

January 25, 2023

Tennessee Valley Authority
1101 Market Street
Chattanooga, Tennessee 37402

Groundwater Monitoring System, Revision 2
North Rail Loop Landfill
TVA Gallatin Fossil Plant
Gallatin, Tennessee

1.0 Introduction

This letter documents AECOM's updated certification of the groundwater monitoring system for the Tennessee Valley Authority (TVA) Gallatin Fossil Plant North Rail Loop (NRL) Landfill. The NRL Landfill consists of three landfill cells: existing Cells 1 and 2 and proposed/future Cell 3. Based on CCR Rule definitions (40 CFR § 257.53), NRL Landfill Cell 2 is a lateral expansion of an existing CCR landfill (the NRL Landfill (Cell 1)). The groundwater monitoring system at the NRL Landfill is a multiunit system (40 CFR § 257.91(d)) designed to monitor all three of the constructed (Cells 1 and 2) and proposed (Cell 3) landfill cells.

The monitoring system was originally certified on October 16, 2017. Revision 1, dated June 13, 2018, reflected the addition of a new well to the monitoring system. For this update (Revision 2), there have been no changes to the actual well network; only the well top-of-casing elevations have changed. In November-December of 2021, TVA upgraded the well surface completions, and the monitoring wells were resurveyed in early 2022. This update reflects the current well construction specifications for the NRL Landfill CCR Rule monitoring network.

2.0 Summary of Findings

In establishing the groundwater monitoring system for the NRL Landfill at the Gallatin Fossil Plant in Gallatin, Tennessee, AECOM developed a hydrogeologic characterization of the site, designed and reviewed the installation of the monitoring wells, and evaluated available groundwater data. Based upon review of the available information, the groundwater monitoring system at the NRL Landfill meets the performance standard specified in 40 CFR § 257.91, based on the following criteria:

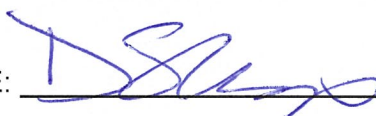
- There are a sufficient number of wells installed at appropriate locations and depths to yield groundwater samples that accurately represent the quality of background groundwater unaffected by CCR and the quality of groundwater at the downgradient waste boundary (257.91(a)(1) and (2)).
- The wells provide samples from the uppermost aquifer (257.91(a) and 257.53).

- The system contains four background wells (GAF-412L, GAF-414L, GAF-426L, GAF-427L) representing conditions unaffected by CCR (257.91(a)(1) and (c)(1)).
- The system contains one well located upgradient of the NRL Landfill (NRL221).
- The system contains five wells located downgradient of the NRL Landfill Cells 1 and 2 and future Cell 3 (NRL015, NRL220, NRL227, NRL230, and NRL301B) to monitor groundwater near the waste boundary (257.91(a)(2) and (c)(1)).
- Wells are constructed appropriately (257.91(e)).

At the NRL Landfill, Cells 1 and 2 have been constructed and are currently receiving CCR. The hydraulic gradient in the Lebanon Limestone, below the NRL Landfill, is toward the east and southeast. On the east side of Cell 1, drilling of four exploratory boreholes (NRL219, NRL228, NRL231, NRL232) at locations shown in Figure 1 between 2011 and 2017 did not encounter the water bearing zone in the Lebanon Limestone or had very poor yield in this area. Well NRL301B was installed at a fifth location in this area (Figure 1), and the well has very poor yield, confirming the lack of groundwater flow. Groundwater flow in the Lebanon Limestone is estimated to flow around and not through this localized area of low permeability on the east side of the landfill. The groundwater monitoring system is based on site-specific hydrogeologic conditions including the lack of water-bearing fracture zones in the Lebanon Limestone on the east side of the landfill (257.91(b)).

3.0 Qualified Professional Engineer Certification

I, David E. Skeggs, PE, being a Registered Professional Engineer in good standing in the State of Tennessee, do hereby certify, to the best of my knowledge, information, and belief that the information contained in this certification is prepared in accordance with the accepted practice of engineering; that the information contained herein is accurate as of the date of my signature below; and that the design and construction of the groundwater monitoring system as described above meets the requirements of 40 CFR § 257.91. Opinions relating to environmental, geologic, and hydrogeologic conditions or other estimates are based on available data; actual conditions may vary from those encountered at the times and locations where data are obtained, despite the use of due care.

SIGNATURE:  _____

DATE: January 25, 2023

PRINTED NAME: David E. Skeggs, PE

ADDRESS: AECOM
5438 Wade Park Boulevard, Suite 200
Raleigh, NC 27607

TELEPHONE: 919-461-1267

Attachments:

Figure 1 – CCR Rule Monitoring System, NRL Landfill
Table 1 – Well Construction Information

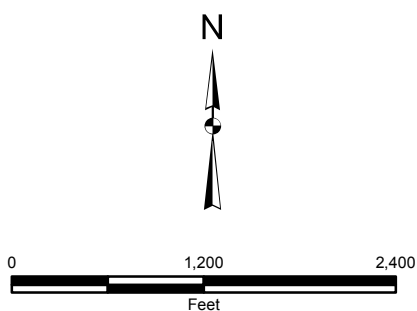




LEGEND

- CCR Rule Monitoring System Wells
- Drilled borehole in Lebanon Limestone - not water-bearing
- TVA Gallatin Fossil Plant Property Boundary (Approximate)
- North Rail Loop (NRL) Landfill

NOTE: Aerial image dated February 2017



AECOM

Figure 1

**CCR RULE MONITORING SYSTEM
NORTH RAIL LOOP (NRL) LANDFILL**

DRAWN BY: MARK.P.SMITH	REVIEWED BY: C.GARLINGTON	APPROVED BY: E. PERRY	REVISION NUMBER: REV. 1
---------------------------	------------------------------	--------------------------	----------------------------

GALLATIN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY

DATE: 6/13/2018	DEPT: FOSSIL AND HYDRO ENGINEERING
--------------------	---------------------------------------

**TABLE 1
WELL CONSTRUCTION INFORMATION
CCR RULE GROUNDWATER MONITORING SYSTEM
NORTH RAIL LOOP (NRL) LANDFILL
TVA GALLATIN FOSSIL PLANT**

Well ID	UNID #	Position Relative to CCR Unit	Top of Casing Elevation (ft)	Ground Elevation (ft)	Screened Interval (ft btoc)	Screened Formation	Total Well Depth (ft btoc)	Pump Intake Depth (ft btoc)	Well Diameter (in) / Material	Well Coordinates	
										TN State Plane NAD27 Northing (ft)	TN State Plane NAD27 Easting (ft)
GAF-412L	GAF-00-GW-43-019	Background	477.58	473.7	109.5 - 129.5	Lebanon Limestone	129.8	123.0	4-in PVC	710930.63	1880028.39
GAF-414L	GAF-00-GW-43-021	Background	481.45	478.6	93.2 - 103.2	Lebanon Limestone	103.2	98.0	4-in PVC	710439.64	1880406.18
GAF-426L	GAF-00-GW-43-030	Background	506.83	502.6	176.7 - 186.7	Lebanon Limestone	187.0	181.0	2-in PVC	711283.43	1881641.44
GAF-427L	GAF-00-GW-43-032	Background	488.41	484.2	144.4 - 159.4	Lebanon Limestone	159.9	152.0	4-in PVC	710607.73	1882087.46
NRL015	GAF-00-GW-43-042	Downgradient	550.07	543.7	184.9 - 194.9	Lebanon Limestone	195.0	186.0	2-in PVC	704591.25	1882452.49
NRL220	GAF-00-GW-43-044	Downgradient	505.98	500.0	167.5 - 187.5	Lebanon Limestone	186.7	172.0	2-in PVC	704405.75	1884142.78
NRL221	GAF-00-GW-43-045	Upgradient	481.54	476.0	117.0 - 137.0	Lebanon Limestone	137.3	125.0	2-in PVC	705358.82	1881485.21
NRL227	GAF-00-GW-43-046	Downgradient	562.47	557.2	186.8 - 196.8	Lebanon Limestone	197.2	190.0	2-in PVC	704220.14	1883459.69
NRL230	GAF-00-GW-43-052	Downgradient	511.80	507.8	161.8 - 181.8	Lebanon Limestone	181.8	165.0	4-in PVC	705841.91	1883858.54
NRL301B	GAF-00-GW-43-048	Downgradient	502.19	495.3	144.0 - 174.0	Lebanon Limestone	174.4	172.0	2-in PVC	705245.24	1884140.90

Notes:

Survey information from DDS Survey; elevation in National Geodetic Vertical Datum (NGVD) 1929, coordinates based on North America Datum (NAD) 1927.

ft btoc - feet below top of casing

in - inches (inside diameter)

Surface completions were upgraded in November-December 2021, and the monitoring wells were resurveyed in early 2022.

The information presented here represents the most up-to-date information on well conditions, which may have changed since the initial well installation.

(e.g., modified TOC, well re-survey, well construction updates based on video survey, etc.).