Texas Commission on Environmental Quality

Waste Permits Division Correspondence Cover Sheet

Date: December 13, 2022
Facility Name: Fort Bliss Municipal Solid Waste Landfill
Permit or Registration No.: 1422

Nature of Correspondence:
☐ Initial/New
☒ Response/Revision to TCEQ Tracking No.: 27754305 (from subject line of TCEQ letter regarding initial submission)

Affix this cover sheet to the front of your submission to the Waste Permits Division. Check appropriate box for type of correspondence. Contact WPD at (512) 239-2335 if you have questions regarding this form.

Table 1 - Municipal Solid Waste Correspondence

Applications	Reports and Notifications
☐ New Notice of Intent	☐ Alternative Daily Cover Report
☐ Notice of Intent Revision	☐ Closure Report
☐ New Permit (including Subchapter T)	☐ Compost Report
☐ New Registration (including Subchapter T)	☐ Groundwater Alternate Source Demonstration
☐ Major Amendment	☐ Groundwater Corrective Action
☐ Minor Amendment	☐ Groundwater Monitoring Report
☐ Limited Scope Major Amendment	☐ Groundwater Background Evaluation
☒ Notice Modification	☐ Landfill Gas Corrective Action
☐ Non-Notice Modification	☐ Landfill Gas Monitoring
☐ Transfer/Name Change Modification	☐ Liner Evaluation Report
☐ Temporary Authorization	☐ Soil Boring Plan
☐ Voluntary Revocation	☐ Special Waste Request
☐ Subchapter T Disturbance Non-Enclosed Structure	☐ Other:
☐ Other:	

Table 2 - Industrial & Hazardous Waste Correspondence

Applications	Reports and Responses
☐ New	☐ Annual/Biennial Site Activity Report
☐ Renewal	☐ CPT Plan/Result
☐ Post-Closure Order	☐ Closure Certification/Report
☐ Major Amendment	☐ Construction Certification/Report
☐ Minor Amendment	☐ CPT Plan/Result
☐ CCR Registration	☐ Extension Request
☐ CCR Registration Major Amendment	☐ Groundwater Monitoring Report
☐ CCR Registration Minor Amendment	☐ Interim Status Change
☐ Class 3 Modification	☐ Interim Status Closure Plan
☐ Class 2 Modification	☐ Soil Core Monitoring Report
☐ Class 1 ED Modification	☐ Treatability Study
☐ Class 1 Modification	☐ Trial Burn Plan/Result
☐ Endorsement	☐ Unsaturated Zone Monitoring Report
☐ Temporary Authorization	☐ Waste Minimization Report
☐ Voluntary Revocation	☐ Other:
☐ 335.6 Notification	
☐ Other:	

DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND
HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT BLISS
[redacted]

February 1, 2023

SUBJECT: Response to TCEQ Technical Review Comments
Fort Bliss Landfill, MSW Permit No. 1422
RN100210095/CN600126262; TCEQ Tracking No. 27754305

[redacted]
Municipal Solid Waste Permits Section, MC 124
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, TX 78711-3087

Dear [redacted]

Fort Bliss Military Installation is submitting to the Texas Commission on Environmental Quality (TCEQ) the enclosed application revisions to the Notice Permit Modification Application for the Fort Bliss Municipal Solid Waste Landfill (MSWLF), located in Fort Bliss, El Paso County, Texas. The revisions address TCEQ Technical Review comments dated September 19, 2022 and December 6, 2022, which were received via email. The following are provided as enclosures to this letter:

a. Enclosure 1 contains a Response To Comments matrix. The first column of the matrix contains the TCEQ comments which are grouped under header rows for the September 19, 2022 email comments and the December 6, 2022 email comments. The second column provides the response and indicates the location of each revision by reference to part, section, and page number, as applicable.

b. Enclosure 2 contains an original and a copy of the certification statement in accordance with 30 TAC §305.44 which indicates the name, title, and address of the Texas Engineer of Record for this application. The certification replaces the one located behind the sealed application cover page. The Engineering Certification page covers the pages submitted in enclosure 4 and enclosure 5.

c. Enclosure 3 to this letter contains an original and a copy of the application signature page (page 5 of TCEQ Form 20650). The application signature page covers the pages submitted in enclosure 4 and enclosure 5.

d. Enclosure 4 contains the revised application pages associated with the September 19, 2022 TCEQ comments.

e. Enclosure 5 contains the revised application pages associated with the December 6, 2022 TCEQ comments.

The revised pages in enclosures 4 and 5 include the revision number and date in the footer. These enclosures are organized by comment number (i.e., revised pages for each comment are provided in separate sub- enclosures, which are referenced in the Response To Comments Matrix). The revised pages are provided in the following order in the sub- enclosures: 1) the original, 2) one unmarked (clean) copy, and 3) one marked (reline/strikeout) copy.

If you have any questions or concerns, please do not hesitate to contact Ms. [redacted] Fort Bliss Solid Waste Program Manager, Environmental Division, Directorate of Public Works, at [redacted] or by email: [redacted] Please address any return correspondence to the Directorate of Public Works – Environmental Division, [redacted] Fort Bliss, Texas, 79916.

Alfredo J. Riera, P.E.
Director of Public Works

Enclosures

cc:
TCEQ Region 6 (unmarked revised pages only)

Attachment 1

RTC Matrix

Response to Comments Matrix - TCEQ Technical Review Comments Dated September 19, 2022 and December 6, 2022
Notice Permit Modification Application Dated July 11, 2022
Fort Bliss Landfill (MSW Permit No. 1422), El Paso County Texas
TCEQ Tracking No. 27754305

Comment #	TCEQ Comment:	Response:
	Comments in Email Dated September 19, 2022	
1	The current Fort Bliss Municipal Solid Waste Landfill Permit 1422 Modification Application dated July 11, 2022 cannot be found on the internet URL address provided in Section 5 of the TCEQ-20650 form. Please ensure that a copy of the current permit modification application, and all future revisions to that application, are uploaded to the publicly accessible web site listed in the TCEQ form.	Per the requirements of the Fort Bliss Public Affairs Office, the application is currently being reviewed and scrubbed of personal identifiable information (PII), logos, identifying marks, etc. It will then be posted to the publicly accessible website. The URL address has been updated on page 1 of TCEQ Form 20650. **Attachment 4a_Comment 1** contains revised Page 1 of TCEQ Form 20650 with the updated Application URL in Box 5.
2	The provided updated landowners map and list has some inconsistencies between the version submitted as marked (redline/strikeout) pages and the version submitted as unmarked revised pages. For example, Attachment 2 contains 38 affected "Landowners Cross-Referenced to Landowners Map (Figure 1)," whereas Attachment 1 contains only 34 affected entities. Please ensure consistency between the marked and unmarked revised pages of the application and submit a final, correctly updated land ownership map with accompanying landowners list.	As part of the current application, the landowner map was updated based on changes to subdivision of some parcels. Also, some parcels that are outside of the distance radius had been numbered previously but were not included in the revised landowner list. To facilitate review, the numbering system has been updated to match the previous submittal, and a footnote has been added to clarify parcels not contained in the landowner list due to being outside of the required radius. **Attachment 4b_Comment 2** contains revised Part 1 Attachment pages including the 1/4 Mile Landownership Information (Figure 1) and the table showing "Landowners Cross-Referenced to Landowners Map (Figure 1)"
3	The revised narrative for Section 3.4, Waste Management Unit Design (pg. 3-3) of revised Part III appears to use an incorrect reference, "Sheet C-8," to the landfill unit cross-sections. Please revise this reference to the correct revised figure, "Sheet C-6."	The narrative in Section 3.4 has been updated to reference Sheet C-6. **Attachment 4c_Comment 3** contains the revision to Application Part III, Section 3.4, on page 3-3.
4	The discussion in revised Part III, Section 3.4.4.4 (pg. 3-7) provides for an increase in remaining airspace (volume) in the non-Subtitle D construction and demolition (C&D) cell. Based on agency records, a July 2007 letter from the Department of the Army indicates that the facility requested a 10-foot (ft) height increase to accommodate additional waste capacity. Please confirm if this height increase was for both the Subtitle D cell and the C&D cell or if this height increase was for only the Subtitle D cell.	The approved height increase was for the Subtitle D Cell only. **No Change is proposed.**

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Comment #	TCEQ Comment:	Response:
5	It is not clear in the permit modification application if the facility will be able to relocate to the Subtitle D cell and the non-subtitle D, C&D cell the waste that is currently located outside of the permitted cells. Please explain in greater detail how the facility arrived at the calculations performed in July 2021 estimating the airspace remaining in the Subtitle D and the C&D cells, respectively, to determine that sufficient airspace (volume) was available to relocate the waste identified outside the permitted cells. Section 4.1, Optimized ET Cover System (pg. 4-2) of revised Appendix O explains that relocated waste will be deposited in the Subtitle D cell area or be hauled to an off-site permitted MSW facility. If the expectation is to use remaining available airspace (volume) for waste located outside of the permitted cell boundaries and then transport off-site all remaining waste located outside of the permitted cell boundaries that could not be relocated to the Subtitle D and/or C&D cells, please confirm this and if possible, provide additional discussion on this intent**.**	Relocated waste from outside of permitted cell limits will be placed in the Subtitle D cell or disposed of off-site. No on-site material other than debris and crushed concrete with rebar removed will be placed in the C&D cell as part of general fill. Remaining airspace volumes were calculated by comparing the 2018 topography (Digital Mapping) to the Top of Waste (TOW) design surface as described in Section 3-1. Note that the Subtitle D Cell design is unchanged between the 2014 amendment and this submittal for subgrade and final grades. **No Change is proposed**.
6	According to the revised figure Sheet C-6, the elevation of the proposed final cover appears to be equal to or less than the current elevation of waste and/or intermediate/daily cover for some parts of the respective operationally inactive Cells 1, 4, and 5. If the facility overfilled some parts of the respective cells with waste, the facility will need to submit revised final contours.	After work was halted and landfill closure was not completed under the 2014 amendment, updated topographic mapping of the site was completed in 2018. The 2018 topography was used as the existing site condition for this revised design. The 2018 topography, includes the effects of earth movements, waste material relocation and soil placement for subgrade that was not complete when work was stopped. Mapping of existing conditions in 2018 combined with the updated Limits of Waste Investigation (LOWI) is the current basis used for earthworks and waste material relocation shown in the revised design. **No Change is proposed.**

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Comment #	TCEQ Comment:	Response:
		Waste material within the permitted cells is to be excavated and placed within each respective cell boundary to achieve subgrade. Estimated earthwork volumes of waste material, mixed waste material and general fill material to be moved by cell is : Cell 1 - 20,600 CY, Cell 3 - 17,226 CY, Cell 4 - 54,210 CY, and Cell 5 - 65,585 CY. Waste material excavated from areas outside of permitted cell limits will be relocated to the Subtitle D cell or disposed of off-site, if volumes are in excess of Subtitle D Cell available air space. The Subtitle Cell D has an estimated airspace volume remaining of 17,890 CY. The estimated volume of waste material located outside of the permitted cell boundaries to be placed in the Subtitle D cell is 14,932 CY. No on-site material other than debris and crushed concrete with rebar removed will be placed in the C&D cell as part of general fill. **No Change is proposed.**
7	Explanatory notes in Sheet C-6 appear to indicate that the facility intends to excavate waste as necessary to provide enough space to install the alternative final cover system. If this is correct, please provide additional detail, for example but not limited to, the nature of the waste, the intended final location of the excavated and relocated waste, the anticipated quantity of waste to be excavated and relocated.	
		Table 2-2 Section 2.1 "Runoff Volume" column is now shown to two decimal places. With removal of the rounding error produced from showing only one decimal place, the Total Volume calculates to be 14.71. **Attachment 4d_Comments 8_9** contains the revision to Appendix L, Section 2.1, Table 2-2 on page 2-3 2-4.
8	For Table 2-2 of Section 2.1 (pg. 2-3) of revised Appendix L, the revised values for Runoff Volume (ac-ft) do not total 14.7; they total 15.1. Please revise this summary table as appropriate.	
		Section 2.1 (pg. 2-3) "2." is revised to "21" **Attachment 4d_Comments 8_9** contains the revision to Appendix L, Section 2.1, Table 2-2 on page 2-3.
9	Regarding the revised number of watersheds for Section 2.1 (pg. 2-3) of revised Appendix L, confirm the revised number is "2." If not, please revise as appropriate.	
		Section 2.3, Peak Runoff Velocity Calculations, Table 2-6 (pg. 2-8) for downchute DC-2 is revised to 5.9 fps. **Attachment 4e_Comment 10** contains the revision to Appendix L, Section 2.3, Table 2-6 on page 2-8.
10	Based on the Downchute Hydraulic Analysis, 25-Year Storm in revised Appendix L, the velocity (ft/s) for downchute, DC-2, in Section 2.3, Peak Runoff Velocity Calculations, Table 2-6 (pg. 2-9) should be 5.9, as opposed to 5.8; please revise (round) accordingly.	
		Section 2.4 text revised to remove reference to a pond. Culvert DC-2 discharges into a wide drainage swale area with the drivable swale outlet in the southwest corner. **Attachment 4f_Comments 11_12_13_14** contains the revision to Appendix L, Section 2.4, page 2-8 2-9.
11	The discussion on pg. 2-9 for the one internal culvert located at the construction entrance on the west side of the site, proposed Culvert DC-2, in Section 2.4 of revised Appendix L, contains a reference to a pond. If this pond is a proposed detention or retention pond for storage of water runoff, please provide a discussion of its features, designs of the pond, and calculations associated with this drainage feature.	

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Comment #	TCEQ Comment:	Response:
12	The discussion on pg. 2-9 of Section 2.4 references Culvert 4, with 36-inch barrels, as a drainage feature. This culvert is not listed on revised Table 2-7, nor is it shown on revised Sheet D-1. Please revise the table and figure as appropriate or revise the discussion for Section 2.4 as appropriate for revised Appendix L.	Text on page 2-9 revised to correctly reference the culvert naming conventions, Table 2-7 corrected Text added to Section 2.4 with drivable swale flow velocity. **Attachment 4f_Comment 11_12_13_14** contains the revision to Appendix L, Section 2.4, page 2-9.
13	Revised Culvert, DC-3 in revised Table 2-7 of Section 2.4 (pg. 2-11) of revised Appendix L does not appear in revised figure Sheet D-1. No offsite discharge value is listed for proposed Culvert, C-2 in Sheet D-1. Furthermore, Table 2-7 lists culverts as "DC-#" whereas Sheet D-1 shows culverts as "C-#." Please revise as necessary to show consistency between the summary table and figure for revised Appendix L.	Text on page 2-9 revised to correctly reference the culvert naming conventions in Table 2-7 to match Sheet D-1. Off-site discharge occurs at culverts C-1 and C-3 and the driveable swale. Culvert C-2 discharges upstream of the driveable swale. **Attachment 4f_Comments 11_12_13_14** contains the revision to Appendix L, Section 2.4, Table 2-7 page 2-9
14	Revised figure Sheet D-1 shows a proposed drivable swale, with an offsite discharge of 55.1 cubic feet per second (cfs). This proposed swale is not listed in either Table 2-4 nor in revised Table 2-5, Velocities and Depths of Flow in Perimeter Swales, with its proposed estimated peak discharge in cfs, flow depth (ft), and velocity (ft/s). Please revise the summary table(s) as appropriate, explain the features of the proposed swale, and provide calculations for the proposed swale for revised Appendix L.	Hydraulic calculation worksheet output for the drivable swale is now included in Appendix L, attachment 1. Text is added to Section 2.4 to reference 1.0 fps exit velocity. Supporting calculations are included in Appendix L Attachment 1. **Attachment 4f_Comments 11_12_13_14** contains: revision to Appendix L, Section 2.4, page 2-9. Hydraulic calculations included in Appendix L Attachment 1.
15	Please explain the origination of the value of 5.8 feet per second (ft/s) for Swale-Off Landfill in Table 3-1 (pg. 3-4) of Section 3.2.2, Erosion and Sediment Controls Design of revised Appendix L.	Table 3-1 will be revised from 5.8 to 6.1 ft/sec. Origin source of velocity is Table 2-4, Diversion Swale DS-4C/4D. **Attachment 4g_Comments 15_16** contains the revision to Appendix L, Section 3.2.2, page 3-4.
16	Please clarify, and revise accordingly, if the value of 2.5 ft/s for the temporary soil berm in Section 3.2.2 of Appendix L is supposed to be 3.0 ft/s, as potentially indicated in Table 3-1 for Temp. Soil Berm-Subtitle D Top Dome (pg. 3-4). Table 3-1 contains a revision of the velocity from 2.5 ft/s to 3.0 ft/s. If these two values of velocity are intended to be for different temporary soil berms, please explain the different drainage control measures/features and the need to discuss the two different features for purposes of temporary erosion and sediment controls design.	Table 3-1 will be revised. Value of 5.8 to 6.1 ft/sec. Origin source of velocity is Table 2-4, Diversion Swale DS-4C/4D. **Attachment 4g_Comments 15_16** contains the revision to Appendix L, Section 3.2.2, page 3-4.

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TCEQ Tracking No. 27754305

Comment #	TCEQ Comment:	Response:
17	In revised Attachment 2, Intermediate Erosion and Soil Control Design Calculations of revised Appendix L, the (first) slope length is 140 ft with an average slope steepness of 5.0%, and the (second) slope length is 350 ft with an average slope steepness of 2.5%. However, the revised discussion in Section 3.2 Interim Construction Stages of Appendix L (pg. 3-5) reads that the soil estimation slope was divided into two segments, a 1,000-ft segment with an average slope of 1.8% and the 500-ft segment with an average slope of 1.8%. Please revise as appropriate or explain the differences and why the differences are necessary. Please also ensure the reports for intermediate control measures for Attachment 2 of revised Appendix L are representative of this permit modification request (July 2022) and not past reports showing results of modeling conducted for the 2014 permit modification request.	Text is corrected to read: "A 1,000 foot segment with an average slope of **2.6%** was calculated using the following flow segments: 270 feet at **5.0%**; 280 feet at 1.7%; 20 feet at 25%; and 430 feet at 1.6%. The 500 foot segment has an average slope of 1.8% RUSLE 2 calculations are updated. **Attachment 4h_Comments 17** contains the revision to Appendix L, Section 3.2.2, page 3-5 and Attachment 2 RULSE 2 Report Output
18	The reports in revised Attachment 3, Final Erosion and Soil Control Design Calculations of revised Appendix L reference the Fort Bliss Permit Modification from 2014. Please provide an updated report for this modification (July 2022) or explain how the modeling for the 2014 permit modification request is representative of this (July 2022) permit modification request.	RUSLE 2 Calculation Reports are updated. **Attachment 4i_Comments_18** contains the revision to Appendix L, Attachment 3, Updated RUSLE 2 report output.
19	For Section 3.3.1, Erosion and Sedimentation Controls Design (pg. 3-7) of revised Appendix L, please explain or provide a list of what is considered “etc.” for the input data for management operations that changed.	Text revised to remove "etc." for clarity. Input data are selected from templates for management operations in the RUSLE 2 software. Input selections for the calculations are included in the RUSLE 2 Report output. (See Attachment 4i_Comments_18) **Attachment 4j_Comments_19** contains the revision to Appendix L, Section 3.3.1, page 3-7
20	It is unclear in revised Appendix L how the proposed changes to the approved final contours and approved final slopes due to potential relocation and excavation will not adversely impact the existing surface water drainage patterns for the landfill unit. The revised narrative for Appendix L explains how interim and final/permanent control measures will be implemented to control surface water runoff and how post-development conditions will account for a 25-year, 24-hour storm event. However, the resulting peak discharge flowrate and peak discharge velocity for some watershed areas increase compared to the values for the same parameters for pre-development conditions. The same observation can be made for the revised culverts. Please explain in greater detail how the increases in peak flowrates and velocities will not adversely affect the existing drainage patterns, or indicate where in the permit modification application this more detailed discussion is located. Additionally, please explain how the estimated final ranges for peak discharge and velocity between pre- and post-development conditions will also not adversely impact existing drainage patterns, Table 2-8 of Section 2.5 (pg. 2-11), considering for post-development conditions the range maximum of peak discharge is expected to be less than, and the range maximum of velocity is expected to be greater than, the range maxima of those for pre-development conditions.	Text revised on page 2-2 to include information on peak flow calculations with explanation of TCEQ methodology update changing peak discharge values and volumes by calculation rather than design changes. **Attachment 4k_Comment 20** contains the revision to Appendix L_,Section 2.1, page 2-2.

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Fort Bliss Landfill (MSW Permit No. 1422), El Paso County Texas
TCEQ Tracking No. 27754305

Comment #	TCEQ Comment:	Response:
21	In revised Appendix L, Table of Contents, the title for Attachment 5 refers to "2005 Stormwater Pollution Prevention Plan" and "U.S. Army Center for Health Promotion and Preventative Medicine." Please revise this title to be consistent with proposed title change of "2021 Stormwater Pollution Prevention Plan (For Reference Only – Prepared by Directorate of Public Works Environmental Division Stormwater Compliance."	The Table of Contents has been revised to reference the 2021 Stormwater Pollution Prevention Plan. **Attachment 4l_Comment 21** contains the revised Appendix L Table of Contents Page iv. Additionally, Appendix L Table of Contents Pages iii and iv are provided to show page renumbering that has occurred while addressing other Appendix L comments.
22	It is unclear what the proposed fate is of the concrete piles that will not be transported off-site for recycling at an off-site concrete recycling facility; see revised Appendix O, pg. 3-2. Please explain the fate of these concrete piles.	Concrete piles to be managed on site are intended to go the Subtitle D cell and the C&D cell. Small concrete with rebar removed will be placed as general fill in C&D Cell. Large concrete that can not be relocated to the Subtitle D Cell will be disposed off-site. **Attachment 4m_Comment 22** contains the revision to Appendix O, Section 3.0, on page 3-2.
23	Section 4.5, Subtitle D Area (Type I) (pg. 4-3) of revised Appendix O explains that the final closure grades will be generally consistent with the March 2009 modification grades. Please revise this statement to include an acknowledgement that the final closure grades will also be consistent with this proposed July 2022 modification, if approved, given the proposed change in approved final contours and approved final slopes in this permit modification.	The narrative in Section 4.5 has been revised to state that the final closure grades will also be consistent with the final closure grades proposed in Sheets C-4 and C-5 in Appendix B of the permit, once approved. **Attachment 4n_Comment 23** contains the revision to Appendix O, Section 4.5, on page 4-3.
24	Regarding the revised test method in Section 5.2.3.4, Field QA Testing (pg. 5-6) of revised Appendix O, confirm the revised test method is "ASTM D248." If not, please revise as appropriate.	Text revised to call for ASTM D2487. **Attachment 4o_Comment 24** contains the revision to Appendix O, Section 5.2.3.4, on page 5-6.
25	Section 5.2.5.3, Field QA Testing (pg. 5-8) of revised Appendix O explains that the test method for sieve and hydrometer analysis testing for the top lift of the alternative final cover system design will be ASTM D422. The same Field QA Testing for the bottom (Section 5.2.3.4) and second (Section 5.2.4.3) lifts, respectively, is proposed to change from ASTM D422 to ASTM D6913. Please explain why the proposed test method for the top lift must be different, or please revise Section 5.2.5.3 accordingly.	Text revised to call for ASTM D6913. **Attachment 4p_Comment 25** contains the revision to Appendix O, Section 5.2.5.3, on page 5-8.
26	Section 6.2, (pg. 6-1) of revised Appendix O explains that final top slopes and side slopes are provided in Sheets C-2 and C-3 in Appendix B of the permit application; however, the referenced sheets do not indicate final top and side slopes. Please provide revised figures/drawings showing the proposed final top and side slopes.	Language is retained from 2014 permit modification. It is to indicate that sheets showing the final cover grading plan convey the final top and side slopes via the final grade contours and labels. **No Change is proposed, other than updating the sheet call outs in response to Comment 28, below.**

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Notice Permit Modification Application Dated July 11, 2022
Fort Bliss Landfill (MSW Permit No. 1422), El Paso County Texas
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Comment #	TCEQ Comment:	Response:
27	The final surface drainage features appear to be provided on revised figures Sheets C-4 and C-5, respectively. If this is correct, please revise the narrative in Section 6.2 (pg. 6-1) of revised Appendix O accordingly.	Text in Section 6.2 (Contour Map) has been revised to call out Sheets C-4 and C-5 which provide the final contours, top slopes, side slopes, and the proposed surface drainage. Also, a slight wording change has been made to clarify that Appendix B is part of the Permit. **Attachment 4q_Comment 27** contains the revision to Appendix O, Section 6.2, on page 6-1.
28	For Section 6.6 (pg. 6-3) of Appendix O, please provide a statement that a certified copy of the modified deed will be submitted to the TCEQ and that a copy will be placed in the site's operating record, pursuant to §§330.457(g) and 330.461(c)(1).	The text in Section 6.6 (pg. 6-3) of Appendix O has been revised to include a statement that a certified copy of the modified base master plan will be submitted to the TCEQ and that a copy will be placed in the site's operating record, pursuant to §§330.457(g) and 330.461(c)(1). **Attachment 4r_Comment 28_29** contains the revision to Appendix O, Section 6.6, on page 6-3.
29	Please remove the third bullet of Section 6.6 (pg. 6-3) of Appendix O considering §330.461(c)(3) is not applicable; the facility will require post-closure care and will be required to comply with post-closure care requirements, §§330.457(f)(5) and 330.463.	The text in Section 6.6 (pg. 6-3) of Appendix O has been revised remove the bullet stating revocation of the facility permit will be requested. **Attachment 4r_Comment 28_29** contains the revision to Appendix O, Section 6.6, on page 6-3
Comments in Email Dated December 6, 2022		
1	Please provide the Engineering Certification page with the responsible engineer's seal, signature, and date to accompany the revised pages of the permit modification application.	The Engineering Certification page with the responsible engineer's seal, signature, and date to accompany the revised pages of the permit modification application is provided in **Attachment 2**. The Engineering Certification page covers the pages submitted in **Attachment 4 and Attachment 5**.
2	On page 3-4, the discussion of the first paragraph reads "…velocity through the swale off the landfill is 5.8 ft/sec as…" Based on the proposed revision in Table 3-1 to revise the velocity for the "Swale – Off Landfill" from 5.8 to 6.1 ft/sec, please revise the text in the first paragraph to also read 6.1 ft/sec to match the proposed revision for Table 3-1.	The first paragraph of Page 3-4 of Section 3.2.2 in revised Appendix L has been revised to read 6.1 ft/sec to match the proposed revision for Table 3-1. **Attachment 5a_Comment 2** contains the revision to Appendix L page 3-4. This page replaces the one provided in **Attachment 4g_**.

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TCEQ Tracking No. 27754305

Comment #	TCEQ Comment:	Response:
3	Please provide the responsible engineer's seal, signature, and date for the revised land ownership map, Figure 1 – Fort Bliss Municipal Solid Waste Landfill-Properties Within ¼ Mile of Landfill Boundary	Figure 1 – Fort Bliss Municipal Solid Waste Landfill-Properties Within ¼ Mile of Landfill Boundary has been sealed and includes the responsible engineer's seal, signature, and date for the revised map. **Attachment 5b_Comment 3** contains the sealed version of Figure 1. The sealed Figure 1 page replaces the one presented in **Attachment 4b_**.
4	Please provide a revision date for the a) title page of revised Appendix B, Landfill Modification and Closure Design Drawings and for the b) Table of Contents – List of Drawings of Appendix B. Please also ensure the responsible engineer's seal, signature, and date are also on the updated title page and Table of Contents.	The title page and the Table of Contents (List of Drawings) for Appendix B (Landfill Modification and Closure Design Drawings) have been revised to include revision dates. The responsible engineer's seal, signature, and date are also included on the updated title page and Table of Contents. **Attachment 5c_Comment 4** contains the revised Appendix B title page and Table of Contents.
5	Please provide a revision date for the title page of revised Appendix L – Final Facility Surface Water Drainage Report. Please also ensure the responsible engineer's seal, signature, and date are also on the updated title page.	The title page for Appendix L (Final Facility Surface Water Drainage Report) has been revised to include the revision date and updated address under "Prepared By:". The responsible engineer's seal, signature, and date are also included on the updated title page. **Attachment 5d_Comment 5** contains the revised Appendix L title page.
6	Please provide revised pages of the Table of Contents of revised Appendix L with the responsible engineer's seal, signature, and date on pages iii and iv, respectively.	The revised Appendix L Table of Contents pages iii and iv have been updated with the responsible engineer's seal, signature, and date. **Attachment 5e_Comment 6** contains the revised Appendix L Table of Contents pages.
7	Please provide a revision date for the title page of revised Appendix O – Final Closure Plan. Please also ensure the responsible engineer's seal, signature, and date are also on the updated title page.	The title page for Appendix O (Final Closure Plan) has been updated to include the revision date, with the last revision being November 8, 2022, and updated address under "Prepared By:". The responsible engineer's seal, signature, and date are also included on the updated title page. **Attachment 5f_Comment 7** contains the revised Appendix O title page.
8	Please provide a new Signature Page, with notary, to accompany the revised pages of the permit modification application.	A Signature Page, with notary is provided in **Attachment 3**. The signture page covers the pages submitted in Attachment 4 and **Attachment 5**.
End of Comments		

Attachment 2

30 TAC 305.44 Certification Statement

Engineering Certification

I attest that this Application has been prepared in accordance with good engineering practices, including consideration of applicable industry standards, and with the requirements of Title 30 of the Texas Administrative Code (Title 30 TAC) Chapter §330. This certification in no way relieves Fort Bliss of its duty to prepare and fully implement this Application.

Certifying Engineer: [redacted]

State: Texas

Registration Number: [redacted]

Signature: [redacted]

Certification Date: 12/16/2022

Engineering Seal:

Engineering Certification

I attest that this Application has been prepared in accordance with good engineering practices, including consideration of applicable industry standards, and with the requirements of Title 30 of the Texas Administrative Code (Title 30 TAC) Chapter §330. This certification in no way relieves Fort Bliss of its duty to prepare and fully implement this Application.

Certifying Engineer: [redacted]

State: Texas

Registration Number: [redacted]

Signature: [redacted]

Certification Date: 12/16/2022

Engineering Seal:

Attachment 3

Application Signature Page (Pg. 5 of TCEQ Form 20650)

Signature Page

I, [redacted] DIRECTOR of PUBLIC WORKS
(Site Operator (Permittee/Registrant)'s Authorized Signatory) (Title)

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

Signature: [redacted] Date: 1/26/2023

TO BE COMPLETED BY THE OPERATOR IF THE APPLICATION IS SIGNED BY AN AUTHORIZED REPRESENTATIVE FOR THE OPERATOR

I, _____, hereby designate _____
(Print or Type Operator Name) (Print or Type Representative Name)

as my representative and hereby authorize said representative to sign any application, submit additional information as may be requested by the Commission; and/or appear for me at any hearing or before the Texas Commission on Environmental Quality in conjunction with this request for a Texas Water Code or Texas Solid Waste Disposal Act permit. I further understand that I am responsible for the contents of this application, for oral statements given by my authorized representative in support of the application, and for compliance with the terms and conditions of any permit which might be issued based upon this application.

NOT USED

_____
Printed or Typed Name of Operator or Principal Executive Officer

_____
Signature

SUBSCRIBED AND SWORN to before me by the said [redacted]

On this 26th day of JANUARY 2023

My commission expires on the 8th day of NOVEMBER 2025

[redacted]
Notary Public in and for
EL PASO County, Texas
(Note: Application Must Bear Signature & Seal of Notary Public)

[redacted] Notary Public, State of Texas [redacted]

Signature Page

I, [redacted] DIRECTOR of PUBLIC WORKS
(Site Operator (Permittee/Registrant)'s Authorized Signatory) (Title)

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

Signature: [redacted] Date: 1/26/2023

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(Print or Type Operator Name) (Print or Type Representative Name)

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_____
Printed or Typed Name of Operator or Principal Executive Officer

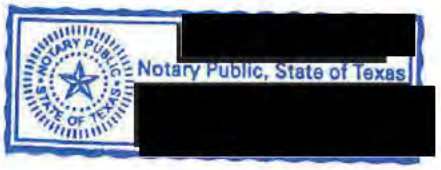
_____
Signature

SUBSCRIBED AND SWORN to before me by the said [redacted]

On this 26th day of JANUARY 2023

My commission expires on the 8th day of NOVEMBER 2025

[redacted]
Notary Public in and for
EL PASO County, Texas
(Note: Application Must Bear Signature & Seal of Notary Public)



Attachment 4

Revised Application Pages Based on:
TCEQ Comments in Email Dated September 19, 2022

4a. Comment 1 – Part I, TCEQ Form 20605, Pg. 1

Facility Name: Fort Bliss Municipal Solid Waste Landfill
Permittee/Registrant Name: U.S. Army Air Defense Artillery and Fort Bliss (USAADACENFB)
MSW Authorization #: 1422
Initial Submittal Date: 7/11/2022
Revision Date: 11/**8**/2022

Texas Commission on Environmental Quality

Permit/Registration Modification and Temporary Authorization Application Form for an MSW Facility

1. Reason for Submittal

☒ Initial Submittal ☐ Notice of Deficiency (NOD) Response

2. Authorization Type

☒ Permit ☐ Registration

3. Application Type

☒ Modification with Public Notice ☐ Modification without Public Notice
☐ Temporary Authorization (TA) ☐ Modification for Name Change/Transfer

4. Application Fees

☐ Pay by Check ☒ Online Payment

If paid online, enter ePay Trace Number:

5. Application URL

Is the application submitted for a permit/registration modification with public notice?

☒ Yes ☐ No

If the answer is "Yes", enter the URL address of a publicly accessible internet web site where the application and all revisions to that application will be posted in the space provided:
http://https://home.army.mil/bliss/index.php/about/Garrison/directorate-public-works/environmental

6. Confidential Documents

Does the application contain confidential documents?

☐ Yes ☒ No

If "Yes", cross-reference the confidential documents throughout the application and submit as a separate attachment in a binder clearly marked "CONFIDENTIAL."

Facility Name: Fort Bliss Municipal Solid Waste Landfill
Permittee/Registrant Name: U.S. Army Air Defense Artillery and Fort Bliss (USAADACENFB)
MSW Authorization #: 1422
Initial Submittal Date: 7/11/2022
Revision Date: 11/**8**/2022

Texas Commission on Environmental Quality

Permit/Registration Modification and Temporary Authorization Application Form for an MSW Facility

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☒ Initial Submittal ☐ Notice of Deficiency (NOD) Response

2. Authorization Type

☒ Permit ☐ Registration

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☒ Yes ☐ No

If the answer is "Yes", enter the URL address of a publicly accessible internet web site where the application and all revisions to that application will be posted in the space provided:
[redacted]/home.army.mil/bliss/index.php/about/Garrison/directorate-public-works/environmental

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Permittee/Registrant Name: U.S. Army Air Defense Artillery and Fort Bliss (USAADACENFB)
MSW Authorization #: 1422
Initial Submittal Date: 7/11/2022
Revision Date:

Texas Commission on Environmental Quality

Permit/Registration Modification and Temporary Authorization Application Form for an MSW Facility

1. Reason for Submittal

☒ Initial Submittal ☐ Notice of Deficiency (NOD) Response

2. Authorization Type

☒ Permit ☐ Registration

3. Application Type

☒ Modification with Public Notice ☐ Modification without Public Notice
☐ Temporary Authorization (TA) ☐ Modification for Name Change/Transfer

4. Application Fees

☐ Pay by Check ☒ Online Payment

If paid online, enter ePay Trace Number:

5. Application URL

Is the application submitted for a permit/registration modification with public notice?

☒ Yes ☐ No

If the answer is "Yes", enter the URL address of a publicly accessible internet web site where the application and all revisions to that application will be posted in the space provided:

[redacted]**://home.army.mil/bliss/index.php/about/Garrison/directorate-public-works/environmental**

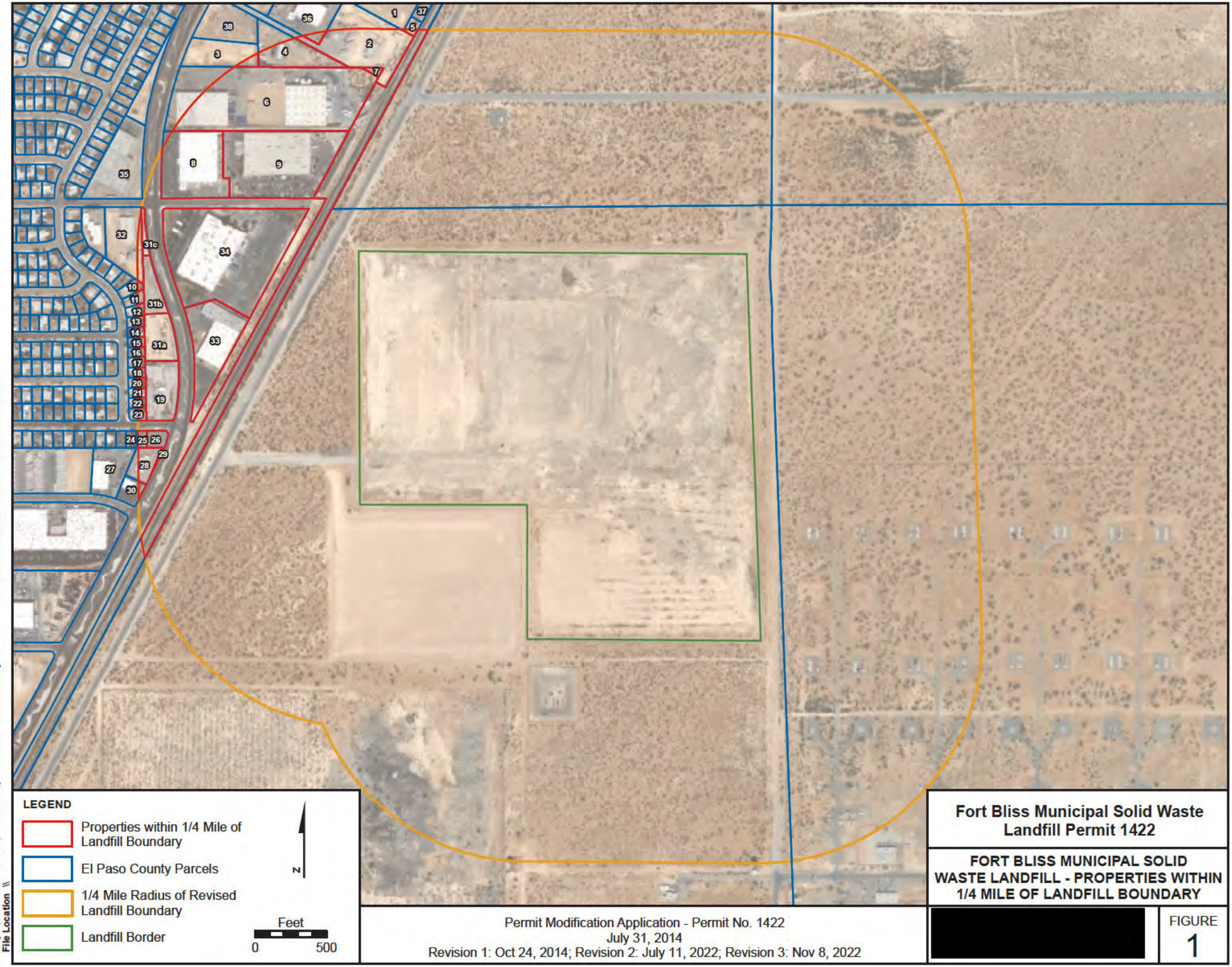
6. Confidential Documents

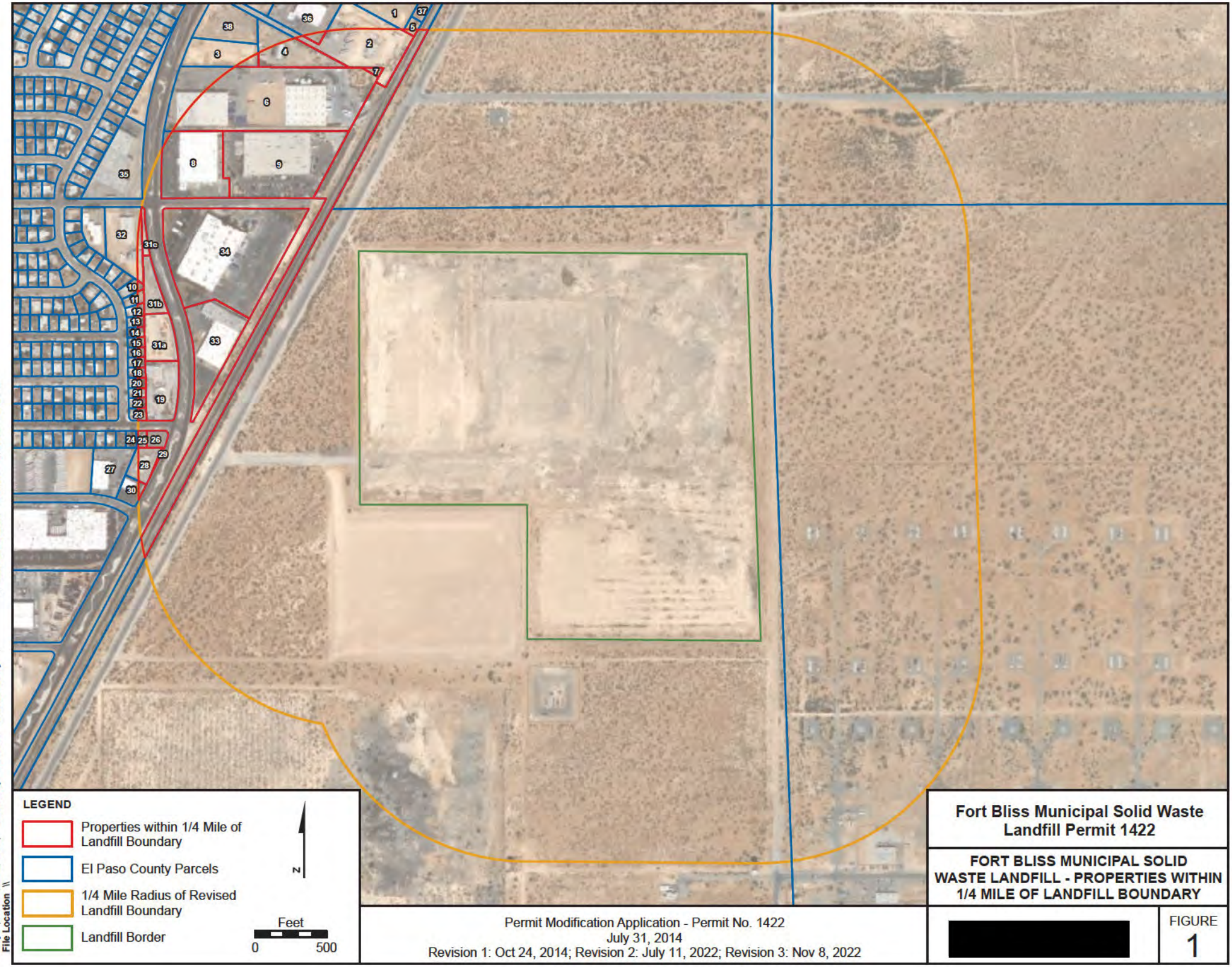
Does the application contain confidential documents?

☐ Yes ☒ No

If "Yes", cross-reference the confidential documents throughout the application and submit as a separate attachment in a binder clearly marked "CONFIDENTIAL."

4b. Comment 2 – Part I Attachment: ¼ Mile Landownership Information


LEGEND
Properties within 1/4 Mile of Landfill Boundary
El Paso County Parcels
1/4 Mile Radius of Revised Landfill Boundary
Landfill Border
N
Feet
0
500
Fort Bliss Municipal Solid Waste Landfill Permit 1422
FORT BLISS MUNICIPAL SOLID WASTE LANDFILL - PROPERTIES WITHIN 1/4 MILE OF LANDFILL BOUNDARY
Permit Modification Application - Permit No. 1422
July 31, 2014
Revision 1: Oct 24, 2014; Revision 2: July 11, 2022; Revision 3: Nov 8, 2022
FIGURE
1
Last saved date October 10, 2022 10:42 PM
Last saved by WATER
Div/Group
Project 30143880
City (i.e. ATL, DAL, HOU)
File Location \\



Last saved date October 10, 2022 10:42 PM

[redacted]

Last saved by WATER

Div/Group

Project 30143880

City (i.e. ATL, DAL, HOU)

File Location \\

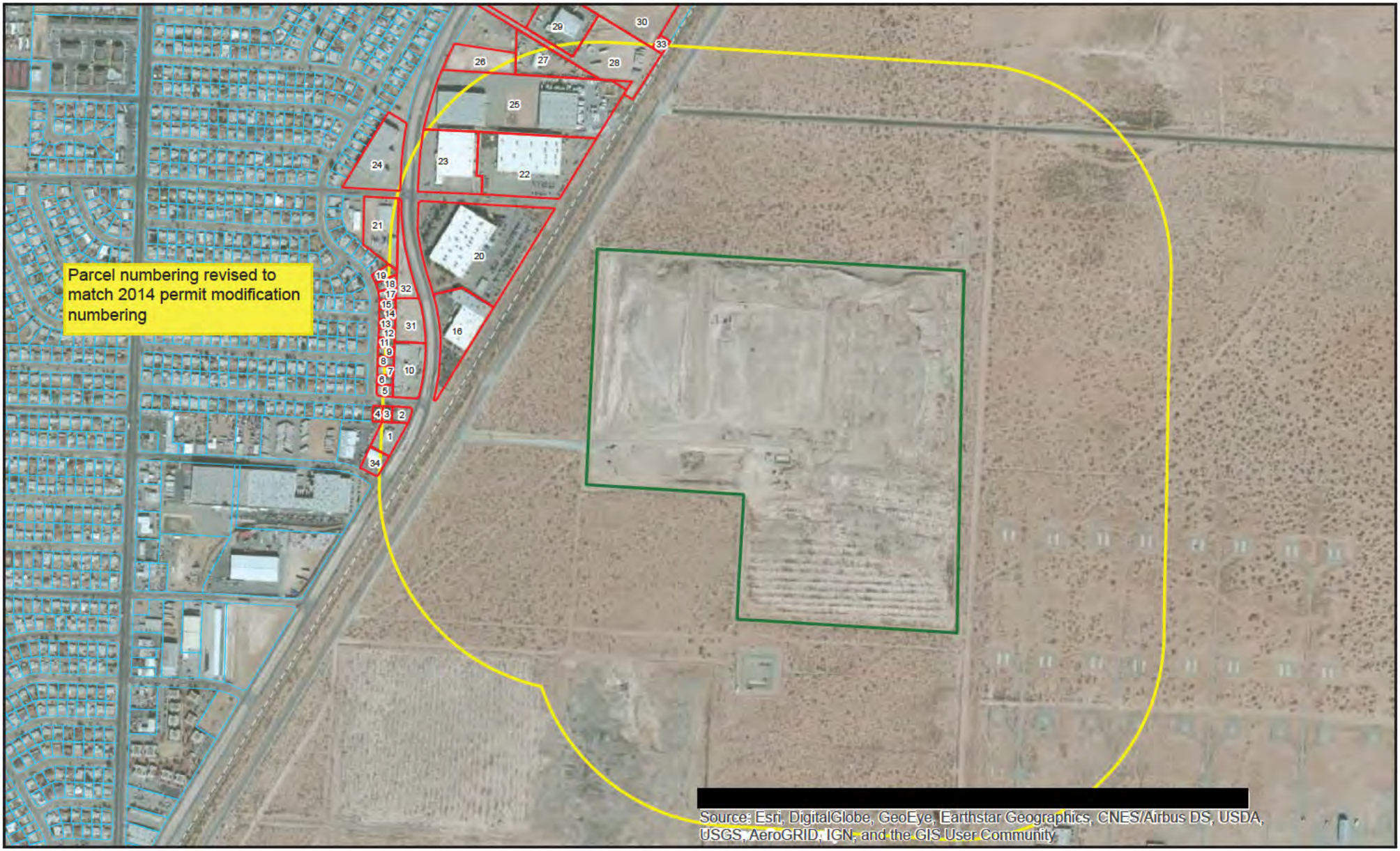
Fort Bliss Municipal Solid Waste Landfill Permit 1422

FORT BLISS MUNICIPAL SOLID WASTE LANDFILL - PROPERTIES WITHIN 1/4 MILE OF LANDFILL BOUNDARY

Permit Modification Application - Permit No. 1422
July 31, 2014
Revision 1: Oct 24, 2014; Revision 2: July 11, 2022; Revision 3: Nov 8, 2022

[redacted]

FIGURE
1



LEGEND

- Quarter Mile Land Parcels
- Mile Land Parcels
- Landfill Boundary
- Quarter Mile Radius Boundary

REFERENCE:
El Paso Central Appraisal District
Files for 2021 as of October 4; 91.7 MB
https://epcad.org/OpenGovernment#shapefiles

N

0 0.075 0.15 0.3 Miles

U.S. ARMY
CORPS OF ENGINEERS

FORT BLISS MUNICIPAL SOLID WASTE LANDFILL - PROPERTIES WITHIN 1/4 MILE OF LANDFILL BOUNDARY

[redacted]

FIGURE
1

Landowners Cross-Referenced to Landowners Map (Figure 1)

[1]MAP ID	Parcel Size (acres)	Owner Name	Address	City	State
2	3.60	[redacted]	[redacted]	EL PASO	TX
3	1.637	[redacted]	[redacted]	EL PASO	TX
4	2.000	[redacted]	[redacted]	EL PASO	TX
5	0.11	[redacted]	[redacted]	EL PASO	TX
6	9.49	[redacted]	[redacted]	EL PASO	TX
7	0.085	[redacted]	[redacted]	EL PASO	TX
8	3.826	[redacted]	[redacted]	ALBUQUERQUE	NM
9	5.89	[redacted]	[redacted]	EL PASO	TX
10	0.2295	[redacted]	[redacted]	EL PASO	TX
11	0.2163	[redacted]	[redacted]	EL PASO	TX
12	0.1730	[redacted]	[redacted]	EL PASO	TX
13	0.1505	[redacted]	[redacted]	EL PASO	TX
14	0.1446	[redacted]	[redacted]	EL PASO	TX
15	0.1446	[redacted]	[redacted]	EL PASO	TX
16	0.1446	[redacted]	[redacted]	EL PASO	TX
17	0.1446	[redacted]	[redacted]	EL PASO	TX
18	0.1446	[redacted]	[redacted]	EL PASO	TX
19	1.4058	[redacted]	[redacted]	EL PASO	TX
20	0.1446	[redacted]	[redacted]	EL PASO	TX
21	0.1446	[redacted]	[redacted]	EL PASO	TX
22	0.1446	[redacted]	[redacted]	EL PASO	TX
23	0.1808	[redacted]	[redacted]	EL PASO	TX
25	0.1400	[redacted]	[redacted]	EL PASO	TX
26	0.2385	[redacted]	[redacted]	EL PASO	TX
28	0.7610	[redacted]	[redacted]	EL PASO	TX
29	0.0000	[redacted]	[redacted]	EL PASO	TX
30	0.4530	[redacted]	[redacted]	HOUSTON	TX
31a	1.0626	[redacted]	[redacted]	EL PASO	TX
31b	0.6000	[redacted]	[redacted]	EL PASO	TX
31c	2.6050	[redacted]	[redacted]	EL PASO	TX
32	2.0700	[redacted]	[redacted]	EL PASO	TX
33	2.6774	[redacted]	[redacted]	EL PASO	TX
34	8.8838	[redacted]	[redacted]	EL PASO	TX
36	2.7439	[redacted]	[redacted]	EL PASO	TX

Note: [1]Map IDs 1, 24, 27, 35, 37, and 38 are not included in this table because they are beyond the 1/4 mile radius of the landfill. However, they are shown on the map for consistency with the 2014 permit modification.

Landowners Cross-Referenced to Landowners Map (Figure 1)

[1]MAP ID	Parcel Size (acres)	Owner Name	Address	City	State
2	3.60	[redacted]	[redacted]	EL PASO	TX
3	1.637	[redacted]P	[redacted]	EL PASO	TX
4	2.000	[redacted]	[redacted]	EL PASO	TX
5	0.11	[redacted]	[redacted]	EL PASO	TX
6	9.49	[redacted]	[redacted]	EL PASO	TX
7	0.085	[redacted]	[redacted]	EL PASO	TX
8	3.826	[redacted]	[redacted]	ALBUQUERQUE	NM
9	5.89	[redacted]	[redacted]	EL PASO	TX
10	0.2295	[redacted]	[redacted]	EL PASO	TX
11	0.2163	[redacted]	[redacted]	EL PASO	TX
12	0.1730	[redacted]	[redacted]	EL PASO	TX
13	0.1505	[redacted]	[redacted]	EL PASO	TX
14	0.1446	[redacted]	[redacted]	EL PASO	TX
15	0.1446	[redacted]	[redacted]	EL PASO	TX
16	0.1446	[redacted]	[redacted]	EL PASO	TX
17	0.1446	[redacted]	[redacted]	EL PASO	TX
18	0.1446	[redacted]	[redacted]	EL PASO	TX
19	1.4058	[redacted]	[redacted]	EL PASO	TX
20	0.1446	[redacted]	[redacted]	EL PASO	TX
21	0.1446	[redacted]	[redacted]	EL PASO	TX
22	0.1446	[redacted]	[redacted]	EL PASO	TX
23	0.1808	[redacted]	[redacted]	EL PASO	TX
25	0.1400	[redacted]	[redacted]	EL PASO	TX
26	0.2385	[redacted]	[redacted]	EL PASO	TX
28	0.7610	[redacted]	[redacted]	EL PASO	TX
29	0.0000	[redacted]	[redacted]	EL PASO	TX
30	0.4530	[redacted]	[redacted]	HOUSTON	TX
31a	1.0626	[redacted]	[redacted]	EL PASO	TX
31b	0.6000	[redacted]	[redacted]	EL PASO	TX
31c	2.6050	[redacted]	[redacted]	EL PASO	TX
32	2.0700	[redacted]	[redacted]	EL PASO	TX
33	2.6774	[redacted]	[redacted]	EL PASO	TX
34	8.8838	[redacted]	[redacted]	EL PASO	TX
36	2.7439	[redacted]	[redacted]	EL PASO	TX

Note: [1]Map IDs 1, 24, 27, 35, 37, and 38 are not included in this table because they are beyond the 1/4 mile radius of the landfill. However, they are shown on the map for consistency with the 2014 permit modification.

Landowners Cross-Referenced to Landowners Map (Figure 1)

Map ID	Type	Parcel Size (acres)	Owner Name	Address	City	State
1	Commercial	0.761	[redacted]	[redacted]	EL PASO	TX
2	Commercial	0.2385			EL PASO	TX
3	Residential	0.14			EL PASO	TX
4	Residential	0.1423			EL PASO	TX
5	Residential	0.1808			EL PASO	TX
6	Residential	0.1446			EL PASO	TX
7	Residential	0.1446			EL PASO	TX
8	Residential	0.1446			EL PASO	TX
9	Residential	0.1446			EL PASO	TX
10	Commercial	1.4058			EL PASO	TX
11	Residential	0.1446			EL PASO	TX
12	Residential	0.1446			EL PASO	TX
13	Residential	0.1446			EL PASO	TX
14	Residential	0.1446			EL PASO	TX
15	Residential	0.1505			EL PASO	TX
16	Commercial	2.6774			EL PASO	TX
17	Residential	0.173			EL PASO	TX
18	Residential	0.2163			EL PASO	TX
19	Residential	0.2295			EL PASO	TX
20	Commercial	8.8838			EL PASO	TX
21	Commercial	2.07	C		EL PASO	TX
22	Commercial	5.8994			EL PASO	TX
23	Commercial	3.8266			ALBUQUERQUE	NM
24	Commercial	2.633			MIDLAND CITY	AL
25	Commercial	9.4907			EL PASO	TX
26	Commercial	1.6378			EL PASO	TX
27	Commercial	2			EL PASO	TX
28	Commercial	3.6089			EL PASO	TX
29	Commercial	2.7439			EL PASO	TX
30	Commercial	60			EL PASO	TX
31	Commercial	1.0626			EL PASO	TX
32	Commercial	0.6			EL PASO	TX
33	Commercial	0.115			EL PASO	TX
34	Commercial	0.453			HOUSTON	TX

Table revised to match numbering revisions on the Landowner's Map

4c. Comment 3 – Application Part III, Section 3.4, Pg. 3-3

3.2.4. Water Pollution Control from Processing

§330.63(b)(4)

Not Applicable. No processing units are located at the MSWLF, and liquids are not generated.

3.2.5. Endangered Species Protection

§330.63(b)(5)

Not applicable. No threatened or endangered species (federally listed) or critical habitat are located in the MSWLF area (see Part II of the Application, Section 2.14).

3.3. Facility Surface Water Drainage Report

3.3.1. Drainage Analysis

§330.63(c)(1)(A)

Appendix L provides the updated facility surface water drainage report which complies with 30 TAC §330.63 and §330.303. The following information is provided:

- Drawings and Calculations
- Design of Drainage Facilities
- Sample Calculations
- Description of Hydrologic Methods and Calculations

3.3.2. Flood Control and Analysis

§330.63(c)(2)

This section is not applicable; Appendix H provides a flood insurance rate map showing that the MSWLF is located outside the 100-year floodplain but within the 500-year flood plain.

3.4. Waste Management Unit Design

Previous approved permit modifications included a 10-foot height increase to the permitted maximum cover elevation (from 3945 to 3955 feet above mean sea level) for the Subtitle D landfill area as shown on the closure design drawings in Appendix B. Based on the revised landfill closure design presented in this application, the proposed maximum elevation of waste is 3951 feet and the proposed maximum elevation of the final cover is 3955 as indicated on the cross-sections on Sheet C-6 of the revised closure design drawings.

The landfill operations for this modification will remain consistent with the 2007 Site Operating Plan (Appendix A) and the proposed Closure Plan (Appendix O).

3.2.4. Water Pollution Control from Processing

§330.63(b)(4)

Not Applicable. No processing units are located at the MSWLF, and liquids are not generated.

3.2.5. Endangered Species Protection

§330.63(b)(5)

Not applicable. No threatened or endangered species (federally listed) or critical habitat are located in the MSWLF area (see Part II of the Application, Section 2.14).

3.3. Facility Surface Water Drainage Report

3.3.1. Drainage Analysis

§330.63(c)(1)(A)

Appendix L provides the updated facility surface water drainage report which complies with 30 TAC §330.63 and §330.303. The following information is provided:

- Drawings and Calculations
- Design of Drainage Facilities
- Sample Calculations
- Description of Hydrologic Methods and Calculations

3.3.2. Flood Control and Analysis

§330.63(c)(2)

This section is not applicable; Appendix H provides a flood insurance rate map showing that the MSWLF is located outside the 100-year floodplain but within the 500-year flood plain.

3.4. Waste Management Unit Design

Previous approved permit modifications included a 10-foot height increase to the permitted maximum cover elevation (from 3945 to 3955 feet above mean sea level) for the Subtitle D landfill area as shown on the closure design drawings in Appendix B. Based on the revised landfill closure design presented in this application, the proposed maximum elevation of waste is 3951 feet and the proposed maximum elevation of the final cover is 3955 as indicated on the cross-sections on Sheet C-6 of the revised closure design drawings.

The landfill operations for this modification will remain consistent with the 2007 Site Operating Plan (Appendix A) and the proposed Closure Plan (Appendix O).

3.2.4. Water Pollution Control from Processing

§330.63(b)(4)

Not Applicable. No processing units are located at the MSWLF, and liquids are not generated.

3.2.5. Endangered Species Protection

§330.63(b)(5)

Not applicable. No threatened or endangered species (federally listed) or critical habitat are located in the MSWLF area (see Part II of the Application, Section 2.14).

3.3. Facility Surface Water Drainage Report

3.3.1. Drainage Analysis

§330.63(c)(1)(A)

Appendix L provides the updated facility surface water drainage report which complies with 30 TAC §330.63 and §330.303. The following information is provided:

- Drawings and Calculations
- Design of Drainage Facilities
- Sample Calculations
- Description of Hydrologic Methods and Calculations

3.3.2. Flood Control and Analysis

§330.63(c)(2)

This section is not applicable; Appendix H provides a flood insurance rate map showing that the MSWLF is located outside the 100-year floodplain but within the 500-year flood plain.

3.4. Waste Management Unit Design

Previous approved permit modifications included a 10-foot height increase to the permitted maximum cover elevation (from 3945 to 3955 feet above mean sea level) for the Subtitle D landfill area as shown on the closure design drawings in Appendix B. Based on the revised landfill closure design presented in this application, the proposed maximum elevation of waste is 3951 feet and the proposed maximum elevation of the final cover is 3955 as indicated on the cross-sections on Sheet C-6– of the revised closure design drawings.

The landfill operations for this modification will remain consistent with the 2007 Site Operating Plan (Appendix A) and the proposed Closure Plan (Appendix O).

4d. Comments 8, 9 – Appendix L, Section 2.2, Pg. 2-3

A copy of Wor sheet 2 from T -55 is provided as Attachment 1 of this report.

Table 2-1
Summary of Runoff Volumes

Precipitation (P)	Runoff (Q)	Total Runoff Volume (V)
3.3 inches (25-year, 24-hour)	1.62 inches	14.7 ac-ft

The landfill was divided into 21 separate drainage (watershed) areas based on the final grading plan as shown on Sheets C-2 and C-3 of Appendix B (Design Drawings) of the permit modification application. The following table summari es the runoff volume for each watershed.

Table 2-2
Runoff Volumes by Watershed

Watershed No.	Area (acres)	Runoff Volume (ac-ft)
1	4.41	0.60
2	12.50	1.69
3	1.95	0.26
4	0. 4	0.10
5	1.29	0.17
6	2.04	0.28
7	2.12	0.29
	0. 0	0.11
9	1.93	0.26
10	1.31	0.18
11	0.52	0.07
12	11.13	1.50
13	3.36	0.450
14	4.35	0.59
15	4.44	0.60
16	7.90	1.07
17	19.32	2.61
1	17.06	2.30
19	4.24	0.57
20	2.60	0.35
21	4. 7	0.66
Total:	10 .9	14.71

2.2. Peak Discharges

The pea discharge at any storm water control outlet or overland flow from a watershed area is dependent on the time of concentration of that watershed area or drainage swale outfall. The following paragraphs described the rational method and assumptions used to calculate the pea discharge flows for each of the 21 watershed areas shown on Drawing D-1 in Attachment 1 of this report.

A copy of Wor sheet 2 from T -55 is provided as Attachment 1 of this report.

Table 2-1
Summary of Runoff Volumes

Precipitation (P)	Runoff (Q)	Total Runoff Volume (V)
3.3 inches (25-year, 24-hour)	1.62 inches	14.7 ac-ft

The landfill was divided into 21 separate drainage (watershed) areas based on the final grading plan as shown on Sheets C-2 and C-3 of Appendix B (Design Drawings) of the permit modification application. The following table summari es the runoff volume for each watershed.

Table 2-2
Runoff Volumes by Watershed

Watershed No.	Area (acres)	Runoff Volume (ac-ft)
1	4.41	0.60
2	12.50	1.69
3	1.95	0.26
4	0. 4	0.10
5	1.29	0.17
6	2.04	0.28
7	2.12	0.29
	0. 0	0.11
9	1.93	0.26
10	1.31	0.18
11	0.52	0.07
12	11.13	1.50
13	3.36	0.450
14	4.35	0.59
15	4.44	0.60
16	7.90	1.07
17	19.32	2.61
1	17.06	2.30
19	4.24	0.57
20	2.60	0.35
21	4. 7	0.66
Total:	10 .9	14.71

2.2. Peak Discharges

The pea discharge at any storm water control outlet or overland flow from a watershed area is dependent on the time of concentration of that watershed area or drainage swale outfall. The following paragraphs described the rational method and assumptions used to calculate the pea discharge flows for each of the 21 watershed areas shown on Drawing D-1 in Attachment 1 of this report.

A copy of Wor sheet 2 from T -55 is provided as Attachment 1 of this report.

Table 2-1
Summary of Runoff Volumes

Precipitation (P)	Runoff (Q)	Total Runoff Volume (V)
3 3 inches (25-year, 24-hour)	1 62 inches	14 7 ac-ft

The landfill was divided into 21 separate drainage (watershed) areas based on the final grading plan as shown on Sheets C-2 and C-3 of Appendix B (Design Drawings) of the permit modification application. The following table summari es the runoff volume for each watershed.

Table 2-2
Runoff Volumes by Watershed

Watershed No.	Area (acres)	Runoff Volume (ac-ft)
1	4 41	0.60
2	12 50	1.697
3	1 95	0.263
4	0 4	0.10
5	1 29	0.172
6	2 04	0.283
7	2 12	0.293
	0 0	0.11
9	1 93	0.263
10	1 31	0.182
11	0 52	0.074
12	11 13	1.50
13	3 36	0.450
14	4 35	0.596
15	4 44	0.60
16	7 90	1.074
17	19 32	2.61
1	17 06	2.30
19	4 24	0.576
20	2 60	0.354
21	4 7	0.667
Total:	109 9 0	14 71

2.2. Peak Discharges

The pea discharge at any storm water control outlet or overland flow from a watershed area is dependent on the time of concentration of that watershed area or drainage swale outfall. The following paragraphs described the rational method and assumptions used to calculate the pea discharge flows for each of the 21 watershed areas shown on Drawing D-1 in Attachment 1 of this report.

4e. Comment 10, Appendix L, Section 2.3, Pg. 2-8 Table 2-6

Table 2-5
Velocities and Depths of Flow in Perimeter Swales

Perimeter Swale	Watershed Associated with Swale	Peak Discharge (cfs)	Flow Depth (ft)	Velocity (ft/s)
PS-1A	3 thru 5, 10 & 19	22.3	0.4	2.5
PS-1B	10	3.0	0.2	1.1
PS-2A/2B/2C/2D	1, 6 thru 9	26.1	0.3	1.5
PS-3A	2	29.0	0.8	2.7
PS-4A	16 & 18	57.8	0.5	1.8
PS-4B	16	18.3	0.3	2.3
PS-5A	11, 12, 13, 17, 20 & 21	97.5	0.6	3.0
PS-5B	11, 12, 20 & 21	44.3	0.6	1.8
PS-5C/5D/5E/5F	11, 20 & 21	27.2	0.4	2.4

Table 2-6
Velocities and Depths of Flow in Downchutes

Downchute	Watershed Associated with Downchute	Peak Discharge (cfs)	Flow Depth (ft)	Velocity (ft/s)
DC-1	4 & 5	4.9	0.1	4.5
DC-2	6 & 7	9.6	0.1	5.9
DC-3	8 & 9	6.3	0.1	5.0
DC-4	14 & 15	20.4	0.2	7.9

2.4. Culvert Capacity Calculations

There are three locations of discharge to the natural surrounding flow patterns at the southeast, southwest, and northwest corners of the landfill. Storm water from the perimeter drainage swales drain to 2 sets of culverts at discharge lo natural surroundings and one internal culvert located at the construction entrance on the west side connecting to a widened area, PS-2A where confluence of Perimeter Swales PS-3A and PS-2B occur, then exiting at the third discharge point exiting at the southwest discharge location across a drivable access swale. All discharge locations are armored to protect against erosion at the discharge locations.

The headwater/depth ratio and outlet velocity are summarized below in Table 2-7. Culverts C-1 and C-2 will consist of 24-inch CMP barrels, and Culvert C-3 will have four 36-inch barrels. Culverts were sized using nomographs from the Federal Highway Administration HEC-5 manual. These nomographs are provided in Attachment 1. Culverts were size to provide sufficient capacity to convey peak flow from the 25-year, 24-hour storm event without overtopping. A gabion mattress will be used for erosion

Table 2-5
Velocities and Depths of Flow in Perimeter Swales

Perimeter Swale	Watershed Associated with Swale	Peak Discharge (cfs)	Flow Depth (ft)	Velocity (ft/s)
PS-1A	3 thru 5, 10 & 19	22.3	0.4	2.5
PS-1B	10	3.0	0.2	1.1
PS-2A/2B/2C/2D	1, 6 thru 9	26.1	0.3	1.5
PS-3A	2	29.0	0.8	2.7
PS-4A	16 & 18	57.8	0.5	1.8
PS-4B	16	18.3	0.3	2.3
PS-5A	11, 12, 13, 17, 20 & 21	97.5	0.6	3.0
PS-5B	11, 12, 20 & 21	44.3	0.6	1.8
PS-5C/5D/5E/5F	11, 20 & 21	27.2	0.4	2.4

Table 2-6
Velocities and Depths of Flow in Downchutes

Downchute	Watershed Associated with Downchute	Peak Discharge (cfs)	Flow Depth (ft)	Velocity (ft/s)
DC-1	4 & 5	4.9	0.1	4.5
DC-2	6 & 7	9.6	0.1	5.9
DC-3	8 & 9	6.3	0.1	5.0
DC-4	14 & 15	20.4	0.2	7.9

2.4. Culvert Capacity Calculations

There are three locations of discharge to the natural surrounding flow patterns at the southeast, southwest, and northwest corners of the landfill. Storm water from the perimeter drainage swales drain to 2 sets of culverts at discharge lo natural surroundings and one internal culvert located at the construction entrance on the west side connecting to a widened area, PS-2A where confluence of Perimeter Swales PS-3A and PS-2B occur, then exiting at the third discharge point exiting at the southwest discharge location across a drivable access swale. All discharge locations are armored to protect against erosion at the discharge locations.

The headwater/depth ratio and outlet velocity are summarized below in Table 2-7. Culverts C-1 and C-2 will consist of 24-inch CMP barrels, and Culvert C-3 will have four 36-inch barrels. Culverts were sized using nomographs from the Federal Highway Administration HEC-5 manual. These nomographs are provided in Attachment 1. Culverts were size to provide sufficient capacity to convey peak flow from the 25-year, 24-hour storm event without overtopping. A gabion mattress will be used for erosion

Table 2-5
Velocities and Depths of Flow in Perimeter Swales

Perimeter Swale	Watershed Associated with Swale	Peak Discharge (cfs)	Flow Depth (ft)	Velocity (ft/s)
PS-1A	3 thru 5, 10 & 19	22.3	0.4	2.5
PS-1B	10	3.0	0.2	1.1
PS-2A/2B/2C/2D	1, 6 thru 9	26.1	0.3	1.5
PS-3A	2	29.0	0.8	2.7
PS-4A	16 & 18	57.8	0.5	1.8
PS-4B	16	18.3	0.3	2.3
PS-5A	11, 12, 13, 17, 20 & 21	97.5	0.6	3.0
PS-5B	11, 12, 20 & 21	44.3	0.6	1.8
PS-5C/5D/5E/5F	11, 20 & 21	27.2	0.4	2.4

Table 2-6
Velocities and Depths of Flow in Downchutes

Downchute	Watershed Associated with Downchute	Peak Discharge (cfs)	Flow Depth (ft)	Velocity (ft/s)
DC-1	4 & 5	4.9	0.1	4.5
DC-2	6 & 7	9.6	0.1	5.89
DC-3	8 & 9	6.3	0.1	5.0
DC-4	14 & 15	20.4	0.2	7.9

2.4. Culvert Capacity Calculations

There are three locations of discharge to the natural surrounding flow patterns at the southeast, southwest, and northwest corners of the landfill. Storm water from the perimeter drainage swales drain to 2 sets of culverts at discharge lo natural surroundings and one internal culvert located at the construction entrance on the west side connecting to a widened area, PS-2A where confluence of Perimeter Swales PS-3A and PS-2B occur, then exiting at the ~~pond. The~~ third discharge point exiting~~s~~ at the southwest discharge location across a drivable access swale. All discharge locations are armored to protect against erosion at the discharge locations.

The headwater/depth ratio and outlet velocity are summarized below in Table 2-7. Culverts C-1 ~~through~~ and C-2 ~~3~~ will consist of 24-inch CMP barrels, ~~and~~ Culvert C-3~~4~~ will have four 36-inch barrels. Culverts~~,~~ were sized using nomographs from the Federal Highway Administration HEC-5 manual. These nomographs are provided in Attachment 1. Culverts were size~~d~~ to provide sufficient capacity to convey peak flow from the 25-year, 24-hour storm event without overtopping. A gabion mattress will be used for

4f. Comments 11, 12, 13, 14 Appendix L, Section 2.4, Pgs. 2-8, 2-9

Table 2-5
Velocities and Depths of Flow in Perimeter Swales

Perimeter Swale	Watershed Associated with Swale	Peak Discharge (cfs)	Flow Depth (ft)	Velocity (ft/s)
PS-1A	3 thru 5, 10 & 19	22.3	0.4	2.5
PS-1B	10	3.0	0.2	1.1
PS-2A/2B/2C/2D	1, 6 thru 9	26.1	0.3	1.5
PS-3A	2	29.0	0.8	2.7
PS-4A	16 & 18	57.8	0.5	1.8
PS-4B	16	18.3	0.3	2.3
PS-5A	11, 12, 13, 17, 20 & 21	97.5	0.6	3.0
PS-5B	11, 12, 20 & 21	44.3	0.6	1.8
PS-5C/5D/5E/5F	11, 20 & 21	27.2	0.4	2.4

Table 2-6
Velocities and Depths of Flow in Downchutes

Downchute	Watershed Associated with Downchute	Peak Discharge (cfs)	Flow Depth (ft)	Velocity (ft/s)
DC-1	4 & 5	4.9	0.1	4.5
DC-2	6 & 7	9.6	0.1	5.9
DC-3	8 & 9	6.3	0.1	5.0
DC-4	14 & 15	20.4	0.2	7.9

2.4. Culvert Capacity Calculations

There are three locations of discharge to the natural surrounding flow patterns at the southeast, southwest, and northwest corners of the landfill. Storm water from the perimeter drainage swales drain to two sets of culverts at discharge to natural surroundings and one internal culvert located at the construction entrance on the west side connecting to a widened area, PS-2A where confluence of Perimeter Swales PS-3A and PS-2B occur, then exiting at the third discharge point exiting at the southwest discharge location across a drivable access swale. All discharge locations are armored to protect against erosion at the discharge locations.

The headwater/depth ratio and outlet velocity are summarized below in Table 2-7. Culverts C-1 and C-2 will consist of 24-inch CMP barrels, and Culvert C-3 will have four 36-inch barrels. Culverts were sized using nomographs from the Federal Highway Administration HEC-5 manual. These nomographs are provided in Attachment 1. Culverts were size to provide sufficient capacity to convey peak flow from the 25-year, 24-hour storm event without overtopping. A gabion mattress will be used for erosion

control on the outlet side of each culvert. A concrete apron on the inlet side of the culverts will provide erosion control at the culvert entrance. Discharge flows exiting the at the drivable swale at 1 foot per second. As discussed in Section 3.2.2 below, the permissible velocity for gabions mattresses is 18 ft/sec.

Table 2-7
Velocities and HW/D Ratios of Flow in Culverts

ul ert	Watershed Associated with ul ert	ul ert Si e	Peak Discharge (cfs)	W/D atio	utlet Velocity (ft/s)
C-1	3 thru 5, 10 & 19	Two Barrel, 24 CMP	22.3	1.5	5.8
C-2	1, 6 thru 9	Two Barrel, 24 CMPs	26.2	1.5	6.1
C-3	11 thru 18, 20, 21	Four Barrel, 36 CMPs	175.0	1.3	8.1

2.5. Summary of Drainage Analysis

Table 2-8 summarizes the results from the pre-developed permitted facility conditions per the approved 1995 Closure Plan and post-developed conditions final closure with optimized ET cover design and grading plan to demonstrate that the proposed modification does not adversely affect the drainage patterns. The comparison illustrates that the range of peak flow and normal depth of flow decrease compared to pre-developed conditions. This is due to the smaller watersheds created by the modified grading plan. However, the maximum velocities increase over the pre-development condition. This is due to the use of internal downchutes off two of the landfill cells. These downchutes will be protected from scour with the use of gabion mattresses as described in Section 3.2.2 below and will discharge to shallow swales before the stormwater is discharged off-site. The drainage patterns were not altered significantly so as to change the previously permitted drainage conditions of the site.

Table 2-8
Comparison of Peak Discharges, Flow Depths, and Flow Velocities in Swales

ondition and Analysis	ange of Peak Discharge (cfs)	ange of ormal Depth of Flow y (ft)	ange of Flow Velocities (ft/s)
Pre-Development 2005 Permitted	10.9 73.6	0.7 1.1	1.9 3.9
Post-Development ptimized ET Cover and rading	1.1 44.8	0.1 1.0	1.1 7.9

Table 2-5
Velocities and Depths of Flow in Perimeter Swales

Perimeter Swale	Watershed Associated with Swale	Peak Discharge (cfs)	Flow Depth (ft)	Velocity (ft/s)
PS-1A	3 thru 5, 10 & 19	22.3	0.4	2.5
PS-1B	10	3.0	0.2	1.1
PS-2A/2B/2C/2D	1, 6 thru 9	26.1	0.3	1.5
PS-3A	2	29.0	0.8	2.7
PS-4A	16 & 18	57.8	0.5	1.8
PS-4B	16	18.3	0.3	2.3
PS-5A	11, 12, 13, 17, 20 & 21	97.5	0.6	3.0
PS-5B	11, 12, 20 & 21	44.3	0.6	1.8
PS-5C/5D/5E/5F	11, 20 & 21	27.2	0.4	2.4

Table 2-6
Velocities and Depths of Flow in Downchutes

Downchute	Watershed Associated with Downchute	Peak Discharge (cfs)	Flow Depth (ft)	Velocity (ft/s)
DC-1	4 & 5	4.9	0.1	4.5
DC-2	6 & 7	9.6	0.1	5.9
DC-3	8 & 9	6.3	0.1	5.0
DC-4	14 & 15	20.4	0.2	7.9

2.4. Culvert Capacity Calculations

There are three locations of discharge to the natural surrounding flow patterns at the southeast, southwest, and northwest corners of the landfill. Storm water from the perimeter drainage swales drain to two sets of culverts at discharge to natural surroundings and one internal culvert located at the construction entrance on the west side connecting to a widened area, PS-2A where confluence of Perimeter Swales PS-3A and PS-2B occur, then exiting at the third discharge point exiting at the southwest discharge location across a drivable access swale. All discharge locations are armored to protect against erosion at the discharge locations.

The headwater/depth ratio and outlet velocity are summarized below in Table 2-7. Culverts C-1 and C-2 will consist of 24-inch CMP barrels, and Culvert C-3 will have four 36-inch barrels. Culverts were sized using nomographs from the Federal Highway Administration HEC-5 manual. These nomographs are provided in Attachment 1. Culverts were size to provide sufficient capacity to convey peak flow from the 25-year, 24-hour storm event without overtopping. A gabion mattress will be used for erosion

control on the outlet side of each culvert. A concrete apron on the inlet side of the culverts will provide erosion control at the culvert entrance. Discharge flows exiting the at the drivable swale at 1 foot per second. As discussed in Section 3.2.2 below, the permissible velocity for gabions mattresses is 18 ft/sec.

Table 2-7
Velocities and HW/D Ratios of Flow in Culverts

ul ert	Watershed Associated with ul ert	ul ert Si e	Peak Discharge (cfs)	W/D atio	utlet Velocity (ft/s)
C-1	3 thru 5, 10 & 19	Two Barrel, 24 CMP	22.3	1.5	5.8
C-2	1, 6 thru 9	Two Barrel, 24 CMPs	26.2	1.5	6.1
C-3	11 thru 18, 20, 21	Four Barrel, 36 CMPs	175.0	1.3	8.1

2.5. Summary of Drainage Analysis

Table 2-8 summarizes the results from the pre-developed permitted facility conditions per the approved 1995 Closure Plan and post-developed conditions final closure with optimized ET cover design and grading plan to demonstrate that the proposed modification does not adversely affect the drainage patterns. The comparison illustrates that the range of peak flow and normal depth of flow decrease compared to pre-developed conditions. This is due to the smaller watersheds created by the modified grading plan. However, the maximum velocities increase over the pre-development condition. This is due to the use of internal downchutes off two of the landfill cells. These downchutes will be protected from scour with the use of gabion mattresses as described in Section 3.2.2 below and will discharge to shallow swales before the stormwater is discharged off-site. The drainage patterns were not altered significantly so as to change the previously permitted drainage conditions of the site.

Table 2-8
Comparison of Peak Discharges, Flow Depths, and Flow Velocities in Swales

ondition and Analysis	ange of Peak Discharge (cfs)	ange of ormal Depth of Flow y (ft)	ange of Flow Velocities (ft/s)
Pre-Development 2005 Permitted	10.9 73.6	0.7 1.1	1.9 3.9
Post-Development ptimized ET Cover and rading	1.1 44.8	0.1 1.0	1.1 7.9

Table 2-5
Velocities and Depths of Flow in Perimeter Swales

Perimeter Swale	Watershed Associated with Swale	Peak Discharge (cfs)	Flow Depth (ft)	Velocity (ft/s)
PS-1A	3 thru 5, 10 & 19	22.3	0.4	2.5
PS-1B	10	3.0	0.2	1.1
PS-2A/2B/2C/2D	1, 6 thru 9	26.1	0.3	1.5
PS-3A	2	29.0	0.8	2.7
PS-4A	16 & 18	57.8	0.5	1.8
PS-4B	16	18.3	0.3	2.3
PS-5A	11, 12, 13, 17, 20 & 21	97.5	0.6	3.0
PS-5B	11, 12, 20 & 21	44.3	0.6	1.8
PS-5C/5D/5E/5F	11, 20 & 21	27.2	0.4	2.4

Table 2-6
Velocities and Depths of Flow in Downchutes

Downchute	Watershed Associated with Downchute	Peak Discharge (cfs)	Flow Depth (ft)	Velocity (ft/s)
DC-1	4 & 5	4.9	0.1	4.5
DC-2	6 & 7	9.6	0.1	5.~~8~~9
DC-3	8 & 9	6.3	0.1	5.0
DC-4	14 & 15	20.4	0.2	7.9

2.4. Culvert Capacity Calculations

There are three locations of discharge to the natural surrounding flow patterns at the southeast, southwest, and northwest corners of the landfill. Storm water from the perimeter drainage swales drain to ~~2~~ two sets of culverts at discharge t~~l~~o natural surroundings and one internal culvert located at the construction entrance on the west side connecting to a widened area, PS-2A where confluence of Perimeter Swales PS-3A and PS-2B occur, then exiting at the ~~pond. The~~ third discharge point exitings~~s~~ at the southwest discharge location across a drivable access swale. All discharge locations are armored to protect against erosion at the discharge locations.

The headwater/depth ratio and outlet velocity are summarized below in Table 2-7. Culverts C-1 ~~through~~ and C-2~~-3~~ will consist of 24-inch CMP barrels, ~~-~~and Culvert C-34 will have four 36-inch barrels. Culverts~~-~~ were sized using nomographs from the Federal Highway Administration HEC-5 manual. These nomographs are provided in Attachment 1. Culverts were size~~d~~ to provide sufficient capacity to convey peak flow from the 25-year, 24-hour storm event without overtopping. A gabion mattress will be used for

erosion control on the outlet side of each culvert. A concrete apron on the inlet side of the culverts will provide erosion control at the culvert entrance. Discharge flows exiting the at the drivable swale at 1 foot per second. As discussed in Section 3.2.2 below, the permissible velocity for gabions mattresses is 18 ft/sec.

Table 2-7
Velocities and HW/D Ratios of Flow in Culverts

ul ert	Watershed Associated with ul ert	ul ert Si e	Peak Discharge (cfs)	W/D atio	utlet Velocity (ft/s)
~~D~~C-1	3 thru 5, 10 & 19	Two Barrel, 24 CMP	22.3	1.5	5.8
~~D~~C-2	1, 6 thru 9	Two Barrel, 24 CMPs	26.2	1.5	6.1
~~D~~C-3	11 thru 18, 20, 21	Four Barrel, 36 CMPs	175.0	1.3	8.1

2.5. Summary of Drainage Analysis

Table 2-8 summarizes the results from the pre-developed permitted facility conditions per the approved 1995 Closure Plan and post-developed conditions final closure with optimized ET cover design and grading plan to demonstrate that the proposed modification does not adversely affect the drainage patterns. The comparison illustrates that the range of peak flow and normal depth of flow decrease compared to pre-developed conditions. This is due to the smaller watersheds created by the modified grading plan. However, the maximum velocities increase over the pre-development condition. This is due to the use of internal downchutes off two of the landfill cells. These downchutes will be protected from scour with the use of gabion mattresses as described in Section 3.2.2 below and will discharge to shallow swales before the stormwater is discharged off-site. The drainage patterns were not altered significantly so as to change the previously permitted drainage conditions of the site.

Table 2-8
Comparison of Peak Discharges, Flow Depths, and Flow Velocities in Swales

ondition and Analysis	ange of Peak Discharge (cfs)	ange of ormal Depth of Flow y (ft)	ange of Flow Velocities (ft/s)
Pre-Development 2005 Permitted	10.9 73.6	0.7 1.1	1.9 3.9
Post-Development ptimized ET Cover and rading	1.1 44.8	0.1 1.0	1.1 7.9

4g. Comments 15,16 – Appendix L, Section 3.2.2, Pg. 3-4

along the temporary soil berm is 3.0 ft/sec on the top dome and the flow velocity through the permanent swale along the top dome is 2.9 ft/sec. Thereafter, the velocity through the downchute is 7.9 ft/sec and the velocity through the swale off the landfill is 5.8 ft/sec as calculated in Section 3 and presented in Tables 2-4 through 2-6 and Attachment 1.

Drainage and conveyance structures were designed and sized to withstand erosive forces of water and not to exceed the permissible non-erodible velocities presented in Section 3.2.2 and summarized in Table 3-1.

Table 3-1
Comparison of Calculated Flow Velocities and Permissible Non-Erodible Velocities

ype	Velocity	Permissi le on rodi le Velocity
Temp. Soil Berm Subtitle D Top Dome	3.0 ft/sec	3 ft/sec silty-loam
Swale Subtitle D Top Dome	2.9 ft/sec	9 to12 ft/sec ECP or ecycled ip- ap
Downchute ff Subtitle D Top Dome	7.9 ft/sec	18 ft/sec abion Mattress
Swale ff andfill	6.1 ft/sec	9 to12 ft/sec ECP or ecycled ip- ap

To further reduce flow velocities and allow sediments and other pollutants to settle, rock check dams will be installed along the drainage swales as shown on Sheets C-4 and C-5 in Appendix B Design Drawings .

The hydraulic calculation supporting this design of the temporary soil berm is included in Attachment 2. The hydraulic calculation supporting the design of the permanent diversion drainage swales are included in Attachment 1.

Soil Loss Calculations

Soil erosion loss was estimated utilizing the evised niversal Soil oss E uation ersion 2 S E2 . S E2 uses factors that represent the effects of climate erosivity, precipitation, and temperature , soil erodibility, topography, cover management, and support practices to compute soil loss and erosion.

S E2 is a mathematical model that uses a system of e uations implemented in a computer program to estimate erosion rates. The other ma or component of S E2 is a database containing an extensive array of site/county specific values precipitation, , E , etc. that are used by the S E2 user to describe a site-specific condition so S E2 can compute erosion values that directly reflect conditions at a particular site. The S E2 computer program and its extensive database information were developed by the SDA-Agricultural esearch Service A S , SDA- atural esources Conservation Service

along the temporary soil berm is 3.0 ft/sec on the top dome and the flow velocity through the permanent swale along the top dome is 2.9 ft/sec. Thereafter, the velocity through the downchute is 7.9 ft/sec and the velocity through the swale off the landfill is 5.8 ft/sec as calculated in Section 3 and presented in Tables 2-4 through 2-6 and Attachment 1.

Drainage and conveyance structures were designed and sized to withstand erosive forces of water and not to exceed the permissible non-erodible velocities presented in Section 3.2.2 and summarized in Table 3-1.

Table 3-1
Comparison of Calculated Flow Velocities and Permissible Non-Erodible Velocities

ype	Velocity	Permissi le on rodi le Velocity
Temp. Soil Berm Subtitle D Top Dome	3.0 ft/sec	3 ft/sec silty-loam
Swale Subtitle D Top Dome	2.9 ft/sec	9 to12 ft/sec ECP or ecycled ip- ap
Downchute ff Subtitle D Top Dome	7.9 ft/sec	18 ft/sec abion Mattress
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To further reduce flow velocities and allow sediments and other pollutants to settle, rock check dams will be installed along the drainage swales as shown on Sheets C-4 and C-5 in Appendix B Design Drawings .

The hydraulic calculation supporting this design of the temporary soil berm is included in Attachment 2. The hydraulic calculation supporting the design of the permanent diversion drainage swales are included in Attachment 1.

Soil Loss Calculations

Soil erosion loss was estimated utilizing the evised niversal Soil oss E uation ersion 2 S E2 . S E2 uses factors that represent the effects of climate erosivity, precipitation, and temperature , soil erodibility, topography, cover management, and support practices to compute soil loss and erosion.

S E2 is a mathematical model that uses a system of e uations implemented in a computer program to estimate erosion rates. The other ma or component of S E2 is a database containing an extensive array of site/county specific values precipitation, , E , etc. that are used by the S E2 user to describe a site-specific condition so S E2 can compute erosion values that directly reflect conditions at a particular site. The S E2 computer program and its extensive database information were developed by the SDA-Agricultural esearch Service A S , SDA- atural esources Conservation Service

along the temporary soil berm is 3.02.5 ft/sec on the top dome and the flow velocity through the permanent swale along the top dome is 2.9 ft/sec. Thereafter, the velocity through the downchute is 7.9 ft/sec and the velocity through the swale off the landfill is 5.8 ft/sec as calculated in Section 3 and presented in Tables 2-4 through 2-6 and Attachment 1.

Drainage and conveyance structures were designed and sized to withstand erosive forces of water and not to exceed the permissible non-erodible velocities presented in Section 3.2.2 and summarized in Table 3-1.

Table 3-1
Comparison of Calculated Flow Velocities and Permissible Non-Erodible Velocities

ype	Velocity	Permissi le on rodi le Velocity
Temp. Soil Berm Subtitle D Top Dome	3.0 ft/sec	3 ft/sec silty-loam
Swale Subtitle D Top Dome	2.9 ft/sec	9 to12 ft/sec ECP or ecycled ip- ap
Downchute ff Subtitle D Top Dome	7.9 ft/sec	18 ft/sec ablon Mattress
Swale ff andfill	6.15.8 ft/sec	9 to12 ft/sec ECP or ecycled ip- ap

To further reduce flow velocities and allow sediments and other pollutants to settle, rock check dams will be installed along the drainage swales as shown on Sheets C-4 and C-5 in Appendix B Design Drawings .

The hydraulic calculation supporting this design of the temporary soil berm is included in Attachment 2. The hydraulic calculation supporting the design of the permanent diversion drainage swales are included in Attachment 1.

Soil Loss Calculations

Soil erosion loss was estimated utilizing the evised niversal Soil oss E uation ersion 2 S E2 . S E2 uses factors that represent the effects of climate erosivity, precipitation, and temperature , soil erodibility, topography, cover management, and support practices to compute soil loss and erosion.

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4h. Comment 17 – Appendix L, Section 3.2.2, Pg. 3-5, Attachment 2

CS and the niversity of Tennessee. The soil loss estimation slope is 1,500 feet long from the crest of the subtitle D cell to the perimeter swale. The S E2 computer program allows for a maximum of 1,000 feet. Therefore, the soil estimation slope was divided into two segments. A 1,000 foot segment with an average slope of 2.6 was calculated using the following flow segments 270 feet at 5.0 280 feet at 1.7 20 feet at 25 and 430 feet at 1.6 . The 500 foot segment has an average slope of 1.8 .

esults show soil losses of 2.9 tons/acre/year. ith the rock check dams installed as a best management practice BMP for pollution prevention, the soil losses would be reduced to 0.08 tons/acre/year. The soil loss analyses demonstrate that proposed erosion and sedimentation controls can achieve effective erosional stability. Soil loss calculations are included in Attachment 2.

3.2.3. Soil Surface Stabilization – Interim Measures

The selected BMPs to be implemented during landfill operations, for soil stabilization and stormwater control, are ones that are proven and commonly used as described below.

Temporary stabilization of intermediate cover on top dome and external slopes will be completed within 180 days after installation and maintained until the final cover is placed and permanent stabilization controls implemented. The specific cover practices that will be implemented prior to installation of final closure

- Mulch - Mulching is the application of a layer of organic, biodegradable material which is spread over areas where vegetation is not yet established. Types of mulch include compost, straw, wood chips, or manufactured products. Mulch application can be in dry or hydraulic forms. hen applied dry, the thickness of the mulch will vary depending on the type of mulch applied. Primary-grind mulch e.g. wood shreds that form a mass of intermixed fragments , which will be used primarily for erosion control, will be applied using spreading e uipment, such as a bulldozer, at a minimum thickness of 2-inches. Compost material, which will consist of more finely ground mulch, will be applied using mechanical spreaders or sprayers. A tackifier or binder can be used to increase the strength and durability of the mulch. Hydraulic mulch applications consist of the use of hydromulch, bonded fiber matrix, Flexible rowth Medium F M , as well as other commercially available products. Hydraulic mulch typically includes a tackifier or binder. Seeds can be applied to the soil first or mixed into the hydraulic mulch.

  The application method and application rate of hydraulic mulch will be based on manufacturers recommendations to ensure a uniform and complete coverage. Any

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  The application method and application rate of hydraulic mulch will be based on manufacturers recommendations to ensure a uniform and complete coverage. Any

RUSLE2 Expanded Profile Erosion Calculation Record

Info:

File: profiles\Fort Bliss Final Intermediate Condition

Inputs:
Location: USA\Texas\El Paso County
Soil: SSURGO\El Paso County, Texas (Main Part)\HW Hueco-Wink association, hummocky\Wink Fine sandy loam 35%
T value: 3.0 t/ac/yr
Slope length (horiz): 140 ft
Avg. slope steepness: 5.0 %

R Factor	*Annual precip*	*10-yr 24-hr rainfall*	*In Req area?*
39	9.56	2.8	No

Management	*Vegetation*	*Yield units*	*# yield units, #/ac*

Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)
Subsurface drainage: (none)
Adjust res. burial level: Normal res. burial

Outputs:

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
1/1/0	default		0

T value: 3.0 t/ac/yr
Soil loss erod. portion: 1.2 t/ac/yr
Detachment on slope: 1.2 t/ac/yr
Soil loss for cons. plan: 1.2 t/ac/yr
Sediment delivery: 1.2 t/ac/yr

Crit. slope length: 140 ft
Surf. cover after planting: -- %

Soil conditioning index (SCI): 0.107
Avg. annual slope STIR: 0.150
Wind & irrigation-induced erosion for SCI: 0 t/ac/yr

The SCI is the Soil Conditioning Index rating. If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system. If the index is a positive value, soil organic matter levels are predicted to increase under that system.

The STIR value is the Soil Tillage Intensity Rating. It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation. STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.

Period Start Date	*Operation*	*PLU*	*Avg. surf. cover, fraction*	*Avg. SC subfactor*	*Avg. CC subfactor*	*Avg. roughness, in.*	*Avg. SR subfactor*	*Avg. C factor*	*EI, %*
1/1/0	default	0.45	0	1.0	100	0.24	1.00	0.45	0.14
1/16/0		0.45	0	1.0	100	0.24	1.00	0.45	0.19
2/1/0		0.45	0	1.0	100	0.24	1.00	0.45	0.26
2/15/0		0.45	0	1.0	100	0.24	1.00	0.45	0.30
3/1/0		0.45	0	1.0	100	0.24	1.00	0.45	0.35
3/16/0		0.45	0	1.0	100	0.24	1.00	0.45	0.42
4/1/0		0.45	0	1.0	100	0.24	1.00	0.45	0.48
4/16/0		0.45	0	1.0	100	0.24	1.00	0.45	0.60
5/1/0		0.45	0	1.0	100	0.24	1.00	0.45	0.86
5/16/0		0.45	0	1.0	100	0.24	1.00	0.45	1.4
6/1/0		0.45	0	1.0	100	0.24	1.00	0.45	3.8
6/16/0		0.45	0	1.0	100	0.24	1.00	0.45	6.3
7/1/0		0.45	0	1.0	100	0.24	1.00	0.45	13
7/16/0		0.45	0	1.0	100	0.24	1.00	0.45	15
8/1/0		0.45	0	1.0	100	0.24	1.00	0.45	14
8/16/0		0.45	0	1.0	100	0.24	1.00	0.45	15
9/1/0		0.45	0	1.0	100	0.24	1.00	0.45	10
9/16/0		0.45	0	1.0	100	0.24	1.00	0.45	7.4
10/1/0		0.45	0	1.0	100	0.24	1.00	0.45	3.8
10/16/0		0.45	0	1.0	100	0.24	1.00	0.45	2.6
11/1/0		0.45	0	1.0	100	0.24	1.00	0.45	1.1
11/16/0		0.45	0	1.0	100	0.24	1.00	0.45	0.98
12/1/0		0.45	0	1.0	100	0.24	1.00	0.45	0.91
12/16/0		0.45	0	1.0	100	0.24	1.00	0.45	0.81

Period Start Date, m/d/y	*Operation Name*	*Man soil loss rate, t/ac*	*Man sed del. rate*	*EI, %*
1/1/0	default	0	0	0.14
1/16/0		0.0025	0.0025	0.19
2/1/0		0.0048	0.0048	0.26
2/15/0		0	0	0.30
3/1/0		0.0053	0.0053	0.35
3/16/0		0.0069	0.0069	0.42
4/1/0		0	0	0.48
4/16/0		0.0098	0.0098	0.60
5/1/0		0	0	0.86
5/16/0		0.016	0.016	1.4
6/1/0		0.068	0.068	3.8
6/16/0		0	0	6.3
7/1/0		0.20	0.20	13
7/16/0		0.27	0.27	15
8/1/0		0	0	14
8/16/0		0.30	0.30	15
9/1/0		0	0	10
9/16/0		0.18	0.18	7.4
10/1/0		0.057	0.057	3.8
10/16/0		0	0	2.6
11/1/0		0.024	0.024	1.1
11/16/0		0.016	0.016	0.98
12/1/0		0	0	0.91
12/16/0		0.013	0.013	0.81

USDA NRCS Natural Resources Conservation Service

RUSLE2 Expanded Profile Erosion Calculation Record

Info:

File: profiles\Fort Bliss Final Intermediate Condition

Inputs:
Location: USA\Texas\El Paso County
Soil: SSURGO\El Paso County, Texas (Main Part)\HW Hueco-Wink association, hummocky\Wink Fine sandy loam 35%
T value: 3.0 t/ac/yr
Slope length (horiz): 350 ft
Avg. slope steepness: 2.5 %

R Factor	*Annual precip*	*10-yr 24-hr rainfall*	*In Req area?*
39	9.56	2.8	No

Management	*Vegetation*	*Yield units*	*# yield units, #/ac*

Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)
Subsurface drainage: (none)
Adjust res. burial level: Normal res. burial

Outputs:

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
1/1/0	default		0

T value: 3.0 t/ac/yr
Soil loss erod. portion: 0.68 t/ac/yr
Detachment on slope: 0.68 t/ac/yr
Soil loss for cons. plan: 0.68 t/ac/yr
Sediment delivery: 0.68 t/ac/yr

Crit. slope length: 350 ft
Surf. cover after planting: -- %

Soil conditioning index (SCI): 0.145
Avg. annual slope STIR: 0.150
Wind & irrigation-induced erosion for SCI: 0 t/ac/yr

The SCI is the Soil Conditioning Index rating. If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system. If the index is a positive value, soil organic matter levels are predicted to increase under that system.

The STIR value is the Soil Tillage Intensity Rating. It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation. STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.

Period Start Date	*Operation*	*PLU*	*Avg. surf. cover, fraction*	*Avg. SC subfactor*	*Avg. CC subfactor*	*Avg. roughness, in.*	*Avg. SR subfactor*	*Avg. C factor*	*EI, %*
1/1/0	default	0.45	0	1.0	100	0.24	1.00	0.45	0.14
1/16/0		0.45	0	1.0	100	0.24	1.00	0.45	0.19
2/1/0		0.45	0	1.0	100	0.24	1.00	0.45	0.26
2/15/0		0.45	0	1.0	100	0.24	1.00	0.45	0.30
3/1/0		0.45	0	1.0	100	0.24	1.00	0.45	0.35
3/16/0		0.45	0	1.0	100	0.24	1.00	0.45	0.42
4/1/0		0.45	0	1.0	100	0.24	1.00	0.45	0.48
4/16/0		0.45	0	1.0	100	0.24	1.00	0.45	0.60
5/1/0		0.45	0	1.0	100	0.24	1.00	0.45	0.86
5/16/0		0.45	0	1.0	100	0.24	1.00	0.45	1.4
6/1/0		0.45	0	1.0	100	0.24	1.00	0.45	3.8
6/16/0		0.45	0	1.0	100	0.24	1.00	0.45	6.3
7/1/0		0.45	0	1.0	100	0.24	1.00	0.45	13
7/16/0		0.45	0	1.0	100	0.24	1.00	0.45	15
8/1/0		0.45	0	1.0	100	0.24	1.00	0.45	14
8/16/0		0.45	0	1.0	100	0.24	1.00	0.45	15
9/1/0		0.45	0	1.0	100	0.24	1.00	0.45	10
9/16/0		0.45	0	1.0	100	0.24	1.00	0.45	7.4
10/1/0		0.45	0	1.0	100	0.24	1.00	0.45	3.8
10/16/0		0.45	0	1.0	100	0.24	1.00	0.45	2.6
11/1/0		0.45	0	1.0	100	0.24	1.00	0.45	1.1
11/16/0		0.45	0	1.0	100	0.24	1.00	0.45	0.98
12/1/0		0.45	0	1.0	100	0.24	1.00	0.45	0.91
12/16/0		0.45	0	1.0	100	0.24	1.00	0.45	0.81

Period Start Date, m/d/y	*Operation Name*	*Man soil loss rate, t/ac*	*Man sed del. rate*	*EI, %*
1/1/0	default	0	0	0.14
1/16/0		0.0014	0.0014	0.19
2/1/0		0.0028	0.0028	0.26
2/15/0		0	0	0.30
3/1/0		0.0031	0.0031	0.35
3/16/0		0.0040	0.0040	0.42
4/1/0		0	0	0.48
4/16/0		0.0057	0.0057	0.60
5/1/0		0	0	0.86
5/16/0		0.0095	0.0095	1.4
6/1/0		0.039	0.039	3.8
6/16/0		0	0	6.3
7/1/0		0.12	0.12	13
7/16/0		0.16	0.16	15
8/1/0		0	0	14
8/16/0		0.18	0.18	15
9/1/0		0	0	10
9/16/0		0.10	0.10	7.4
10/1/0		0.033	0.033	3.8
10/16/0		0	0	2.6
11/1/0		0.014	0.014	1.1
11/16/0		0.0095	0.0095	0.98
12/1/0		0	0	0.91
12/16/0		0.0076	0.0076	0.81

4i. Comment 18 – Appendix L, Attachment 3

RUSLE2 Expanded Profile Erosion Calculation Record

Info: Ft. Bliss Permit Modification 2022
Final Conditions
1st Segment of 1,500' Soil Loss Estimation Slope

File: profiles\Ft Bliss MSWLF Final Cover

Inputs:
Location: USA\Texas\El Paso County
Soil: Generic Soils\loamy sand
T value: 3.0 t/ac/yr
Slope length (horiz): 1000 ft
Avg. slope steepness: 2.60 %

R Factor	*Annual precip*	*10-yr 24-hr rainfall*	*In Req area?*
39	9.56	2.8	No

Management	*Vegetation*	*Yield units*	*# yield units, #/ac*
managements\CMZ 23\d.Construction Site Templates\Construction site	vegetations\Grama, yr 1	lbs	300
managements\Strip/Barrier Managements\Straw bale barrier	vegetations\Permanent cover not harvested\straw bale barrier	pounds	50.0

Contouring: a. rows up-and-down hill
Strips/barriers: Straw bale barriers\1 Straw bale barrier at end of slope
Diversion/terrace, sediment basin: (none)
Subsurface drainage: (none)
Adjust res. burial level: Normal res. burial

Outputs:

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
2/15/0	Bulldozer, clearing/cutting		0
3/15/0	Bulldozer, filling/leveling		0
8/15/0	Disk, tandem light finishing		0
9/1/0	Drill or airseeder, double disk	Grama, yr 1	0
9/2/0	Add mulch		69

9/3/0	Mulch crimper		68
1/1/1	Begin growth	Permanent cover not harvested\straw bale barrier	0

T value: 3.0 t/ac/yr
Soil loss erod. portion: 2.13 t/ac/yr
Detachment on slope: 2.13 t/ac/yr
Soil loss for cons. plan: 2.12 t/ac/yr
Sediment delivery: 0.0836 t/ac/yr

Crit. slope length: 1000 ft
Surf. cover after planting: 0 %

Soil conditioning index (SCI): -0.081
Avg. annual slope STIR: 48.7
Wind & irrigation-induced erosion for SCI: 0 t/ac/yr

The SCI is the Soil Conditioning Index rating. If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system. If the index is a positive value, soil organic matter levels are predicted to increase under that system.

The STIR value is the Soil Tillage Intensity Rating. It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation. STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.

Period Start Date	*Operation*	*PLU*	*Avg. surf. cover, %*	*Avg. SC subfactor*	*Avg. CC subfactor*	*Avg. roughness, in.*	*Avg. SR subfactor*	*Avg. C factor*	*EI, %*
2/15/0	Bulldozer, clearing/cutting	1.00	0	1.0	1.0	0.32	0.95	0.95	0.30
3/1/0		1.00	0	1.0	1.0	0.31	0.95	0.95	0.33
3/15/0	Bulldozer, filling/leveling	1.0	0	1.0	1.0	0.24	1.00	1.00	0.024
3/16/0		1.00	0	1.0	1.0	0.24	1.00	1.00	0.42
4/1/0		1.00	0	1.0	1.0	0.24	1.00	1.00	0.48
4/16/0		1.00	0	1.0	1.0	0.24	1.00	0.99	0.60
5/1/0		0.99	0	1.0	1.0	0.24	1.00	0.99	0.86
5/16/0		0.99	0	1.0	1.0	0.24	1.00	0.99	1.4
6/1/0		0.99	0	1.0	1.0	0.24	1.00	0.98	3.8
6/16/0		0.98	0	1.0	1.0	0.24	1.00	0.98	6.3
7/1/0		0.98	0	1.0	1.0	0.24	1.00	0.98	13
7/16/0		0.98	0	1.0	1.0	0.24	1.00	0.97	15
8/1/0		0.97	0	1.0	1.0	0.24	1.00	0.97	13
8/15/0	Disk, tandem light finishing	1.0	0	1.0	1.0	0.27	0.98	0.98	0.97
8/16/0		1.00	0	1.0	1.0	0.27	0.98	0.98	15
9/1/0	Drill or airseeder, double disk => Grama, yr 1	1.00	0	1.0	1.0	0.26	0.98	0.98	0.76
9/2/0	Add mulch	1.00	69	0.16	1.00	0.26	0.98	0.16	0.75
9/3/0	Mulch crimper	0.98	67	0.17	1.00	0.26	0.99	0.16	8.7
9/16/0		0.93	66	0.17	0.98	0.26	0.99	0.15	7.4
10/1/0		0.88	65	0.17	0.96	0.26	0.99	0.15	3.8
10/16/0		0.84	64	0.18	0.95	0.26	0.99	0.14	2.6
11/1/0		0.82	64	0.18	0.94	0.26	0.99	0.13	1.1
11/16/0		0.82	64	0.18	0.93	0.26	0.99	0.13	0.98
12/1/0		0.81	64	0.18	0.94	0.25	0.99	0.14	0.91
12/16/0		0.81	63	0.18	0.95	0.25	0.99	0.14	0.81
1/1/1	Man #2: Begin growth => Permanent cover not harvested\straw bale barrier	0.81	63	0.18	0.95	0.25	0.99	0.14	0.14
1/16/1		0.81	63	0.18	0.96	0.25	0.99	0.14	0.19
2/1/1		0.80	63	0.18	0.96	0.25	0.99	0.14	0.26

Period Start Date, m/d/y	*Operation Name*	*Man soil loss rate, t/ac*	*Man sed del. rate*	*EI, %*
2/15/0	Bulldozer, clearing/cutting	0	0	0.30
3/1/0		0.016	0.016	0.33
3/15/0	Bulldozer, filling/leveling	0	0	0.024
3/16/0		0.019	0.019	0.42
4/1/0		0	0	0.48
4/16/0		0.026	0.026	0.60
5/1/0		0	0	0.86
5/16/0		0.043	0.043	1.4
6/1/0		0.17	0.17	3.8
6/16/0		0	0	6.3
7/1/0		0.48	0.48	13
7/16/0		0.62	0.62	15
8/1/0		0	0	13
8/15/0	Disk, tandem light finishing	0	0	0.97
8/16/0		0.70	0.70	15
9/1/0	Drill or airseeder, double disk => Grama, yr 1	0	0	0.76
9/2/0	Add mulch	0	0	0.75
9/3/0	Mulch crimper	0	0	8.7
9/16/0		0.043	0.043	7.4
10/1/0		0.012	0.012	3.8
10/16/0		0	0	2.6
11/1/0		0.0045	0.0045	1.1
11/16/0		0.0030	0.0030	0.98
12/1/0		0	0	0.91
12/16/0		0.0024	0.0024	0.81
1/1/1	Man #2: Begin growth => Permanent cover not harvested\straw bale barrier	0	0	0.14
1/16/1		0.00047	0.00047	0.19
2/1/1		0.00090	0.00090	0.26

USDA NRCS Natural Resources Conservation Service

RUSLE2 Expanded Profile Erosion Calculation Record

Info: Ft. Bliss Permit Modification 2022
Final Conditions
1st Segment of 1,500' Soil Loss Estimation Slope

File: profiles\Ft Bliss MSWLF Final Cover

Inputs:
Location: USA\Texas\El Paso County
Soil: Generic Soils\loamy sand
T value: 3.0 t/ac/yr
Slope length (horiz): 500 ft
Avg. slope steepness: 1.80 %

R Factor	*Annual precip*	*10-yr 24-hr rainfall*	*In Req area?*
39	9.56	2.8	No

Management	*Vegetation*	*Yield units*	*# yield units, #/ac*
managements\CMZ 23\d.Construction Site Templates\Construction site	vegetations\Grama, yr 1	lbs	300
managements\Strip/Barrier Managements\Straw bale barrier	vegetations\Permanent cover not harvested\straw bale barrier	pounds	50.0

Contouring: a. rows up-and-down hill
Strips/barriers: Straw bale barriers\1 Straw bale barrier at end of slope
Diversion/terrace, sediment basin: (none)
Subsurface drainage: (none)
Adjust res. burial level: Normal res. burial

Outputs:

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
2/15/0	Bulldozer, clearing/cutting		0
3/15/0	Bulldozer, filling/leveling		0
8/15/0	Disk, tandem light finishing		0
9/1/0	Drill or airseeder, double disk	Grama, yr 1	0
9/2/0	Add mulch		69

9/3/0	Mulch crimper		68
1/1/1	Begin growth	Permanent cover not harvested\straw bale barrier	0

T value: 3.0 t/ac/yr
Soil loss erod. portion: 1.03 t/ac/yr
Detachment on slope: 1.03 t/ac/yr
Soil loss for cons. plan: 1.02 t/ac/yr
Sediment delivery: 0.0247 t/ac/yr

Crit. slope length: 500 ft
Surf. cover after planting: 0 %

Soil conditioning index (SCI): 0.0060
Avg. annual slope STIR: 48.7
Wind & irrigation-induced erosion for SCI: 0 t/ac/yr

The SCI is the Soil Conditioning Index rating. If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system. If the index is a positive value, soil organic matter levels are predicted to increase under that system.

The STIR value is the Soil Tillage Intensity Rating. It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation. STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.

Period Start Date	*Operation*	*PLU*	*Avg. surf. cover, %*	*Avg. SC subfactor*	*Avg. CC subfactor*	*Avg. roughness, in.*	*Avg. SR subfactor*	*Avg. C factor*	*EI, %*
2/15/0	Bulldozer, clearing/cutting	1.00	0	1.0	1.0	0.32	0.95	0.95	0.30
3/1/0		1.00	0	1.0	1.0	0.31	0.95	0.95	0.33
3/15/0	Bulldozer, filling/leveling	1.0	0	1.0	1.0	0.24	1.00	1.00	0.024
3/16/0		1.00	0	1.0	1.0	0.24	1.00	1.00	0.42
4/1/0		1.00	0	1.0	1.0	0.24	1.00	1.00	0.48
4/16/0		1.00	0	1.0	1.0	0.24	1.00	0.99	0.60
5/1/0		0.99	0	1.0	1.0	0.24	1.00	0.99	0.86
5/16/0		0.99	0	1.0	1.0	0.24	1.00	0.99	1.4
6/1/0		0.99	0	1.0	1.0	0.24	1.00	0.98	3.8
6/16/0		0.98	0	1.0	1.0	0.24	1.00	0.98	6.3
7/1/0		0.98	0	1.0	1.0	0.24	1.00	0.98	13
7/16/0		0.98	0	1.0	1.0	0.24	1.00	0.97	15
8/1/0		0.97	0	1.0	1.0	0.24	1.00	0.97	13
8/15/0	Disk, tandem light finishing	1.0	0	1.0	1.0	0.27	0.98	0.98	0.97
8/16/0		1.00	0	1.0	1.0	0.27	0.98	0.98	15
9/1/0	Drill or airseeder, double disk => Grama, yr 1	1.00	0	1.0	1.0	0.26	0.98	0.98	0.76
9/2/0	Add mulch	1.00	69	0.16	1.00	0.26	0.98	0.15	0.75
9/3/0	Mulch crimper	0.98	67	0.17	1.00	0.26	0.99	0.16	8.7
9/16/0		0.93	66	0.17	0.98	0.26	0.99	0.15	7.4
10/1/0		0.88	65	0.17	0.96	0.26	0.99	0.15	3.8
10/16/0		0.84	64	0.18	0.95	0.26	0.99	0.14	2.6
11/1/0		0.82	64	0.18	0.94	0.26	0.99	0.14	1.1
11/16/0		0.82	64	0.18	0.93	0.26	0.99	0.14	0.98
12/1/0		0.81	64	0.18	0.94	0.25	0.99	0.14	0.91
12/16/0		0.81	63	0.18	0.95	0.25	0.99	0.14	0.81
1/1/1	Man #2: Begin growth => Permanent cover not harvested\straw bale barrier	0.81	63	0.18	0.95	0.25	0.99	0.14	0.14
1/16/1		0.81	63	0.18	0.96	0.25	0.99	0.14	0.19
2/1/1		0.80	63	0.18	0.96	0.25	0.99	0.14	0.26

Period Start Date, m/d/y	*Operation Name*	*Man soil loss rate, t/ac*	*Man sed del. rate*	*EI, %*
2/15/0	Bulldozer, clearing/cutting	0	0	0.30
3/1/0		0.0076	0.0076	0.33
3/15/0	Bulldozer, filling/leveling	0	0	0.024
3/16/0		0.0089	0.0089	0.42
4/1/0		0	0	0.48
4/16/0		0.012	0.012	0.60
5/1/0		0	0	0.86
5/16/0		0.020	0.020	1.4
6/1/0		0.082	0.082	3.8
6/16/0		0	0	6.3
7/1/0		0.23	0.23	13
7/16/0		0.30	0.30	15
8/1/0		0	0	13
8/15/0	Disk, tandem light finishing	0	0	0.97
8/16/0		0.33	0.33	15
9/1/0	Drill or airseeder, double disk => Grama, yr 1	0	0	0.76
9/2/0	Add mulch	0	0	0.75
9/3/0	Mulch crimper	0	0	8.7
9/16/0		0.024	0.024	7.4
10/1/0		0.0066	0.0066	3.8
10/16/0		0	0	2.6
11/1/0		0.0026	0.0026	1.1
11/16/0		0.0018	0.0018	0.98
12/1/0		0	0	0.91
12/16/0		0.0014	0.0014	0.81
1/1/1	Man #2: Begin growth => Permanent cover not harvested\straw bale barrier	0	0	0.14
1/16/1		0.00027	0.00027	0.19
2/1/1		0.00052	0.00052	0.26

4j. Comment 19 – Appendix L, Section 3.3.1, Pg. 3-7

Soil Loss Calculations

S E2 was exercised to compute the soil loss analysis for the final cover surfaces. The 1,000 foot segment now has an average slope of 2.6 , which was calculated using the following flow segments 270 feet at 5.0 280 feet at 1.7 20 feet at 25 and 430 feet at 1.6 . The 500 foot segment has an average slope of 1.8 . The input data for management operations have been selected to include vegetative cover and rip-rap surface treatment on embankments added. The results show soil losses of 3.16 tons/acre/year without surface erosion measures in place. The soil losses were reduced to 0.11 tons/acre/year with the use of erosion control measures to meet the permissible soil loss rates. The soil loss analysis demonstrates that the landfill surfaces with proposed erosion and sedimentation controls can achieve recommended soil loss rate. According to *ui anc o ssin osional Sta ilit u in all as s o Lan ill ation* 30 TAC 330.63 c , 330.305 c , d and e , 02/14/07, the soil erosion loss of 50 tons/acre/year is a permissible soil erosion loss rate and 2 to 3 tons/acre/year is a recommended rate for final cover phase .

Erosion calculations report is included in Attachment 3. Based on velocity and soil erosion analyses, selections of BMPs are identified and general installation guidance is provided in Appendix B Design Drawings of the permit modification.

3.3.2. Soil Surface Stabilization – Permanent Measures

The selected BMPs that will be implemented for final cover and post closure landfill operations, to meet the soil stabilization and stormwater control re uirements, are ones that are proven and commonly used as described below.

egetation - egetative cover reduces erosion potential by shielding the soil surface from the direct erosive impact of raindrops, improving the soil s water storage porosity and capacity, so more water can infiltrate, slowing the runoff and allowing the sediment to drop out, and physically holding the soil in place with plant roots. egetative cover will consist of a balanced mixture of native herbaceous and vascular plants. Appendix E of the Final Cover Design report prepared by [redacted], C provides a recommended seed mix for vegetation establishment that utilizes indigenous species of the area such as red threeawn and mesa dropseed. This type of vegetation is more suitable for the area and was selected in accordance with rules and regulations published in the Federal Seed Act and Texas Seed aw. The standard seeding specification published by the Texas Department of Transportation TxD T is provided in Attachment 4.

ocalized erosion control protection such as rip-rap surface treatment, ECP, and gabion mattresses will be installed as determined by Fort Bliss at the time of closure.

Soil Loss Calculations

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ocalized erosion control protection such as rip-rap surface treatment, ECP, and gabion mattresses will be installed as determined by Fort Bliss at the time of closure.

Soil Loss Calculations

S E2 was exercised to compute the soil loss analysis for the final cover surfaces. The 1,000 foot segment now has an average slope of 2.6 , which was calculated using the following flow segments 270 feet at 5.0~~3.5~~ 280 feet at 1.7 20 feet at 25 and 430 feet at 1.6 . The 500 foot segment has an average slope of 1.8 . The input data for management operations have been ~~changed~~selected to include vegetative cover and rip-rap surface treatment on embankments added~~, etc.~~. The results show soil losses of 3.16 tons/acre/year without surface erosion measures in place. The soil losses were reduced to 0.~~08~~ 11 tons/acre/year with the use of erosion control measures to meet the permissible soil loss rates. The soil loss analysis demonstrates that the landfill surfaces with proposed erosion and sedimentation controls can achieve recommended soil loss rate. According to *ui anc o ssin osional Sta ilit u in all as s o Lan ill ation* 30 TAC 330.63 c , 330.305 c , d and e , 02/14/07, the soil erosion loss of 50 tons/acre/year is a permissible soil erosion loss rate and 2 to 3 tons/acre/year is a recommended rate for final cover phase .

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ocalized erosion control protection such as rip-rap surface treatment, ECP, and gabion mattresses will be installed as determined by Fort Bliss at the time of closure.

4k. Comment 20 – Appendix L, Section 2.1, Pg. 2-2

to confirm that the existing drainage patterns for the landfill will not be adversely affected because of these modifications.

2.1. Runoff Volume

The volume of runoff from the landfill cover is dependent on the anticipated amount of precipitation and potential abstractions principally infiltration which depend on the soil type, vegetative cover, and the hydraulic conditions of the soil and proposed cover material.

Since approval of the 2014 Permit Modification the Texas Department of Transportation issued an update to the ational Method calculation for Peak unoff and runoff volume in 2019. AAH Atlas 14 rainfall data was reduced from 3.5 inches to 3.3 inches for the 25 year 24 hour event. The results compared to the 2014 Permit Modification provide a higher peak discharges with lower volumes. The differences are due to the updated methodology rather than impacts due to modifications to the final cover grades. Comparison of permissible outlet velocities compared to calculation velocities in Table 3-1 show that exit velocities are at or below permissible velocities.

The runoff volume from the landfill is calculated in accordance with 30 TAC 330.63 c 1 C and 330.305 a using the Curve umber C Method, also known as the Soil Conservation Service SCS unoff Curve umber Method method T -55

$$= \frac{\left(-0.2S\right)^2}{\left(+0.8S\right)}$$

here runoff inches over the watershed area

P precipitation for the 25-year/24-hour storm event inches

S 1000/C 10 potential maximum retention after runoff begins inches

C SCS curve number Table 2-2, Chapter 2, T -55

The following assumptions were used to obtain the values above

P 3.3 inches AA ational eather Service, AA Atlas 14 olume 11, ersion 2 atitude 31.8811 ongitude -106.3928

C 82 weighted average 106.3 acres of C 81 from Table 2.2d, fair herbaceous cover Hydrologic Soil Type C and 3.2 acres of C 85 from Table 2.2a, ravel access roads Hydrologic Soil Type B

Therefore, the total runoff volume for the landfill during a 25-year, 24-hour storm event is

S 1000/82 10 2.2

3.3 0.2 2.2 ^{2} / 3.5 0.8 2.2 1.62 inches

unoff olume A 1.62 inches 109.5 acres /12 14.7 acre-feet ac-ft .

to confirm that the existing drainage patterns for the landfill will not be adversely affected because of these modifications.

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S 1000/82 10 2.2

3.3 0.2 2.2 ^{2} / 3.5 0.8 2.2 1.62 inches

unoff olume A 1.62 inches 109.5 acres /12 14.7 acre-feet ac-ft .

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Therefore, the total runoff volume for the landfill during a 25-year, 24-hour storm event is

S 1000/82 10 2.2

3.3 0.2 2.2 ^{2} / 3.5 0.8 2.2 1.62 inches

unoff olume A 1.62 inches 109.5 acres /12 14.7 acre-feet ac-ft .

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4m. Comment 22_Appendix O, Section 3.0, Pg. 3-2

A volume analysis was completed with data from the for waste material outside of the permitted cell limits. The results of the volume analysis are as follows

- Perimeter mixed waste material volume estimate 14,932 cubic yards

Sixteen concrete and debris piles consisting of fencing, wiring, masonry piles, demolished concrete and large concrete pieces with rebar, were also identified during the . The estimated volumes of these piles are as follows

- 6 concrete piles volume estimate 20.3 cubic yards
- 10 debris piles volume estimate 2,157 cubic yards

An analysis of available airspace in the Subtitle D Cell was completed using the latest available topographic data based on a survey that was conducted in une of 2018 to document site topographic conditions after work was ceased. The results of the airspace analysis are as follows

- Subtitle D Cell available airspace volume estimate 17,986 cubic yards.
- C&D Cell available airspace volume estimate. 17,310 cubic yards.

As part of closure, the above volumes of materials will be handled as follows

- To the extent practical, waste containing material located outside of the permitted cell limits will be relocated to Subtitle D Cell.
- Concrete Piles will have rebar removed and will either be relocated to the C&D cell or the Subtitle D Cell. arge concrete pieces will be transported offsite and recycled at a concrete recycling facility.
- Debris piles will either be relocated to the C&D cell and the Subtitle D Cell, or they will be transported to and disposed at an off-site permitted MS facility authorized to receive the waste.

f the Subtitle D Cell reaches the design top of waste elevation limits, filling will stop. f there is still waste containing material remaining on the perimeter, the contingency plan is that this waste will be taken off-site for disposal at a permitted MS facility authorized to receive the waste. The Subtitle D Cell design parameters for maximum elevation are not changed in this revision.

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- Concrete Piles will have rebar removed and will either be relocated to the C&D cell or the Subtitle D Cell. arge concrete pieces will be transported offsite and recycled at a concrete recycling facility.
- Debris piles will either be relocated to the C&D cell and the Subtitle D Cell, or they will be transported to and disposed at an off-site permitted MS facility authorized to receive the waste.

f the Subtitle D Cell reaches the design top of waste elevation limits, filling will stop. f there is still waste containing material remaining on the perimeter, the contingency plan is that this waste will be taken off-site for disposal at a permitted MS facility authorized to receive the waste. The Subtitle D Cell design parameters for maximum elevation are not changed in this revision.

A volume analysis was completed with data from the for waste material outside of the permitted cell limits. The results of the volume analysis are as follows

- Perimeter mixed waste material volume estimate 14,932 cubic yards

Sixteen concrete and debris piles consisting of fencing, wiring, masonry piles, demolished concrete and large concrete pieces with rebar, were also identified during the . The estimated volumes of these piles are as follows

- 6 concrete piles volume estimate 20.3 cubic yards
- 10 debris piles volume estimate 2,157 cubic yards

An analysis of available airspace in the Subtitle D Cell was completed using the latest available topographic data based on a survey that was conducted in une of 2018 to document site topographic conditions after work was ceased. The results of the airspace analysis are as follows

- Subtitle D Cell available airspace volume estimate 17,986 cubic yards.
- C&D Cell available airspace volume estimate. 17,310 cubic yards.

As part of closure, the above volumes of materials will be handled as follows

- To the extent practical, waste containing material located outside of the permitted cell limits will be relocated to Subtitle D Cell.
- Concrete Piles will have rebar removed and will either be relocated to the C&D cell ~~and~~or the Subtitle D Cell. arge concrete pieces will be ~~that are will be transferred off site will be~~ transported offsite ~~to~~ and recycled at a~~n off site~~ concrete recycling facility.
- Debris piles will either be relocated to the C&D cell and the Subtitle D Cell, or they will be transported to and disposed at an off-site permitted MS facility authorized to receive the waste.

f the Subtitle D Cell reaches the design top of waste elevation limits, filling will stop. f there is still waste containing material remaining on the perimeter, the contingency plan is that this waste will be taken off-site for disposal at a permitted MS facility authorized to receive the waste. The Subtitle D Cell design parameters for maximum elevation are not changed in this revision.

4n. Comment 23 – Appendix O, Section 4.5, Pg. 4-3

meet the requirements of the intermediate cover component of the optimized ET cover system.

4.4. Non-Subtitle D Area (Type I)

The closure of the Non-Subtitle D Type I cell was approved by TCEQ on February 24, 1999. However, general fill materials will be installed over top of the approved final cover for this area to allow for a smoother transition of grading between adjacent cells and to provide necessary drainage.

4.5. Subtitle D Area (Type I)

The final cover for the Type I Subtitle D area will be the ET final cover system as described in Section 4.1. Final closure grades will be generally consistent with the March 2009 MOD grades and with the final closure grades proposed in Sheets C-2 and C-3 in Appendix B of the permit, once approved, and will form a landfill plateau with minimum 2% top slopes and maximum 25% side slopes.

4.6. Non-Subtitle D Area (Type IV)

The final cover for the Type IV Non-Subtitle D area will be the optimized ET final cover system as described in Section 4.1. The final grading of the Non-Subtitle D cell will create a uniform pyramidal shape with a minimum of a 5 percent slope to account for estimated future settlement in this disposal area

meet the requirements of the intermediate cover component of the optimized ET cover system.

4.4. Non-Subtitle D Area (Type I)

The closure of the Non-Subtitle D Type I cell was approved by TCEQ on February 24, 1999. However, general fill materials will be installed over top of the approved final cover for this area to allow for a smoother transition of grading between adjacent cells and to provide necessary drainage.

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The final cover for the Type IV Non-Subtitle D area will be the optimized ET final cover system as described in Section 4.1. The final grading of the Non-Subtitle D cell will create a uniform pyramidal shape with a minimum of a 5 percent slope to account for estimated future settlement in this disposal area

meet the requirements of the intermediate cover component of the optimized ET cover system.

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4.6. Non-Subtitle D Area (Type IV)

The final cover for the Type IV Non-Subtitle D area will be the optimized ET final cover system as described in Section 4.1. The final grading of the Non-Subtitle D cell will create a uniform pyramidal shape with a minimum of a 5 percent slope to account for estimated future settlement in this disposal area

4o. Comment 24 – Appendix O, Section 5.2.3.4, Pg. 5-6

be tilled to a minimum depth of 12-inches, and re-compacted with appropriate energy to meet the pro ect re uirements. Surveying and grade stakes will be used to verify the final grades of the bottom lift.

5.2.3.4. Field QA Testing

To ensure performance of the constructed optimized ET cover is similar to that modeled during design, the material for the bottom lift will be sampled and tested at the minimum fre uencies presented below prior to and during construction

- Soil Classification testing ASTM D2487 - Minimum fre uency of 1 test per 10,000 C of material for existing intermediate cover material and/or stockpiled material.
- Standard Proctor moisture/density testing ASTM D698 Minimum fre uency of 1 test per soil type per lift of existing intermediate cover material or 1 test per soil type of stockpiled material.
- Sieve and hydrometer analysis testing ASTM D6913 - Minimum fre uency 1 test per soil type per lift of existing intermediate cover material or 1 test per soil type stockpiled material. Soils shall be classified as SM, SC, or any combination thereof to be considered acceptable for use in the final optimized ET cover system.
- Saturated hydraulic parameter testing ASTM D5084 or EM 1110-2-1906 Appendix - Minimum fre uency of 1 test per 6 acres of existing intermediate cover material or 1 test per 10,000 C stockpiled material. Saturated hydraulic conductivity shall be less than or e ual to 2.4x10E-4 cm/sec to be considered acceptable for use in the optimized ET cover system.
- Field density and moisture content testing ASTM D6938 Minimum fre uency of 1 test per 10,000 SF for existing intermediate cover material and/or stockpile material installed.
- Thickness erification instrument survey methods Minimum fre uency of 1 survey shot per 10,000 SF performed on a 100-foot grid and at all grade breaks.

5.2.4. Optimized ET Cover – Second Lift

5.2.4.1. Material Specification

The optimized ET cover second lift will be installed over the first lift as approved by the Engineer of ecord and will consist of a minimum of 12-inches of stockpiled SM/SC material compacted to a minimum of 85 and not to exceed a maximum of 90 of the Standard Proctor maximum dry density at a moisture content less than optimum. This material may be excess intermediate cover soil material that has been removed and

be tilled to a minimum depth of 12-inches, and re-compacted with appropriate energy to meet the pro ect re uirements. Surveying and grade stakes will be used to verify the final grades of the bottom lift.

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4p. Comment 25 – Appendix O, Section 5.2.5.3, Pg. 5-8

not to exceed a maximum of 90 of the Standard Proctor maximum dry density at a moisture content less than optimum. The soil will be inspected as placed to be free of vegetation, roots, debris, and rocks greater than 2-inches in diameter. here possible, stockpiled SM/SC material visually observed to contain a higher organic content will be reserved for use in the top lift or surface layer.

5.2.5.2. Constr ction e irements

The surface layer top lift will be placed as a single lift to achieve a minimum compacted thickness of 12-inches and compacted to a minimum of 85 and not to exceed a maximum of 90 of the Standard Proctor maximum dry density at a moisture content less than the optimum moisture content. ver-compacted material will be tilled and re-compacted. Placement of surface layer material will not occur during rainfall events to prevent saturation and overcompaction. Surveying will be performed to verify the thickness and final grades of the surface layer.

The top 4-inches of the surface layer will be tilled perpendicular to the slope of the surface in preparation for seeding in accordance with Section 5.3.

5.2.5.3. Field QA Testing

To ensure performance of the constructed optimized ET cap is similar to that modeled during design, the surface layer material will be sampled and tested at the minimum fre uencies presented below during construction

- Soil Classification testing ASTM D2487 - Minimum fre uency of 1 test per 10,000 C of stockpiled material.
- Standard Proctor moisture/density testing ASTM D698 Minimum fre uency of 1 test per soil type of stockpiled material installed.
- Sieve and hydrometer analysis testing ASTM 6913 - Minimum fre uency or 1 test per soil type stockpiled material. Soils shall be classified as SM, SC, or any combination thereof to be considered acceptable for use in the optimized ET cover system.
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- Sieve and hydrometer analysis testing ASTM 6913 - Minimum fre uency or 1 test per soil type stockpiled material. Soils shall be classified as SM, SC, or any combination thereof to be considered acceptable for use in the optimized ET cover system.
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- Field density and moisture content testing ASTM D6938 Minimum fre uency of 1 test per 10,000 SF stockpiled material installed.

4q. Comment 27 – Appendix O, Section 6.2, Pg. 6-1

6. Schedule for Closure Activities

The landfill closure schedule and other closure related activities shall follow the requirements of Title 30 TAC §330.457(f) and (g).

6.1. Closure Schedule

Title 30 TAC §330.457(e)(4)

An overall timetable for the closure of the Fort Bliss MSWLF is presented following this section. This schedule is based on the current BRAC realignment process at Fort Bliss and the regulatory closure requirements described in subsequent sections.

6.2. Final Contour Map

Title 30 TAC §330.457(e)(5)

A final contour map depicting the proposed final contours, top slopes, and side slopes, and proposed surface drainage features is provided as Sheets C-4 and C-5 in Appendix B of the permit. The MSWLF is not within a 100-year flood plain.

6.3. Location of Plan

Title 30 TAC §330.457(f)(1)

Fort Bliss DPW-ENV shall maintain a copy of the closure plan in the operating record.

6.4. Written Notification

Title 30 TAC §330.457(f)(2)

No later than 45 days prior to the initiation of closure activities for an MSW landfill unit, the owner or operator must provide written notification to the Executive Director of the intent to close the unit or facility and place this notice of intent in the operating record. Fort Bliss made this notification in a letter to the TCEQ dated November 22, 2017.

No later than 90 days prior to the initiation of a final facility closure, the owner or operator must, through a public notice in the newspaper(s) of largest circulation in the vicinity of the facility, provide public notice for final facility closure. This notice must provide the following information:

- Facility Name
- Facility Address

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The landfill closure schedule and other closure related activities shall follow the requirements of Title 30 TAC §330.457(f) and (g).

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An overall timetable for the closure of the Fort Bliss MSWLF is presented following this section. This schedule is based on the current BRAC realignment process at Fort Bliss and the regulatory closure requirements described in subsequent sections.

6.2. Final Contour Map

Title 30 TAC §330.457(e)(5)

A final contour map depicting the proposed final contours, top slopes, and side slopes, and proposed surface drainage features is provided as Sheets C-42 and C-53 in Appendix B of the permit ~~modification application~~. The MSWLF is not within a 100-year flood plain.

6.3. Location of Plan

Title 30 TAC §330.457(f)(1)

Fort Bliss DPW-ENV shall maintain a copy of the closure plan in the operating record.

6.4. Written Notification

Title 30 TAC §330.457(f)(2)

No later than 45 days prior to the initiation of closure activities for an MSW landfill unit, the owner or operator must provide written notification to the Executive Director of the intent to close the unit or facility and place this notice of intent in the operating record. Fort Bliss made this notification in a letter to the TCEQ dated November 22, 2017.

No later than 90 days prior to the initiation of a final facility closure, the owner or operator must, through a public notice in the newspaper(s) of largest circulation in the vicinity of the facility, provide public notice for final facility closure. This notice must provide the following information:

- Facility Name
- Facility Address

4r. Comments 28, 29_Appendix O, Section 6.6, Pg. 6-3

- the Closure Plan modification application as indicated. n the meantime, the permittee shall carry out all activities in accordance with the permit conditions. .

This revised Closure Plan is submitted as part of the modification application referenced in the une 3, 2019 TCE response letter to the second extension re uest. The estimated schedule for the remaining closure activities is as follows

- TCE approval of Closure Plan modification application ovember 2022
- overnment bidding and award of contract for Closure Construction Contractor ovember 2022 through third uarter 2023
- Completion of closure construction activities fourth uarter 2023 and first uarter 2024.

ithin 10 days of completion of the final closure activities, Fort Bliss shall submit to the Executive Director, via registered mail, the following

- A certified copy of an affidavit to the public in accordance with the re uirements of 330.19 and 330.457 g and place a copy of the affidavit in the operating record.
- Additionally, pursuant to 330.457 g and 330.461 c 1 , Fort Bliss will record a certified notation in the base master plan with the designation of the lands as having been used as a landfill facility and specifying that the use of the land is restricted in accordance with the provisions of 330.465. Fort Bliss will submit a certified copy of the modified base master plan to the Executive Director and place a copy in the operating record within 10 days of completion of the final closure activities.
- A certification signed by an independent, licensed professional engineer, verifying the facility closure has been completed in accordance with the approved closure plan, pursuant to 330.461 c 2 . The submittal to the Executive Director shall include all applicable documentation necessary for the certification of the final facility closure.

Following the completion of all closure activities, Fort Bliss shall comply with the post-closure care re uirements.

6.7. Certification

itle A (f)( )

Following final closure of the MS F unit or facility, the owner or operator shall submit to the Executive Director for review and approval a Final Cover System Evaluation eport FCSE , a egetation Establishment eport, signed by an independent licensed professional engineer, verifying that final closure has been completed in accordance with the approved final closure plan. The submittal to the Executive Director shall include all

- the Closure Plan modification application as indicated. n the meantime, the permittee shall carry out all activities in accordance with the permit conditions. .

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- A certification signed by an independent, licensed professional engineer, verifying the facility closure has been completed in accordance with the approved closure plan, pursuant to 330.461 c 2 . The submittal to the Executive Director shall include all applicable documentation necessary for the certification of the final facility closure.

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- A c~~C~~ertification signed by an independent, licensed professional engineer, verifying the facility closure has been completed in accordance with the approved closure plan, pursuant to 330.461 c 2 . The submittal to the Executive Director shall include all applicable documentation necessary for the certification of the final facility closure.
- ~~e uest for revocation of the facility permit or registration as applicable.~~

Following the completion of all closure activities, Fort Bliss shall comply with the post-closure care re uirements.

6.7. Certification

itle A (f)( )

Following final closure of the MS F unit or facility, the owner or operator shall submit to the Executive Director for review and approval a Final Cover System Evaluation eport

Attachment 5

Revised Application Pages Based on:
TCEQ Comments in Email Dated December 6, 2022

5a Comment 2_Appendix L, Section 3.2.2, Pg. 3-4

along the temporary soil berm is 3.0 ft/sec on the top dome and the flow velocity through the permanent swale along the top dome is 2.9 ft/sec. Thereafter, the velocity through the downchute is 7.9 ft/sec and the velocity through the swale off the landfill is 6.1 ft/sec as calculated in Section 3 and presented in Tables 2-4 through 2-6 and Attachment 1.

Drainage and conveyance structures were designed and sized to withstand erosive forces of water and not to exceed the permissible non-erodible velocities presented in Section 3. 2.2 and summarized in Table 3-1.

Table 3-1
Comparison of Calculated Flow Velocities and Permissible Non-Erodible Velocities

Type	Velocity	Permissible Non-Erodible Velocity
Temp. Soil Berm – Subtitle D Top Dome	3.0 ft/sec	3 ft/sec (silty-loam)
Swale – Subtitle D Top Dome	2.9 ft/sec	9 to12 ft/sec (RECP or Recycled Rip-Rap)
Downchute – Off Subtitle D Top Dome	7.9 ft/sec	18 ft/sec (Gabion Mattress)
Swale – Off Landfill	6.1 ft/sec	9 to12 ft/sec (RECP or Recycled Rip-Rap)

To further reduce flow velocities and allow sediments and other pollutants to settle, rock check dams will be installed along the drainage swales as shown on Sheets C-4 and C-5 in Appendix B (Design Drawings).

The hydraulic calculation supporting this design of the temporary soil berm is included in Attachment 2. The hydraulic calculation supporting the design of the permanent diversion drainage swales are included in Attachment 1.

Soil Loss Calculations

Soil erosion loss was estimated utilizing the Revised Universal Soil Loss Equation Version 2 (RUSLE2). RUSLE2 uses factors that represent the effects of climate (erosivity, precipitation, and temperature), soil erodibility, topography, cover management, and support practices to compute soil loss and erosion.

RUSLE2 is a mathematical model that uses a system of equations implemented in a computer program to estimate erosion rates. The other major component of RUSLE2 is a database containing an extensive array of site/county specific values (precipitation, R, EL, etc.) that are used by the RUSLE2 user to describe a site-specific condition so RUSLE2 can compute erosion values that directly reflect conditions at a particular site. The RUSLE2 computer program and its extensive database information were developed by the USDA-Agricultural Research Service (ARS), USDA-Natural Resources Conservation Service

along the temporary soil berm is 3.0 ft/sec on the top dome and the flow velocity through the permanent swale along the top dome is 2.9 ft/sec. Thereafter, the velocity through the downchute is 7.9 ft/sec and the velocity through the swale off the landfill is 6.1 ft/sec as calculated in Section 3 and presented in Tables 2-4 through 2-6 and Attachment 1.

Drainage and conveyance structures were designed and sized to withstand erosive forces of water and not to exceed the permissible non-erodible velocities presented in Section 3. 2.2 and summarized in Table 3-1.

Table 3-1
Comparison of Calculated Flow Velocities and Permissible Non-Erodible Velocities

Type	Velocity	Permissible Non-Erodible Velocity
Temp. Soil Berm – Subtitle D Top Dome	3.0 ft/sec	3 ft/sec (silty-loam)
Swale – Subtitle D Top Dome	2.9 ft/sec	9 to12 ft/sec (RECP or Recycled Rip-Rap)
Downchute – Off Subtitle D Top Dome	7.9 ft/sec	18 ft/sec (Gabion Mattress)
Swale – Off Landfill	6.1 ft/sec	9 to12 ft/sec (RECP or Recycled Rip-Rap)

To further reduce flow velocities and allow sediments and other pollutants to settle, rock check dams will be installed along the drainage swales as shown on Sheets C-4 and C-5 in Appendix B (Design Drawings).

The hydraulic calculation supporting this design of the temporary soil berm is included in Attachment 2. The hydraulic calculation supporting the design of the permanent diversion drainage swales are included in Attachment 1.

Soil Loss Calculations

Soil erosion loss was estimated utilizing the Revised Universal Soil Loss Equation Version 2 (RUSLE2). RUSLE2 uses factors that represent the effects of climate (erosivity, precipitation, and temperature), soil erodibility, topography, cover management, and support practices to compute soil loss and erosion.

RUSLE2 is a mathematical model that uses a system of equations implemented in a computer program to estimate erosion rates. The other major component of RUSLE2 is a database containing an extensive array of site/county specific values (precipitation, R, EL, etc.) that are used by the RUSLE2 user to describe a site-specific condition so RUSLE2 can compute erosion values that directly reflect conditions at a particular site. The RUSLE2 computer program and its extensive database information were developed by the USDA-Agricultural Research Service (ARS), USDA-Natural Resources Conservation Service