UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: August 7, 1981

SUBJECT: LiPari Landfill Remedial Measures

200612

FROM: Robert Cobiella, P.E. - OSC LiPari Landfill, Emergency Response Unit

Thru: Fred N. Rubel, Chief - Hazard Response Branch, and
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To: Kenneth Stoller, P.E. - Director, Office of Hazardous Waste Response

Attached for your consideration is a:

1. Chronology of Events
2. Chronology of Expenditures
3. Cost Estimates for Alternatives
4. Schedules for Alternatives

Attachment

RC:ls

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EPA Form 1320-6 (Rev. 3-76)

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Brief

The landfill is located atop a 30-foot escarpment bordering Chestnut Branch, a tributary of the Delaware River. Natural ground and surface water drainage flows into Chestnut Branch. Chestnut Branch is a small stream with headwaters in Pitman and Glassboro, New Jersey and is subject to highly variable flows which overtop its banks during large storm events.

Upland areas are underlain by well-drained soils and a thin veneer of very permeable sand and gravel deposits. These deposits overlie beds of silty, fine sand and clayey silt where the permeability was found to be on the order of 10^{-7} cm/sec. Approximately one-third the groundwater flow issuing from the site comes from precipitation falling on the landfill and two-thirds from horizontal groundwater movement into the landfill from the watershed surrounding the site.

Some relevant chronological events:

1958-May, 1971	-	Operation of LiPari Landfill
1958-1970	-	Liquid and solid chemical waste dumping
May, 1971	-	Solid waste dumping
1974	-	Civil actions brought by NJDEP. Court ordered LiPari to improve drainage and treat leachate
1975-1979	-	Various minor investigations of landfill seepage
April, 1979	-	Interest by Congressman Florio sparked EPA reaction to lack of abatement of leachate at LiPari. A research project was proposed by OR & D.
August 9, 22, 23, 1979	-	S&A sampling of landfill and environs. Benzene, ethylbenzene, phenols, toluene, bis (2-chloroethyl) ether (BCEE) were found in milligram quantities in leachate seeps. The maximum concentration for BCEE, a carcinogen, in the analyses performed was 210 milligrams per liter.
April, 1980	-	Report by Roy F. Weston Inc., consultants to Rohm and Haas on LiPari Landfill submitted to Rohm and Haas.
April, 1980	-	Five month 311 contract to Wright Associates for a study to determine remedial measures on LiPari including collection and treatment of leachate and to provide a bid document for construction. Contract cost $74,000.
June, 1980	-	Four year OR & D contract to Woodward-Clyde for manual on cleaning up hazardous waste sites. LiPari to be used as an example. Contract cost $778,000.
August 20, 1980	-	Meeting of OR & D, Region II and consultants. Relevant points were:

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Woodward-Clyde report stated that a geologic relation of sand over clay occurs at about 30 feet below land and that in the area of the landfill about 5 to 30 gpm of groundwater discharges along the escarpment.

September, 9 1980 - Court ordered LiPari to construct fence by October 25th and to refrain from excavating, farming, etc. at landfill.

October 22, 1980 - Meeting at EPA HQ, New York which included representatives from EPA Region II, HQ, U.S. Justice, Woodward-Clyde (W-C) and Coast Guard. Kolmer (W-C) argued that landfill is in sandy sediments that Kimmel had perviously indicated were of low permeability because of its silt content and predominantly clay sediments occur below the landfill and cause outward migration of the contaminated groundwater along the escarpment of Chestnut Branch. A second report from W-C on their geophysical investigations shows:

1. Groundwater is highly contaminated relative to surrounding water at site of the landfill.

2. Three sites of probable drum concentrations to be avoided in drilling.

3. Sites for 25 borings in and around the landfill.

4. Woodward-Clyde experiencing difficulty in access to the LiPari site.

5. Woodward-Clyde estimate that to fulfill their obligation for research program for OR & D, field work would take one year before remedial action could be considered.

November 3, 1980 - Draft of Wright Associates report on remedial measures for landfill.

Conclusions:

- Leachate is treatable, but expensive.

- Drainage ditch system not practical.

- Cut-off wall and containment best solution.

November 7, 1980 - Meeting of Surveillance and Analysis Branch concluded after reviewing LiPari investigations that:

- Can accept the conclusions of the Wright report and develop a scheme for confinement of the landfill with the addition of a drilling and sampling scheme to produce bid documents.

- 311 funds should be applied to effect a final solution to the site forewith, as a faster method of effecting a final solution. OR & D agreed to maintain involvement and afford post-closure monitoring. OR & D has $778,000 committed to LiPari to this effect.

November 14, 1980 - Regional Administrator briefed and agreed to plan of action.

November 8, 1980 to February 9, 1981 - Design of drilling and sampling scheme.

December 11, 1980 - Superfund Legislation Enacted.

December 12, 1980 - Request for bids, drilling program.

January 14, 1981 - Regional Response Team endorses cut-off wall and cap. Request submitted for funding of $1,250,000 through Clean Waters Act.

February 2, 1981 - OR & D Reiterated committment of $778,000.

February 9, 1981 to March 2, 1981 - Review of drilling scheme, scope of work, costing and contracting by U.S. EPA Region II and U.S. EPA OR & D.

March 2, 1981 to March 24, 1981 - Drilling program implemented.

Drilling program designed to:

1. Accurately define the thickness and level of the clay below the landfill to allow a cut-off wall construction bid to be developed.

2. Obtain permeability values for the soil.

3. Obtain contaminant levels and extent in the landfill and upper (Cohansey) aquifer to:

   A. Define the exact line of the cut-off wall.

   B. Check that contaminants are restricted to the upper aquifer.

4. Study the leaching characteristics of the contaminated sediments to answer how long and what method will it take to clean the aquifer.

5. Install long-term monitoring wells.

6. Obtain contaminated soil and leachate to test against the cut-off wall materials (compatibility testing).

7. Monitor the air during drilling to estimate the magnitude of the volatile problem to be encountered during construction phase.

Eighteen wells drilled and piezometers installed.

March 24, 1981 - Laboratory soil testing began.

March 24, 1981 to May 15, 1981 - Development of proper water flows from the boreholes to obtain representative leachate samples. Field permeability testing.

May 8, 1981 - Design of marsh investigation completed.

May 28, 1981 to June 19, 1981 - Marsh investigation: soils, hydrology, geology and installation of sampling piezometers.

June 15, 1981 - Leachate samples collected from developed wells.

June 15, 1981 to August 10, 1981 - Laboratory chemical analyses of soil and leachate.

August 5, 1981 - Review of data by U.S. EPA, NJDEP, and consultants.

Conclusions:

1. Proceed with cut-off wall design bid documents.

2. Encapsulation not an acceptable solution by itself.

3. Consultants recommendation is cut-off wall plus treatment with recharge, possibly followed by 6 acre cap.

4. Selection of remedial treatment design consultants not firm pending administrative selection.