

**Exposure Point Concentration Guidance for Discrete Sampling  
Case Study 1: Pesticides in Soil**

ATSDR received a petition from a citizen in a rural community regarding an elementary school recently constructed over a former crop-dusting airport active through the 1970s. The petitioner asked ATSDR to investigate the elementary school property for potential contamination. ATSDR accepted the petition and worked with state agencies to address the community's environmental health concerns.

The elementary school students use almost the entire school grounds as play areas, and members of the community use the school yard for various activities. A health assessor assigned the entire school campus as an exposure unit. During a recent environmental investigation, ten soil samples were collected across the school campus from 0 to 3 inches below ground surface (bgs) and tested for a suite of pesticides. At this hypothetical site, dieldrin, a persistent insecticide, was detected in all samples at levels shown in Table 1. ATSDR minimal risk levels (MRLs) for dieldrin are available for intermediate and chronic duration oral exposures and were chosen as comparison values by the health assessor.

Table 1  
Environmental Sampling Data for Dieldrin<sup>1</sup>

Sample ID	Result (mg/kg)
Sample 1	0.11
Sample 2	1.5
Sample 3	4.5
Sample 4	5.0
Sample 5	0.66
Sample 6	0.83
Sample 7	3.5
Sample 8	1.6
Sample 9	1.5
Sample 10	3.1

Review the data provided above and answer the following questions.

- 1) What EPC statistic should the health assessor select for determining intermediate and chronic duration exposure at this site? Identify the criteria considered for making your selection.
- 2) Calculate the appropriate EPC identified in Question 1.

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<sup>1</sup> NOTE: All sampling data provided are for a hypothetical site. Assume that the sampling data are of a known and high quality and are representative of actual exposure concentrations.

### Case Study 2: Vinyl Chloride in Air

ATSDR received a petition from a state agency to assist in evaluating environmental health concerns of a residential community located near a manufacturing facility. The community members have previously complained of odors in the summer resembling that of volatile organic compounds (VOCs). ATSDR accepted the state's request to assist in evaluating their environmental monitoring data.

The nearest residences are in a housing complex 1000 feet from the plant boundary. A health assessor assigned the housing complex property as an exposure unit. An ambient air monitoring station was installed at the housing complex, and 24-hour air monitoring samples were collected every three days from June through August. For every fifth sampling event, a co-located sample was collected as a means of quality control. At this hypothetical site, vinyl chloride, a VOC, was identified as a contaminant of concern. Measurements are shown in Table 1. ATSDR minimal risk levels (MRLs) for vinyl chloride are available for acute, intermediate, and chronic-duration inhalation exposures. The health assessor has already determined that acute exposures do not pose a risk to health, and that intermediate duration exposure are of concern given the presence of odors only during summer months.

Table 1  
 Environmental Sampling Data for Vinyl Chloride<sup>2</sup>

Sample ID	Result (µg/m <sup>3</sup> )	Sample ID	Result (µg/m <sup>3</sup> )	Sample ID	Result (µg/m <sup>3</sup> )
Sample 1a	0.42	Sample 11a	0.32	Sample 21a	0.15
Sample 1b	0.45	Sample 11b	0.51	Sample 21b	0.11
Sample 2	0.29	Sample 12	< 0.01	Sample 22	0.19
Sample 3	< 0.01	Sample 13	0.66	Sample 23	0.06
Sample 4	1.02	Sample 14	0.15	Sample 24	0.81
Sample 5	0.12	Sample 15	0.35	Sample 25	0.04
Sample 6a	7.57	Sample 16	0.35	Sample 26a	0.02
Sample 6b	9.1	Sample 16b	0.43	Sample 26b	0.08
Sample 7	0.45	Sample 17	< 0.01	Sample 27	0.79
Sample 8	0.89	Sample 18	0.06	Sample 28	0.09
Sample 9	0.07	Sample 19	0.36	Sample 29	0.61
Sample 10	< 0.01	Sample 20	0.04	Sample 30	1.52

Review the data provided above and answer the following questions.

- 1) What EPC statistic should the health assessor select for determining intermediate duration exposure at this site? Identify the criteria considered for making your selection.
- 2) Calculate the appropriate EPC identified in Question 1.

<sup>2</sup> NOTE: All sampling data provided are for a hypothetical site. Assume that the sampling data are of a known and high quality and are representative of actual exposure concentrations.