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Subject: Surface Water Control Test for MW-7 Area of Lemon Lane Landfill

In preparation for the project managers meeting this week, one of the items we want to discuss is a surface water control test that Westinghouse has been examining for the southwest corner of Lemon Lane Landfill. In preparation for those discussions we are sending you this information.

An analysis of storm testing performed in the spring of 1996 shows that PCB peaks that occur during storms may be associated with waters that run off the cap and pond near MW-7. These waters enter the subsurface near the southwest corner of the landfill via existing swallets and rapidly move to the spring via conduits. Between the surface and the main conduit, it is believed that these waters flush PCBs that exist in the upper bedrock zones.

Included in the range of alternatives Westinghouse is investigating are surface water controls for cap runoff waters to eliminate this PCB transport process. The goal of the testing is to determine the impact on PCB discharges of preventing water that currently ponds during storms at MW-7 from entering the subsurface at the southwest corner of the landfill. Testing will involve installing temporary berms and liners to prevent the run off and/or infiltration of water near MW-7. The waters will be rerouted to Sargent's Pond, where much of the cap drainage currently drains. After the temporary measures are installed, a series of storm event and base flow PCB samples will be taken to compare to historical levels. It is envisioned that testing will require a minimum of one full year to evaluate the relationship. Attached is a description of the proposed test.

It may still be possible to install the temporary measures this fall if the parties can quickly concur in doing this test. In any event, if the parties accept this concept, we need to complete installation prior to April or May 1997, when peak flows typically are expected.

Sincerely,

Dorothy M. Alke  
Project Director  
BP96-0117

Attachment

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## **Proposed Testing of Surface Water Controls at Lemon Lane Landfill**

In July 1996, Westinghouse presented to the CD parties its initial results from storm water sampling conducted at the Illinois Central Spring in May 1996. As discussed, the data indicate that water that runs off the present Lemon Lane Landfill cap and pond in the vicinity of MW-7 provide a transport force which can cause an elevation of PCB concentrations at Illinois Central Spring during storms.

One method to control elevated PCB concentrations during storms, as well as potentially limit the transport of PCBs during baseflows, is to control the flow of water entering the bedrock near the site. The major source of water that enters the bedrock in this area during a storm event is that which runs off the site cap. This is because the current cap covers ten acres and is totally non-retentive of storm water.

As has been discussed, Westinghouse feels that the permanent cap which will be vegetated will reduce and retard the storm run off. Additionally, surface water controls that limit the potential for waters to rapidly infiltrate to the bedrock near the known hot spot should also limit transport potential. However, at this time it is unclear how much impact on PCB transport can be realized by such measures.

In order to aid in the selection of final remedies for the site and affected springs, Westinghouse is proposing to conduct testing of surface water control measures. Specifically, we propose to construct temporary berms on the landfill surface to reroute runoff that currently flows to the southwest to the northwest (where much of the current runoff flows). This water will flow in previously constructed storm channels into Sargent's Pond. Sargent's Pond is currently the discharge for about half of the site runoff.

Additionally, a liner will be placed in the depression around MW-7. This liner will prevent water from entering a series of swallets in this area. It is the waters flowing off the cap and entering the subsurface in these swallets that was traced during May 1996 storm monitoring that were shown to be carrying the elevated PCBs at the Illinois Central Spring.

The specifics of the berms and liners are shown in the attachment to this memo. With CD party concurrence with this testing, Westinghouse will seek to complete the installation of these measures as soon as possible. Storm monitoring during the spring of 1997 for comparison to 1995 and 1996 results is a critical part of this test. Westinghouse would plan to monitor a minimum of three storms in the spring of 1997 and also conduct base flow monitoring on a monthly basis.

9/20/96

## Purpose

This memorandum presents a recommended approach for constructing a temporary surface water infiltration control system to minimize the infiltration of surface water runoff in the MW-7 area. It specifically supports Westinghouse's testing and validation of the conceptual site model and final development of remedial alternatives for the Lemon Lane Landfill and associated spring.

## Background

The conceptual site model of the Lemon Lane Landfill has been refined as new site data became available over the last several years. The current model for a significant portion of the PCBs transported away from the landfill is summarized below:

- About half of the storm water which falls on the current site cap flows off the cap and ponds near the southwest corner of the site by well MW-7. This water then rapidly infiltrates to the subsurface via soil macro pores and swallets some of which are readily visible in this area.
- The rapidly infiltrating water flows directly down to the epikarst portion of the bedrock.
- Water flows horizontally through the epikarst toward the throat of the southwest sinkhole. It is believed that the main conduit is located directly below the southwest sinkhole on the landfill. As the water flows in this direction, it suspends PCB-contaminated soil within the epikarst and the sinkhole throat beneath the landfill.
- The PCB-laden sediment is carried with the water as it flows through the main bedrock conduit to the Illinois Central Spring.

Because infiltrating water from the MW-7 area is suspected of being a major contributor of PCB loading to the spring water, reducing the amount of infiltrating water in this area should significantly affect the PCB concentrations measured at Illinois Central Spring during storms and possibly at base flows also. This memorandum describes the recommended temporary infiltration control system to be placed in the MW-7 area.

## General Assumptions and Conceptual Design Criteria

The primary conceptual design criteria for the recommended approach are listed below.

- The system should capture or divert runoff from a 2-inch storm event that would normally flow to the MW-7 area. This includes runoff from about half of the top of the cap surface area (roughly 163,000 gallons); the south slope of the landfill, including the railroad ditch (83,000 gallons); the west slope of the landfill (53,000 gallons); and the grass-covered field that drains to MW-7 (18,000 gallons; see Figure 1).
- While temporary, the installed system should be designed to last a minimum of two years to prevent failure during near term testing.
- The system should be capable of transferring all drainage to Sargent's Pond.
- The pumping system should begin to operate automatically and be as reliable as possible.
- Site security (i.e., a perimeter fence) should be maintained.
- Provisions should be made to prevent damage to the system or site from storm events greater than 2 inches.

## Description of Temporary Infiltration Control System

The system will consist of two primary components: a soil berm and a lined retention pond. The soil berm would be located near the top of slope along the south and west sides of the landfill (Figure 2), and would be about 2 feet high. The berm would consist of granular material (e.g., sand) contained in a geotextile fabric envelope. During construction, the fabric would be rolled out on top of the existing Hypalon geomembrane, sand would be placed in the center of the geotextile with a Bobcat-type loader, and the fabric would be formed over the sand into a sealed envelope. Leakage through the soil berm is expected to be minimal. The purpose of the upper berm is to divert water runoff from the cap, which currently flows towards MW-7, so that it runs off to the northwest towards Sargent's Pond. (Figure 1).

The MW-7 area, including the lower west end of the railroad ditch area, would be prepared and lined with a Hypalon liner to an elevation of 862 feet. The liner is designed to reduce rapid, gross infiltration of surface water into swallets and macro pores in the MW-7 area. The new Hypalon liner material will be solvent welded to the existing Hypalon material along the toe of the landfill. The new liner will be anchored in an anchor trench along its remaining sides. The lined pond would store the runoff from a 2-inch storm across the south and west slope drainage areas and grass slope drainage area (estimated to be about 154,000 gallons; Figure 1). A sump and a 100 gpm pump would be installed into the lined area to pump impounded water to the surface of the landfill where it will then runoff to Sargent's Pond. The capacity of the pump is sufficient to pump the 154,000 gallons of impounded water within about 24 hours.

## Discussion of Temporary Infiltration Control System

The recommended system can be designed and constructed to meet the design criteria discussed in this memorandum. Several key elements regarding the system include:

- Although the system is intended to be used as a means to validate the conceptual site model and improve our ability to design appropriate final control measures, it may also reduce the current discharge of PCBs to the Illinois Central Spring system
- If the Consent Decree parties reach agreement on doing this test by mid-October, Westinghouse plans to construct the entire system during the fall of 1996, weather permitting.
- The upper berm at the top of the landfill slope will directly divert a significant portion of the potential drainage to Sargent's Pond. This reduces both the pond storage capacity and the pump size compared to a system that does not include the upper berm.
- Site security will be maintained by extending fencing around the proposed pond.
- Work within the MW-7 area and the adjacent railroad ditch will probably require coordination and approvals from the railroad and gas company that have rights-of-way in the proposed work areas.

In summary, the temporary surface water control system recommended in this memorandum can be constructed to minimize, to the maximum extent practicable, surface water infiltration in the MW-7 area associated with a hypothetical 2-inch storm event. The system will divert all liner runoff to Sargent's Pond, where it will slowly infiltrate into the same bedrock groundwater flow system that it would have if it had infiltrated in the MW-7 area.



