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February 11, 2009

Mr. Steve Morgan  
Florida Department of Environmental Protection  
13051 N. Telecom Parkway  
Temple Terrace, FL 33637

Subject: Sinkhole Formation Potential – A-4 Ash Cell

Dear Mr. Morgan:

In furtherance of our discussion on February 4, 2009, Camp Dresser & McKee, Inc. (CDM) is hereby providing the following synopsis of previously generated data, analyses, and conclusions related to sinkhole formation potential within the geographic footprint of the proposed Cell A-4 located at the West Pasco Solid Waste Facility. The synopsis presented herein is not intended to replace or supersede the conclusions and/or recommendations previously developed by other professionals related to the geologic conditions at the West Pasco site. Rather, as requested by your Department, this synopsis is intended to summarize previously gathered findings and conclusions which CDM relied upon while developing the design for the A-4 cell.

### Phase I Borings

During the preliminary evaluation of the geologic suitability of the site in the late 1980's, approximately 57 boreholes were installed throughout the site. Of these boreholes, two (D-40 and E-40) were located within the footprint of the A-4 cell (see **Attachment 1**). The specific stratigraphy of boreholes D-40 and E-40 (see **Attachment 2**) is consistent with that observed in the other boreholes used (in part) to establish the favorable area of the landfill footprint. Generally, the "favorable area" that was previously approved included those areas where test borings :

- "a. showed at least five (5) feet or more of intact and nearly continuous clayey semi-confining unit material (Star 8 or 9 as described on the soils legend(see **Attachment 3**);
- b. were in general conformance with the trend of the neighboring soil stratigraphy;
- c. lacked significant evidence or indicators of internal soil erosion in the overburden soils, and/or the propagation of this feature upward;



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d. in general, showed the typical results, that is, sand over clay over limestone; or with some acceptable deviation from this soil profile."<sup>1</sup>

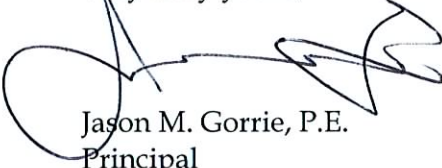
### Ground Penetrating Radar (GPR) Data

In addition to the borings discussed above, the United States Department of Agriculture (USDA) conducted Ground Penetrating Radar (GPR) testing throughout the West Pasco site in May of 1986. The purpose of this testing was to expand upon the borehole data and to further identify those areas of the site that were suitable for locating solid waste disposal cells, a subset of which includes the current A-4 cell. The GPR testing undertaken by the USDA identified eighteen (18) potential subsurface anomalies located throughout the West Pasco site. Of the 18 locations identified, one (1) location, previously and hereinafter referred to as "location E-45+60", is located in the vicinity of the geographic footprint of the proposed A-4 cell (see **Attachment 1**).

To further investigate this anomaly, a ground truth boring was installed at the location identified by the USDA. Both the GPR signature and the SPT boring at location E-45+60 are included as **Attachment 4**. The interpretation of this boring indicated "(a)t location E-45+60, this boring does not represent an anomaly. This soil stratigraphy is typical of what is anticipated under the favorable area of the landfill."<sup>2</sup>

In summary, previous investigations at the West Pasco site, inclusive of the geographic footprint of the A-4 cell, indicate that the potential for sinkhole formation is slight. CDM relied upon these previously submitted and accepted findings while preparing the construction details for the A-4 cell. If the Department would like to discuss this issue further, please do not hesitate to contact me at (813) 281-2900

Very truly yours,



Jason M. Gorrie, P.E.  
Principal  
Camp Dresser & McKee Inc.

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<sup>1</sup> "Summary Report, Geotechnical/Hydrogeologic Study, Proposed Class I Sanitary/Ash Landfill Site – Hays Road, Pasco County, Florida", pg. 27, Jammal & Associates, Inc., April 17, 1987

<sup>2</sup> Ibid., pg. 36

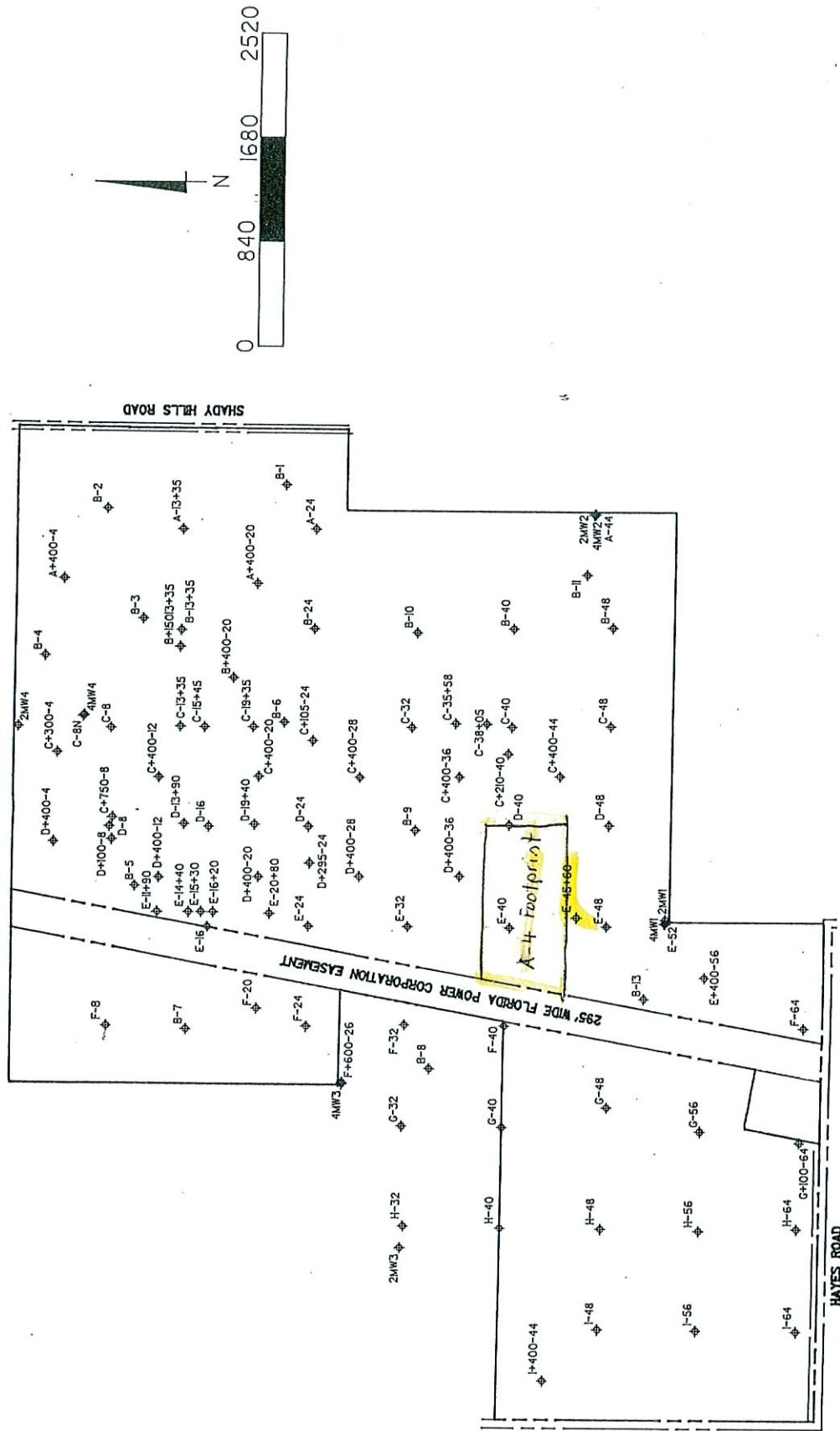


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cc: John Power, Pasco County

## ATTACHMENT 1

### Boring Locations

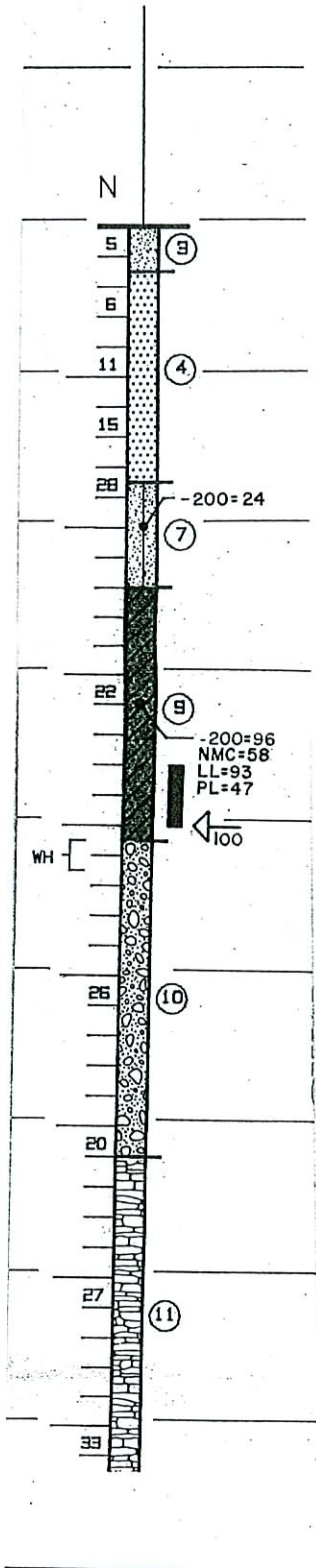
Pasco County Resource Recovery Program  
Standard Penetration Test Borings

## ATTACHMENT 2

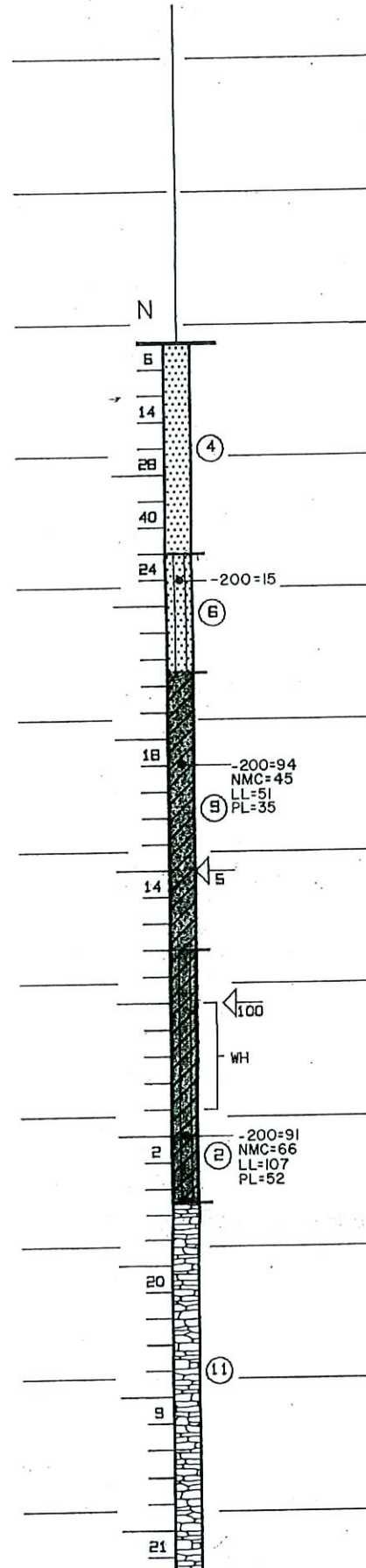
D-40 and E-40 Boring Logs



D-40














E-40



ATTACHMENT 3  
Stratigraphy Legend



# LEGEND

- ①  Black organic debris - MUCK (PT)
- ②  Dark gray to black silty to sandy CLAY (CL/CH)
- ③  Gray slightly silty fine SAND, trace roots (SP-SM)
- ④  Light brown to brown fine SAND to slightly silty fine SAND (SP/SP-SM)
- ⑤  Dark brown slightly silty fine SAND to silty fine SAND (SP-SM/SM)
- ⑥  Brown to orange-brown silty fine SAND to slightly clayey fine SAND (SM/SP-SC)
- ⑦  Gray clayey SAND (SC)
- ⑧  Light gray and reddish-brown mottled sandy CLAY to CLAY (CL/CH)
- ⑨  Light brown or greenish-gray to green sandy CLAY to CLAY (CL/CH)
- ⑩  White to light brown calcareous silty CLAY, with limestone fragments and traces of green clay
- ⑪  White to light gray weathered LIMESTONE

SP Unified Soil Classification group symbol as determined by visual examination

N "N" value in blows/foot

50/4" Fifty blows for four inches

← Loss of circulation (%)

WK Fell under weight of rod & kelly

WH Fell under weight of rod & hammer

WR Fell under weight of rod

-200 Fines passing No. 200 sieve (%)


NMC Natural Moisture Content (%)

LL Liquid Limit (%)

PL Plastic Limit (%)

© Consolidation test performed

k<sub>v</sub> Coefficient of Vertical Permeability (cm/sec)

 Shelby tube sample location

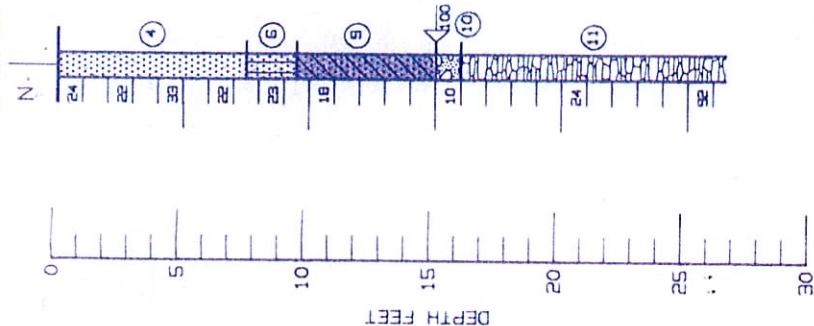
\* Grain Size Analysis performed, see appendices

## ATTACHMENT 4

E-45+60 GPR Trace and SPT Boring



E-45+60



# GROUND TRUTH SPT BORING

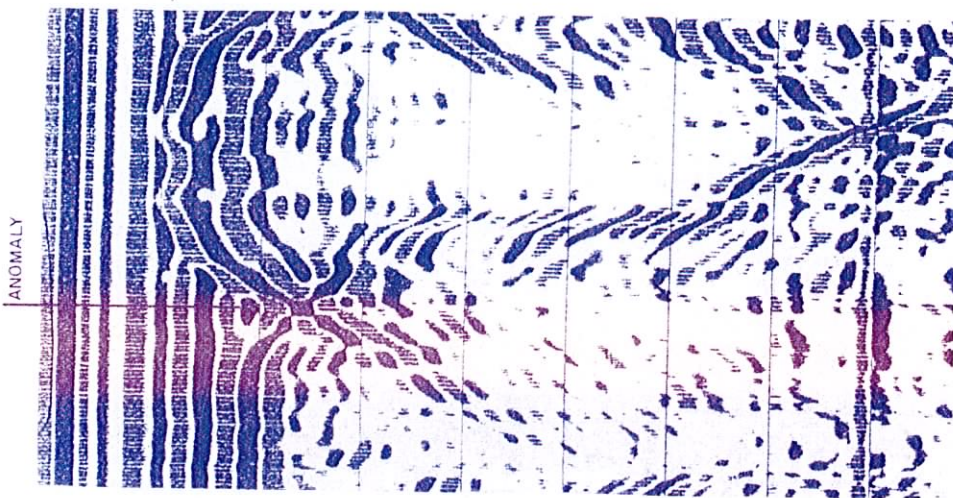
(Date: Oct. 6, 1986)

GEOTECHNICAL / HYDROGEOLOGIC STUDY  
PROPOSED PASCO COUNTY LANDFILL -  
HAYS ROAD SITE  
PASCO COUNTY, FLORIDA

JAMMAL & ASSOCIATES, INC. Consulting Engineers

DATE DEC. 86 PROJ NO 85-30267

PLATE 18



## GPR RESULT

(Slow Speed, Oct. 3, 1986)

LOCATION:

E-45+60

DRAWN	KFB
CHECKED	KFB
APPROVED	RAM
SCALE	

## GPR RESULT

(Fast Speed, May 29, 1986)

