



August 16, 2019

Ms. Allison Smith, Ph.D.
Brownfields Program Manager
Office of Advanced Planning and Sustainability
Louisville Metro Government
444 S. 5th Street, Suite 600
Louisville, KY 40202

Email: allison.smith@louisvilleky.gov
Phone (502) 574-1569

Re: Remediation Cost Alternatives
Former Rhodia Facility
1495 S. 11th Street
Louisville, KY
ATC Project No. LOUEN19038

Dear Ms. Smith:

ATC Group Services LLC (ATC) is pleased to provide this remediation cost alternatives to Louisville Metro Government (Client) at the above referenced property located (Property).

The following alternatives, outlined below, are based on the latest groundwater monitoring reports and site characterization reports provided to us. Soil investigation information is over 15 years old, and may not reflect current site conditions. Additional site characterization may be required and would add costs beyond what is estimated below. The estimated costs for each alternative are provided for planning purposes only, and should not be considered final and do not reflect a specific, adequately developed scope of work. The remediation alternatives are in consideration of achieving clean closure (to meet the most stringent residential regulatory standards). Costs would likely be reduced if commercial/industrial closure options are considered.

Groundwater Remediation Alternatives:

- **No Action:** On-going groundwater monitoring appears to indicate that natural attenuation may be occurring for contaminants of concern (COCs). However, due to the unknown timeframe by which natural attenuation will eventually reduce the COCs to below regulatory levels, this is not considered an effective option for groundwater remediation. **Cost = \$0.**
- **In-situ Injection of an Activated Carbon Solution:** An activated carbon solution, which would remove hydrocarbons from the groundwater by adsorption, would also stimulate biodegradation by introducing electron acceptors. This option would likely include the

installation of over 100 injection points into the groundwater to inject the selected activated carbon solution into the groundwater across two treatment zones. Subsequent groundwater monitoring on a quarterly basis would be required, typically until the site achieves four consecutive quarters of sample results below the regulatory levels. **Estimated cost = \$290,000 – \$400,000.**

- Pump & Treat: Conventional groundwater pumping and treatment technology has proven to be effective in removing and containing dissolved hydrocarbons in groundwater. This is accomplished by establishing a groundwater capture zone, typically requiring a series of recovery wells or trenches. In addition to removing and containing the dissolved hydrocarbons, groundwater pump and treatment systems also remediate hydrocarbons in the saturated soil and groundwater via extraction. Through groundwater pumping, groundwater flow is induced in the direction of the recovery wells or trenches. As groundwater flows toward the wells, hydrocarbons adsorbed to the saturated soil particles will desorb into the captured groundwater, which is then pumped to the surface for treatment. This remedial technique typically operates for a longer period of time than other remedial options because the hydrocarbons must be drawn through the subsurface to recovery wells. In some instances, the effectiveness of conventional groundwater pumping and treatment can be limited as the rate of desorption may be relatively slow. Based on known site conditions, this remedial approach may be a technically feasible option for this site (dependent upon pilot testing, permitting, and/or further investigation). **Estimated cost = \$850,000 - \$1,000,000.**

Soil Remediation Alternatives:

- No Action: This alternative would not be effective in meeting the goals of cleanup to residential standards.
- Focused Excavation: The 4 identified impacted areas determined by previous site investigations could be excavated and disposed of at an approved landfill facility. While this option would be the fastest methodology to achieve clean-up to residential standards, it would be the most expensive and would rely upon confirmation sampling and in-the-field delineation of impacted soils may be beyond what has been represented in previous site reports. Based on the previously identified impacted areas (which may require additional assessment), 105,000 tons is estimated to be excavated/disposed. **Estimated cost = \$6,900,000 to \$9,200,000.**
- Cap/Leave in Place: Capping the soil impacted areas could be an effective option to eliminate human direct contact, but not as effective to prevent contact for commercial/construction workers. This may not be effective for preventing vapor intrusion concerns to existing and/or planned buildings constructed on the site. Vapor mitigation options would need to be considered with this option if buildings/structures are to be constructed on site. Proposed construction would also require an evaluation of the location of the capped areas. This option would also require a regulatory environmental restrictive covenant (ERC), an institutional control (attached to the property deed) that could restrict



residential use of the property and require annual inspections. If the site is anticipated to be used for residential purposes, then this option may not be the best alternative. **Estimated cost = \$350,000 – \$600,000**

Thank you for the opportunity to be of service to you on this project. If you have any questions or require further information, please email or call the undersigned.

Sincerely,

ATC GROUP SERVICES LLC

A handwritten signature in blue ink that reads 'John A. Case'.

John Case, CHMM
Project Geologist
502.710.0257
john.case@atcgs.com