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October 29, 2021

Office of District and Business Support
Division of Waste Management
Florida Department of Environmental Protection
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

VIA Email Only: ODBS_Review@FloridaDEP.gov

**RE: Florida Brownfields Association, Technical Committee Comments
Draft Guidance for Use of Geomembranes and Geotextiles as
Engineering Controls at 62-780, F.A.C. Sites to Satisfy 62-
780.680(2) or (3), F.A.C. No Further Action**

Dear FDEP Committee:

On behalf of the Florida Brownfields Association ("FBA"), we thank and commend the Florida Department of Environmental Protection (FDEP) for your work on the above-referenced draft guidance document.

The FBA Technical Committee has reviewed the draft guidance document, with many practitioner and stakeholder perspectives included.

Please accept for consideration of revisions, the comments, edits and suggestions outlined using "tracked changes" mode in the attached MSWord version of the draft guidance document.

The FBA Technical Committee is available to answer any questions or provide further clarification of the intent of the suggestions, which are meant to enhance and ease the implementation of the guidance for FDEP and practitioners, as well stakeholders of Brownfields sites, or any affected properties.

The FBA Technical Committee would support scheduling a meeting with the FDEP draft guidance committee to review the suggestions with FDEP, and provide additional insight, to assist with the further development of this and other guidance documents.

We look forward to ongoing collaboration with the FDEP, offering valuable voluntary support, to reach consensus on matters that are in the best interest of the State of Florida on these important documents.

The FBA Technical Committee appreciates the opportunity to review the draft guidance document.

Please feel free to contact any of the Subcommittee members with questions.

Sincerely,

The FBA Technical Committee:

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Cc: Christian Wells, PhD, FBA President, ecwells@usf.edu

Attachment via email: FBA Technical Committee Comments on DRAFT Guidance for Use of Geomembranes and Geotextiles as Engineering Controls at 62-780, F.A.C. Sites to Satisfy 62-780.680(2) or (3), F.A.C. No Further Action

Guidance for Use of Geomembranes and Geotextiles as Engineering Controls at 62-780, F.A.C. Sites to Satisfy 62-780.680(2) or (3), F.A.C. No Further Action

Florida Department of Environmental Protection

Division of Waste Management

District and Business Support Program

Tallahassee, FL

DRAFT –August 17, 2021

[Tracked comments provided by the Technical Committee of the Florida Brownfields Association to the FDEP on October 29, 2021.](#)

This document is only intended as guidance when proposing to install geomembrane or geotextile liners as an engineering control as part of the Rule 62-780.680, Florida Administrative Code (F.A.C.) No Further Action [with Conditions](#) (NFAC) process. The use of geomembranes or geotextiles to satisfy 62-780.680, F.A.C., engineering control requirements will necessitate a more detailed engineering analysis and will need to include a more robust Engineering Control Maintenance Plan (ECMP). Nothing in this guidance supersedes any Federal, State, or Local requirements; [redacted] requirements. All applicable Department rules must still be adhered to. Any regulatory decisions made by the Florida Department of Environmental Protection (FDEP) in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.

Commented [GU1]: Arguably this guidance does create new requirements, so this statement is incorrect. Words used herein such as "should be" create new requirements.

The FDEP District and Business Support Program (DBSP) has prepared this guidance to assist those conducting site rehabilitation and FDEP site/project managers when considering the use of geomembranes to prevent leaching of contamination to groundwater or to provide protection from direct exposure to soils; or geotextiles to provide protection from direct exposure to soils remaining in place at a Chapter 62-780, [Florida Administrative Code \(F.A.C.\)](#) site that exceeds the Chapter 62-777, F.A.C., default soil cleanup target levels (SCTLs).

Background

No Further Action with conditions is allowable at contaminated sites if criteria set forth in [Subsections Rules 62-780.680\(2\)](#), F.A.C., or [62-780.680\(3\)](#) F.A.C., are satisfied. To satisfy these criteria, engineering controls are often used to protect against direct exposure to remaining soil impacts or to eliminate or minimize the migration or spread of groundwater contamination. Any proposed engineering control must be protective for direct exposure for as long as the soils exceed the applicable SCTLs, which are typically the residential direct exposure SCTLs, or prevent infiltration if leachability is the concern. All engineering controls must be maintained to provide the intended protection. Occasionally, Persons Responsible for Site Rehabilitation (PRSR) request the use of manufactured synthetic liners as a protective direct exposure control or infiltration control for soils exceeding the applicable SCTL. Many times, the request also includes elimination of a portion of the more common engineering control of 2-feet (ft) clean fill.

Purpose

This guidance primarily focusses on geomembrane and geotextile liners installed within the 2 ft surface soil interval. Two feet of clean soil fill (a permeable cover) and impervious covers (asphalt and concrete pavement and building foundations as described herein) are commonly acceptable engineering controls.

Cover/Cap/Engineering Control Definition

A cover/cap is a barrier located over contaminated soil that mitigates exposure to potential receptors (e.g., direct exposure, infiltration). The capping control must be protective of human health and the environment for as long as the soil exceeding applicable SCTLs remains in the subsurface.

“Engineering Control” means the use of existing features (such as buildings) or modifications to a site to reduce or eliminate the potential for migration or exposure to, contaminants. Examples of modifications include physical or hydraulic control measures, capping, point-of-use treatment, or slurry walls.¹

¹ Subsection 62-780.200(16), F.A.C.

Such protection is provided by interrupting an exposure pathway or by exerting control of contaminant movement. It should be noted that all engineering controls are reviewed, evaluated, and approved as part of the site closure process and that the requirements for maintaining the engineering control must be documented in the Engineering Control Maintenance Plan (ECMP) submitted to FDEP. These engineering controls are also memorialized in a Declaration of Restrictive Covenant (DRC) that is recorded with the property in the county records, or another equivalent Non-Recorded Institutional Control (NRIC), such as the FDEP's approved Memoranda of Understanding/Agreement.

Engineering Controls are constructed or installed barriers that control the following:

1. Exposure to contaminated soils exceeding applicable direct exposure SCTLs.
2. Downward migration, infiltration or seepage of surface runoff or rainfall if there remains the potential for natural leaching/migration of contamination over time through the subsurface to the groundwater.

Characteristics of 2 ft of Clean Fill Cover:

- Clean soil fill has varying permeability depending on clay/silt content but generally does not prevent infiltration.
- Clean fill is soil that has been either imported from off-site or from "clean areas" (i.e., areas in which the soil does not exceed the SCTLs in Chapter 62-777, F.A.C.) to the contaminated site.
- Slope and erosion stability need to be considered from a maintenance standpoint.
- Demarcation below the 2 ft of fill is not required.
- The end use of the property should be considered when selecting an engineering control cover.
- The rule does not specify that the soil have a vegetative or gravel cover on top of the clean fill. It could be left as bare ground if there is an appropriate maintenance plan.
- Clean fill is generally acceptable, inexpensive, and repairable.
- Clean fill is not permanent. It is susceptible to erosion, the cover can be breached with minimal equipment, and the base of fill in contact with impacted remaining soil can be cross contaminated by contact.
- The engineering control location including an area survey (as per Institutional Control Procedures Guidance (ICPG), Section C.9: Survey), should be included as an exhibit in a DRC, which is then incorporated by reference into ~~and~~ the Conditional Site Rehabilitation Completion Order (C-SRCO). The maintenance requirements should be documented in the ECMP, which will be referenced in the DRC and C-SRCO.
- Requires an institutional control, such as a DRC.

Commented [GU2]: please clarify or elaborate

Characteristics of Impervious Caps:

- Impervious caps are engineering controls that address both the exposure and infiltration concerns.
- Examples of impervious caps include asphalt or concrete pavement or concrete slabs. Existing pavement cover may be acceptable as an impervious cap.

- Buildings or structure foundations - An existing or new building or structure may be used to prevent direct contact exposure and infiltration. Buildings with badly cracked slabs or basement floors or walls in contact with contaminated soil should have the cracks repaired. Dirt floors in buildings should be treated like any other 2 ft ~~clean-back~~fill cover. Buildings located on soils subject to shifting and settlement, which can result in significant future cracking in slabs, floors or walls, may not be acceptable impervious caps.
- Asphalt and concrete have issues with cracking due to a variety of causes such as weather, roots, and settlement. The service life of these caps is highly dependent on the frequency and type of use, weathering, and construction factors. These factors should be considered in the ECMP when designing an inspection and maintenance plan.
- May require additional consideration for site storm water management because ~~engineering~~ controls add impervious surfaces.
- Location and an area survey (as per ICPG, Section C.9: Survey), should be included ~~as an exhibit~~ in a DRC, ~~if applicable, which is then incorporated by reference into~~ and the C-SRCO. The maintenance requirements should be documented in ~~the~~ ECMP, which will be referenced in the ~~DRC, if applicable, and the~~ C-SRCO.
- Requires institutional control, such as a DRC ~~or a NRIC as applicable.~~

Characteristics of Synthetic Liners - Geomembranes versus Geotextiles

Geomembranes are relatively thin sheets of flexible thermoplastic or thermo set polymeric material. Geomembranes generally function as containment. They are regularly used in the solid waste and hazardous waste industry for containing ~~leachate~~, contaminated soils or waste. Geomembranes can be installed either exposed or buried. They are generally impervious if the integrity of the material is maintained. ~~However, they can be susceptible to tears depending on the specifications.~~ ~~Geomembranes are placed in pieces and joined via welding. Repairs to tears are also done by welding. Material is pieced together and repaired by a welding process.~~ Specialty geomembranes are manufactured to act as a vapor barrier, and various degrees of puncture resistance are produced, as well as, various thicknesses.

Geotextiles are synthetic material that are either woven or non-woven in sheets. They are primarily used to function as filtration or drainage or as a separation layer or ~~to~~ provide structural reinforcement. Geotextiles are less impervious than geomembranes but more resistant to penetration damage. Geotextiles ~~may not be suitable~~~~should not be used~~ for controlling leachability issues, ~~unless engineered specifically for that purpose.~~ The cost for geotextiles is generally less than the cost of geomembranes.

Approval Considerations for synthetic liner systems

Due to complexities related to inspection and maintenance of synthetic liners, the use of geomembranes or geotextiles to satisfy ~~Section~~ 62-780.680, F.A.C., engineering control requirements will ~~need to provide~~ ~~necessitate~~ ~~additional supporting engineering elements~~ ~~more detailed engineering analysis such as manufacturer's specifications or information~~

Commented [GU3]: Is this sentence necessary or relevant to this guidance? It states the obvious.

contained in a Remedial Action Plan (RAP) or other design document, and will need to include a more robust ECMP. *(Perhaps the Department could provide some examples?)*

In general, the use of synthetic liners installed deeper than 2 ft in depth does not conflict with engineering control requirements (for example when a geomembrane is used as an infiltration barrier to prevent leaching contamination from migrating migration to the groundwater or when voluntary installation of geotextile is used as a demarcation layer).

However, if a geomembrane or geotextile is proposed within the upper 2 ft direct exposure interval, then FDEP may will request additional information related to the rationale for using a synthetic liner (for example - grade issues, dense tree presence, whether use of traditional engineering control is cost prohibitive, and slope stability or drainage issues, etc.) During its in the review of such a proposal for an NFA with conditions, and the FDEP will also consider specifics about the type of synthetic liner and details regarding installation (i.e., depth installed, type and thickness of cover material, and proposed maintenance requirements).

Other considerations in evaluating if a synthetic liner should be used as an engineering control include the location where the control will be installed. Will the liner extend within a utility easement where subsequent utility repairs may necessitate make the potential repairs to the liner not feasible? If so, then a description of how such repairs will be accomplished should be included in the proposed ECMP. In this example, the ECMP should describe how the continued use of the liner as an engineering control may will not be compromised and how liner repairs will provide removing the protectiveness that was originally intended.

Site-specific issues should be included with or presented as a proposed addendum to a site Remedial Action Plan (RAP), RAP modification or the Site Rehabilitation Completion Report (SRCR) for review and consideration in evaluating whether a synthetic liner should be approved as an engineering control for conditional site closure under Subsections 62-780.680(2) or (3), F.A.C.

If a synthetic liner is approved by the FDEP, the maintenance for the liner used as an engineering control will need to be described in the ECMP and the C-SRCCO as required by Paragraph Rule 62-780.680(7)(f), F.A.C. (see the FDEP -Institutional Controls Procedures Guidance document for additional information).

Commented [GU4]: Need more guidance here on maintenance concerns.

Commented [GU5]: Unclear. What is meant by a "more robust ECMP"? An ECMP is designed to evaluate the conditions of engineering controls ON TOP of contaminated media. How will a PE certify the structural status of a buried EC such as a geotextile or geomembrane without compromising the EC?

Commented [GU6]: Doesn't a synthetic liner have equal (or greater) protection for direct exposure as 2 ft of clean fill?

Commented [GU7]: Under what conditions a liner would NOT be approved by the FDEP? Seems that as long as a liner is approved by ASTM and specified by a P.E. in charge (As per engineering practice rules), approval is automatic Note, all geotextiles and geomembranes in the market have to meet strict mechanical testing requirements specified by ASTM. These meet all requirements for tensile strength/shearing, weathering, leak testing, etc. It would be better to refer to a product meeting ASTM testing requirements that is granted automatic approval.

Commented [GU8]: Note: maintenance of a buried liner does not take place in actual engineering practice. There is no scenario where a liner is uncovered to "maintain" it. A liner meeting ASTM specs has an indefinite lifecycle as long as its tensile/shearing strength is not exceeded. Equivalent to throwing a plastic bag into a landfill: it will not decay and retain its specs forever as long as its tensile strength is not exceeded by a puncture or weight. The only way a tear or defect is discovered in a synthetic liner is by settling of waste (GPS survey height of waste cell) or monitoring wells around the waste detecting groundwater contamination.