

**Summary and Response to Public Comments
Supplemental Investigation Work Plan and Quality Assurance Project Plan
Non-Public Properties Study Area
Hamden, Connecticut**

April 22, 2004

The Remediation Section of the Bureau of Waste Management asked for public comments on the proposed "Supplemental Investigation Work Plan, Non-Public Properties [mostly residential] Study Area, Hamden, Connecticut," prepared for Olin Corporation by Malcolm Pirnie, Inc., between January 22, 2004 and March 15, 2004. Two public meetings were held for the public to learn about the proposed Work Plan and ask questions. Copies of the Work Plan were available for public review at the Department of Environmental Protection's office in Hartford, the Miller Library and the Whitneyville Branch Library in Hamden, and at the project's website. During this time period, in addition to comments made at the public meetings, the Department received three written comment documents on the proposed Work Plan. The Department's response to the written public comments is summarized below.

In general, the Department believes that the proposed Work Plan is comprehensive. However, depending on the results of the investigation, additional testing in the Non-Public Properties study area may be necessary.

Comment 1: Has asbestos been discovered in any of the waste materials?

Response 1: To date, asbestos or suspect asbestos-containing materials have not been discovered in the waste materials in the Non-Public Properties Study Area. However, if such debris or materials are encountered in waste materials during the investigation, the Department is requiring these materials to be tested for the presence of asbestos.

Comment 2: Has methane been detected in areas where municipal landfill activities occurred?

Response 2: Testing for methane has been done at the Hamden Middle School and some private residences. Methane was detected beneath the solid concrete floor of the boiler room at the school. However, it is unclear whether the methane came from landfill waste or from fuel oil that may have leaked from the nearby underground storage tank. Indoor air samples have been collected from the basements of approximately twenty residences that are known to have been built on municipal landfill waste at the site. Methane was not detected in the indoor air at any of these residences.

Comment 3: Additional areas, beyond locations where pesticides or PCBs are detected, should be randomly sampled for the presence of dioxins and furans.

Response 3: The Department does not believe that random sampling for dioxins and furans is necessary. The Department believes the most useful analytical data for dioxins and furans would be obtained from fill samples showing evidence of burning where pesticides, PCBs or chlorinated solvents have been found that would have possibly allowed for dioxins and furans to form.

Comment 4: The timeframe for accomplishing the investigation proposed in the Work Plan should be shortened from 11 months to 6 months.

Response 4: The Department recognizes the frustration of area residents and the need to complete the investigation and remediation of the site as quickly as possible. After carefully examining the proposed schedule, the Department believes the time period proposed is the shortest in which the proposed work can reasonably be accomplished, given the number of samples and amount of data to be collected.

Comment 5: Are state standards for essential metals adequately protective of human health for individuals with sensitivities?

Response 5: The standards listed in the DEP's Remediation Standard Regulations were developed in conjunction with the Department of Public Health to protect both human health and the environment. The health protective standards, the residential direct exposure criteria for soils and the residential volatilization criteria for groundwater, are designed to be protective of the most sensitive individuals who may be exposed (usually children).

Comment 6: How are standards developed for chemicals not specifically listed in the Remediation Standard Regulations?

Response 6: Scientists and engineers develop criteria for unlisted chemicals by using mathematical formulas found in the Remediation Standard Regulations. These are the same formulas that the Department of Public Health used to develop existing human health protective criteria for DEP. Once new criteria for the unlisted chemicals are developed, they are reviewed by the Department of Public Health and DEP. The Department of Public Health will then confirm that the new standard that has been proposed is protective of human health.

Comment 7: It is not clear from the Work Plan exactly where sampling will take place to determine the perimeter edge of the landfill. Additional detail is requested.

Response 7: The Department believes that the conceptual approach proposed by Olin to determine the edge of known landfill areas is appropriate and adequate given the nature of the site. Exact sample locations will be determined with each property owner in the field and will vary from property to property depending on site conditions, including the presence of sheds, playground equipment, automobiles, and buried utilities. Any reports of waste or bare soil spots that may have been noted by the property owner or the Olin representative at the time of the site visit will also be considered in deciding where to sample. Many of these decisions, of necessity, will be made in the field and with each property owner's input.

Comment 8: For the edge of fill investigation, the Work Plan should be revised to definitively state that a minimum of three borings will be placed along each transect (at intervals of as close to 20 feet as possible), and that all transects will be advanced outward until undisturbed native soil is encountered.

Response 8: The Work Plan states that a minimum of three borings is envisioned along each transect to determine the edge of fill. The objective is to determine the extent of fill materials within 20 feet by using repeated borings to locate undisturbed, native soil. The Department sees no technical reason to specify that at least three borings must be used if the edge of fill can adequately be determined with fewer sample locations.

Comment 9: For the edge of fill investigation, the number of samples proposed for laboratory analysis is insufficient. Considering the assumed variability and heterogeneity of the fill, there is not a sufficient number of samples to verify that the soil beyond the limits of the fill has not been impacted by leaching or other forms of migration from the filled area. A minimum of one soil sample should be collected from outside the fill area from each transect, and should be analyzed for the parameters specified in Section 3.2.1.1. of the Work Plan.

Response 9: The Department believes that the number of samples proposed for laboratory analysis to determine the horizontal edge of fill is sufficient. Although pollutants can move vertically or downward with rain, they cannot migrate horizontally. Therefore native soil beyond the edge of former landfill would not be affected by leaching pollutants. Because pollutants will not move horizontally, the heterogeneity of the fill is not important. The laboratory analysis proposed on undisturbed, native soil samples is for confirmation only, since the edge of fill will be determined primarily through visual observations of borings. Nonetheless, the Department will require field screening for metals using X-ray fluorescence at the end boring location of each transect, in addition to the laboratory confirmation analysis proposed for native soil samples from 38 of the 115 planned transects.

Comment 10. The Work Plan does not include the collection of surficial soil samples from above the fill and does not propose the collection or analysis of representative fill samples. Both representative fill samples and surface soil samples should be collected for laboratory analysis at a minimum frequency of one sample of each media from each property on which, or adjacent to properties on which, the presence of fill is indicated by visual inspection of boring samples, field screening analyses and/or other testing data that may be available, or where the presence of fill is inferred, suspected or known to be present based on data gathered during previous investigations.

Response 10. The Work Plan **does** include provisions for the collection and analysis of 26 fill samples and 14 native soil samples from 14 locations where ground water monitoring wells will be installed in known fill areas (see Section 3.2.1.3 of the Work Plan). This new data will supplement the already extensive data characterizing the fill material previously obtained from at least 275 samples collected from approximately 200 locations by the Department and Olin.

The Department does not believe that sampling surficial soil above areas where fill has already been identified at depth serves a useful purpose. If fill is present, it will have to be remediated. Surficial sampling of materials overlying the fill does not further our understanding of the fill or affect the development of a remedial action plan.

However, the Department is concerned about potential exposure to bare soil areas overlying known fill areas that may be polluted and wants to ensure that these areas do not pose a risk to residents in the short term until a final remedy is implemented. The Department of Public Health has also recommended that bare soil areas be assessed to determine if contaminants are present in surface soils that may present a health risk to residents. The Work Plan does contain provisions to locate and assess the presence of bare soil areas within the study area, including those areas where known landfill areas have been identified.

Comment 11: The scope of work proposed in the potential isolated fill areas provides neither sufficient borings, nor sufficient sample analyses, to adequately delineate or characterize the extent, magnitude or nature of fill in these areas. The scope of investigation should be expanded to include a minimum of one boring on each residential property and laboratory analysis on a minimum of one representative fill sample (where the presence of fill is indicated by field investigation or inferred from other data) and one surficial soil sample from each property. At each location where the presence of fill is indicated by field investigation or inferred from other data, the extent of fill should be delineated by a series of borings on radial transects in a manner similar to that proposed for properties adjoining the previously identified contiguous fill areas.

Response 11: The Work Plan proposes an iterative process for the evaluation of potential isolated fill areas that may result in additional investigation beyond what is initially proposed in the Work Plan. The locations proposed for initial sampling are based on review of historic aerial photographs, historic accounts of site conditions, and anecdotal reports as well the results of soil sampling previously completed by the Department. The Department anticipates that a second round of sampling to determine the extent of isolated fill areas will be required and can most likely be completed within the same time frame, depending on the initial test results.

Comment 12: The Work Plan does not appear to contain provisions to provide advance notice of boring locations or copies of analytical results or other data directly to the property owner. The plan should require that each property owner be provided with a map of anticipated boring locations before access is sought and should require that property owners be provided with copies of all field data summaries, field screening data and/or analytical reports pertaining to borings or samples collected on their property. This information should be provided within 30 days of the completion of all quality assurance/quality control data validation, and should not be contingent upon completion of the entire study area or the issuance of a final report.

Response 12: Actual boring locations will be determined in the field with each property owner and Olin representative. This is necessary to work around outdoor structures such as sheds and playground equipment, automobiles, buried utilities, and to include areas of reported waste or bare soil spots that may be noted at the time of the site visit. Many of these decisions, of necessity, will be made in the field and with each property owner's input. Therefore, it is impractical to provide a map of anticipated boring locations in advance of seeking access from each property owner.

The Department will require Olin to provide copies of field screening and laboratory analytical data to each property owner within 30 days of completion of data validation procedures.

Response to Comments About Areas Outside Consent Order

The Department received several comments regarding investigative activity in residential areas located outside of the Non-Public Properties boundary established by Consent Order No. SRD-128. The Department's response to public comments is summarized below.

Comment 1: Please provide information on DEP's sampling beyond the study area boundary.

Response 1: Information regarding the Department's plan for investigating areas lying outside of the Consent Order boundary will be provided to the public at a later date when plans are finalized.

Comment 2: All properties within the area designated "Extent of Filled Area" on the attached Exhibit that are not part of the previously identified "Contiguous Fill Areas", should be considered potential isolated fill locations unless and until proven otherwise by actual field investigation. The investigation of isolated fill areas should include all properties designated as being within the extent of the filled area on the attached Exhibit, rather than being limited to the Non-Public Properties designated in the Work Plan.

Response 12: Many of the areas delineated on the Exhibit accompanying this request are located east, north, or west of the Consent Order boundary and will not be included in the investigation conducted by Olin Corporation. The Department will conduct any investigation beyond the established boundary where necessary and appropriate.

Comment 3: Requests were made to conduct surface and subsurface sampling and analysis on all properties within the project area defined by Consent Order No. SRD-128 and a list of specific properties provided to DEP.

Response 3: The Department believes that it is not technically necessary to sample every property located within the Non-Public Properties study area to determine the extent of the landfill materials and degree of contamination in order to develop a remedial action plan.

Of the specific properties included in the second request, 9 of the 30 properties listed are located outside of the Non-Public Properties study area and will not be included in the investigation Olin is required to complete. Of the remaining 21 properties located within the study area, the Department, the US Environmental Protection Agency, or Olin has previously sampled at least 16 of the properties listed.