



**INITIAL RUN-ON AND RUN-OFF
CONTROL SYSTEM PLAN
Montrose CCR Landfill
Montrose Generating Station**

**20250 Hwy. 45 North
Weston, Missouri**

Kansas City Power & Light Company

October 17, 2016

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MONTROSE GENERATING STATION

CCR LANDFILL

RUN-ON AND RUN OFF CONTROL SYSTEM PLAN REVISION HISTORY

Revision Number	Revision Date	Section Revised	Summary of Revisions

Revisions are accomplished in accordance with Section 5.

SECTION 1

BACKGROUND

The purpose of this CCR Run-on and Run Off Control System Plan (Plan) is to document, in accordance with the Coal Combustion Residuals Rule (CCR Rule),¹ how the run-on and run-off control systems for the Montrose Generating Station (Montrose) CCR landfill have been designed and constructed with recognized and generally accepted good engineering practices and to meet the applicable requirements of 40 CFR 257.81. The following sections provide background information on the facility and related regulatory requirements.

1.1 Facility Information

Name of Facility: Montrose Generating Station

Name of CCR Unit: CCR Landfill

Name of Operator: Kansas City Power & Light Company (KCP&L)

Facility Mailing Address: 400 Southwest Hwy. P, Clinton, MO 64735

Location: Approximately ten miles southwest of Clinton, Missouri.

Facility Description: The Montrose Generating Station has three coal-fired units that produce fly ash, economizer ash, and bottom ash. CCR is either shipped off-site for beneficial use or transported to the landfill for disposal. Related landfill facilities include a groundwater monitoring system, storm water and leachate management systems, and haul/access roads. The footprint for the permitted landfill area has been constructed. The southern approximate 2/3 of the landfill is currently inactive. The current active area is within the northern 1/3 of the permitted landfill area.

1.2 Regulatory Requirements

This Plan has been developed for the Montrose Generating Station CCR Landfill in accordance with 40 CFR 257.81 (c). The CCR Rule requires preparation of a Run-on and Run-off Control System Plan for all existing CCR landfills in operation as of

October 19, 2015, the effective date of the CCR Rule. The plan must document how the run-on and run-off control systems have been designed and constructed to meet the applicable requirements of 40 CFR 257.81, and must be supported by appropriate engineering calculations².

The owner or operator of a CCR unit must prepare a written Plan that includes the information specified in 40 CFR 257.81 (a) and (b). These items and the section of this plan responsive to each follows:

40 CFR 257.81 Run-on and Run-off Controls for CCR landfills

- (a) The owner or operator of an existing or new CCR landfill or any lateral expansion of a CCR landfill must design, construct, operate and maintain (Section 2):
 - (1) A run-on control system to prevent flow onto the active portion of the CCR unit during the peak discharge from a 24-hour, 25-year storm; and
 - (2) A run-off control system from the active portion of the CCR unit to collect and control at least the water volume resulting from a 24-hour, 25-year storm
- (b) Run-off from the active portion of CCR unit must be handled in accordance with the surface water requirements under §257.3-3 (Section 3).

Selected definitions from the CCR Rule are provided below.

Active portion means that part of the CCR unit that has received or is receiving CCR or non-CCR waste and that has not completed closure in accordance with §257.102.

Closed means placement of CCR in a CCR unit has ceased, and the owner or operator has completed closure of the CCR unit in accordance with § 257.102 and has initiated post-closure care in accordance with § 257.104.

CCR (coal combustion residuals) means fly ash, bottom ash, boiler slag, and flue gas desulfurization materials generated from burning coal for the purpose of generating electricity by electric utilities and independent power producers.

CCR Landfill means an area of land or an excavation that receives CCR and which is not a surface impoundment, an underground injection well, a salt dome formation, a salt bed formation, an underground or surface coal mine, or a cave. For purposes of this subpart, a CCR landfill also includes sand and gravel pits

and quarries that receive CCR, CCR piles, and any practice that does not meet the definition of a beneficial use of CCR.

CCR Unit means any CCR landfill, CCR surface impoundment, or lateral expansion of a CCR unit, or a combination of more than one of these units, based on the context of the paragraph(s) in which it is used. This term includes both new and existing units, unless otherwise specified.

Qualified Professional Engineer means an individual who is licensed by a state as a Professional Engineer to practice one or more disciplines of engineering and who is qualified by education, technical knowledge and experience to make the specific technical certifications required under this subpart. Professional engineers making these certifications must be currently licensed in the state where the CCR unit(s) is located.

Run-off means any rainwater, leachate, or other liquid that drains over land from any part of a CCR landfill or lateral expansion of a CCR landfill.

Run-on means any rainwater, leachate, or other liquid that drains over land onto any part of a CCR landfill or lateral expansion of a CCR landfill.

SECTION 2

LANDFILL RUN-ON AND RUN-OFF CONTROLS

2.1 Design and Construction

The design for the Montrose CCR Landfill storm water run-on and run-off control system was completed in December 2009 by URS Corporation³. The design was developed and sealed by a professional engineer licensed in the State of Missouri and in accordance with the Missouri Department of Natural Resources (MDNR) rules for Utility Waste Landfills⁴. These rules require the run-on and run-off control systems for utility waste landfills to be based on the 24-hour, 25-year storm event. The MDNR Solid Waste Management Program reviewed and approved the design of the landfill and storm water management system in 2010⁵.

The storm water system design for the landfill consists of benches, ditches, berms, culverts, and letdown channels designed with typical slopes of between 0.3% and 25%; and three ponds used to manage storm water run-off. The components of the storm water management system are constructed commensurate with landfill construction, other than the ponds and perimeter ditches, which are already constructed. Perimeter landfill berms and/or ditches surround the landfill area to prevent run-on. Landfill runoff from active areas is routed to the storm water ponds before release through the ponds' NPDES-permitted outfalls.

2.2 Run-on Controls

The landfill is bounded on all sides by an elevated perimeter berm and road constructed to approximately elevation 762.5⁶ feet North American Vertical Datum of 1988 (NAVD 88) and ditch system to prevent run-on to the active and inactive landfill areas. The active fill area is a low area within a constructed berm on the north, east, and west sides that rises approximately to elevation 780 feet⁷. The active area is protected from upstream run-on from the inactive landfill area to the south by a ditch system that diverts surface water around the active area. The ditch system is sized to protect the active area from run-on from the 24-hour, 25-year storm event². The run-on protection system meets or exceeds the requirement to provide protection from run-on from the 24-hour, 25-year storm event.

2.3 Run-off Controls

The run-off control system designed for the landfill consists of benches, berms, ditches, culverts and letdown channels, as well as three ponds that collect storm water runoff. For the current configuration explained in Section 2.2, water is contained within the active area using a perimeter berm. Contained storm water is managed through the leachate collection system. Storm water run-off is routed to letdowns by gravity flow and/or pumped, as necessary, after storm events to the perimeter ditches. Both leachate and storm water are conveyed by perimeter ditches to the aforementioned ponds. The storm water management system components for the landfill were constructed and are operated in accordance with plans approved by the MDNR.^{5,6} Only drainage from the north third of the landfill is from the active area, which is managed via the landfill interior ditches, letdowns, culverts, and two storm water ponds (West Pond and East Pond). Benches are not currently used to control storm water from the active area.

Table 1 presents the excess capacities of the storm water run-off system components from the current active area for the design storm event.

Table 2-1 Run-off Control Protection^{2,3}

Storm Water System Component	Calculated Excess Capacity/Parameter*	Units
West Pond*	0.7	acre-ft
East Pond (100 year storm event) ⁸	2.9	ft freeboard
Culverts 3 x 30" Northeast Drainage Area/Outfall 3*	1.6	feet headwater
Culverts 3 x 36" Drainage Area/Outfall 1*	2.4	feet headwater
Berm/Ditch at Landfill Base-Northeast* (Drainage Area 3)	129.5	cubic feet per second
Berm/Ditch at Landfill Base-Northwest* (Drainage Area 4)	154.3	cubic feet per second
Letdowns	>300	cubic feet per second

*For highest calculated flow for the final landfill design. Culverts have additional capacity if additional available headwater depths are considered.

The run-off protection system meets or exceeds the requirement to provide protection from run-off from the 24-hour, 25-year storm event.

SECTION 3

RUN-OFF CONTROL FOR §257.3-3

The run-off from the Montrose CCR Landfill active area is routed to ponds and discharged via NPDES-permitted outfalls. Per the current NPDES permit, discharged water is tested for pollutants and the discharge meets the minimum regulatory requirements of the permit. Therefore, the facility does not cause a discharge of pollutants into waters of the United States that is in violation of the requirements of the NPDES under Section 402 of the Clean Water Act, and therefore meets the requirements of 40 CFR 257.81 (b).

SECTION 4

AMENDMENT OF RUN-ON AND RUN-OFF CONTROL PLAN

The owner or operator may amend the written run-off and run-on control system plan at any time provided the revised plan is placed in the facility's operating record as required by § 257.105(g)(3).

The owner or operator must amend the written run-on and runoff control system plan whenever there is a change in conditions that would substantially affect the written plan in effect. Additionally, the owner or operator of the CCR unit must prepare periodic run-on and runoff control system plans every five years. The date of completing the initial plan is the basis for establishing the deadline to complete the first subsequent plan.

The owner or operator may complete any required plan prior to the required deadline provided the completed plan is placed into the facility's operating record within a reasonable amount of time.

A written certification from a qualified professional engineer that the initial and any amendment of the written run-on and run-off control system plan meets the requirements of § 257.81 must be obtained. Plan changes will be documented using the Revision History which prefaces this Plan. Changes to this plan will be certified by a Qualified Professional Engineer.

SECTION 5

ENGINEERING CERTIFICATION

Pursuant to 40 CFR 257.81 (c) (5) and by means of this certification, I attest that:

- (i) I am a Qualified Professional Engineer licensed in the State of Missouri;
- (ii) I am familiar with the requirements of the CCR Rule (40 CFR 257);
- (iii) I, or my agent, have visited and examined the Montrose Generating Station landfill;
- (iv) I do hereby certify to the best of my knowledge, information, and belief that this Run-on and Run-off Control System Plan has been prepared in accordance with good engineering practice, including consideration of applicable industry standards, and with the requirements of the CCR Rule;
- (v) this Run-on and Run-off Control System Plan meets the requirements of 40 CFR 257.81 (c); and
- (vi) the pages certified herein include Pages i, ii, 1 through 7, altogether a total of 9 pages in a protected Adobe™ document.

Walter J. Martin, P.E.

Printed Name of Qualified Professional Engineer
1200 Main St, Kansas City, MO 64105, 816-556-2200

P.E. SEAL, STATE OF MISSOURI



10-17-2016

SECTION 6

REFERENCES

1. U.S. Environmental Protection Agency, Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments, 40 CFR §257, Federal Register 80, Subpart D, April 17, 2015.
2. Kansas City Power & Light Company, Support Calculations, Initial Run-on and Run-off Control System Plan, Montrose CCR Landfill, Montrose Generating Station, October 17, 2016.
3. URS Corporation (now AECOM), Appendix Q, Montrose Generation Station Utility Waste Landfill Expansion, Montrose Generating Station, Prepared for Kansas City Power & Light Company, December 2009.
4. Missouri Department of Natural Resources, Code of State Regulations, Rules of Department of Natural Resources, Division 80, Solid Waste Management, Chapter 11, Utility Waste Landfill, 1997.
5. Missouri Department of Natural Resources, Kansas City Power & Lights (sic) Company, Montrose Generating Station Utility Waste Landfill, Construction Permit Number 0908301, Henry County, Date: June 21, 2010.
6. URS Corporation (now AECOM), Montrose Utility Waste Landfill Expansion, Operating Permit Application, prepared for Kansas City Power & Light Company, November 2011.
7. Whitehead Consultants, Inc., Topographic Survey, December 2015.
8. AECOM, Initial Inflow Design Flood Control System Plan, North Ash Impoundment, Montrose Generating Station, October 2016