MEMORANDUM

DATE: 16 March 2026

TO: Stakeholders of the Olin Six Lakes Site, Hamden, CT

FROM: Gaboury Benoit, PhD

SUBJECT: Analysis of December 2025 Site Investigation Report (WSP/Olin) – Six Lakes Site

Purpose

This memorandum provides a detailed assessment of the December 2025 Site Investigation Report prepared by WSP on behalf of Olin for the Six Lakes (Pine Swamp) site in Hamden, Connecticut. The intent is to evaluate both the substance and implications of the report in light of the goals of ensuring thorough remediation and supporting appropriate future use of the property.

This review focuses on several key questions: what the latest report reveals about the nature and extent of contamination at the site; the adequacy and quality of the investigative work performed; remaining gaps or uncertainties; recommended next steps; and the implications of current findings for future site use. The goal is not simply to summarize the report, but to interpret its findings in a way that is useful for decision-making by stakeholders, especially the Six Lakes Park Coalition.

General Comments

The 2025 Site Investigation Report represents a meaningful and substantive advancement over prior work conducted at the Six Lakes site. The document is well organized, clearly written, and supported by extensive figures, tables, and appendices. The breadth of investigation—encompassing soil, groundwater, surface water, and infrastructure—reflects a serious and generally appropriate effort to characterize site conditions.

Missing is a summary whose details fall between the narrative of Section 4 and the endless tables of non-detects found in the full 1000+ page report.

Olin, working through WSP, continues to operate as a credible and good-faith actor in this process. The methods employed are consistent with accepted scientific and engineering standards, and the scope of work reflects a logical progression from earlier investigations. In particular, the addition of surface water sampling and the expansion of investigation into Potential Release Areas represent important improvements.

At the same time, the report also makes clear that the site is more complex than a simple collection of discrete contaminated areas. The emerging picture is of a heterogeneous and

interconnected system in which multiple contaminant sources, transport pathways, and external influences interact. This complexity introduces challenges that are not fully resolved by the current investigative approach, particularly where that approach remains focused on predefined Areas of Concern rather than the site as a whole.

Specific Comments

Section 1 is largely a review of material presented in past reports, especially a summary of descriptive information about the seven AOCs.

Section 2 repeats information from past reports that describes the site and its physical and community setting. The descriptions are clear and do present some new information. It would be good if Section 2.2.2 reconciled the idea of there being either 5 or 6 lakes or ponds on the site, especially as the latter is how it is referred to by the interested community group. This difference arises because of a small wetland area between Ponds A and C that sometimes is inundated but is not counted as a pond in this report.

Some new information about hydrogeology is presented in section 2.2.3, specifically groundwater flow data and estimates. There is an opportunity to greatly increase understanding in this matter based on surface water monitoring as will be described below.

(Section 2.2.5 continues to erroneously refer to the Whitney Dam as "Goose Dam", a name not used by stakeholders such as the Regional Water Authority who operate it, or members of the Mill River Watershed Association.)

Section 3 describes new analyses performed as part of the 2025 site investigation. These include Soil Investigations (section 3.1), Groundwater Investigations (section 3.2), Surface Water Investigations (section 3.3), and Infrastructure Investigations (section 3.4). Section 3 describes sampling and does not present the results, something which is done in Section 4.

> It is notable that for soils, QAQC duplicates have been increased from 1 in 20 to 1 in 10 samples an improvement that was recommended in our last report.
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> A significant addition to the soil analyses has been inclusion of radiological analyses. These tests were triggered by a historical report of uncertain reliability suggesting that radioactive materials may have been present. I will discuss below.

Section 4 concisely summarizes the results of the latest site investigation (i.e., measurements conducted in 2025). It covers soils (4.1), groundwater (4.2), and surface water (4.3).

> Of special interest were precautionary measurements of potential radiological materials for three bunkers. Findings were negative with levels consistent with the absence of any contamination. The report mentions detection of ^{137}Cs, which was produced in the course of atomic weapons testing in the 1950s and 60s. This radionuclide was spread globally through the atmosphere and can be found at very low levels in virtually any soil. Its detection here is testimony to the sensitivity of the

analysis and does not indicate contamination of the site. Similarly, ^{238}U that was detected occurs naturally and does not indicate contamination. Another form of uranium (^{235}U) is also natural but much less abundant than ^{238}U and was not detected.

Surface waters were found to have low levels of metals, VOCs, SVOCs, and ETPH, and concentrations fell below drinking water standards. This is an important finding considering that these ponds are hydrologically connected to the site's groundwaters, many of which show signs of contamination. Low levels of contaminants in the pond waters may indicate both the natural self-cleansing capacity of the site as well as the sampling regime. Specifically, the grab samples collected inadequately characterize the probably highly variable conditions that exist in surface waters compared to soils and groundwater. Many more pond samples should be collected under varying seasonal and weather conditions to better understand temporal variations.

Overview of Key Findings

The site's historical use as a firearms-related industrial property, including burning, disposal, and storage of various waste materials, has resulted in a wide range of contaminants distributed across multiple areas. These include metals, volatile and semi-volatile organic compounds, polychlorinated biphenyls, and petroleum hydrocarbons. The diversity of contaminants reflects the varied nature of historical site activities.

A key finding of the report is that all seven designated Areas of Concern contain contamination exceeding Connecticut regulatory criteria in at least some portions. While this was known previously, the current investigation provides a more refined understanding of the extent and distribution of these contaminants. Importantly, contamination is not uniformly distributed. Instead, it is spatially complex, with "hot spots" and gradients that vary both horizontally and with depth.

The Battery Waste Area, for example, contains fill material extending to significant depths, with associated metal contamination. Other areas, such as the Anixter Area, show contamination more characteristic of chemical disposal in native soils. These differences underscore the potential need for area-specific remediation strategies.

Another major advancement in this report is the improved understanding of the site's hydrology. The interconnected system of ponds and groundwater flow paths means that contaminants are not confined to their original disposal locations. Groundwater movement toward surface water bodies, and the ultimate connection to Lake Whitney, elevates the importance of even relatively low-level contamination.

The report also highlights the significant role of stormwater inputs from surrounding developed areas. With hundreds of acres of urban and suburban land draining into the site, there is a substantial and ongoing influx of water and associated contaminants. This complicates the interpretation of site data, as it becomes difficult to distinguish between contamination originating on-site and that introduced from off-site sources. Nevertheless,

these offsite sources should not obscure the mostly local identity of contamination. Still and extensive campaign of measurements of contaminants and their fluxes is warranted.

Finally, the report confirms that infrastructure limitations, particularly degraded bridges and access roads, continue to constrain the investigation. As a result, portions of the site remain under-characterized, introducing uncertainty into the overall assessment.

Evaluation of Investigation Quality

The technical quality of the investigation is generally high. Sampling methods, laboratory analyses, and quality assurance procedures are consistent with standard practice. The number of soil borings and monitoring wells reflects a significant investment in data collection, and the iterative nature of the investigation, where findings from earlier phases inform later work is appropriate.

The conceptual site models presented for each Area of Concern are useful and represent a mature understanding of those areas individually. However, the investigation still tends to treat these areas somewhat in isolation. There is less emphasis on integrating these models into a comprehensive understanding of the site as a single, connected system.

Quality assurance and quality control procedures are adequate, though there is room for improvement. Increasing the frequency of duplicate and blank samples, and providing clearer summaries of QA/QC results, would strengthen confidence in the data.

Overall, the work can be considered consistent with scientific and engineering norms and represents good practice. The limitations that remain are less about execution and more about presentation

Key Gaps and Remaining Uncertainties

Despite the progress reflected in the report, several important gaps remain. One of the most significant is incomplete spatial coverage. Areas of the site that are currently inaccessible by heavy equipment have barely been investigated yet may contain previously unrecognized contamination or serve as pathways for contaminant migration. Just as importantly, they may be relatively uncontaminated opening the possibility for human uses.

There is also essentially no effort to establish background conditions. Without a clear understanding of what constitutes natural or regional baseline levels of contaminants, it is difficult to interpret the significance of measured concentrations, particularly in areas influenced by stormwater inputs. This sampling and analysis need not be extensive but is important. Background samples should be collected from similar nearby locations (in terms of soils, geology, groundwater, etc.) that are known to be uncontaminated. Good candidates exist.

The role of off-site contamination remains insufficiently resolved. While the report acknowledges stormwater as a potential source of contaminants, it does not provide a quantitative assessment of its contribution relative to on-site sources. This is an important issue, both for understanding current conditions and for assigning responsibility.

Surface water dynamics are another area where additional work would be beneficial. The current sampling program provides useful snapshots but does not capture temporal variability, such as changes during storm events or seasonal fluctuations. Nor does it reveal vertical variations, which can be large even in shallow ponds.

It is potentially very useful that flow out from the ponds is controlled by individual weirs. This affords an opportunity to quantify flows based on continuous inexpensive monitoring of water depth. Weirs could also be retrofitted with V notches, which would make even low flows measurable reliably. With such data it would be easy to understand water fluxes throughout the site including inferences that could be made about groundwater flows.

Recommendations

Future work should build on the strong foundation established by the current report while addressing its limitations. **Investigation should be expanded beyond the predefined Areas of Concern** to include reconnaissance of areas with no known history of disposal, in order to establish background conditions, better understand contaminant migration, and begin to assess parts of the site where contamination is expected to be lower. This is especially important as these other areas are the ones where human use seems like a realistic possibility.

Evaluation of stormwater inputs is needed, including measurement of both flow volumes and contaminant concentrations. This would allow for a clearer distinction between on-site and off-site sources of contamination.

Surface water monitoring should be enhanced to include both storm-event sampling and baseflow sampling after extended dry antecedent periods, as well as vertical profiling in selected ponds. Measurement of further parameters should be added that would elucidate how the ponds function chemically and hydrologically. These could include nutrients (P, N forms), dissolved oxygen, suspended solids, and abundant anions (Cl^-, HCO_3^-, and SO_4^{2-}) and cations (Na^+, K^+, Ca^{2+}, and Mg^{2+}). These measures would provide a more complete picture of contaminant transport within the aquatic system.

Related to this, very inexpensive continuous monitoring of pond water depths combined with existing weirs would yield enormously valuable information about water flows through the system.

Resolving access limitations is essential. Repairing or replacing critical infrastructure such as bridges will enable investigation of currently inaccessible areas and improve the overall completeness of the site characterization. However, manual sampling can begin before

infrastructure upgrades are completed and should be initiated to begin to close this critical knowledge gap.

Quality assurance procedures should include clearer summaries of QA/QC results. This has been recommended previously but remains incomplete. Finally, consideration should be given to establishing a long-term monitoring framework that tracks changes in site conditions over time, rather than relying solely on discrete sampling events.

Future reports should make an effort to better summarize results.

Implications for Future Site Use

The findings of the report have important implications for the future use of the site. Given the presence of widespread and in some cases significant contamination, unrestricted residential development is not currently a realistic option without extensive remediation.

More plausible near-term uses include passive open space or conservation-oriented uses, potentially combined with controlled recreational access. Such uses would need to be carefully designed to minimize exposure risks and would likely require institutional controls and ongoing monitoring.

The site's hydrologic connection to a drinking water resource further underscores the need for a cautious and protective approach. Any future use must be compatible with the long-term protection of surface water quality.

Ultimately, the suitability of the site for various uses will depend on the extent and effectiveness of remediation efforts, as well as the level of residual risk deemed acceptable by regulators and the community.

Conclusion

The December 2025 Site Investigation Report represents a strong and credible step forward in understanding the Six Lakes site. It confirms that contamination is widespread and complex, and it provides an improved basis for decision-making.

At the same time, it highlights the need to move beyond a narrow focus on individual Areas of Concern and even PRAs toward a more integrated, system-level understanding of the site. Addressing remaining gaps—particularly those related to (1) spatial coverage, (2) stormwater inputs, and (3) background conditions—will be critical in the next phase of work.

Perhaps most important is to begin to assess conditions in the northern part of the property. Hand sampling can begin before bridges are repaired that would allow egress for heavier equipment.

With these improvements, the investigation can support not only effective remediation, but also thoughtful planning for the site's future use in a way that could serve both environmental and community interests.