

**SCS ENGINEERS**July 28, 2003  
File No. 09198036.25

SWAP 03-1

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Solid Waste Section

Mr. Richard Tedder, P.E.  
Florida Department of Environmental Protection (FDEP)  
2600 Blair Stone Road  
Twin Tower Office Building  
Tallahassee, Florida 32399-2400

Subject: Request for Approval of Alternate Procedure  
Landfill Composite Liner Construction  
Escambia County Section 3C Expansion  
Permit No. 000667-003-SO

Perdido LF

Dear Mr. Tedder:

On behalf of Escambia County, SCS Engineers (SCS) is submitting this request for an alternate procedure to the Department to allow for the construction of the soil component of the composite liner using 8-inch lifts in lieu of the prescribed 6-inch lifts. This letter was prepared in order to request approval of this alternate procedure in accordance with the criteria set forth in Rule 62-701.310(2), Florida Administrative Code, FAC. A fee of \$2,000 in accordance with Rule 62-701.310(6), FAC, is also attached.

The criteria set forth in Rule 62-701.310(2), FAC, for approval of an alternate design is summarized in the following table and addressed in more detail in subsequent sections.

Rule	Criteria	Response
62-701.310(2)(a), FAC	Specific facility for which an exception is sought.	Escambia County Perdido Landfill Section 3C Expansion
62-701.310(2)(b), FAC	Specific provisions from which an exception is sought	Requirement to construct soil liner components using 6-inches thick lifts. Rule 62-701.400(3)(b)2, FAC
62-701.310(2)(c), FAC	Basis for the exception	The available on-site clay materials are very workable and routinely able to achieve the required hydraulic conductivity using 8-inch lifts with the equipment and procedures employed.



Rule	Criteria	Response
62-701.310(2)(d), FAC	Alternate procedure sought and demonstration that the alternate procedure provides an equal degree of protection for the public and environment	Construction of the two-foot soil liner using three 8-inch lifts. The alternative results in a soil liner meeting the required hydraulic conductivity throughout the profile of the liner, thus providing an equal degree of protection as the prescriptive construction method.
62-701.310(2)(e), FAC	Demonstration of effectiveness of proposed alternate procedure	Documentation of hydraulic conductivity in the soil liner test pad is provided.

**Rule 62-701.310(2)(a), FAC – Facility for Which Exception is Sought**

This exception is sought for the Escambia County Perdido Landfill Section 3C Expansion in Cantonment, Florida.

**Rule 62-701.310(2)(b), FAC – Provisions for Which Exception is Sought**

The proposed lining system specifications for the Escambia County Perdido Landfill Section 3C Expansion were included in the approved permit application package. The specifications required four six-inch lifts for the clay component of the composite liner system.

In accordance with Rule 62-701.400(3)(b), FAC, a composite liner system shall consist of an upper 60-mil geomembrane and a lower two foot thick soil liner with a maximum hydraulic conductivity of  $1 \times 10^{-7}$  cm/sec is proposed for this expansion. The exception is being sought for the soil liner installation criteria set forth in Rule 62-701.400 (3)(b)2, FAC, which states that the lower soil liner shall be constructed in 6-inch lifts. The proposed alternative includes construction of the 2-foot soil layer using three lifts, a minimum of 8-inches thick each.

**Rule 62-701.310(2)(c), FAC – Basis for the Exception**

The exception is based on acceptable hydraulic conductivity test data from a constructed liner test strip using the on-site clay soils and 8-inch thick lifts. Quality assurance testing of the clay test strip was provided by Professional Services Industries, Inc. (PSI) of Pensacola, Florida. The specific equipment and procedures used to construct the test strip are documented in PSI's report on the clay test strip (Attachment A). This method of clay liner construction was previously used in the construction of the soil barrier layer on previous phases of the landfill, which included numerous test results indicating the constructed clay liner exceeds the rule requirements for hydraulic conductivity. In addition and in consultation with the Department,

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additional testing was conducted on the above referenced test strip to document that the hydraulic conductivity results were valid throughout the entire profile of each lift. The results of the clay test strip testing including the additional testing conducted at the direction of the Department are included in Attachment A, Perdido Landfill Cell 3C Clay Liner Test Strip Results, PSI, dated July 15, 2003.

The clay soils available at the subject site are a combination of fines and sand particles which make them an easily workable and compactable material over a relatively wide range of moisture conditions. In support of this statement, PSI prepared a supplementary letter report addressing the issue of the acceptable permeability zone for the clay soils. This report is included as Attachment B. In summary, the clay soils excavated and stockpiled on site are quite variable with regard to gradation except that they contain at least 50 percent fines and when compacted to modest levels, exhibit low hydraulic conductivity (i.e. less than  $7.7 \times 10^{-8}$  cm/sec). The properties of the on-site soils allow achievement of the required hydraulic conductivity using a thicker lift than what would be needed for a more typical clay material. This is affirmatively demonstrated by the hydraulic conductivity test results presented herein and in previous projects conducted at the site.

#### **Constructability--**

As indicated in Attachment A, the construction procedures employed in constructing the test strip to achieve the required hydraulic conductivity of the constructed clay liner are procedures that are typically employed in the local area for clay liner construction. Thus the constructability and reliability of the constructed product is not dependent on unreasonable or unproven procedures.

#### **Benefit Considerations--**

The proposed alternate procedure has the benefit of improving the construction of the project by requiring less material handling and overall reduced opportunity for construction related imperfections in the liner system because only three lifts must be constructed instead of four. Therefore the equivalent 2-foot thick clay liner is constructed using fewer steps in the process. The proposed construction methodology will also have the benefit of speeding construction of this component of the liner system.

#### **Rule 62-701.310(2)(d), FAC – Alternate Procedure for Which the Approval is Sought and Demonstration that the Alternate Procedure Provides an Equal Degree of Protection for the Public and Environment**

The alternate procedure being sought is to construct the clay liner portion of the composite liner system using 8-inch lifts instead of 6-inch lifts. As stated above, construction of the clay liner using 8-inch lifts using the on-site clay soils, results in a hydraulic conductivity of less than the required  $1 \times 10^{-7}$  cm/sec, as documented in Attachment A.

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Since the primary function of the clay component of the composite liner system is to create impedance to leachate migration, it is a logical conclusion that attainment of the required hydraulic conductivity and total required liner thickness provides the same level of protection for the public and the environment as the prescribed construction method. The prescribed 6-inch thick lifts were included in the Rule because for most clay soils a 6-inch thick lift is the maximum for which effective needling and compaction can be achieved. For this material, it has been demonstrated that effect needling and compaction can be achieved consistently using 8-inch lifts.

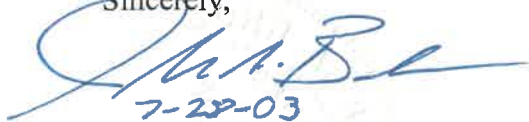
**Rule 62-701.310(2)(e), FAC – Demonstration of the Effectiveness of the Proposed Alternate Procedure**

The effectiveness of the proposed alternate procedure is demonstrated by the results of hydraulic conductivity testing documented in Attachment A. In addition Section 3B of the Perdido Landfill was constructed using this method, after approval was obtained from the Department, and all required tests met the requirements for hydraulic conductivity.

To further demonstrate the effectiveness of the proposed alternate procedure, PSI conducted special testing of each lift of the test strip near the bottom of each lift and at the interface between the lifts to confirm that the required hydraulic conductivity is being achieved throughout the entire profile of the lifts and the 2-foot thick liner. These results demonstrated that the requirements are being met across the entire profile.

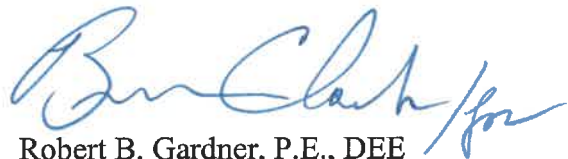
SCS appreciates the opportunity to request an alternate procedure for the Escambia County Perdido Landfill Section 3C Expansion. We look forward to your comments. Please contact us if you have any questions or need additional information to assist in the review process.

Sincerely,



7-28-03

John A. Banks, P.E.  
Project Manager  
SCS ENGINEERS



Robert B. Gardner, P.E., DEE  
Senior Vice President  
SCS ENGINEERS

BJC:eac

cc: R. Mark Triplett, P.E. – Escambia County  
Marshal Seymore, P.E. – FDEP Pensacola

Application Fee

Attachment A Perdido Landfill Cell 3C Clay Test Strip Results, PSI, dated July 15, 2003

Attachment B PSI Supplemental Letter Report on the Acceptable Permeability Zone, Dated July 16, 2003