



August 6, 2019

RECEIVED

AUG 07 2019

Hillary Young
Chief Engineer
Land Protection Division
Oklahoma Department of Environmental Quality
707 North Robinson, P.O. Box 1677
Oklahoma City, Oklahoma 73101-1677

LAND PROTECTION DIVISION
DEPT. OF ENVIRON. QLTY

Re: Response to Notice of Deficiency
Land Treatment Unit (LTU) Post-Closure Sampling and Evaluation Work Plan
HollyFrontier Tulsa Refining LLC – Tulsa West Refinery
EPA ID OKD058078775

Dear Ms. Young:

HollyFrontier Tulsa Refining LLC (HFTR) has received the Oklahoma Department of Environmental Quality's (ODEQ's) Notice of Deficiency (NOD), dated June 21, 2019, concerning the Land Treatment Unit (LTU) Post-Closure Sampling and Evaluation Work Plan dated December 7, 2018. HFTR submitted this Work Plan to gain the ODEQ's approval to collect and analyze soil samples from the three land treatment units (LTUs) at the Tulsa West Refinery to determine if the post-closure care period could be terminated for these regulated units. The proposed sampling and analysis were to be performed to meet the requirements of 40 CFR 264.280(d), which provides a process for demonstrating that the post-closure care period can be reduced or ended, based on site conditions. If successful, the demonstration would allow the three LTUs to exit post-closure care for regulated units; however, because the LTUs are also solid waste management units (SWMUs), they would continue to be monitored and otherwise addressed as part of the Refinery's Resource Conservation and Recovery Act (RCRA) corrective action program.

The NOD noted uncertainties associated with future land use as well as issues with the historical sampling data (e.g., some missing sample location information). As a result, the ODEQ recommended changes to the size of the proposed decision units as well as the number of samples to be collected. The Work Plan proposed that each LTU be considered a single decision unit, and a total of 60 samples be collected from 30 locations at the three LTUs (two depths at each sample location: 11 at the West LTU, 10 at the Central LTU, and 9 at the East LTU). In the NOD, the ODEQ recommended one-acre decision units, with five point composite samples collected in each one-acre unit for both the Treatment Zone and Below Treatment Zone intervals.

HFTR is not prepared to implement the ODEQ's modified decision unit and soil sampling approach at this time. Because of the age of the historical sampling data, HFTR would prefer to implement its proposed sampling as an initial voluntary step in determining current site conditions before considering additional sampling. Also, HFTR does not want

Hillary Young
August 6, 2019
Page 2 of 2

to further delay the ODEQ's review of the RCRA Permit Renewal Application submitted in December 2018 pending consensus on this post-closure sampling.

Therefore, HFTR is notifying the ODEQ that it is withdrawing the request to remove the three LTUs from post-closure care and the associated LTU Post-Closure Sampling and Evaluation Work Plan. HFTR has revised the appropriate sections of the RCRA Permit Renewal Application that refer to this sampling and associated demonstration under 40 CFR 264.280(d), so that the ODEQ's review of the Application may proceed. The revised pages of the RCRA Permit Renewal Application are attached to this letter (both clean and redline versions of the revised pages).

In the meantime, HFTR intends to proceed with its proposed sampling of the LTUs, on a voluntary basis and at its own risk, to determine current site conditions within the LTUs. Once those data are available, HFTR would like to meet with the ODEQ to review the information and jointly determine the best path forward for evaluating post-closure care of the LTUs.

If you have any questions, or require additional information, please contact Arsin Sahba at (972) 689-8540 or Jennifer Sanchez at (918) 588-1167.

Respectfully;



Skipp Kistler
Vice President and Refinery Manager
HollyFrontier Tulsa Refining LLC

Attachments

ATTACHMENTS

Revised Pages to RCRA Permit Renewal Application

- **Section 1: Pages 1-5 and 1-6**
- **Table 1-1: Page 1**
- **Section 5: Pages 5-1 to 5-8**

**Includes “Clean” and “Redline” Versions
Revised Pages Dated August 6, 2019**

SECTION 1
Revised Pages 1-5 and 1-6

- Section 1 – Introduction
- Section 2 – Facility Security
- Section 3 – Inspection Plan
- Section 4 – Preparedness and Prevention
- Section 5 – Post-Closure Plan for Land Treatment Units
- Section 6 – Post-Closure and Corrective Action Cost Estimates and Financial Assurance
- Section 7 – Geology and Hydrology Report
- Section 8 – Groundwater Monitoring and LNAPL Management Plan
- Section 9 – Solid Waste Management Units

An updated Part A Application is provided as part of this Renewal Application submittal package, as is the required signature and certification by a principal corporate official regarding the method of preparation of this Renewal Application and the accuracy and completeness of its contents. There are no new documents or changes in this Renewal Application that require certification by a qualified professional engineer (PE) or professional geologist (PG).

1.1 Public Participation

Per OAC 252:4-7-53(8), this Renewal Application is classified as a Tier II application, thereby triggering the public notice requirements under Title 27A, Part 2-14-301, of the 2014 Oklahoma Statutes (27A OK Stat § 27A-2-14-301). Per OAC 252:4-7-13(a) and 27A OK Stat § 27A-2-14-301, HFTR must publish a notice in the local newspaper, containing the information specified in OAC 252:4-7-13(c) and identifying locations where the application may be reviewed, including the location in Tulsa County where the Refinery is located. In accordance with OAC 252:4-7-13(c), HFTR will provide the ODEQ with a draft notice for review prior to publication. Within 20 days of publication, HFTR will provide documentation to the ODEQ that the appropriate notifications were completed.

As directed by the ODEQ, HFTR will send written notice to the “interested parties” mailing list maintained by the ODEQ, the adjacent landowners, and to state and local authorities. The Refinery mailing list can be found in Appendix 1.1. The adjacent landowners list and maps can be found in Appendix 1.2. The adjacent landowners and Refinery mailing lists are current as of December 3, 2018. Since HFTR owns the property on which the Refinery is located, no landowner notice under OAC 252:4-7-13(b) is required. The applicable affidavit of property ownership is provided in Appendix 1.3.

At such time as the ODEQ deems the HFTR Renewal Application to be administratively and technically complete, HFTR will issue public notice of the draft renewed and modified Permits in compliance with 40 CFR Part 124 Subparts A and B, and 40 CFR Part 270.

1.2 References

ODEQ 2009. Resource Conservation and Recovery Act Post-Closure and Corrective Action Permit for a Closed Hazardous Waste Management Facility No. 058078775-PC. Oklahoma Department of Environmental Quality. June 1, 2009.

Caldwell Environmental Associates, Inc., Norman Oklahoma, June 1999. Certification of Closure for the Hazardous Waste Land Treatment Unit at Sunoco, Inc. (R&M) Tulsa Refinery.

FEMA, 2012. Flood Insurance Rate Map. Map number 40143C0220L. Panel 0220L.

- Section 1 – Introduction
- Section 2 – Facility Security
- Section 3 – Inspection Plan
- Section 4 – Preparedness and Prevention
- Section 5 – Post-Closure Plan for Land Treatment Units
- Section 6 – Post-Closure and Corrective Action Cost Estimates and Financial Assurance
- Section 7 – Geology and Hydrology Report
- Section 8 – Groundwater Monitoring and LNAPL Management Plan
- Section 9 – Solid Waste Management Units

~~In addition, HFTR plans to submit a work plan to the ODEQ to support a demonstration that the LTUs have completed their PCC period and PCC should be terminated. If this demonstration is successful, HFTR proposes to either modify this Renewal Application prior to issuance of the renewed permit or submit a Class 3 permit modification requesting termination of the PCC period for the LTUs, depending on the timing of the demonstration and its outcome.~~

An updated Part A Application is provided as part of this Renewal Application submittal package, as is the required signature and certification by a principal corporate official regarding the method of preparation of this Renewal Application and the accuracy and completeness of its contents. There are no new documents or changes in this Renewal Application that require certification by a qualified professional engineer (PE) or professional geologist (PG).

1.1 Public Participation

Per OAC 252:4-7-53(8), this Renewal Application is classified as a Tier II application, thereby triggering the public notice requirements under Title 27A, Part 2-14-301, of the 2014 Oklahoma Statutes (27A OK Stat § 27A-2-14-301). Per OAC 252:4-7-13(a) and 27A OK Stat § 27A-2-14-301, HFTR must publish a notice in the local newspaper, containing the information specified in OAC 252:4-7-13(c) and identifying locations where the application may be reviewed, including the location in Tulsa County where the Refinery is located. In accordance with OAC 252:4-7-13(c), HFTR will provide the ODEQ with a draft notice for review prior to publication. Within 20 days of publication, HFTR will provide documentation to the ODEQ that the appropriate notifications were completed.

As directed by the ODEQ, HFTR will send written notice to the “interested parties” mailing list maintained by the ODEQ, the adjacent landowners, and to state and local authorities. The Refinery mailing list can be found in Appendix 1.1. The adjacent landowners list and maps can be found in Appendix 1.2. The adjacent landowners and Refinery mailing lists are current as of December 3, 2018. Since HFTR owns the property on which the Refinery is located, no landowner

notice under OAC 252:4-7-13(b) is required. The applicable affidavit of property ownership is provided in Appendix 1.3.

At such time as the ODEQ deems the HFTR Renewal Application to be administratively and technically complete, HFTR will issue public notice of the draft renewed and modified Permits in compliance with 40 CFR Part 124 Subparts A and B, and 40 CFR Part 270.

1.2 References

ODEQ 2009. Resource Conservation and Recovery Act Post-Closure and Corrective Action Permit for a Closed Hazardous Waste Management Facility No. 058078775-PC. Oklahoma Department of Environmental Quality. June 1, 2009.

Caldwell Environmental Associates, Inc., Norman Oklahoma, June 1999. Certification of Closure for the Hazardous Waste Land Treatment Unit at Sunoco, Inc. (R&M) Tulsa Refinery.

FEMA, 2012. Flood Insurance Rate Map. Map number 40143C0220L. Panel 0220L.

TABLE 1-1
Revised Page 1

Table 1-1. Tabular Summary of Requested Modifications to the RCRA Post-Closure and Corrective Action Permit

Primary Reference	Change	Mod. Class	Mod. Class Applicable Regulatory Citation (40 CFR ¹)	Description and Justification the Modification Request
Section 1.3	Requesting reduction or termination of the Post-Closure Care (PCC) period for the LTUs.	3	40 CFR 270.42 Appendix I.E.3; Reduction in the post-closure care period.	HFTR has submitted an LTU work plan to the ODEQ to support a demonstration that the LTUs have completed their PCC period and PCC should be terminated per 40 CFR 264.117(a)(2)(i). HFTR understands that a decision regarding this request cannot be made until sampling and negotiations are complete. The federal regulations at 40 CFR 264.117(a)(2)(i) allow the Agency to shorten the PCC period for a closed HWMU if the reduced period is sufficient to protect human health and the environment.
Sections 3.1, 3.2, and 3.3; Appendices 3.1 and 3.2	Changing format and content of LTU, SWMU, and Arkansas River inspection forms.	1	40 CFR 270.42 Appendix I.A.1; Administrative and informational changes.	Changes reflect current inspection procedures and revised Arkansas river inspection requirements. Changes maintain compliance with regulatory requirements
Section 3.3	Changing frequency of inspections along the Arkansas River from every other week to weekly.	2	40 CFR 270.42 Appendix I.B.4; Changes in frequency or content of inspection schedules.	Changes reflect ODEQ requested revisions to Arkansas River inspections (ODEQ letter dated October 31, 2018)
Section 5.1	Request reduction of the post-closure care period to 10 years.	3	40 CFR 270.42 Appendix I.E.3; Reduction in the post-closure care period.	Proposing that the post-closure care period be set for the duration of the renewed Permit. The post-closure period will extend concurrent with the ten (10) year period of the renewed Permit and will be re-evaluated during preparation of the next Part B Permit Renewal Application. The federal regulations at 40 CFR 264.117(a)(2)(i) allow the Agency to shorten the PCC period for a closed HWMU if the reduced period is sufficient to protect human health and the environment.

¹ Federal hazardous waste regulations are incorporated into the Oklahoma State rules by Title 252, Chapter 205, Section 3-2 of the Oklahoma Administrative Code.

Table 1-1. Tabular Summary of Requested Modifications to the RCRA Post-Closure and Corrective Action Permit

Primary Reference	Change	Mod. Class	Mod. Class Applicable Regulatory Citation (40 CFR ¹)	Description and Justification the Modification Request
Section 1.3	Requesting reduction or termination of the Post-Closure Care (PCC) period for the LTUs.	3	40-CFR 270.42 Appendix I.E.3; Reduction in the post-closure care period.	HFTR has submitted an LTU work plan to the ODEQ to support a demonstration that the LTUs have completed their PCC period and PCC should be terminated per 40 CFR 264.117(a)(2)(i). HFTR understands that a decision regarding this request cannot be made until sampling and negotiations are complete. The federal regulations at 40 CFR 264.117(a)(2)(i) allow the Agency to shorten the PCC period for a closed HWMU if the reduced period is sufficient to protect human health and the environment.
Sections 3.1, 3.2, and 3.3; Appendices 3.1 and 3.2	Changing format and content of LTU, SWMU, and Arkansas River inspection forms.	1	40 CFR 270.42 Appendix I.A.1; Administrative and informational changes.	Changes reflect current inspection procedures and revised Arkansas river inspection requirements. Changes maintain compliance with regulatory requirements
Section 3.3	Changing frequency of inspections along the Arkansas River from every other week to weekly.	2	40 CFR 270.42 Appendix I.B.4; Changes in frequency or content of inspection schedules.	Changes reflect ODEQ requested revisions to Arkansas River inspections (ODEQ letter dated October 31, 2018)
Section 5.1	Request reduction of the post-closure care period to 10 years.	3	40 CFR 270.42 Appendix I.E.3; Reduction in the post-closure care period.	Proposing that the post-closure care period be set for the duration of the renewed Permit. The post-closure period will extend concurrent with the ten (10) year period of the renewed Permit and will be re-evaluated during preparation of the next Part B Permit Renewal Application unless there is a successful demonstration to cease PCC in that time. The federal regulations at 40 CFR 264.117(a)(2)(i) allow the Agency to shorten the PCC period for a closed HWMU if the reduced period is sufficient to protect human health and the environment.

¹ Federal hazardous waste regulations are incorporated into the Oklahoma State rules by Title 252, Chapter 205, Section 3-2 of the Oklahoma Administrative Code.

SECTION 5
Revised Pages 5-1 to 5-8

5 POST-CLOSURE PLAN FOR LAND TREATMENT UNITS

The HollyFrontier Tulsa Refining LLC (HFTR) Tulsa West Refinery (the Refinery) historically operated three Resource Conservation and Recovery Act (RCRA)-permitted Land Treatment Units (LTUs) for management of hazardous and non-hazardous waste—the East LTU, the Central LTU, and the West LTU. All three LTUs were closed per Title 40 Part 264 Subpart G of the Code of Federal Regulations (40 CFR 264 Subpart G) and are currently in the post-closure care (PCC) period. The closed LTUs are also classified as a solid waste management unit (SMWU [SWMU 16]) in the Refinery's Corrective Action Program (CAP).

In accordance with 40 CFR 270.14(b)(13), HFTR is including this Post-Closure Plan in the Refinery's Part B Permit Renewal Application (Renewal Application). The Post-Closure Plan details the operating, maintenance, and monitoring activities to occur at the LTUs during the post-closure period, and includes the following information as required under 40 CFR 264.118:

- Groundwater monitoring activities and frequencies;
- Maintenance and inspection activities and the frequencies they will be performed; and
- Refinery contact information and recordkeeping procedures.

In addition, the Post-Closure Plan documents compliance with the applicable requirements of 40 CFR 264.280 for closure and PCC of LTUs. Information regarding the LTUs as SWMU 16 is provided in Section 9 (Solid Waste Management Units) of this Renewal Application.

5.1 Post-Closure Care Period

The Oklahoma Department of Environmental Quality (ODEQ) approved closure of the three LTUs on August 22, 2003, thereby initiating the PCC period. Background information regarding closure of the LTUs is provided below.

The PCC period is set by 40 CFR 264.117(a)(1) as thirty (30) years from the date of closure of the hazardous waste management unit (HWMU) (i.e., from August 23, 2003 to August 23, 2033 for the closed LTUs).

5.2 Description and Location of LTUs

The Refinery historically operated three RCRA-regulated LTUs, covering a total of 72.5 acres of the Refinery property—the East LTU, the Central LTU, and the West LTU. The East LTU occupies approximately 15.37 acres and is located along the southern boundary of the Refinery to the west of SWMU 8 and to the east of the Central LTU. The Central LTU is approximately 28.74 acres and is located along the southern boundary of the Refinery between the East and West LTUs. The West LTU is approximately 28.39 acres and is located along the western boundary of the Refinery and adjacent to SWMU 2. A site location map is provided as Figure 5-1. Site geology is discussed in Section 7 (Geology and Hydrology Report) of this Renewal Application.

5.2.1 LTU History and Closure

The East LTU and Central LTU began operations in the mid-1970s and the West LTU began operations in 1985. All three units initially operated under RCRA interim status, including establishment of background values and soil-core and soil-pore liquid (unsaturated zone) monitoring, until the RCRA operating permit was issued jointly by the Oklahoma State Department of Health¹ (OSDH) and the United States Environmental Protection Agency (USEPA) on November 1, 1988 (1988 Permit). Soil-core and soil-pore liquid monitoring and groundwater monitoring were required by the 1988 Permit for eighteen Principal Hazardous Constituents (PHCs) during the operational period.

The primary hazardous wastes that were historically applied to the LTUs included dissolved air flotation float (K048), slop oil emulsion solids (K049), American Petroleum Institute separator sludge (K051), leaded gasoline tank bottom sludge (K052), and oil/water/solids separation sludge (F037). All units stopped receiving K-listed hazardous wastes by November 8, 1990, as a result of the implementation of RCRA land disposal restrictions (LDRs). The establishment of LDRs for F037 ended land application of that waste stream by June 30, 1993, and similarly, waste application of D018 (Toxicity Characteristic - benzene) ceased by April 8, 1998. Non-hazardous waste application ceased on October 31, 1998.

In August 1998, Sunoco provided notice to the ODEQ of the planned closure of the LTUs. Closure activities, including tilling, continued unsaturated zone monitoring and groundwater monitoring, and vegetative cover installation were conducted from November 1, 1998, to April 30, 1999. A Closure Certification Report was submitted on June 30, 1999 (Caldwell Environmental Associates Inc., 1999), and was approved by the ODEQ on August 22, 2003.

Waste had never been applied to some areas within the boundaries of the West LTU (see Figure 5-2). Subsequent to completion of closure activities, one of the waste areas was covered with gravel and temporary trailers, power poles and an electrical panel were installed. In January 2018, HFTR submitted a Class 2 permit modification request to: clarify the LTU boundaries and harmonize LTU boundaries with LTU deed restriction boundaries; conduct maintenance activities on utility lines (i.e., electrical, gas, and hydrocarbons) crossing the LTUs either above- or below-ground; document relocation of the temporary trailers from the gravel pad per discussions with the ODEQ; and to request authorization to maintain the gravel over this waste portion of the West LTU. Yellow ropes were installed at the West LTU to provide a visual demarcation of the waste areas. The Refinery also requested authorization to conduct activities such as equipment and materials laydown, storage, placement of construction office trailers, parking, maintenance

¹ Prior to the inception of the ODEQ on January 1, 1993, environmental issues were managed by the Oklahoma State Department of Health (OSDH). Responsibilities were transferred from OSDH to ODEQ as a result of Oklahoma's Environmental Quality Act which set out to consolidate widely spread environmental laws.

activities, and/or RCRA permit-exempt activities on portions of the LTUs where waste had not been applied (see Figure 5-2). The ODEQ approved the Class 2 modification request on June 21, 2018. ODEQ provided clarification to the June 2018 approval in a letter dated November 1, 2018; this clarification indicated that “HFTRW is approved to use the areas where waste was never applied at all three (3) LTUs for trailer placement, parking, storage, stockpiling, and/or RCRA exempt activities”; the previous approval only provided this clause for the West LTU.

As part of this Permit renewal, HFTR has researched aerial photographs of the LTU areas from 1967 to 2016 and has identified 2 additional areas where waste was never applied. The historical aerial photographs are presented in Appendix 5.1. In the Central LTU, operational facilities associated with a butane storage cavern are present in the northwest portion of the LTU, and waste was never applied to this area. Additionally, above ground pipes and pipe racks are present in the northwest portion of the East LTU, and waste was never applied in this area. As part of this Permit renewal, HFTR proposes that the boundaries of the Central and East LTUs exclude these non-waste areas, as presented on Figure 5-2. As these areas were included within the Central and East LTU boundaries in error, and did not receive land-applied wastes, HFTR proposes that this Permit renewal authorize utilization of these areas as non-regulated whether vegetated, graveled, and/or paved; and for potential Facility roadways, parking, laydown, storage, operations and maintenance staging. Existing roads within the LTUs are proposed to remain in use and will be maintained.

Following approval of this Permit renewal, HFTR will survey the redefined Central and East LTU boundaries and submit revised legal descriptions to the Tulsa County Clerk, Indian Nations Council of Government, and to the ODEQ.

5.2.2 Corrective Action for the LTUs

The three closed LTUs (also referred to as SWMU 16) are situated among existing SWMUs or areas of concern (AOCs), and therefore corrective action (e.g., any warranted investigation and remediation) at the LTUs is addressed as part of the Refinery’s ongoing corrective action. Additional information regarding corrective actions at the LTUs/SWMU 16 is provided in Section 9 (Solid Waste Management Units) of this Renewal Application.

As discussed further in Section 5.3, the ODEQ has directed HFTR to follow the groundwater monitoring requirements set forth in the 2009 Permit for SWMUs (i.e., inclusion in a Refinery-wide groundwater monitoring program) rather than those requirements for groundwater monitoring programs set forth in 40 CFR 264.91 through 264.100.

5.3 Groundwater Monitoring Program

Groundwater monitoring for the three closed LTUs is incorporated into the Refinery-wide groundwater monitoring program, as allowed under the 2009 Permit. HFTR has committed to

conduct groundwater monitoring across the entire Refinery, as described in Section 8 (Groundwater Monitoring and LNAPL Management Plan).

HFTR performs semi-annual groundwater monitoring, typically in the spring and fall of each calendar year. The elements of the groundwater monitoring program include:

- Semi-annual monitoring of downgradient point of compliance (POC; boundary) wells;
- Semi-annual gauging of wells for groundwater and light non-aqueous phase liquid (LNAPL) elevations;
- Annual monitoring of POC upgradient wells;
- Semi-annual reporting of gauging data and sample results; and
- Semi-annual reporting of LNAPL recovery progress, and any modifications to the LNAPL recovery systems.

Details regarding the groundwater monitoring program, including inspection and maintenance of the monitoring well network, are provided in Section 8 (Groundwater Monitoring and LNAPL Management Plan) of this Renewal Application.

5.4 Post-Closure Activities

In accordance with 40 CFR 264.280(c), the Refinery will conduct the following activities at the LTUs, as applicable, during the post-closure period:

- Continue all operations (including pH control) necessary to enhance degradation and transformation and sustain immobilization of hazardous constituents in the treatment zone to the extent that such measures are consistent with other post-closure activities;
- Maintain the cover over the LTUs;
- Maintain the surface water run-on/run-off control and management systems;
- Control wind dispersion of hazardous waste; and
- Continue to comply with prohibitions on the growth of food chain crops.

In addition, the Refinery will continue to address groundwater monitoring for the LTUs, including inspection and maintenance of the groundwater monitoring well network, as part of the refinery-wide groundwater monitoring program (see Section 8 of this Renewal Application).

5.4.1 Unsaturated Zone Monitoring

Soil-pore liquid monitoring ceased following the ODEQ's acceptance of the LTU closure certification in 2003. Soil-core sampling continued through 2004 and, based on the results of previous soil-core sampling events, the Refinery petitioned the ODEQ to suspend the requirement for soil-core sampling. The ODEQ authorized suspension of soil-core sampling in 2005 and in 2006 on the grounds that "while there are relatively low levels of hazardous constituents still

present in the soils, they are not at levels of concern” (December 2005 and 2006 letters from the ODEQ). In 2008, the ODEQ authorized continued suspension of the soil-core monitoring program for the remainder of the Permit term, and no requirement for soil-core monitoring is included in the 2009 Permit.

5.4.2 Inspections

At a minimum, each LTU is inspected on a semi-annual basis, or on an as-needed basis contingent upon weather conditions (e.g., after a major storm event yielding seven or more inches of precipitation within 24 hours or less). Inspection forms will be completed for each post-closure inspection. The detailed inspection program and inspection schedules for the LTUs are outlined in Section 3 (Inspection Plan) of this Renewal Application.

Any changes, concerns, or sub-standard conditions observed during the inspections will be recorded on Refinery inspection forms and brought to the attention of the Refinery Environmental Manager. The Environmental Manager will arrange to have any deficiencies corrected as soon as practicable by the Refinery maintenance staff or contractors. Completion of repairs is documented on the inspection forms. Example inspection forms are provided in Section 3 (Inspection Plan) of this Renewal Application.

5.4.3 Maintenance

5.4.3.1 LTU Maintenance

Site maintenance activities will be performed with the primary goal of maintaining the integrity of the LTUs’ surface cover. A vegetative cover is maintained across the East and Central LTUs, and the West LTU cover primarily includes vegetation with limited areas covered by gravel, or pavement. Activities which could disturb the integrity of the final cover are prohibited, with the exception of approved activities such as equipment and materials laydown, storage, placement of construction office trailers, parking, maintenance activities, and/or RCRA permit-exempt activities per the approved 2018 Class 2 modification (ODEQ, 2018) on portions of the LTUs where waste had not been applied.

Routine maintenance practices to preserve the integrity of the cover include:

- Maintaining the integrity and effectiveness of the vegetative cover to correct the effects of settling, subsidence, erosion, and other events through fertilization, watering, mowing, and reseeded, as applicable;
- Mowing the vegetative cover, as necessary;
- Maintaining gravel and paved portions of cover, as necessary; and
- Completing routine repairs to the covers and engineered dike systems, as necessary, to correct and control the effects of settling, subsidence, erosion, etc.

Additional site maintenance details are provided in Section 3 (Inspection Plan) of this Renewal Application.

5.4.3.2 Utility Maintenance

Several surface and subsurface utility and/or hydrocarbon lines are known to run through portions of the LTUs, and these lines require periodic inspection and potential maintenance. These inspection and maintenance events may include disturbances of the vegetative cover and materials beneath the ground surface, including in areas where waste was historically applied.

For any excavation work to be conducted within the LTUs related to utility/hydrocarbon line maintenance, the Refinery will ensure that:

- ODEQ will be notified prior to any excavation;
- A consultant oversees the work and stops work if waste material is encountered;
- Work will be performed by Hazardous Waste Operations and Emergency Response (HAZWOPER) trained personnel;
- Excavated soil will be placed back into the excavation, to the degree feasible, and any remaining excavation will be backfilled with clean material;
- If waste or hydrocarbon-saturated soils are encountered during excavation, this material will not be replaced in the excavation;
- Any soil that cannot be replaced in the excavation will be sampled, characterized, and managed/disposed of properly;
- Surface cover will be reestablished upon project completion; and
- A summary of new activities/post-construction information in a given six-month period will be provided to the ODEQ in the semi-annual monitoring reports.

5.4.3.3 Security

Warning signs identifying the specific LTUs are posted at the three closed LTUs, requiring authorization from the Environmental Department prior to entry. Security at the Refinery is discussed in detail in Section 2 (Security) of this Renewal Application.

5.4.3.4 Record Keeping and Site Contact

The Refinery will continue post-closure care for a period of at least ten (10) years (for the duration of the Permit), or until the Refinery receives ODEQ approval to cease post-closure care activities.

During the post-closure period, the Refinery's Environmental Manager will serve as the Refinery's post-closure care contact. The contact information for the Refinery Environmental Manager is provided below:

Environmental Manager
HollyFrontier Tulsa Refining LLC
PO Box 21001
Tulsa, OK 74107
918-594-6000

This Post-Closure Plan will be amended subject to the approval of the ODEQ when operating plans or Refinery design changes affect the Post-Closure Plan. A copy of the Post-Closure Plan and any amendments will be maintained with the Renewal Application in the Environmental File Records Room located in the Refinery Environmental Department offices.

5.5 References

- Caldwell Environmental Associates, Inc., 1999. Certification of Closure for the Hazardous Waste Land Treatment Unit at Sunoco, Inc. (R&M) Tulsa Refinery. Norman, Oklahoma. June 1999.
- Land Protection Division, 2005. RCRA Post-Closure Permit – Consent Order 02-190 2005 Land Treatment Unit (LTU) Soil Core Sampling. Oklahoma Department of Environmental Quality Land Protection Division. December 28, 2005.
- Land Protection Division, 2006. RCRA Post-Closure Permit – Consent Order 02-190 2006 Land Treatment Unit (LTU) Soil Core Sampling. Oklahoma Department of Environmental Quality Land Protection Division. December 27, 2006.
- Oklahoma State Department of Health and EPA, 1998. Joint Hazardous Waste Management Permit, Permit Number 3572041. The Oklahoma State Department of Health and United States Environmental Protection Agency, Region VI. November 1, 1998.
- ODEQ, 2009. Resource Conservation and Recovery Act Post-Closure and Corrective Action Permit for a Closed Hazardous Waste Management Facility No. 058078775-PC. Oklahoma Department of Environmental Quality. June 1, 2009.
- ODEQ, 2018. Class 2 Permit Modification Request, HollyFrontier Tulsa Refining LLC – West Facility (HFTR), Tulsa County, Oklahoma, EPA ID OKD990750960. Oklahoma Department of Environmental Quality. June 21, 2018.

5 POST-CLOSURE PLAN FOR LAND TREATMENT UNITS

The HollyFrontier Tulsa Refining LLC (HFTR) Tulsa West Refinery (the Refinery) historically operated three Resource Conservation and Recovery Act (RCRA)-permitted Land Treatment Units (LTUs) for management of hazardous and non-hazardous waste—the East LTU, the Central LTU, and the West LTU. All three LTUs were closed per Title 40 Part 264 Subpart G of the Code of Federal Regulations (40 CFR 264 Subpart G) and are currently in the post-closure care (PCC) period. The closed LTUs are also classified as a solid waste management unit (SMWU [SWMU 16]) in the Refinery's Corrective Action Program (CAP).

In accordance with 40 CFR 270.14(b)(13), HFTR is including this Post-Closure Plan in the Refinery's Part B Permit Renewal Application (Renewal Application). The Post-Closure Plan details the operating, maintenance, and monitoring activities to occur at the LTUs during the post-closure period, and includes the following information as required under 40 CFR 264.118:

- Groundwater monitoring activities and frequencies;
- Maintenance and inspection activities and the frequencies they will be performed; and
- Refinery contact information and recordkeeping procedures.

In addition, the Post-Closure Plan documents compliance with the applicable requirements of 40 CFR 264.280 for closure and PCC of LTUs. Information regarding the LTUs as SWMU 16 is provided in Section 9 (Solid Waste Management Units) of this Renewal Application.

5.1 Post-Closure Care Period

The Oklahoma Department of Environmental Quality (ODEQ) approved closure of the three LTUs on August 22, 2003, thereby initiating the PCC period. Background information regarding closure of the LTUs is provided below.

The PCC period is set by 40 CFR 264.117(a)(1) as thirty (30) years from the date of closure of the hazardous waste management unit (HWMU) (i.e., from August 23, 2003 to August 23, 2033 for the closed LTUs); ~~however, 40 CFR 264.280(d) provides a process for facilities to request a variance to reduce or end the PCC period at any time during the PCC period. To obtain approval to cease PCC, HFTR must demonstrate that treatment zone (TZ) soils in the LTUs show no statistically significant concentrations over background levels, regional screening levels (RSLs), and/or risk-based screening levels (RBSLs) for hazardous constituents listed in the Refinery's Permit.~~

~~HFTR would like to explore the option of a reduced PCC period for the LTUs, and to that end, the Refinery will submit the LTU Post Closure Soil Sampling Work Plan (the LTU Work Plan) to the ODEQ. The Work Plan will detail the soil sampling and analysis program, which would supplement extensive unsaturated zone data, and proposes collecting the necessary data to make a demonstration under 40 CFR 264.280(d) for a reduced PCC period.~~

~~Pending ODEQ approval of the LTU Work Plan, results from the soil investigation will be evaluated, and if no statistically significant concentrations are over background levels, RSLs and/or RSBL values for constituents of concern are detected, HFTR plans to petition ODEQ to cease PCC of the LTUs.~~

~~Pending completion of the proposed LTU soil sampling effort and possible demonstration to support ceasing PCC, HFTR proposes that the post-closure period in the renewed permit be set for the duration of the renewed Permit. The post-closure period will extend concurrent with the ten (10) year period of the renewed Permit and will be re-evaluated during preparation of the next Part B Permit Renewal Application, unless a successful demonstration to cease PCC is completed prior to that time.~~

5.2 Description and Location of LTUs

The Refinery historically operated three RCRA-regulated LTUs, covering a total of 72.5 acres of the Refinery property—the East LTU, the Central LTU, and the West LTU. The East LTU occupies approximately 15.37 acres and is located along the southern boundary of the Refinery to the west of SWMU 8 and to the east of the Central LTU. The Central LTU is approximately 28.74 acres and is located along the southern boundary of the Refinery between the East and West LTUs. The West LTU is approximately 28.39 acres and is located along the western boundary of the Refinery and adjacent to SWMU 2. A site location map is provided as Figure 5-1. Site geology is discussed in Section 7 (Geology and Hydrology Report) of this Renewal Application.

5.2.1 LTU History and Closure

The East LTU and Central LTU began operations in the mid-1970s and the West LTU began operations in 1985. All three units initially operated under RCRA interim status, including establishment of background values and soil-core and soil-pore liquid (unsaturated zone) monitoring, until the RCRA operating permit was issued jointly by the Oklahoma State Department of Health¹ (OSDH) and the United States Environmental Protection Agency (USEPA) on November 1, 1988 (1988 Permit). Soil-core and soil-pore liquid monitoring and groundwater monitoring were required by the 1988 Permit for eighteen Principal Hazardous Constituents (PHCs) during the operational period.

The primary hazardous wastes that were historically applied to the LTUs included dissolved air flotation float (K048), slop oil emulsion solids (K049), American Petroleum Institute separator sludge (K051), leaded gasoline tank bottom sludge (K052), and oil/water/solids separation sludge (F037). All units stopped receiving K-listed hazardous wastes by

¹ Prior to the inception of the ODEQ on January 1, 1993, environmental issues were managed by the Oklahoma State Department of Health (OSDH). Responsibilities were transferred from OSDH to ODEQ as a result of Oklahoma's Environmental Quality Act which set out to consolidate widely spread environmental laws.

November 8, 1990, as a result of the implementation of RCRA land disposal restrictions (LDRs). The establishment of LDRs for F037 ended land application of that waste stream by June 30, 1993, and similarly, waste application of D018 (Toxicity Characteristic - benzene) ceased by April 8, 1998. Non-hazardous waste application ceased on October 31, 1998.

In August 1998, Sunoco provided notice to the ODEQ of the planned closure of the LTUs. Closure activities, including tilling, continued unsaturated zone monitoring and groundwater monitoring, and vegetative cover installation were conducted from November 1, 1998, to April 30, 1999. A Closure Certification Report was submitted on June 30, 1999 (Caldwell Environmental Associates Inc., 1999), and was approved by the ODEQ on August 22, 2003.

Waste had never been applied to some areas within the boundaries of the West LTU (see Figure 5-2). Subsequent to completion of closure activities, one of the waste areas was covered with gravel and temporary trailers, power poles and an electrical panel were installed. In January 2018, HFTR submitted a Class 2 permit modification request to: clarify the LTU boundaries and harmonize LTU boundaries with LTU deed restriction boundaries; conduct maintenance activities on utility lines (i.e., electrical, gas, and hydrocarbons) crossing the LTUs either above- or below-ground; document relocation of the temporary trailers from the gravel pad per discussions with the ODEQ; and to request authorization to maintain the gravel over this waste portion of the West LTU. Yellow ropes were installed at the West LTU to provide a visual demarcation of the waste areas. The Refinery also requested authorization to conduct activities such as equipment and materials laydown, storage, placement of construction office trailers, parking, maintenance activities, and/or RCRA permit-exempt activities on portions of the LTUs where waste had not been applied (see Figure 5-2). The ODEQ approved the Class 2 modification request on June 21, 2018. ODEQ provided clarification to the June 2018 approval in a letter dated November 1, 2018; this clarification indicated that “HFTRW is approved to use the areas where waste was never applied at all three (3) LTUs for trailer placement, parking, storage, stockpiling, and/or RCRA exempt activities”; the previous approval only provided this clause for the West LTU.

As part of this Permit renewal, HFTR has researched aerial photographs of the LTU areas from 1967 to 2016 and has identified 2 additional areas where waste was never applied. The historical aerial photographs are presented in Appendix 5.1. In the Central LTU, operational facilities associated with a butane storage cavern are present in the northwest portion of the LTU, and waste was never applied to this area. Additionally, above ground pipes and pipe racks are present in the northwest portion of the East LTU, and waste was never applied in this area. As part of this Permit renewal, HFTR proposes that the boundaries of the Central and East LTUs exclude these non-waste areas, as presented on Figure 5-2. As these areas were included within the Central and East LTU boundaries in error, and did not receive land-applied wastes, HFTR proposes that this Permit renewal authorize utilization of these areas as non-regulated whether vegetated, graveled, and/or paved; and for potential Facility roadways, parking, laydown, storage,

operations and maintenance staging. Existing roads within the LTUs are proposed to remain in use and will be maintained.

Following approval of this Permit renewal, HFTR will survey the redefined Central and East LTU boundaries and submit revised legal descriptions to the Tulsa County Clerk, Indian Nations Council of Government, and to the ODEQ.

5.2.2 Corrective Action for the LTUs

The three closed LTUs (also referred to as SWMU 16) are situated among existing SWMUs or areas of concern (AOCs), and therefore corrective action (e.g., any warranted investigation and remediation) at the LTUs is addressed as part of the Refinery's ongoing corrective action. Additional information regarding corrective actions at the LTUs/SWMU 16 is provided in Section 9 (Solid Waste Management Units) of this Renewal Application.

As discussed further in Section 5.3, the ODEQ has directed HFTR to follow the groundwater monitoring requirements set forth in the 2009 Permit for SWMUs (i.e., inclusion in a Refinery-wide groundwater monitoring program) rather than those requirements for groundwater monitoring programs set forth in 40 CFR 264.91 through 264.100.

5.3 Groundwater Monitoring Program

Groundwater monitoring for the three closed LTUs is incorporated into the Refinery-wide groundwater monitoring program, as allowed under the 2009 Permit. HFTR has committed to conduct groundwater monitoring across the entire Refinery, as described in Section 8 (Groundwater Monitoring and LNAPL Management Plan).

HFTR performs semi-annual groundwater monitoring, typically in the spring and fall of each calendar year. The elements of the groundwater monitoring program include:

- Semi-annual monitoring of downgradient point of compliance (POC; boundary) wells;
- Semi-annual gauging of wells for groundwater and light non-aqueous phase liquid (LNAPL) elevations;
- Annual monitoring of POC upgradient wells;
- Semi-annual reporting of gauging data and sample results; and
- Semi-annual reporting of LNAPL recovery progress, and any modifications to the LNAPL recovery systems.

Details regarding the groundwater monitoring program, including inspection and maintenance of the monitoring well network, are provided in Section 8 (Groundwater Monitoring and LNAPL Management Plan) of this Renewal Application.

5.4 Post-Closure Activities

In accordance with 40 CFR 264.280(c), the Refinery will conduct the following activities at the LTUs, as applicable, during the post-closure period:

- Continue all operations (including pH control) necessary to enhance degradation and transformation and sustain immobilization of hazardous constituents in the treatment zone to the extent that such measures are consistent with other post-closure activities;
- Maintain the cover over the LTUs;
- Maintain the surface water run-on/run-off control and management systems;
- Control wind dispersion of hazardous waste; and
- Continue to comply with prohibitions on the growth of food chain crops.

In addition, the Refinery will continue to address groundwater monitoring for the LTUs, including inspection and maintenance of the groundwater monitoring well network, as part of the refinery-wide groundwater monitoring program (see Section 8 of this Renewal Application).

~~If the demonstration to cease PCC under 40 CFR 264.280(d), pending ODEQ approval at the time of submittal of this Renewal Application, is successful, these activities will be discontinued.~~

5.4.1 Unsaturated Zone Monitoring

Soil-pore liquid monitoring ceased following the ODEQ's acceptance of the LTU closure certification in 2003. Soil-core sampling continued through 2004 and, based on the results of previous soil-core sampling events, the Refinery petitioned the ODEQ to suspend the requirement for soil-core sampling. The ODEQ authorized suspension of soil-core sampling in 2005 and in 2006 on the grounds that "while there are relatively low levels of hazardous constituents still present in the soils, they are not at levels of concern" (December 2005 and 2006 letters from the ODEQ). In 2008, the ODEQ authorized continued suspension of the soil-core monitoring program for the remainder of the Permit term, and no requirement for soil-core monitoring is included in the 2009 Permit.

5.4.2 Inspections

At a minimum, each LTU is inspected on a semi-annual basis, or on an as-needed basis contingent upon weather conditions (e.g., after a major storm event yielding seven or more inches of precipitation within 24 hours or less). Inspection forms will be completed for each post-closure inspection. The detailed inspection program and inspection schedules for the LTUs are outlined in Section 3 (Inspection Plan) of this Renewal Application.

Any changes, concerns, or sub-standard conditions observed during the inspections will be recorded on Refinery inspection forms and brought to the attention of the Refinery Environmental

Manager. The Environmental Manager will arrange to have any deficiencies corrected as soon as practicable by the Refinery maintenance staff or contractors. Completion of repairs is documented on the inspection forms. Example inspection forms are provided in Section 3 (Inspection Plan) of this Renewal Application.

5.4.3 Maintenance

5.4.3.1 LTU Maintenance

Site maintenance activities will be performed with the primary goal of maintaining the integrity of the LTUs' surface cover. A vegetative cover is maintained across the East and Central LTUs, and the West LTU cover primarily includes vegetation with limited areas covered by gravel, or pavement. Activities which could disturb the integrity of the final cover are prohibited, with the exception of approved activities such as equipment and materials laydown, storage, placement of construction office trailers, parking, maintenance activities, and/or RCRA permit-exempt activities per the approved 2018 Class 2 modification (ODEQ, 2018) on portions of the LTUs where waste had not been applied.

Routine maintenance practices to preserve the integrity of the cover include:

- Maintaining the integrity and effectiveness of the vegetative cover to correct the effects of settling, subsidence, erosion, and other events through fertilization, watering, mowing, and reseeded, as applicable;
- Mowing the vegetative cover, as necessary;
- Maintaining gravel and paved portions of cover, as necessary; and
- Completing routine repairs to the covers and engineered dike systems, as necessary, to correct and control the effects of settling, subsidence, erosion, etc.

Additional site maintenance details are provided in Section 3 (Inspection Plan) of this Renewal Application.

5.4.3.2 Utility Maintenance

Several surface and subsurface utility and/or hydrocarbon lines are known to run through portions of the LTUs, and these lines require periodic inspection and potential maintenance. These inspection and maintenance events may include disturbances of the vegetative cover and materials beneath the ground surface, including in areas where waste was historically applied.

For any excavation work to be conducted within the LTUs related to utility/hydrocarbon line maintenance, the Refinery will ensure that:

- ODEQ will be notified prior to any excavation;
- A consultant oversees the work and stops work if waste material is encountered;

- Work will be performed by Hazardous Waste Operations and Emergency Response (HAZWOPER) trained personnel;
- Excavated soil will be placed back into the excavation, to the degree feasible, and any remaining excavation will be backfilled with clean material;
- If waste or hydrocarbon-saturated soils are encountered during excavation, this material will not be replaced in the excavation;
- Any soil that cannot be replaced in the excavation will be sampled, characterized, and managed/disposed of properly;
- Surface cover will be reestablished upon project completion; and
- A summary of new activities/post-construction information in a given six-month period will be provided to the ODEQ in the semi-annual monitoring reports.

5.4.3.3 Security

Warning signs identifying the specific LTUs are posted at the three closed LTUs, requiring authorization from the Environmental Department prior to entry. Security at the Refinery is discussed in detail in Section 2 (Security) of this Renewal Application.

5.4.3.4 Record Keeping and Site Contact

The Refinery will continue post-closure care for a period of at least ten (10) years (for the duration of the Permit), or until the Refinery receives ODEQ approval to cease post-closure care activities.

During the post-closure period, the Refinery's Environmental Manager will serve as the Refinery's post-closure care contact. The contact information for the Refinery Environmental Manager is provided below:

Environmental Manager
HollyFrontier Tulsa Refining LLC
PO Box 21001
Tulsa, OK 74107
918-594-6000

This Post-Closure Plan will be amended subject to the approval of the ODEQ when operating plans or Refinery design changes affect the Post-Closure Plan. A copy of the Post-Closure Plan and any amendments will be maintained with the Renewal Application in the Environmental File Records Room located in the Refinery Environmental Department offices.

5.5 References

Caldwell Environmental Associates, Inc., 1999. Certification of Closure for the Hazardous Waste Land Treatment Unit at Sunoco, Inc. (R&M) Tulsa Refinery. Norman, Oklahoma. June 1999.

Land Protection Division, 2005. RCRA Post-Closure Permit – Consent Order 02-190 2005 Land Treatment Unit (LTU) Soil Core Sampling. Oklahoma Department of Environmental Quality Land Protection Division. December 28, 2005.

Land Protection Division, 2006. RCRA Post-Closure Permit – Consent Order 02-190 2006 Land Treatment Unit (LTU) Soil Core Sampling. Oklahoma Department of Environmental Quality Land Protection Division. December 27, 2006.

Oklahoma State Department of Health and EPA, 1998. Joint Hazardous Waste Management Permit, Permit Number 3572041. The Oklahoma State Department of Health and United States Environmental Protection Agency, Region VI. November 1, 1998.

ODEQ, 2009. Resource Conservation and Recovery Act Post-Closure and Corrective Action Permit for a Closed Hazardous Waste Management Facility No. 058078775-PC. Oklahoma Department of Environmental Quality. June 1, 2009.

ODEQ, 2018. Class 2 Permit Modification Request, HollyFrontier Tulsa Refining LLC – West Facility (HFTR), Tulsa County, Oklahoma, EPA ID OKD990750960. Oklahoma Department of Environmental Quality. June 21, 2018.