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N.Y.S. DEPT. OF
ENVIRONMENTAL CONSERVATION
DIV. ENVIRONMENTAL ENFORCEMENT
BUFFALO FIELD UNIT

Pfohl Brothers Landfill Cheektowaga, Erie County, N.Y.

Site No. 09-15-043

**Responsiveness Summary for:
Remedial Investigation Report**

**Public Meeting
March 7, 1991**

**Issue Date:
April 12, 1991**

Dear Citizen:

A public meeting was held on March 7, 1991 at Erie County Community College to discuss the results of the Remedial Investigation and to answer questions and gather comments from interested citizens.

A number of questions and comments were received prior to the public meeting and prepared written responses to these issues were handed out at the meeting. This prepared material is included in this responsiveness summary as an attachment.

In addition to the Remedial Investigation Report, the June 1990 Supplemental Sampling Report was also briefly discussed. The conclusions and recommendations from this report are also included with this responsiveness summary.

Approximately 40 people attended the meeting and included nearby residents local officials, interested citizens and a number of students studying environmentally related topics. The following are the questions which were asked at the meeting or presented in writing to NYSDEC, accompanied by our responses. In some cases we have combined or summarized questions that were similar. We hope that you will find this information to be beneficial.

Question 1: Now that NYSDEC has completed the RI what comes next?

Answer: The Remedial Investigation Report has shown that the landfill is the source of a wide variety of hazardous substances. The landfill area is now being separated from further off-site investigations for remediation. This means that the landfill area is currently in the Feasibility Study (F.S.) stage where alternative methods technologies are evaluated and a proposed remedy is selected. We expect the remedy selection process to be completed this fall.

In addition, two areas of the site have been identified as priorities where removal actions should be accelerated. The NYSDEC will develop plans to remove these materials from their current location and either secure or treat them at the site.

A work plan for sampling wildlife at the site has been developed by the NYSDEC Wildlife Pathology Unit and we expect that this sampling will be completed in 1991. This study will document any detrimental effects the site may have had on wildlife in the area and how widespread the effects may be.

A Phase II Remedial Investigation will be implemented during 1991. The goals will be to more exactly determine the southern boundary of the landfill and to better determine the offsite extent and pathways of groundwater contamination. The groundwater wells to be installed will also serve as long term monitoring wells which will monitor the effectiveness of source control measures when implemented at the landfill site.

Question 2: What is NYSDEC doing about contaminants that have migrated off site?

Answer: The offsite groundwater in the bedrock aquifer has shown a few exceedences of standards. A Phase II Remedial Investigation will address shallow and deep groundwater concerns in the area between the site and Ellicott Creek. This work should be implemented in the summer of 1991.

The neighborhood south of the Pfohl Landfill was sampled for surface soils, basement and sump samples and radon gas. None of the information to date has indicated an immediate health threat and no further work is planned for this area other than borings to more exactly determine the southern landfill boundary.

Based on the current information, the source control remedial efforts at the landfill will be the major component of the solution to the environmental impacts resulting from the wastes located there. Offsite impacts identified thus far are minimal and do not currently warrant further remedial efforts. However, should the Phase II Remedial Investigation identify more serious effects offsite, they will be taken into account in future actions.

Question 3: The landfill has had a negative impact on property values along Pfohl Road. What can we do to get our assessment lowered? Is the State going to buy the homes? Why were we not told about the hazardous waste site when we purchased our home?

Answer: As a result of its status as a Class 2 inactive hazardous waste site and the public perception regarding the ongoing investigation, property values in the vicinity of the site may have been adversely affected. NYSDEC has no authority to change them. This issue should be pursued with the local governments involved.

During remediation of a site NYSDEC does not take possession of private property. Generally, the owners of the properties continue to own the property and NYSDEC simply has access to the property for the purposes of sampling and securing work zones. For example, NYSDEC does not own the Pfohl Brothers Landfill property and even once actual construction of the remedy begins, NYSDEC does not typically take possession of the property but obtains easements which allow the work to proceed.

The Feasibility Study, which identifies the proposed remedy for the site, could identify impacts on the homes adjacent to the landfill. The homes and businesses close to the landfill may be impacted by the location of the remedy and the type of remedy chosen for this site. Public acceptance is one of the factors taken into account when alternatives are evaluated and we encourage those businesses and home owners adjacent to the landfill to attend the Feasibility Study public meeting which will be announced in the Spring of 1991 so that their concerns can be taken into account.

As far as warning potential home owners, the NYSDEC does not have the legal authority to put warnings or restrictions into property deeds

of other real estate transaction documents. Many businesses and mortgage lenders are beginning to require "environmental audits" of property prior to purchase, however, the NYSDEC has not been empowered with the authority to perform such audits. If requested, the NYSDEC can provide information to prospective buyers about any inactive hazardous waste sites on the Registry in the vicinity of property being considered for purchase. This same information can also be obtained from the County Clerk's Office, pursuant to Section 316-b of the real property law which provides for an index of past and present owners and operators of inactive hazardous waste disposal sites.

Comment submitted by: Lyn Baker (Question 4)

Question 4: Has electromagnetic profiling and electrical conductivity measurement been taken at the site to determine what is beneath the surface of the landfill?

Answer: A magnetometer survey was used to determine the presence of ferrous metal and drums on the site. An electromagnetic survey was used in an attempt to determine the boundary of the landfill and areas of trenches on site. The results of this work was inconclusive due to the materials at the site and the pattern of dumping.

A copy of the Geophysical Report is available at both the Cheektowaga North Branch Library and the Williamsville Library should anyone wish to examine the report and findings in more detail.

Question 5: Have fish from Aero Lake and Ellicott Creek been tested for contaminants?

Answer: Yes, fish from Aero Lake and Ellicott Creek were sampled for contaminants in 1987. The contaminants tested for included PCBs, DDT, chlordane, mirex and dieldrin. All contaminants were below the United States Food and Drug Administration action levels. Based on this data, DOH had no reason to restrict fishing in these waters.

Both Aero Lake and Ellicott Creek are currently under the general statewide health advisory which advises that individuals eat no more than one meal (1/2 pound) per week of fish from the State's fresh waters.

As part of this RI/FS program, additional fish from Aero Lake, Aero Creek and Ellicott Creek were collected in 1990 by the NYSDEC Division of Fish and Wildlife. These fish were analyzed for dioxins, furans, PCBs, pesticides and mercury. The results of these analyses have been reviewed by the NYSDEC Division of Fish and Wildlife and no advisory beyond the general statewide health advisory is anticipated. These results will be formally submitted to the NYSDOH when the report on this sampling is completed. The report is expected in April 1991 and will also be available in the site document repositories.

Comments submitted by Elinor Weiss (Questions 6 - 12)

Question 6: Subsoil testing and water sampling (on an on-going basis) has been less intensive than I would like to see. Variable hydraulic activity over the year (depending on weather conditions and seasonal climatic cycles) can lead to very different data and therefore conclusions. Thus, short-term testing may be valid in itself but cannot reveal the long-period contamination phenomena.

Answer: Short term testing does have limitations as stated. However, at this site two rounds of groundwater samples were taken and both showed little in the way of groundwater standard exceedences. Therefore, based on the available information the source control remediation should proceed now, since additional sampling will not change anything. The additional wells planned for the Phase II investigation will provide further information regarding off-site conditions. Future modifications to the remedy, if necessary, would be based on the results of the long term effectiveness of the remedy.

Question 7: Surface contamination may or may not be directly related to the landfill except in seepage areas where (a) the water table intersects the surface in topographic depressions and/or (b) where the capillary conductivity of the soils permit vertical diffusion. I suspect that the proximity to the airport runways as well as that of the heavily-travelled section and ramp of the New York Thruway (as well as the traffic on Transit Road) contribute considerably to the presence of surface soil contaminants.

Answer: In general, we agree with this comment. It is for this reason that local "background" samples are collected and comparisons with similar areas of similar environments are used. These comparisons are intended to present areas which may be influenced by the surroundings but not by the site which is of specific concern. The desired result is to determine contaminant levels that exceed the local "background" conditions and that these exceedences would indicate a problem that could be attributed to the specific site of concern.

Question 8: In view of the fact that the waste materials were not segregated by kind (or by area of deposition) when placed into the landfill, all testing by virtue of this situation will remain incomplete. Therefore, random results may not reflect the total, collective danger represented by the site. Moreover, subsequent combinations of chemical substances (mixing in ground water, for example) may produce unpredictable binary and tertiary effects now and in the future.

Answer: This comment's concerns are also shared by the NYSDEC. We believe that the potential threat posed by the site is sufficient to warrant remediation of the landfill as the source area of contamination.

Question 9: In view of the information available, and especially in the presence of highly toxic heavy metals (including mercury, cadmium, and lead) I feel that any further land development in and immediately next to the site should not be permitted.

Answer: The NYSDEC will continue to provide site information as it is developed to the Town of Cheektowaga when questions as to nearby development arise.

Question 10: The pH level of both soils and ground water should be determined in as many locations as possible. The level of reaction (from alkaline to acid) strongly affects the solubility of many substances and can thereby influence their migration potential. This is especially so for heavy metals which become highly unstable under acid conditions.

Answer: The NYSDEC agrees fully with this comment and pH will be taken into account during the Feasibility Study and in any future investigations.

Question 11: Effective deep-drainage facilities (and possibly collection points) should be installed (especially south and west of areas B and C) to intercept leachates. Such procedure would facilitate long-range monitoring of the leachates and water quality; it could also reduce lateral diffusion.

Answer: These type of controls will be further evaluated in the Feasibility Study for selection of the remedy for the landfill.

Question 12: Deep wells should be maintained close to Ellicott Creek to ascertain whether water and/or sediment pollution derives from the landfill drainage and erosion or whether the contaminants origin from other sources upstream.

Answer: This is one goal of the monitoring wells to be installed under the Phase II Remedial Investigation work plan that will be implemented in 1991.

Comments submitted by Marcia VanDewark (Questions 13 - 20)

Question 13: Testing for the full range of dioxins should be done.

Answer: The full range of dioxins were analyzed in the Supplemental Sampling Investigation in June of 1990. The results of this testing in offsite areas is available in the Supplemental Sampling Report. A more detailed answer to this question is contained on Page 3 of the "Technical Questions" attachment to this Responsiveness Summary.

Question 14: Material in all the drums on the site should be tested. Since extremely high detection levels were used when limited testing of drums was performed, possible hazards may have been minimized. Lower detection levels should be used on the next round of testing.

Answer: The goal of the Remedial Investigation is to identify the nature and extent of contamination at the site. The testing performed to date on the drums indicates that they contain hazardous substances which will have to be included in the remediation. To further test these individual drums would not alter the general findings but would escalate the investigation costs considerably since the analytical work efforts would be quite costly. At this time from a cost standpoint it is more efficient to include all the drums into the site remediation than to test each individual drum.

Question 15: Baseline levels used by Camp, Dresser and McKee for metals in sediments are much higher than levels to be considered as normal for the region. This type of high background factor can make problems appear less serious than they are. Data related to metals should be re-analyzed using more reasonable background factors.

Answer: This questions is answered in detail in the "Technical Questions", Page 5 attachment to this Responsiveness Summary. However, it should be noted that the Pfohl Brothers Landfill is now in the remedy selection process. Although there are some weakness in the data, that is not unusual for projects of this magnitude. Overall there

is a preponderance of data showing that the critical problem is source control and the remedy for this site will focus on source control and mitigation or elimination of the causes of offsite migration pathways.

Question 16: DEC's Soil Borings Report (pp. 5-27) acknowledged that there is offsite contamination of groundwater. "... the site contamination has impacted the groundwater on and off site". Because of offsite groundwater contamination, it is imperative that additional monitoring wells be placed within a 2.32 mile radius of the site's boundaries after a clearer picture is obtained of the direction of groundwater flow. Additional offsite seeps need to be analyzed. Area residents have complained of noxious materials flowing off the site during times of heavy rain fall and have photographed this type of flow. The figure of 2.32 miles was calculated on the basis of rate of groundwater flow cited in DEC reports. The reports describe groundwater flow from the site as "radial".

Answer: Yes, chemical compounds have been detected in the groundwater and in the leachate seeps at the site. As mentioned previously, the remedy for the site will focus on eliminating the seeps and reducing the offsite migration. In addition, the Phase II Remedial Investigation Work Plan calls for the installation of monitoring wells further out from the landfill boundary and in the proximity of Ellicott Creek. These wells will provide information on offsite migration and will also serve as long term monitoring wells once the source control remedy is implemented.

The current information in the Remedial Investigation indicates that although chemical compounds have migrated offsite the concentrations of these compounds in the environment are not very great. In most cases they are either below regulatory standards or marginally above the standards. The proposed monitoring wells will serve to improve our understanding of the offsite migration situation. However,

based on the current information it is appropriate to focus on source control measures and to accelerate the site remedy implementation, as opposed to waiting for additional offsite data and delaying the remedy. This decision has been made by NYSDEC and we expect remedy selection to be completed this summer.

Question 17: Even if DEC/DOH were to argue that it is difficult to establish a causal connection between exposure to contaminants and health problems, economic hardship suffered by persons living near the site can be established easily enough. It is obvious that the value of homes in the area have fallen; in addition, it is doubtful that people in the area could sell their homes if they chose to do so. Banks may be very reluctant in the future to approve loans for businesses in the future if those businesses are near the site. In addition, liability to workers if they are exposed to site contamination when working on construction may make new development untenable.

Answer: Establishing, evaluating and determining property values or tax assessments of property adjacent to, or associated with, inactive hazardous waste sites is the responsibility of the local tax assessor. The New York State Board of Equalization and Assessment established rules, regulations and guidance that provides the local assessor with a framework within which to establish tax rates and property values. The NYSDEC does not, and cannot, set or alter tax rates on property values established by the State's tax assessment system.

The investigation of the Pfohl Brothers Landfill (Site No. 9-14-043) located in the Town of Cheektowaga in Erie County has established that there is hazardous waste located on the site. The specific chemicals, concentrations, and locations are identified in the New York State Remedial Investigation Report (January, 1991). The NYSDEC has placed a 6-foot chain link fence around the perimeter of the site and placed over 100 18" by 24" yellow and black aluminum signs stating that there is a hazardous waste area located there and that

people should stay off the site because it is dangerous. A large number of public mailings have been made, public meetings held and materials distributed that have identified the site as a hazardous waste site, discussed the remedial investigation, and recommended that people do not enter onto the site.

In addition, there has been a great deal of media coverage about the site and the presence of hazardous waste. This coverage has included the newspaper, radio and television. The site has also been the subject many town, county and other municipal meetings and correspondence and public meetings organized and hosted by area interested citizens.

The knowledge that hazardous waste is present on the Pfohl Brothers Landfill site is widely distributed and well known. The concerns, worries and fears expressed by a variety of individuals and groups associated with the site, including some individuals living adjacent to or near the site, have been the subject of a great deal of public discussion and media coverage.

There have been a number of instances in New York State where loss of property value has been one of the identified and generally accepted results of being located adjacent to or near an identified hazardous waste site. Most notably Love Canal and Forest Glen Trailer Park in Niagara County and the Moreau Landfill in Saratoga County. In the cases of Love Canal and Forest Glen, the Federal Superfund was used to purchase homes and properties. Properties near the Moreau Landfill were found to have their value sufficiently affected that property taxes were reduced.

There is compelling evidence to suggest that it is not necessary to prove hazardous waste is found on a particular parcel of land for its value to be reduced. Close association and identification with a hazardous waste problem or concern may be sufficient to effectively reduce property values.

Whether the acknowledge presence of a hazardous waste site, widely distributed information about the site does reduce the value of adjacent or nearby property is not a determination that the NYSDEC can make. Determining the effect of this type of information on property value and any resulting effect on property assessments must be made by the local property assessor.

The only relief which NYSDEC can provide is to accomplish the remediation of the site in as expeditiously a manner as possible. This is the objective we have set out to achieve in the Feasibility Study at the Pfohl Landfill.

Question 18: Since surface water run-off and drainage problems could alter health hazardous significantly at short notice, surface water seeps and ground water flow should be studied extensively. DEC's Soil Borings Report states (pp. 5-26), "... organic contaminants have leached into the groundwater of the unconsolidated aquifer as demonstrated by the relationship between soil and groundwater contamination at locations MW-2S/2D, 16S, and 17S. Additionally, the organic contamination has further migrated into the bedrock aquifer as shown by the relationship between contaminants and contaminant concentrations at MW-2S and 2D".

Answer: Surface water drainage, groundwater flow, and the relationships between surface groundwater, especially regarding the seeps have been studied extensively on and around the landfill. It has been established that water coming into contact with wastes, whether as precipitation infiltrating to the water table, as surface water runoff, or as groundwater flowing towards a seep, will be contaminated with various compounds. The remedial alternatives under elevation will be designed to intercept and control any and all of the contaminant pathways discussed above.

Organic contamination in the bedrock aquifer may or may not be attributable to actual migration from the overburden. Additional

samples from the existing bedrock wells in conjunction with the planned phase II wells are necessary to fully characterize the bedrock aquifer.

Question 19: More samples should be drawn from Ellicott Creek, Aero Lake, and the surrounding residential areas. There is heavy metal and volatile compound contamination of the creek and lake according to DEC's own reports. DEC's Soil Borings Report (pp. 5-15) also states that, "This similarity between well 5D and 2D may indicate that the bedrock aquifer is transporting contaminated groundwater from Area B to Ellicott Creek".

Answer: Additional samples have been collected from Ellicott Creek. Results continue to indicate that the landfill is not impacting the quality of Ellicott Creek.

Five additional sediment and water samples are planned for Aero Lake this spring.

Further evaluation of the site geology and hydrogeology suggests that the bedrock aquifer does not contribute to the flow of Ellicott Creek. Specifically, the low permeable clay and silt unit between the creek and bedrock, combined with downward vertical hydraulic gradient present south of area B suggests groundwater from the bedrock does not flow to Ellicott Creek. Bedrock and overburden monitoring wells are planned for phase II on both sides of Ellicott Creek to fully define the relationship between the creek and groundwater.

Question 20: Offsite wells should be established at the southern and eastern site boundaries. This is necessary because, according to DEC's own soil boring reports, "It is likely that organic compounds have migrated offsite at the southern and eastern site boundaries" (pp. 5-25).

Answer: Additional monitoring wells are planned for the phase II investigation, and located further offsite. Several of the locations have been selected downgradient to the south and east. Each monitoring well location will have a bedrock and overburden monitoring well cluster. The additional wells will be used to provide a larger "picture" of groundwater flow conditions and to determine if contaminants have migrated offsite.

GENERAL QUESTIONS

Question:

Has the investigation uncovered any information that shows a health threat to those residences south of the landfill?

Response:

Based on the data available to date no health threats associated with the landfill have been identified for residents living to the south along Pfohl Road. This conclusion relates to the residential area, including Ellicott Creek, and is drawn from an evaluation of all relevant data in the remedial investigation and data from the various New York State Department of Health (NYSDOH) environmental sampling programs in the residential neighborhoods.

NYSDOH will be meeting with interested citizens in March 1991 to discuss the medical survey results, any appropriate medical monitoring and the results of the cancer cluster study for the Ellicott Creek area.

Question:

What is the basis for the conclusion that Ellicott Creek appears to be unaffected by the Pfohl Landfill?

Response:

During the Remedial Investigation (RI) Ellicott Creek was sampled in three locations (SE-8, 18 & 19). In June 1990 two locations were selected upstream of the landfill surface water drainage area and two locations downstream of the western most surface water drainage area. Again in December 1990 an additional location approximately 1500 feet east of the Pfohl Landfill was sampled along with a repeat of the surface water locations upstream of the landfill sampled in June 1990.

All of these eight locations together give an indication of the quality of the water and sediments upstream of the site where it is not influenced by the Pfohl Landfill, areas of the stream influenced by drainage from the site where migration may have affected quality, and downstream of the site where migration from any area of the site could have affected quality.

The results of the analysis show that all the locations sampled were very similar in composition. The fact that upstream areas, adjacent areas and downstream areas are of similar quality means that any possible migration of contaminants from the landfill has not significantly altered the quality of the creek. This simply means that Ellicott Creek before entering the Pfohl Landfill area and after leaving the landfill area appears to be the same with respect to the chemical components analyzed for.

This finding does not mean that no contaminants have reached the creek, but rather that the quantity, if any, has been such that it has not had a measurable impact on the water quality of Ellicott Creek.

Comment:

It is concluded that Aero Lake and Ellicott Creek are not adversely affected by the landfill, and that there does not appear to be widespread contravention of surface water quality standards. Yet the report's test results clearly show heavy metal and volatile compound contamination in these two bodies of water.

Response:

Although volatile organic and inorganic constituents were detected in the Aero Lake and Ellicott Creek, the data does not conclusively show that such contamination is attributable to the landfill. If these water bodies were being negatively impacted by these compounds, we would expect to find higher concentrations of the more mobile contaminants detected onsite. This is not the case. The presence of certain inorganic constituents, even at concentrations above background levels, may be derived from other sources (i.e., such as roadwater runoff or natural geologic formations). The presence of volatile compounds and their potential source in Aero Lake and Ellicott Creek are discussed on pages 4-75 through 4-79 of the RI report.

Question:

Are contaminants migrating off site through the deep (bedrock) groundwater flow?

Response:

Based on current information, the groundwater in the bedrock aquifer appears to be flowing to the south and southwest beneath the site. Analysis of bedrock groundwater samples indicate that the landfill has had minimal impact on the deep aquifer. Understanding flow conditions within the bedrock aquifer and between the bedrock and shallow aquifers is not yet complete. More bedrock monitoring wells, groundwater samples, and pumping tests are scheduled in the second phase RI.

The information gained from the second phase RI combined with what is already known will better define the regional flow conditions and any impacts of the landfill on the bedrock aquifer.

Question:

Are contaminants migrating off site through shallow groundwater flow?

Response:

Groundwater in the overburden materials at the site flows radially in all directions from the site. Analysis of shallow groundwater samples collected from monitoring wells around the perimeter of the site resulted in few contraventions of groundwater standards, indicating the contaminants found at the site are relatively immobile in the shallow groundwater. The second phase remedial investigation includes the installation of additional monitoring wells located farther from the site. These wells will serve several purposes: 1) to further verify that contaminants have not migrated from the site via shallow groundwater flow, 2) a better picture of the regional shallow groundwater flow pattern, unbiased by the fill associated with the landfill and, 3) act as long-term monitoring wells after site remediation to monitor the effectiveness of the remedy on a routine basis.

Question:

Does the landfill have a continuous impermeable bottom to contain the contaminants?

Response:

No. The depth to bedrock is much less in the north part of the site as compared to the south. Depths of eight to ten feet to bedrock are found in the north compared to more than thirty feet in the south. During the test pit investigation, landfill materials were found in direct contact with the bedrock in the northern part of Area B, due to the fact that bedrock is so shallow and the soil was easily excavated during landfilling operations. It is suspected there are other areas in the northern part of Area B that have the same conditions. A significant thickness of undisturbed silty soil was found in all locations in the southern half of Area B and all of Area C, suggesting a confining zone in those areas. There is an upward gradient present between the deep and shallow aquifers in the area of shallow bedrock. This gradient is critical to retarding, and possibly preventing completely, any migration of contaminants into the bedrock aquifer.

The pump test scheduled for the second phase RI is being designed to more clearly define the vertical gradients across the site and to determine the extent of a confining unit between the two aquifers.

Question:

What kind of remedies are looked at in the Feasibility Study and what will be the basis of the selection process?

Response:

The following five general descriptions explain the general type of remedies evaluated in the Feasibility Study. In addition, the chart titled "Criteria for Detailed Analysis of Remedial Alternatives" illustrates the criteria used in the selection process. The number shown on this chart in parenthesis is the relative weight given to each of the seven selection criteria. This evaluation of alternatives is currently underway by the NYSDEC consultant, Camp Dresser & McKee, and they have currently scheduled completion of this process by July 1991.

Types of Remedies

- (a) Destruction: This type of remedy will irreversibly destroy or detoxify all or most of the hazardous wastes to "acceptable clean-up levels". The treated materials will have no residue containing unacceptable levels of hazardous wastes. This type of remedy will result in permanent reduction in the toxicity of all or most of the hazardous wastes to "acceptable clean-up level(s);"

- (b) Separation/Treatment: Using on-site mobile or transportable unit, this type of remedial action will separate or concentrate the hazardous waste from the wastes; this remedy would leave a treated waste stream with acceptable levels of hazardous wastes and a concentrated waste stream with high levels of contaminants - e.g. treatment of contaminated leachate by granulated activated carbon. This type of remedy will result in permanent and significant reduction in volume of waste mixed with hazardous wastes. In these instances where the concentrated waste stream can be destroyed or detoxified as in (a) above, preference shall be given to this additional treatment;

- (c) Solidification/Chemical Fixation: This type of remedy will, for a site containing predominantly inorganic hazardous wastes significantly reduce the mobility of inorganic hazardous wastes. This type of remedy may not significantly reduce the toxicity or volume of the inorganic hazardous wastes, but will significantly and permanently reduce the mobility and hence the availability of the inorganic hazardous waste to environmental transport and uptake.
- (d) Control and Isolation Technologies: This type of remedial action will significantly reduce the mobility of the hazardous wastes, but will not significantly reduce the volume or toxicity of the hazardous wastes. It also includes construction of physical barrier to control migration of leachate, contaminated groundwater and surface runoff, solidification/fixation of organic hazardous wastes, and pumping and treatment of contaminated leachate/groundwater.
- (e) Off-Site Land Disposal: This type of remedy will remove contaminated soil, sediment, leachate, groundwater, etc. and land dispose the wastes at an off-site permitted facility.

Tab. 5.1
CRITERIA FOR DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES

COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE NEW YORK STATE STANDARDS, CRITERIA AND GUIDELINES (SCGs)(10)	PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT (20)	SHORT-TERM EFFECTIVENESS (10)	LONG-TERM EFFECTIVENESS & PERMANENCE (15)	REDUCTION OF TOXICITY, MOBILITY AND VOLUME (15)	IMPLEMENTABILITY (15)	CDST (15)
<ul style="list-style-type: none"> °Compliance With Contaminant-Specific SCGs °Compliance With Action-Specific SCGs °Compliance With Location-Specific SCGs 	<ul style="list-style-type: none"> °Environmental Impacts °Transport of Hazardous Materials °Health Impacts 	<ul style="list-style-type: none"> °Protection of Community During Remedial Actions °Protection of Workers During Remedial Actions °Environmental Impacts °Time Until Remedial Action Objectives Are Achieved 	<ul style="list-style-type: none"> °Magnitude of Residual Risk °Adequacy of Controls °Reliability of Controls 	<ul style="list-style-type: none"> °Treatment Process Used and Materials Treated °Amount of Hazardous Materials Destroyed or Treated °Degree of Expected Reductions in Toxicity, Mobility and Volume °Degree to Which Treatment is Irreversible °Type and Quantity of Hazardous Residuals Remaining After Treatment 	<ul style="list-style-type: none"> °Ability to Construct and Operate the Technology °Reliability of the Technology Based on its Acceptable Demonstrations °Ease of Undertaking Additional Remedial Actions, if Necessary °Ability to Monitor Effectiveness of Remedy °Availability of Necessary Equipment and Specialists °Timing of New Technology Under Consideration 	<ul style="list-style-type: none"> °Immediate Capital Costs °Operating and Maintenance Costs °Future Capital Costs °Cost to Future Land Use °Present Worth Cost

TECHNICAL QUESTIONS

Handout at the 3/7/91 Meeting
in response to questions raised
during internal NYSDEC review

Comment:

Statements such as "Both acetone and methylene chloride were commonly found in trip and laboratory blanks." (p.4-3, Volume I) can be found throughout the text. What do words or phrases such as "commonly", "most", and "almost all" mean?

Response:

Both methylene chloride and acetone are constituents routinely used in decontaminating field equipment and in laboratory extraction procedures as explained in paragraph 4 on page 4-3 of the RI document. Acetone also occurs naturally in the environment. As such, the presence of these compounds in the environmental samples may not necessarily be attributed to contamination from the landfill.

A discussion is provided, as well as specific concentration ranges, on the results of the QA/QC samples for the seeps and surface water/sediments on page 4-57 and 4-70 of the RI report. This information supports statements regarding the presence of acetone and methylene chloride in the various sample media.

Comment:

The data charts reveals many samples which have been totally rejected due to QA/QC. Many single pieces of data within samples have also been rejected due to QA/QC. Although no lab can have perfect quality control, in this case the amount of data rejected seems to be unusually high. The scientific failing is that samples completely rejected as a result of poor QA/QC were not analyzed or replaced with new samples and analyses.

Response:

Data rejected was about 8% for volatile organics in groundwater and about 1-3% for other media and compounds sampled. Additional samples were collected for some of the rejected groundwater samples and are reported in the Supplement Sampling Report released earlier this month. The NYSDEC Quality Assurance Section considers the 8% rejection rate low and the 1-3% rejection rate very low.

The main reasons for the large amount of qualified dioxin data stems from the fact that the analytical laboratory did not follow the precise procedures and documentation specifically called for in the NYSDEC Contract Laboratory Protocols (CLP). However, the NYSDEC and its consultant, Camp Dresser & McKee, have determined that the methods used by the laboratory and their documentation are acceptable and the data is useable. This determination was made after an on-site audit of the analytical laboratory where personnel, files and documentation were evaluated by an independent firm. Based on the results of that audit the data was considered useable although specific procedures called for by the NYSDEC CLP were not followed.

There is no doubt that the NYSDEC had the right to reject this data and resample. However, in this case, it was not necessary. The rejection of the data totally would have resulted in increased cost but more importantly, a substantial time delay in the Remedial Investigation report due to repeat sampling and analysis and evaluation of the data. The decision that was made was appropriate for the NYSDEC goal of characterizing the site. The useable data allows decisions to be made based on the presence or absence of dioxin and whether high concentrations or low concentrations are present.

While the qualifications may limit the reliability of the exact analytical numerical result, based on the audit of the laboratory and our consultant's recommendation, we are confident that the results are useable for the purpose of this Remedial Investigation Report which is to determine the absence, presence and magnitude of the dioxin present in waste environmental samples.

Comment:

Samples analyzed for dioxin appear to have only been tested for the presence of 2,3,7,8 TCDD rather than for the complete range (mono-octa) of dioxin. Failing to test for all but the most toxic of the dioxins could misrepresent the actual threat posed by dioxins from the site.

Response:

The total characterizations of the site with respect to dioxins and dibenzofurans is contained in the Remedial Investigation Report and supplemented by the results contained in the "June 1990 Supplemental Sampling Report." The combinations of these two reports do show that the less toxic dioxins are present at higher levels, however, the threat as represented by a "toxic equivalent" to the 2,3,7,8 TCDD isomer is relatively unaffected by these less toxic compounds.

The levels of dioxins found in tars at the site are quite high when compared to the remediation level of 1 part per billion concentration. Hence, even if the addition of other components resulted in a higher "toxic equivalent" it would make little difference to the characterization of the wastes present at the site as having elevated dioxin content which requires remediation. In other words, the exact concentration isn't as important as knowing that dioxin is present considerably above the 1 ppb remediation level for dioxin.

The dioxin results reported in the RI represent the first screening of the site, and the potentially impacted areas around the site, when during the course of the investigation the presence of wastes with a likelihood of dioxin contamination was identified. Once the presence of dioxin in some drums of waste was confirmed, the study was quickly expanded to include a screening of other media (groundwater, surface water, sediments) which could be possible routes of migration, requiring further action. After reviewing this initial screening, combined with a growing understanding of waste deposition and migration pathways at the site, it was recognized that additional sampling was in order. This Supplemental Sampling performed in June 1990 and reported in a separate report also recognized the need for a full scan of polychlorinated dioxin and polychlorinated dibenzofuran analysis, in certain areas, more sensitive for environmental or public health impacts.

Comment:

It appears that much of the material found in drums on the site was not identified. Extremely high detection levels used during analysis of these materials resulted in the identification of very little. Those samples in which nothing was detected should have been rerun using a much lower detection level. MS/GS (sic) analyses should also be used to tentatively identify constituents of the drum contents.

Response:

Samples collected from source material are potentially contaminated with a high concentration of chemical compounds and/or a mixture of compounds. As such, it is necessary for the laboratory to dilute the sample in order to obtain a reasonable instrument response. It is true that "high detection limits" may mask the presence of other chemicals present in the samples at lower concentrations. However, the detection of extremely elevated concentrations (greater than 100,000 ppb) of a single analyte provides evidence that the drum material or contaminated soils represent a source of contamination.

Comment:

Baseline levels used by Camp, Dresser, and McKee for several metals in sediments are much higher than levels which would be considered within the normal range for this region. The baseline level of 741 ppm lead (Table 4-3), determined from the surficial soil sample taken from the protected wetland 2.5 miles southwest of the Pfohl Brothers site, is at least 15 times higher than the level one would expect to find in an uncontaminated sample taken in the eastern United States (10-37 ppm, Adriano, 1986; Nriagu, 1978).

Response:

The lead concentration detected in the Dvirka and Bartilucci "background" sample was elevated. This concern was addressed in the Phase II RI work plan which calls for the collection and analyses of additional background samples. Because of our concerns on the lead concentrations in the soils, CDM compared the concentrations of lead detected in the leachate seep sediment samples with the concentrations detected in the surface water sediment samples when performing the health risk assessment. However, since this concern was not explicitly stated in the draft report, it will be discussed further in the Final RI Report.

It is true that road water runoff is contributing contaminants to the surface water and sediments in and around the landfill. This is particularly true in any urbanized environment. It would be inappropriate to utilize a "background" sample from a pristine area since it would not be truly representative of the conditions in the study area.

Comment:

Only one of the many rubber-like discs found at the site were tested for dioxins, and even though this test failed QA/QC criteria, it was concluded that the discs "probably" did not contain dioxins. Considering the number of discs found at the site, and the fact that they are as yet still unidentified, CDM's conclusion should be considered as unacceptable.

Response:

The disc that was sample was extremely hard black "plastic like" material. It appeared to be some sort of resin which had hardened in a bottom of a drum. The general shape was about the circumference of a drum and 2"-4" in thickness. The disc was sampled because similar ones were identified around the surface of the landfill in Area B, however, they do not represent a significant volume of the total material at the landfill.

A sample of this material was taken to the NYSDEC Mobile Laboratory and mixed with various solvents. It was found that the solvents did not affect the disc and therefore when the test method was performed using these solvents, it would be ineffective in extracting the components of interest.

Therefore, the correct conclusion is that the test method used was not sufficient to determine if dioxin were present in the disc. The discs are chemically stable in their current form and any components of the material are not mobile in the environment.

Comment:

The report suggests that it is more likely that high levels of cadmium and mercury are a result of atmospheric deposition and naturally occurring high background levels than landfill influence.

Response:

The presence of mercury, at concentrations exceeding background levels, may be attributable to atmospheric deposition from the landfill and/or other airborne sources. This is based on the conclusions of Sorensen et. al, (1990) and the fact that almost no other contaminants that were present in the ground water, leachate seeps, and surrounding ditches were found in the samples. Sorensen's study concluded that the primary source of mercury contamination in Minnesota Lakes was found to be of atmospheric origin. Geological and point source contributions were not significant. Transport from soils and organic materials may be important, but the mercury from these areas probably originates from precipitation and direct atmospheric sorption by watershed components. Although it was originally believed that cadmium concentrations above background levels may also be attributable to atmospheric deposition, additional surface water samples collected by CDM personnel in Ellicott Creek on December 10, 1990, indicate that cadmium may be derived from an upstream source.

Supplementary Sampling Report

June 1990

Conclusions

and

Recommendations

Conclusions

Monitoring Wells

- o No volatile compounds were detected in the five monitoring wells sampled. A more complete analysis of the groundwater quality can be found in the "Interim Report: Soil Borings and Groundwater" and the "Remedial Investigation Report".

Ellicott Creek Sediments

- o Ellicott Creek sediments both upstream and downstream of the Pfohl Landfill site surface drainage showed no significant level of contamination.

Ellicott Creek Surface Water

- o The radiological analysis of samples of Ellicott Creek water from the upstream location showed normal levels of radiation, within the regulatory levels for drinking water sources.
- o Ellicott Creek surface water analytical results from locations both upstream and downstream of the Pfohl Landfill Site drainage were similar and showed no significant levels of contamination.

Area C Marsh Sediments

- o Area C Marsh sediments had higher levels of contaminants than the Aero Creek sediments. While no significant accumulation of contaminants in quiescent areas was discovered, it does, however, appear that the drainage from Area C could be impacting this area.

Aero Lake Path Surface Soils

- o Aero Lake Path surface soils showed no evidence of elevated contaminant levels. This indicates that, there has been no significant impact by the Pfohl Landfill site on the lake area soils.

Residential Surface Soils

- o No significant levels of contamination were found on residential properties south of Pfohl Road. These areas exhibit levels similar to the background sample and the Aero Lake Path samples.
- o The properties north of Pfohl Road showed slightly higher levels of contamination near the border of the landfill.
- o The NYSDOH has concluded that the metals found in the residential soils are at levels found in other suburban areas and that the 2,3,7,8 TCDD equivalents for the dioxins and furans were found to be below the Centers for Disease Control's level of concern of 1 ppb for residential soils.