

2020 Corrective Action Status Evaluation Report

CLOSED LAUREL VALLEY CENTER SANITARY LANDFILL

PERMIT NUMBER 251

Prepared for:

Culpeper County

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Submitted to:

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EXECUTIVE SUMMARY

The Virginia Solid Waste Management Regulations (VSWMR) became effective in December 1988 and were most recently amended in February 2019 (effective date of March 6, 2019). These regulations (9VAC20-81-260.G) and Condition XIV.M.2 of the Facility's solid waste permit require Culpeper County to submit a Corrective Action Status Evaluation (CASE) Report (Report) to the Virginia Department of Environmental Quality (DEQ) on a tri-annual basis following the incorporation of groundwater corrective action provisions into the Facility's solid waste permit (November 5, 2008). The previous Report was submitted to the DEQ on November 3, 2017. This Report documents the progress of the site-wide groundwater corrective actions for the period of November 2017 through October 2020.

Culpeper County began monitoring groundwater at the landfill in July 1993 under the Detection Monitoring Program and in December 1994 the Assessment Monitoring Program was initiated. Based on the results from the Assessment Monitoring Program the DEQ amended the original 1978 Facility permit on November 18, 1998, to include Groundwater Protection Standards (GPS), which included a variance for Alternate Concentration Limits (ACLs). In May 1999, the GPS for vinyl chloride was exceeded at three downgradient monitoring wells. Consistent with the VSWMR a Nature and Extent Study (NES) and an Assessment of Corrective Measures (ACM) were completed for the Facility. In coordination with the DEQ a Corrective Action Plan (CAP) was submitted to the DEQ and on November 5, 2008, the DEQ amended the Facility's solid waste permit to include provisions of the CAP. The first semi-annual corrective action monitoring event occurred during the second 2008 groundwater monitoring event. Corrective action monitoring results have since been reported to DEQ in tri-annual Reports dated November 3, 2011, November 5, 2014, and November 3, 2017. This Report documents the sampling, analysis, and data evaluations completed for the groundwater corrective action program at the Facility in the November 2017 through October 2020 timeframe.

Based on evaluation of the monitoring results collected during the current CASE period, Golder believes that the current remedies continue to function as designed and are capable of achieving the corrective action program remediation goals within a reasonable timeframe. For the current monitoring period, there were three landfill-derived volatile organic compound (VOC) constituents of concern (COCs) with GPS exceedances documented in the past 3 years. These COCs are 1,1-dichloroethane, vinyl chloride, and trichloroethene. In addition to the VOC COCs, there was a one-time suspect GPS exceedance documented in MW-4 during the September 2018 sampling event for naphthalene (no exceedances before or since). Finally, the reducing conditions associated with the release from the landfill has created conditions that are conducive to the dissolution of iron-oxyhydroxide minerals which has released cobalt to the groundwater at concentrations that exceed its GPS, and thus cobalt is a naturally occurring release-induced COC for this Facility.

For the current CASE period, with exception of cobalt, the combination of presumptive remedies (PR) and natural biological activity has combined to reduce the observed groundwater concentrations in the CLFP-1 plume to less

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than the COC-specific GPS. These results indicate that the PR has been successful for the CLFP-1 plume and it is expected that with time, the groundwater geochemical conditions will revert to an oxidizing condition that will immobilize the residual dissolved cobalt. Continued monitoring of the CLFP-1 plume is recommended to verify that the landfill-derived COCs have been controlled and that the cobalt concentrations are naturally attenuating.

Review of the current CASE period data for the CLFP-2 plume indicates that the plume continues to expand downgradient from the closed landfill. However, the overall concentrations are reduced, and the risk is still controlled. Specifically, there was breakthrough for nested wells MW-1E and MW-1F (concentrations to be verified in 2nd semi-annual 2020 event) and in downgradient wells MW-1G and MW-1H in the CLFP-2 plume for 1,1-dichloroethane and vinyl chloride during the current CASE period. The last sentinel well MW-1I continues to be breakthrough free as of the date of this report. Evaluation of the analytical results indicates that the CLFP-2 plume continues to migrate deeper into the fractured bedrock. The depth of plume migration is expected to be limited however, since artesian aquifer conditions are documented to exist downgradient of the plume at location MW-1I. Based on evaluation of the concentration trends over the last 3 years it appears that the plume migration may have stabilized at its current limits. Continued monitoring of the CLFP-2 plume is recommended to verify that the extent of the landfill-derived COCs is stable. In the event that breakthrough in the form of a GPS exceedance is documented at MW-1I during any future events, a confirmation sample will be collected to verify the breakthrough. If verified breakthrough is confirmed, additional sentinel wells and/or implementation of the enhanced bioremediation remedy may be warranted to control the plume extent.

Review of the current CASE period MNA monitoring results for the CLFP-3 plume indicates that the MNA remedy is continuing to control the CLFP-3 plume on the southern side of the Facility. There are currently two COCs in the CLFP-3 plume, trichloroethene and 1,1-dichloroethane. The concentrations of these COCs at CLF-15A have been steady or declining since 2017 indicating that the plume is stable. Similarly, the concentration of 1,1-dichloroethane at sentinel well CLF-S3 has remained stable and less than the GPS since 2012. Trichloroethene is not detected at CLF-S3. The COC concentrations in sentinel well CLF-S1 continue to be non-detect. Continued monitoring of the CLFP-3 plume is recommended to verify that the landfill derived COCs have been controlled and that the cobalt concentrations in this area are naturally attenuating.