: Please see the referenced related responses.

h) **Appendix B, "ST" borings (table of values)** - *[Related comments are provided in item 1)l) of this letter.]*

Response: Please see the referenced related responses.

i) **Appendix C (topographic survey for west side of Cell 1)** - *[This survey shows a berm (not a swale). Related comments are provided in item 2)d) of this letter.]*

Response: Please see the referenced related responses.

j) **Appendix D (water elevations)** - *[Related comments are provided in item 1)u) of this letter.]*

Response: Please see the referenced related responses.

To gain a better understanding of the project, the Department has reviewed the original permit application and Department files, and offers the following comments *[comments provided in italics with cross-references underlined].*

3) **Document entitled Enterprise Recycling and Disposal Facility Class III Landfill Permit Application, November 2000 (with revisions included):**

Response: HAI confirmed that this comment and associated subparts are informational and do not require a response.

a) **Section 1 (application form, part B.21.)** - HAI requested a liner and LCRS exemption due to acceptance of only Class III waste and the presence of a natural confining layer. *[This has been typical for Class III landfill designs.]*

b) **Section 3.7 (Engineering Report)** - HAI states that the landfill base will be "at least 5 feet above SHWT". *[This was/is part of the original design and part of the Department's basis for approval. Confirmation that the SHWT has been and will be at least 5 feet below the Cell 1 base/floor should be provided. Related comments are provided in item 1)u) of this letter.]*

c) **Section 3.7 (Engineering Report)** - HAI states that each cell will be overcut by 50 feet for truck traffic and stormwater transport from the cell to the temporary pond, and a 6 feet high berm will prevent stormwater from entering the working face, as shown on Sheet G-1. *[Cell 1 was not overcut for stormwater on the south or the west, and the berm to divert stormwater and the conveyance for runoff from Cell 1 to the temporary pond do not appear to be constructed as designed. Related comments are provided in item 2)d) of this letter.]*

d) **Section 3.8.3 (Engineering Report)** - HAI states that each 6-acre cell is expected to last 2 years with two ten-foot lifts per year. *[no comments]*

e) **Section 3.10.1 (Engineering Report)** - HAI states that "Surface water and groundwater contact with the Class III wastes will be prevented by the proposed facility design." *[Related comments are provided in items 1)u), 2)d) and 3)b) of this letter.]*

f) **Section 3.10.1 (Engineering Report)** - HAI states that "Since the facility proposes to accept only those wastes described in 62-701.340(3)(c), FAC, *[now described in 62-701.200(14)]* it is not expected to produce a leachate that would pose a threat to public health or the environment" *[The Department has not reached this same conclusion at*

this time. This comment does not require a response.], and "the strict method of controlling type of wastes disposed of also supports the liner exemption". *[Related comments are provided in item 4)b) of this letter.]*

g) **Section 3.15 (Engineering Report)** - HAI states that "if the test data from the cell floor section does not meet the requirements, additional random samples may be tested, and if the additional testing demonstrates that the hydraulic conductivity meets the requirements, the cell will be considered acceptable". *[The Department agrees that retests are appropriate in some instances. An explanation should be provided for all retests (such as an area was reworked and retested, or due to a specifically described laboratory error).]*

h) **Figures 3-6 - 3-12 (Sheets C-1 - C-6, and G-1)** - *[These drawings should be provided as record drawings for the initial construction, and should show the SHWT based on more data, and to show the initial berms and conveyances, and other new features (such as the locations of gas probes, groundwater monitoring wells, and stormwater ponds).]*

4) **Review of correspondence in Department files - #177982-001-SC:**

Response: HAI confirmed that this comment and associated subparts are informational and do not require a response.

a) **5/31/01, HAI response** - HAI explains that after dilution from rainfall and not including dispersion, diffusion, sorption, and biodegradation, only iron will exceed at the ZOD. *[Related comments are provided in item 4)b) of this letter.]*

b) **6/28/01, Department memorandum** - *[As indicated during the permit review, the Department has not considered the dilution equation and associated assumptions as adequate to describe the potential impacts to groundwater quality, however, other assurances were provided by the "control of unauthorized wastes, site hydrogeology, stormwater control, groundwater monitoring, and cell certification." Due to the variable geology of the site uncovered during construction that appears to be different than what was intended as part of permitting, additional assurances should be provided to demonstrate and confirm adequate environmental protection. Related comments are provided in item 1)u) of this letter.]*

c) **7/25/03 report by HAI** - Borings and LS areas are shown on Figure 1 (dated 7/14/03). *[This figure/map is the first topographic survey (with both horizontal and vertical control) for the Cell 1 base/floor and shows the LS areas, with elevations to the nearest tenth of a foot. Related comments are provided in items 1)k), and 1)m) of this letter.]*

d) **8/05/03 report by HAI** - HAI describes CQA for patching the LS areas, and states that "a soil liner is not being constructed at this site. The tie-ins are being constructed to ensure a continuous confining unit at the base of Cell 1." The report includes Figure 3 (not dated). *[This figure/map is the second topographic survey (with both horizontal and vertical control) for the Cell 1 base/floor and shows the locations for the "AS" (at surface) borings, with elevations to the nearest hundredth of a foot. Related comments are provided in items 1)k), and 1)m) of this letter.]*

e) **8/12/03, report by HAI** - This report includes Figure 6 (not dated). *[This figure/map appears to be incomplete and does not appear to qualify as a topographic survey (with both horizontal and vertical control) for the Cell 1 base/floor and shows the locations for some of the "AS" and "SSA" borings, (without elevations) with a note that states that the "locations are approximate". Both horizontal and vertical control are essential to the success of this certification. The intended use of this map should be described and clarification should be provided for the lack of both horizontal and vertical control. Related comments are provided in items 1)k), and 1)m) of this letter.]*

f) **8/19/03, Department meeting with HAI and Angelo's (notes in files)** - Discussed the Plan of Action required by specific condition #5 for LS, and that the intended design was/is that the clay layer/confining unit is either at the base/floor and/or at depth below the base/floor. Agreed that the top of clay layer/confining unit contour map must show the clay layer/confining unit to be continuous with at least 3 feet at 1x10-6cm/sec, with no averaging. Discussed the north half of Cell #1 and the concern for demonstrating that the clay layer/confining unit is at the base/floor due to the west side sandy area that may have the clay layer/confining unit at depth. *[Related comments are provided in item 1)m) of this letter.]* Discussed Cell #15 and the concern that the bottom cannot be observed due to water. Discussed Cell #16 and the concern with the sandy area at north end, and the need for acceptable permeability test results in the target clay layer/confining unit. *[Related comments are provided in item 1)m) of this letter.]*

g) **9/08/03 Fax from SWFWMD** - SWFWMD approves an on-site potable drinking water supply well (converted from an existing irrigation well). *[The operations plan should be revised to describe the use of this on-site potable drinking water supply well rather than bottled drinking water, and to describe the plans for its future use or abandonment as waste disposal progresses to within 500 feet.]*

Comments from John Morris' Memo (memo text is in italics with responses inserted as necessary):

*The section of the HAI transmittal letter dated October 8, 2003 entitled "**TEMPORARY POND AREA**" includes a sub-heading entitled "Cell 16" (page 6) that indicates the following: "Due to a conflict of a preliminary correlation between permeability and percent fines with the actual permeability values obtained from test locations ST-13, ST-14, ST-16, and ST-17 in Cell 16, and ST-21 in Cell 14, tested by Ardaman (considered as outliers), some of the remaining intact Shelby tube samples were re-evaluated by UES." The initial and retest results for the referenced locations are summarized below:*

Boring #	Cell #	Sample #	Sample Depth (ft BLS/elevation)	% Fines	Perm. (cm/sec)
B-20 (initial test)	16	ST-13	8 – 10 / 65 – 67	38.1	5.3×10^{-6}
B-20 (retest)	16	ST-13	8 – 10 / 65 – 67	47.6	4.9×10^{-7}
B-21 (initial test)	16	ST-14	4 – 6 / 69 – 71	64.7	2.6×10^{-6}
B-21 (retest)	16	ST-14	4 – 6 / 69 – 71	52.3	6.7×10^{-8}
B-22 (initial test)	16	ST-16	44 – 46 / 29 – 31	13.3	9.2×10^{-6}
B-22 (retest)	16	ST-16	44 – 46 / 29 – 31	57.2	1.9×10^{-7}
B-23 (initial test)	16	ST-17	2 – 4 / 71 – 73	25.4	1.3×10^{-5}
B-23 (retest)	16	ST-17	2 – 4 / 71 – 73	38.8	6.9×10^{-8}
B-28 (initial test)	14	ST-21	32 – 34 / 62 – 64	33.8	2.1×10^{-6}
B-28 (retest)	14	ST-21	32 – 34 / 62 – 64	33.1	7.5×10^{-7}

The basis for determining that the initial results from these five locations were outliers was not presented in the certification submittals. The procedure for handling the Shelby tubes to prepare the samples that were submitted for retesting and the intervals within the Shelby tube submitted for retesting were not described in the certification submittals. The reasons for the different results were not presented in the certification submittals. Descriptions of the lithology of the samples submitted for retesting were not presented in the certification submittals.

Response: It was agreed during the January 5 meeting that Cell 16 would not be certified at this time. A berm is to be constructed between Cells 15 and 16 until the sandy areas of Cell 16 can be properly "patched" with appropriate confining material.

Samples from ST-13, ST-14, ST-16, ST-17, and ST-21 were re-evaluated by Universal Engineering Sciences due to the questionable results originally received from Ardaman & Associates, Inc.

*The section of the HAI transmittal letter dated October 8, 2003 entitled "**CELL 1 CQA TESTING**" indicates that the correlation between permeability and percent fines results in acceptable confining materials containing at least 31% fines, as presented in Appendix B of the submittal. It appears that the initial testing results from these five locations ("outliers") were omitted from the correlation between sample permeability and percent fines. It also appears that a power function was selected by HAI for this correlation for all permeability tests conducted at the facility excluding the outliers, with an R^2 value of about 0.54. Alternate correlation #1 was prepared with the same data points using an exponential function to better fit the data and resulted in an R^2 value of about 0.66. Using alternate correlation #1, it is estimated that acceptable confining materials would be required to contain about 42% fines (see attached plot entitled "Perms. vs % Fines (Alternate Correlation #1) and attached summary table).*

*The section of the HAI transmittal letter dated October 8, 2003 entitled "**CELL 1 CQA TESTING**" describes seven "field units" in the soils encountered at the facility, four of which were indicated to be acceptable confining materials (sandy clay, silty clay, clay and clayey sand) and three of which were indicated to be unacceptable confining materials (silty sand, limestone marl and limestone). It appears that the clayey sand field unit exhibits a range of percent fine and permeability values that require further evaluation regarding its suitability as confining material. Alternate correlation #2 was prepared with only the samples that were described to be clayey sands to obtain a better solution ("better fit") for the data points. To be consistent with the approach taken by HAI, the "outliers" were excluded from alternate correlation #2, and an exponential function was selected, with an R^2 value of about 0.77. Using alternate correlation #2, it is estimated that acceptable confining materials would be required to contain about 37% fines (see attached plot entitled "Perms. vs % Fines (Alternate Correlation #2) and attached summary table).*

The differences in the correlation between percent fines and permeability provided by HAI and the alternate correlations described above appear to be significant when depicting the soil types that are included as part of the confining unit. It appears appropriate to exclude the clayey sand field unit from the confining materials based solely on physical description unless the clayey sand sediments in individual borings have testing data that demonstrates an acceptable % fines content is present.

Instances where the thickness of the confining unit within Cell 1 as shown on Figure 38 in the HAI submittal dated October 8, 2003 is subject to revision if acceptable confining materials are determined by using at least 37% fines and clayey sands are excluded unless supported by a sieve test are summarized below:

- *AS-6: a sieve test conducted on the clayey sands encountered at 2 feet BLS indicated the sample was 31.7% fines; it appears that no acceptable confining materials were demonstrated at this location rather than the 3 feet shown on Figure 38.*

- *AS-11: it does not appear that a sieve test was conducted on the clayey sands that were encountered from 2.5-3 feet BLS; it appears that 2.5 feet of acceptable confining materials were demonstrated at this location rather than the 3 feet shown on Figure 38.*

- *AS-16: it does not appear that a sieve test was conducted on the clayey sands that were encountered from 0-2 feet BLS; it appears that 1 foot of acceptable confining materials was demonstrated at this location rather than the 3 feet shown on Figure 38; it is unclear if this boring location was included in the area excavated as part of Test Pit No. 4.*

- *AS-18: the silty sand sediments encountered from 0-2 feet BLS were indicated to be unacceptable materials for the confining layer; it appears that the boring was too shallow to demonstrate the occurrence of 3 feet of acceptable confining materials at this location.*

- *AS-19: it does not appear that a sieve test was conducted on the clayey sands that were encountered from 0-2 feet BLS; a sieve test conducted on the sandy clay encountered at 2 feet BLS indicated the sample was 34.9% fines; it appears that no acceptable confining materials were demonstrated at this location rather than the 3 feet shown on Figure 38.*

- *AS-34: it does not appear that a sieve test was conducted on the clayey sands that were encountered from 0-1 foot below land surface (ft BLS); it appears that 2 feet of acceptable confining materials were demonstrated at this location rather than the 3 feet shown on Figure 38; it is unclear if this boring location is outside the portion of Cell 1 that was intended to be included in the certification.*

- *AS-37: it does not appear that a sieve test was conducted on the clayey sands that were encountered from 1.5-1.75 feet BLS; it appears that 1.25 feet of acceptable confining materials were demonstrated at this location rather than the 3 feet shown on Figure 38.*

- *AS-38: it does not appear that a sieve test was conducted on the clayey sands that were encountered from 1-1.75 feet BLS; it appears that 1.25 feet of acceptable confining materials were demonstrated at this location rather than the 3 feet shown on Figure 38.*

- *AS-42: a sieve test conducted on the clayey sands encountered at 2 feet BLS indicated the sample was 15.8% fines; it appears that no acceptable confining materials were demonstrated at this location rather than the 3 feet shown on Figure 38.*

- *AS-44: a sieve test conducted on the clayey sands encountered at 2 feet BLS indicated the sample was 33.5% fines; it appears that no acceptable confining materials were demonstrated at this location rather than the 3 feet shown on Figure 38.*

- *SSA-19: it does not appear that sieve tests were conducted on the clayey sands that were encountered from 0-4 ft BLS and 9-13 ft BLS; it appears that 5 feet of acceptable confining materials were demonstrated at this location rather than the 13 feet shown on Figure 38; it is unclear if this boring location is outside the portion of Cell 1 that was intended to be included in the certification.*

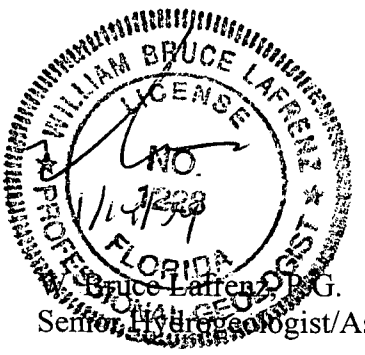
- *SSA-20: a sieve test conducted on the clayey sands encountered from 5-10 feet BLS indicated the sample was 29% fines; it appears that 4 feet of acceptable confining materials were demonstrated at this location rather than the 18 feet shown on Figure 38; it is unclear if this boring location is outside the portion of Cell 1 that was intended to be included in the certification.*

Response: Please see the response to comment 2)c).

Given the importance of determining the occurrence of acceptable confining materials at the facility, it does not seem appropriate to further review the boring logs, contour maps and cross sections until the questions about the correlation evaluation have been resolved.

Response: The boring logs, contour maps, and cross-sections have already been reviewed by Kim Ford, with responses provided to the Department.

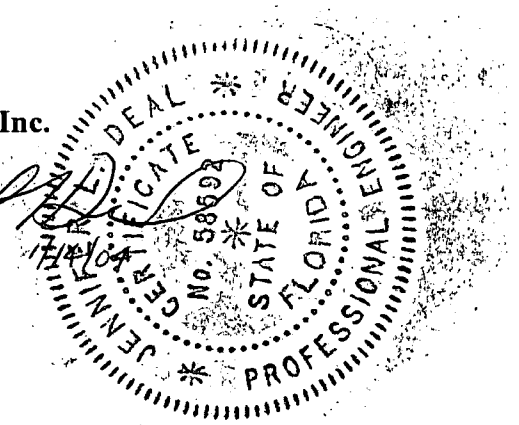
We trust this submittal will allow the Department's approval for operation of the landfill in Cell 1. Please call us if you have any questions.



W. Bruce Lafrenz, P.G.
Senior Hydrogeologist/Associate

Very truly yours,

Hartman & Associates, Inc.



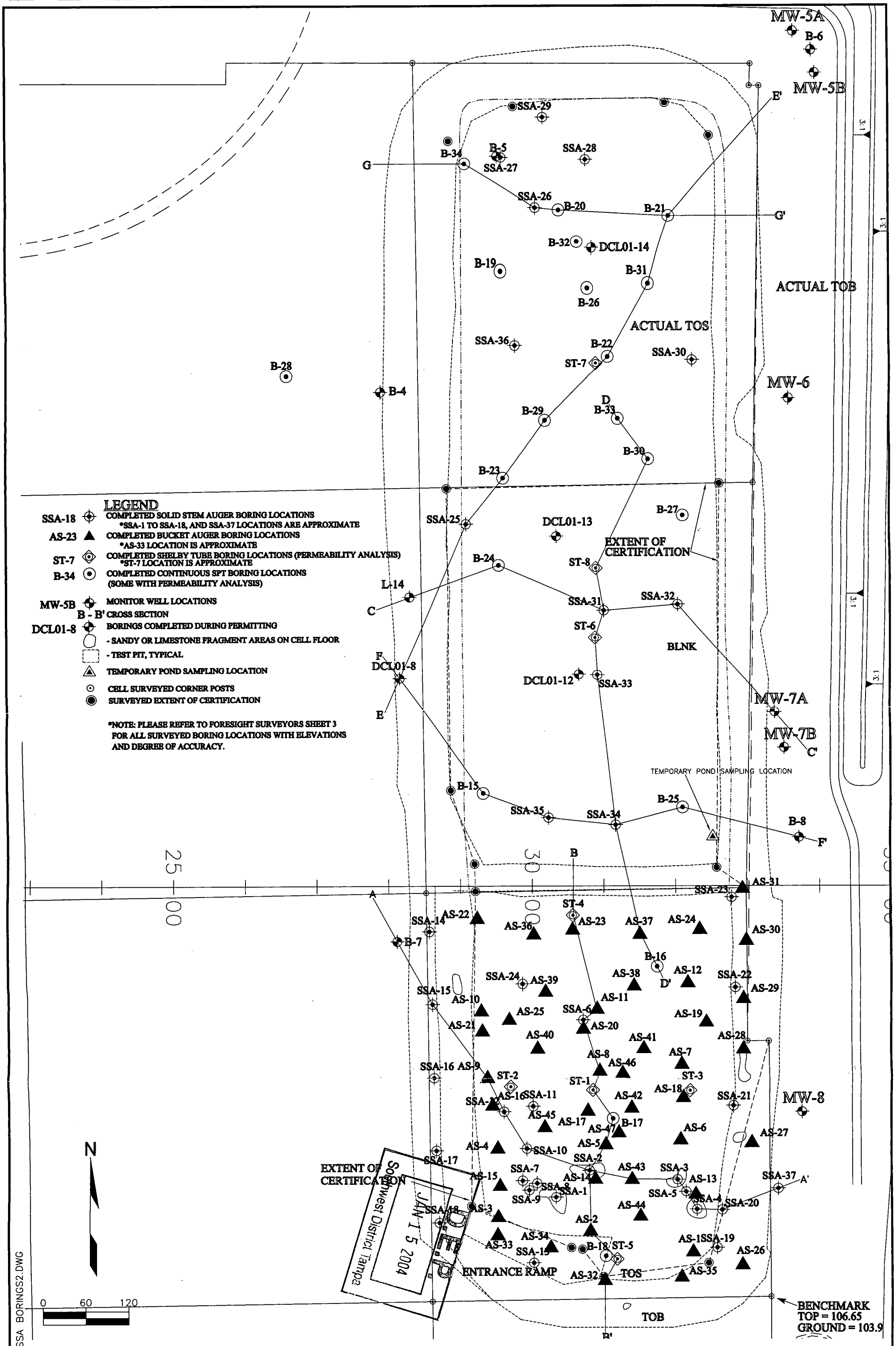
Jennifer L. Deal, P.E.
Project Manager

JLD/wbl/cr/99.0331.007/pelz.doc

cc: Dominic Iafrate, Angelo's
Craig Bryan, Angelo's
Kim Ford, P.E., FDEP
John Morris, P.G., FDEP
James E. Golden, P.G., HSA Golden

APPENDICES

APPENDIX A



LEGEND

- SSA-18 — COMPLETED SOLID STEM AUGER BORING LOCATIONS
  *SSA-1 TO SSA-18, AND SSA-37 LOCATIONS ARE APPROXIMATE
- AS-23 — COMPLETED BUCKET AUGER BORING LOCATIONS
  *AS-33 LOCATION IS APPROXIMATE
- ST-7 — COMPLETED SHELBY TUBE BORING LOCATIONS (PERMEABILITY ANALYSIS)
  *ST-7 LOCATION IS APPROXIMATE
- B-34 — COMPLETED CONTINUOUS SPT BORING LOCATIONS (SOME WITH PERMEABILITY ANALYSIS)
- MW-5B — MONITOR WELL LOCATIONS
- B - B' — CROSS SECTION
- DCL01-8 — BORINGS COMPLETED DURING PERMITTING
- - SANDY OR LIMESTONE FRAGMENT AREAS ON CELL FLOOR
- - TEST PIT, TYPICAL
- TEMPORARY POND SAMPLING LOCATION
- CELL SURVEYED CORNER POSTS
- SURVEYED EXTENT OF CERTIFICATION

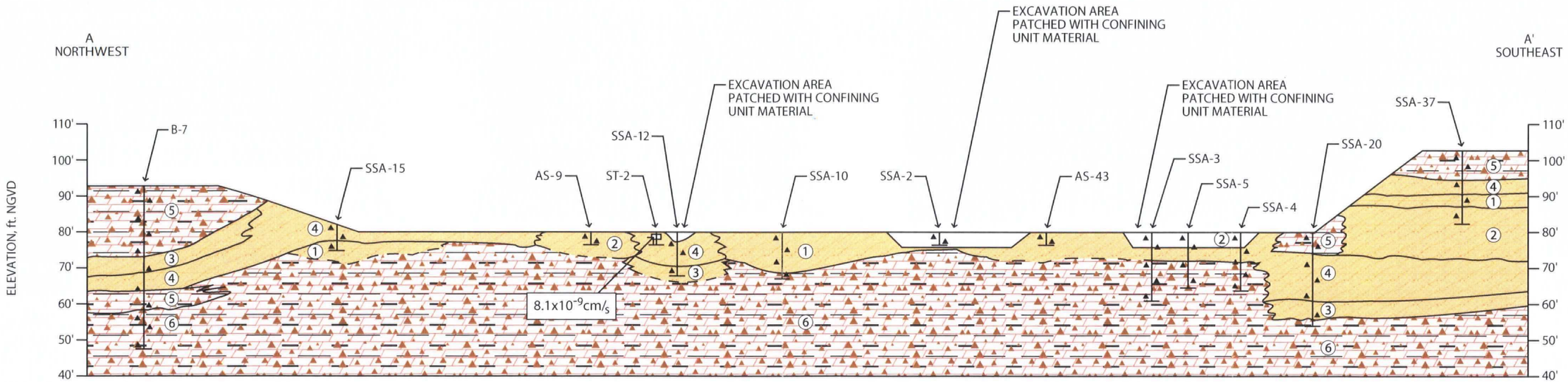
*NOTE: PLEASE REFER TO FORESIGHT SURVEYORS SHEET 3 FOR ALL SURVEYED BORING LOCATIONS WITH ELEVATIONS AND DEGREE OF ACCURACY.

SSA BORINGS2.DWG

FIGURE 1

HARTMAN & ASSOCIATES, INC.
engineers, hydrogeologists, surveyors & management consultants
201 EAST PINE STREET – SUITE 1000 – ORLANDO, FL 32801
TELEPHONE (407) 839-3955 – FAX (407) 839-3790

BORING AND PERMEABILITY TEST LOCATIONS
ENTERPRISE RECYCLING DISPOSAL FACILITY
DADE CITY, FLORIDA



HORIZONTAL SCALE 1" = 60'
VERTICAL SCALE 1" = 30'

0 60

LEGEND

- CONFINING UNITS 1-4:
  - (1) SANDY CLAY
  - (2) SILTY CLAY
  - (3) CLAY
  - (4) CLAYEY SAND
- UNITS 5-7: (5) SILTY SAND, (6) LS MARL, (7) LIMESTONE
- 5.1×10^{-8} CM/S - PERMEABILITY TEST RESULTS
- LIMESTONE FRAGMENTS

990331007-15_djh-Fig01_11x17_01/08/04.ai

FIGURE 1

HARTMAN & ASSOCIATES, INC.
engineers, hydrogeologists, surveyors, & management consultants
201 EAST PINE STREET - SUITE 1000 - ORLANDO, FL 32801
TELEPHONE (407) 839-3955 - FAX (407) 839-3790

CELL No. 1- CROSS-SECTION A-A' - CERTIFICATION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
DADE CITY, FLORIDA

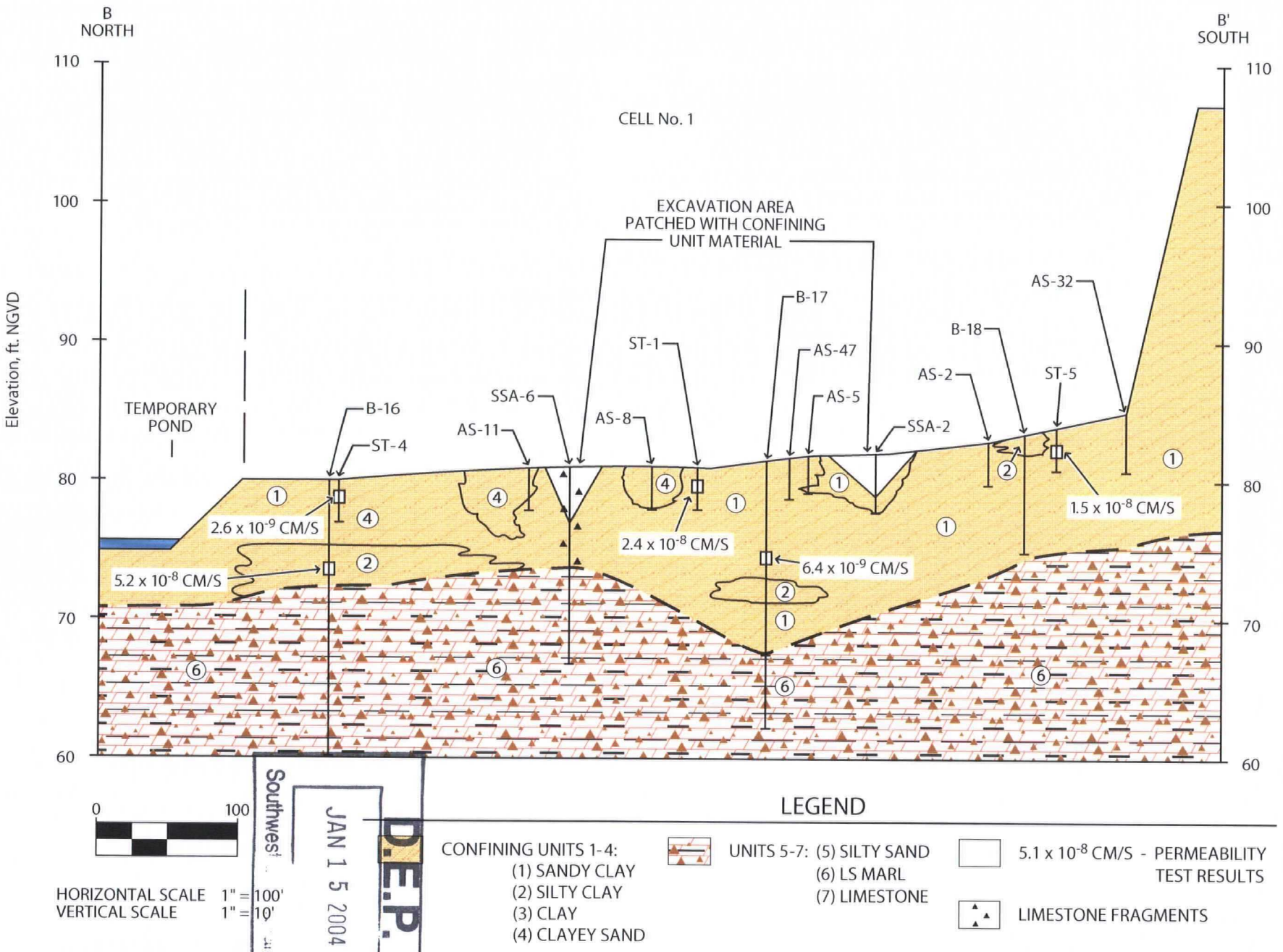


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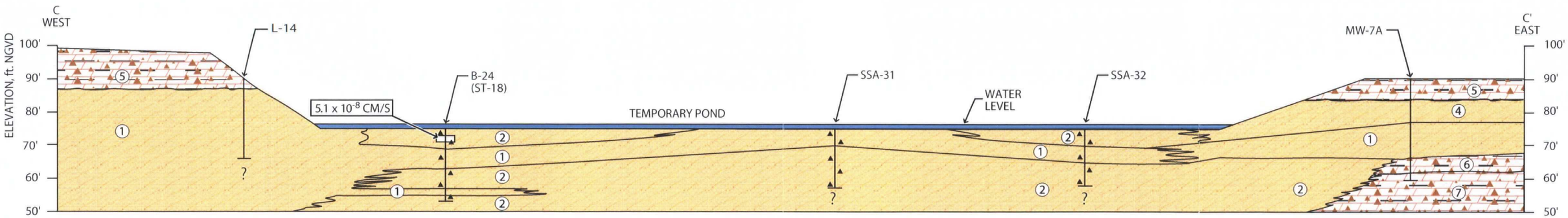
FIGURE 2

HARTMAN & ASSOCIATES, INC.
engineers, hydrogeologists, surveyors, & management consultants
201 EAST PINE STREET - SUITE 1000 - ORLANDO, FL 32801
TELEPHONE (407) 839-3955 - FAX (407) 839-3790

CELL No. 1 - CROSS-SECTION B-B' - CERTIFICATION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
DADE CITY, FLORIDA



HORIZONTAL SCALE 1" = 60'
VERTICAL SCALE 1" = 30'

0 60

LEGEND

- CONFINING UNITS 1-4:
  - (1) SANDY CLAY
  - (2) SILTY CLAY
  - (3) CLAY
  - (4) CLAYEY SAND
- UNITS 5-7: (5) SILTY SAND, (6) LS MARL, (7) LIMESTONE
- 5.1 x 10^{-8} CM/S - PERMEABILITY TEST RESULTS
- LIMESTONE FRAGMENTS

99E033\007-15-dph-Fig03 11x17 10/07/03.ai

FIGURE 3

HARTMAN & ASSOCIATES, INC.
engineers, hydrogeologists, surveyors, & management consultants
201 EAST PINE STREET - SUITE 1000 - ORLANDO, FL 32801
TELEPHONE (407) 839-3955 - FAX (407) 839-3790

CELL No. 15 - CROSS-SECTION C-C' - CERTIFICATION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
DADE CITY, FLORIDA

1572197 ①

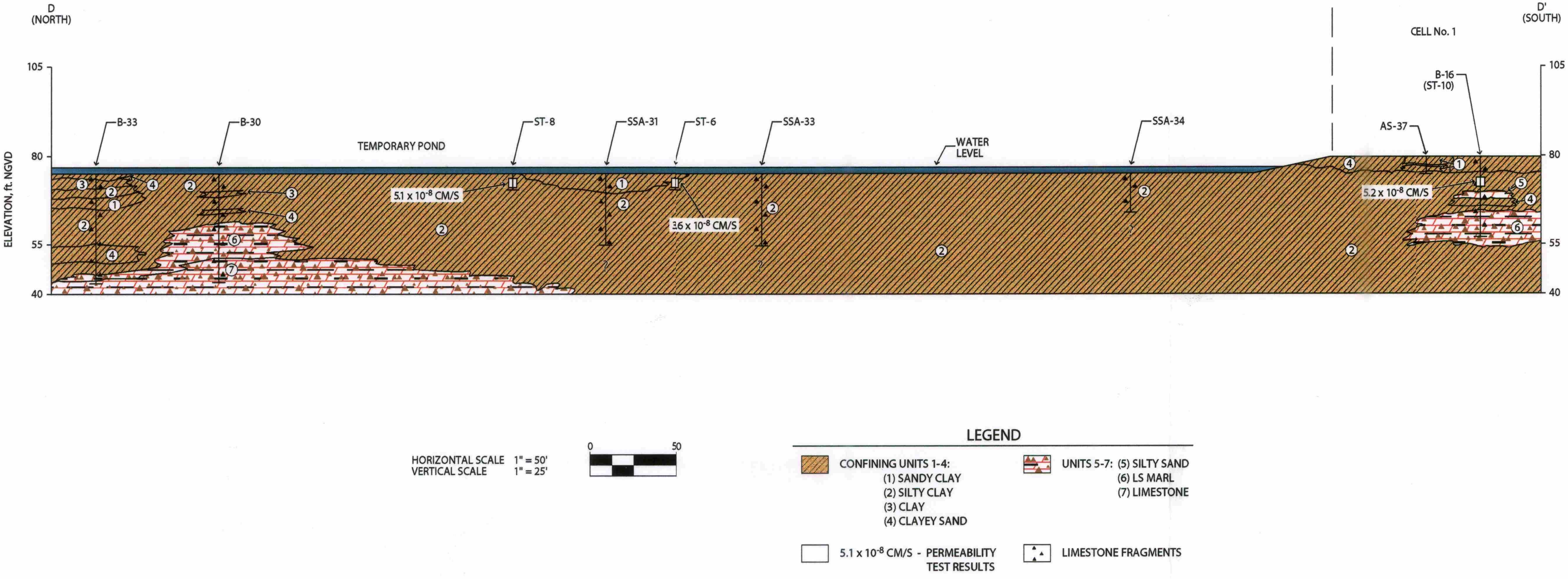


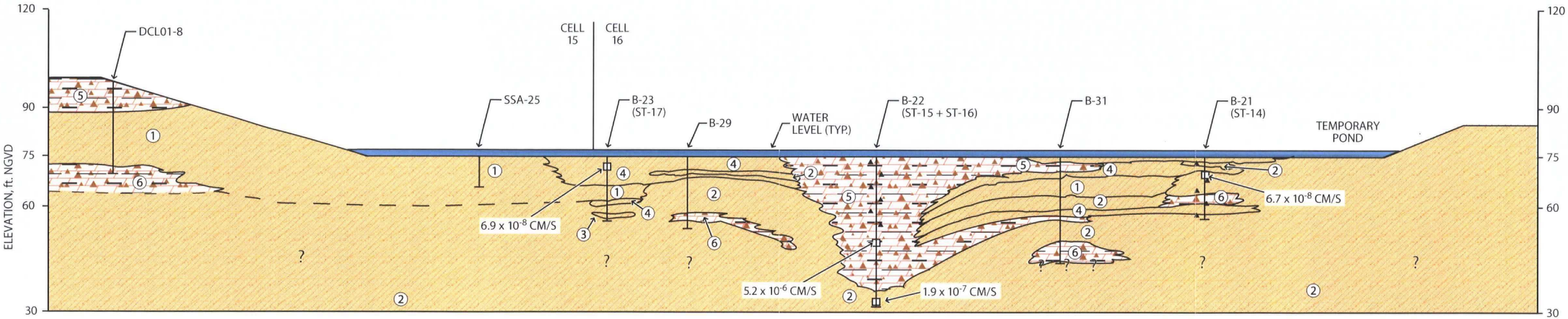
FIGURE 4

HARTMAN & ASSOCIATES, INC.
engineers, hydrogeologists, surveyors, & management consultants
201 EAST PINE STREET - SUITE 1000 - ORLANDO, FL 32801
TELEPHONE (407) 839-3955 - FAX (407) 839-3790

CELL No. 15 - CROSS-SECTION D-D' - CERTIFICATION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
DADE CITY, FLORIDA

E
(SOUTHWEST)

E'
(NORTHEAST)



HORIZONTAL SCALE 1" = 60'
VERTICAL SCALE 1" = 30'

0 60

LEGEND

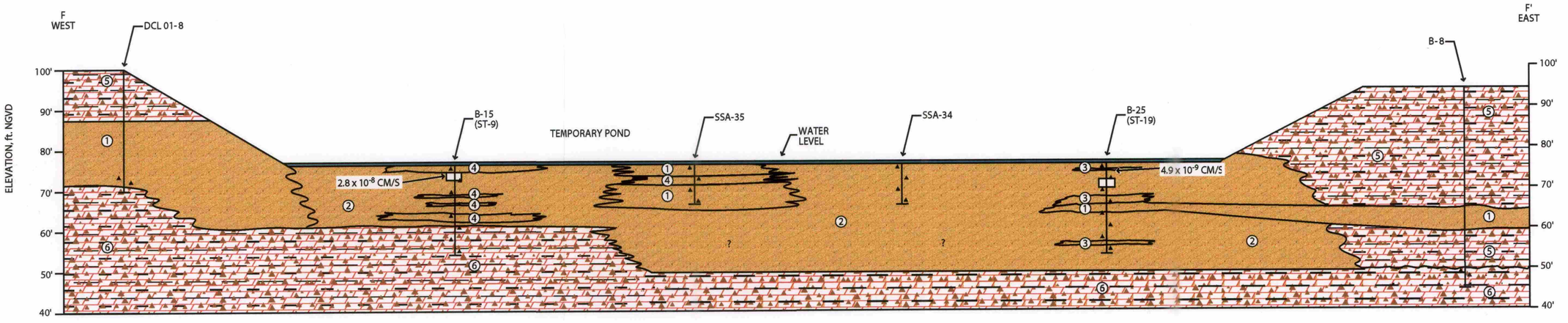
- CONFINING UNITS 1-4:
  - (1) SANDY CLAY
  - (2) SILTY CLAY
  - (3) CLAY
  - (4) CLAYEY SAND
- UNITS 5-7:
  - (5) SILTY SAND
  - (6) LS MARL
  - (7) LIMESTONE
- 5.1×10^{-8} CM/S - PERMEABILITY TEST RESULTS
- LIMESTONE FRAGMENTS

96.033.007-t5. djh-Fig05. 11x17. 10/07/03.ai

FIGURE 5

HARTMAN & ASSOCIATES, INC.
engineers, hydrogeologists, surveyors, & management consultants
201 EAST PINE STREET - SUITE 1000 - ORLANDO, FL 32801
TELEPHONE (407) 839-3955 - FAX (407) 839-3790

CELL No. 16 - CROSS-SECTION E-E' - CERTIFICATION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
DADE CITY, FLORIDA



HORIZONTAL SCALE 1" = 40'
VERTICAL SCALE 1" = 20'

0 40

LEGEND

- CONFINING UNITS 1-4:
  - (1) SANDY CLAY
  - (2) SILTY CLAY
  - (3) CLAY
  - (4) CLAYEY SAND
- UNITS 5-7:
  - (5) SILTY SAND
  - (6) LS MARL
  - (7) LIMESTONE
- 5.1 x 10^{-8} CM/S - PERMEABILITY TEST RESULTS
- LIMESTONE FRAGMENTS

D.E.P.
JAN 1 5 2004
Southwest District Tampa

FIGURE 6

HARTMAN & ASSOCIATES, INC.
engineers, hydrogeologists, surveyors, & management consultants
201 EAST PINE STREET - SUITE 1000 - ORLANDO, FL 32801
TELEPHONE (407) 839-3955 - FAX (407) 839-3790

CELL No. 15 - CROSS-SECTION F-F' - CERTIFICATION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
DADE CITY, FLORIDA

APPENDIX B

N

0 40 80

CELL 15

CELL 1

ENTRANCE RAMP

TOS

TOB

SSA-33 (18)

DCL01-12 (14)

DCL01-8 (20)

MW-7 (30)

B-15 (13)

SSA-35 (8)

SSA-34 (8)

B-25 (20)

B-8 (14)

AS-31

SSA-23 (20)

AS-22 (3)

SSA-14 (14)

AS-36 (3)

AS-23 (3)

AS-37 (3)

AS-24 (3)

AS-30 (3)

B-16 (12)

SSA-24 (20)

AS-39 (3)

AS-38 (3)

AS-12 (3)

SSA-22 (20)

AS-29 (3)

SSA-15 (12)

AS-10 (3)

AS-25 (3)

AS-11 (3)

SSA-6 (20)

AS-20 (3)

AS-21 (3)

AS-19 (3)

AS-40 (3)

AS-41 (3)

AS-28 (3)

AS-7 (3)

SSA-16 (16)

DCL01-9 (2.5)

AS-9 (3.25)

AS-8 (3)

AS-46 (3)

B-14 (7)

AS-18 (3)

AS-16 (3)

SSA-12 (14)

SSA-11 (11)

AS-17 (3)

AS-42 (3)

B-17 (12)

SSA-21 (16)

AS-45 (3)

AS-47 (3)

AS-5 (3)

AS-6 (3)

AS-27 (0)

SSA-17 (0)

AS-4 (3)

SSA-10 (11)

SSA-2 (4)

SSA-7 (14)

SSA-8 (8)

SSA-9 (8)

AS-14 (3)

AS-43 (3)

SSA-3 (7)

SSA-5 (15)

SSA-37 (13)

AS-15 (8)

SSA-1 (6)

AS-13 (8)

SSA-4

SSA-20 (18)

AS-3 (3)

AS-44 (3)

SSA-18 (18)

AS-33 (9)

AS-2 (3)

AS-34 (3)

B-18 (7.5)

AS-1 (3)

SSA-19 (20)

SSA-13

AS-32 (3)

AS-35 (3)

AS-26 (3)

BENCHMARK
TOP = 106.65
GROUND = 10

75 80 85 90 95 70

LEGEND:

7.5 / B–18 — BORING W/ THICKNESS OF CONFINING LAYER, FT.

⑤ — TEST PIT, TYPICAL / LIMESTONE OVER EXCAVATION AREA W/ PIT NUMBER

—80— CONFINING LAYER CONTOUR, FT., NGVD

CELL SURVEYED CORNER POSTS

SURVEYED EXTENT OF CERTIFICATION

*NOTE: PLEASE REFER TO FORESIGHT SURVEYORS SHEET 3 FOR ALL SURVEYED BORING LOCATIONS WITH ELEVATION AND DEGREE OF ACCURACY.

*CONTOUR LINES OUTSIDE THE EXTENT OF CERTIFICATION ARE EXTRAPOLATED.

DEP Southwest District Tampa JAN 15 2004

WILLIAM BRUCE LAFRENZ LICENSE NO. 1223 STATE OF FLORIDA PROFESSIONAL GEOLOGIST

N:\CAD\DWG\1999\99-331.01\MODELS\CELL 1 SSA BORINGS2.DWG

Plotted: Jan 14, 2004 – 1:19pm by smf

FIGURE 38

HARTMAN & ASSOCIATES, INC.
engineers, hydrogeologists, surveyors & management consultants
201 EAST PINE STREET – SUITE 1000 – ORLANDO, FL 32801
TELEPHONE (407) 839-3955 – FAX (407) 839-3790

CONFINING LAYER CONTOUR MAP - CELL 1
ENTERPRISE RECYCLING & DISPOSAL FACILITY
DADE CITY, FLORIDA

LEGEND:

7.5 / B-18 — BORING W/ THICKNESS OF CONFINING LAYER, FT.

TEST PIT, TYPICAL / LIMESTONE OVER EXCAVATION AREA W/ PIT NUMBER

80 — CONFINING LAYER CONTOUR, FT., NGVD

CELL SURVEYED CORNER POSTS

SURVEYED EXTENT OF CERTIFICATION

*NOTE: PLEASE REFER TO FORESIGHT SURVEYORS SHEET 3 FOR ALL SURVEYED BORING LOCATIONS WITH ELEVATIONS AND DEGREE OF ACCURACY.

*CONTOUR LINES OUTSIDE THE EXTENT OF CERTIFICATION ARE EXTRAPOLATED.

WILLIAM BRUCE LAFRENZ LICENSE NO. 1228 STATE OF FLORIDA 14/24

CELL 16

CELL 16 PHASE 2

CELL 15 PHASE 3

SSA-29 (15) · B-5 (30) · B-34 (12.5) · SSA-28 (15) · SSA-26 (17) · B-20 (6) · B-21 (9) · B-32 (20) · B-19 (4) · B-36 (6) · B-31 (11) · SSA-36 (18) · B-22 (4) · SSA-30 (12) · B-29 (16) · B-33 (28) · B-30 (11.5) · B-23 (18) · SSA-25 (18) · B-27 (14.5) · B-24 (20) · L-14 (21) · SSA-31 (18) · SSA-32 (18) · SSA-33 (18) · DCL01-8 (20) · DCL01-12 (14) · MW-7 (30) · B-15 (13) · B-25

65 70 75 80 85 90 55 45 35

Southwest District Tampa D.E.P. JAN 15 2004

N

0 40 80

N:\CAD\DWG\1999\99-331.01\MODELS\CELL 1 SSA BORINGS2.DWG

Plotted: Jan 14, 2004 – 1:03pm by smf

FIGURE 39

HARTMAN & ASSOCIATES, INC.
engineers, hydrogeologists, surveyors & management consultants
201 EAST PINE STREET – SUITE 1000 – ORLANDO, FL 32801
TELEPHONE (407) 839-3955 – FAX (407) 839-3790

CONFINING LAYER CONTOUR MAP TEMPORARY POND ENTERPRISE RECYCLING & DISPOSAL FACILITY DADE CITY, FLORIDA

Cell 1													
X	Y	Top of Clay	Ground Elev	Clay thickness	Boring	Symbol)							
		(ft, NGVD)	(ft, NGVD)	(ft, BTOG)	No.	for plotting)							
613666.21	1454553.35	52.5	75.00	30	B-5	44							
613499.52	1453482.00	73	93.00	10	B-7	44							
614062.48	1453624.70	63	93.00	14	B-8	44							
613483.64	1453255.17	90	110.00	19	L-13	18							
613543.36	1453943.14	87	100.00	21	L-14	18							
613937.96	1453268.36	81.5	110.00	7	B-14	44							
613991.27	1452779.82	12.5	98.00	5	B-16P	44							
613542.01	1453775.63	91.5	100.00	20	DCL01-8	6							
613541.98	1453253.67	79.5	104.00	2.5	DCL01-9	6							
613549.11	1452667.25	92.5	106.00	16.5	DCL01-11	6							
613796.49	1453780.55	86.5	95.00	14	DCL01-12	6							
614080.63	1453809.83	86	91.00	30	MW-7	103							
614115.80	1453252.03	94.5	98.00	26.5	MW-8	103							
614117.78	1452752.03	107.5	111.00	21.5	MW-9	103							
613643.87	1453672.59	73.27	75.27	13	B-15	44							
613885.70	1453429.42	80.38	80.38	12	B-16	44							
613823.27	1453217.37	81.02	81.02	12	B-17	44							
613812.84	1453023.70	83.43	83.43	7.5	B-18	44							
613670.48	1454397.54	72.89	74.89	4	B-19	44							
613751.91	1454480.13	69.23	75.23	6	B-20	44							
613904.87	1454472.28	73.27	75.27	9	B-21	44							
613819.30	1454283.82	34.18	75.18	4	B-22	44							
613672.92	1454117.22	73	75.00	18	B-23	44							
613666.42	1453994.73	73.19	75.19	20	B-24	44							
613921.87	1453653.02	73.62	75.62	20	B-25	44							
613791.55	1454377.08	27	75.00	6	B-26	44							
613923.38	1454065.01	72.89	74.89	14.5	B-27	44							
613371.99	1454257.30	64	96.00	8	B-28	44							
613731.41	1454196.56	72.97	74.97	16	B-29	44							
613875.70	1454143.76	73.12	75.12	11.5	B-30	44							
613876.14	1454383.18	71.02	75.02	14	B-31	44							
613777.05	1454434.64	67.55	75.05	26.5	B-32	44							
613833.12	1454199.21	73.51	75.51	28	B-33	44							
613621.17	1454542.79	63.97	75.43	12.5	B-34	44							
613712.21	1453013.87	95	95.00	24	SSA-13	12							
613568.19	1453478.04	92	92.00	14	SSA-14	12							
613572.19	1453376.67	91.5	91.50	12	SSA-15	12							

613574.22	1453273.94	93	93.00	16	SSA-16	12								
613577.06	1453172.90	80	94.00	0	SSA-17	12	clay at less than 80 feet							
613581.01	1453070.33	97	97.00	18	SSA-18	12								
613967.84	1453035.54	84.89	84.89	20	SSA-19	12								
613975.02	1453088.72	79.43	84.43	18	SSA-20	12								
613991.18	1453235.26	82.77	82.77	16	SSA-21	12								
613993.89	1453400.13	82.26	82.26	20	SSA-22	12								
613989.67	1453525.38	80.7	80.70	20	SSA-23	12								
613697.65	1453405.08	80.11	80.11	20	SSA-24	12								
613621.30	1454052.73	72.25	74.25	8	SSA-25	12								
613719.12	1454483.28	72.01	75.01	17	SSA-26	12								
							613666.10	1454553.46	no clay	74.79	0	SSA-27	12	
613789.86	1454548.77	70.07	75.07	15	SSA-28	12								
613730.34	1454607.37	71.77	76.77	15	SSA-29	12								
613936.84	1454279.58	73.12	75.12	12	SSA-30	12								
613813.08	1453931.81	73.53	75.53	18	SSA-31	12								
613916.19	1453940.40	73.03	75.03	18	SSA-32	12								
613803.86	1453838.52	73.26	75.26	18	SSA-33	12								
613828.80	1453628.21	72.93	74.93	8	SSA-34	12								
613734.96	1453638.36	73.27	75.27	8	SSA-35	12								
613690.11	1454299.11	72.89	74.89	18	SSA-36	12								
614054.76	1453133.21	98	103.00	13	SSA-37	12								
613935.21	1453029.25	83.29	83.29	3	AS-1	2								
613791.82	1453057.84	82.49	82.49	3	AS-2	2								
613918.35	1453187.88	81.1	81.1	3	AS-6	2								
613920.00	1453292.65	81.03	81.03	3	AS-7	2								
613649.25	1453273.24	80.3	80.3	3.25	AS-9	2								
613801.24	1453368.97	81.04	81.04	3	AS-11	2								
613928.37	1453406.26	80.29	80.29	3	AS-12	2								
613938.63	1453110.74	82.74	82.74	3	AS-13	2								
613665.68	1453122.47	82.6	82.6	3	AS-15	2								
613656.18	1453234.63	80.55	80.55	3	AS-16	2								
613788.38	1453227.58	80.89	80.89	3	AS-17	2								
613954.09	1453351.20	81.04	81.04	3	AS-19	2								
613641.90	1453337.49	80.43	80.43	3	AS-21	2								
613634.96	1453495.09	79.98	79.98	3	AS-22	2								
613767.99	1453480.20	79.93	79.93	3	AS-23	2								
613944.84	1453480.30	79.88	79.88	3	AS-24	2								
613678.58	1453353.70	80.31	80.31	3	AS-25	2								
614002.73	1453010.81	96.25	96.25	3	AS-26	2								
614016.46	1453183.52	no clay	92.18	0	AS-27	2								
614005.07	1453313.59	86.57	86.57	3	AS-28	2								

614005.78	1453384.78	84.98	84.98	3	AS-29	2							
614008.96	1453465.79	85.03	85.03	3	AS-30	2							
614004.88	1453537.17	no clay	84.87	0	AS-31	2							
613811.59	1452988.89	85.14	85.14	3	AS-32	2							
613736.03	1453035.22	82.81	82.81	3	AS-34	2							
613918.46	1452993.19	85.62	85.62	3	AS-35	2							
613713.63	1453475.07	79.98	79.98	3	AS-36	2							
613861.94	1453476.25	79.96	79.96	3	AS-37	2							
613853.35	1453403.70	80.2	80.2	3	AS-38	2							
613729.59	1453396.38	79.96	79.96	3	AS-39	2							
613735.31	1453306.43	81.07	81.07	3	AS-40	2							
613866.79	1453316.45	81.13	81.13	3	AS-41	2							
613849.70	1453132.69	81.73	81.73	3	AS-43	2							
613861.53	1453079.57	82.25	82.25	3	AS-44	2							
613704.05	1453194.87	81.26	81.26	3	AS-45	2							
613831.31	1453199.87	81.29	81.29	3	AS-47	2							
							excavated/patched borings						
613662.47	1453078.03	83.23	83.23	3	AS-3	0							
613662.93	1453174.84	81.49	81.49	3	AS-4	0							
613812.76	1453181.39	80.9	80.9	3	AS-5	0							
613804.95	1453282.22	80.64	80.64	3	AS-8	0							
613640.78	1453365.78	80.33	80.33	3	AS-10	0							
613797.95	1453131.64	81.77	81.77	3	AS-14	0							
613921.27	1453245.96	81.02	81.02	3	AS-18	0							
613781.62	1453341.84	81.05	81.05	3	AS-20	0							
613663.88	1453050.36	85.67	85.67	3	AS-33	0							
613849.72	1453232.57	81.04	81.04	3	AS-42	0							
613836.81	1453282.73	81.06	81.06	3	AS-46	0							
613743.35	1453106.69	82.2	82.2	6	SSA-1	11							
613790.32	1453144.95	80.8	80.8	4	SSA-2	11							
613912.99	1453131.98	81.8	81.8	7	SSA-3	11							
613939.92	1453089.47	83.0	83.0	7	SSA-4	11							
613924.84	1453114.76	82.5	82.5	15	SSA-5	11							
613782.12	1453354.61	80.8	80.8	7	SSA-6	11							
613696.87	1453130.51	82.0	82.0	9	SSA-7	11							
613716.93	1453126.64	81.7	81.7	8	SSA-8	11							
613706.02	1453116.80	82.1	82.1	14	SSA-9	11							
613702.82	1453175.65	82.1	82.1	11	SSA-10	11							
613711.86	1453234.41	80.9	80.9	11	SSA-11	11							
613671.16	1453226.89	80.7	80.7	14	SSA-12	11							

APPENDIX C

DEP Form # 62-701.900(2)
Form Title Certification of Construction Completion
Effective Date May 19, 1994

DEP Application No. _____
(Filled by DEP)

Florida Department of Environmental Protection
Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, FL 32399-2400

Certification of Construction Completion of a Solid Waste Management Facility

DEP Construction Permit No: 177982-001-SC County: Pasco

Name of Project: Enterprise Recycling & Disposal Facility

Name of Owner: Angelo's Aggregate Materials, Ltd.

Name of Engineer: Hartman & Associates, Inc.

Type of Project: Confining layer certification for Cells 1 and 15, as indicated by survey markers on Figure 1 of Appendix A of this report.

Cost: Estimate $ 400,000 Actual $ 450,000

Site Design: Quantity: 1500 cy/day ton/day Site Acreage: 9.2 Acres

Deviations from Plans and Application Approved by DEP: Please see the attached summary.

Address and Telephone No. of Site: Enterprise Road, west of Auton Road, Dade City
813-781-6177

Name(s) of Site Supervisor: Jeff Rogers

Date Site inspection is requested: Pre-arranged inspection on January 21, 2004

D.E.P.
JAN 15 2004
Southwest District Tampa

This is to certify that, with the exception of any deviation noted above, the construction of the project has been completed in substantial accordance with the plans authorized by Construction

Permit No. 177982-001-SC :Dated: October 5, 2001

Date: 1/14/04

Signature of Professional Engineer

STATE OF FLORIDA PROFESSIONAL ENGINEER

Northwest District
160 Governmental Center
Pensacola, FL 32501-5794
850-595-8360

Northeast District
7825 Baymeadows Way, Ste. B200
Jacksonville, FL 32256-7590
904-448-4300

Central District
3319 Maguire Blvd., Ste. 232
Orlando, FL 32803-3767
407-894-7555

Southwest District
3804 Coconut Palm Dr.
Tampa, FL 33619
813-744-6100

South District
2295 Victoria Ave., Ste. 364
Fort Myers, FL 33901-3881
941-332-6975

Southeast District
400 North Congress Ave.
West Palm Beach, FL 33401
561-681-6600

SUMMARY OF DEVIATIONS FROM FDEP APPROVED PLANS
ENTERPRISE RECYCLING & DISPOSAL FACILITY
DADE CITY, FLORIDA

As-built survey data to confirm the grades in Cell 1 is provided in Appendix D. The survey shows that the cell grades are in substantial compliance with the requirements of the approved excavation plan, as required by the specific conditions of the facility construction permit.

Deviations to the original approved plans for Cell 1 are indicated in the as-built survey and illustrated on the record drawing in Appendix D. The 50-foot overcut and associated berm and transport swale was not constructed as planned. A berm has been constructed near the western slope of Cell 1, and an open channel slopes towards the temporary pond. HAI has confirmed that the open channel is adequate to transport the stormwater runoff from west of the slope to the temporary pond. A modification to the stormwater permit is pending and is expected to be issued by February 16, 2004.

The interior side slopes of Cell 1 were constructed steeper than shown on the approved excavation plan. All side slopes were to be constructed to 6H:1V until immediately prior to waste placement against the slopes. At this point, the slopes were to be cut back to 2H:1V. The south and west side slopes of the cell are approximately 3H:1V, and the east slope is approximately 4H:1V. These steeper slopes will have a higher potential for erosion, so Angelo's must implement the erosion controls in the approved plans on an as needed basis, rather than when the 2H:1V slopes are excavated.

The north and central portions of the eastern boundary of Cell 1 were excavated beyond the boundary indicated on the excavation plans, into a portion of the area designated for construction of Pond 2. Clean soil will need to be placed and compacted into the eastern slope prior to pond construction. However, the newly placed soil may be inadequate for construction and the pond may need to be redesigned in the remaining setback area to accommodate the required stormwater volume. This determination will require a geotechnical evaluation prior to construction. Pond 2 must be designed, constructed, and certified prior to any waste disposal at or above the pre-construction grade elevation of Cell 1.

Ditches have been recently constructed north to south near the center of the site, and west to east across the northeastern portion of the site in order to divert stormwater to an existing borrow pit in the north-central portion of the site. These ditches have reduced the quantity of stormwater flowing to the temporary pond, and therefore, will allow for construction of the western leg of the temporary pond (Cell 14) to be postponed until additional stormwater retention is required. A stormwater permit modification is currently under review by the Department's stormwater section.

Pond 1 was modified to accept some drainage from Enterprise Road. This modification was included in the above referenced stormwater permit modification.

The location of the entrance, scalehouse, scales, and maintenance area have changed, as shown on the revised drawings.

The six (6) foot chain link fence (post and barbed wire fence in some locations), 12-foot compacted perimeter road, entrance gate, "No Trespassing" signs, entrance sign, and placement

of roll-off containers have been completed. The maintenance area is intended for future use and therefore is not completed at this time.

A temporary berm has been constructed between Cells 15 and 16 and will remain in place until Cell 16 is certified.

APPENDIX D

ENTERPRISE RECYCLING AND DISPOSAL FACILITY

Site Volume Table:

Site	Stratum Surf1	Surf2	Cut yards	Fill yards	Net yards	Method
LIME AREAS	lime areas	LIME AREAS TEMP POND		2410	2410 (F)	Composite
SOUTH POND	south pond	southpond pre southpond		44952	44952 (F)	Composite
TEMP POND	temp pond	TEMP POND pre contours		451895	451895 (F)	Composite

TOTAL VOLUME REMOVED IN TEMP POND, SOUTHEAST POND, AND LIMEROCK AREAS = 499,257.00 CU YDS.

NOTES:

1. THIS DRAWING IS NOT INTENDED TO REPRESENT A BOUNDARY SURVEY.
2. ELEVATIONS SHOWN HEREON ARE BASED ON THE CONSTRUCTION PLANS FOR THE ENTERPRISE RECYCLING & DISPOSAL FACILITY AND ENTERPRISE RD. BENCH MARK USED IS A NAIL & DISK IN A POWER POLE STATION 115+74.55 58.36 LT. ELEVATION = 114.02'.
3. THIS SURVEY DRAWING WAS PREPARED FOR THE EXCLUSIVE USE OF THE PARTY OR PARTIES CERTIFIED TO BELOW FOR THE EXPRESS PURPOSE STATED HEREON AND/OR CONTAINED IN THE CONTRACT BETWEEN FORESIGHT SURVEYORS, INC. AND THE CLIENT FOR THIS PROJECT. COPYING, DISTRIBUTING, AND/OR USING THIS DRAWING, IN WHOLE OR IN PART FOR ANY PURPOSE OTHER THAN ORIGINALLY INTENDED WITHOUT WRITTEN CONSENT FROM FORESIGHT SURVEYORS, INC. IS STRICTLY PROHIBITED, AND RENDERS THE SURVEYOR'S CERTIFICATION, SIGNATURE AND SEAL HEREON NULL AND VOID. ANY QUESTIONS CONCERNING THE CONTENT OR PURPOSE OF THIS DRAWING SHOULD BE DIRECTED TO FORESIGHT SURVEYORS, INC.
4. THE DEGREE OF ACCURACY IS WITHIN 0.1 OF A FOOT HORIZONTALLY AND 0.05 OF A FOOT VERTICALLY ON ALL WORK PERFORMED.

D.E.P.
JAN 15 2004
Southwest District Tampa

TITLE: **ASBUILT SURVEY**

FOR: GOODWIN BROS. CONSTRUCTION/HARTMAN AND ASSCOCIATES

DESC: SECTION 8, TOWNSHIP 25 SOUTH, RANGE 22 EAST

THIS SURVEY IS NOT VALID WITHOUT THE SIGNATURE AND ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER.

A. DANIEL MILLER, FLORIDA SURVEYORS REGISTERED LAND SURVEYOR NO. 6294

NO.	REVISION	DATE	BY
	ADD CORNER POSTS, BORINGS AND M.W.'S	01-08-04	ADM

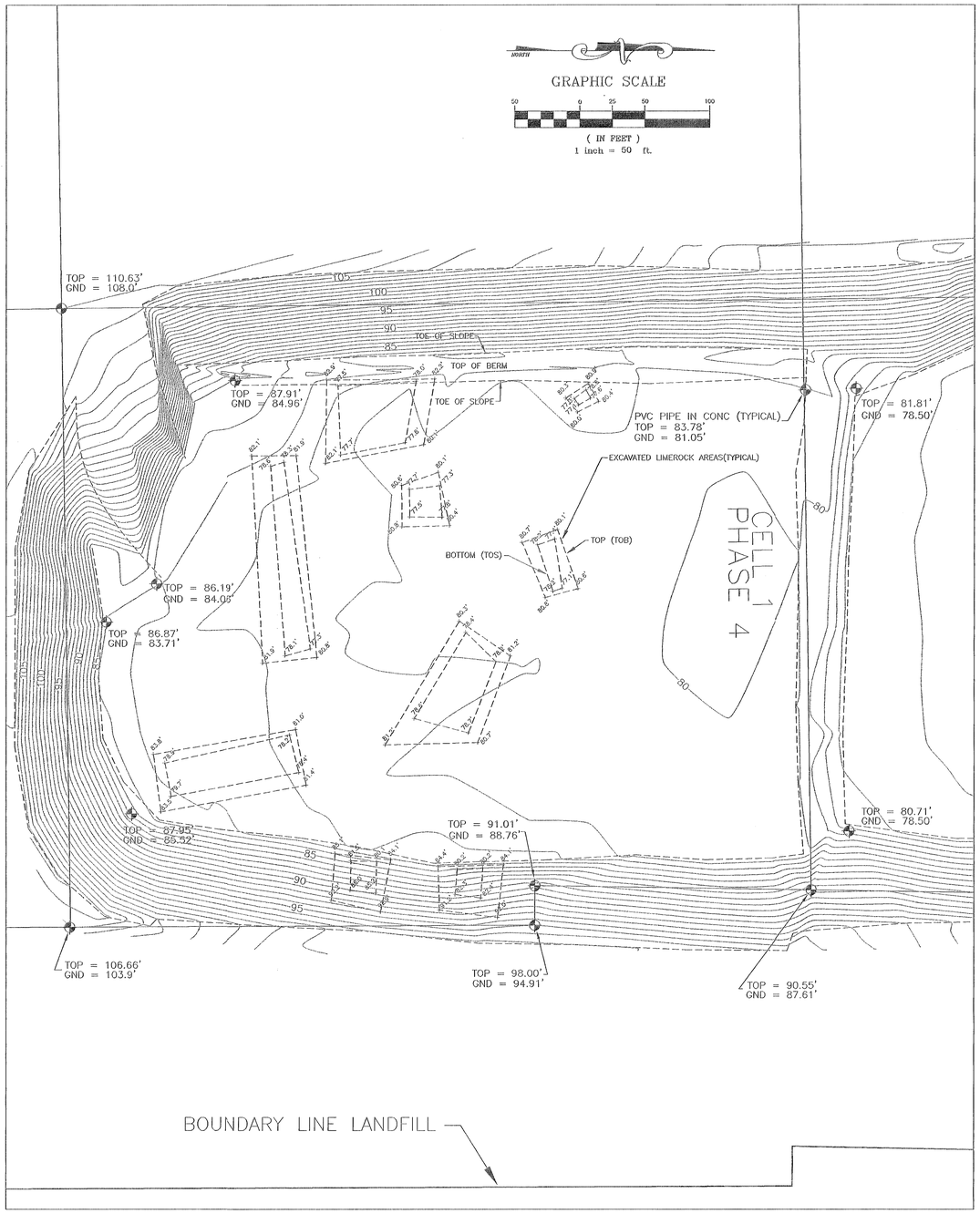
FORESIGHT SURVEYORS, INC.
HYDROGRAPHIC, LAND & CONSTRUCTION SURVEYING
773 PROVIDENCE BOULEVARD, BROOKSVILLE, FLORIDA 34601
PH. (352) 797-6306 FAX (352) 797-6308 LB No.: 5776

CADD FILE: ASBUILT	PROJ MAN: ____	DRAWN BY: ADM	CHECKED BY: ____
PROJ. NO.: 22126	FB B64, PG 28	FIELD DATE: 11/07/03	SCALE: 1"=100'

SHEET 1 OF 3

ENTERPRISE RECYCLING AND DISPOSAL FACILITY

LIMEROCK AREAS



NOTES:

1. THIS DRAWING IS NOT INTENDED TO REPRESENT A BOUNDARY SURVEY.
2. ELEVATIONS SHOWN HEREON ARE BASED ON THE CONSTRUCTION PLANS FOR THE ENTERPRISE RECYCLING & DISPOSAL FACILITY AND ENTERPRISE RD. BENCH MARK USED IS A NAIL & DISK IN A POWER POLE STATION 115+74.55 58.36 LT. ELEVATION = 114.02'.
3. THIS SURVEY DRAWING WAS PREPARED FOR THE EXCLUSIVE USE OF THE PARTY OR PARTIES CERTIFIED TO BELOW FOR THE EXPRESS PURPOSE STATED HEREON AND/OR CONTAINED IN THE CONTRACT BETWEEN FORESIGHT SURVEYORS, INC. AND THE CLIENT FOR THIS PROJECT. COPYING, DISTRIBUTING, AND/OR USING THIS DRAWING, IN WHOLE OR IN PART FOR ANY PURPOSE OTHER THAN ORIGINALLY INTENDED WITHOUT WRITTEN CONSENT FROM FORESIGHT SURVEYORS, INC. IS STRICTLY PROHIBITED, AND RENDERS THE SURVEYOR'S CERTIFICATION, SIGNATURE AND SEAL HEREON NULL AND VOID. ANY QUESTIONS CONCERNING THE CONTENT OR PURPOSE OF THIS DRAWING SHOULD BE DIRECTED TO FORESIGHT SURVEYORS, INC.
4. THE DEGREE OF ACCURACY IS WITHIN 0.1 OF A FOOT HORIZONTALLY AND 0.05 OF A FOOT VERTICALLY ON ALL WORK PERFORMED.

TITLE: ASBUILT SURVEY
FOR: GOODWIN BROS. CONSTRUCTION/HARTMAN AND ASSOCIATES
DESC: SECTION 8, TOWNSHIP 25 SOUTH, RANGE 22 EAST

THIS SURVEY IS NOT VALID WITHOUT THE SIGNATURE AND ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER.

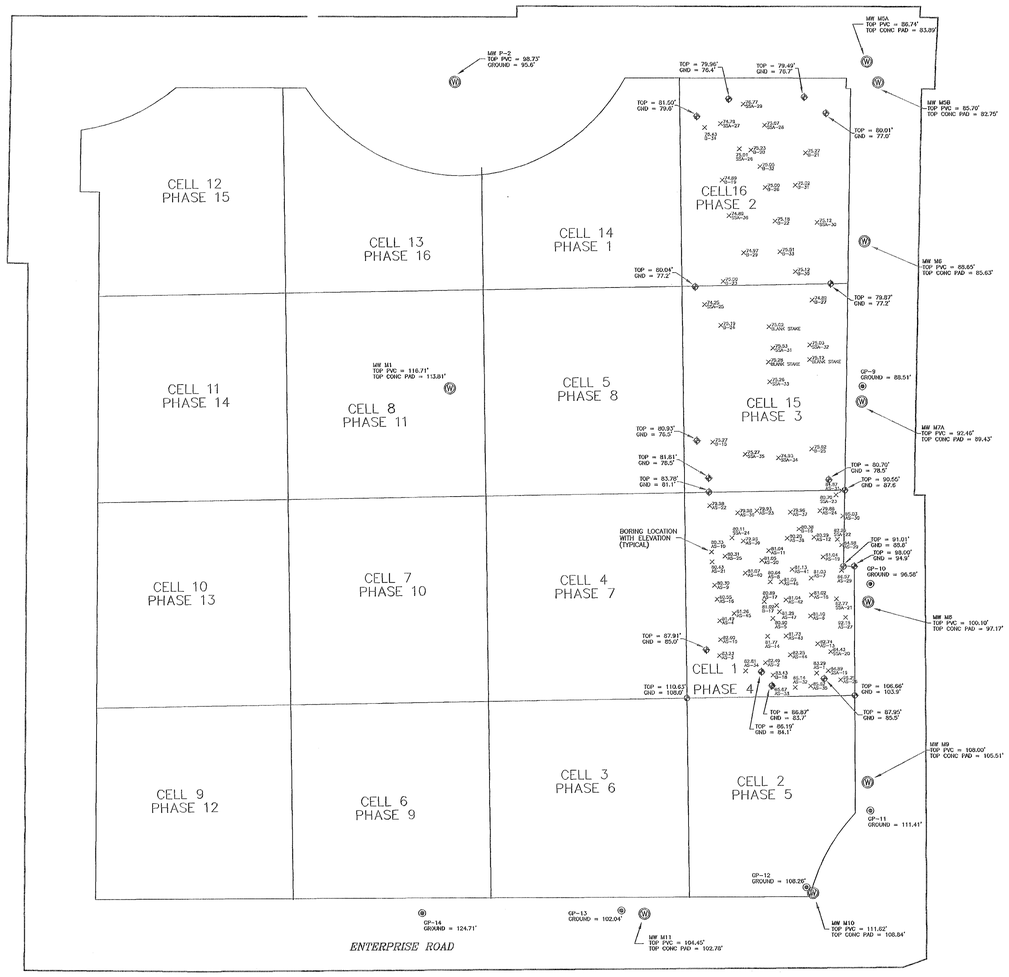
NO.	REVISION	DATE	BY

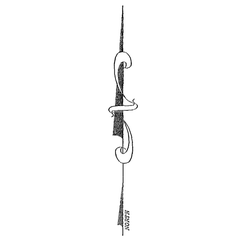
FORESIGHT SURVEYORS, INC.
HYDROGRAPHIC, LAND & CONSTRUCTION SURVEYING
773 PROVIDENCE BOULEVARD, BROOKSVILLE, FLORIDA 34601
PH. (352) 797-6306 FAX (352) 797-6308 LB No.: 5776

CADD FILE: ASBUILT	PROJ MAN: ____	DRAWN BY: ADM	CHECKED BY: ____
PROJ. NO.: 22126		FIELD DATE:	SCALE: 1"=50'

ENTERPRISE RECYCLING AND DISPOSAL FACILITY

LOCATIONS OF MONITORING WELLS, GAS PROBES, AND BORING SITES





= PVC PIPE IN CONCRETE (CORNER POST LOCATION)

= MONITORING WELL LOCATION

= GAS PROBE LOCATION

NOTES:

1. THIS DRAWING IS NOT INTENDED TO REPRESENT A BOUNDARY SURVEY.
2. ELEVATIONS SHOWN HEREON ARE BASED ON THE CONSTRUCTION PLANS FOR THE ENTERPRISE RECYCLING & DISPOSAL FACILITY AND ENTERPRISE RD. BENCH MARK USED IS A NAIL & DISK IN A POWER POLE STATION 115+74.55 58.36 LT. ELEVATION = 114.02'.
3. THIS SURVEY DRAWING WAS PREPARED FOR THE EXCLUSIVE USE OF THE PARTY OR PARTIES CERTIFIED TO BELOW FOR THE EXPRESS PURPOSE STATED HEREON AND/OR CONTAINED IN THE CONTRACT BETWEEN FORESIGHT SURVEYORS, INC. AND THE CLIENT FOR THIS PROJECT. COPYING, DISTRIBUTING, AND/OR USING THIS DRAWING, IN WHOLE OR IN PART FOR ANY PURPOSE OTHER THAN ORIGINALLY INTENDED WITHOUT WRITTEN CONSENT FROM FORESIGHT SURVEYORS, INC. IS STRICTLY PROHIBITED, AND RENDERS THE SURVEYOR'S CERTIFICATION, SIGNATURE AND SEAL HEREON NULL AND VOID. ANY QUESTIONS CONCERNING THE CONTENT OR PURPOSE OF THIS DRAWING SHOULD BE DIRECTED TO FORESIGHT SURVEYORS, INC.
4. THE DEGREE OF ACCURACY IS WITHIN 0.1 OF A FOOT HORIZONTALLY AND 0.05 OF A FOOT VERTICALLY ON ALL WORK PERFORMED.

TITLE: *ASBUILT SURVEY*

FOR: HARTMAN AND ASSOCIATES

DESC: SECTION 8, TOWNSHIP 25 SOUTH, RANGE 22 EAST

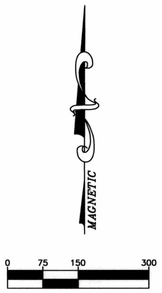
THIS SURVEY IS NOT VALID WITHOUT THE SIGNATURE AND ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER.

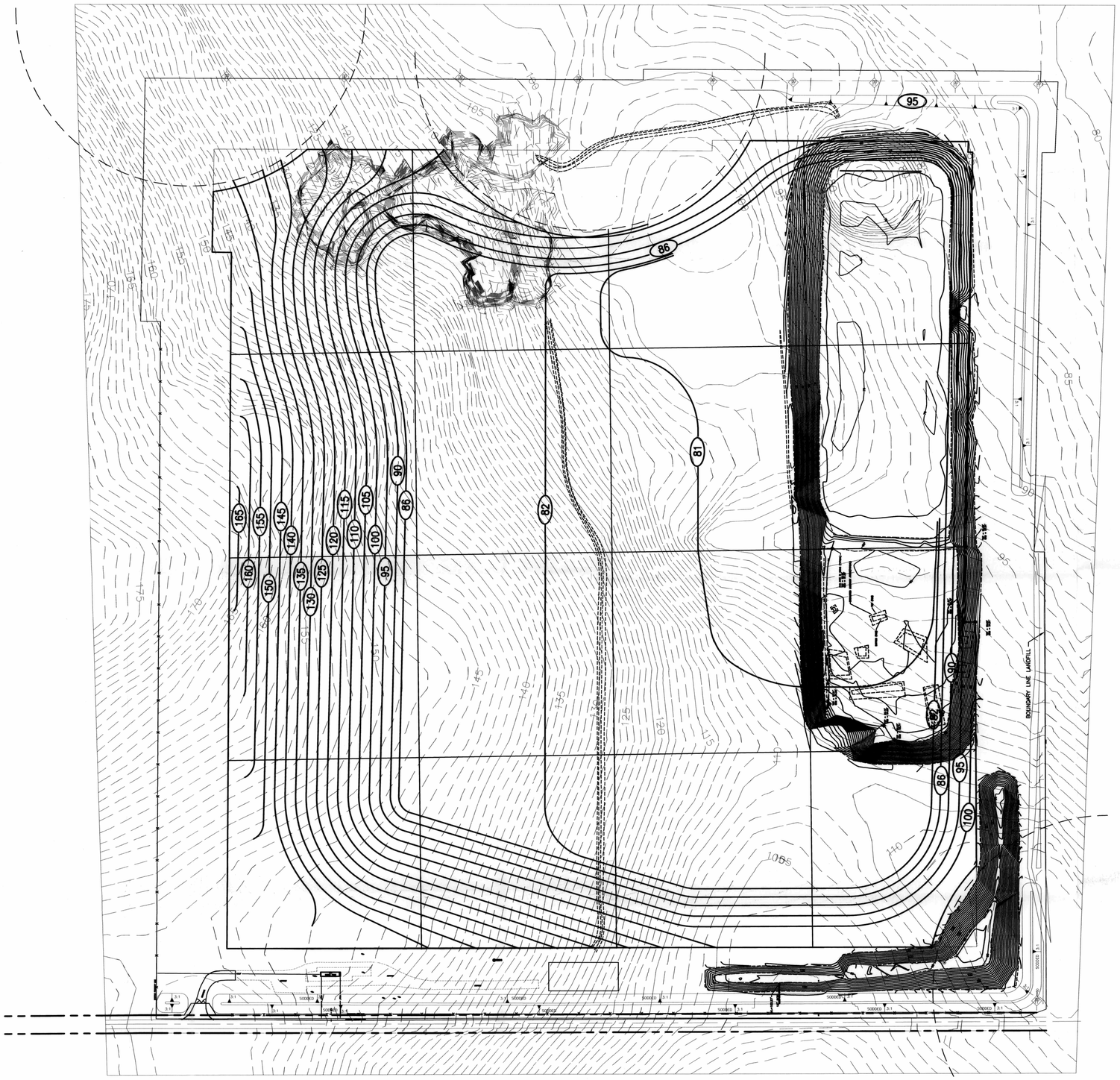
NO.	REVISION	DATE	BY

FORESIGHT SURVEYORS, INC.
HYDROGRAPHIC, LAND & CONSTRUCTION SURVEYING
773 PROVIDENCE BOULEVARD, BROOKSVILLE, FLORIDA 34601
PH. (352) 797-6306 FAX (352) 797-6308 LB No.: 5776

CADD FILE: ASBUILT	PROJ MAN: ____	DRAWN BY: ADM	CHECKED BY: ____
PROJ. NO.: 22126			SCALE: 1"=200'

SHEET 3 OF 3





ELEV. PROPOSED EXCAVATION CONTOURS

Hartman & Associates, Inc.
201 E. Pine St., Suite 1000
Orlando, FL 32801
Engineering Business #5814
Jennifer L. Deal, P.E.
Florida Registration #
0000059592
Solid Waste

Hartman & Associates, Inc.
201 E. Pine St., Suite 1000
Orlando, FL 32801
Engineering Business #5814
Roderick K. Cole, P.E.
Florida Registration # 45169
1/15/04
Paving/Grading/Drainage

D.E.P.
JAN 15 2004
Southwest District Tampa

"RECORD DRAWING"

INCORPORATING THOSE CHANGES MADE DURING TYHE CONSTRUCTION PHASE OF THE PROJECT, BASED ON DATA FURNISHED BY THE CONTRACTOR TO THE ENGINEER.

H:\CAD\DWG\1999\99-331\Civil\Final\BORROW PIT.dwg
Plotted: Jan 14, 2004 - 4:11pm by RCC

HARTMAN & ASSOCIATES, INC.
engineers, hydrogeologists, surveyors & management consultants
201 EAST PINE STREET – SUITE 1000 – ORLANDO, FL 32801
TELEPHONE (407) 839-3955 – FAX (407) 839-3790
ENGINEERING BUSINESS No. 5814

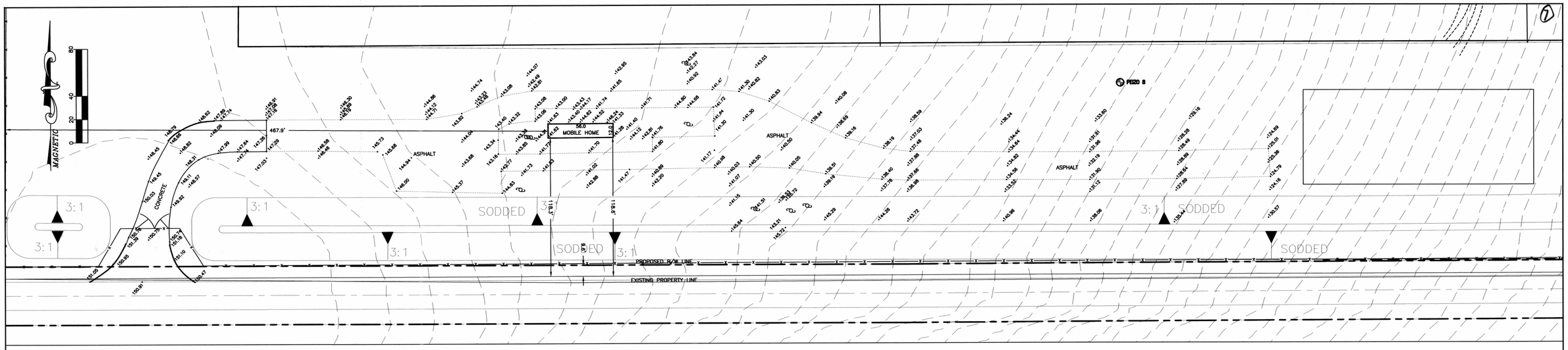
ENTERPRISE LANDFILL
PASCO COUNTY
FLORIDA

RECORD DRAWING

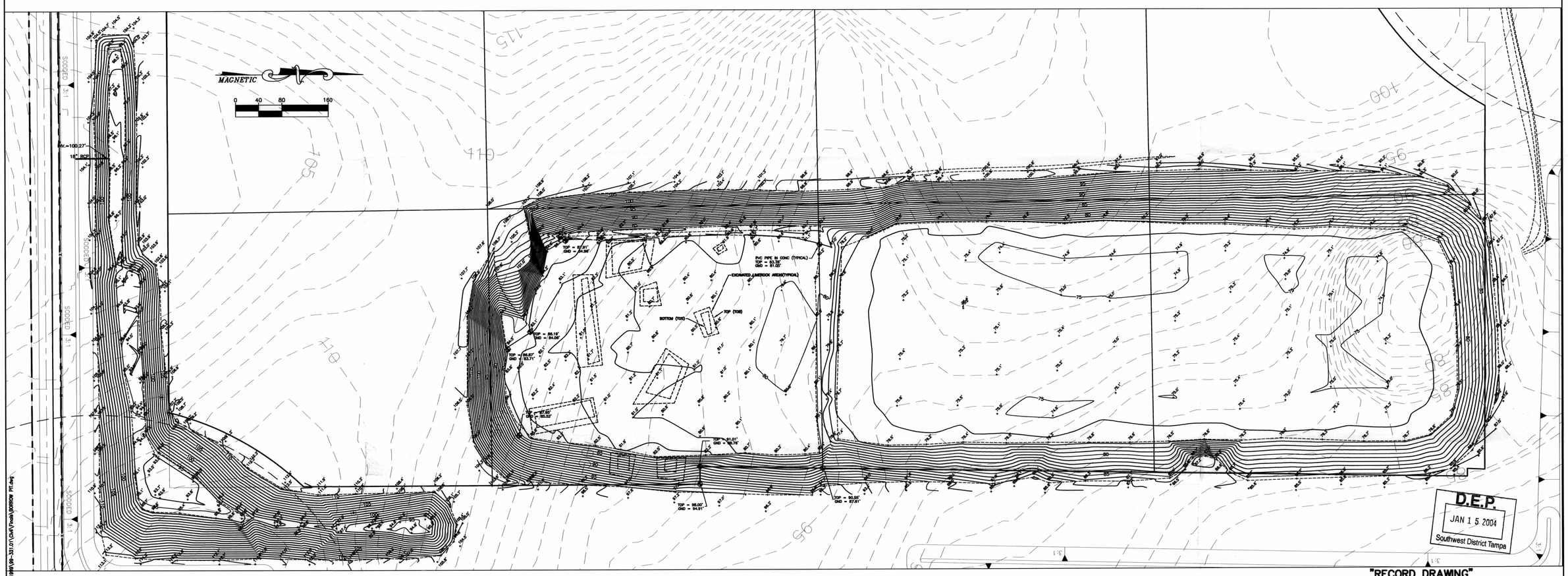
DATE	REVISIONS	REVISED	CHECKED

	BY	DATE
DESIGNED	RCC	6/03
DRAWN	RCC	6/03
CHECKED	RKC	1/04
QC APPROVAL	RKC	1/04
FILE: BORROW PIT.dwg		

PROJECT NO. 99.0331.001
SCALE 1" = 150'
SHEET OF



SCALEHOUSE ENTRANCE



POND 1

TEMP POND

"RECORD DRAWING"

INCORPORATING THOSE CHANGES MADE DURING THE CONSTRUCTION PHASE OF THE PROJECT, BASED ON DATA FURNISHED BY THE CONTRACTOR TO THE ENGINEER.

N:\CAD\DWG\ 99\99-331.01\Civil\Finish\BORROW PIT.dwg
Plotted: Jan 14, 2004 – 4:05pm by RCC

HARTMAN & ASSOCIATES, INC.
engineers, hydrogeologists, surveyors & management consultants
201 EAST PINE STREET – SUITE 1000 – ORLANDO, FL 32801
TELEPHONE (407) 839-3955 – FAX (407) 839-3790
ENGINEERING BUSINESS No. 5814

ENTERPRISE LANDFILL
PASCO COUNTY
FLORIDA

RECORD DRAWING

DATE	REVISIONS	REVISED	CHECKED

Hartman & Associates, Inc. 201 E. Pine St., Suite 1000 Orlando, FL 32801 Engineering Business No. 5814 Kennedy L. Deal, P.E. No. 58592 Registered Professional Engineer in the State of Florida

Hartman & Associates, Inc. 201 E. Pine St., Suite 1000 Orlando, FL 32801 Engineering Business No. 5814 Richard K. Kennedy, P.E. No. 58592 Registered Professional Engineer in the State of Florida

	BY	DATE
DESIGNED	RCC	6/03
DRAWN	RCC	6/03
CHECKED	RKC	1/04
QC APPROVAL	RKC	1/04

FILE: BORROW PIT.dwg

PROJECT NO. 99.0331.001
SCALE AS SHOWN
SHEET OF

APPENDIX E

SS BUCKET AUGER BORING AS-1 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 16, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	3	83.29	(3) CLAY, Gray, Orange, (mottled), Very Firm, Minor LR fragments	1					

SS BUCKET AUGER BORING AS-2 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 16, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	2.75	82.49	(3) CLAY, Gray, Orange, (mottled), Firm to Very Firm, LS Fragments	1					
2.75	3	79.49	(1) SANDY CLAY, Lt Gray & Orange, Firm	2					

SS BUCKET AUGER BORING AS-3 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 16, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	2	83.23	(3) CLAY, Lt Gray & Orange, (mottled), Firm to Semi-Firm	1					
2	4	79.23	(2) SILTY CLAY, Very Firm	2					

SS BUCKET AUGER BORING AS-4 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 16, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	0.75	81.49	(1) SANDY CLAY, Lt Gray, Mod Brittle, Semi-Firm to Firm	1					
0.75	4	77.49	(5) SILTY SAND, Orange & Tan, Fine to Silt, Soft, Little to no Clay	2					

SS BUCKET AUGER BORING AS-5 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 16, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	1	80.90	(2) SILTY CLAY, Orange, Gray, & Dk Brown, (mottled), Very Firm	1					
1	2.5	78.40	(5) SILTY SAND, Lt Gray, Semi-Firm, Large LR fragment @2.5'	2					

SS BUCKET AUGER BORING AS-6 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 16, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	3	81.10	(4) CLAYEY SAND, Lt Gray,Orange, Very Firm, Mod Clay	1					

SS BUCKET AUGER BORING AS-7 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 17, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	3	81.03	(1) SANDY CLAY, Lt Gray & Orange, Very Firm, Minor LS Frag	1					

SS BUCKET AUGER BORING AS-8 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 17, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	1.75	80.64	(4) CLAYEY SAND, Dk Orange, Gray,(mottled) Med to VF, Soft	1					
1.75	3.25	77.39	(4) CLAYEY SAND, Orange & Gray, Brittle, Firm	2					

SS BUCKET AUGER BORING AS-9 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 17, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	3.25	80.30	(2) SILTY CLAY, Lt Gray & Orange, Very Firm, Minor LR frag	1					

SS BUCKET AUGER BORING AS-10 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 17, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	3	80.33	(5) SILTY SAND, Tan-Orange, Fine to Very Fine, Soft	1					

SS BUCKET AUGER BORING AS-11 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 17, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	0.5	81.04	(1) SANDY CLAY, Lt Gray, Orange, (mottled), Very Firm	1					
0.5	2.5	78.54	(1) SANDY CLAY, Gray, Brittle, Firm, Minor LS fragments	2					
2.5	3	78.04	(4)CLAYEY SAND, Lt Gray, Orange, Firm	3					

SS BUCKET AUGER BORING AS-12 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 17, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	3	80.29	(1) SANDY CLAY, Tan & Orange, Very Firm to Semi-Firm	1					

SS BUCKET AUGER BORING AS-13 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 23, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	0.5	82.74	(1) SANDY CLAY, Lt Gray & Orange,(mottled), Firm	1					
0.5	3	79.74	(3) CLAY, Lt Gray & Orange,(mottled), Very Firm	2					

SS BUCKET AUGER BORING AS-14 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 23, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	1.5	81.77	(4) CLAYEY SAND, Lt Gray & Orange, (mottled), Very Firm	1					
1.5	2	79.77	Hard Limestone Cobble or Boulder, Stopped Boring	2					

SS BUCKET AUGER BORING AS-15 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 23, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	3	82.60	(4) CLAYEY SAND, Lt Gray & Orange, Very Firm to Firm,	1					
			Minor LS Fragments @2.5'						

SS BUCKET AUGER BORING AS-16 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 23, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	2	80.55	(4) CLAYEY SAND, Lt Gray & Orange, (mottled), Firm to V-Firm	1					
2	3	77.55	(2) SILTY CLAY, Orange & Lt Gray, (mottled), Very Firm	2					

SS BUCKET AUGER BORING AS-17 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 23, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	2.5	80.89	(4) CLAYEY SAND, Lt Gray, Semi-Firm to Firm	1					
2.5	3	77.89	(3) CLAY, Gray & Black, Massive, Extremely Firm	2					

SS BUCKET AUGER BORING AS-18 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 23, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	2	81.02	(5) SILTY SAND, Lt Gray & Orange, (mottled), Semi-Soft to Firm	1					
2	3	78.02	(2) SILTY CLAY, Lt Gray, Very Firm	2					

SS BUCKET AUGER BORING AS-19 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 23, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	2	81.04	(4) CLAYEY SAND, Lt Gray & Orange,(mottled) V-Firm to S-Firm	1					
2	3	78.04	(1) SANDY CLAY, Orange & Lt Gray, (mottled) Very Firm	2					

SS BUCKET AUGER BORING AS-20 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 23, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	1.5	81.05	(2) SILTY CLAY, Lt Gray & Black, Semi-Firm to Very Firm	1					
1.5	2.5	78.55	(2) SILTY CLAY, Lt Gray, Firm to Very Firm	2					
2.5	3	78.05	Weathered LS, White, Brittle w/ 2-6 cm Fragments	3					

SS BUCKET AUGER BORING AS-21 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 23, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	2	80.43	(2) SILTY CLAY, Lt Gray & Orange, (mottled), Very Firm	1					
2	2.5	77.93	(1) SANDY CLAY, Dk Brown-Gray, Semi-Firm to Firm	2					
2.5	3	77.43	(3) CLAY, Lt Gray, Very Firm	3					

SS BUCKET AUGER BORING AS-22 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 23, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	3	79.98	(1) SANDY CLAY, Lt Gray & Tan-Orange, Very Firm	1					

SS BUCKET AUGER BORING AS-23 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 23, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	2	79.93	(1) SANDY CLAY, Tan & Orange, (mottled), Very Firm	1					
2	2.5	77.43	(4) CLAYEY SAND, Tan-Orange, Brown, (mottled), Firm	2					
2.5	3	76.93	(2) SILTY CLAY, Tan-Orange	3					

SS BUCKET AUGER BORING AS-24 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 23, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	1.5	79.88	(2) SILTY CLAY, Lt Tan & Lt Orange, (mottled), Firm to Very Firm	1					
1.5	3	76.88	(1) SANDY CLAY, Lt Tan-Orange, Very Firm	2					

SS BUCKET AUGER BORING AS-25 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 23, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	3	80.31	(3) CLAY, Lt-Dk Gray, Massive, Sm Amt Sand, Ext Firm, Minor	1					
			LS (small) Fragments (soft and hard)						

SS BUCKET AUGER BORING AS-26 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 25, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	2	96.25	(4) CLAYEY SAND, Rust-Orange, Fine to Very Fine, Soft	1					
2	3	93.25	(4) CLAYEY SAND, Lt Gray,Orange, Fine to V-Fine, S-Firm,	2					
			Increase in Clay from 2.5'-3'	3					

SS BUCKET AUGER BORING AS-27 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 25, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	3	92.18	(5) SILTY SAND, Rust-Orange, Fine to Silt, Soft, Fe-Nodules	1					

SS BUCKET AUGER BORING AS-28 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 25, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	1.5	86.57	(4) CLAYEY SAND, Rust-Orange, Fine to V-Fine, Soft	1					
1.5	2.75	83.82	(4) CLAYEY SAND, Lt Gray,Rust, & Orange,(mottled), Semi-Firm	2					
2.75	3	83.57	(4) CLAYEY SAND, Lt Gray,Rust,Orange,(mottled), Firm	3					

SS BUCKET AUGER BORING AS-29 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 25, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	3	84.98	(4) CLAYEY SAND, Lt Gray, Fine to Silt, Very Firm, Weathered	1					
			LR Fragments from 1'-3'						

SS BUCKET AUGER BORING AS-30 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 25, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	1.5	85.03	(4) CLAYEY SAND, Tan-Orange, Fine to Silt, Soft to Semi-Firm	1					
1.5	3	82.03	(4) CLAYEY SAND, Lt Gray, Fine to Silt, Firm to Very Firm,	2					
			Increase in Clay with Depth						

SS BUCKET AUGER BORING AS-31 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 25, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	3	84.87	(5) SILTY SAND, Tan-Orange, Fine to Silt, Very Soft	1					

SS BUCKET AUGER BORING AS-32 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 25, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	1.5	85.14	(1) SANDY CLAY, Lt Gray & Black, Very Firm	1					
1.5	3	82.14	(3) CLAY, Lt Gray, Orange, & Black,(mottled), Ext Firm	2					

SS BUCKET AUGER BORING AS-33 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 25, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	1	85.67	(4) CLAYEY SAND,Lt gray,Orange, & Black, S. Firm to Firm	1					
1	2	83.67	(1) SANDY CLAY, Lt Gray, Orange, Very Firm, Hard LS	2					
			Fragment @ 2' , Stopped Boring						

SS BUCKET AUGER BORING AS-34 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 25, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	1	82.81	(4) CLAYEY SAND,Lt gray,Orange,(mottled), Firm to Very Firm	1					
1	3	79.81	(1) SANDY CLAY, Lt Gray, Orange,(mottled), V-Firm to Ext Firm	2					

SS BUCKET AUGER BORING AS-35 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: July 25, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	1.5	85.62	(3) CLAY, Lt gray & Lt Orange (mottled), Very Firm	1					
1.5	3	82.62	(1) SANDY CLAY, Lt Orange,Gray,Black,(mottled) V-F to E-Firm	2					
			Soft Weathered LS Fragments						

SS BUCKET AUGER BORING AS-36 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: August 8, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	3	79.98	(1) SANDY CLAY, Gray, Orange, (mottled), Ext Firm to Firm	1					

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SS BUCKET AUGER BORING AS-37 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: August 8, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	1.5	79.96	(2) SILTY CLAY, Lt Gray, Orange, (mottled), Very Firm to Firm	1					
1.5	1.75	78.21	(4) CLAYEY SAND, Lt Gray, Orange, Semi-Firm to Firm	2					
1.75	3	76.96	(2) SILTY CLAY, Dk Brown,Lt Gray,Orange, V-Firm to S-Firm,	3					
			Minor Weathered LS Fragments @ 2.9'						

SS BUCKET AUGER BORING AS-38 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: August 8, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	1	80.20	(2) SILTY CLAY,Lt Gray,Orange,Dk Brn, (mottled) Firm to VFirm	1					
1	1.75	78.45	(4) CLAYEY SAND, Lt Gray, Dk Brown, Semi-Firm to Firm	2					
1.75	3	77.20	(1) SANDY CLAY,Lt Gray,Orange,Dk Brn, (mottled), Very Firm	3					

SS BUCKET AUGER BORING AS-39 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: August 8, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	3	79.96	(2) SILTY CLAY, Lt Gray, Lt Orange, (mottled), Ext Firm	1					

SS BUCKET AUGER BORING AS-40 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: August 8, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	1.5	81.07	(1) SANDY CLAY, Lt Gray, Orange, (mottled), Very Firm	1					
1.5	2.5	78.57	(3) CLAY, Lt Gray, Tan-Orange, Ext Firm	2					
2.5	3	78.07	(1) SANDY CLAY, Lt Gray, Orange, (mottled) Ext Firm to V-Firm	3					

SS BUCKET AUGER BORING AS-41 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: August 8, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	3	81.13	(2) SILTY CLAY, Lt Gray-Tan,Lt Orange,(mottled) Firm to V-Firm	1					
			Very Small LS Fragments @ 2.5'						

SS BUCKET AUGER BORING AS-42 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: August 8, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	4	81.04	(4) CLAYEY SAND, Lt Gray, Dk Orange, Fine to Silt, Soft	1					

SS BUCKET AUGER BORING AS-43 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: August 8, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	2	81.73	(1) SANDY CLAY, Lt Gray, Tan-Orange, Very Firm	1					
2	3	78.73	(1) SANDY CLAY, Lt Gray, Tan-Orange, Very Firm, Small	2					
			Increase in Sand from 2'-3'						

SS BUCKET AUGER BORING AS-44 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: August 8, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	2	82.25	(4) CLAYEY SAND, Rust, Fine to Silt, Firm to Semi-Firm	1					
2	3	79.25	(4) CLAYEY SAND, Rust, Lt Gray, Fine to Silt, Firm to Semi-Firm	2					

SS BUCKET AUGER BORING AS-45 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: August 8, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	3	81.26	(1) SANDY CLAY, Lt Gray,Orange, (mottled), V-Firm to Ext Firm	1					

SS BUCKET AUGER BORING AS-46 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: August 8, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	1	81.06	(5) SILTY SAND, Orange, Fine to Silt, Well Sorted, Soft	1					
1	3	78.06	(4) CLAYEY SAND, Orange-Tan, Semi-Firm to Firm	2					

SS BUCKET AUGER BORING AS-47 LITHOLOGIC DESCRIPTION
ENTERPRISE RECYCLING AND DISPOSAL FACILITY
PASCO COUNTY, FLORIDA

SAMPLE DATE: August 8, 2003
COLLECTED BY: Miguel Garcia
WATER DEPTH: NA

DEPTH FROM	TO	APPROX. ELEV. (NGVD)	SOIL DESCRIPTION	Sample No.	Blow Count/ 6" 1st	2nd	3rd	4th	N
0	3	81.29	(1) SANDY CLAY, Gray,Lt Orange,Black,(mottled) Firm to V-firm	1					
			Soft, Weathered LR from 0.75' to 3'						

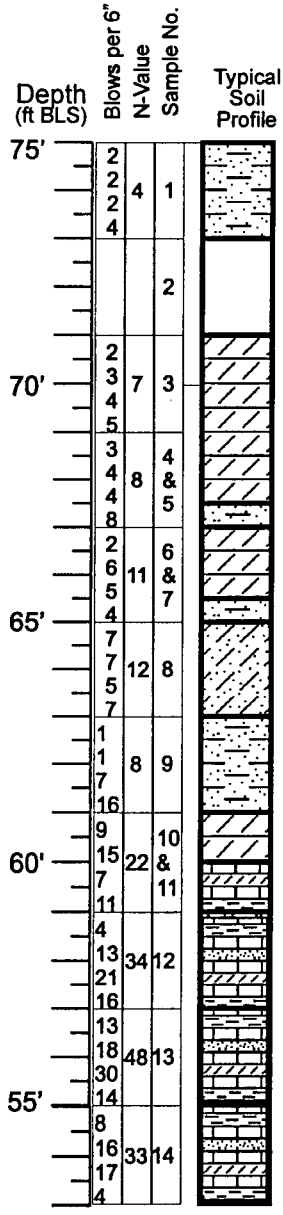
B-15
(SPT Boring)

PROJECT
NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING
GR. ELEV: 75.27' NGVD
DIA-TYPE: 3 3/4"-Mud Rotary
DEPTH: 22' BLS
DATE STARTED: 8-22-03
DATE ENDED: 8-22-03

DRILLING
RIG TYPE: CME 45
CREW: Amdrill

LEGEND
(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(4) CLAYEY SAND: 0'-2'	Light orange & Gray, Very firm to Firm, 0'-2'
	~ 20% small weathered limerock fragments, 1.75'-2'
SHELBY TUBE: ST-9	
(2) SILTY CLAY: 4'-7.5'	Light tan & Black, Firm to Very firm, 4'-7.5'
(4) CLAYEY SAND: 7.5'-8'	Light tan, Semi firm to Firm, 7.5'-8'
(2) SILTY CLAY: 8'-9.5'	Light tan & Light orange, Firm, ~ 5-10% small weathere limerock fragments, 8.5'-9.5'
(4) CLAYEY SAND: 9.5'-10'	Light gray, Semi firm, ~ 25% weathered limerock fragments 9.5'-10'
(5) SILTY SAND: 10'-12'	Light gray, Soft to semi firm, 10'-12'
(4) CLAYEY SAND: 12'-14'	Possible LS fragments or hard clay/chert ~ 10-15%, 11'-12'
(2) SILTY CLAY: 14'-15'	Light gray & Light tan, Soft to Very firm, 12'-14'
(6) LS MARL: 15'-22'	Hard and brittle LS fragments ~ 50%, 13.5'-16'
	Light gray & Light green, Soft to firm, 14'-15'
	Light tan, White, Soft to firm 15'-22'
	~ 30-40 % limestone fragments, 16'-22'
	Hard limestone at 22' bls

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STRATIGRAPHIC COLUMN
ENTERPRISE RECYCLING & DISPOSAL FACILITY
DADE CITY, FLORIDA

FIGURE 1

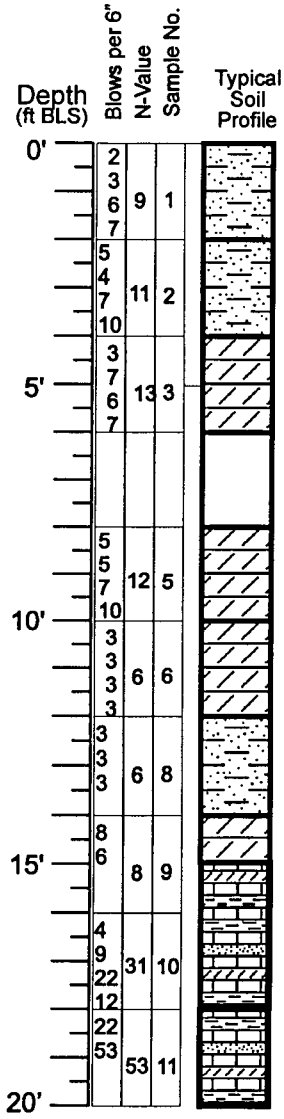
B-16
(SPT Boring)

PROJECT
NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING
GR. ELEV: 80.38' NGVD
DIA-TYPE: 3 3/4"-Mud Rotary
DEPTH: 20' BLS
DATE STARTED: 8-22-03
DATE ENDED: 8-22-03

DRILLING
RIG TYPE: CME 45
CREW: Amdrill

LEGEND
(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(4) CLAYEY SAND: Light orange & gray, semi firm to very firm 0'-4'	~ 5-15 % small weathered limerock fragments, (<1 cm) 0'-3'
(2) SILTY CLAY: Light gray & Orange, Very firm, 4'-6'	
SHELBY TUBE: 6'-8'	ST-10
(2) SILTY CLAY: Light gray, Orange, Dark brown, Semi firm to Very firm, 8'-12'	~ 5-10% small weathered limerock fragments, 8.5'-9.5' ~ 25% weathered limerock fragments, 9.5'-10' Possible LS fragments or hard clay/chert ~ 10-15%, 11'-12'
(6) LS MARL: Soft to firm (silty clay matrix), 12'-16'	Hard and brittle LS fragments ~ 50%, 13.5'-16'
(6) LS MARL: light tan, Soft, 16'-18'	~ 30-40 % limestone fragments, 16'-20'
(6) LS MARL: Light tan, Mod sand, Soft, 18'-20'	

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STRATIGRAPHIC COLUMN
ENTERPRISE RECYCLING & DISPOSAL FACILITY
DADE CITY, FLORIDA

FIGURE 2

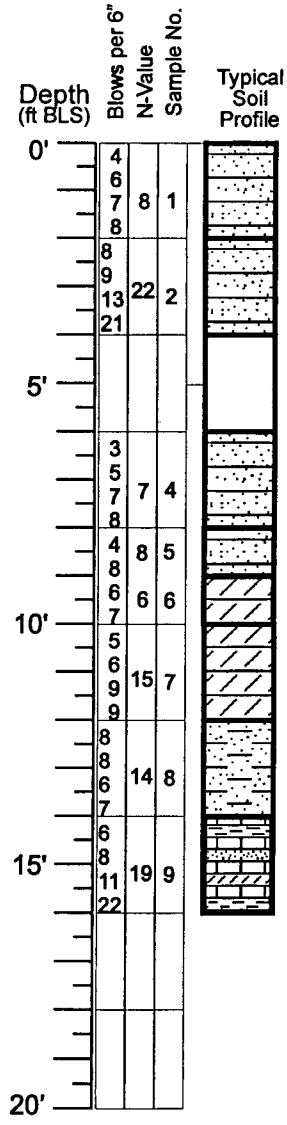
B-17
(SPT Boring)

PROJECT
NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING
GR. ELEV: 81.02' NGVD
DIA-TYPE: 3 3/4"-Mud Rotary
DEPTH: 16' BLS
DATE STARTED: 8-23-03
DATE ENDED: 8-23-03

DRILLING
RIG TYPE: CME 45
CREW: Amdrill

LEGEND
(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(1) SANDY CLAY: 0'-2'	Red brown to Tan yellow, Very fine sand
(1) SANDY CLAY: 2'-4'	
SHELBY TUBE: 6'-8'	ST-11
(1) SANDY CLAY: 8'-10'	
(1) SANDY CLAY: 8'-9'	
(2) SILTY CLAY: 9'-10'	Silty clay, light gray-light olive, minor very fine sand
(1) SANDY CLAY: 10'-12'	
(1) SANDY CLAY: 12'-14'	~ 0.5' limestone from 13.5'-14'
(6) LIMESTONE MARL: light tan, soft	

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STRATIGRAPHIC COLUMN
ENTERPRISE RECYCLING
& DISPOSAL FACILITY
DADE CITY, FLORIDA

FIGURE 3

B-18

(SPT Boring)

PROJECT

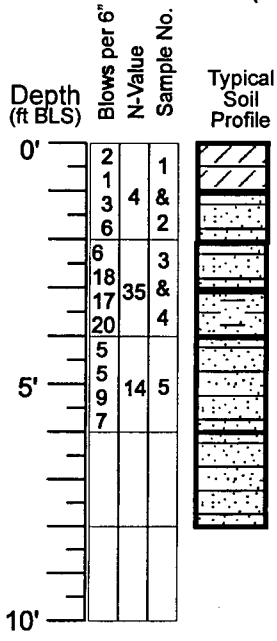
NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING

GR. ELEV: 83.43' NGVD
DIA-TYPE: 3 3/4"-Mud Rotary
DEPTH: 8' BLS
DATE STARTED: 8-23-03
DATE ENDED: 8-23-03

DRILLING

RIG TYPE: CME 45
CREW: Amdrill



Soil Description

(2) SILTY CLAY: 0'-1'

(1) SANDY CLAY: 1'-3'

(1) SANDY CLAY: 4'-6'

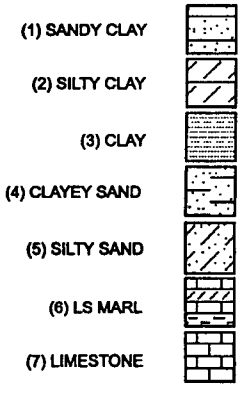
(1) SANDY CLAY: 6'-8'

Remarks

Very pale olive green

Failed shelby tube from 6'-8' (limerock @ 7.5') rotary wash 0'-4' in new boring, collected ST-11 from 4'-6'

LEGEND



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STRATIGRAPHIC COLUMN
ENTERPRISE RECYCLING
& DISPOSAL FACILITY
DADE CITY, FLORIDA

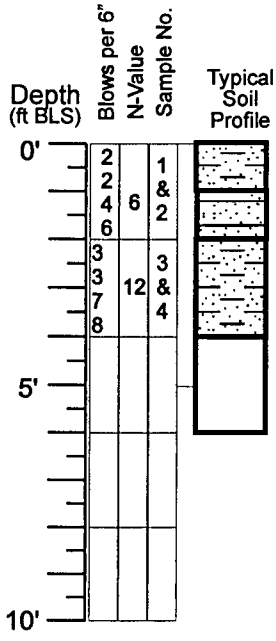
FIGURE 4

B-19
(SPT Boring)

PROJECT
NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

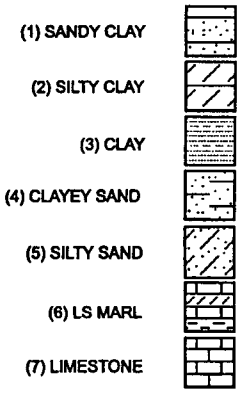
BORING
GR. ELEV: 74.89' NGVD
DIA-TYPE: 3 3/4"-Mud Rotary
DEPTH: 6' BLS
DATE STARTED: 8-26-03
DATE ENDED: 8-26-03

DRILLING
RIG TYPE: CME 45
CREW: Amdrill



Soil Description	Remarks
(4) CLAYEY SAND: Light gray & Light orange, Firm to very firm, 0'-1'	Fe-cemented sandstone nodules from 1'-2'
(1) SANDY CLAY: Light gray & Orange, Very firm, 1'-2'	
(4) CLAYEY SAND: Light gray & Orange, Fine to silt, Very firm, 2'-4'	
SHELBY TUBE: 4'-6'	ST-12A

LEGEND



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DADE CITY, FLORIDA

FIGURE 5

B-20

(SPT Boring)

PROJECT

NUMBER: 99.0331.007

NAME: Enterprise Recycling & Disposal Facility

LOCATION: Dade City, FL

BORING

GR. ELEV: 75.23' NGVD

DIA-TYPE: 3 3/4"-Mud Rotary

DEPTH: 16' BLS

DATE STARTED: 8-26-03

DATE ENDED: 8-26-03

DRILLING

RIG TYPE: CME 45

CREW: Amdrill

LEGEND

(1) SANDY CLAY

(2) SILTY CLAY

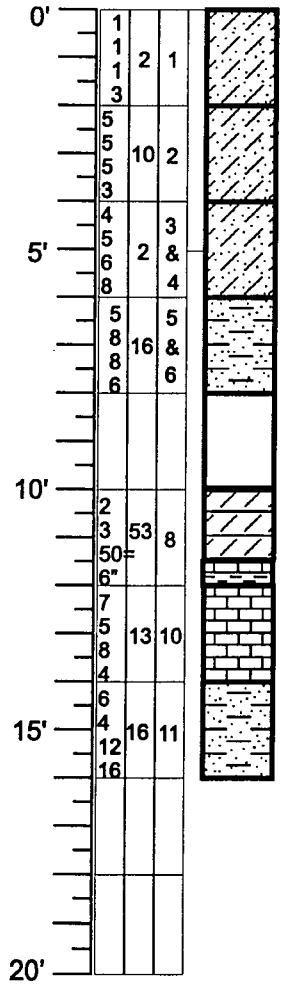
(3) CLAY

(4) CLAYEY SAND

(5) SILTY SAND

(6) LS MARL

(7) LIMESTONE



Soil Description	Remarks
(5) SILTY SAND: 0'-2'	Fine to silt, Very small amount of clay, Fe-cemented nodules 0'-2'
(5) SILTY SAND: 2'-4'	Gray-tan, Med to silt, Small amount of clay, 2'-4'
(5) SILTY SAND: 4'-5.5'	Gray-tan, Med to silt, 4'-5.5'
(4) CLAYEY SAND: 5.5'-7.5'	Light gray & Dark orange, firm, 5.5'-7.5'
(2) SILTY CLAY: 7.5'-8'	Light gray-green, Very firm, 7.5'-8'
SHELBY TUBE: 8'-10'	ST-13
(2) SILTY CLAY: 10'-11.5'	Light gray-green, Very firm, 10'-11.5'
(6) LS MARL: 11.5'-12'	white, moderate sand, brittle, sharp, limestone fragments, 11'-12'
(7) LIMESTONE: hard, 12'-13.9'	lost circulation at 13.9'
(6) LS MARL: 14'-16'	White, Moderate sand, Large amount of hard limestone and chert fragments, 14'-16'

N:\HYDRO\LARKIN\boring logs\B-20.CDR

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DADE CITY, FLORIDA

FIGURE 6

B-21

(SPT Boring)

PROJECT

NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING

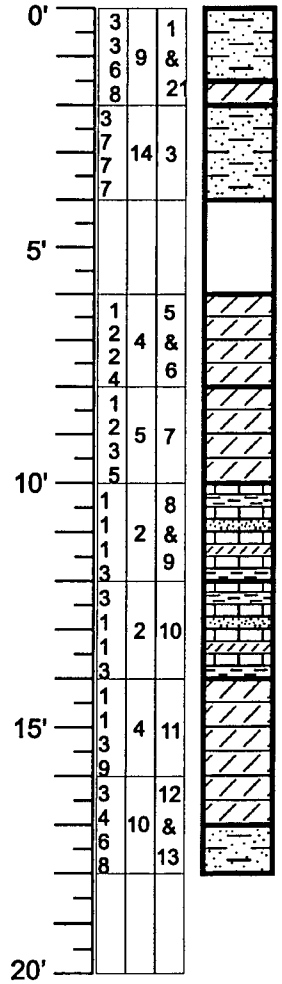
GR. ELEV: 75.27' NGVD
DIA-TYPE: 3 3/4"-Mud Rotary
DEPTH: 18' BLS
DATE STARTED: 8-26-03
DATE ENDED: 8-26-03

DRILLING

RIG TYPE: CME 45
CREW: Amdrill

LEGEND

(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Depth (ft BLS)	Soil Description	Remarks
0'	(4) CLAYEY SAND: 0'-1.5'	Light gray & Orange, Fine to silt, Firm to Very firm, 0'-1.5'
	(2) SILTY CLAY: 1.5'-2'	
	(4) CLAYEY SAND: 2'-4'	Light gray, Firm, Fe-cemented nodules (1-2 cm) from 2'-3'
5'	SHELBY TUBE: 4'-6'	ST-14
	(4) CLAYEY SAND: 6'-7'	Light gray, Fine to Silt, Semi firm to Firm, 6'-7'
	(2) SILTY CLAY: 7'-8'	Light gray, Firm, 8'-11'
	(2) SILTY CLAY: 8'-10'	~10-25% limestone fragments (<1-3 cm), 8'-10'
10'	(2) SILTY CLAY: 10'-11'	
	(6) LS MARL: White, Moderate sand 11'-12'	White, Moderate sand, ~10-3.5% limestone fragments (<1-5 cm), 12'-14'
	(6) LS MARL: 12'-14'	
15'	(2) SILTY CLAY: 14'-17'	White, Semi firm 14'-17'
	(4) CLAYEY SAND: 17'-18'	White, Medium to silt, Soft, ~10-20% limestone fragments (1-3 cm), 17'-18'
20'		

N:\HYDRO\LARKIN\boring logs\B-21.CDR

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DADE CITY, FLORIDA

FIGURE 7

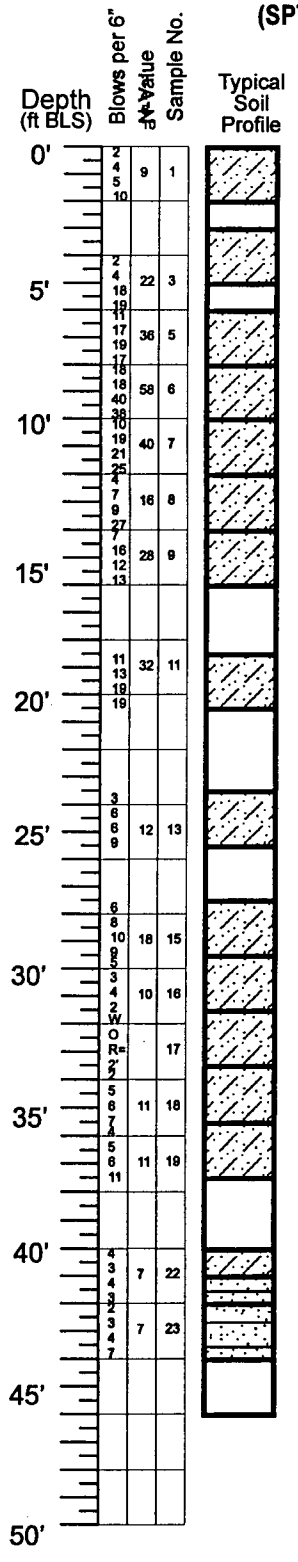
B-22
(SPT Boring)

PROJECT
NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING
GR. ELEV: 75.18' NGVD
DIA-TYPE: 3 3/4"-Mud Rotary
DEPTH: 46' BLS
DATE STARTED: 8-26-03
DATE ENDED: 8-26-03

DRILLING
RIG TYPE: CME 45
CREW: Amdrill

LEGEND
(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(5) SILTY SAND:	Tan-brown, Fine to Silt, Semi firm to Firm, 0'-2'
SHELBY TUBE: failed attempt 2'-3'	
(5) SILTY SAND: 3'-5'	Orange-brown, Tan, Fine to Silt, Firm, 3'-5'
ROTARY WASH: 5'-6'	Orange-brown, Tan, Fine to Silt, Firm, 6'-12'
(5)SILTY SAND: 6'-16'	small limestone fragments (<1 cm), 8.5'-9'
	Tan-orange, Semi firm to Firm, very small limestone fragments (<1 cm), 12'-14.5'
ROTARY WASH: 16'-18.5'	
(5)SILTY SAND: 18.5'-20.5'	very small limestone fragments (<1 cm), 19.5'-20'
ROTARY WASH: 20.5'-23.5'	
(5) SILTY SAND: 23.5'-25.5'	increase in clay from 25'-25.5'
SHELBY TUBE: 25.5'-27.5'	ST-15
(5) SILTY SAND: 27.5'-37.5'	Orange, Fine to Silt, Firm, 27.5'-33.5'
	Orange rust, Fine to Silt, Firm, 33.5'-41'
ROTARY WASH: 37.5'-40'	
(5) SILTY SAND: 40'-41"	Orange-tan, Very firm 41'-44'
(1) SANDY CLAY: 41'-42'	
(1) SANDY CLAY: 42'-44'	only ~1.25' recovery from shelby tube
SHELBY TUBE: 44'-46'	ST-16

N:\HYDRO\LARKIN\boring logs\B-22.CDR

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FIGURE 8

B-23

(SPT Boring)

PROJECT

NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING

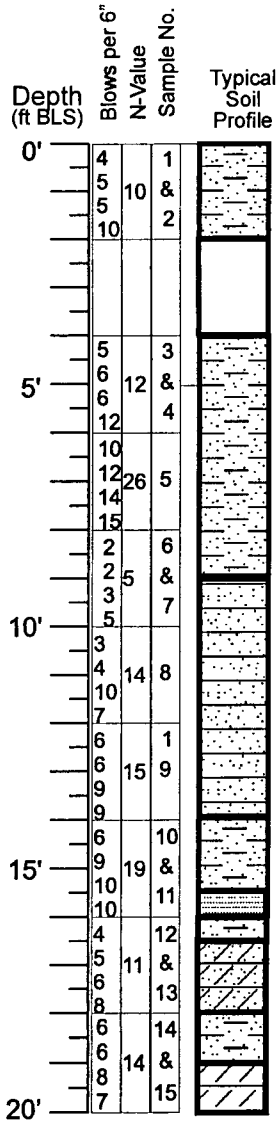
GR. ELEV: 75.00' NGVD
DIA-TYPE: 3 3/4"-Mud Rotary
DEPTH: 20' BLS
DATE STARTED: 8-26-03
DATE ENDED: 8-26-03

DRILLING

RIG TYPE: CME 45
CREW: Amdrill

LEGEND

(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(4) CLAYEY SAND: 0'-2'	White, Fine to silt, Semi firm to Firm, High sand content 0'-1'
SHELBY TUBE: 2'-4'	ST-17
(4) CLAYEY SAND 4'-9' :	White, Tan-orange, Medium to Silt, Firm to Very firm, 4'-9'
(1) SANDY CLAY: 9'-14'	Light-tan, Orange, Extremely firm, 9'-14'
:	Limestone fragments (~1-2 cm), 11.75'-12'
(4) CLAYEY SAND: 14'-15.5'	Limestone fragments (~1-2 cm), 12'-13.5'
(3) CLAY: 15.5'-16'	Tan-orange, Light gray, Soft to Firm, 14'-15.5'
(4) CLAYEY SAND: 16'-16.5'	Limestone fragments (~1-3 cm), 17'-18'
(2) SILTY CLAY: 16.5'-18'	
(4) CLAYEY SAND: 18'-19'	White, Tan-orange, Black, Very firm, 19'-20'
(2) SILTY CLAY: 19'-20'	

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FIGURE 9

B-24

(SPT Boring)

PROJECT

NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING

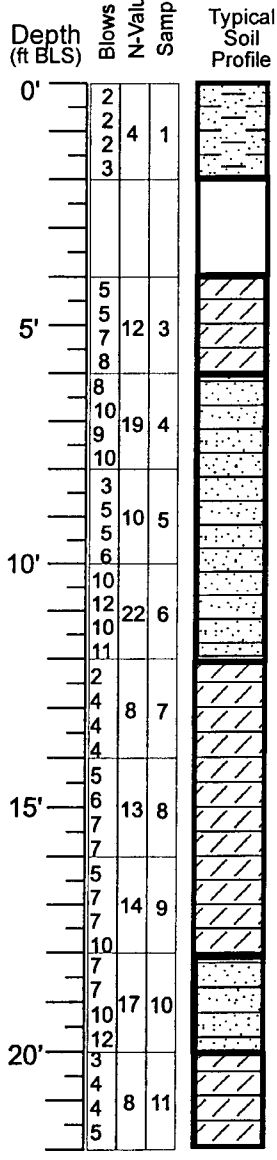
GR. ELEV: 75.19' NGVD
DIA-TYPE: 3 3/4"-Mud Rotary
DEPTH: 22' BLS
DATE STARTED: 8-27-03
DATE ENDED: 8-27-03

DRILLING

RIG TYPE: CME 45
CREW: Amdrill

LEGEND

(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(2) SILTY CLAY: 0'-2'	Light gray, Light orange, Firm to Extremely firm, 0'-2'
SHELBY TUBE: 2'-4'	ST-18
(2) SILTY CLAY: 4'-6'	Light gray, Light orange, Extremely firm, ~10-25% limestone fragments (~1-2 cm), 4'-6'
(1) SANDY CLAY: 6'-12'	Light gray, Light orange, Very firm, 6'-12'
	Dark Rust (Fe) mottling from 10.5'-12'
(2) SILTY CLAY: 12'-18'	Light gray, Light orange-rust, Very firm, 12'-18'
	~5-10% limestone fragments (1-2 cm), 12.5'-16'
(1) SANDY CLAY: 18'-20'	Light tan, Orange, Dark rust, Extremely firm, ~5-10% limestone fragments (1-2 cm), 18'-20'
(2) SILTY CLAY: 20'-22'	Tan-orange, Tan, Firm to Very firm, 20'-22'

N:\HYDRO\LARKIN\boring logs\B-24.CDR

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DADE CITY, FLORIDA

FIGURE 10

B-25

(SPT Boring)

PROJECT

NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING

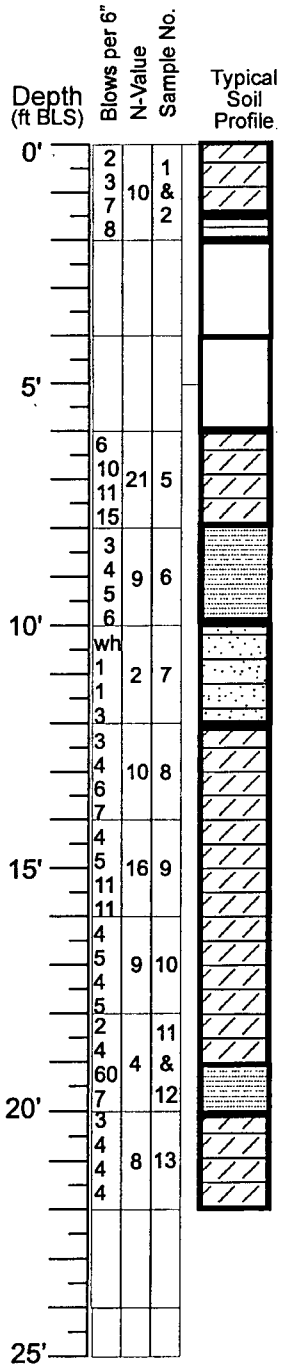
GR. ELEV: 75.62' NGVD
DIA-TYPE: 3 3/4"-Mud Rotary
DEPTH: 22' BLS
DATE STARTED: 8-27-03
DATE ENDED: 8-27-03

DRILLING

RIG TYPE: CME 45
CREW: Amdrill

LEGEND

(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(2) SILTY CLAY: 0'-1.5' (3) CLAY: 1.5'-2'	Light gray, Light orange, Very Firm to Extremely firm, Limestone fragments ~(1-2cm), 0'-1.5'
FAILED SHELBY TUBE: 2'-4'	Light gray, Extremely firm 1.5'-2'
SHELBY TUBE: 4'-6'	ST-19
(2) SILTY CLAY: 6'-8'	Light tan, Light orange, Light gray, Very Firm to Extremely firm 6'-8'
(3) CLAY: 8'-10'	Light tan, Orange, Extremely firm 8'-10'
(1) SANDY CLAY: 10'-12'	Orange, Tan, Fine sand, Very firm, 8'-10'
	Light Orange, Semi firm to Extremely firm, 12'-19'
(2) SILTY CLAY: 12'-19'	~5-10% limestone fragments (>2 cm), 14.5'-15.5'
(3) CLAY: 19'-20'	~5-10% limestone fragments (>1-3 cm), 17'-18' Light Gray, Extremely firm 19'-20'
(2) SILTY CLAY: 20'-22'	Light gray-green, Light orange, Very firm 20'-22'

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DADE CITY, FLORIDA

FIGURE 11

B-26
(SPT Boring)

PROJECT

NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING

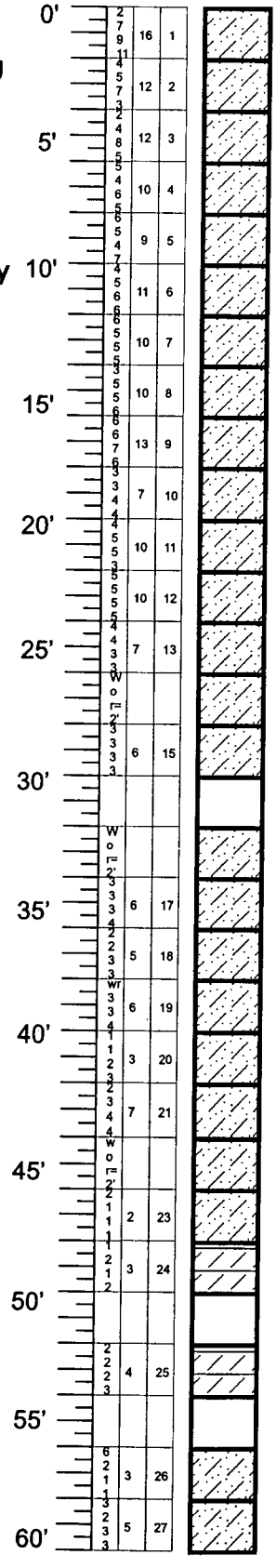
GR. ELEV: 75.00' NGVD
DIA-TYPE: 3 3/4"-Mud Rotary
DEPTH: 60' BLS
DATE STARTED: 8-28-03
DATE ENDED: 8-28-03

DRILLING

RIG TYPE: CME 45
CREW: Amdrill

LEGEND

(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(5) SILTY SAND: 0'-30'	Tan-orange, Medium to silt, Well sorted, Semi-firm 0'-2'
	Tan to light gray, Fine to silt, Soft, Small amount of clay (interstitial) 2'-8'
	Gray, Fine to silt, Soft, Clay (interstitial) 8'-18'
	Dark orange-tan 18'-26'
	Light orange-tan & Light gray, Fine to silt, Semi firm, Moderate clay 26'-32'
SHELBY TUBE: failed attempt, 30'-32'	
(5) SILTY SAND: 32'-48'	Small increase in clay, Fe-cemented sandstones, ~ 4 cm 36.5'-37.5'
	Tan-orange, Fine to silt, Soft to semi-firm 40'-48'
	Only ~10" recovery 44'-46'
(2) SILTY CLAY:	Yellow-tan, Firm to Very firm 48'-50'
SHELBY TUBE: Failed attempt, 50'-52'	
(2) SILTY CLAY:	Yellow-tan, Semi-firm to Very firm 52'-54'
SHELBY TUBE: Failed attempt, 54'-56'	
(5) SILTY SAND:	Light gray and Tan-orange, Medium to silt, Soft 56'-60'
(5) SILTY SAND:	Increase in clay 59.5'-60'

N:\HYDRO\LARKIN\boring logs\B-26.CDR

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DADE CITY, FLORIDA

FIGURE 12

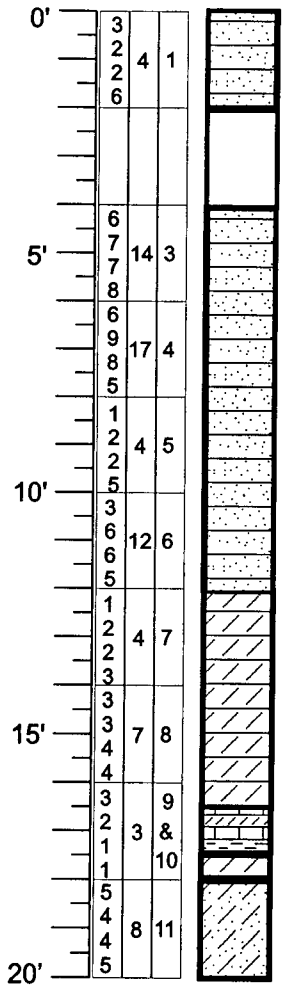
B-27
(SPT Boring)

PROJECT
NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING
GR. ELEV: 75.89' NGVD
DIA-TYPE: 3 3/4"-Mud Rotary
DEPTH: 20' BLS
DATE STARTED: 8-29-03
DATE ENDED: 8-29-03

DRILLING
RIG TYPE: CME 45
CREW: Amdrill

LEGEND
(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Depth (ft BLS)	Soil Description	Remarks
0'	(1) SANDY CLAY: 0'-2'	Light orange, Moderate sand, Very firm, ~10% limestone fragments (~1-2 cm), 1'-2'
	SHELBY TUBE: 2'-4'	ST-20
5'	(1) SANDY CLAY: 4'-12'	Light gray, Light orange, Extremely firm to Semi firm 4'-12' ~30% limestone fragments (~1-3 cm), 4'-5' ~10-20% limestone fragments (~1-3 cm) 6'-8'
10'	(2) SILTY CLAY: 12'-16.5'	Tan-orange, Light gray, Semi firm to Very firm 12'-16.5' ~5-10% limestone fragments (>2 cm), 14.5'-15.5'
15'	(6) LS MARL: 16.5'-17.5' (2) SILTY CLAY: 17.5'-18'	~5-10% limestone fragments (>1-3 cm), 17'-18'
20'	(5) SILTY SAND: 18'-20'	~20-30% limestone fragments (>1-3 cm), 18'-20'

N:\HYDRO\LARKIN\boring logs\B-27.CDR

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DADE CITY, FLORIDA

FIGURE 13

B-28

(SPT Boring)

PROJECT

NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING

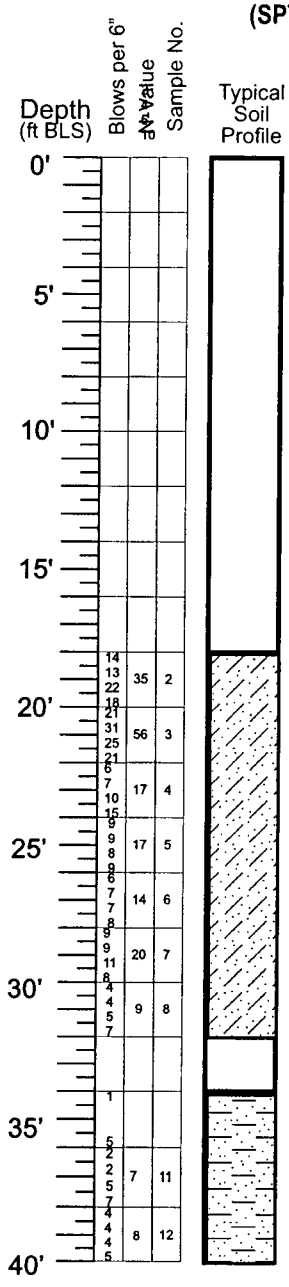
GR. ELEV: 96' NGVD
DIA-TYPE: 3 3/4"-Mud Rotary
DEPTH: 40' BLS
DATE STARTED: 8-29-03
DATE ENDED: 8-29-03

DRILLING

RIG TYPE: CME 45
CREW: Amdrill

LEGEND

(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
ROTARY WASH: 0'-18'	
	Dark tan-rust, Firm to very firm, 18'-22'
	Light gray, Dark rust, Firm to very firm 22'-32'
(5) SILTY SAND: 18'-32'	Small limestone fragments (~1-2 cm), 18'-28'
	Fe-Nodules 30'-32'
SHELBY TUBE: 32'-34'	ST-21
(1) CLAYEY SAND: 34'-40'	Light gray, Light orange, Fine to silt, Very firm 34'-40'

N:\HYDRO\LARKIN\boring logs\B-28.CDR

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DADE CITY, FLORIDA

FIGURE 14

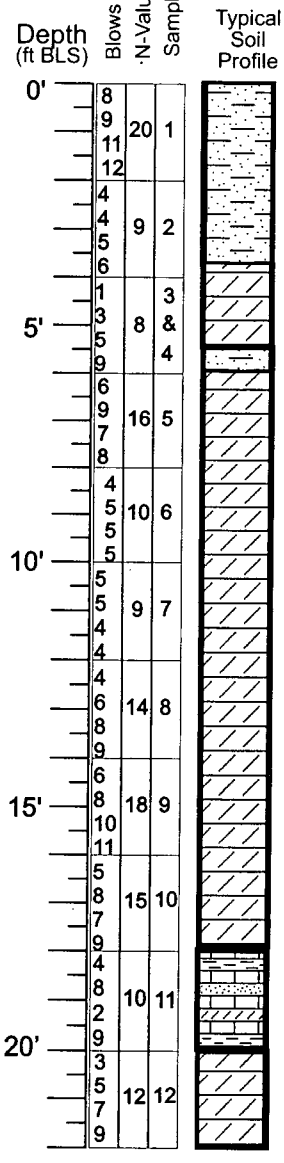
B-29
(SPT Boring)

PROJECT
NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING
GR. ELEV: 74.97' NGVD
DIA-TYPE: 3 3/4"-Mud Rotary
DEPTH: 22' BLS
DATE STARTED: 8-29-03
DATE ENDED: 9-2-03

DRILLING
RIG TYPE: CME 45
CREW: Amdrill

LEGEND
(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(4) CLAYEY SAND: 0'-3.75' :	Light gray, Light orange, Very firm to extremely firm 0'-3.75'
	~5-15% limestone fragments (<1 cm) 0.5'-2'
(2) SILTY CLAY: 3.75'-5.5'	~5-15% limestone fragments (~1-3 cm) 2'-5.5'
(4) CLAYEY SAND: 5.5'-6'	Light gray, Moderate sand, Very firm 5.5'-6
	~10-20% limestone fragments (~1-2 cm) 5.5'-10'
(2) SILTY CLAY: 6'-18'	Light gray-light green, Semi to Very firm 6'-18'
	~5-10% limestone fragments (>1-2 cm), 15'-15.5'
	White, Large amount of limestone fragments 18'-20'
(6) LS MARL: 18'-20'	~15-40% limestone fragments (>1-4 cm), 15.5'-19'
	Lost Circulation @ 19'
(2) SILTY CLAY: 20'-22'	White, Soft to firm 20'-22'

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DADE CITY, FLORIDA

FIGURE 15

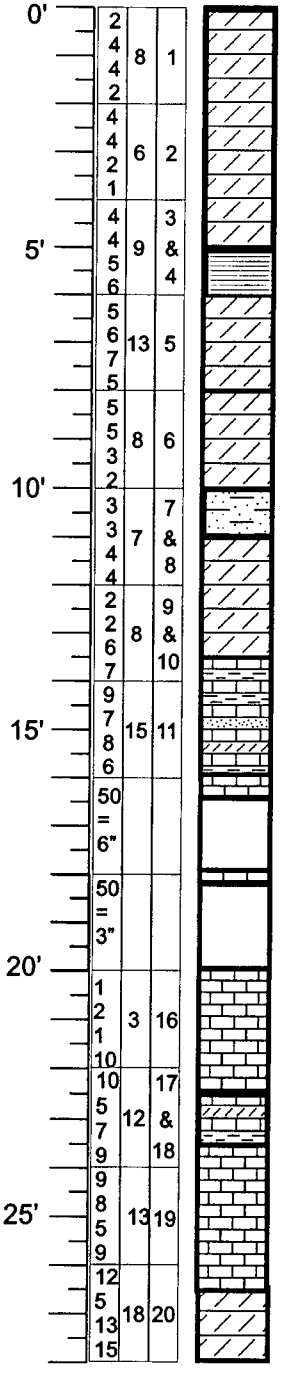
B-30
(SPT Boring)

PROJECT
NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING
GR. ELEV: 75.12' NGVD
DIA-TYPE: 3 3/4"-Mud Rotary
DEPTH: 28' BLS
DATE STARTED: 9-2-03
DATE ENDED: 9-2-03

DRILLING
RIG TYPE: CME 45
CREW: Amdrill

LEGEND
(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(2) SILTY CLAY: 0'-5'	Light gray & orange (mottled), Firm to extremely firm, ~ 5-15% limerock fragments, (<1 cm), 0.5'-5'
(3) CLAY: 5'-6'	Light gray/light green, Very firm, Minor sand 5'-6'
(2) SILTY CLAY: 6-10'	Light gray/light green & orange (mottled), Very firm 6'-10' ~ 10 % limestone fragments, (<1-2 cm) 6.25'-10'
(4) CLAYEY SAND: 10'-11'	Light tan-gray & tan- orange (mottled), Fine sand, Firm, Fe-nodules ~1 cm, 10'-11'
(2) SILTY CLAY: 11'-13.5'	
(6) LS MARL: 13.5'-16'	Light gray & light orange, Very firm 11'-12'
(7) LIMESTONE: 16'-16.5'	
Rotary Wash 16.5'-18'	Light tan, Soft, ~ 30-40 % limestone fragments 16'-22'
(7) LIMESTONE: 18'-18.25'	
Rotary Wash 18.25'-20'	
(7) LIMESTONE: 20'-22.5'	Hard limestone at 22' bls
(6) LS MARL: 22.5'-23.5'	Light tan, Soft, ~ 30-40 % limestone fragments (<1-3 cm), 22.5'-23.5'
(7) LIMESTONE: 23.5'-26.5'	
(2) SILTY CLAY: 26.5'-28'	White, Soft, ~ 30-50 % limestone fragments (~1-4 cm), 26.5'-28'

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FIGURE 16

B-31
(SPT Boring)

PROJECT

NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING

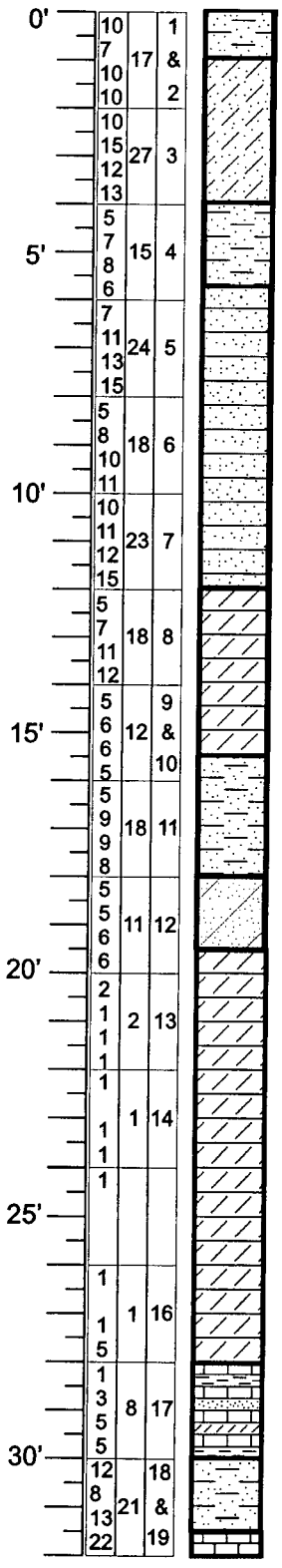
GR. ELEV: 75.02' NGVD
DIA-TYPE: 3 3/4"-Mud Rotary
DEPTH: 32' BLS
DATE STARTED: 9-2-03
DATE ENDED: 9-2-03

DRILLING

RIG TYPE: CME 45
CREW: Amdrill

LEGEND

(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(4) CLAYEY SAND: 0'-1'	~5-10% limestone fragments (<1-2 cm), 0.5'-2'
(5) SILTY SAND: 1'-4'	Orange-tan, Firm 1'-4'
(4) CLAYEY SAND: 4'-5.75'	Light orange, Light gray, Moderate sand, Very firm, Increase in Clay 4'-5.75'
	Light orange, Light gray, Very firm 5.75'-12'
(1) SANDY CLAY : 5.75'-12'	Light gray, Orange, Very firm 12'-18'
(2) SILTY CLAY: 12'-15.5'	Fe-Hp nodules limestone fragments (~1 cm) 10.5'-11.5'
	~5-10% limestone fragments (<1-2 cm), 12.5'-13.5'
(4) CLAYEY SAND: 15.5'-18'	~5% limestone fragments (<1 cm), 15.'-15.5'
	Increase in Sand 17'-17.5'
(5) SILTY SAND: 18'-19.5'	Dark rust, Fine to silt, soft 18'-19.5'
	Light tan to White, Semi firm to soft 19.5'-28'
(2) SILTY CLAY: 19.5'-28'	~5% limestone fragments (~0.5 cm), 20.'-24'
	~5-20% limestone fragments (<1 cm), 24.'-26'
	Lost Circulation @28'
(6) LS MARL: 28'-30'	White, Large amount of hard limestone fragments 28'-30'
(4) CLAYEY SAND: 30'-31.5'	

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FIGURE 17

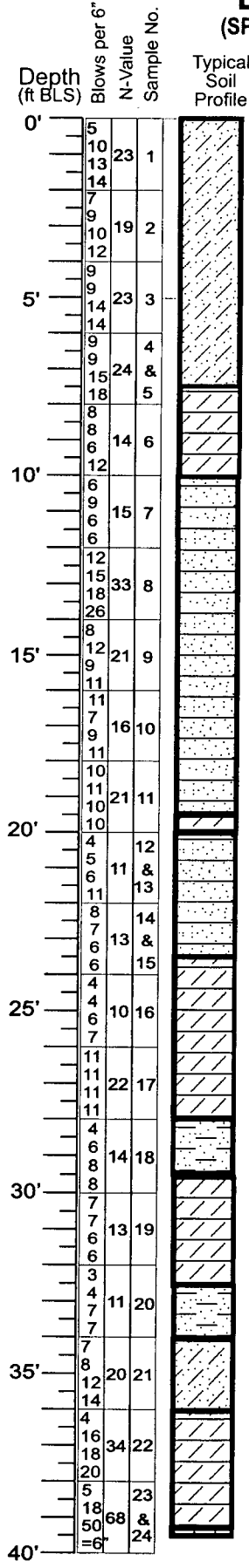
B-32
(SPT Boring)

PROJECT
NUMBER: 99.0331.007
NAME: Enterprise Recyling & Disposal Facility
LOCATION: Dade City, FL

BORING
GR. ELEV: 75.05' NGVD
DIA-TYPE: 3 3/4"-Mud Rotary
DEPTH: 39.5' BLS
DATE STARTED: 9-3-03
DATE ENDED: 9-3-03

DRILLING
RIG TYPE: CME 45
CREW: Amdrill

LEGEND
(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(5) SILTY SAND: 0'-7.5'	Tan-orange, Light brown, Fine to silt, Soft to Very firm 0'-7.5' Large Amount of Clay 6.5'-7.5'
(2) SILTY CLAY: 7.5'-10'	Tan, Light orange, Very firm 7.5'-10'
	Light Tan, Light orange, Very firm 10'-14' Fe-Hardpan fragments 8.5'-17'
(1) SANDY CLAY : 10'-19.5'	Light gray, Moderate sand, Very firm 14'-19.5' ~5-10% limestone fragments (<1-2 cm), 16.5'-22'
(2) SILTY CLAY: 19.5'-20'	Light Tan, Light orange, Very firm
(1) SANDY CLAY : 20'-23.5'	20'-23.5'
(2) SILTY CLAY: 23.5'-28'	Light gray, Orange, Very firm, ~5-10% limestone fragments (~1-2 cm), 23.5.'-28'
(4) CLAYEY SAND: 28'-29.5'	Tan, Light gray, Orange, Very firm, ~1-5% limestone fragments (<1 cm), 29'-32.5'
(2) SILTY CLAY: 29.5'-32.5'	
(4) CLAYEY SAND: 32.5'-34'	Light gray, Tan, Orange, Moderate sand, Very firm 32.5'-34'
(5) SILTY SAND: 34'-36'	Light gray, Orange, Light brown, Medium to silt, Soft to firm 34'-36'
(2) SILTY CLAY: 36'-39.25'	White, Semi firm to firm, ~5-25% limestone fragments (<1-4 cm), 36'-39.5'
(7) LIMESTONE: 39.25'-39.5'	

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FIGURE 18

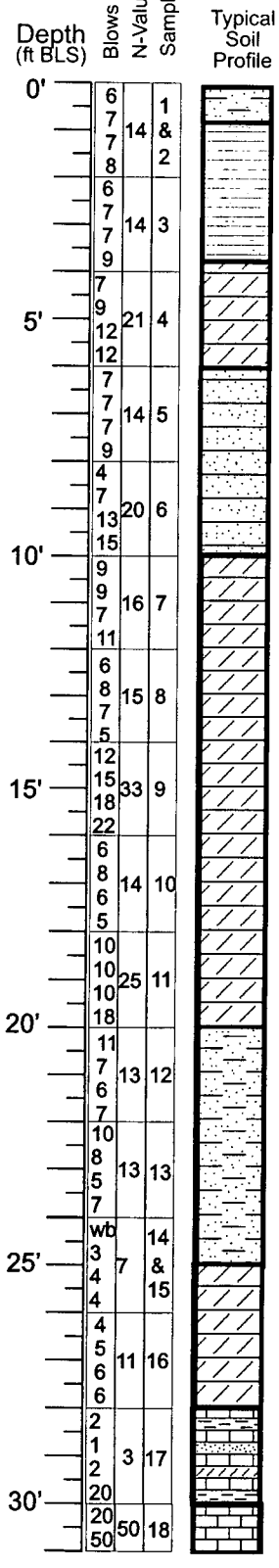
B-33
(SPT Boring)

PROJECT
NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING
GR. ELEV: 75.51' NGVD
DIA-TYPE: 3 3/4"-Mud Rotary
DEPTH: 31' BLS
DATE STARTED: 9-4-03
DATE ENDED: 9-4-03

DRILLING
RIG TYPE: CME 45
CREW: Amdrill

LEGEND
(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(4) CLAYEY SAND: 0'-0.75'	Orange-light gray, Extremely firm 0-3.75'
(3) CLAY: 0.75'-3.75'	~5% limestone fragments (<0.5 cm), 1'-4.5'
(2) SILTY CLAY: 3.75'-6'	Orange, Light gray, Tan, Very firm 3.75'-6'
(1) SANDY CLAY : 6'-10'	Light gray-orange, Extremely firm 6'-10' ~5-10% limestone fragments (<1-2 cm), 9'-10'
(2) SILTY CLAY: 10'-20'	Orange, Light gray, Tan, (mottled) Extremely firm 10'-20' ~5-10% limestone fragments (<1-2 cm), 16'-17.5' Sm Increase in Fine Sand 18.5'-19.5' Light tan, Orange, Light gray, Very firm to firm 20'-25'
(4) CLAYEY SAND: 20'-25'	~5-10% limestone fragments (<1-2 cm), 20.5.'-21.5'
(2) SILTY CLAY: 25'-28'	Tan, Orange, Very firm, ~5-15% limestone fragments (<1-3 cm), 25'-28'
(6) LS MARL: 28'-30'	White, Soft, Moderate sand, ~20-40% limestone fragments (<1-4 cm), 28'-30'
(7) LIMESTONE: 30'-31'	White, Hard and brittle 30'-31'

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FIGURE 19

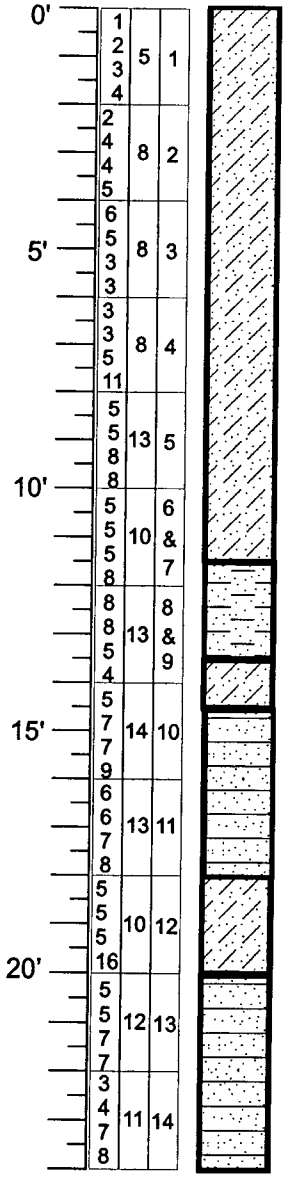
B-34
(SPT Boring)

PROJECT
NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING
GR. ELEV: 75.43' NGVD
DIA-TYPE: 3 3/4"-Mud Rotary
DEPTH: 24' BLS
DATE STARTED: 9-4-03
DATE ENDED: 9-4-03

DRILLING
RIG TYPE: CME 45
CREW: Amdrill

LEGEND
(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(5) SILTY SAND: 0'-11.5'	Tan-orange to Brown, Fine to silt, Soft to Very firm 0'-11.5'
	Fe-Hp nodules (~4 cm) 4'-6'
	~5-10% limestone fragments (<1-2 cm), 7'-10'
	Fe-Hp nodules limestone fragments (<1-2 cm) 10'
(4) CLAYEY SAND: 11.5'-13.5'	Light Tan, Orange, Semi firm to Very firm 11.5'-13.5'
(2) SILTY CLAY: 13.5'-14.5'	Orange, Light gray, Very firm 13.5'-14.5'
(1) SANDY CLAY: 14.5'-18'	Orange, Light gray, Tan, Very firm 14.5'-24'
(2) SILTY CLAY: 18'-20'	~5-15% limestone fragments (<1-3 cm), 16'-24'
(1) SANDY CLAY: 20'-24'	Dark Brown Zone ~23.5'

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FIGURE 20

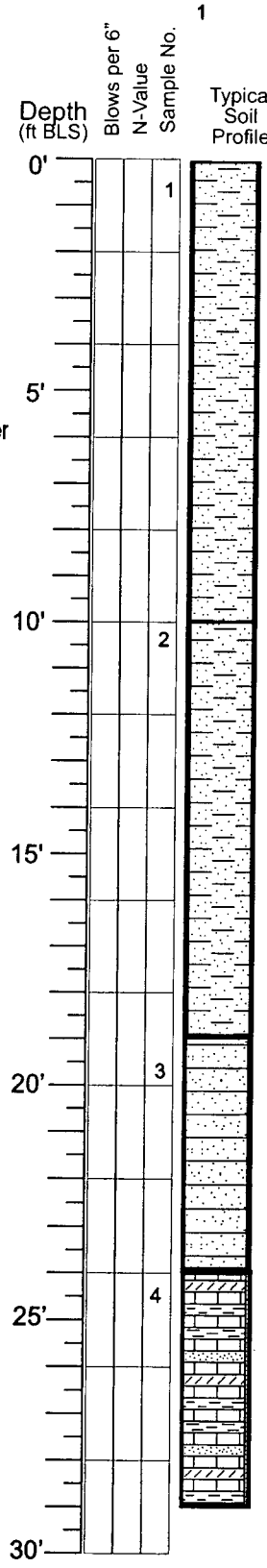
SSA-14
(Solid-stem Auger Boring)

PROJECT
NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING
GR. ELEV: 99' NGVD
DIA-TYPE: 3"-Solid Stem Auger
DEPTH: 29' BLS
DATE STARTED: 7-31-03
DATE ENDED: 7-31-03

DRILLING
RIG TYPE: CME 45
CREW: EDS

LEGEND
(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(4) CLAYEY SAND: Lt Brown 0'-10'	Fine to Silt, Semi-Firm to Firm
(4) CLAYEY SAND: Lt Brown 10'-19'	Fine to Silt, Firm to Very Firm
(1) SANDY CLAY: Gray 19'-24'	Mod Fine Sand, Firm to Soft, Limestone Fragments
(6) LS MARL: Lt Tan, Lt Gray 24'-29'	Clay with Limestone Fragments

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FIGURE 14

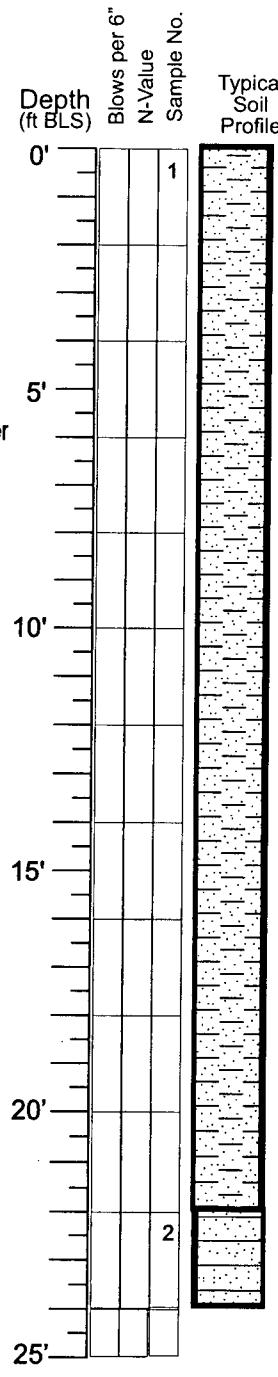
SSA-15
(Solid-stem Auger Boring)

PROJECT
NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING
GR. ELEV: 103' NGVD
DIA-TYPE: 3"-Solid Stem Auger
DEPTH: 24' BLS
DATE STARTED: 7-31-03
DATE ENDED: 7-31-03

DRILLING
RIG TYPE: CME 45
CREW: EDS

LEGEND
(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description

(4) CLAYEY SAND: Lt Tan- Orange 0'-22'

(1) SANDY CLAY: Lt Green-Gray 22'-24'

Remarks

Firm to Very-Firm, Limerock Fragments

Semi-Firm to Very-Firm, Limestone Fragments

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FIGURE 15

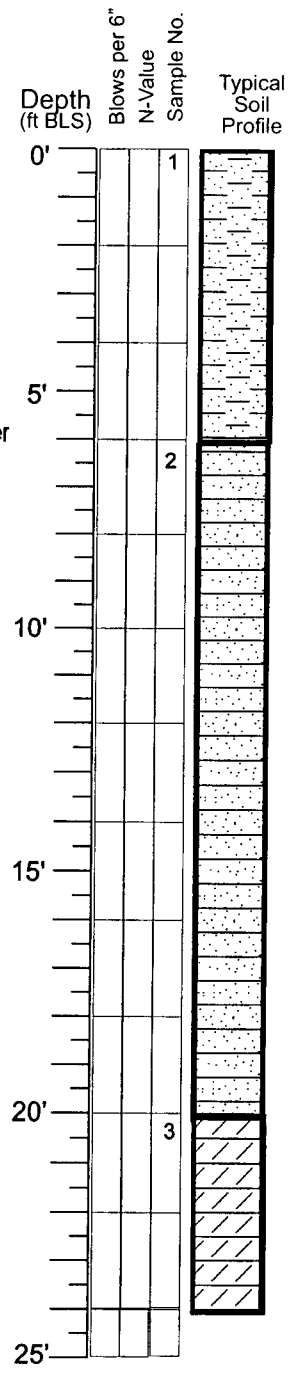
SSA-16
(Solid-stem Auger Boring)

PROJECT
NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING
GR. ELEV: 104' NGVD
DIA-TYPE: 3"-Solid Stem Auger
DEPTH: 24' BLS
DATE STARTED: 7-31-03
DATE ENDED: 7-31-03

DRILLING
RIG TYPE: CME 45
CREW: EDS

LEGEND
(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description

(4) CLAYEY SAND: Tan- Orange 0'-6'

(1) SANDY CLAY: Lt Tan-Orange (mottled) 6'-20

(2) SILTY CLAY: Gray-Green 20'-24'

Remarks

Fine to Silt, Very Firm

Fine to Silt, Very Firm

Sm Amt Sand, Extremely Firm

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FIGURE 16

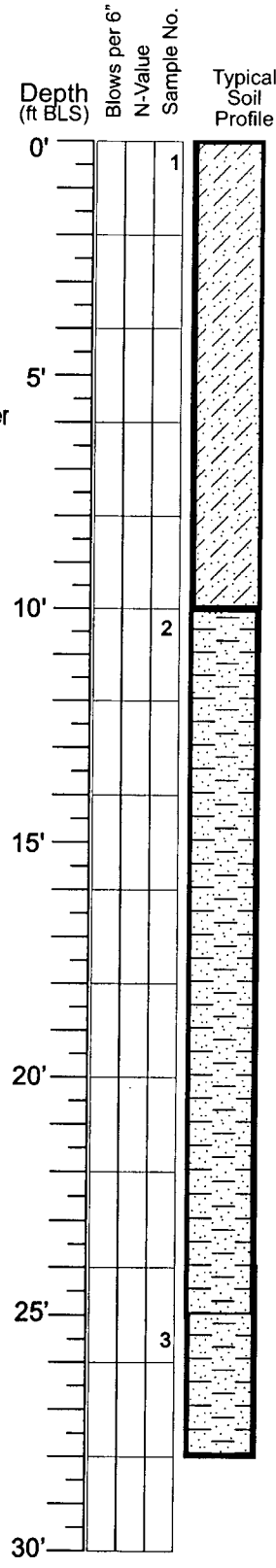
SSA-17
(Solid-stem Auger Boring)

PROJECT
NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING
GR. ELEV: 107' NGVD
DIA-TYPE: 3"-Solid Stem Auger
DEPTH: 29' BLS
DATE STARTED: 7-31-03
DATE ENDED: 7-31-03

DRILLING
RIG TYPE: CME 45
CREW: EDS

LEGEND
(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(5) SILTY SAND: Tan-Orange 0'-10'	Med to Very-Fine, Soft
(4) CLAYEY SAND: Brown-Orange 10'-25'	Fine to Silt, Soft to Semi-Firm
(4) CLAYEY SAND: Gray 25'-29'	Fine to Silt, Soft to Semi-Firm Limestone Fragments

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DADE CITY, FLORIDA

FIGURE 17

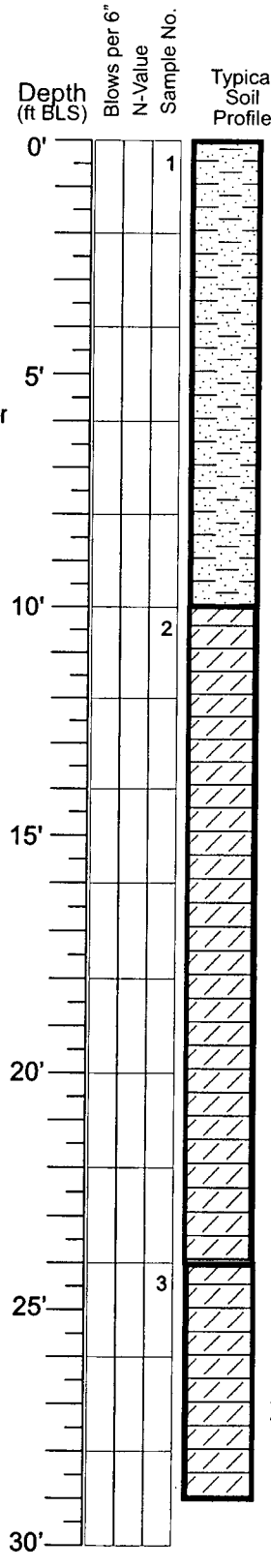
SSA-18
(Solid-stem Auger Boring)

PROJECT
NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING
GR. ELEV: 108' NGVD
DIA-TYPE: 3"-Solid Stem Auger
DEPTH: 29' BLS
DATE STARTED: 7-31-03
DATE ENDED: 7-31-03

DRILLING
RIG TYPE: CME 45
CREW: EDS

LEGEND
(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(4) CLAYEY SAND: Tan-Orange 0'-10'	Fine to Very-Fine, Soft
(2) SILTY CLAY: Lt. Tan, Lt. Orange 10'-24'	Very-Fine to Silt, Very-Firm
(2) SILTY CLAY: Lt Tan, Lt Orange 24'-29'	Very-Firm

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FIGURE 18

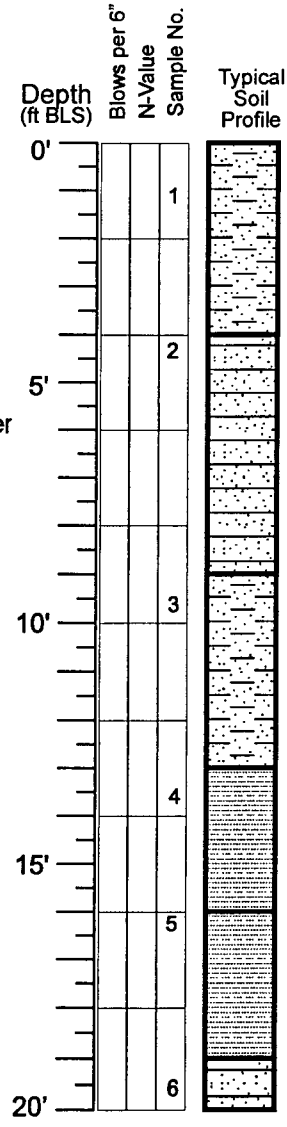
SSA-19
(Solid-stem Auger Boring)

PROJECT
NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING
GR. ELEV: 84.89' NGVD
DIA-TYPE: 3"-Solid Stem Auger
DEPTH: 20' BLS
DATE STARTED: 8-23-03
DATE ENDED: 8-23-03

DRILLING
RIG TYPE: CME 45
CREW: Amdrill

LEGEND
(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(4) CLAYEY SAND: medium yellow brown 0'-4'	
(1) SANDY CLAY: Tan ,Yellow-Brown 4'-9'	
(4) CLAYEY SAND: Light gray to red brown 9'-13'	(mottled)
(3) CLAY: Light brown, 13'-16'	slightly sandy
(3) CLAY: Light brown 16'-19',	slightly sandy limerock fragments (<2 cm)
(1) SANDY CLAY: Light gray 19'-20'	

N:\HYDRO\LARKIN\boring logs\SSA-19.CDR

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FIGURE 19

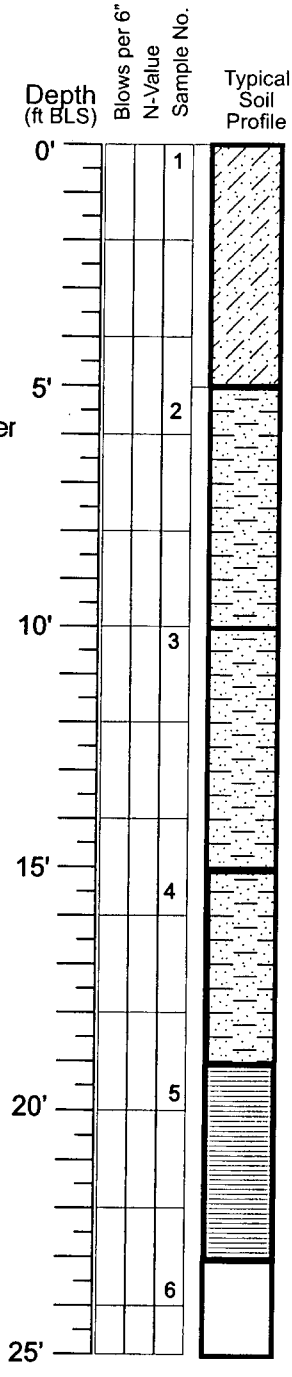
SSA-20
(Solid-stem Auger Boring)

PROJECT
NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING
GR. ELEV: 84.43' NGVD
DIA-TYPE: 3"-Solid Stem Auger
DEPTH: 25' BLS
DATE STARTED: 8-23-03
DATE ENDED: 8-23-03

DRILLING
RIG TYPE: CME 45
CREW: Amdrill

LEGEND
(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description

(5) SILTY SAND:
Red-Brown
0'-5'

(4) CLAYEY SAND:
Light red brown
5'-10'

(4) CLAYEY SAND:
Light red brown
10'-15'

(4) CLAYEY SAND:
Light red brown
15'-19'

(3) CLAY:
Light gray,
minor sand
19'-23'

SHELBY TUBE:
failed (too soft)
23'-25'

Remarks

N:\HYDRO\LARKIN\boring logs\SSA-20.CDR

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FIGURE 20

SSA-21

(Solid-stem Auger Boring)

PROJECT

NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING

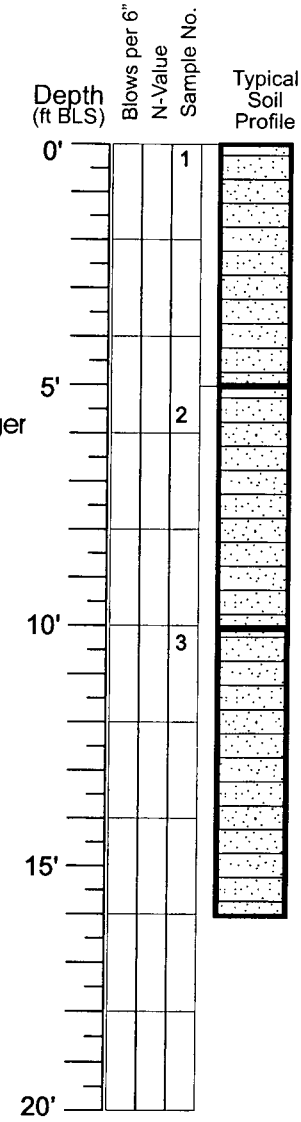
GR. ELEV: 82.77' NGVD
DIA-TYPE: 3"-Solid Stem Auger
DEPTH: 16' BLS
DATE STARTED: 8-23-03
DATE ENDED: 8-23-03

DRILLING

RIG TYPE: CME 45
CREW: Amdrill

LEGEND

(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(1) SANDY CLAY: yellow brown 0'-5'	
(1) SANDY CLAY: yellow brown 5'-10'	Limestone fragments <2 cm
(1) SANDY CLAY: light brown tan 10'-16'	Limerock fragments <3 cm
	Hard Limestone at 16' bls

N:\HYDRO\LARKIN\boring logs\SSA-21.CDR

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FIGURE 21

SSA-22

(Solid-stem Auger Boring)

PROJECT

NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING

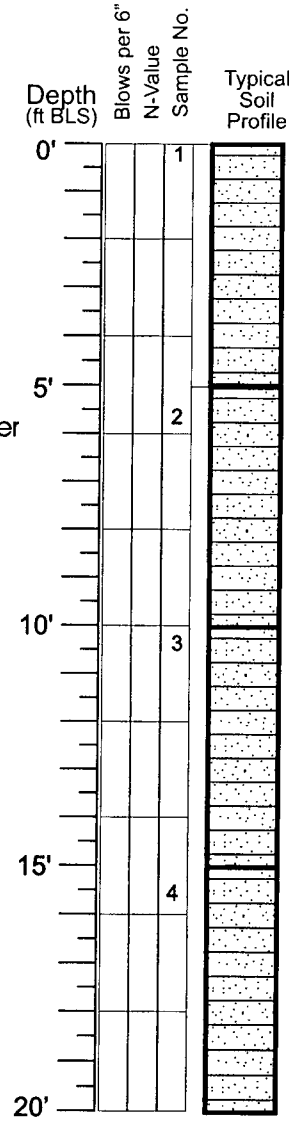
GR. ELEV: 82.26' NGVD
DIA-TYPE: 3"-Solid Stem Auger
DEPTH: 20' BLS
DATE STARTED: 8-23-03
DATE ENDED: 8-23-03

DRILLING

RIG TYPE: CME 45
CREW: Amdrill

LEGEND

(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(1) SANDY CLAY: 0'-5'	
(1) SANDY CLAY: 5'-10'	
(1) SANDY CLAY: 10'-15'	Small rock fragments <2 cm, Fe concretions
(1) SANDY CLAY: 15'-20'	Small rock fragments <2 cm, Fe-concretions

N:\HYDRO\LARKIN\boring logs\SSA-22.CDR

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FIGURE 22

SSA-23

(Solid-stem Auger Boring)

PROJECT

NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING

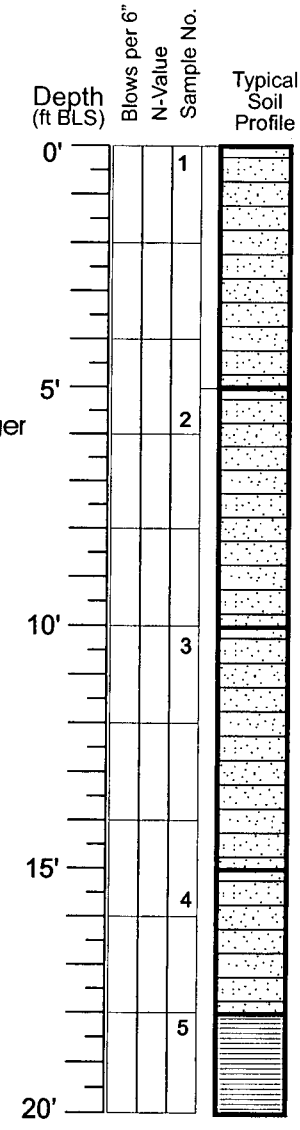
GR. ELEV: 80.70' NGVD
DIA-TYPE: 3"-Solid Stem Auger
DEPTH: 20' BLS
DATE STARTED: 8-23-03
DATE ENDED: 8-23-03

DRILLING

RIG TYPE: CME 45
CREW: Amdrill

LEGEND

(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(1) SANDY CLAY: 0'-5'	
(1) SANDY CLAY: 5'-10'	Small limestone or rock fragments < 1/2 cm
(1) SANDY CLAY: 10'-15'	Small limestone fragments < 1/2 cm
(1) SANDY CLAY: 15'-18'	Small limestone fragments < 2 cm
(3) CLAY: 18'-20'	Hard Limestone at 20' bls

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FIGURE 23

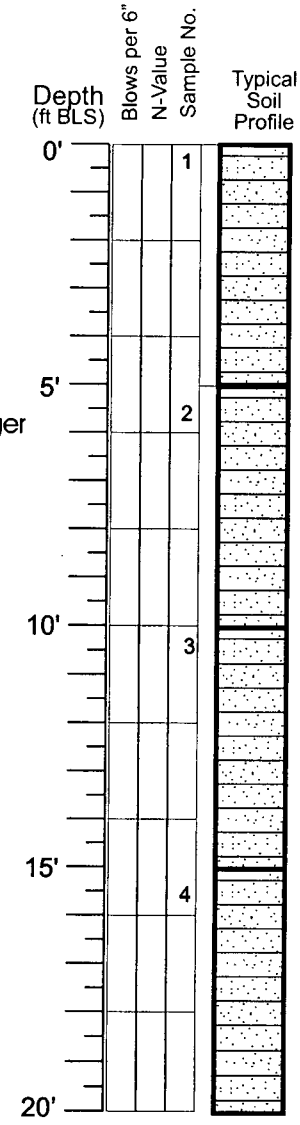
SSA-24
(Solid-stem Auger Boring)

PROJECT
NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING
GR. ELEV: 80.11' NGVD
DIA-TYPE: 3"-Solid Stem Auger
DEPTH: 20' BLS
DATE STARTED: 8-23-03
DATE ENDED: 8-23-03

DRILLING
RIG TYPE: CME 45
CREW: Amdrill

LEGEND
(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(1) SANDY CLAY: Light gray 0'-5'	
(1) SANDY CLAY: Light gray 5'-10'	
(1) SANDY CLAY: Light gray 10'-15'	Small limerock fragments
(1) SANDY CLAY: Light gray 15'-20'	Small limerock fragments

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FIGURE 24

SSA-25
(Solid-stem Auger Boring)

PROJECT

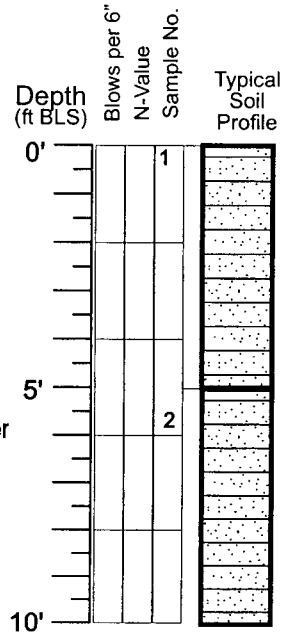
NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING

GR. ELEV: 75.25' NGVD
DIA-TYPE: 3"-Solid Stem Auger
DEPTH: 10' BLS
DATE STARTED: 9-3-03
DATE ENDED: 9-3-03

DRILLING

RIG TYPE: CME 45
CREW: Amdrill



Soil Description	Remarks
(1) SANDY CLAY: Light gray 0'-5'	Moderate sand, Extremely Firm
(1) SANDY CLAY: Light gray-Light green 5'-10'	Moderate sand, Extremely Firm

LEGEND

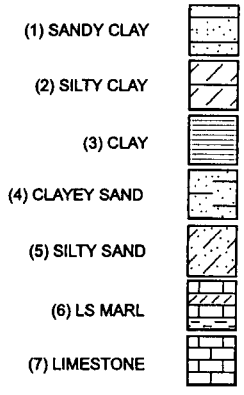


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FIGURE 25

SSA-26

(Solid-stem Auger Boring)

PROJECT

NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING

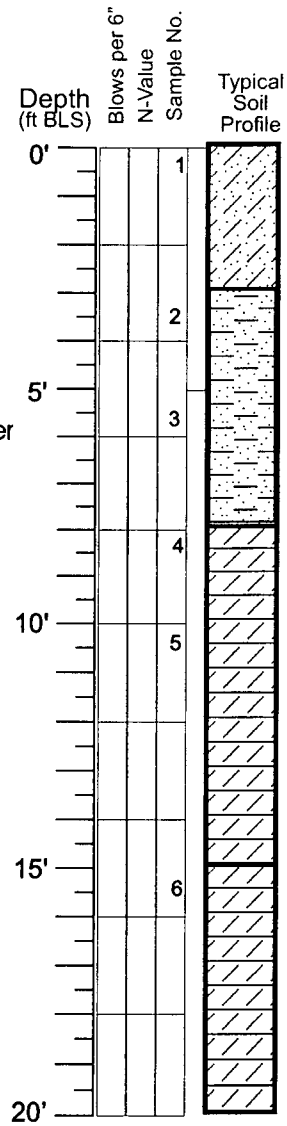
GR. ELEV: 75.01' NGVD
DIA-TYPE: 3"-Solid Stem Auger
DEPTH: 20' BLS
DATE STARTED: 9-3-03
DATE ENDED: 9-3-03

DRILLING

RIG TYPE: CME 45
CREW: Amdrill

LEGEND

(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(5) SILTY SAND: Dark gray 0'-3'	Medium to silt, Well sorted, Soft
(4) CLAYEY SAND: Tan-orange & Light gray 3'-8'	Fine to silt, Soft to Very-firm
(2) SILTY CLAY: Light gray & Tan-orange 8'-15'	Very firm,~15%-20% limerock fragments, <1 cm, 8'-15' bls
(2) SILTY CLAY: Tan-orange & Light gray 15'-20'	Firm to soft, ~10%-20% limerock fragments, <1 - 15 cm, 15'-20' bls

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FIGURE 26

SSA-27

(Solid-stem Auger Boring)

PROJECT

NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING

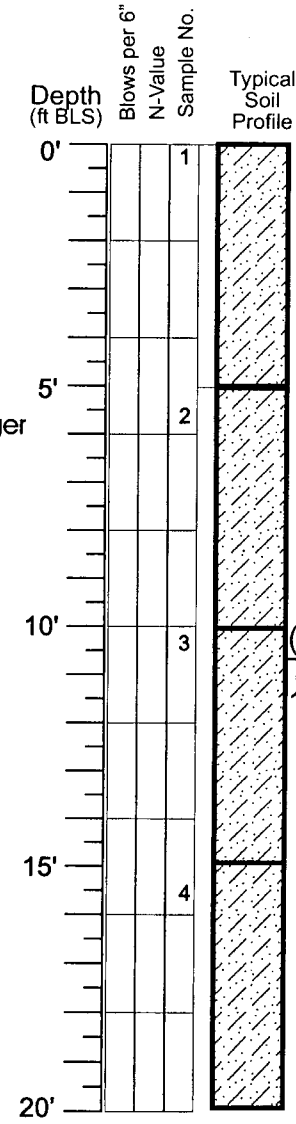
GR. ELEV: 74.79' NGVD
DIA-TYPE: 3"-Solid Stem Auger
DEPTH: 20' BLS
DATE STARTED: 9-3-03
DATE ENDED: 9-3-03

DRILLING

RIG TYPE: CME 45
CREW: Amdrill

LEGEND

(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(5) SILTY SAND: Tan-brown 0'-10'	Medium to silt, Well sorted, Soft, Small amount of clay (interstitial)
(5) SILTY SAND: Tan-brown 15'-20'	Medium to silt, Well sorted, Soft, Small increase in clay content from 10'-15'

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FIGURE 27

SSA-28

(Solid-stem Auger Boring)

PROJECT

NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING

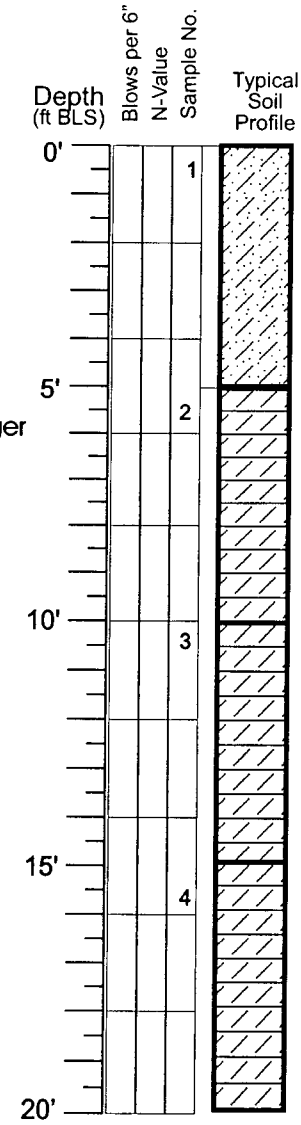
GR. ELEV: 75.07' NGVD
DIA-TYPE: 3"-Solid Stem Auger
DEPTH: 20' BLS
DATE STARTED: 9-3-03
DATE ENDED: 9-3-03

DRILLING

RIG TYPE: CME 45
CREW: Amdrill

LEGEND

(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(5) SILTY SAND: Gray and orange 0'-5'	Small iron nodules
(2) SILTY CLAY: Gray-white 5'-10'	Trace limestone fragments
(2) SILTY CLAY: Yellow-orange 10'-15'	Minor limestone fragments
(2) SILTY CLAY: Gray & yellow-orange 15'-20'	Limestone fragments

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FIGURE 28

SSA-29
(Solid-stem Auger Boring)

PROJECT

NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING

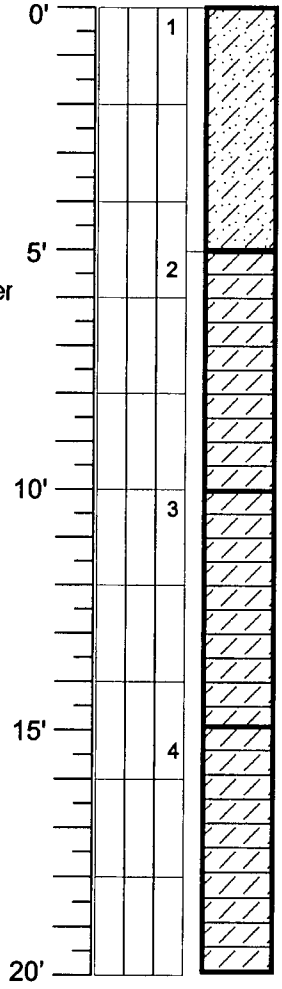
GR. ELEV: 76.77' NGVD
DIA-TYPE: 3"-Solid Stem Auger
DEPTH: 20' BLS
DATE STARTED: 9-3-03
DATE ENDED: 9-3-03

DRILLING

RIG TYPE: CME 45
CREW: Amdrill

LEGEND

(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(5) SILTY SAND: Gray & light brown 0'-5'	Medium to silt, Well Sorted, Soft, ~5% limerock fragments (1-4cm) from 0'-5'
(2) SILTY CLAY: Light gray & Light orange 5'-10'	Semi firm to Very firm 5'-10'
(2) SILTY CLAY: Light gray & Light orange 10'-15'	Very firm
(2) SILTY CLAY: Light gray & Light orange 15'-20'	Very firm

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FIGURE 29

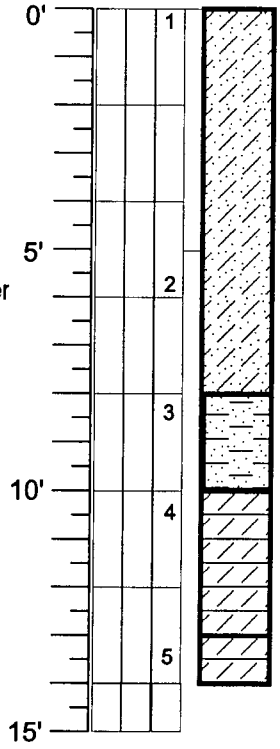
SSA-30
(Solid-stem Auger Boring)

PROJECT
NUMBER: 99.0331.007
NAME: Enterprise Disposal & Disposal Facility
LOCATION: Dade City, FL

BORING
GR. ELEV: 75.12' NGVD
DIA-TYPE: 3"-Solid Stem Auger
DEPTH: 14' BLS
DATE STARTED: 9-4-03
DATE ENDED: 9-4-03

DRILLING
RIG TYPE: CME 45
CREW: Amdrill

LEGEND
(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(1) SILTY CLAY: light gray & light orange, very firm to extremely firm 0'-8'	
(4) CLAYEY SAND: dark orange, firm, moderate sand 8'-10'	
(1) SILTY CLAY: orange, semi firm to firm10'-13'	~5%-10% limerock fragments (<0.5 cm) from 10'-14'
(1) SILTY CLAY: light gray, soft 13'-14'	Hard limerock at 14' bls

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FIGURE 30

SSA-31

(Solid-stem Auger Boring)

PROJECT

NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING

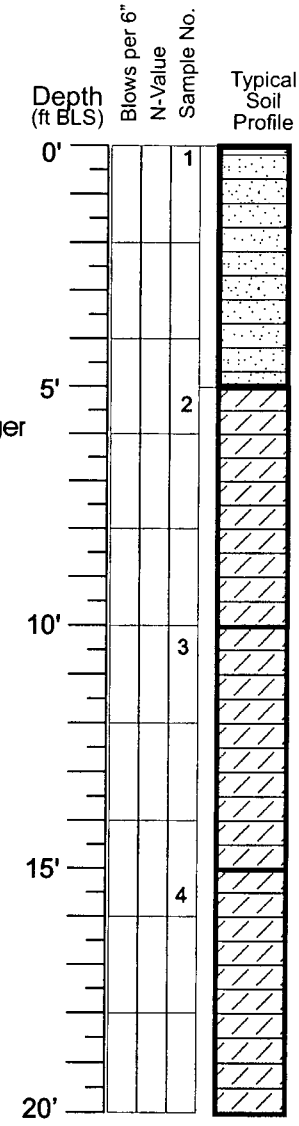
GR. ELEV: 75.53' NGVD
DIA-TYPE: 3"-Solid Stem Auger
DEPTH: 20' BLS
DATE STARTED: 9-3-03
DATE ENDED: 9-3-03

DRILLING

RIG TYPE: CME 45
CREW: Amdrill

LEGEND

(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(1) SANDY CLAY: Light gray to Orange 0'-5'	Medium to fine grain, very firm, ~5%-10% limerock fragments (<1 - 3 cm) from 2'-5' bls
(2) SILTY CLAY: Gray, Light gray, Tan, Orange (mottled) 5'-10'	Firm to very firm,~10%-20% limerock fragments (<1-2 cm) from 5'-10'
(2) SILTY CLAY: Light tan 10'-15'	Semi firm to firm, ~10%-20% limerock fragments (<1-3 cm) from 10'-15'
(2) SILTY CLAY: Light tan 15'-20'	Soft, ~20%-25% limerock fragments (<1-5 cm) from 15'-20'

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FIGURE 31

SSA-32

(Solid-stem Auger Boring)

PROJECT

NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING

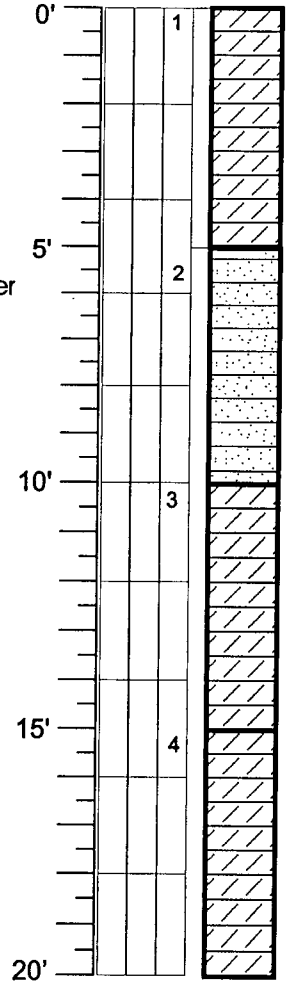
GR. ELEV: 75.03' NGVD
DIA-TYPE: 3"-Solid Stem Auger
DEPTH: 20' BLS
DATE STARTED: 9-3-03
DATE ENDED: 9-3-03

DRILLING

RIG TYPE: CME 45
CREW: Amdrill

LEGEND

(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(2) SILTY CLAY: Light gray, Light orange 0'-5'	Extremely firm, ~5%-15% Limerock fragments (<1 - 2 cm) from 1'-5' bls
(1) SANDY CLAY: Light gray, Orange 5'-10'	Very firm to Extremely firm, Moderate sand, ~5%-20% Limerock fragments (<1-3 cm) from 5'-10'
(2) SILTY CLAY: Light gray & Light orange (mottled) 10'-15'	Very firm
(2) SILTY CLAY: Orange & Light gray 15'-20'	Firm to Very firm

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FIGURE 32

SSA-33

(Solid-stem Auger Boring)

PROJECT

NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING

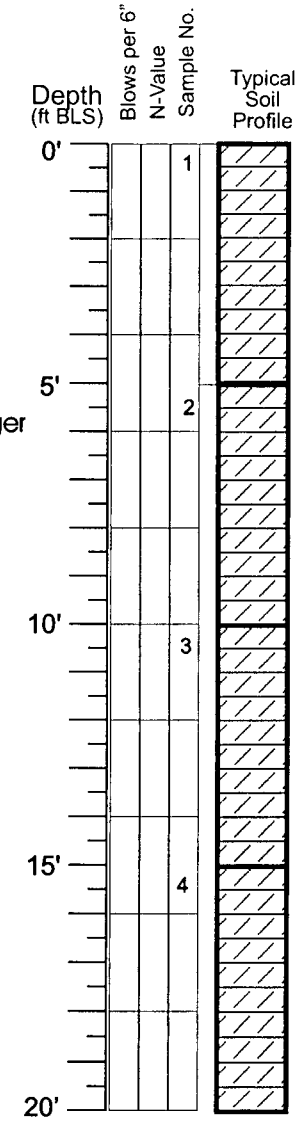
GR. ELEV: 75.26' NGVD
DIA-TYPE: 3"-Solid Stem Auger
DEPTH: 20' BLS
DATE STARTED: 9-3-03
DATE ENDED: 9-3-03

DRILLING

RIG TYPE: CME 45
CREW: Amdrill

LEGEND

(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(2) SILTY CLAY: Light gray, Orange 0'-5'	Very firm, ~5%-10% Limerock fragments (<0.5 cm) from 0'-5' bls
(2) SILTY CLAY: Light tan 5'-10'	Soft, ~20% - 30% hard limestone fragments (<1-3 cm) from 5'-10' bls
(2) SILTY CLAY: Light tan 10'-15'	Soft, ~20% - 30% hard Limestone fragments (<1-3 cm) from 10'-15' bls
(2) SILTY CLAY: Light tan & Light gray 15'-20'	Soft to firm, ~20% - 30% hard & soft limestone fragments (<1-3 cm) from 15'-20' bls

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FIGURE 33

SSA-34

(Solid-stem Auger Boring)

PROJECT

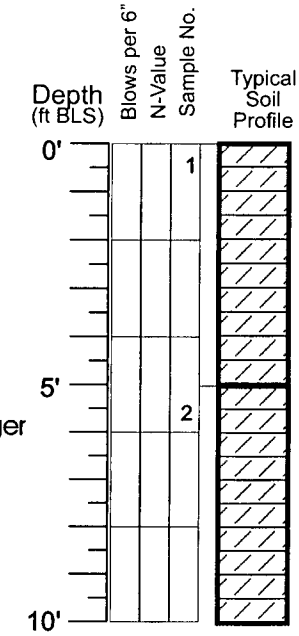
NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING

GR. ELEV: 74.93' NGVD
DIA-TYPE: 3"-Solid Stem Auger
DEPTH: 10' BLS
DATE STARTED: 9-3-03
DATE ENDED: 9-3-03

DRILLING

RIG TYPE: CME 45
CREW: Amdrill



Soil Description	Remarks
(2) SILTY CLAY: Light gray, Orange, Dark brown (mottled) 0'-10'	Small amount of sand, Very firm, ~5%-10% hard & soft limerock fragments (<1-2 cm) from 4'-10' bls

LEGEND

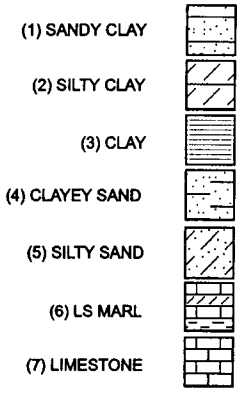


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FIGURE 34

SSA-35

(Solid-stem Auger Boring)

PROJECT

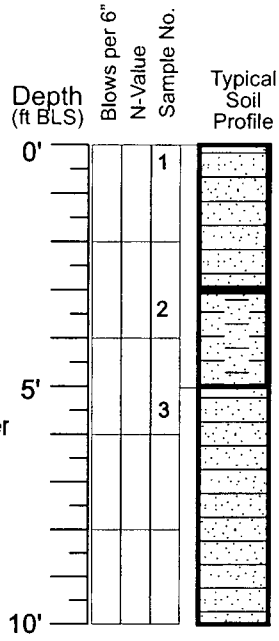
NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING

GR. ELEV: 75.27' NGVD
DIA-TYPE: 3"-Solid Stem Auger
DEPTH: 10' BLS
DATE STARTED: 9-4-03
DATE ENDED: 9-4-03

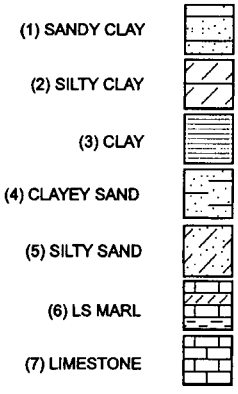
DRILLING

RIG TYPE: CME 45
CREW: Amdrill



Soil Description	Remarks
(1) SANDY CLAY: Gray & Dark rust 0'-3'	Small to moderate amount of sand (fine), Very firm 0'-3'
(4) CLAYEY SAND: Gray & Dark rust 3'-5'	Moderate amount of sand (fine), Very firm to Firm 3'-5'
(1) SANDY CLAY: Light gray & Light orange, (mottled) 5'-10'	Small amount of sand, Very firm to Extremely firm 5'-10'

LEGEND



N:\HYDRO\LARKIN\boring logs\SSA-35.CDR

HARTMAN & ASSOCIATES, INC.
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STRATIGRAPHIC COLUMN
ENTERPRISE RECYCLING
& DISPOSAL FACILITY
DADE CITY, FLORIDA

FIGURE 35

SSA-36
(Solid-stem Auger Boring)

PROJECT

NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING

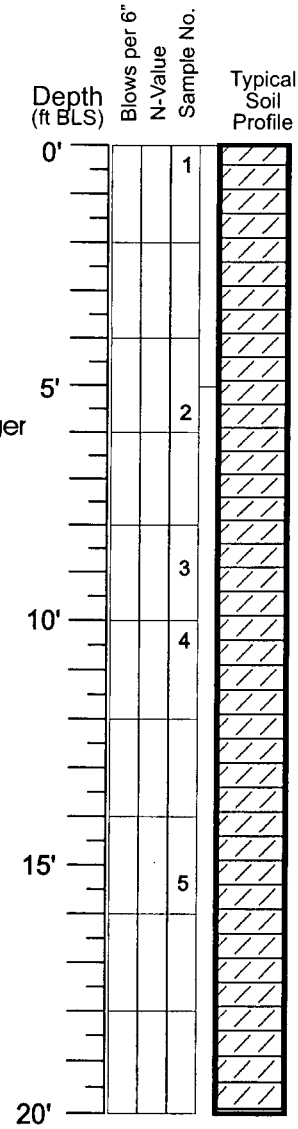
GR. ELEV: 75.89' NGVD
DIA-TYPE: 3"-Solid Stem Auger
DEPTH: 20' BLS
DATE STARTED: 9-4-03
DATE ENDED: 9-4-03

DRILLING

RIG TYPE: CME 45
CREW: Amdrill

LEGEND

(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(2) SILTY CLAY: Gray, Orange, Black (mottled) 0'-5'	Very firm, ~5-10% Limerock fragments (<1-2 cm) from 3.5'-5'
(2) SILTY CLAY: Light orange 5'-10'	Firm to Semi firm from 5'-8.5' Soft from 8.5'-10', ~5-10% Limerock fragments (<1-2 cm) from 3.5'-10'
(2) SILTY CLAY: Light tan 10'-15'	Soft to Firm, ~10-25% Limerock fragments (<1-3 cm) from 10'-15'
(2) SILTY CLAY: Gray, Light orange, Tan 15'-20'	Firm to very firm, ~20-35% Limerock fragments from 18'-20'

N:\HYDRO\LARKIN\boring logs\SSA-36.CDR

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STRATIGRAPHIC COLUMN
ENTERPRISE RECYCLING
& DISPOSAL FACILITY
DADE CITY, FLORIDA

FIGURE 36

SSA-37

(Solid-stem Auger Boring)

PROJECT

NUMBER: 99.0331.007
NAME: Enterprise Recycling & Disposal Facility
LOCATION: Dade City, FL

BORING

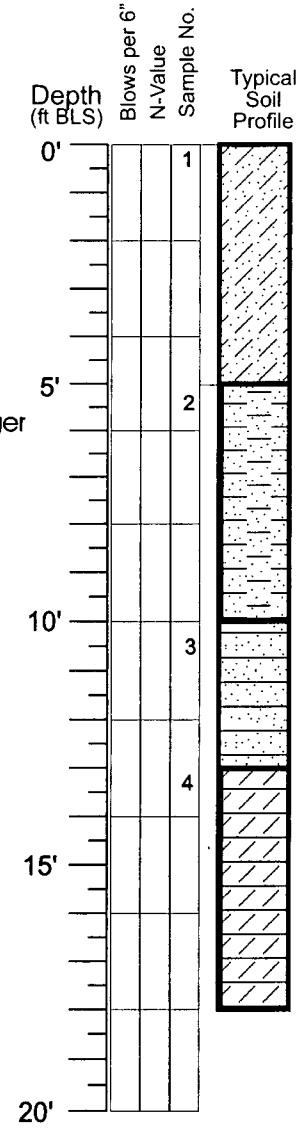
GR. ELEV: 103' NGVD
DIA-TYPE: 3"-Solid Stem Auger
DEPTH: 18' BLS
DATE STARTED: 9-4-03
DATE ENDED: 9-4-03

DRILLING

RIG TYPE: CME 45
CREW: Amdrill

LEGEND

(1) SANDY CLAY
(2) SILTY CLAY
(3) CLAY
(4) CLAYEY SAND
(5) SILTY SAND
(6) LS MARL
(7) LIMESTONE



Soil Description	Remarks
(5) SILTY SAND: Dark brown to Brown rust 0'-5'	Fine to silt, Well sorted, Soft, Organics from 0'-3'
(4) CLAYEY SAND: Dark rust 5'-10'	Medium to silt, Soft to Firm, Increase of clay with depth from 5'-10'
(1) SANDY CLAY: Orange & Light gray 10'-13'	Very firm to Extremely firm, 10'-13'
(2) SILTY CLAY: Light gray, Orange, Brown 13'-18'	Firm to Extremely firm, ~5-15% limerock fragments, Soft and hard (<1-2 cm) from 14'-18' Hard drilling (clayey sediments) from 17'-18'

N:\HYDRO\LARKIN\boring logs\SSA-37.CDR

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STRATIGRAPHIC COLUMN
ENTERPRISE RECYCLING & DISPOSAL FACILITY
DADE CITY, FLORIDA

FIGURE 37

Bucket Auger Borings
Enterprise Recycling and Disposal Facility
Dade City, Florida

Boring Name	Date of Boring	Cell # or Location	Total Depth, Ft BLS	Surface Elevation, Ft NGVD	Top of Confining Material Elevation, Ft NGVD	Clay Thickness, Ft	Sieve Test Elevation	% Passing No. 200
AS-1*	7/16/03	Cell 1	3	83.29	83.29	3	83 to 80	68.1
AS-2*	7/16/03	Cell 1	3	82.49	82.49	3	88 to 79	56.5
AS-3	7/16/03	Cell 1	4	83.23	83.23	4	82 to 80	59.8
							80 to 78	56.6
AS-4	7/16/03	Cell 1	4	81.49	81.49	**0.75**	81 to 77	41.0
AS-5*	7/16/03	Cell 1	2.5	80.90	80.90	**1**	81 to 78.5	52.5
AS-6	7/16/03	Cell 1	3	81.10	81.10	3	81 to 78	31.7
AS-7*	7/17/03	Cell 1	3	81.03	81.03	3	81 to 78	56.7
AS-8	7/17/03	Cell 1	3.25	80.64	80.64	3.25	80 to 76.75	44.0
AS-9*	7/17/03	Cell 1	3.25	80.30	80.30	3.25	80 to 76.75	60.7
AS-10	7/17/03	Cell 1	3	80.33	NA	**0**	80 to 79	**16.4**
AS-11*	7/17/03	Cell 1	3	81.04	81.04	3	81 to 78	60.9
AS-12	7/17/03	Cell 1	3	80.29	80.29	3	80 to 79	52.6
AS-13	7/23/03	Cell 1	3	82.74	82.74	3	82 to 79	72.6
AS-14*	7/23/03	Cell 1	2	81.77	81.77	**1.5**	81 to 79	49.3
AS-15*	7/23/03	Cell 1	3	82.60	82.60	3	82 to 79	54.9
AS-16	7/23/03	Cell 1	3	80.55	80.55	3	80 to 77	62.7
AS-17	7/23/03	Cell 1	3	80.89	80.89	3	81 to 78	64.0
AS-18	7/23/03	Cell 1	3	81.02	80.02	**1**	80 to 78	48.9
AS-19	7/23/03	Cell 1	3	81.04	81.04	3	81 to 78	34.9
AS-20*	7/23/03	Cell 1	3	81.05	81.05	3	81 to 78	47.0
AS-21	7/23/03	Cell 1	3	80.43	80.43	3	80 to 77	57.1
AS-22	7/23/03	Cell 1	3	79.98	79.98	3	80 to 77	67.8
AS-23	7/23/03	Cell 1	3	79.93	79.93	3	80 to 77	53.9
AS-24	7/23/03	Cell 1	3	79.88	79.88	3	80 to 77	62.2
AS-25*	7/23/03	Cell 1	3	80.31	80.31	3	80 to 77	79.8
AS-26	7/25/03	Cell 1	3	96.25	96.25	3	96 to 93	29.8
AS-27*	7/25/03	Cell 1	3	92.18	NA	**0**	92 to 89	25.0
AS-28	7/25/03	Cell 1	3	86.57	86.57	3	86 to 83	37.5
AS-29*	7/25/03	Cell 1	3	84.98	84.98	3	85 to 82	47.2
AS-30	7/25/03	Cell 1	3	85.03	85.03	3	85 to 82	42.6
AS-31	7/25/03	Cell 1	3	84.87	NA	**0**	84 to 81	25.2
AS-32	7/25/03	Cell 1	3	85.14	85.14	3	85 to 82	80.4
AS-33	7/25/03	Cell 1	2	85.67 (approx.)	85.67 (approx.)	**2**	85 to 83	55.8
AS-34	7/25/03	Cell 1	3	82.81	82.81	3	82 to 79	55.0
AS-35*	7/25/03	Cell 1	3	85.62	85.62	3	85 to 82	74.3
AS-36	8/8/03	Cell 1	3	79.98	79.98	3	80 to 77	57.9
AS-37*	8/8/03	Cell 1	3	79.96	79.96	3	80 to 77	45.8
AS-38	8/8/03	Cell 1	3	80.20	80.20	3	80 to 77	40.0
AS-39	8/8/03	Cell 1	3	79.96	79.96	3	80 to 77	54.6
AS-40	8/8/03	Cell 1	3	81.07	81.07	3	81 to 78	53.2
AS-41*	8/8/03	Cell 1	3	81.13	81.13	3	81 to 78	76.6
AS-42	8/8/03	Cell 1	4	81.04	81.04	4	81 to 77	**15.8**
AS-43	8/8/03	Cell 1	3	81.73	81.73	3	81 to 78	65.4
AS-44	8/8/03	Cell 1	3	82.25	82.25	3	82 to 79	33.5
AS-45	8/8/03	Cell 1	3	81.26	81.26	3	81 to 78	72.6
AS-46	8/8/03	Cell 1	3	81.06	80.06	**2**	80 to 78	52.0
AS-47*	8/8/03	Cell 1	3	81.29	81.29	3	81 to 78	52.8

Bold indicates insufficient material at the boring location

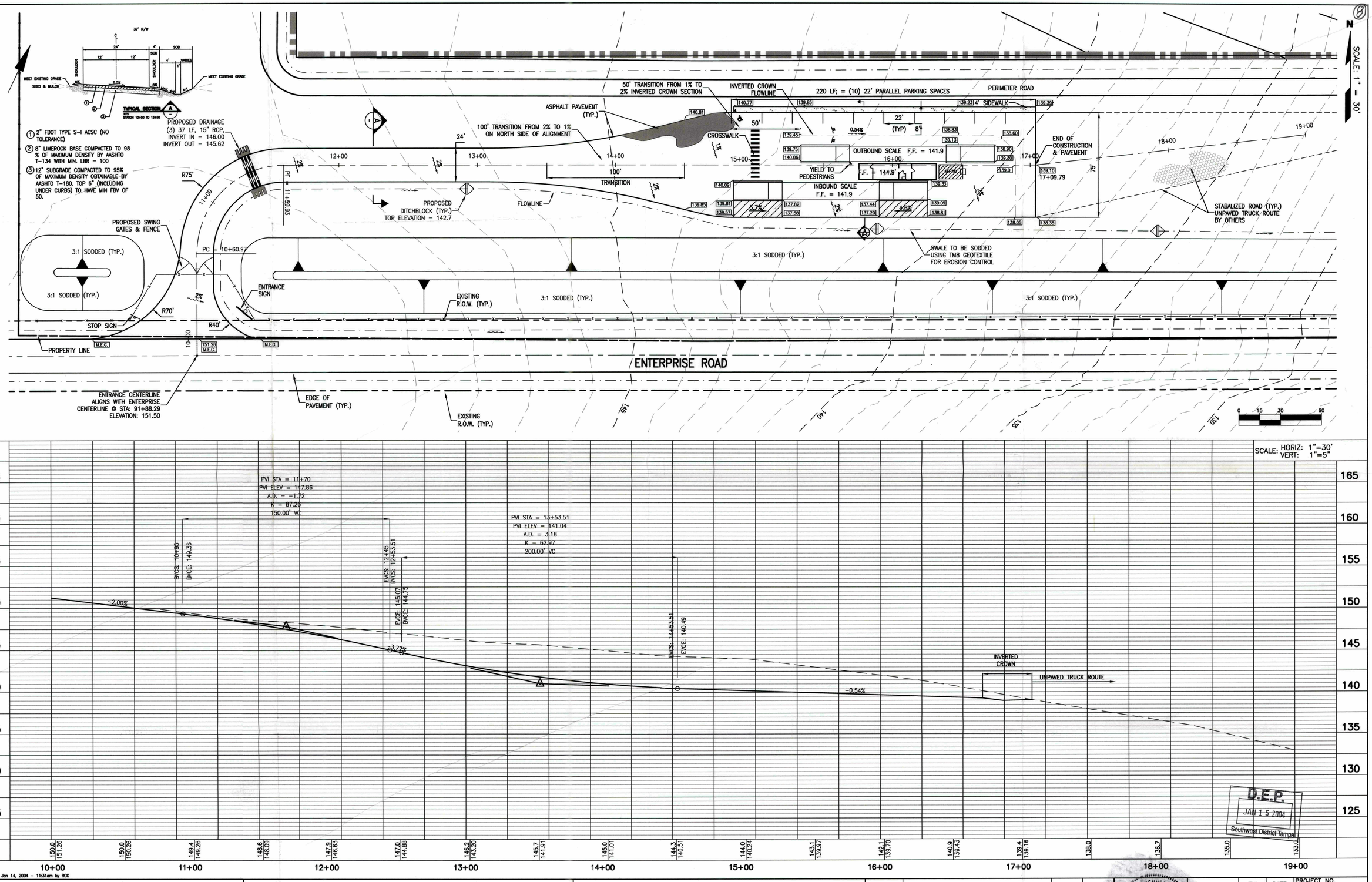
SPT Borings
Enterprise Recycling and Disposal Facility
Dade City, Florida

Boring Name	Date of Boring	Cell # or Location	Total Depth, Ft BLS	Surface Elevation, Ft NGVD (Approx)	Top of Confining Material Elevation, Ft NGVD	Clay Thickness, Ft	ST Elevation, Ft NGVD	ST Sample	Permeability, cm/s	% Passing No. 200
B-1	4/7/03	MW-1	60	115	N/A	N/A				
B-5*	4/3/03	MW-5	95	83	63	49				
B-6*	4/3/03	MW-6	35	88	78	21.5				
B-7*	4/3/03	MW-7A	35	89	85.5	16.5				
B-8*	4/4/03	MW-8	45	97	88.8	30.5				
B-9*	4/7/03	MW-9	45	105	96.5	16.5				
B-10*	4/7/03	MW-10	43.5	108	99.5	6.5				
B-11*	7/14/03	MW-11	40	102	83.5	6.5				
B-15*	8/22/03	Cell 15	22	75.27	73.27	13	73 to 71	ST-9	2.30E-08	42.2
B-16*	8/22/03	Cell 1	20	80.38	80.38	12	74 to 72	ST-10	5.20E-08	35.9
B-17*	8/23/03	Cell 1	16	81.02	81.02	12	75 to 73	ST-11	6.40E-09	45.7
B-18*	8/23/03	Cell 1	8	83.43	83.43	7.5	79 to 77	ST-12	2.40E-07	38.1
B-19	8/26/03	Cell 16	6	74.89	72.89	4	71 to 69	ST-12A	3.00E-09	47.4
B-20*	8/26/03	Cell 16	16	75.23	69.23	6	67 to 65	ST-13	4.90E-07	47.6
B-21*	8/26/03	Cell 16	18	75.27	73.27	9	71 to 69	ST-14	6.70E-08	52.3
B-22*	8/26/03	Cell 16	46	75.18	34.18	4	49.5 to 47.5	ST-15	5.20E-06	21.4
B-22*	8/26/03	Cell 16	46	75.18	34.18	4	31 to 29	ST-16	1.90E-07	57.2
B-23*	8/26/03	Cell 16	20	75.00	73	18	73 to 71	ST-17	6.90E-08	38.8
B-24*	8/27/03	Cell 15	22	75.19	73.19	20	73 to 71	ST-18	5.10E-08	67.6
B-25*	8/27/03	Cell 15	22	75.62	73.62	20	71 to 69	ST-19	4.90E-09	65.1
B-26	8/28/03	Cell 16	60	75.00	27	6				
B-27*	8/29/03	Cell 15	20	74.89	72.89	14.5	73 to 71	ST-20	1.40E-07	39.8
B-28*	8/29/03	Cell 14	40	96.00	64	8	64 to 62	ST-21	7.50E-07	33.1
B-29*	8/29/03	Cell 16	22	74.97	72.97	16				
B-30*	9/2/03	Cell 16	28	75.12	73.12	11.5				
B-31*	9/2/03	Cell 16	32	75.02	71.02	14				
B-32*	9/3/03	Cell 16	39.5	75.05	67.55	26.5				
B-33*	9/4/03	Cell 16	31	75.51	73.51	28				
B-34*	9/4/03	Cell 16	24	75.43	63.97	12.5				
DCL01-1	1/16/01	Cell 6	45.5	122**	83.5	2				
DCL01-2*	1/16/01	Cell 9	35.5	145**	111.5	2				
DCL01-3	1/16/01	Cell 10	40.5	150**	116.5	7				
DCL01-4*	1/16/01	West of Cell 10	35.5	168**	159.5	7				
DCL01-5	1/17/01	Cell 11	50.5	142**	93.5	2				
DCL01-6	1/17/01	Cell 7	35.5	128**	94.5	2				
DCL01-7	1/17/01	Cell 8	75.5	112**	N/A	N/A				
DCL01-8	1/17/01	Cell 5	31	100**	91.5	20				
DCL01-9	1/18/01	Cell 4	40	104**	79.5	2.5				
DCL01-10	1/18/01	Cell 1	40.5	99**	N/A	N/A				
DCL01-11	1/18/01	Cell 3	30.5	106	92.5	16.5				
DCL01-12*	1/18/01	Cell 15	22.5	95**	86.5	14				
DCL01-13	1/18/01	Cell 15	35.5	94**	85.5	21.5				
DCL01-14	1/19/01	Cell 16	40.5	89**	50.5	2				
B-1*	3/3/00	NW of Cell 10	95	170	159	9				
B-2*	3/6/00	North of Cell 7	76	136	136	15				
B-3	3/13/00	North of Cell 13	55	95	79.5	10				
B-4*	3/7/00	Cell 14	50	98	87	29				
B-5	3/13/00	Cell 16	66	83	52.5	30				
B-6*	3/15/00	NW of Cell 16	55	83	63	15				
B-7	3/15/00	Cell 4	45	93	73	10				
B-8*	3/16/00	SE of Cell 15	50	93	63	14				
B-9*	3/17/00	SE of Cell 3	85	101	51	5				
B-10*	3/16/00	South of Cell 6	71.5	133	118	5				
* Limestone fragments in boring										
** Elevation based on NAD, not NGVD										

Solid Stem Auger Borings
Enterprise Recycling and Disposal Facility
Dade City, Florida

Boring Name	Date of Boring	Cell # or Location	Total Depth, Ft BLS	Surface Elevation, Ft NGVD (Approx)	Top of Confining Material Elevation, Ft NGVD	Clay Thickness, Ft	Sieve Test Elevation	% Passing No. 200
SSA-1*	7/30/03	Cell 1	12	83	83	6	N/A	N/A
SSA-2*	7/30/03	Cell 1	4	82.5	82.5	4	N/A	N/A
SSA-3*	7/30/03	Cell 1	18	82.5	82.5	7	N/A	N/A
SSA-4*	7/30/03	Cell 1	15	82.5	82.5	7	75.5	58.6
SSA-5*	7/30/03	Cell 1	15	83	83	15	78	41.9
SSA-6*	7/30/03	Cell 1	14	82.5	82.5	7	76.5	43.6
SSA-7*	7/31/03	Cell 1	14	83	83	9	77	48.7
SSA-8*	7/31/03	Cell 1	14	83	83	8	75	47.0
SSA-9*	7/31/03	Cell 1	14	83	83	14	79	51.9
SSA-10*	7/31/03	Cell 1	14	82.5	82.5	11	78.5	53.2
SSA-11*	7/31/03	Cell 1	14	82	82	11	76	61.5
							73	57.5
							71	47.8
							68	42.4
SSA-12*	7/31/03	Cell 1	14	82	82	14	76	44.8
SSA-13	7/31/03	Cell 1	24	95	95	24	71	21.0
SSA-14*	7/31/03	Cell 1	29	99	99	24	75	36.9
							70	27.7
SSA-15*	7/31/03	Cell 1	24	103	103	24	79	42.3
SSA-16	7/31/03	Cell 1	24	104	104	24	84	48.9
							80	57.6
SSA-17*	7/31/03	Cell 1	29	107	97	19	83	16.1
							78	25.3
SSA-18	7/31/03	Cell 1	29	108	108	29	79	63.0
SSA-19*	8/23/03	Cell 1	20	83	83	20	78 to 73	57.1
SSA-20	8/23/03	Cell 1	25	84	79	18	79 to 74	**29.4**
SSA-21*	8/23/03	Cell 1	16	82	82	16	82 to 77	58.5
SSA-22*	8/23/03	Cell 1	20	82	82	20	82 to 77	44.9
SSA-23*	8/23/03	Cell 1	20	80	80	20	80 to 75	41.2
SSA-24*	8/23/03	Cell 1	20	80	80	20	80 to 75	64.3
SSA-25	9/3/03	Cell 15	10	75	75	8	75 to 70	42.2
SSA-26	9/3/03	Cell 16	20	75	72	17	70 to 65	**28.6**
SSA-27	9/3/03	Cell 16	20	75	N/A	0	65 to 60	**10.7**
SSA-28*	9/3/03	Cell 16	20	75	70	15	70 to 65	49.2
SSA-29*	9/3/03	Cell 16	20	76	71	15	71 to 66	39.5
SSA-30*	9/4/03	Cell 16	14	75	73	12	75 to 70	51.7
SSA-31*	9/3/03	Cell 15	20	75	73	18	75 to 70	47.0
SSA-32*	9/3/03	Cell 15	20	75	73	18	75 to 70	58.3
SSA-33*	9/3/03	Cell 15	20	75	73	18	75 to 70	52.6
SSA-34*	9/3/03	Cell 15	10	75	73	8	75 to 70	49.1
SSA-35	9/4/03	Cell 15	10	75	73	8	75 to 70	36.1
SSA-36*	9/4/03	Cell 16	20	75	73	18	75 to 70	54.2
SSA-37*	9/4/03	Cell 1	18	103	98	13	93 to 88	53.3
* Limestone fragments in boring								
Bold indicates insufficient material at boring location								

APPENDIX F



D.E.P.
JAN 15 2004
Southwest District Tampa

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Plotted: Jan 14, 2004 - 11:31am by RCC

HARTMAN & ASSOCIATES, INC.
engineers, hydrogeologists, surveyors & management consultants
201 EAST PINE STREET – SUITE 1000 – ORLANDO, FL 32801
TELEPHONE (407) 839-3955 – FAX (407) 839-3790
ENGINEERING BUSINESS No. 5814

ENTERPRISE LANDFILL
PASCO COUNTY
FLORIDA

PLAN & PROFILE
ENTRANCE ROAD

DATE	REVISIONS	REVISED	CHECKED

Roderick K. Cassidy, P.E.
P.E. No. 49190
201 East Pine Street
Orlando, Florida 32801
Engineering Business No. 5814
STATE OF FLORIDA
DATE:

	BY	DATE
DESIGNED	RCC	6/01
DRAWN	RCC	6/01
CHECKED	RKC	6/01
QC APPROVAL	RKC	6/01
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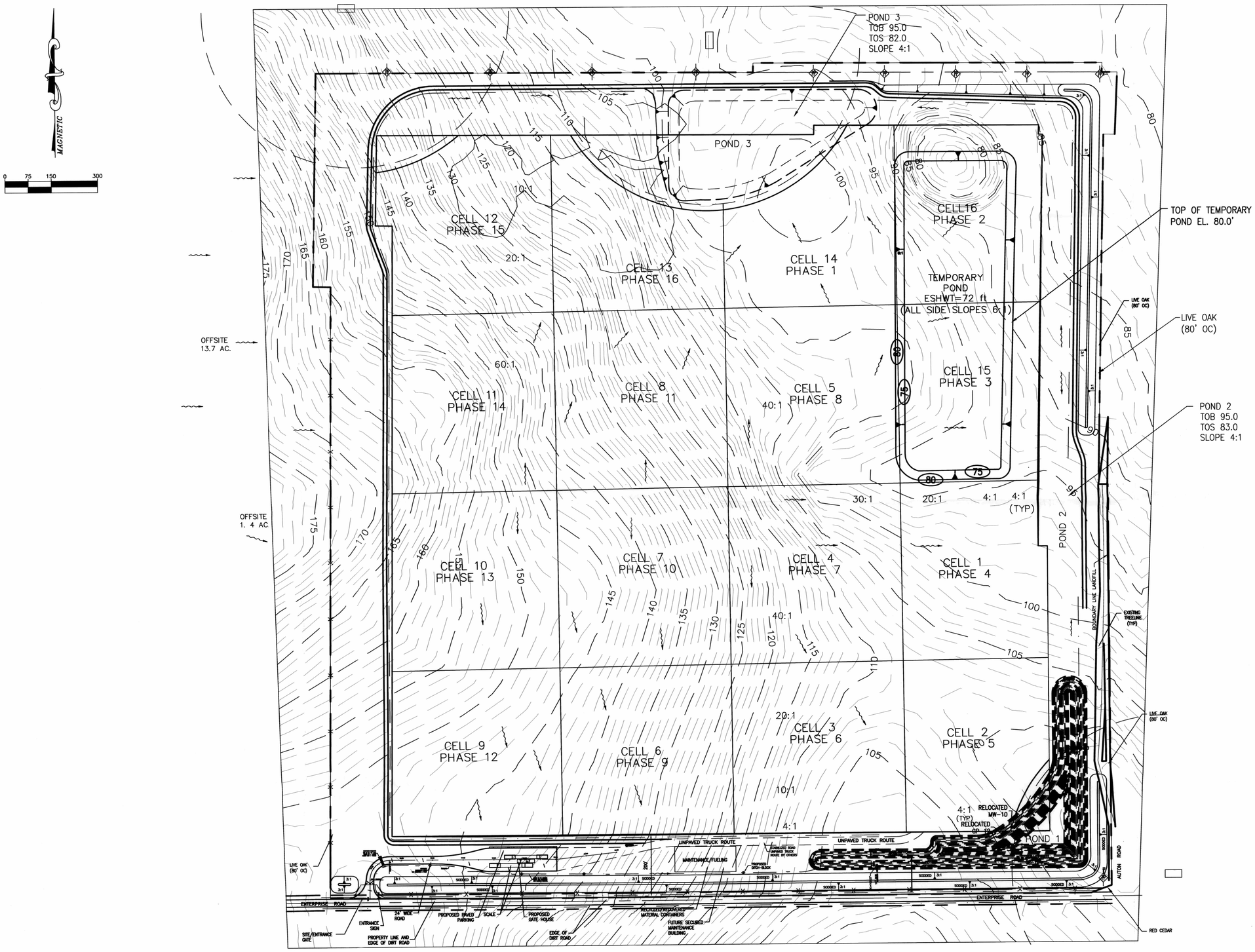
PROJECT NO. 99-331.01
SCALE AS NOTED
PP-1
SHEET 1 OF 4



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Plotted: Jan 14, 2004 - 4:29pm by RCC

D.E.P.
JAN 1 5 2004
Southwest District Tampa

Hartman & Associates, Inc.
201 E. Pine St., Suite 1000
Orlando, FL 32801
Engineering Business No. 5814
Jennifer S. Hunt, P.E.
Florida Registration No. 0000058592

HARTMAN & ASSOCIATES, INC.
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TELEPHONE (407) 839-3955 – FAX (407) 839-3790
ENGINEERING BUSINESS No. 5814

ENTERPRISE LANDFILL
PASCO COUNTY
FLORIDA

ENTRANCE ROAD & TRUCK ROUTE

DATE	REVISIONS	REVISED	CHECKED

Roderick K. Cashe, P.E.
P.E. No. 45168
201 East Pine Street
Orlando, Florida 32801
Engineering Business No. 5814

	BY	DATE
DESIGNED	RCC	6/03
DRAWN	RCC	6/03
CHECKED	RKC	7/03
QC APPROVAL	RKC	7/03
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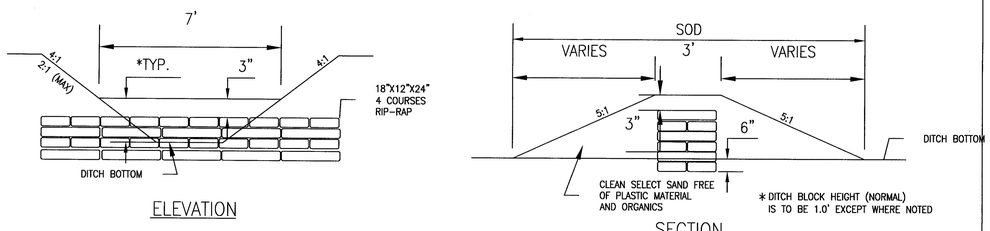
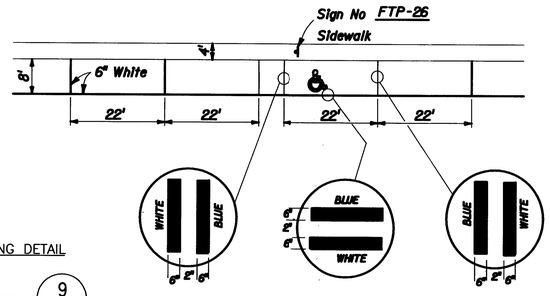
PROJECT NO.
99.0331.001
SCALE
1" = 150'
C-1
SHEET 2 OF 4



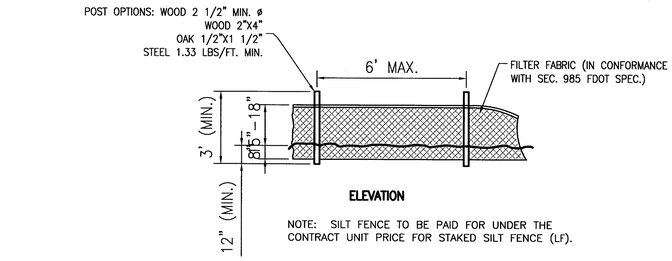
SODDED DITCH BLOCK DETAIL

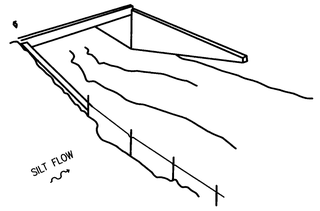
DETAIL 1 — SCALE: NTS

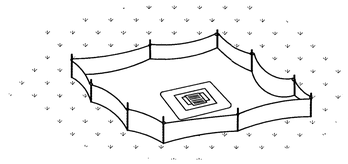


PARALLEL PARKING DETAIL

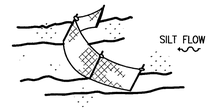
DETAIL 9 — SCALE: NTS







TYPE III SILT FENCE PROTECTION
AROUND DITCH BOTTOM INLETS.

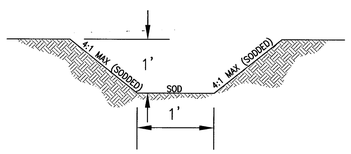


NOTE: SPACING FOR TYPE III FENCE TO BE IN ACCORDANCE WITH CHART I, SHEET 1 OF 3 AND DITCH INSTALLATIONS AT DRAINAGE STRUCTURES SHEET 2 OF 3.

DO NOT DEPLOY IN A MANNER THAT SILT FENCES WILL ACT AS A DAM ACROSS PERMANENT FLOWING WATERCOURSES. SILT FENCES ARE TO BE USED AT UPLAND LOCATIONS AND TURBIDITY BARRIERS USED AT PERMANENT BODIES OF WATER.

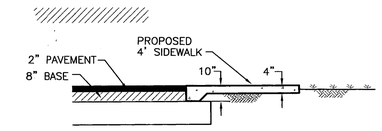
SILT FENCE APPLICATIONS

DETAIL 5 — SCALE: NTS



SWALE DETAIL

DETAIL 3 — SCALE: NTS



INTEGRAL SIDEWALK

DETAIL 8 — SCALE: NTS

The cost of furnishing and installing the extra base material shall be included in the cost of the culvert.

FRANGIBLE BASE

FRANGIBLE BASE

DETAIL 2 — SCALE: NTS — PP-8

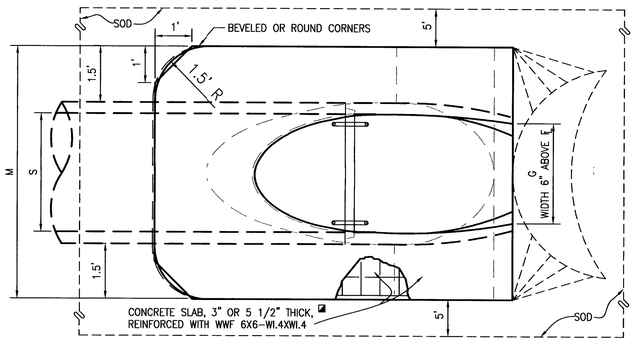
DIMENSIONS AND QUANTITIES

	D	X	A	B	C	E	F	G	M SINGLE PIPE	M DOUBLE PIPE	M TRIPLE PIPE	M QUAD. PIPE	N	5 1/2" CONCRETE SLAB (CY) ◪ SINGLE PIPE	5 1/2" CONCRETE SLAB (CY) ◪ DOUBLE PIPE	5 1/2" CONCRETE SLAB (CY) ◪ TRIPLE PIPE	5 1/2" CONCRETE SLAB (CY) ◪ QUAD. PIPE	SODDING (SQ. YDS.) SINGLE PIPE	SODDING (SQ. YDS.) DOUBLE PIPE	SODDING (SQ. YDS.) TRIPLE PIPE	SODDING (SQ. YDS.) QUAD. PIPE
2:1 SLOPE	15"	2'-7"	1.92'	2.18'	4.10'	2.06'	.5'	1.22'	4.63'	7.21'	9.79'	12.37'	1.19'	0.38	0.58	0.77	0.96	21	24	27	30
	18"	2'-10"	1.97'	2.74'	4.71'	2.56'	6"	1.41'	4.92'	7.75'	10.58'	13.42'	1.21'	0.44	0.65	0.87	1.09	22	25	28	31
	24"	3'-5"	2.06'	3.85'	5.91'	3.56"	7"	1.73'	5.50'	8.92'	12.33'	15.75'	1.25'	0.54	0.83	1.12	1.42	24	28	32	35
	30"	4'-3"	2.15'	4.95'	7.10'	4.56'	8"	2.00'	6.08'	10.33'	14.58'	18.83'	1.29'	0.66	1.09	1.50	1.91	26	31	35	40
	36"	5'-1"	2.25'	6.08'	8.33'	5.56"	9"	2.24'	6.67'	11.75'	16.83'	21.92'	1.33'	0.81	1.38	1.95	2.51	28	34	39	45
	42"	6'-0"	2.34'	7.21'	9.55'	6.56"	10"	2.45'	7.25'	13.25'	19.25'	25.25'	1.38'	0.97	1.70	2.45	3.19	30	37	43	50
	48"	6'-9"	2.43'	8.33'	10.76'	7.56"	11"	2.65'	7.83'	14.58'	21.33'	28.08'	1.42'	1.13	2.04	2.93	3.84	32	39	47	54
	54"	7'-8"	2.52'	9.44'	11.96'	8.56"	12"	2.83'	8.42'	16.08'	23.75'	31.42'	1.46'	1.31	2.44	3.58	4.72	34	42	51	59
	60"	8'-6"	2.62'	10.56'	13.18'	9.56"	14"	3.00'	9.00'	17.50'	26.00'	34.50'	1.50'	1.51	2.89	4.28	5.68	36	45	55	64
	66"	9'-2"	2.71'	11.68'	14.39'	10.56"	15'	3.18'	9.58'	18.75'	27.92'	37.08'	1.54'	1.68	3.25	4.84	6.43	38	48	58	68
	72"	10'-0"	2.80'	12.80'	15.60'	11.56"	16'	3.30'	10.16'	20.16'	30.16'	40.16'	1.58'	1.89	3.74	5.59	7.45	40	51	62	73
4:1 SLOPE	15"	2'-7"	2.27'	4.09'	6.36'	4.03'	8"	1.22'	4.63'	7.21'	9.79'	12.37'	1.19'	0.57	0.87	1.15	1.44	23	26	29	32
	18"	2'-10"	2.36'	5.12'	7.48'	5.03'	9"	1.41'	4.92'	7.75'	10.58'	13.42'	1.21'	0.66	0.99	1.31	1.65	25	28	31	35
	24"	3'-5"	2.53'	7.18△	9.71'	7.03'△	11"	1.73'	5.50'	8.92'	12.33'	15.75'	1.25'	0.85	1.30	1.75	2.20	28	32	36	40
	30"	4'-3"	2.70'	9.25'	11.95'	9.03'	13"	2.00'	6.08'	10.33'	14.58'	18.83'	1.29'	1.10	1.74	2.39	3.05	31	36	41	46
	36"	5'-1"	2.87'	11.31◇	14.18'	11.03'◇	15'	2.24'	6.67'	11.75'	16.83'	21.92'	1.33'	1.32	2.21	3.08	3.96	34	40	46	52
	42"	6'-0"	3.05'	13.37'	16.42'	13.03'	17'	2.45'	7.25'	13.25'	19.25'	25.25'	1.38'	1.58	2.76	3.91	5.09	38	44	51	58
	48"	6'-9"	3.22'	15.43'	18.65'	15.03'	19'	2.65'	7.83'	14.58'	21.33'	28.08'	1.42'	1.85	3.30	4.73	6.17	41	48	56	63
	54"	7'-8"	3.39'	17.49'	20.88'	17.03'	21'	2.83'	8.42'	16.08'	23.75'	31.42'	1.46'	2.14	3.95	5.77	7.58	44	52	61	69
	60"	8'-6"	3.56'	19.55'	23.11'	19.03'	23'	3.00'	9.00'	17.50'	26.00'	34.50'	1.50'	2.45	4.66	6.87	9.07	47	56	66	75
	66"	9'-2"	3.73'	21.62'	25.35'	21.03'	25'	3.18'	9.58'	18.75'	27.92'	37.08'	1.54'	2.88	5.54	8.18	10.84	49	59	69	80
	72"	10'-0"	3.91'	22.68'	26.59'	23.03'	27'	3.30'	10.16'	20.16'	30.16'	40.16'	1.58'	3.54	6.61	9.87	13.13	52	63	74	85

◪ SEE GENERAL NOTE NO. 3.
SEE SHEET 5 FO 6 FOR 3" SLAB QUANTITIES

E △6.25 DIMENSIONS PERMITTED TO ALLOW USE OF 8' STANDARD PIPE LENGTHS.
◇10.40 ◇10.10' DIMENSIONS PERMITTED TO ALLOW USE OF 12' STANDARD PIPE LENGTHS.

B △ CONCRETE SLAB SHALL BE DEEPENED TO FORM BRIDGE ACROSS CROWN OF PIPE. SEE SECTION BELOW.
CONCRETE SLAB SHALL BE DEEPENED TO FORM BRIDGE ACROSS CROWN OF PIPE. SEE SECTION BELOW.

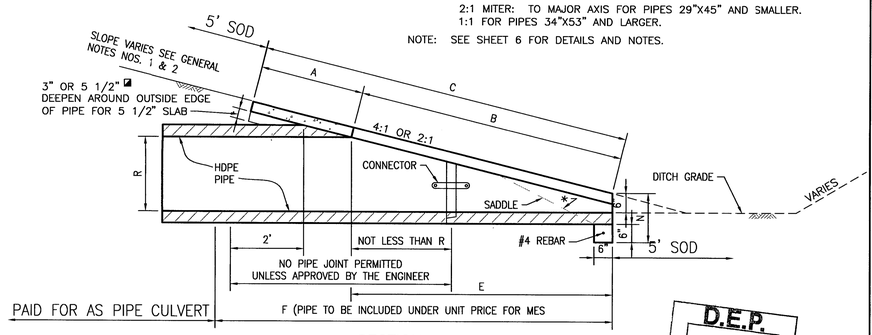


TOP VIEW-SINGLE PIPE

*SLOPE: 4:1 MITER: TO MAJOR AXIS FOR PIPES 24"X38" AND SMALLER.
2:1 FOR PIPES 29"X45" AND LARGER.

2:1 MITER: TO MAJOR AXIS FOR PIPES 29"X45" AND SMALLER.
1:1 FOR PIPES 34"X53" AND LARGER.

NOTE: SEE SHEET 6 FOR DETAILS AND NOTES.



SECTION

DETAIL 4 — SCALE — MITERED END SECTION

D.E.P.
JAN 15 2004
Southwest District Tampa

N:\CAD\DWG\1999\99-331.01\Civil\Finals\D-1.DWG
Plotted: Jan 14, 2004 - 11:29am by RCC

HARTMAN & ASSOCIATES, INC.
engineers, hydrogeologists, surveyors & management consultants
201 EAST PINE STREET - SUITE 1000 - ORLANDO, FL 32801
TELEPHONE (407) 839-3955 - FAX (407) 839-3790
ENGINEERING BUSINESS No. 5814

ENTERPRISE LANDFILL
PASCO COUNTY
FLORIDA

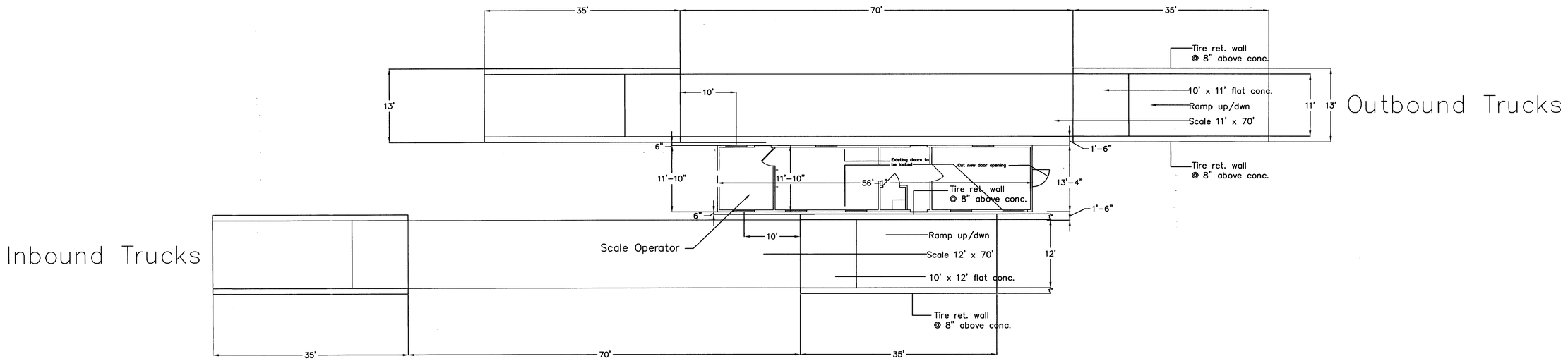
DETAILS

DATE	REVISIONS	REVISED	CHECKED

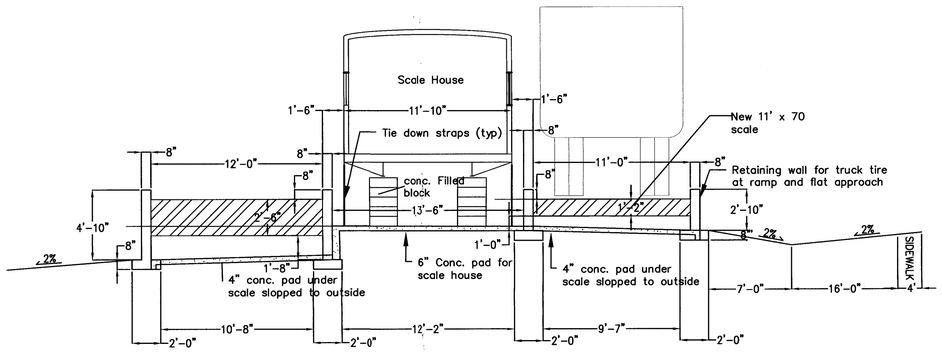
Registered Engineer, P.E. No. 43760, 201 East Pine Street, Orlando, Florida 32801, Registered Business No. 5814, STATE OF FLORIDA

	BY	DATE
DESIGNED	RCC	6/01
DRAWN	RCC	6/01
CHECKED	RKC	7/01
QC APPROVAL	RKC	7/01

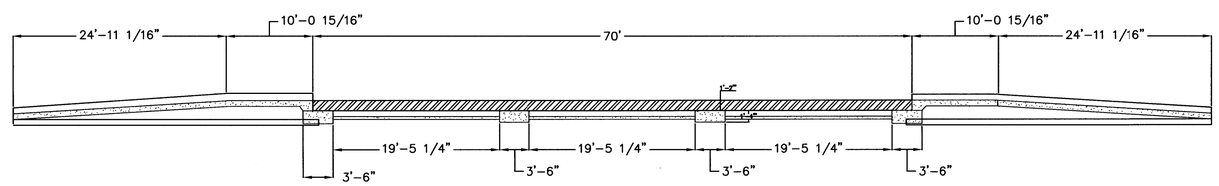
PROJECT NO. 99-331.01
SCALE AS NOTED
D-1
SHEET 3 OF 4
FILE: D-1.DWG



PLAN VIEW
SCALE: N.T.S.

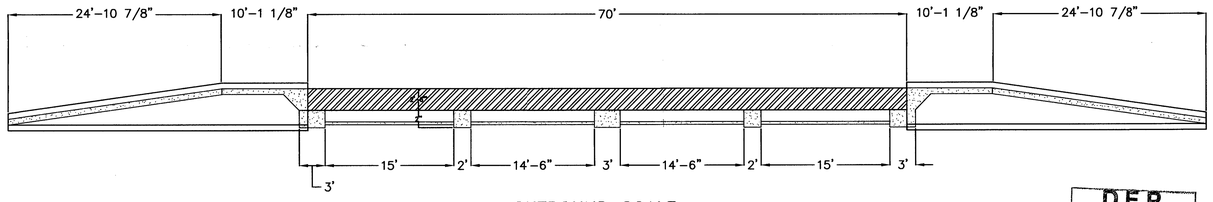


SECTION
N.T.S.
A
–



INBOUND SCALE
(NEW SCALE)

DETAIL
N.T.S.
6
–



OUTBOUND SCALE
(USED SCALE)

DETAIL
N.T.S.
7
–

D.E.P.
JAN 1 5 2004
Southwest District Tampa

N:\CAD\DWG\1999\99-331.01\Cad\Finals\D-2.DWG
Plotted: Jan 14, 2004 - 11:30am by RCC

HARTMAN & ASSOCIATES, INC.
engineers, hydrogeologists, surveyors & management consultants
201 EAST PINE STREET – SUITE 1000 – ORLANDO, FL 32801
TELEPHONE (407) 839-3955 – FAX (407) 839-3790
ENGINEERING BUSINESS No. 5814

ENTERPRISE LANDFILL
PASCO COUNTY
FLORIDA

SCALE DETAILS

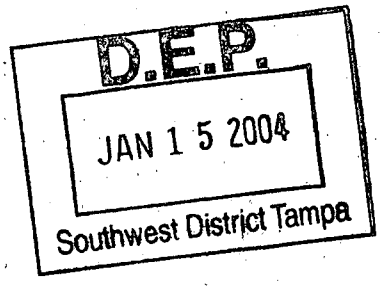
DATE	REVISIONS	REVISED	CHECKED

Roderick W. Gearey, P.E.
P.E. No. 56469
201 East Pine Street
Orlando, Florida 32801
Engineering Business No. 5814
STATE OF FLORIDA
PROFESSIONAL ENGINEER
DATE:

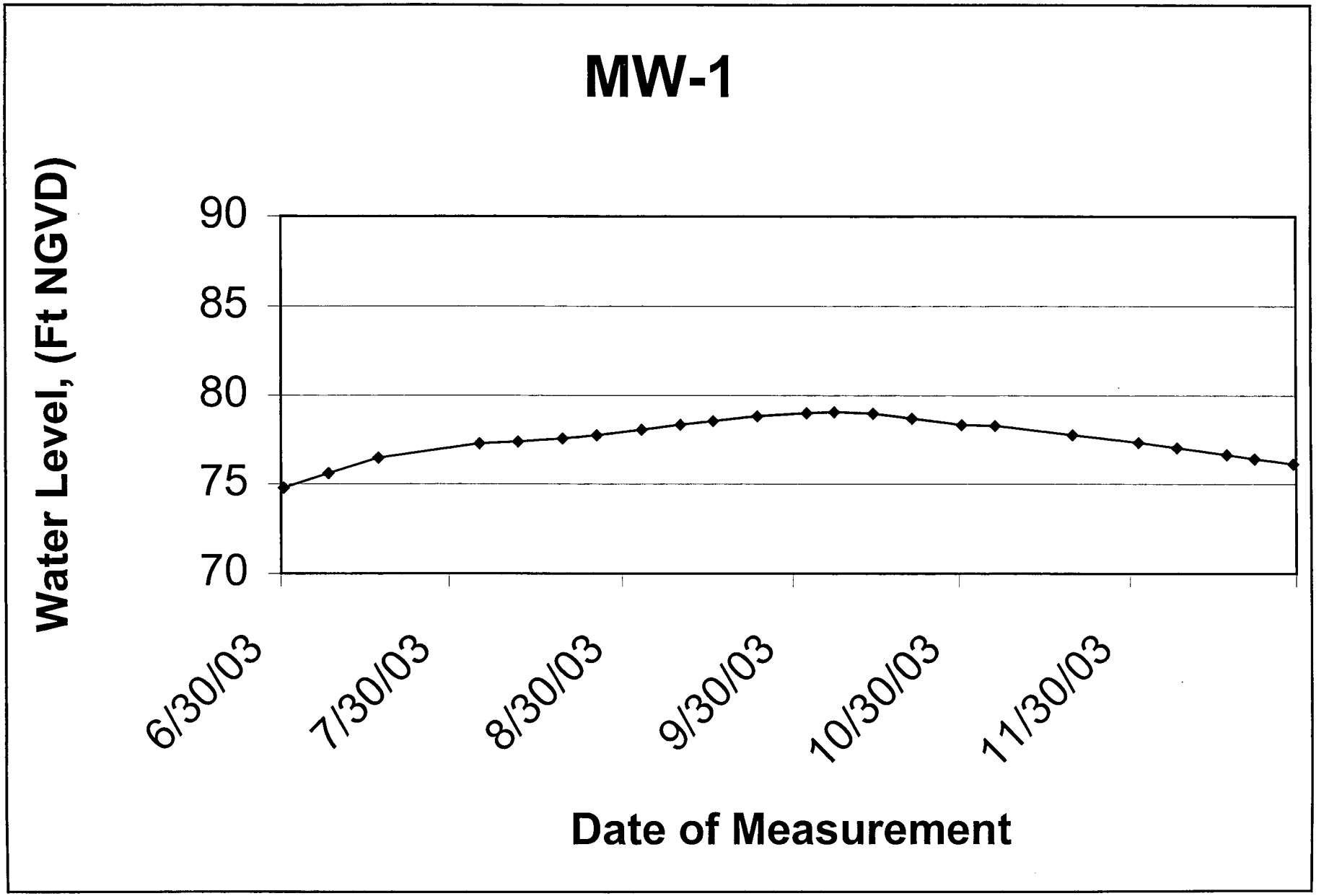
	BY	DATE
DESIGNED	OTHERS	
DRAWN	OTHERS	
CHECKED	OTHERS	
QC APPROVAL	OTHERS	

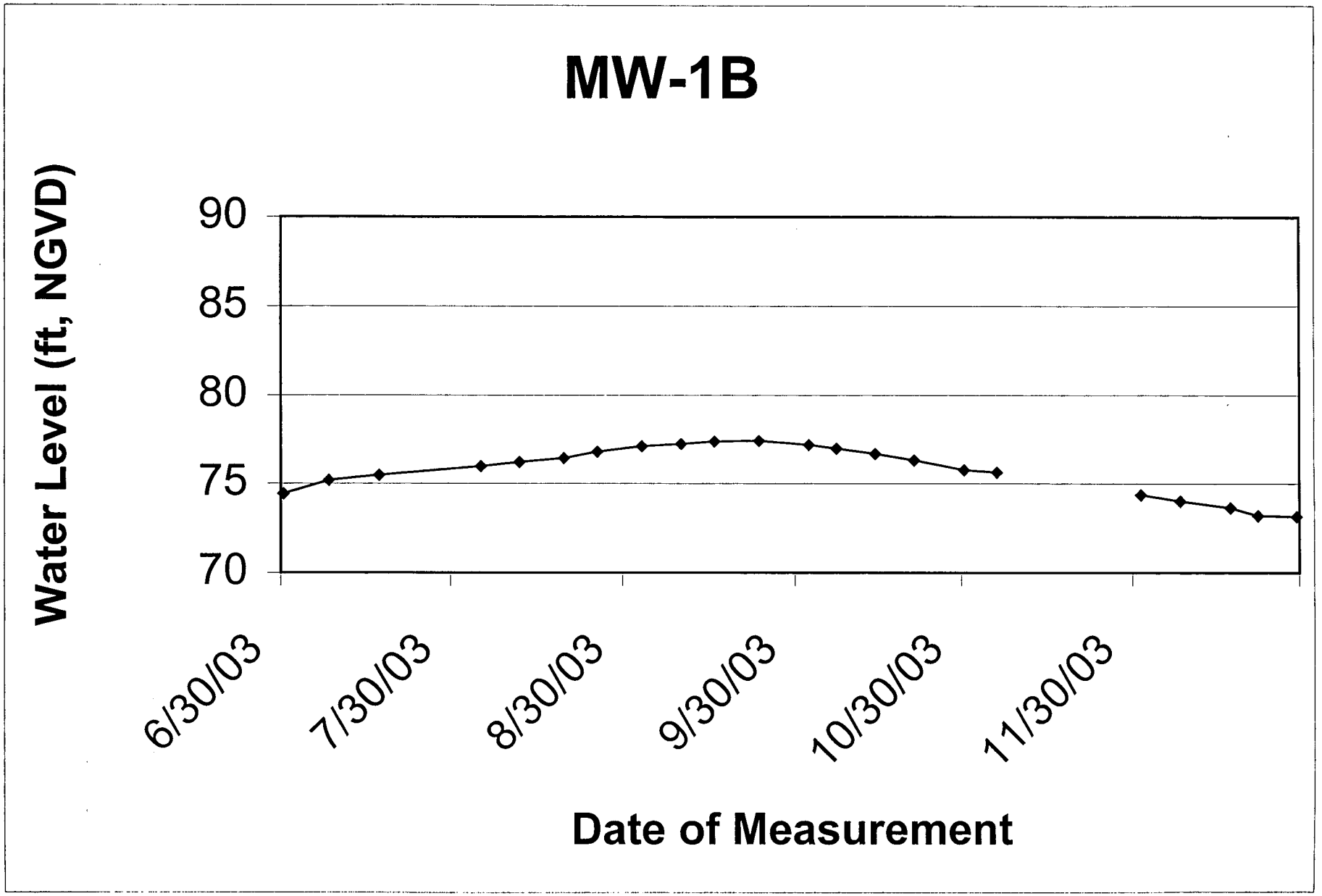
FILE: D-2.DWG

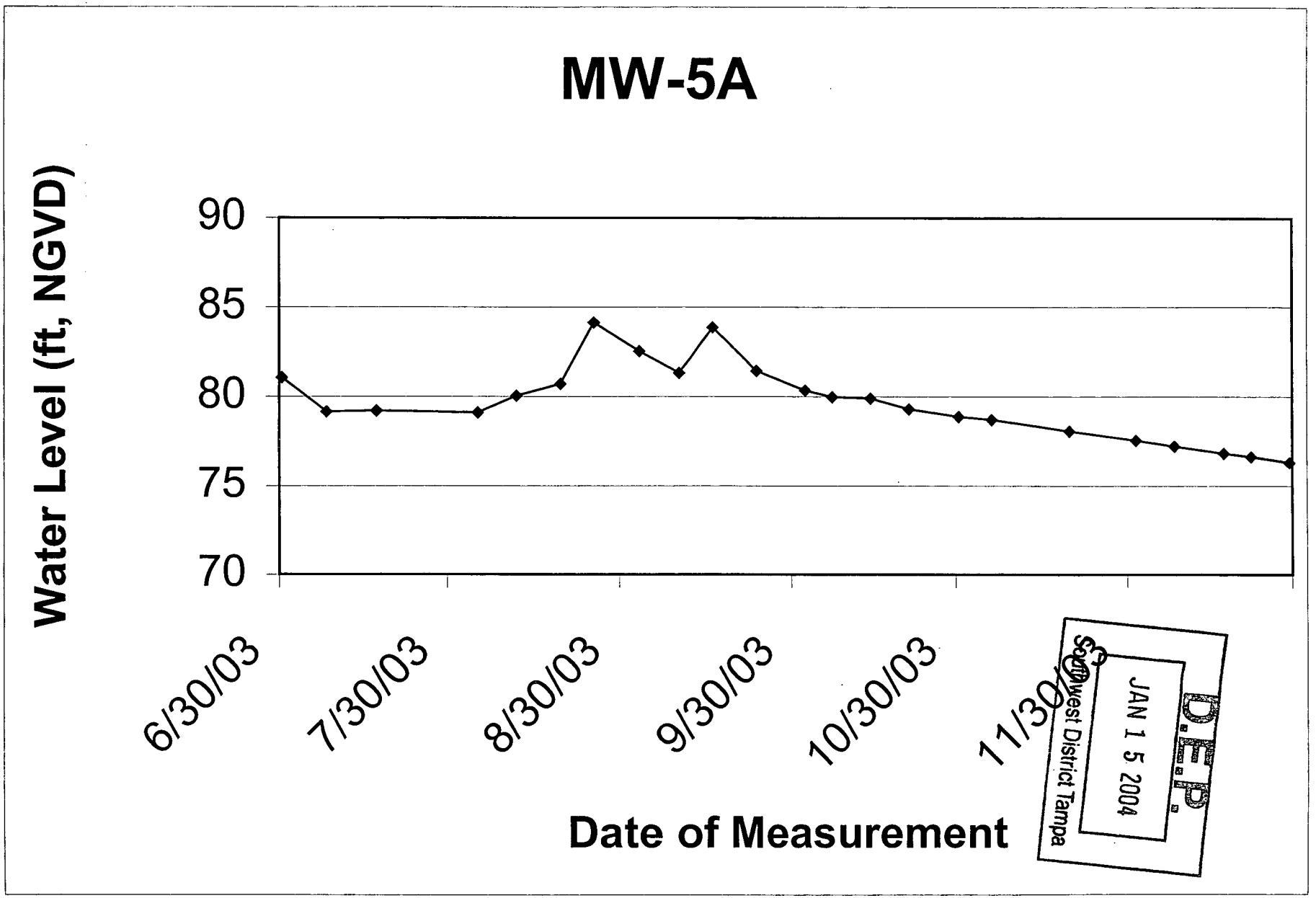
PROJECT NO. 99.0331.001
SCALE AS SHOWN
D-2
SHEET 4 OF 4

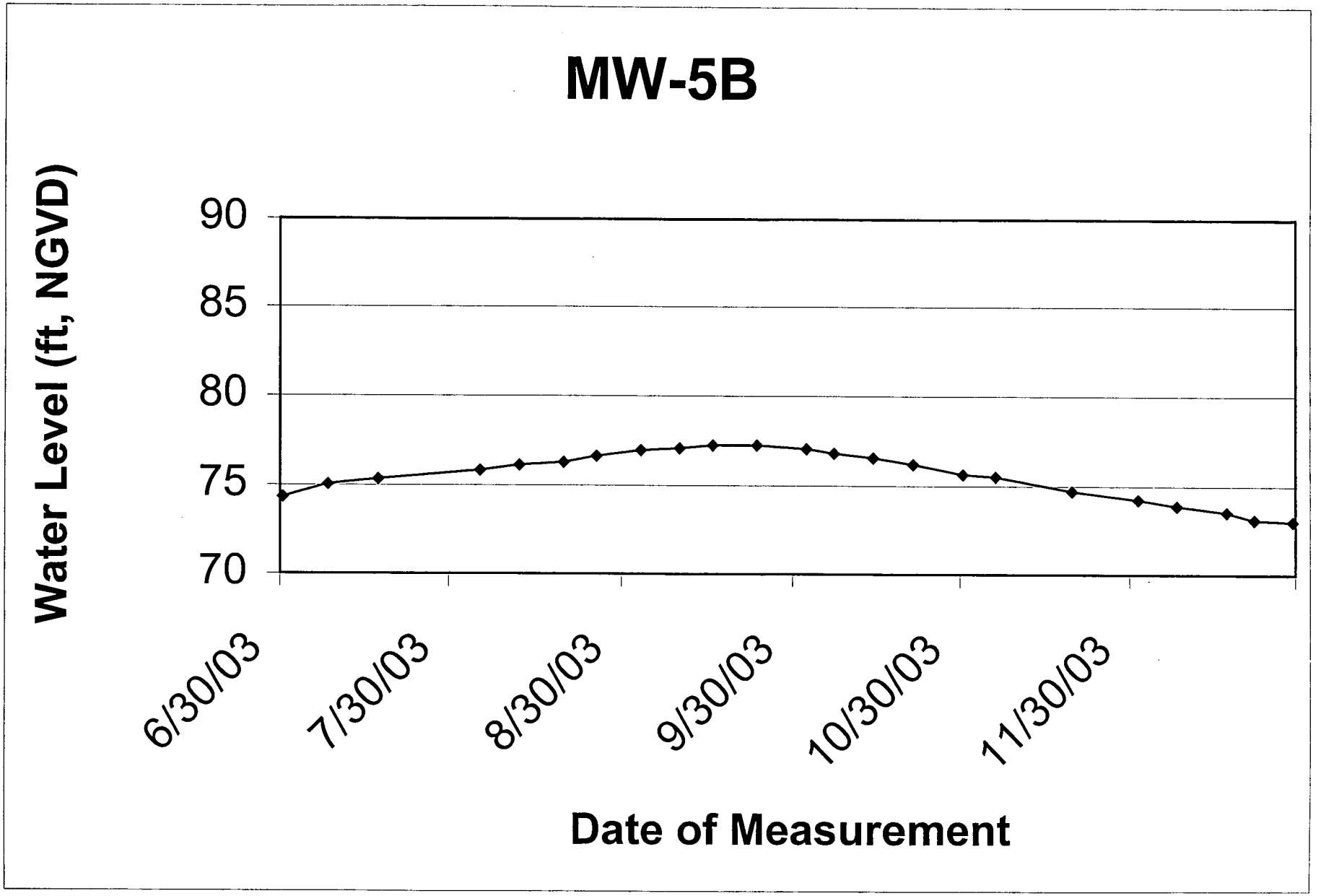


APPENDIX G

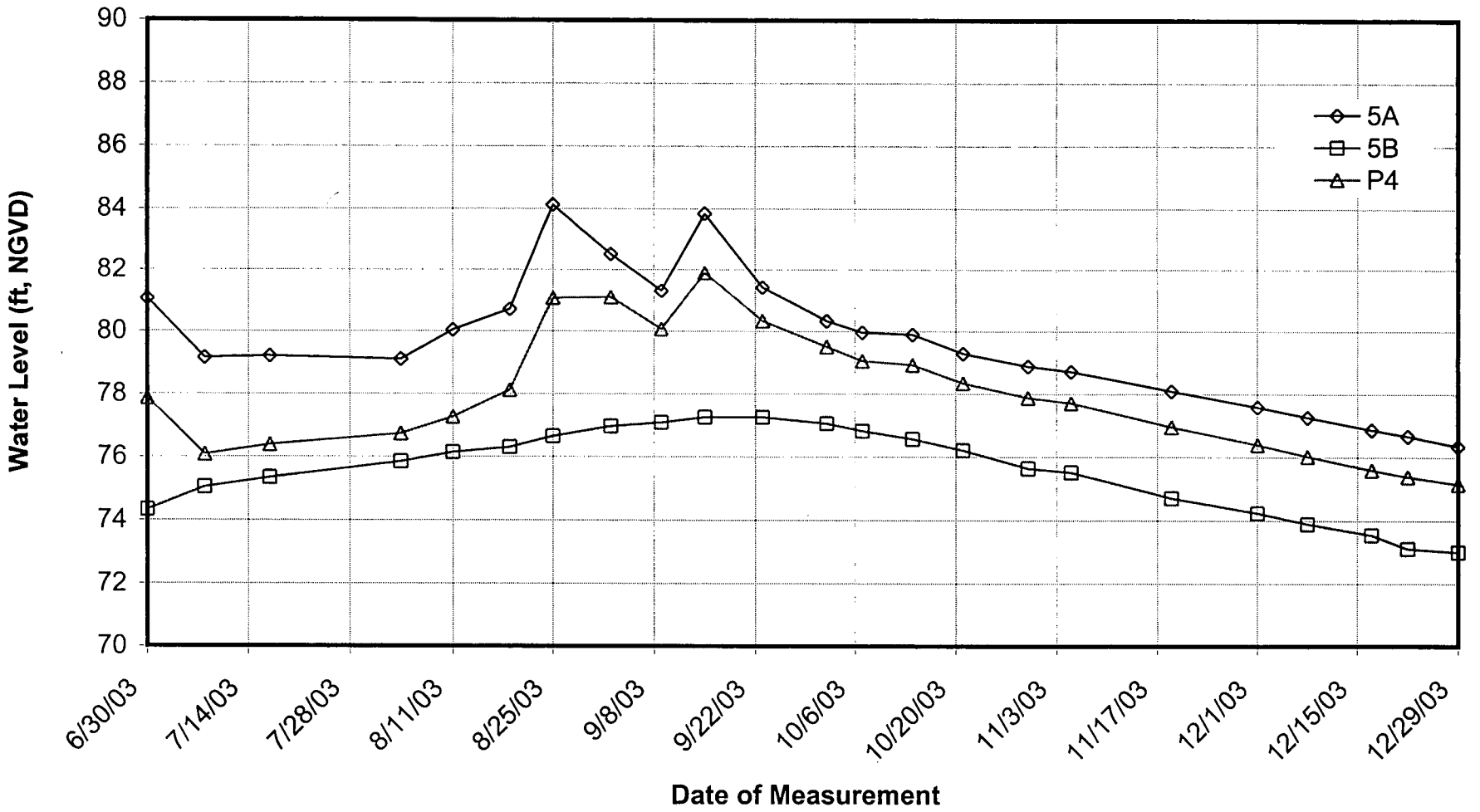

MW-1
Water Level, (Ft NGVD)
90
85
80
75
70
6/30/03
7/30/03
8/30/03
9/30/03
10/30/03
11/30/03
Date of Measurement

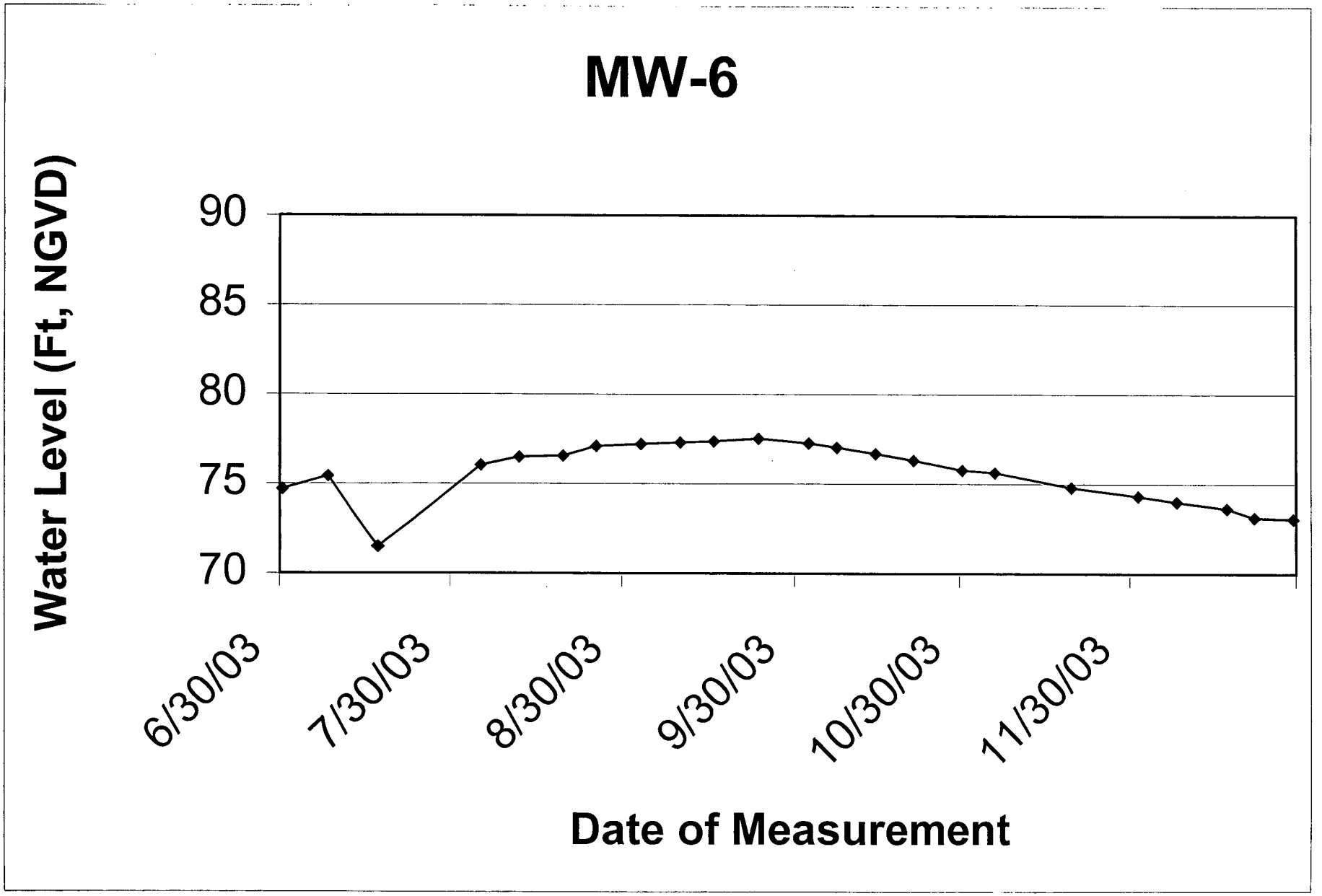

MW-1B
Water Level (ft, NGVD)
90
85
80
75
70
6/30/03
7/30/03
8/30/03
9/30/03
10/30/03
11/30/03
Date of Measurement

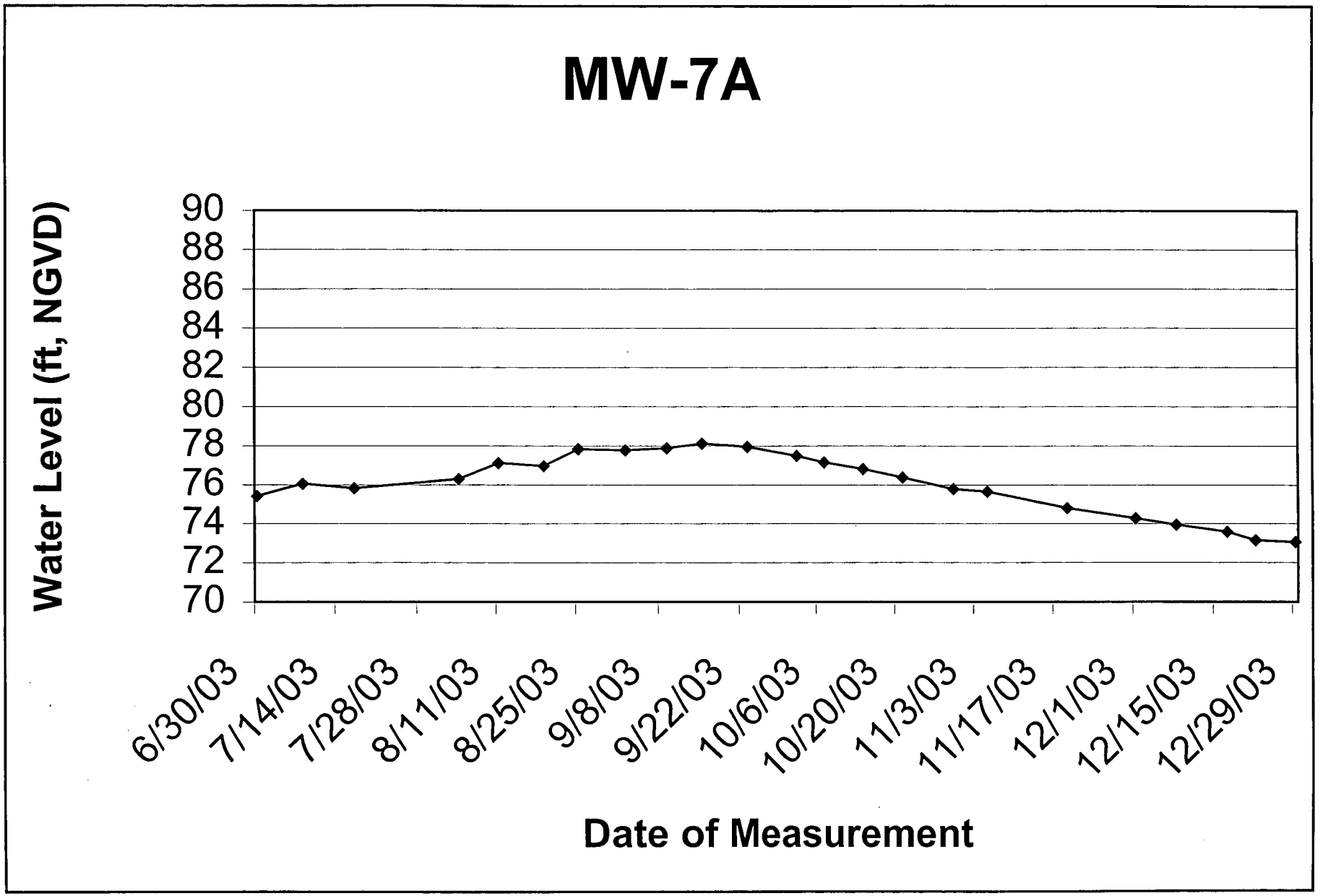

MW-5A
Water Level (ft, NGVD)
90
85
80
75
70
6/30/03
7/30/03
8/30/03
9/30/03
10/30/03
11/30/03
Date of Measurement
D.E.P.
JAN 15 2004
Southwest District Tampa

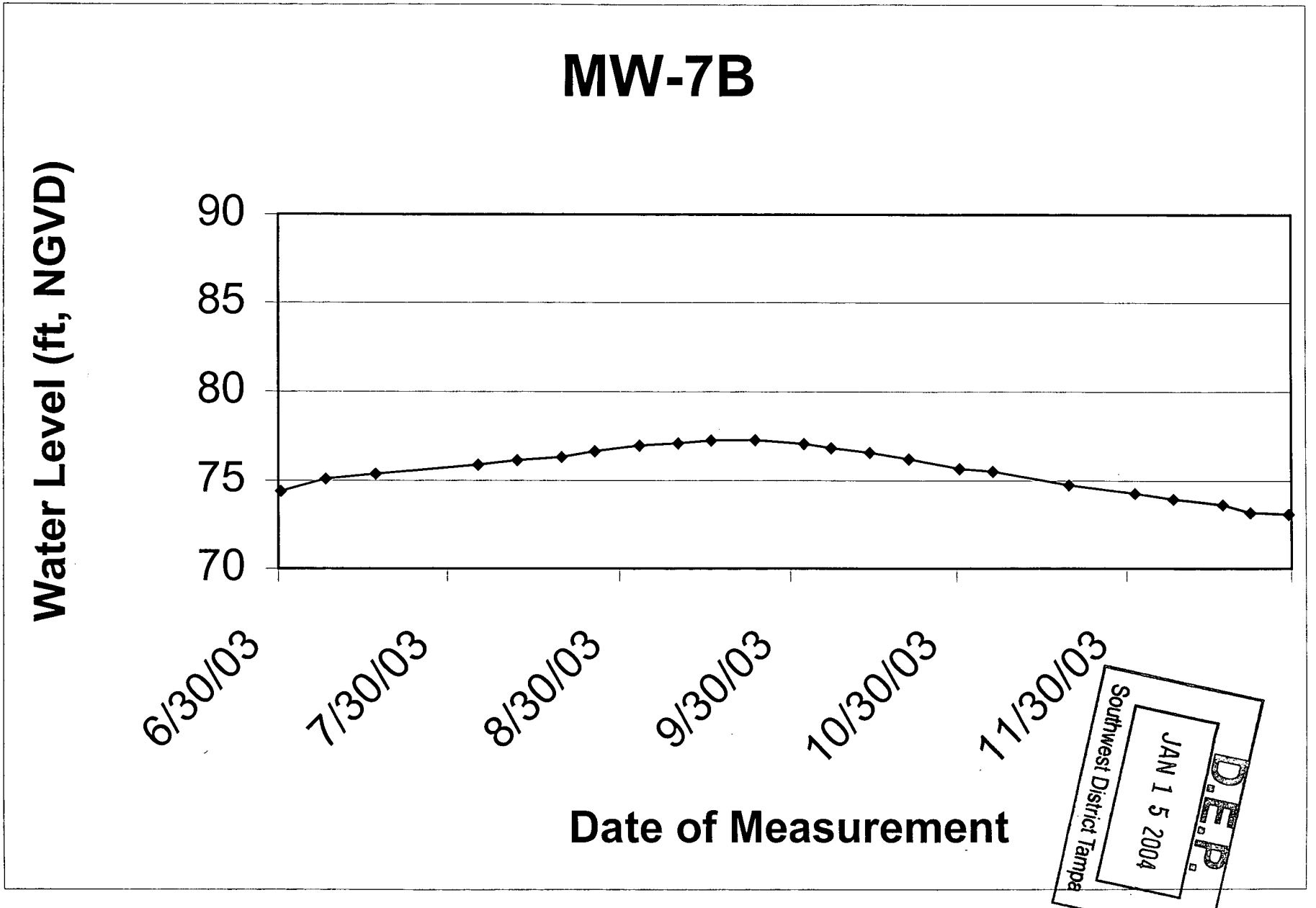

MW-5B
Water Level (ft, NGVD)
90
85
80
75
70
6/30/03
7/30/03
8/30/03
9/30/03
10/30/03
11/30/03
Date of Measurement

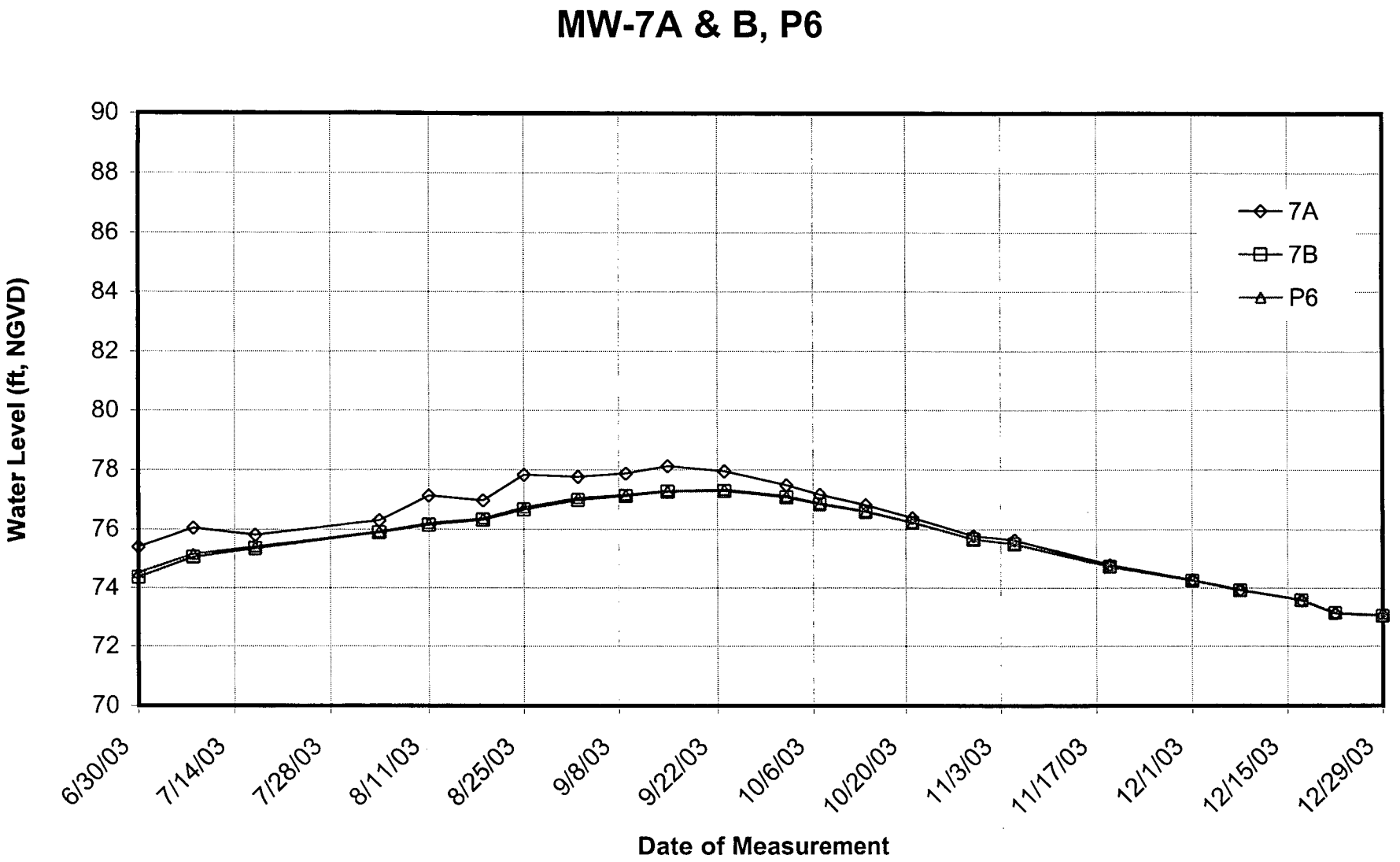
MW-5A & B

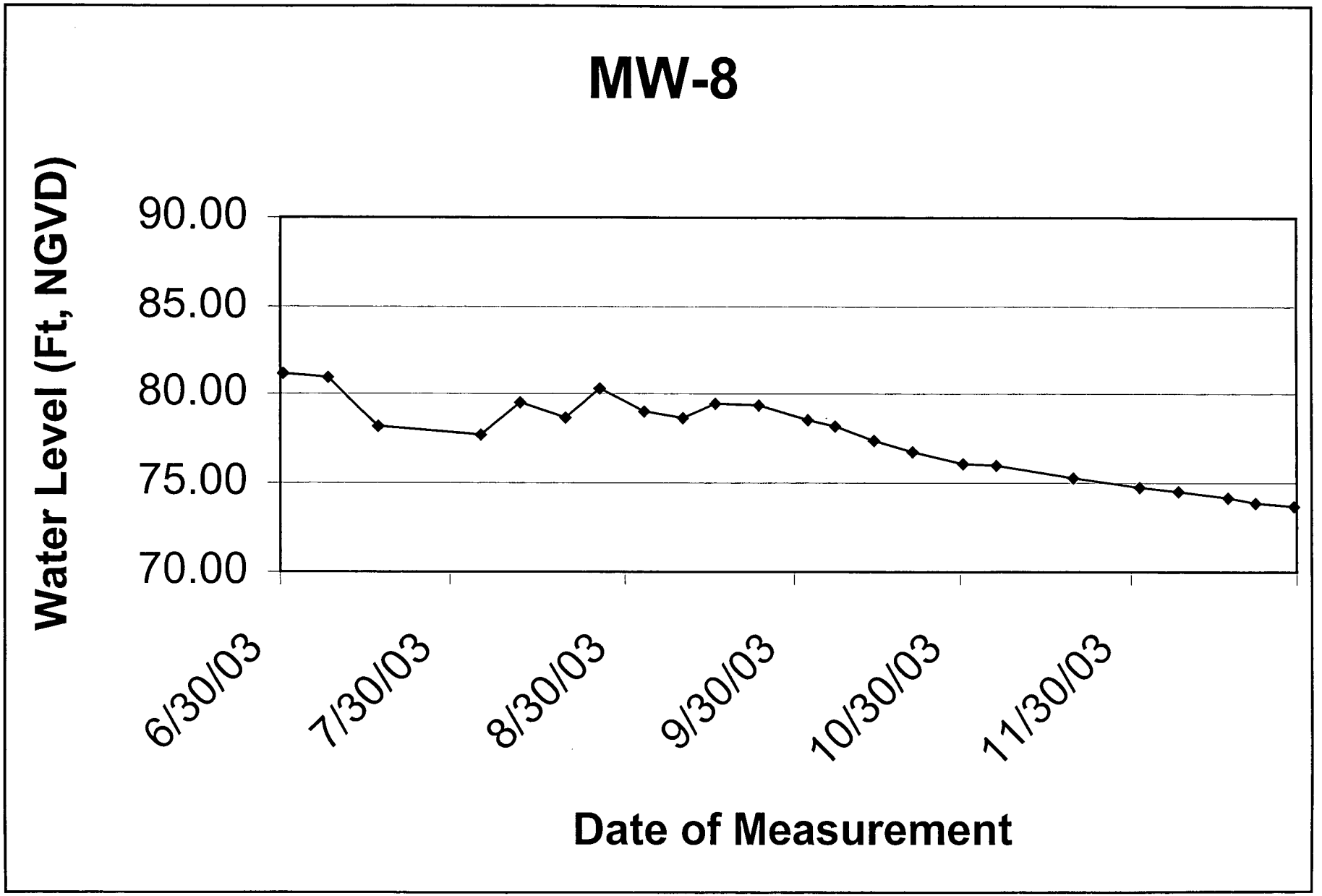

90
88
86
84
82
80
78
76
74
72
70
Water Level (ft, NGVD)
5A
5B
P4
6/30/03
7/14/03
7/28/03
8/11/03
8/25/03
9/8/03
9/22/03
10/6/03
10/20/03
11/3/03
11/17/03
12/1/03
12/15/03
12/29/03
Date of Measurement

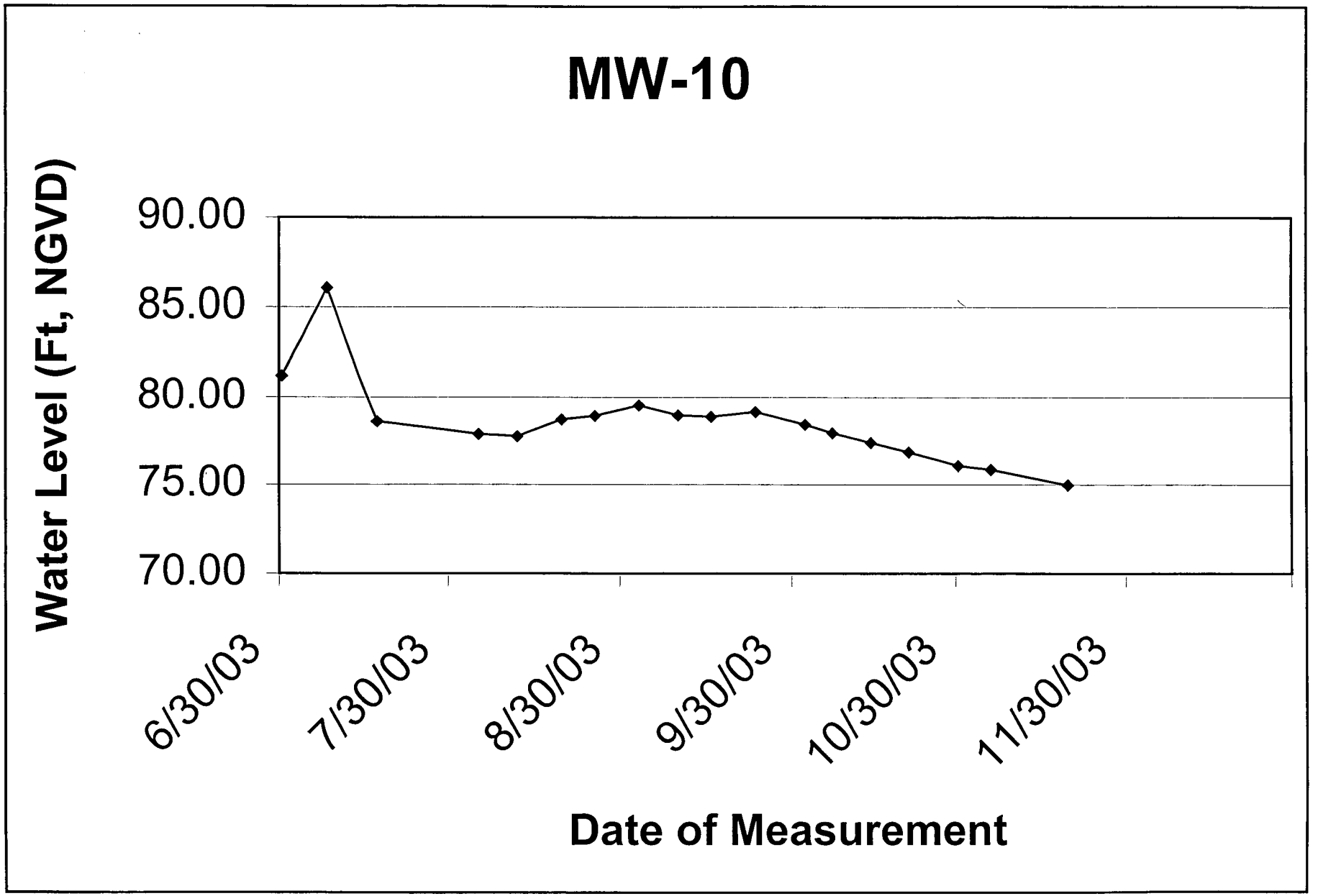

MW-6
Water Level (Ft, NGVD)
90
85
80
75
70
6/30/03
7/30/03
8/30/03
9/30/03
10/30/03
11/30/03
Date of Measurement

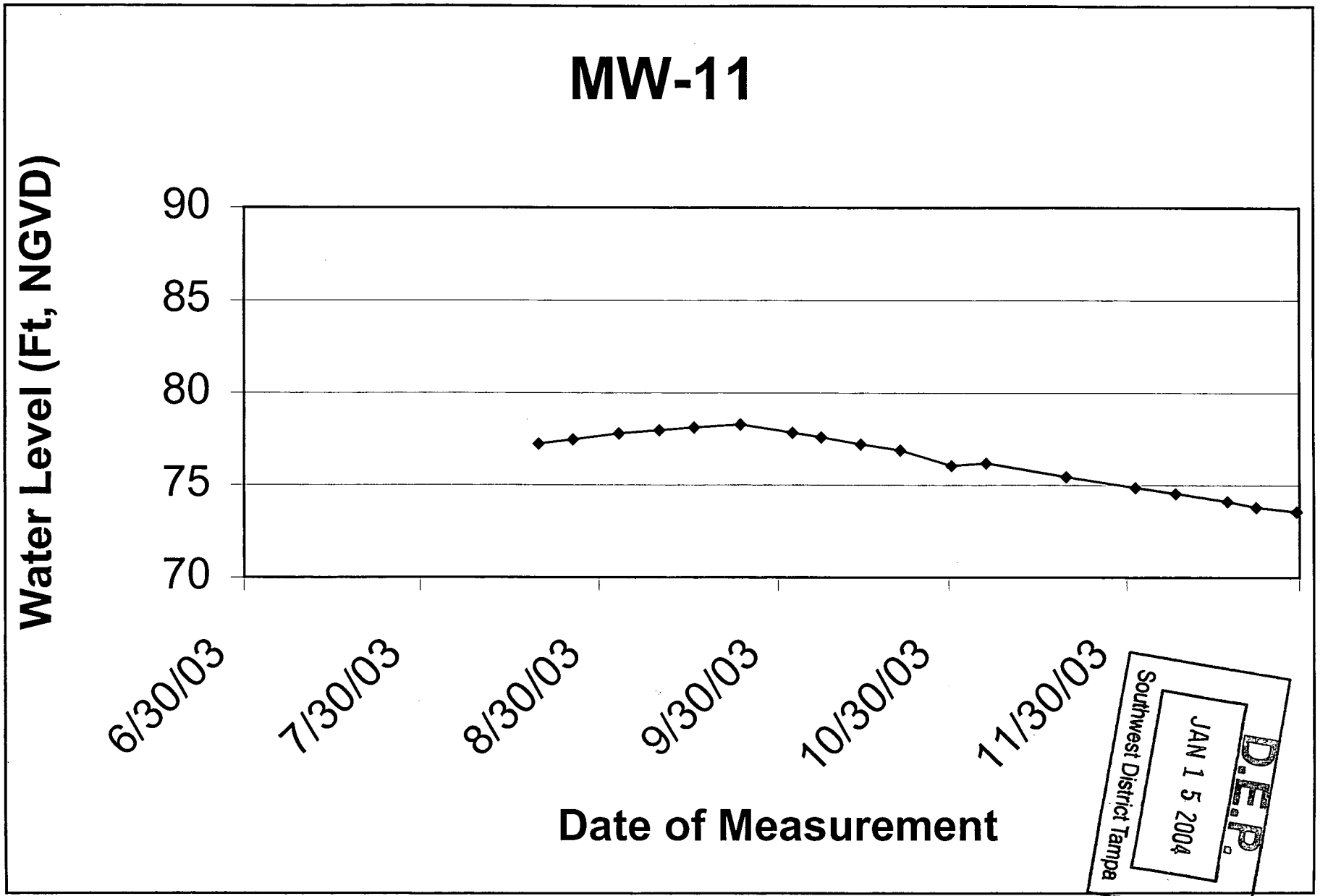

MW-7A
Water Level (ft, NGVD)
90
88
86
84
82
80
78
76
74
72
70
6/30/03
7/14/03
7/28/03
8/11/03
8/25/03
9/8/03
9/22/03
10/6/03
10/20/03
11/3/03
11/17/03
12/1/03
12/15/03
12/29/03
Date of Measurement

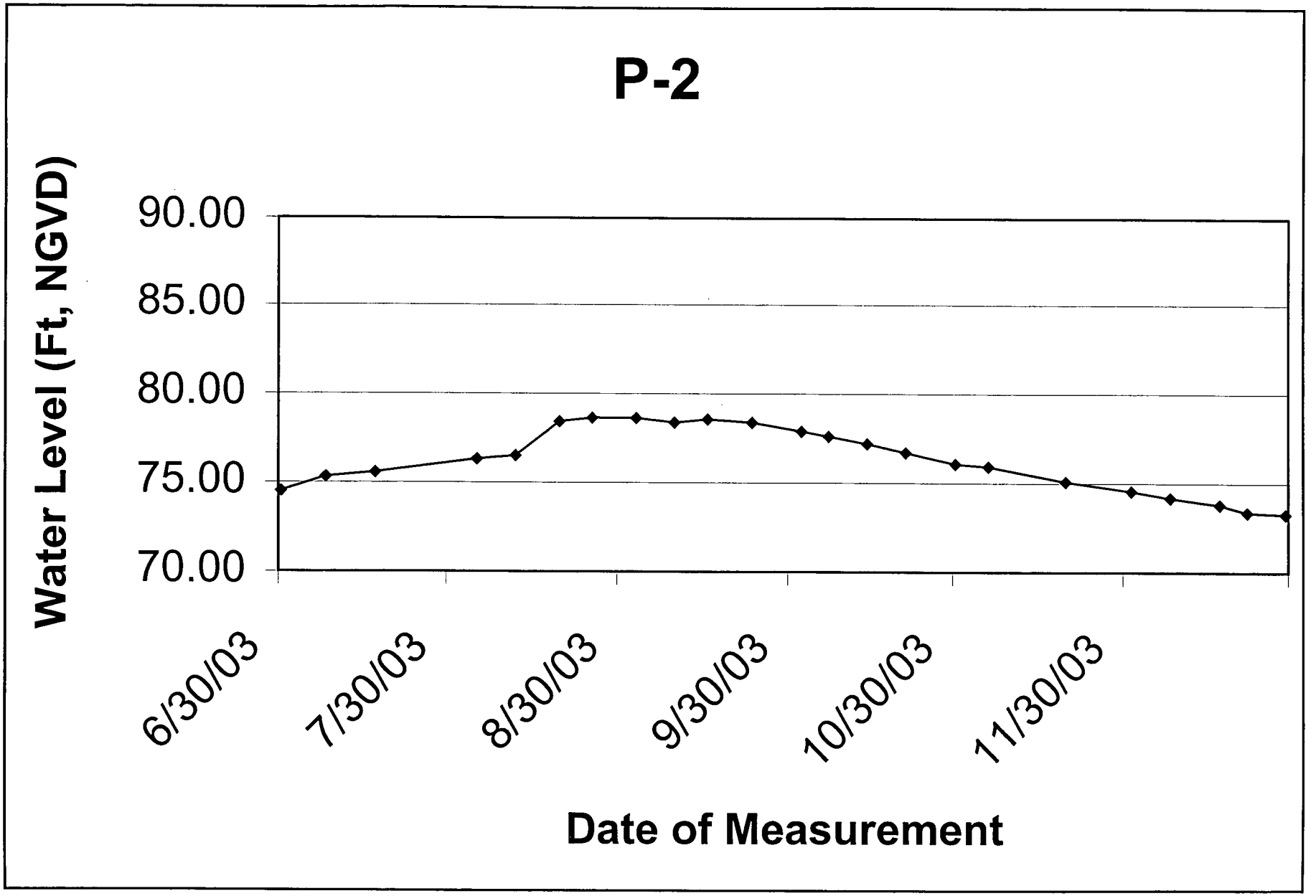


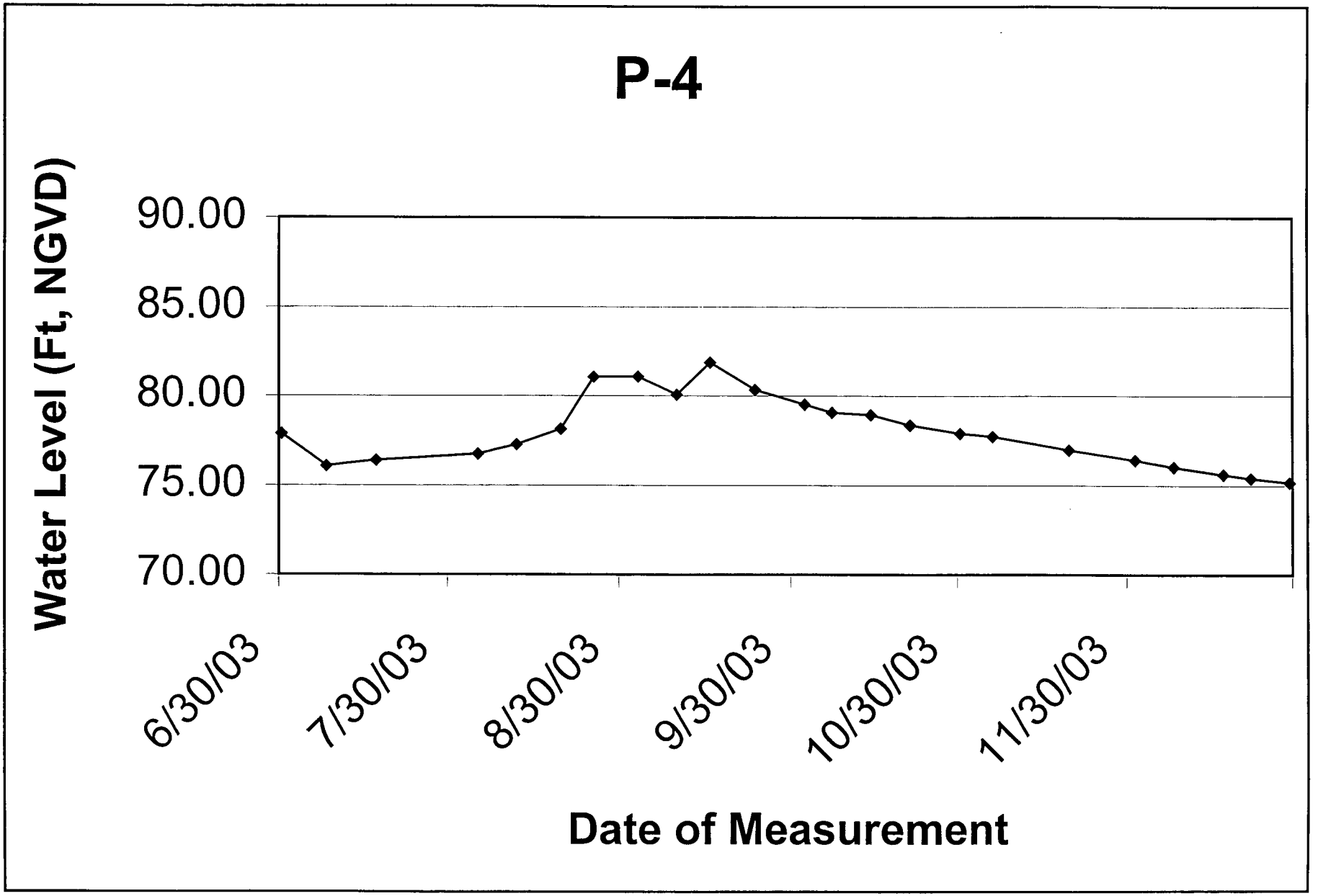

MW-7A & B, P6
Water Level (ft, NGVD)
90
88
86
84
82
80
78
76
74
72
70
7A
7B
P6
6/30/03
7/14/03
7/28/03
8/11/03
8/25/03
9/8/03
9/22/03
10/6/03
10/20/03
11/3/03
11/17/03
12/1/03
12/15/03
12/29/03
Date of Measurement


MW-8
Water Level (Ft, NGVD)
90.00
85.00
80.00
75.00
70.00
6/30/03
7/30/03
8/30/03
9/30/03
10/30/03
11/30/03
Date of Measurement


MW-10
Water Level (Ft, NGVD)
90.00
85.00
80.00
75.00
70.00
6/30/03
7/30/03
8/30/03
9/30/03
10/30/03
11/30/03
Date of Measurement


MW-11
Water Level (Ft, NGVD)
90
85
80
75
70
6/30/03
7/30/03
8/30/03
9/30/03
10/30/03
11/30/03
Date of Measurement
Southwest District Tampa
JAN 15 2004
D.E.P.


P-2
Water Level (Ft, NGVD)
90.00
85.00
80.00
75.00
70.00
6/30/03
7/30/03
8/30/03
9/30/03
10/30/03
11/30/03
Date of Measurement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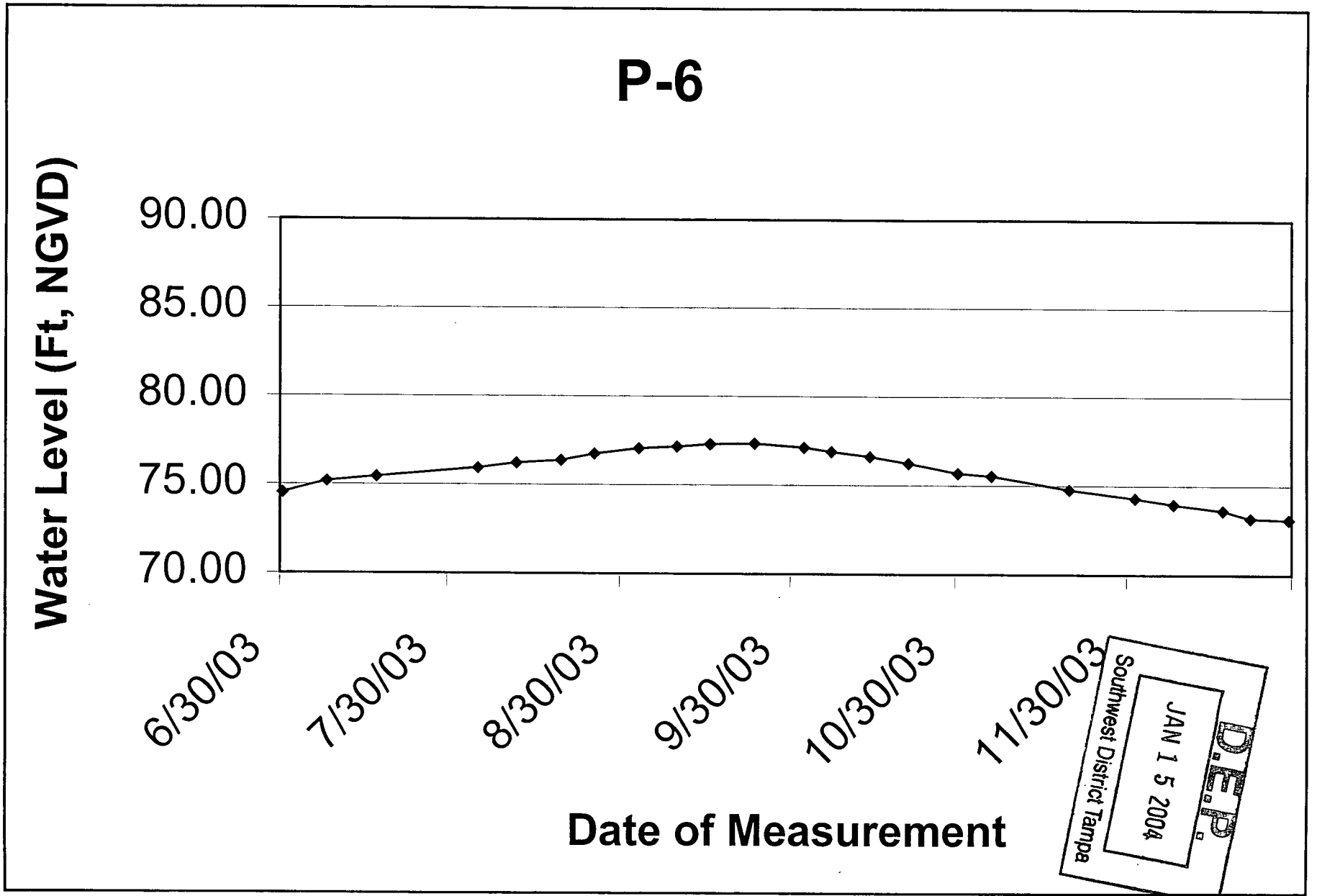
80.00
75.00
70.00
6/30/03
7/30/03
8/30/03
9/30/03
10/30/03
11/30/03
Date of Measurement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80.00
75.00
70.00
6/30/03
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9/30/03
10/30/03
11/30/03
Date of Measurement
DEP
Southwest District Tampa
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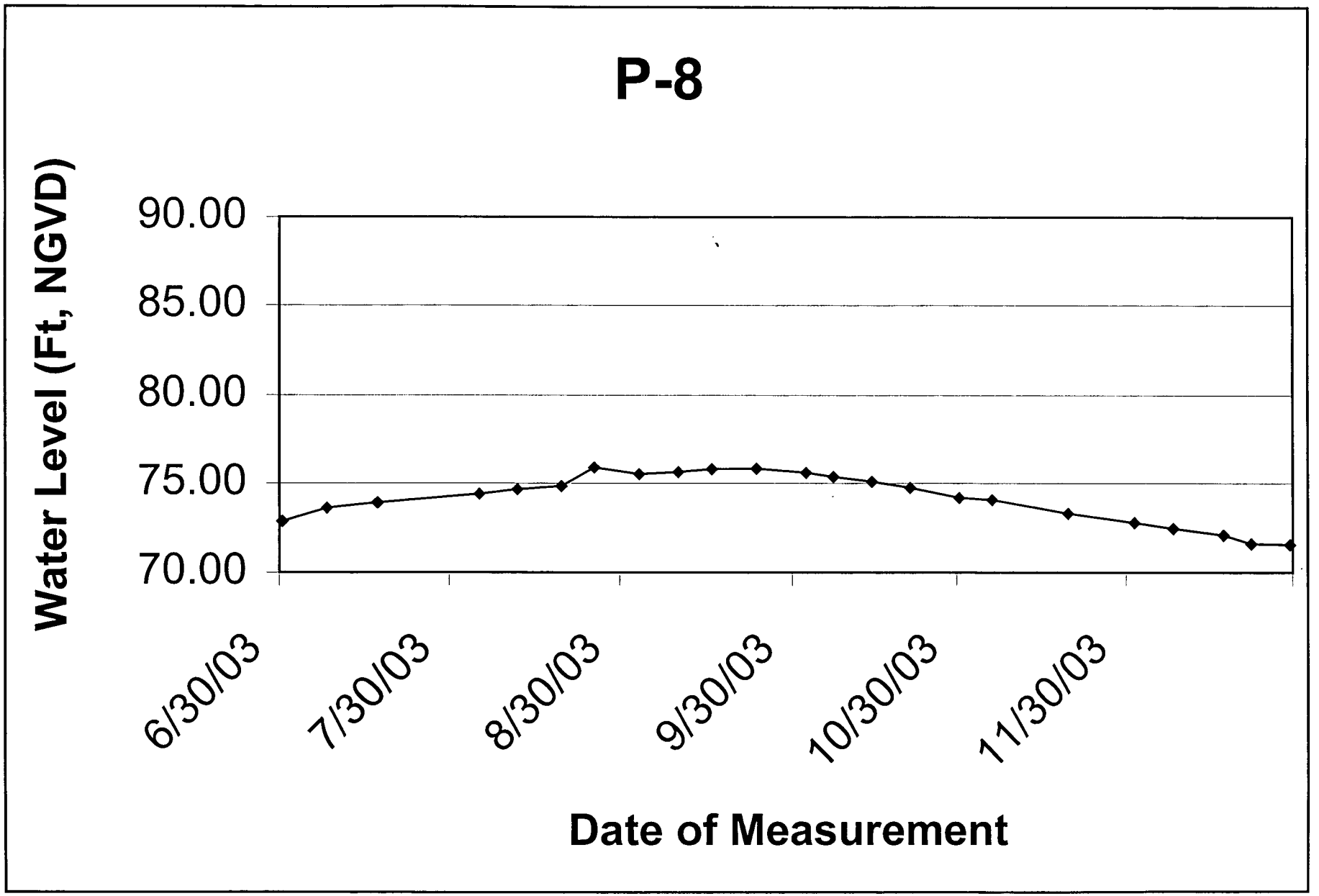
P-8
Water Level (Ft, NGVD)
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75.00
70.00
6/30/03
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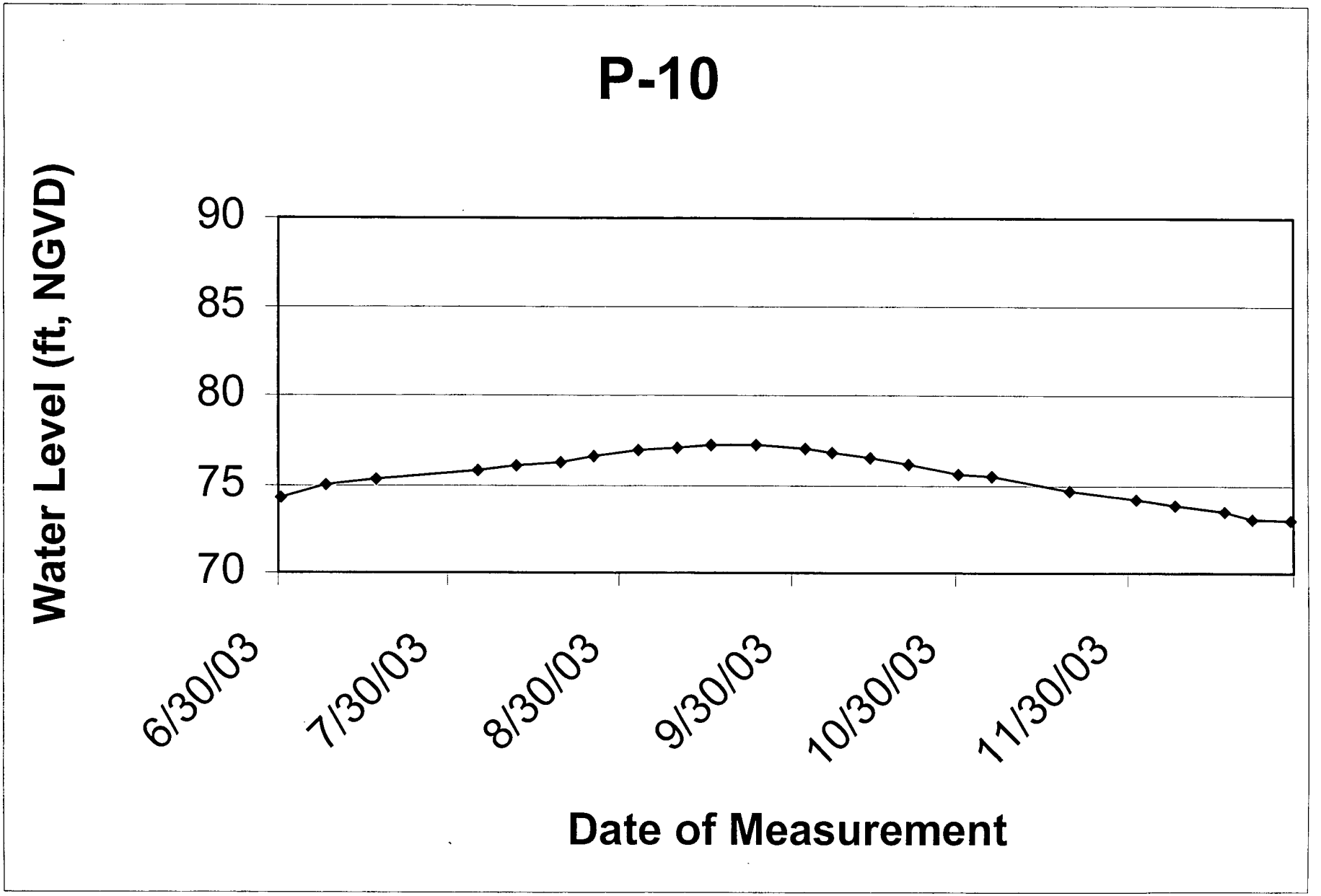
8/30/03
9/30/03
10/30/03
11/30/03
Date of Measurement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Water Level (ft, NGVD)
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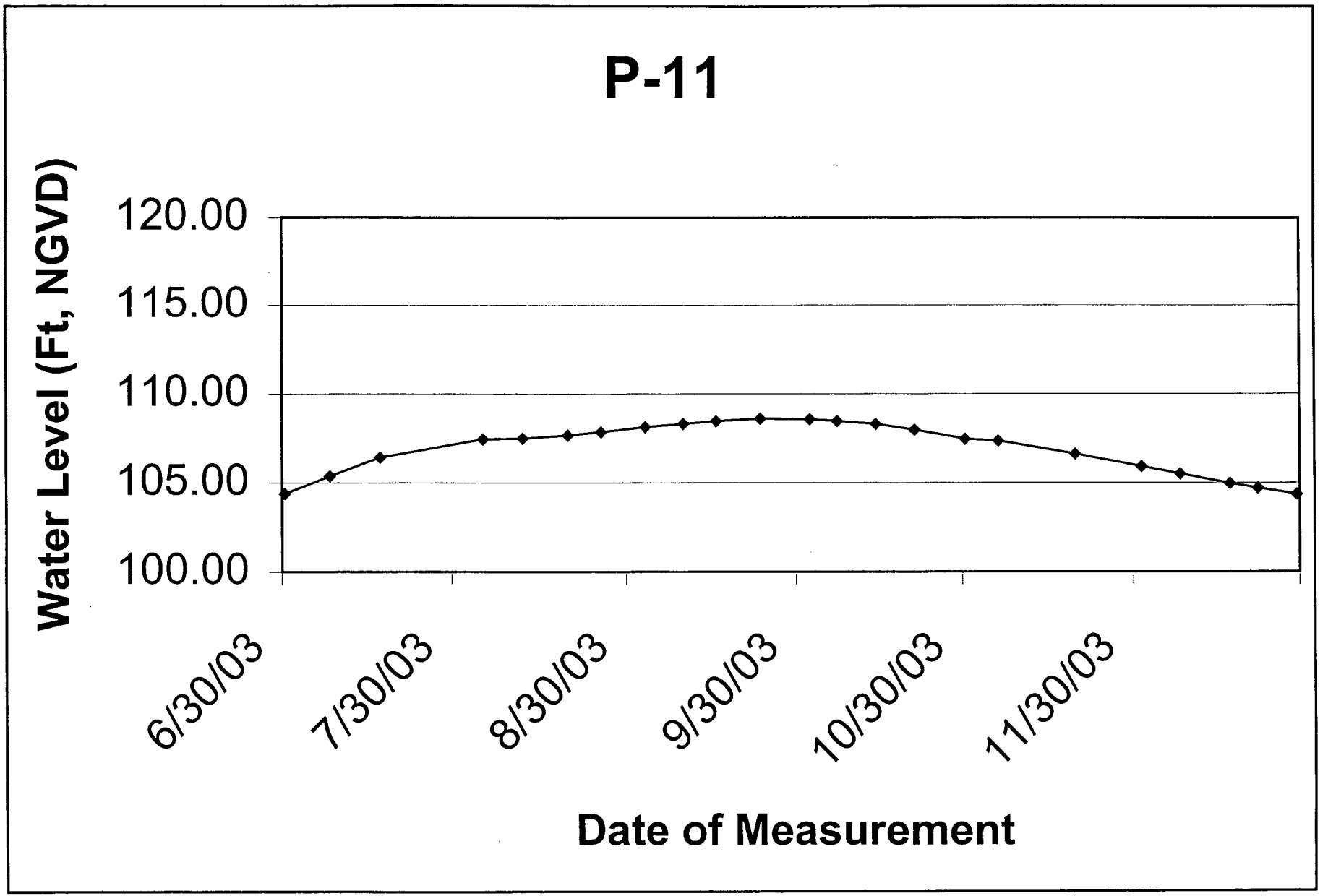
85
80
75
70
6/30/03
7/30/03
8/30/03
9/30/03
10/30/03
11/30/03
Date of Measurement


P-11
Water Level (Ft, NGVD)
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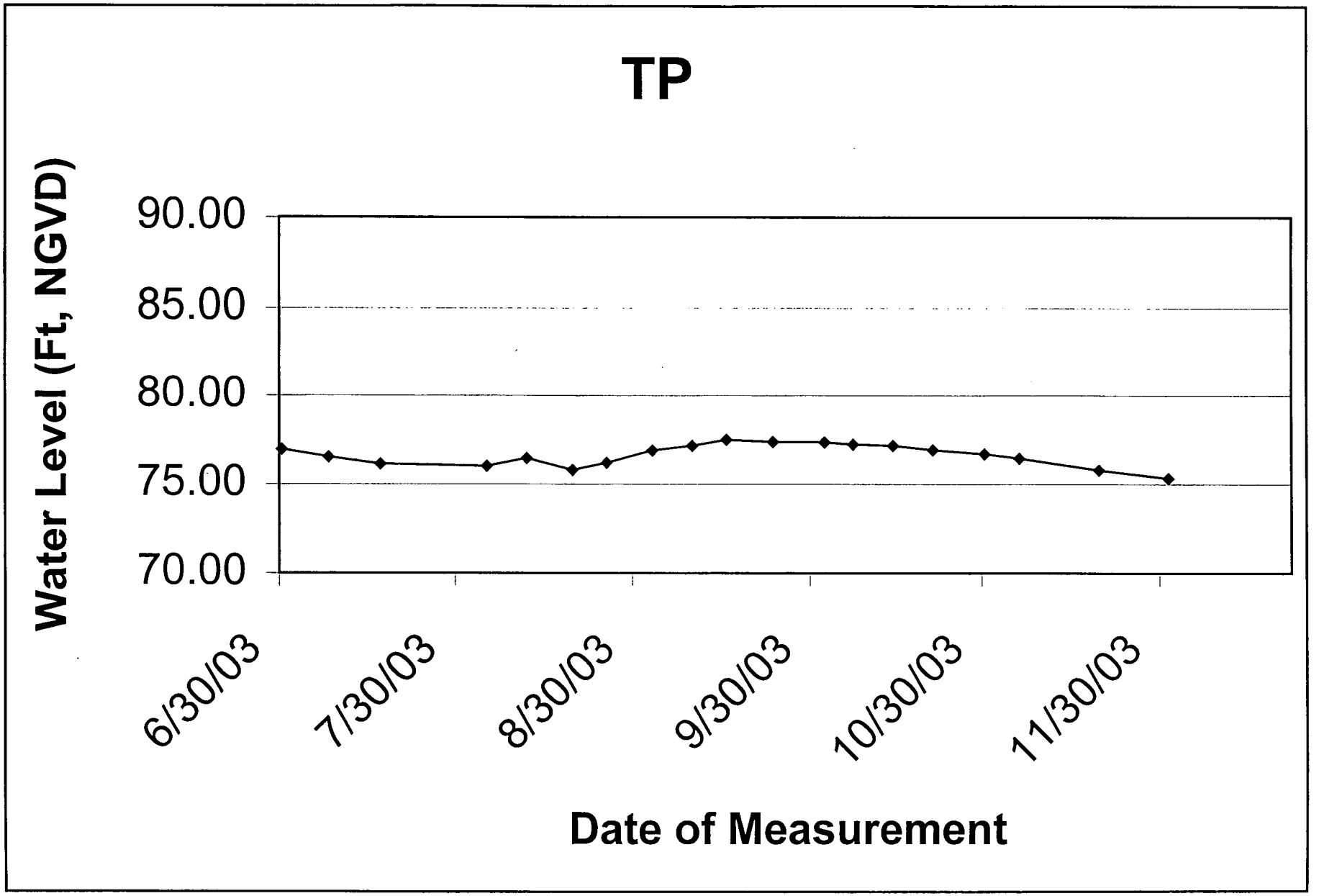
115.00
110.00
105.00
100.00
6/30/03
7/30/03
8/30/03
9/30/03
10/30/03
11/30/03
Date of Measurement


TP
Water Level (Ft, NGVD)
90.00
85.00
80.00
75.00
70.00
6/30/03
7/30/03
8/30/03
9/30/03
10/30/03
11/30/03
Date of Measurement

APPENDIX H

the use of the pumping-test approach is usually inappropriate. It is our opinion that the method is widely overused. Piezometer tests are simpler and cheaper, and they can provide adequate data in many cases where pumping tests are not justified.

8.7 Estimation of Saturated Hydraulic Conductivity

It has long been recognized that hydraulic conductivity is related to the grain-size distribution of granular porous media. In the early stages of aquifer exploration or in regional studies where direct permeability data are sparse, this interrelationship can prove useful for the estimation of conductivity values. In this section, we will examine estimation techniques based on grain-size analyses and porosity determinations. These types of data are often widely available in geological reports, agricultural soil surveys, or reports of soil mechanics testing at engineering sites.

The determination of a relation between conductivity and soil texture requires the choice of a representative grain-size diameter. A simple and apparently durable empirical relation, due to Hazen in the latter part of the last century, relies on the effective grain size, d_{10}, and predicts a power-law relation with K:

$$K = Ad_{10}^2 \tag{8.47}$$

The d_{10} value can be taken directly from a grain-size gradation curve as determined by sieve analysis. It is the grain-size diameter at which 10% by weight of the soil particles are finer and 90% are coarser. For K in cm/s and d_{10} in mm, the coefficient A in Eq. (8.47) is equal to 1.0. Hazen's approximation was originally determined for uniformly graded sands, but it can provide rough but useful estimates for most soils in the fine sand to gravel range.

Textural determination of hydraulic conductivity becomes more powerful when some measure of the spread of the gradation curve is taken into account. When this is done, the *median grain size*, d_{50}, is usually taken as the representative diameter. Masch and Denny (1966) recommend plotting the gradation curve [Figure 8.25(a)] using Krumbein's ϕ units, where $\phi = -\log_2 d$, d being the grain-size diameter (in mm). As a measure of spread, they use the *inclusive standard deviation*, σ_I, where

$$\sigma_I = \frac{d_{16} - d_{84}}{4} + \frac{d_5 - d_{95}}{6.6} \tag{8.48}$$

For the example shown in Figure 8.25(a), $d_{50} = 2.0$ and $\sigma_I = 0.8$. The curves shown in Figure 8.25(b) were developed experimentally in the laboratory on prepared samples of unconsolidated sand. From them, one can determine K, knowing d_{50} and σ_I.

For a fluid of density, ρ, and viscosity, μ, we have seen in Section 2.3 [Eq. (2.26)] that the hydraulic conductivity of a porous medium consisting of uniform

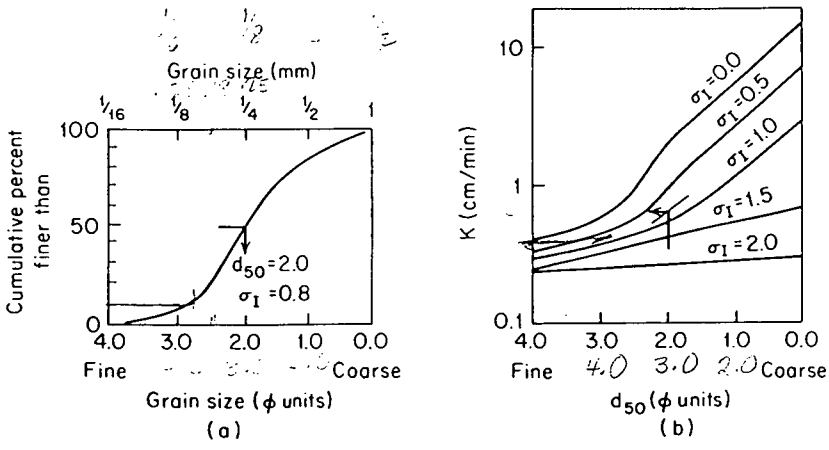


Figure 8.25 Determination of saturated hydraulic conductivity from grain-size gradation curves for unconsolidated sands (after Masch and Denny, 1966).

spherical grains of diameter, d, is given by

$$K = \left(\frac{\rho g}{\mu}\right) C d^2 \tag{8.49}$$

For a nonuniform soil, we might expect the d in Eq. (8.49) to become d_m, where d_m is some representative grain size, and we would expect the coefficient C to be dependent on the shape and packing of the soil grains. The fact that the porosity, n, represents an integrated measure of the packing arrangement has led many investigators to carry out experimental studies of the relationship between C and n. The best known of the resulting predictive equations for hydraulic conductivity is the *Kozeny-Carmen equation* (Bear, 1972), which takes the form

$$K = \left(\frac{\rho g}{\mu}\right)\left[\frac{n^3}{(1-n)^2}\right]\left(\frac{d_m^2}{180}\right) \tag{8.50}$$

In most formulas of this type, the porosity term is identical to the central element of Eq. (8.50), but the grain-size term can take many forms. For example, the *Fair-Hatch equation*, as reported by Todd (1959), take the form

$$K = \left(\frac{\rho g}{\mu}\right)\left[\frac{n^3}{(1-n)^2}\right]\left[\frac{1}{m\left(\frac{\theta}{100}\sum\frac{P}{d_m}\right)^2}\right] \tag{8.51}$$

where m is a packing factor, found experimentally to be about 5; θ is a sand shape factor, varying from 6.0 for spherical grains to 7.7 for angular grains; P is the

percentage of sand held between adjacent sieves; and d_m is the geometric mean of the rated sizes of adjacent sieves.

Both Eqs. (8.50) and (8.51) are dimensionally correct. They are suitable for application with any consistent set of units.

8.8 Prediction of Aquifer Yield by Numerical Simulation

The analytical methods that were presented in Section 8.3 for the prediction of drawdown in multiple-well systems are not sophisticated enough to handle the heterogeneous aquifers of irregular shape that are often encountered in the field. The analysis and prediction of aquifer performance in such situations is normally carried out by numerical simulation on a digital computer.

There are two basic approaches: those that involve a *finite-difference* formulation, and those that involve a *finite-element* formulation. We will look at finite-difference methods in moderate detail, but our treatment of finite-element methods will be very brief.

Finite-Difference Methods

As with the steady-state finite-difference methods that were described in Section 5.3, transient simulation requires a discretization of the continuum that makes up the region of flow. Consider a two-dimensional, horizontal, confined aquifer of constant thickness, b; and let it be discretized into a finite number of blocks, each with its own hydrogeologic properties, and each having a node at the center at which the hydraulic head is defined for the entire block. As shown in Figure 8.26(a), some of these blocks may be the site of pumping wells that are removing water from the aquifer.

Let us now examine the flow regime in one of the interior nodal blocks and its four surrounding neighbors. The equation of continuity for transient, saturated flow states that the net rate of flow into any nodal block must be equal to the time rate of change of storage within the nodal block. With reference to Figure 8.26(b), and following the developments of Section 2.11, we have

$$Q_{15} + Q_{25} + Q_{35} + Q_{45} = S_{s_5} \Delta x \, \Delta y \, b \frac{\partial h_5}{\partial t} \tag{8.52}$$

where S_{s_5} is the specific storage of nodal block 5. From Darcy's law,

$$Q_{15} = K_{15} \frac{h_1 - h_5}{\Delta y} \Delta x \, b \tag{8.53}$$

where K_{15} is a representative hydraulic conductivity between nodes 1 and 5. Similar expressions can be written for Q_{25}, Q_{35}, and Q_{45}.

TABLE 4.6 Ranges of intrinsic permeabilities and hydraulic conductivities for unconsolidated sediments

Material	Intrinsic Permeability (darcys)	Hydraulic Conductivity (cm/s)
Clay	10^{-6}–10^{-3}	10^{-9}–10^{-6}
Silt, sandy silts, clayey sands, till	10^{-3}–10^{-1}	10^{-6}–10^{-4}
Silty sands, fine sands	10^{-2}–1	10^{-5}–10^{-3}
Well-sorted sands, glacial outwash	1–10^{2}	10^{-3}–10^{-1}
Well-sorted gravel	10–10^{3}	10^{-2}–1

4.4.3 Permeability of Sediments

Unconsolidated coarse-grained sediments represent some of the most prolific producers of ground water. Likewise, clays are often used for engineering purposes, such as lining solid-waste disposal sites, because of their extremely low intrinsic permeability. There is obviously a wide-ranging continuum of permeability values for unconsolidated sediments (Table 4.6).

The intrinsic permeability is a function of the size of the pore opening. The smaller the size of the sediment grains, the larger the surface area the water contacts (Figure 4.13). This increases the frictional resistance to flow, which reduces the intrinsic permeability. For well-sorted sediments, the intrinsic permeability is proportional to the grain size of the sediment (Norris & Fidler 1965).

For sand-sized alluvial deposits, several factors relating intrinsic permeability to grain size have been noted (Masch & Denny 1966). These observations would hold true for all sedimentary deposits, regardless of origin of deposition.

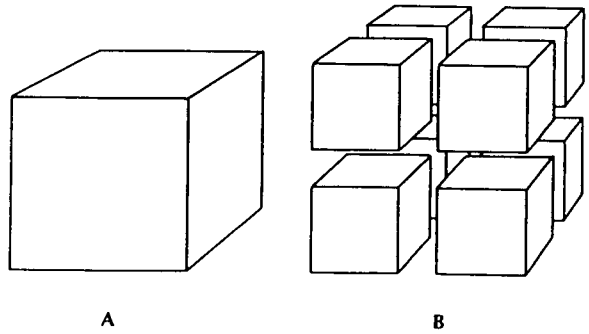


FIGURE 4.13 Relationship of sediment grain size to surface area of pore space. **A.** A cube of sediment with a surface area of 6 square units. **B.** The cube has been broken into 8 pieces, each with a diameter of one-half of the cube in part A. The surface area has increased to 12 square units—an increase of 100%.

1. As the median grain size increases, so does permeability. This is due to larger pore openings.
2. Permeability will decrease for a given median diameter as the standard deviation of particle size increases. The increase in standard deviation indicates a more poorly sorted sample, so that the finer material can fill the voids between larger fragments.
3. Coarser samples show a greater decrease in permeability with an increase in standard deviation than do fine samples.
4. Unimodal (one dominant size) samples have a greater permeability than bimodal (two dominant sizes) samples. This is again a result of poorer sorting of the sediment sizes, as the bimodal distribution indicates.

The hydraulic conductivity of sandy sediments can be estimated from the grain-size distribution curve by the **Hazen method** (Hazen 1911). The method is applicable to sands where the effective grain size (d_{10}) is between approximately 0.1 and 3.0 mm. The Hazen approximation is

$$K = C(d_{10})^2 \qquad \textbf{(4–19)}$$

where

K is hydraulic conductivity (cm/s)
d_{10} is the effective grain size (cm)
C is a coefficient based on the following table

Very fine sand, poorly sorted	40–80
Fine sand with appreciable fines	40–80
Medium sand, well sorted	80–120
Coarse sand, poorly sorted	80–120
Coarse sand, well sorted, clean	120–150

The work of Hazen (1911) demonstrated that hydraulic conductivity could be related to the square of a characteristic dimension of a sediment. Shepherd (1989) analyzed data from 18 published studies where hydraulic conductivity had been related to grain size. He found that all studies could be related to the general formula

$$K = Cd_{50}^{j} \qquad \textbf{(4–20)}$$

where

C is a shape factor
d_{50} is the mean grain size (mm)
j is an exponent

The shape factor, C, and the exponent, j, were greatest for sediments that were texturally mature, as evidenced by well-sorted samples with uniformly sized

particles that had high roundness and sphericity. Both the shape factor and the exponent declined for sediments that were less texturally mature and were least for consolidated sediments.

Shepherd (1989) used the data sets to produce an idealized graph that relates hydraulic conductivity to the mean grain diameter for different sediment types (Figure 4.14). The C values on the graph are those that give the hydraulic

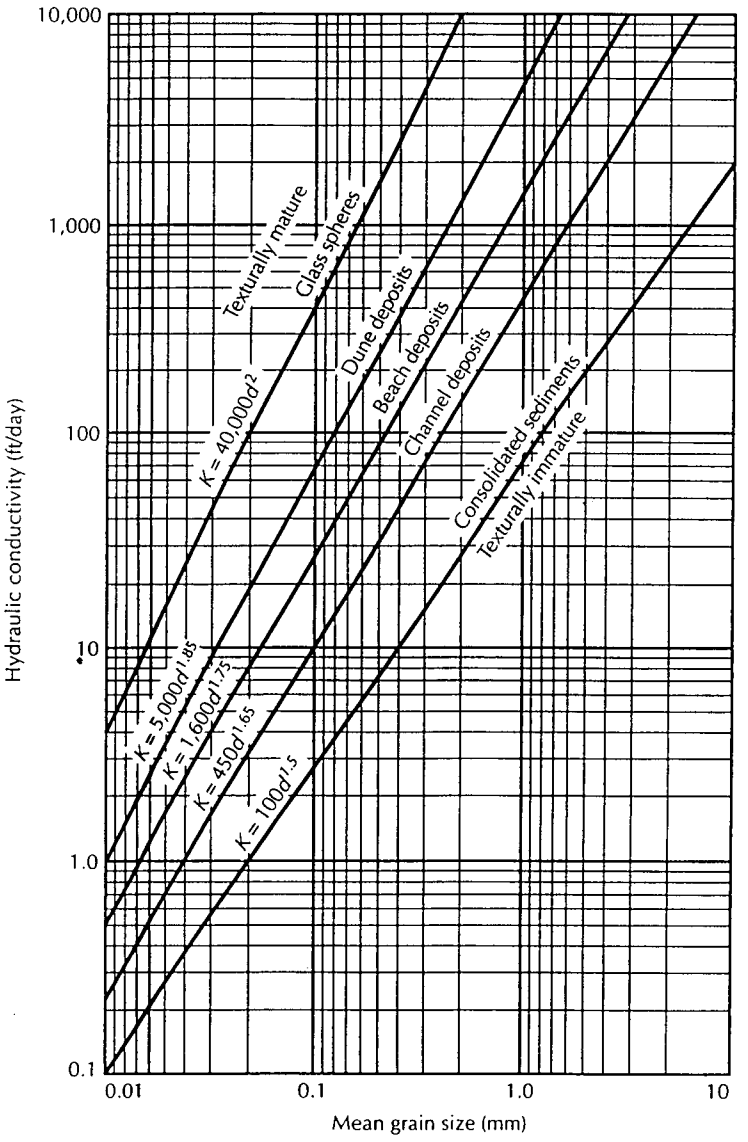


FIGURE 4.14 Graph showing the relationship of hydraulic conductivity to mean grain diameter for sediments of different textural maturity. Modified from R. G. Shepherd, *Ground Water* 27, no. 5 (1989): 633–638. Copyright © 1989 Ground Water Publishing Co.

conductivity in units of feet per day. An upper bound is presented for glass spheres, where the exponent is 2.0. Texturally mature sediments have an exponent of 1.75 or greater, whereas texturally immature sediments can have an exponent as low as 1.5.

CASE STUDY: HYDRAULIC CONDUCTIVITY ESTIMATES IN GLACIAL OUTWASH

A hazardous-waste-processing site was located on a level glacial outwash plain in southern Indiana. There were two aquifers present in the unconsolidated glacial deposits. The upper aquifer consisted of a well-sorted fine to medium sand. There were 27 ground-water monitoring wells installed in this aquifer. The lower aquifer was a poorly sorted fine to coarse sand. There were 9 monitoring wells installed in this aquifer. The grain-size analyses of the sand samples from the screen zones of the wells in each aquifer are summarized in the following table:

	Upper Aquifer		Lower Aquifer	
	Mean	Range	Mean	Range
d_{10}	0.14 mm	0.08–0.20 mm	0.16 mm	0.09–0.26 mm
d_{60}	0.31 mm	0.19–0.45 mm	2.04 mm	0.35–6.70 mm
C_u	2.29	1.50–3.89	11.01	3.89–33.50

The hydraulic conductivities of the sediments at each monitoring well were estimated by the Hazen method, using a coefficient of 100. The hydraulic conductivities of the sediments at each monitoring well were measured by means of a Hvorslev slug test performed on the well (see Section 7.5.3). The following table compares the results in centimeters per second.

	Geometric Mean (cm/s)	Range (cm/s)
	Upper Aquifer	
Hazen method	1.9×10^{-2}	$4.0 \times 10^{-2} - 6.4 \times 10^{-3}$
Hvorslev test	1.9×10^{-2}	$8.9 \times 10^{-2} - 4.2 \times 10^{-3}$
	Lower Aquifer	
Hazen method	1.2×10^{-2}	$2.6 \times 10^{-2} - 8.1 \times 10^{-3}$
Hvorslev test	1.4×10^{-2}	$1.7 \times 10^{-1} - 2.6 \times 10^{-3}$

The geometric means of the data sets were used to compare the Hvorslev test results with the Hazen method results in the above case study. Hydraulic conductivity values frequently vary by more than two orders of magnitude within the same hydrogeologic unit. An arithmetic mean of such a sample population tends to give more weight to the more permeable values. Some hydrogeologists