

ENGINEERING REPORT

FOR

**ANNUAL CCR LANDFILL INSPECTION
40 CFR §257.84(b)**

**FAYETTE POWER PROJECT
COMBUSTION BY-PRODUCTS LANDFILL**

**PREPARED FOR
LCRA
FAYETTE POWER PROJECT**

**PREPARED BY
LCRA ENGINEERING SERVICES
January 13, 2020**



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1.0 BACKGROUND

This report is intended to ensure that the design, construction, operation and maintenance of the Fayette Power Project (FPP) Combustion By-products Landfill (CBL) is consistent with recognized and generally accepted good engineering standards in accordance with the Environmental Protection Agency's Coal Combustion Residual (CCR) rules under 40 CFR Part 257. More specifically this report meets the requirements of 40 CFR §257.84(b) Annual inspections by a qualified professional engineer.

As required by 40 CFR §257.84(b), this inspection report documents the annual inspection of the CBL, located at 6549 Power Plant Road, La Grange, Texas 78945. The CBL is registered by the Texas Commission on Environmental Quality (TCEQ) as an on-site nonhazardous industrial waste landfill (TCEQ Registration No. 31575) and as an on-site waste management unit (Notice of Waste Registration No. MU013) at the FPP.

The CBL and associated support facilities are located in the southwest portion of the FPP, south of the power plant and north of the Missouri-Kansas-Texas railroad line (Appendix A). LCRA deed recorded a 123-acre tract located within the FPP site for disposal of Class 2 nonhazardous industrial waste. To date, an approximately 30-acre area has been developed as Cell 1 and a 7.9 acre area has been developed as Sub-Cell 2D. In a 2013 Notification Revision to TCEQ, LCRA raised the maximum elevation of the CBL from approximately 430 feet above mean sea level (ft-amsl) to 470 ft-amsl and added Sub-Cell 2D. The support facilities for the CBL currently include the CBL Sub-Cell 2D Pond contained within Sub-Cell 2D which collects its contact water, the CBL Runoff Pond which collects the CBL Cell 1 contact water, the associated drainage channel that routes contact water from the CBL Cell 1 to the Runoff Pond, and two stormwater drainage channels that route clean non-contact stormwater off-site.

In accordance with 40 CFR §257.84(b)(3), the 2018 annual inspection was performed, document review was conducted, and this report has been prepared to document this work.

2.0 DOCUMENT REVIEW

Pertinent record documents reviewed as part of the development of past inspections reports were again reviewed for updates since the "ENGINEERING REPORT FOR ANNUAL CCR LANDFILL INSPECTION 40 CFR §257.84(b), FAYETTE POWER PROJECT COMBUSTION BY-PRODUCTS LANDFILL" (2018 Report) was issued on January 14, 2019. This review was intended to capture any revisions or updates to the previously reviewed record documents and addition of new record documents related to design, construction, operation, and maintenance of the CBL. In addition to the 2018 Report there was one (1) new document produced in 2019 that has been posted to the Publicly Accessible Internet Site as required by 40 Code of Federal Regulations § 257.107. As follows:

1. "Annual Coal Combustion Residuals (CCR) Fugitive Dust Control Report – 2019" dated November 14, 2019, by Waste Management National Services, in compliance with 40 CFR §257.80(c).

All documents reviewed were found to ensure adherence to recognized and generally accepted good engineering standards.

The weekly inspections were performed for this facility in calendar year 2019 as required under 40 CFR §257.84(a). These weekly inspection reports for the period from January 1, 2019 through December 31, 2019 were reviewed.

Review of these documents did not result in findings indicating the CBL design, construction, operations or maintenance activities would result in potential structural weakness of the CBL as currently configured.

3.0 LANDFILL GEOMETRY & VOLUME

This is the fifth annual inspection report as required under 40 CFR §257.84(b)(2) with the 2015 report serving as a baseline for changes in geometry of the structure and approximate CCR volume.

An aerial survey was conducted on December 27, 2019 and did not show a change in the landfill impounding structure geometry from the October 17, 2018 survey. This was also confirmed during the field inspection. An approximate layout of the impounding structures is included in Appendix B.

Per 40 CFR §257.84(b)(2)(ii), the CCR volume as documented by monthly impoundment information provided by the material marketer is approximately 1,277,462 cubic yards.

4.0 INSPECTION OF IMPOUNDING STRUCTURES

Inspection of the Fayette Power Project's Combustion By-products Landfill was conducted by Mr. Nathan M. Gullo, P.E. and Mr. Samuel C. Brown, P.E. on the morning of November 7, 2019 beginning at 08:30 and concluding at 10:00 hours. The weather was generally cloudy with temperatures in the mid 60's during the inspection with light rain developing near the end of the inspection. The CBL location had received precipitation amounts of 3.47 inches over the previous 30 days and 37.11 inches since the 2018 inspection. Precipitation data was provided from the LCRA Hydromet rain gauge number 563400 located at the FPP site.

4.1 LANDFILL CELL 1 WESTERN EMBANKMENT SLOPE

Clay Embankment w/ 1 ft. Vertical to 3 ft. Horizontal slope

Approximate Length: 350 ft.

Approximate Max Impoundment Height: 20 ft. @ 410 ft-amsl

General Condition: Good Fair Poor

Problems Noted: None Poor Grass Cover Trees or Brush Animal Burrows or Damage

Standing Water/Ponding Wet Areas Erosion Depressions Rutting Cracks

Bulges Misalignment Sinkhole Other: _____

Comments:

(1) Overall, grass cover was in good condition with full coverage which had been mowed directly prior to the time of inspection with an approximate height of 3-inches. There were no visual signs of active animal activity or past history of such. The slopes are visually in alignment with the 3:1 design and no visual evidence of structural issues was observed.

(2) The active leak at the water meter located at the beginning of the western embankment on the inside of the CBL observed during the prior inspection period was repaired and no standing water or evidence of ground saturation was present.

4.2 LANDFILL NORTHERN EMBANKMENT SLOPE

Clay Embankment w/ 1 ft. Vertical to 3 ft. Horizontal slope

Approximate Length: 1,300 ft.

Approximate Max Impoundment Height: 35 ft. @ 420 ft-amsl

General Condition: Good Fair Poor

Problems Noted: None Poor Grass Cover Trees or Brush Animal Burrows or Damage

Standing Water/Ponding Wet Areas Erosion Depressions Rutting Cracks

Bulges Misalignment Sinkhole Other: _____

Comments:

(1) Overall, grass cover was in good condition with good coverage which had also been recently mowed with an approximate height of 3-inches. There were no visual signs of active animal activity or past history of such. The slopes are visually in alignment with the 3:1 design and no visual evidence of structural issues was observed.

4.3 LANDFILL CELL 1 EASTERN EMBANKMENT SLOPE

Clay Embankment w/ 1 ft. Vertical to 3 ft. Horizontal slope

Approximate Length: 550 ft.

Approximate Max Impoundment Height: 30 ft. @ 420 ft-amsl

General Condition: Good Fair Poor

Problems Noted: None Poor Grass Cover Trees or Brush

Animal Burrows or Damage Standing Water/Ponding Wet Areas Erosion

Depressions Rutting Cracks Bulges Misalignment Sinkhole

Other: _____

Comments:

(1) Overall grass cover was in good condition at the time of inspection with an approximate height of 3-inches and very good cover. There were no visual signs of active animal activity or past history of such. The slopes are visually in alignment with the 3:1 design and no visual evidence of structural issues was observed.

4.4 CELL 1 TOP TEMPORARY CAP

Clay Cap with Topsoil & Grass Vegetation

Approximate Length: 1,000 ft.

Approximate Width: 120 ft.

General Condition: Good Fair Poor

Problems Noted: None Poor Grass Cover Trees or Brush Animal Burrows or Damage
 Standing Water/Ponding Wet Areas Erosion Depressions Rutting Cracks
 Bulges Misalignment Sinkhole Other: _____

Comments:

(1) Overall grass cover was recently mowed and in good visual condition at the time of inspection with an approximate height of 3-inches and very good cover. No visible evidence of erosion or structural issues was observed.

4.5 VISIBLE LINERS

Clay & Synthetic Liners

General Condition: Good Fair Poor

Problems Noted: None Tears Damage Trees or Brush Animal Activity Erosion
 Depressions Rutting Cracks Bulges Other: Water Under HDPE Liner

Comments:

(1) The presence of water beneath the Sub-Cell 2D synthetic liner identified during the prior inspection period was noted in weekly inspection reports initiating January 2, 2019 persisting throughout the year. During the inspection period the pond design engineer, liner manufacturer and certified installer were consulted as recommended. The certified installer performed an assessment of the liner and located three defects in the liner. Six additional incisions were made in the synthetic liner by the certified installer to allow the trapped water above the clay liner to be pumped out. It was reported that not all of the trapped water was able to be removed. A sealed engineering project completion letter was submitted to the TCEQ Water Quality Assessment Team documenting efforts completed in September by the certified installer to repair the three liner defects and six incisions.

The synthetic liner was found during the annual inspection to have no visual defects, punctures, or signs of leakage. However, since (1) it was not possible to remove all of the water under the synthetic liner at the time of the repair (2) there is not an established method or baseline for measuring this water and (3) it has been a relatively short time since the repair, it was not possible to know if the amount of water had increased or decreased since the repair at the time of the inspection. At the time of this report LCRA was developing a monitoring plan to allow for a quantifiable means of determining if the trapped water beneath the HDPE liner and clay is changing in volume.

(2) Minor rutting on the Cell 1 pond north cut bank was identified during the annual inspection (See Photo No. 01). The rutting appeared to be caused by a track mounted equipment used to remove sediment buildup in the pond. No soil depressions were observed but a pair of slight vegetative discontinuities running parallel up the slope were visually apparent. The area should be mowed and reseeded during normal vegetative control operations to ensure full vegetative coverage is maintained.

4.6 RUN-ON/RUN-OFF FACILITIES

Open Channels, Culverts, CBL Pond & Sub-Cell 2D Pond

General Condition: Good Fair Poor

Problems Noted: None Poor Grass Cover Trees or Brush Animal Burrows or Damage

Excessive Sediment Buildup Blockage Erosion Depressions Rutting Cracks

Freeboard Exceeded Misalignment Sinkhole Other: _____

Comments:

(1) The weekly inspection report from February 6, 2019 notes that the heavy silting identified during the prior inspection period of the corrugated metal drainage culverts beneath the site access road and which convey contact runoff from Existing Cell 1 to the Existing Runoff Retention Pond was removed. The culvert was observed to be unblocked and free flowing during the annual inspection (See Photos Nos. 2 & 3).

(2) Tall grassy vegetative growth was identified in front of the inlets of the corrugated metal drainage culverts which convey non-contact runoff from the closed northern slope section beneath the Austin Loop plant road (See Photo No. 4). The tall grass should be trimmed during normal vegetative control activities to prevent blockage and maintain an unobstructed flow.

(3) Excessive sediment buildup was identified behind the rock berm filter located at the Sub-Cell 2D Contact Runoff Retention Pond (See Photo No. 5). Excessive sediment should be removed from behind the rock berm structure sufficient to maintain an unobstructed flow through the berm and prevent silt accumulation in the pond area.

5.0 CONCLUSIONS

The FPP CBL structure was in good condition at the time of this inspection and does not appear to have an actual or potential structural weakness nor any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CBL. The operation and maintenance of the landfill is currently contracted to a landfill manager believed to have good competency with a plan in place to meet the 40 CFR Part 257 requirements for operation of the facility consistent with recognized and generally acceptable good engineering standards.

The CBL is designed, constructed, operated, and maintained consistent with recognized and generally accepted good engineering standards.

6.0 RECOMMENDATIONS

The following recommendations are made based on the document review and the November 7, 2019 inspection:

6.1 OUTSTANDING RECOMMENDATIONS

- Item 2018-001, it was identified during the 2019 annual inspection that the active leak observed on the upstream side of the water meter located at the beginning of the western embankment on the inside of the CBL has been repaired. This item was noted as completed in the weekly inspection report dated February 27, 2019.

This item has been completed and will be removed from future reports.

- Item 2018-002, a Repair Certification Letter to TCEQ regarding the Sub-Cell 2D Contact Water Retention Pond dated September 3, 2019 notes that operations were undertaken to assess the condition of the pond's synthetic liner, remove water ponding beneath it, and perform repair to any defects discovered per regulatory, manufacturer, and industry standards by a certified installer. Completion of the repairs is noted in the weekly inspection report dated September 17, 2019.

This item has been completed and will be removed from future reports.

- Item 2018-003, it was identified during the 2019 inspection that the waste material identified accumulating in front of the corrugated metal drainage culverts which convey contact runoff from Existing Cell 1 to the Existing Runoff Retention Pond located near the intersection of Future Sub-Cell 2A, 2B and Existing Sub-Cell 2D has been removed.

This item has been completed and will be removed from future reports.

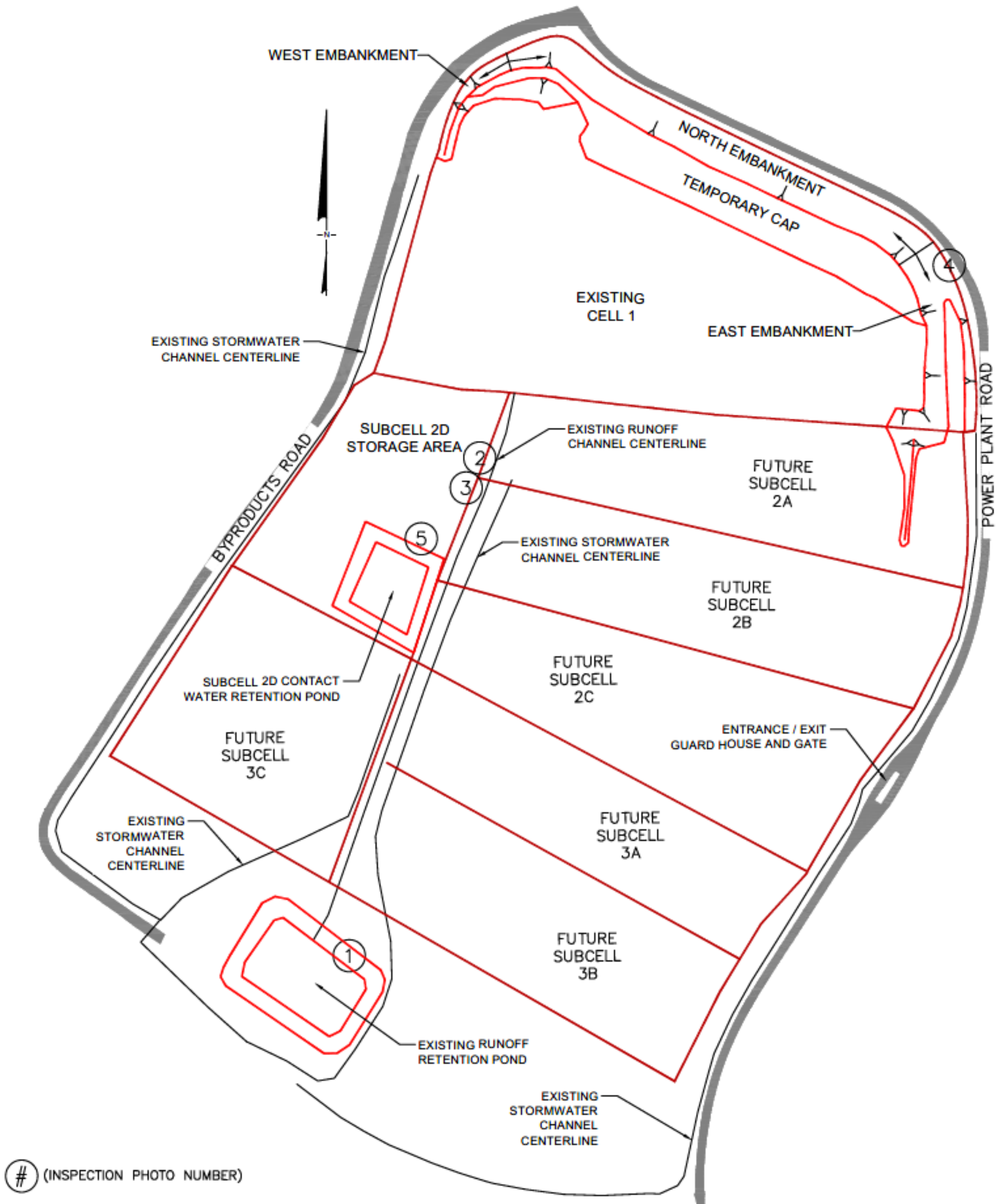
6.2 NEW RECOMMENDATIONS

- Item 2019-001, Develop and implement an inspection plan to determine if the amount of water under the synthetic liner is increasing or decreasing. If it is determined that the amount of water is increasing, implement measures to determine the best course of action to mitigate the issue.
- Item 2019-002, restore vegetative cover in the area of discontinuity identified during the annual inspection on the existing Cell 1 Contact Water Runoff retention Pond North cut bank. The area should be mowed and reseeded during normal vegetative control operations to ensure full vegetative coverage is maintained.
- Item 2019-003, tall grassy vegetation identified in front of the inlets of the corrugated metal drainage culverts which convey non-contact runoff from the closed northern slope section beneath the Austin Loop plant road should be trimmed during normal vegetative control measures to ensure an unobstructed flow is maintained.
- Item 2019-004, excessive sediment buildup identified behind the rock berm filter at the Sub-Cell 2D Contact Runoff Retention Pond should be removed from behind the rock berm structure sufficient to maintain an unobstructed flow and prevent silt accumulation in the pond area.

APPENDIX A
FPP COMBUSTION BY-PRODUCTS LANDFILL
LOCATION DRAWING

APPENDIX B
FPP COMBUSTION BY-PRODUCTS LANDFILL
INSPECTION DRAWING

FPP COMBUSTION BY-PRODUCTS LANDFILL INSPECTION DRAWING



APPENDIX C

INSPECTION PHOTOS



Parallel Tracks Identified on the North Bank of the Existing Runoff Retention Pond

PHOTO 1 – View of vegetative discontinuity identified on the Cell 1 Existing Runoff Retention Pond North cut bank (11-07-2019)



Unobstructed Flow of the Cell 1 Contact Runoff Culverts

PHOTO 2 – View of unblocked inlets for Cell 1 stormwater channel culverts looking South (11-07-2019)



PHOTO 3 – View of unblocked Cell 1 stormwater channel culvert outlets looking North (11-07-2019)



Tall grassy vegetation blocking culverts used to convey non-contact runoff beneath the Austin Loop plant road.

PHOTO 4 – View of grassy vegetation blocking culverts northeast of Cell 1 (11-7-2019)



PHOTO 5 – View of excessive sediment build-up behind rock berm filter (11-07-2019)