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Commingled Plumes, Downgradient Property Status and Privatized Cleanup Programs: Lessons Learned from Two Decades of Practice

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Background/Objectives. Groundwater contamination is widespread in historical industrial and urban areas. Often, investigators have found that plumes of groundwater contamination travel long distances and cross multiple property boundaries. Frequently, plumes from separate sources can intersect each other and result in commingled plumes. When regulatory compliance is overseen by a private licensed professional such as in MA, NJ or CT, many complicated issues arise in these types of multiple source, multiple owner scenarios. Further, in MA, liability for groundwater contamination and cleanup is Joint & Several, where if you own the property, you own the cleanup responsibility. Relief from remediation costs and liability via a Downgradient Property Status (DPS) regulatory filing may be available to the property owner if there is no source on their property, the contamination originates on someone else's land and has migrated in or on groundwater to their property, and there are no current acute risks to receptors. However, in many instances there are conflicting data regarding sources and groundwater flow direction. The objectives of this study are to review the records and lessons learned from two decades of filings in the MA semi-privatized cleanup program including groundwater evaluations regarding downgradient and commingled plumes and their on- and off-site sources of contamination. Lessons learned from use of both traditional groundwater and innovative technical approaches employed (e.g. compound specific isotope analysis-CSIA) and the effectiveness of documentation and professional judgments applied to establish liability protection are explored.

Approach/Activities. The number of such DPS filings was determined, the status of the filings described, and the number of cases actively reviewed by the agency documented. A review of the available records regarding agency audit and action with respect to DPS filings with particular attention to the last 5 years was performed. There are 893 cases in MA with DPS Status. There are 18 cases with DPS Terminated status. MassDEP indicates they screen or audit all DPS filings. Approximately 35 full audits have been conducted recently. Issues regarding the technical merits and the regulatory adequacy of filings are described. Further, this paper will describe the role of the licensed professional within the framework of filing DPS, and technical challenges to understanding and demonstrating both DPS and commingled plumes.

Results/Lessons Learned. Review of the status of DPS/commingled groundwater plumes in MA indicates a variety of outcomes are achieved. Most cases are accepted. In some cases, adequate data have not been demonstrated to show DPS and the agency rejects the filing. In other cases, sensitive receptors (i.e. VI) have not been adequately assessed or addressed to justify the underpinnings of the filing (no hazards to current receptors). In a few cases, the DPS filing led to active source/site discovery actions by MassDEP. Several important factors emerge from inspection of agency review of these cases: (1) carefully evaluate and rule out potential on-site sources. Typically, on-site testing is needed to rule out potential on-site sources. (2) review area historical records and determine the groundwater flow direction at the property to establish up gradient potential contribution areas and candidates for sources; and (3) accurately demonstrate the migration of oil or hazardous materials in or on groundwater onto the property. Further, innovative advanced microbiological techniques such as CSIA are becoming more widely employed to assert commingled plume identification and source identification.