INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
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Eric J. Holcomb
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June 27, 2024

VIA ELECTRONIC SERVICE

Nicholas Gahl, Esq.
Gahl Legal Group
90 E. Cedar Street
Zionsville, IN 46077

Dear Mr. Gahl:

Re: *Remediation Progress Report*
Former Warsaw Chemical Company
Warsaw, IN/Kosciusko County
EPA ID No. IND005430244

The Indiana Department of Environmental Management (IDEM) has reviewed the document *Remediation Progress Report* (*RPR*), dated March 15, 2024, and prepared by Lynn-Douglas, Inc. (LDI) on behalf of Warsaw Chemical Holding, LLC for the former Warsaw Chemical Company, located at 390 Argonne Road, Warsaw, Indiana (Site). This document, as well as others pertaining to the Site, can be found in the Virtual File Cabinet (VFC) online at **https://vfc.idem.in.gov/DocumentSearch.aspx**, as VFC #83611687.

In December 2023, LDI gauged and sampled 12 monitoring wells using low-flow techniques. Groundwater flow in the shallow wells was generally to the southwest. Samples were submitted for laboratory analyses of volatile organic compounds (VOCs), ethane, ethene, and methane. Groundwater contaminant concentrations remain above the *Risk-Based Closure Guide* (R2) groundwater published levels (GWPLs) for tetrachloroethylene (PCE), trichloroethylene (TCE), vinyl chloride (VC), cis 1,2-dichloroethylene (cis-1,2-DCE), 1,2,4-Trimethylbenzene (1,2,4-TMB), 1,3,5-trimethylbenzene (1,3,5-TMB), ethylbenzene, total xylenes, toluene, naphthalene, and/or 1,1,1 trichloroethane (1,1,1 TCA) in all 12 wells sampled. LDI notes an overall decrease in concentrations for VOCs with some exceptions; in particular, decreases of recalcitrant cis-1,2 DCE and petroleum hydrocarbons in Area 1 after full scale injections. Areas 2 and 3 and areas outside the treatment zone also showed decreases in contaminant concentrations. In addition, full scale injections in Area 3 have reached the wells immediately north of Lake Winona (MW-29A and MW-29B). LDI states reductions in contaminant concentrations between December 2022 and December 2023 are favorable for pursuing site closure. By the end of 2024, 10 to 12 total groundwater sampling events will have been completed focusing on monitoring wells within and downgradient of the three groundwater treatment zones.

Although initial data shows generally decreasing concentrations of contaminants, currently there is insufficient data to evaluate long-term plume stability. As previously noted, a period of re-equilibration is needed prior to beginning plume evaluation monitoring (R2 Section 3.2.2.2). Remedial injections were last conducted in November 2022; therefore, the post-equilibration sampling starts with the December 2023

monitoring. If the consultant plans to use statistical analysis to demonstrate plume stability as a line of evidence (LOE) towards closure, a minimum of eight sampling events are necessary for each well (R2, Appendix C). Therefore, quarterly monitoring may be necessary to attain site closure within the desired timeframe. Additional monitoring may be needed beyond that proposed pending final evaluation of the sampling events. A final sampling event of **all** monitoring wells is required to ensure the plume was not "pushed" further out beyond historical extents by injections.

A cross-section figure showing the plume was presented, however please provide planar view maps showing extents of contamination above applicable published levels. Additionally, a table showing well construction and gauging data is necessary for a complete evaluation of the plume behavior. Please provide this information in the next *Remediation Progress Report*.

One field duplicate was incorrectly identified as collected at MW-39A on the December 2023 Low-Flow Test Report form. Field duplicates were collected at wells MW-16S (August 2023), MW-46B (October 2023), and MW-36A (December 2023), and the VOCs and dissolved gases results showed acceptable agreement, except for 1,2,4-TMB in December 2023. Therefore, all detections of 1,2,4-TMB in the December 2023 samples are considered estimated. A trip blank accompanied the samples for all 3 events and VOCs were not detected.

Six laboratory reports with R2 Level II elements (minimum data documentation requirements) were provided in Appendix C, and Office of Land Quality Chemistry Program could verify groundwater results summarized on Tables 1, 2, and 3 and shown on Figures 5 and 6. The analytical methods were acceptable for monitoring. The laboratory flagged the October 2023 total xylenes result (6,760 micrograms per liter (µg/L)) for LMW-5 as estimated; otherwise, no other significant qualifications to the results were noted in the laboratory reports. Site-specific matrix spike/matrix spike duplicate (MS/MSD) results for VOC analyses were not included in the laboratory reports, and Chemistry could not evaluate potential matrix interference in VOC results. Future *Remediation Progress Reports* should include results for site-specific MS/MSDs. Results for PCE, TCE, cis-1,2-DCE, 1,1,1-TCA, VC, naphthalene, benzene, ethylbenzene, toluene, total xylenes, 1,2,4-TMB, and 1,3,5-TMB exceeded R2 GWPLs for one or more wells.

In Section 6, LDI provided lines of evidence (LOEs) indicating that additional vapor intrusion evaluation at the on-Site and off-Site buildings is not necessary. IDEM considers this conclusion to be premature. LDI should provide further LOEs or conduct winter worst case sampling at Buildings 3 and 4 and summer worst case sampling at off-site Harbor Shores Condominium Units A and B. IDEM continues to recommend these actions to further evaluate the vapor intrusion pathway.

In Section 7, LDI discussed plans to “continue to perform monitoring well groundwater sampling to evaluate the response to the injection activities in accordance with the approved *Revised RWP* (see *Revised Remediation Work Plan*, VFC # 83319695 and approval VFC# 83349854).” The groundwater sampling and analysis data in the *RPR* was acceptable overall and therefore, IDEM generally agrees with this recommendation. As noted above, results for site-specific MS/MSDs should be included in future reports. Also, LDI should address recommendations for demonstrating plume stability as LOE towards closure.

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Continued groundwater monitoring is required to demonstrate plume stability. If you have any questions or comments, please contact me at 317/234-0434.

Sincerely,

Dawn M. Groves

Dawn M. Groves
Hazardous Waste Permit Section
Office of Land Quality

ec: IDEM Northern Regional Office
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