SECTION 4

Presentation of Remedial Options

As presented in Section 3, sufficient data is available to generally characterize the nature of methane generation, release and migration, to suggest the need to control methane migration from the landfill, and to develop general approaches for options that will lead to successful mitigation of methane at Landfill 26. Additional data are required to provide more certainty regarding the technical basis for placement and design of any remedial measures. Additional data needs are described in Section 6.

This section presents the range of options considered to address methane found to be migrating at Landfill 26. In this section the components of each option, as conceptualized at this time, are presented and are briefly described in Table 4-1. Section 5 presents more-detailed information on the components of the conceptual options, as well as an evaluation of each option, including effectiveness, cost, and application uncertainty.

To understand the appropriateness and benefits of each option, the intended function of each option is identified in Table 4-1. Function refers to how the option will monitor and/or mitigate the potential for methane to generate, accumulate, and migrate from Landfill 26 and reach receptors. For example:

- **Options that address generation/accumulation** are intended to identify the location and to mitigate and/or monitor the magnitude of landfill gas generated within the landfill, or beneath the RCRA cap.
- **Options that address release** are intended to mitigate and/or monitor the point or seasonal time at which landfill gas transfers from a given location at the landfill and enters the buffer zone surrounding the landfill.
- **Options that address transport** are intended to mitigate and/or monitor the presence, migration, seasonal trends, and aerobic degradation of methane in the buffer zone, once it has been released from the landfill.
- **Options that address receptor protection** are intended to mitigate and/or monitor risks of methane accumulation near points of human contact.

The basic components of each option evaluated and the function they are designed to address are summarized in Table 4-1. In addition to the options summarized in Table 4-1, conceptual approaches were considered for two other options but were dropped from final consideration. One option included monitoring combined with a single-intervention active remedial extraction system. During the screening evaluation of options, this option was dropped from further consideration because:

- It was expected that sufficient quantities of methane would not be available to operate this system, even for a short period of time.

- This option would not provide long-term mitigation or control of methane migration, because methane could still be generated, even in smaller quantities, following the single intervention.
- The one-time costs for implementing this option could not be justified.

The second option consisted of installing an impermeable barrier trench along the Shea Homes / buffer zone property boundary. During the screening evaluation of options, this option was dropped from further consideration because:

- An impermeable trench that extends into groundwater may significantly impede groundwater flow. Drainage problem and localized flooding in the Shea Homes development could result.
- The impermeable trench would not treat methane.
- The impermeable trench may cause methane to migrate in unintended directions.
- If installed in conjunction with an active or passive venting system, the impermeable trench could prevent the venting system from treating methane beyond the impermeable layer (i.e. on residential property).

TABLE 4-1
Summary of Remedial Options and Their Intended Function

Remedial Option Concept	Intended Function			
	Generation/ Accumulation	**Release**	**Transport**	**Receptor Protection**
1. Continue Landfill Gas Probe Monitoring Continue annual landfill gas probe monitoring of GMP-1 to GMP-23, in accordance with *Final Work Plan for Landfill Monitoring Program,* as amended . Perform additional monitoring of GMP-5 to GMP-13 and 15 additional probes to be installed in 2001.		Monitors	Monitors	Monitors
2. Monitoring Combined with Installation of Passive Cap-Venting System Continue landfill gas probe monitoring, as described for Option 1, and provide for passive ventilation of landfill gas from beneath the RCRA cap.	Mitigates		Mitigates	
3. Monitoring Combined with Installation of Passive Buffer-Zone Venting Trench Continue landfill gas probe monitoring, as described above for Option 1, and provide for passive ventilation of landfill gas within the buffer zone.		Mitigates	Mitigates	
4. Monitoring Combined with Installation of an Active Buffer-Zone Venting Trench Continue landfill gas probe monitoring, as described for Option 1, and provide for active ventilation of a trench to treat landfill gas and/or methane-containing groundwater in the buffer zone adjacent to the lateral limits of the RCRA cap.		Mitigates	Mitigates	
5. Monitoring Combined with Installation of Utility Protection System Continue landfill gas probe monitoring, as described for Option 1, retrofit existing utilities, and install protections: backfill plugs/dams, relief/aeration vents, and conduit seals or vents in subsurface utilities within the buffer zone.				Mitigates
6. Monitoring Combined with Activation of the Existing Groundwater Pump-and-Treat System Continue landfill gas probe monitoring, as described for Option 1, and reactivate the groundwater treatment system.				
7. Monitoring Combined with an Active Extraction System with Pre-established System Shutdown Criteria Continue landfill gas probe monitoring, as described in Option 1, and install and operate an active landfill-gas collection system until a specific criterion is met.	Mitigates		Mitigates	