



GREAT LAKES UNITED

June 18, 1990

Ms. Lisa Carson
Project Manager
U.S. EPA, Region II
26 Federal Plaza, Room 747
New York, New York 10278

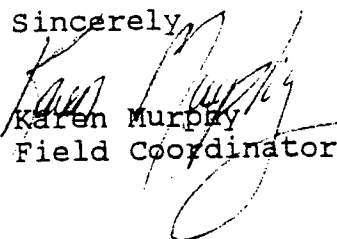
Dear Ms. Carson,

We are submitting the attached comments on the Proposed Remedial Action Plan for the General Motors Foundry Site in Massena, New York on behalf of the following organizations: Atlantic Chapter of Sierra Club; Atlantic States Legal Foundation; Canadian Auto Workers, Local 444; Canadian Environmental Law Association; Canadian Institute for Environmental Law and Policy; Clean Water Alliance; Clearwater; Lake Michigan Federation; National Wildlife Federation, Great Lakes Natural Resource Center; Pollution Probe; and the Ontario Toxic Waste Research Coalition.

We support the Environmental Protection Agency in their selection of permanent treatment technologies as the Preferred Option for the remediation of contamination on the General Motors Site. In addition, we have recommended that specific additions and adjustments be adopted for the Preferred Option. These additions and adjustments specifically address: remediation of the Industrial Landfill; investigation of other permanent treatment technologies; criteria and recommendations for selecting and operating incinerators; cleanup levels for contaminated sediments and soils at the site; a PCB audit for the site; and ongoing communication and work with a citizens' oversight committee.

The addresses for the organizations submitting these comments are attached as an addendum. Please send your response to comments and future correspondence regarding remediation of this site to all the organizations listed. Thank you.

Sincerely,


Karen Murphy
Field Coordinator

Enclosures

An international organization dedicated to conserving and protecting the Great Lakes and St. Lawrence River"
State University College at Buffalo, Cassety Hall • 1300 Elmwood Avenue, Buffalo, New York 14222

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COMMENTS ON THE PROPOSED REMEDIAL ACTION PLAN
FOR THE GENERAL MOTORS CENTRAL FOUNDRY SITE

Submitted to the U.S. Environmental Protection Agency
26 Federal Plaza, Room 747
New York, New York 10278

June 18, 1990

Submitted by:

Great Lakes United
Atlantic Chapter of Sierra Club
Atlantic States Legal Foundation
Canadian Auto Workers Local 444
Canadian Environmental Law Association
Canadian Institute for Environmental Law and Policy
Clean Water Alliance
Clearwater
Lake Michigan Federation
National Wildlife Federation, Great Lakes Natural Resource Center
Pollution Probe
Ontario Toxic Waste Research Coalition

Comments on the Proposed Remedial Action Plan
for the
General Motors Foundry Site
Massena, New York

Submitted to the U.S. Environmental Protection Agency
June 18, 1990

The St. Lawrence River is an important outflow channel from the Great Lakes. The river provides drinking water for many communities as well as important habitat for fish and other aquatic organisms, and wildlife. As organizations active in the Great Lakes Basin, we recognize the importance of the St. Lawrence River to the Basin and to the larger ecosystem to which it flows. We are concerned about the potential for pollutants at this site to harm adjacent and downstream communities.

This site is one of the most highly contaminated areas in the Great Lakes Basin. Actions that are taken on this site will be reviewed and judged by citizens from the U.S. and Canada. If the contamination at this site can be satisfactorily remedied, it will encourage action in other areas.

We support the EPA in their selection of permanent treatment technologies as the preferred option for the remediation of contamination on the General Motors Site. Permanent treatment must be defined as technologies which actually destroy or detoxify hazardous materials or technologies which recover contaminants for reuse.

We recommend that the following additions and adjustments be adopted for the preferred option:

1. EPA should work with a citizen oversight committee to assess, review, select, and monitor the remediation of all contaminants on the site.

The role of the citizen's committee should be one of technology evaluation, selection, and oversight. This committee should participate in the selection of specific technologies and vendors. In addition, it should review and assess the validity and significance of monitoring data and audits, and monitor the implementation and operation of remediation strategies. The committee should participate fully in all decisions that affect the remediation of the site.

The committee cannot be a "stakeholders" group composed of various interest groups. Rather it should be composed of representatives of the communities directly impacted by the cleanup proposals. This particular site is unique in that the

communities that are most impacted -- the Mohawks, Canadians, and anglers -- may not directly derive economic benefit (such as jobs) from General Motors. It is essential that the oversight committee be comprised of representatives from these nations and groups.

2. EPA should identify a preferred option for the Industrial Landfill. This option must be a specific, permanent treatment strategy which will address all contaminants.

We are opposed to capping and containment as a remediation strategy. Capping and containment does not provide long-term protection for the environment. Permanent reductions in the toxicity of contaminated materials, or destruction of contaminated materials, offer the only long-term solutions to remediation of the landfill.

3. The EPA and G.M. should assess other permanent treatment technologies in addition to incineration and biological treatment for all contaminants on the site.

In the Proposed Remedial Action Plan biological treatment is required for PCB contaminated material below 500 ppm and incineration is required for material above 500 ppm. We support the selection of a permanent treatment technology for the site, however we would like further research to be conducted to evaluate other technologies and the potential for combining technologies to achieve the ultimate goal of permanent detoxification or destruction of contaminated materials.

4. If incineration remains the treatment technology chosen for materials contaminated above 500 ppm, EPA must select a thermal destruction technology and require pollution control equipment that will minimize, to the greatest degree, the release of any air pollutants.

Incineration is a technology that has proven difficult to control and operate. Inability to achieve destruction efficiencies and the release of combustion by-products into the air threatens the health of the environment and the communities downwind of the site. The volume of material that must be treated on the G.M. Site, as well as the potential for incineration of PCB contaminated materials from the Reynolds and ALCOA properties, guarantees that this area of the St. Lawrence River will be a significant source of air pollution. In order to protect the downwind communities and the environment, it is essential to minimize to the greatest degree the amount of pollutants that are released into the environment.

This can be accomplished to some degree by carefully selecting the incineration technology and pollution control equipment. EPA should carefully assess a range of thermal treatment technologies. The criteria used to select a technology must be based upon its ability to minimize environmental pollution.

Minimizing air pollution can also be accomplished by carefully controlling the feed stock to the incinerator. We are concerned about the incineration of such an enormous volume of soil. The inconsistent nature of the soils may make it extremely difficult to control the temperature and other parameters necessary to ensure that destruction of contaminated materials is achieved. EPA and G.M. should evaluate the use of extraction methods to pull the PCBs from the soils prior to incineration. Pretreatment with an extraction technology will also prevent the incineration of metals and their subsequent release into the environment.

5. We support EPA's proposal to excavate and treat contaminated sediments in the St. Lawrence and Raquette River and Turtle Creek. However, we feel that the cleanup levels for PCBs in sediments are not protective enough. The United States Fish and Wildlife Service has recommended a cleanup level of 0.05 ppm for other Superfund sites and for sediment remediation in the Kalamazoo River. This number is based upon bioaccumulation of PCBs in wildlife. (1)

Sediments in the river act as a reservoir and as a source of contamination to fish, wildlife, and human populations. PCBs are persistent, bioaccumulative chemicals. These characteristics enable them to cycle through the ecosystem. Therefore, it is essential that PCBs are removed from the environment. We do not feel that the cleanup levels proposed for the PCB contaminated sediments will be protective of the environment.

The U.S. Fish and Wildlife Service has recommended that equally protective cleanup levels be used for terrestrial and aquatic portions of cleanups. The cleanup level of 0.05 ppm for PCBs was not only recommended for sediments but also for soils. Based on this information we recommend that EPA also reevaluate the cleanup levels recommended for soils on the site.

In order to ensure that selected cleanup levels are protective of the environment, we recommend that confirmatory bioassays be conducted pre- and post- cleanup.

6. A PCB audit should be conducted for the site. The burden of proof should be on General Motors to document the destination of any PCBs that are unaccounted for in the audit.

We are concerned that the Remedial Investigation has underestimated the amount of PCB contaminated material on the site. An underestimation of the contamination would seriously jeopardize the effectiveness of the proposed cleanup. Therefore we recommend that an audit be conducted to assess PCB use, offsite transfer of PCBs, and the amount of PCB material remaining on the site.

Conclusion

The Proposed Remedial Action Plan for the General Motors Foundry Site establishes the framework for a permanent remediation strategy. We support the E.P.A. in its' recommendations for utilizing permanent treatment technologies to cleanup this site.

We look forward to participating in future discussions regarding proposed actions to be taken at this site.

References

1. U.S. Department of Interior, Letters from Robert D. Pacific to William Creal (Michigan Department of Natural Resources), U.S. Fish and Wildlife Service, November 9, 1987 and January 15, 1988.

U.S. Department of Interior, Letter from Robert D. Pacific to Steve Luzkow (Michigan Department of Natural Resources), U.S. Fish and Wildlife Service, August 12, 1987.

Copies of these letters are attached.

Addendum
to
Comments on the Proposed Remedial Action Plan
General Motors Foundry Site
Organizational Listing

Organizations

Great Lakes United
SUCB
1300 Elmwood Avenue, Cassety Hall
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Skaneateles, N.Y. 13152

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Burkhard Mausberg
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United States Department of the Interior

FISH AND WILDLIFE SERVICE

IN REPLY REFER TO:

East Lansing Field Office (ES)
Room 302, Manly Miles Building
1405 S. Harrison Road
East Lansing, Michigan 48823
August 12, 1987

Mr. Steve Luzkow
Remedial Action Section
Groundwater Quality Division
Michigan Department of Natural Resources
P.O. Box 30028
Lansing, MI 48909

Dear Mr. Luzkow:

This letter is a follow-up to your August 5, 1987 telephone conversation with Dave Best of my staff concerning the Rose Township-Demodé Road Dump site (CERCLA) in Oakland County, Michigan. This letter provides our written comments on the Remedial Investigation/Feasibility Study of June 1987, prepared by private consultants for the Michigan Department of Natural Resources. Additional information was obtained from Ms. Bonnie Eleder, U.S. Environmental Protection Agency on August 3, 1987. We appreciate the deadline extension for comments to August 12, 1987.

The document adequately describes the high quality terrestrial and wetland habitats surrounding the dump site, and lists numerous wildlife species known or expected to inhabit this area. The U.S. Fish and Wildlife Service concurs with this wildlife evaluation for the site. In November 1986, this office performed a Preliminary Natural Resources Survey of this site at the request of the U.S. Environmental Protection Agency and concluded that trustee resources, including migratory birds and waterfowl, are attracted to the site and adjacent areas, and may be impacted.

Our principle concern with the document is with the discussion regarding the degree of impact of PCB-contaminated soils onsite and offsite, as well as the selected final PCB target cleanup level (TCL). We have learned that the final TCL for PCBs of 10 mg PCB/kg soil dry weight involved two considerations. First, this TCL was based on a human cancer risk assessment (10^{-6} risk) for physical exposure/contact and ingestion of soils at the site.

In addition, there appears to be an economically driven cleanup consideration for this TCL, since the TCL will determine the amount (areal as well as depth) and hence cost, of contaminated soil/sediment that will require excavation for thermal treatment and backfilling, or disposal at a licensed landfill. Both are legitimate considerations and we have no reason to doubt the findings of the PCB human health risk assessment. However, a quantitative wildlife health risk assessment was not performed as part of the setting of the TCL.

It is the opinion of the U.S. Fish and Wildlife Service that the TCL for PCBs is too high and if implemented will lead to direct and adverse impacts to resident and migratory wildlife at the site. We offer a method and suggestions for establishing a final TCL for PCBs in soils which will adequately protect wildlife resources. We feel that our recommended TCL can be further modified to reflect the depth at which the sediment/soil samples are to be taken in preparation for removal, or are to be disposed as part of backfilling at the site after thermal treatment.

Our cause for concern about the designated TCL for PCBs is the known bioaccumulation of PCBs by organisms within a food chain. In general, there is a 10-fold increase in whole organism PCB body burdens between each step up the food chain. The initial step in the food chain at this site is, and will be after site cleanup, the processing of soil materials and accumulation of contaminants by soil invertebrates. The bulk of the soil invertebrates in terrestrial and vegetated wetland situations are earthworms (*Oligochaeta*). We have attached to this letter a table we developed for another project which surveys the expected bioaccumulation potentials (expressed as a storage ratio) for earthworms in various PCB and heavy metal soil situations. The storage ratios for PCBs by earthworms from the surveyed literature conforms quite well with the 10-fold increase between trophic levels.

There is little doubt about the ability of soil invertebrates, earthworms in particular, to accumulate PCBs to levels well in excess of soil concentrations. This known accumulation is the avenue by which impacts to the more visible and economically important wildlife species will occur at the site. There are numerous wildlife species (avian, mammalian, reptilian and amphibian) which prey wholly, or in part, on earthworms and other soil invertebrates (reference attached). The impacts of feeding on earthworms having various PCB burdens have not been directly studied. However, the U.S. Fish and Wildlife Service has recently published a synoptic review of hazards to fish, wildlife and invertebrates by way of PCB exposure in their diets and media, or in selected tissues and organs (reference attached). For birds, it is reported that concentrations of PCBs in excess of 3 mg PCB/kg fresh weight in a diet are associated with an increased likelihood of death from PCB poisoning. For the mink, one of the most susceptible small mammals, a diet as low as 0.1 mg PCB/kg fresh weight is reported to cause death and reproductive toxicity.

Based on our visit to the Rose Township dump site in October 1986, this office believes that mink are permanent residents at and adjacent to the dump site. The preferred habitat would be the vegetated wetlands and fringing upland areas which surround the site. However, mink are quite mobile and could easily use the dump site presently and upon completion of cleanup. Obviously, numerous avian species use the dump site and surrounding areas for feeding, migratory and breeding areas.

Although mink have not been documented from gut content studies to be direct predators of earthworms, they are opportunistic predators which are known to feed on a variety of vertebrate and invertebrate species. Many of these vertebrate species are known predators of earthworms. The existence of these intermediate worm predators only exacerbates the potential PCB threat to mink through the food chain.

Utilizing the mean storage ratios and PCB soil concentrations from our attached table, we have attempted to calculate the approximate PCB body burdens in earthworms which one would expect from various soil PCB concentrations. These calculated body burdens can then be compared to PCB hazards in wildlife diets, as reported above. The results are as follows:

<u>PCBs in soil</u> <u>(mg/kg, dry weight)</u>	<u>PCB in worms</u> <u>(mg/kg, fresh weight)</u>
110.3	608.9
9.7	13.0
0.73	0.92
< 0.13	0.08

These values are approximations only, as mean values were used in the calculations and the original tests were run with different soil types, experimental designs and exposure periods. However, please note that the fresh wet PCB concentration in earthworms does not approach the health hazard level for mink diets until the PCB concentration in the soils approach the level of 0.1 mg PCB/kg soil dry weight. Therefore, we believe that the final TCL for PCBs in soils/sediment should be set at a maximum of 0.1 mg PCB/kg soil dry weight. To provide for a margin of safety we recommend that this value be halved to 0.05 mg PCB/kg soil dry weight.

This value appears to be well within the potential cleanup range for the thermal treatment process proposed for preliminary testing on contaminated soils at this site, under the Environmental Protection Agency Superfund Innovative Technology Evaluation Program. This process has been reported to be 99.9999% efficient for PCB destruction at the design temperatures of 1850-2300°F. Using this efficiency and the maximum PCB soil concentration reported for the entire site (260 mg PCB/kg soil dry weight), the maximum expected PCB concentration in the resultant ash will be 0.026 mg PCB/kg soil dry weight, which is below our recommended final TCL. Therefore our recommended final TCL is a reasonable value in terms of cleanup technology potential.

Our recommended final TCL does have important implications for degree of excavation and cleanup of soils at the site. This will likely increase the areal extent of the cleanup area, but may not dramatically change the extent of excavation and cleanup in a vertical direction. We believe that our recommended final TCL for PCBs in soils need not apply necessarily to the entire soil depth profile. Since earthworms generally confine their feeding, burrowing and overwintering activities to the top 4-5 feet of a normal soil profile, our recommended final TCL would only need to apply for this upper soil stratum. This upper soil stratum would not only be present at the southwest dump site, but would also be applicable to the west facing drainage slope below the southwest site and the single wetland sediment site where PCBs above our recommended final TCL were detected. A higher final TCL value may be appropriate for excavation or backfilling criteria for PCB contaminated soil and ash below the five-foot depth contour. Groundwater extraction and treatment will help protect/control the environmental impact of these higher PCB concentrations in the lower soil strata.

Our final TCL for soil PCBs may also be modified if sufficient capping of the backfilled thermal treatment ash occurs. At this time, there is no information as to whether capping will occur. It is only known that the ash resulting from thermally treated soils excavated from the site will have to pass EP toxicity tests, as being a non-hazardous waste, in order to be backfilled onto the site. If backfilling and capping of the site does occur, a 4 to 5 foot topsoil layer should be considered for installation above the protective cap. This topsoil layer will permit soil invertebrate activity to occur without jeopardizing the integrity and function of the cap.

Special consideration should be given to better documentation of sediment/soil concentrations of PCBs offsite. PCB concentrations on the drainage slope below the dump site and the one wetland site with detectable PCBs, were all above our recommended final TCL at which we consider impacts to wildlife will occur. We suggest that additional soil/sediment samples be taken in these two areas, particularly in the wetland area, to better determine the presence and levels of PCBs. Additional soil/sediment sampling in other areas of the wetland west of the dump site is also suggested. Should PCBs indeed be present at these sites above our recommended final TCL, then our next recommended step would be to collect soil invertebrates at these sites for PCB residue analyses. If significant bioaccumulation of PCBs is indicated, then additional collection and testing of predator organisms, such as mink and waterfowl may be warranted. All of these bioassays may be preliminary to actual soil/sediment removal and cleanup at these sites. These bioassays may also be useful after cleanup of the southwest dump site to determine the appropriateness of the final selected TCL and the success of the cleanup in preventing impacts to the environment. This office would be willing to assist in the design of these bioassay techniques.

It was not clear in the document if actual cleanup is proposed for areas with PCB-contaminated soil outside and adjacent to the southwest dumpsite. This previously mentioned site is located on the upper drainage slope to the wetland and does contain good forested habitat. However, the appearance of good habitat at any site should not factor into the decision for possible cleanup. If PCBs in the soils are indeed above our recommended final TCL, then bioassays and/or cleanup of the soil should occur.

Information is also apparently not available as to the probable uses or processes with which the PCBs were employed, prior to disposal at the site. Thermally employed uses of PCBs can lead to the pyrolytic formation of dioxins/furans. Although the Michigan Department of Natural Resources does not expect dioxins and furans at this site due to the absence of these compounds at a nearby CERCLA site which received similar wastes, we suggest that a selected few soil samples from the southwest dump site undergo dioxin/furan analyses or an extract assay for dioxin equivalence. Since capping of a site is the only available clean-up methodology that we are aware of for dioxins/furans, it may well be worth the expense to document their absence or presence early on in this study. Since the thermal treatment method is proposed to be tested on a small scale at this site, we suggest that the dioxin/furan analyses, or an extract assay for dioxin equivalence, be conducted on a few of the resultant ash samples.

This office is willing to further discuss the above topics and aid, where possible, in the design and documentation of any wildlife health bioassays necessary for this site. Please direct your questions to either Dave Best or Tim Kubiak at (517) 337-6650. Thank you for this opportunity to comment on the Remedial Investigation/Feasibility Study document for the Rose Township dump site.

Sincerely yours,

Robert D. Pacific
Field Supervisor

cc: Bonnie Eleder, U.S. EPA, Chicago, IL (5HE-12)



United States Department of the Interior

FISH AND WILDLIFE SERVICE

IN REPLY REFER TO:

East Lansing Field Office (ES)
Room 302, Manly Miles Building
1405 S. Harrison Road
East Lansing, Michigan 48823

September 17, 1987

Mr. Roger Jones
Remedial Action Section
Groundwater Quality Division
Michigan Department of Natural Resources
P.O. Box 30028
Lansing, MI 48909

Dear Mr. Jones:

This letter provides our written comments on the Remedial Investigation/Feasibility Study of May/August 1987 for the Liquid Disposal Inc. site (CERCLA) in Macomb County, Michigan. Additional information was obtained from Ms. Diane Diks, U.S. Environmental Protection Agency on September 14, 1987. We appreciate the deadline extension for comments to September 18, 1987.

The document adequately describes the high quality Clinton River floodplain and wetland habitats adjacent to the site on the northern and eastern sides. These areas comprise a portion of the Rochester-Utica State Recreation Area and the Shadbrush Tract Nature Study Area. Although individual species were not identified, the document indicates that numerous species of birds, mammals, reptiles, amphibians and aquatic invertebrates exist in these areas. The Clinton River supports anadromous fish including chinook salmon, walleye, brown and rainbow trout, and rainbow smelt. The floodplain, which is largely composed of palustrine forested, scrub-shrub and emergent wetlands, is expected to provide migratory and breeding habitat for waterfowl and passerine birds, including the mallard, black duck, wood duck, great blue heron and woodcock. These areas are also expected to support furbearers such as mink and muskrat. The document indicates that various contaminants have migrated from the site and are present in soils and groundwater seepage sites at elevated concentrations at several sites within the adjacent floodplain and wetland area. It is not known to what degree contaminants have entered the Clinton River. In September 1985, the U.S. Fish and Wildlife Service performed a Preliminary Natural Resources Survey of this site and concluded that trustee resources, including anadromous fish, waterfowl and passerine birds, are attracted to the site and adjacent areas, and may be impacted.

The implementation of the preferred remedial alternative (#7) is expected to effectively immobilize and isolate all onsite contaminants of concern. However, our principle concern with the document is with the discussion regarding the degree of impact of PCB-contaminated soils offsite, as it

relates to the selected final PCB target cleanup level (TCL). The final TCL for PCBs of 1 mg PCB/kg soil dry weight involved two considerations. First, this TCL was based on a human cancer risk assessment (10^{-6} risk) for physical exposure/contact and ingestion of soils.

In addition, there appears to be an economically driven cleanup consideration for this TCL, since the TCL will determine the amount (areal as well as depth) and hence cost, of contaminated offsite soil/sediment that will require excavation, treatment and disposal at the proposed onsite facility. Both are legitimate considerations and we have no reason to doubt the findings of the PCB human health risk assessment. However, a quantitative wildlife health risk assessment was not performed as part of the setting of the TCL.

It is the opinion of the U.S. Fish and Wildlife Service that the TCL for PCBs is too high and if implemented will lead to direct and adverse impacts to resident and migratory wildlife at the site. We offer a method and suggestions for establishing a final TCL for PCBs in offsite soils which will adequately protect wildlife resources.

Our cause for concern about the designated TCL for PCBs is the known bioaccumulation of PCBs by organisms within a food chain. In general, there is a 10-fold increase in whole organism PCB body burdens between each step up the food chain. The initial step in the food chain in the areas adjacent to this site is, and will be after cleanup, the processing of soil materials and accumulation of contaminants by soil invertebrates. The bulk of the soil invertebrates in floodplain and vegetated wetland situations are earthworms (*Oligochaeta*). We have attached to this letter a table we developed for another project which surveys the expected bioaccumulation potentials (expressed as a storage ratio) for earthworms in various PCB and heavy metal soil situations. The storage ratios for PCBs by earthworms from the surveyed literature conforms quite well with the 10-fold increase between trophic levels.

There is little doubt about the ability of soil invertebrates, earthworms in particular, to accumulate PCBs to levels well in excess of soil concentrations. This known accumulation is the avenue by which impacts to the more visible and economically important wildlife species will occur offsite. There are numerous wildlife species (avian, mammalian, reptilian and amphibian) which prey wholly, or in part, on earthworms and other soil invertebrates (reference attached). The impacts of feeding on earthworms having various PCB burdens have not been directly studied. However, the U.S. Fish and Wildlife Service has recently published a synoptic review of hazards to fish, wildlife and invertebrates by way of PCB exposure in their diets and media, or in selected tissues and organs (reference attached). For birds, it is reported that concentrations of PCBs in excess of 3 mg PCB/kg fresh weight in a diet are associated with an increased likelihood of death from PCB poisoning. For the mink, one of the more susceptible small mammals, a diet as low as 0.1 mg PCB/kg fresh weight is reported to cause death and reproductive toxicity.

Based on the floodplain habitats described in the document, this office believes that mink are permanent residents in these areas adjacent to the site. The preferred habitat would be the vegetated wetlands and fringing upland areas which border the site to the north and east. Obviously, numerous avian species also use these areas for feeding, migratory and breeding areas.

Although mink have not been documented from gut content studies to be direct predators of earthworms, they are opportunistic predators which are known to feed on a variety of vertebrate and invertebrate species. Many of these vertebrate species are known predators of earthworms. The existence of these intermediate worm predators only exacerbates the potential PCB threat to mink through the food chain.

Utilizing the mean storage ratios and PCB soil concentrations from our attached table, we have attempted to calculate the approximate PCB body burdens in earthworms which one would expect from various soil PCB concentrations. These calculated body burdens can then be compared to PCB hazards in wildlife diets, as reported above. The results are as follows:

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These values are approximations only, as mean values were used in the calculations and the original tests were run with different soil types, experimental designs and exposure periods. However, please note that the fresh wet PCB concentration in earthworms does not approach the health hazard level for mink diets until the PCB concentration in the soils approach the level of 0.1 mg PCB/kg soil dry weight. Therefore, we believe that the final TCL for PCBs in soils/sediment should be set at a maximum of 0.1 mg PCB/kg soil dry weight. To provide for a margin of safety we recommend that this value be halved to 0.05 mg PCB/kg soil dry weight.

Our recommended final TCL does have important implications for degree of excavation of offsite soils. This will likely increase the areal extent of the cleanup area, but may not dramatically change the depth to which offsite soils are to be excavated for onsite disposal. We believe that our recommended final TCL for PCBs in offsite soils need not apply necessarily to the entire soil depth profile. Since earthworms generally confine their feeding, burrowing and overwintering activities to the top 4-5 feet of a normal soil profile, our recommended final TCL would only need to apply for this upper soil stratum. A higher final TCL value (approaching the value proposed in the document) may be appropriate for excavation of PCB-contaminated offsite soils below the 5-foot depth contour. The proposed groundwater extraction and treatment will help protect/control the environmental impact of these higher PCB concentrations in the lower soil strata offsite.

Special consideration should be given to better documentation of subsurface soil PCB concentrations offsite. Since virtually all offsite soil samples were collected near the surface by a hand auger, PCB concentrations in offsite soils below the 5-foot stratum are undocumented. Subsurface soil sampling and PCB analysis is suggested for the floodplain/wetland areas to the north and east of the site. This data will better characterize the vertical extent of PCB contamination within the offsite soil profile and the extent of required soil excavation and onsite disposal.

The document indicated that soil analyses for polychlorinated dioxins/furans were restricted to five onsite locations. Dioxins were encountered at one sampling site. However, the U.S. Fish and Wildlife Service believes that inappropriately high detection levels were employed in those analyses that may have masked the presence of dioxins at the other four sites. No offsite soil samples were tested. We suggest that a few offsite soil samples from the floodplain/wetland areas undergo dioxin/furan analyses with detection limits in the range of 10 ng/kg (parts per trillion), or an extract assay for dioxin equivalence. Since inplace capping of a site is the only available clean-up methodology that we are aware of for dioxins/furans, it may well be worth the expense to document their absence or presence in these offsite locations.

This office is willing to further discuss the above topics and aid, where possible, in the design and documentation of any wildlife health bioassays necessary for this site. Please direct your questions to either Dave Best or Tim Kubiak at (517) 337-6650. Thank you for this opportunity to comment on the Remedial Investigation/Feasibility Study document for the Liquid Disposal Inc. site.

Sincerely yours,

Robert D. Pacific
Field Supervisor

cc: John Tanaka, U.S. Environmental Protection Agency, Chicago IL (5HE-12)



United States Department of the Interior

FISH AND WILDLIFE SERVICE

IN REPLY REFER TO:

East Lansing Field Office (ES)
Room 302, Manly Miles Building
1405 S. Harrison Road
East Lansing, Michigan 48823

November 9, 1987

Mr. William Creal
Great Lakes Environmental Assessment Section
Surface Water Quality Division
Michigan Department of Natural Resources
P.O. Box 30028
Lansing, MI 48909

Dear Mr. Creal:

We have reviewed the Draft Remedial Action Plan (Plan) for the Kalamazoo River of September 1987 and provide the following comments. We have attached individual pages of the draft Plan with our specific comments noted in the margins.

(1) The most important deficiency in the draft Plan is the absence of specific goals and objectives related to the protection of fish and wildlife. The only criteria utilized in the document for a clean-up goal is the Food and Drug Administration's 2 ug/g (ppm-wet weight) PCB level in fish fillets, used to designate a fish consumption advisory. This criteria is at best a human health criterion, based on national exposures from average national fish consumption with little or no relationship to the health or well-being of the environment. As such, it is an inappropriate criterion by which to solely evaluate effectiveness of proposed remedial actions.

What is needed are specific numerical criteria for water, sediment (instream and terrestrial) and biota to insure environmental health. The International Joint Commission has offered an objective for total PCBs in whole fish of <0.1 ug/g (ppm-wet weight) to protect birds and mammals which consume fish. Likewise this office suggests an objective for total PCBs in sediments (instream and terrestrial) of <0.05 ug/g (ppm-dry weight) to protect fish and wildlife via direct exposure and food chain bioaccumulation. For similar reasons, we further suggest an objective for total PCBs in water of <1.0 ng/l (ppt). Other criteria for biota may also be warranted. However, these three criteria at least start to set meaningful goals for environmental protection, and are readily supportable in the technical literature.

Even more appropriate and meaningful would be to base these specific criteria on congener-specific PCB toxicities. Reporting total PCB concentrations or setting criteria for total PCBs is to a degree misleading since PCB congener-specific toxicities vary by as much as 6 orders of magnitude.

This office is willing to participate in any effort to either develop congener-specific PCB criteria or develop and/or refine total PCB criteria for water, instream and exposed sediment, and biota. The technical literature and data will

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support either approach. The development of environmentally-based goals/criteria is preferable to the sole use of the fish consumption advisory criterion of 2 ug/g (ppm-wet weight). Once these criteria are established, remedial action alternatives can then be evaluated wherever the upstream contamination exceeds the criteria.

(2) The Plan identifies only the lower 26 miles of the river below Calkins Dam as the Area of Concern, and classifies the river above this reach, up to and including Portage Creek, as the source area. It is our understanding that the Michigan Department of Natural Resources (Department) has the latitude to define the ultimate extent of the Area of Concern based on relevant information. In light of the known impaired fisheries uses and suspected impaired wildlife uses in the river up to Battle Creek, we would like the Plan to include more of the river in the designated Area of Concern or provide a rationale as to why this is not possible. If the limited extent of the Area of Concern is based on the blockage of Great Lakes fish stocks by the dam, it should be remembered that the Department has future plans to manage for anadromous fish passage in the river up to Battle Creek. The known impaired fisheries use and future fish management plans strongly suggest that the Area of Concern should be extended upriver to and including Portage Creek. Additional biotic sampling upriver may suggest extending the Area of Concern further upriver to Battle Creek. Expanding the extent of the Area of Concern will help to dispell possible misconceptions that the Plan is designed only to improve impaired use of resources near the mouth.

(3) We believe that the draft Plan underestimates the impaired uses of the river. Impaired fish use is well documented while impaired wildlife use is largely ignored. The limited data on waterfowl contamination which this office provided preliminarily suggests that wildlife resources along the river are similarly impacted. This should at least be indicated in the draft Plan as a possible impairment and as a data gap requiring investigation. This office would be most willing to cooperate in the design, collection and analysis of wildlife samples to quantify presence and degree of wildlife impairment. Earthworms, woodcock, juvenile and adult waterfowl, mink, river otter, and turtles are recommended for evaluation relative to both human health and wildlife health.

Additional data on impaired waterfowl uses were collected this past field season by this office. A high incidence of embryonic developmental problems was noted for mute swan eggs collected from the Allegan State Game Area. The most prevalent problem encountered was subcutaneous hemorrhaging. This syndrome is similar to edema problems associated with PCB poisoning of colonial fish-eating birds in the Great Lakes. This office will attempt to obtain samples of water, sediment and juvenile and adult mute swans from the principal waterfowl wintering areas along the Kalamazoo River, including the Upjohn Ponds located near Portage Creek. This data will help to identify possible causative factors for this syndrome and possible source areas.

(4) The draft Plan discusses PCB contamination to the exclusion of all other types of contamination, indicating that PCBs are the only contaminants of concern. While we have no cause to dispute this assertion, the Plan needs to document via analytical reports including detection limits, the absence or presence of other contaminants in water, instream and exposed sediments, and biota. The draft Plan does indicate that poor water quality resulting from effluent discharge from the Kalamazoo wastewater treatment plant has contributed to environmental stresses on fish. The particular water quality problems are not elaborated in the draft Plan. The revised Plan should quantify this situation and evaluate whether remedial actions are warranted.

(5) The draft Plan discounts the presence and possible importance of point and non-point sources of PCBs to the river and deals exclusively with PCBs associated with instream and exposed sediments. While these latter sources undoubtedly make up the bulk of the active PCB loading to the river, a comparison of Table 10 to Table 4 and Appendix 3 indicates that there are direct National Pollution Discharge Elimination System dischargers of PCBs to the river. Subsequent drafts of this Plan need to address point source PCB inputs from all National Pollution Discharge Elimination System-permitted discharges. Table 10 should be expanded to include all National Pollution Discharge Elimination System permits in the existing Area of Concern and upper Kalamazoo River basin and it should indicate which permits have effluent limitations and monitoring requirements for PCBs. The magnitude of this point source needs to be evaluated relative to the State of Michigan's new water quality standards established earlier this year. Remedial actions to eliminate these PCB point sources, such as more stringent effluent limits, monitoring and compliance, may be necessary to maintain clean-up levels reached by remedial actions taken on in-place pollutants.

Other point sources not adequately covered in the draft Plan include: Superfund and PA 307 sites, sludge disposal areas, and municipal storm water discharges. These sites need further investigation to evaluate possible pollutant loading to the river and should not be discounted at this time.

(6) The draft Plan contains little or no detail on post-remedial action follow-ups. Monitoring, enforcement and compliance activities will be needed to insure that the ultimate environmentally-based criteria for water, instream and exposed sediment, and biota are met. The document should indicate that additional remedial actions may be needed to meet the criteria.

(7) Due to limited time and expertise, we have not been able to examine the PCB model used to evaluate proposed remedial action alternatives. Based on a cursory review, the model appears to be driven by average riverine conditions such as mean flows and velocities, cross-sections, sedimentation rates, etc. Based on other reports in the literature, we strongly suspect that infrequent storm and flood events of large magnitude play a large role in the resuspension and transport of PCBs in this system over and above the average conditions. Further, low flow events can cause increases in dissolved levels of contaminants. Such events can reintroduce PCB-laden sediments or dissolved PCBs via desorption processes creating higher levels than occur at "normal average flows". This is well documented on the Hudson River in New York.

The PCB model was only used to evaluate individual remedial action alternatives. Several of the proposed actions are not mutually exclusive in implementation, and therefore should be combined and evaluated by the model. For instance, combining alternatives B, E, and F would provide for the greatest clean-up to the river system, and should be evaluated by the model.

The Plan should also document whether an independent peer review process will be used to offer comments on the adequacy of the PCB model.

(8) The discussion of the remedial action alternatives indicates that some of the proposed features may not provide adequate environmental protection. Two-foot thick soil caps are proposed in alternatives C and G to isolate exposed sediments containing PCBs. However, based on earlier work with closure (capping) requirements for confined disposal facilities, we believe this thickness will likely be inadequate to prevent sediment disturbance and bioaccumulation of PCBs

by plants, soil invertebrates and burrowing mammals. This thickness may also be structurally unsound during flood events. We anticipate that 4-5 feet of clean soil will be required for the cap. This thickness will permit overwintering soil invertebrates to burrow below the frostline, required for survival, yet remain above the PCB-laden sediments.

A variant on this alternative calls for the removal of a 25-foot wide by 3-foot deep zone of contaminated sediments along the riverbank. This excavated material would be replaced by three feet of clean soils. However, contaminated soils outside the 25-foot wide zone would not be capped, and would be susceptible to erosion and resuspension by storm and flood events, as well as be susceptible to in-place bioaccumulation by plants and animals. In addition, a 3-foot cap of clean soil is not likely to be adequate to isolate PCB-laden soils from disturbance and bioaccumulation by plants and animals. As previously indicated, 4-5 feet of clean soil in a cap will likely prove adequate.

Alternatives E, F, G and H propose excavation of exposed sediments and/or dredging of in-place sediments followed by onsite disposal of these contaminated sediments. It is not clear in the report whether these onsite areas would be situated within or outside the floodplain. We suspect these sites might occur within the floodplain and be subject to deterioration and breaching by flood events. What siting criteria will be used to evaluate these alternatives?

Dewatering facilities for dredged sediments are not adequately described in regards to environmental protection features (leachate collection systems, liners, closure requirements, effluent treatment and limitations). These facilities may also intrude into groundwater zones if located in the floodplain.

Onsite (i.e., in the floodplain) disposal of sediments will likely require more stringent facility design and maintenance to survive flood events than similar disposal structures located offsite (upland, out of the floodplain). The revised Plan should include these issues in the discussions on onsite sediment disposal methods.

(9) The draft Plan often uses comparative terms such as "high" or "low" in reference to PCB concentrations but fails to indicate to which criteria these comparisons are being made. In other cases, it appears that these comparisons are made to inappropriate criteria. We would prefer that the document plainly state the actual contaminant concentrations for a specific situation, and when necessary, utilize the appropriate criterion for a comparison to environmental health, human health or waste disposal needs. For example, references to Toxic Substances Control Act or fish consumption advisory criteria for PCBs should not occur in discussions on environmental effects to fish and wildlife from PCBs in sediments at some quantified level.

There also appears to be instances where there is a misinterpretation of the data. The document presents general conclusions as to the areal and vertical extent of sediment contamination which may not be supportable from an examination of the data. For example, sediment contamination is reported for several reaches to only occur in surface or near-surface sediments. However, the data contained in Appendix B indicates that only surface grabs or shallow core samples were taken. In another situation, little instream sediment contamination is reported for one reach of the river. However, only one instream sediment sample was collected. In a third type of situation, sediment contamination was reported to extend down to a specified depth. However, the report fails to mention that contamination of deeper sediment strata was not investigated. Some of these situations can be

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easily clarified by stating the limitations to the data base. More importantly, these situations indicate that sediment-contamination data gaps do exist that require rectifying before definitive conclusions can be drawn.

(10) The draft Plan presents water quality and fish contaminant data for several areas identified as potential background reference sites. Several of these sites are situated on the river upstream from the City of Kalamazoo and may not represent suitable background sites owing to the known impaired use of the fishery in this river reach. However, once identified as background sites, the draft RAP fails to utilize these sites for comparisons. True background sites from non-Areas of Concern or other aquatic systems without significant contamination should be sought and characterized.

(11) Regardless of whether clean-up of the Portage Creek/Bryant Mill Ponds reach of the river is accomplished via Superfund, PA 307, or other authority, the Plan needs to discuss what is perceived at this time as needed remedial actions for this area. Such perceived remedial actions are not elaborated to any great extent in the draft Plan. Considering that the need for a remedial action alternative in this river reach was the only alternative recommended from the results of the PCB model, remedial actions for this area need substantial elaboration.

(12) The evaluated alternatives and the ongoing remedial actions are not well integrated as a sequence of timely events. In our opinion, cleanup of point source and in-place pollutants should proceed in a sequence from upstream to downstream sites. This prevents the despoiling of previously cleaned up sites from existing clean-up activities, i.e., sediment resuspension and erosion, at upriver sites. This aspect of the Plan timetable is not discussed in the draft report. In fact, it appears that the ongoing remedial actions are occurring in an upstream direction with activity taking place first at Trowbridge impoundment and moving upriver to Otsego and Plainwell impoundments. These activities would then be followed by possible Plan activities at the more upriver site on Portage Creek/Bryant Mill Ponds. As was indicated in the draft Plan, no amount of precautions will likely eliminate all resuspension of PCB-laden sediments at any site. Downstream impacts are then likely. The technical reality is to minimize short term degradation so that ultimate long-term remediation is achieved.

(13) Section 7.2 in the Plan outlines remedial actions which are in progress or will be soon implemented at the three drawdown impoundments on the river. These outlined actions appear very similar to aspects of three of the remedial action alternatives (C,C1,D) evaluated by the PCB model. If indeed similar, then why are these remedial actions proceeding when the similar appearing alternatives failed to be recommended by the PCB model analysis? If different, then why were these presently occurring remedial actions not proposed and evaluated by the PCB model? Clarification on this point is needed.

(14) The draft Plan provides cost estimates for each of the remedial action alternatives, but does not discuss the procedures used to reach a decision on cost-effectiveness. Several of the alternatives are identified as not being cost-effective, while others receive no determination. Additional discussion of the cost-effectiveness analysis is strongly encouraged. Each alternative or combination thereof should clarify dollars spent relative to environmental objectives (instream and exposed sediment, water, fish, and wildlife).

(15) The draft Plan fails to indicate whether PCB concentrations are reported on a wet or dry weight basis. Sediment concentrations typically are reported on a dry weight basis whereas biotic samples are reported on a wet weight or lipid

weight basis. We assume this is the case, but subsequent drafts of the document should indicate appropriate units of measure for respective data sets.

(16) The Plan should contain relatively large scale maps of the river reaches and other pertinent areas showing the locations of instream and exposed sediment, water and biotic samples, National Pollution Discharge Elimination System point discharges, municipal stormwater outfalls, sludge disposal areas, Superfund and PA 307 sites, etc. A similar series of figures should show the PCB concentrations in the various media tested, to give perspective as to degree of areal and vertical (for sediment) extent of PCB contamination, as well as to suggest areas requiring additional sampling.

In conclusion, we feel there is considerable room for improvement in the draft Plan prior to its release for public review. The document is lacking a meaningful discussion of the environmental effects under existing conditions or following remedial actions. This is largely due to an absence of environmentally-based goals and criteria for water, instream and exposed sediment, and biota. We offer our services and expertise to rectify this situation. We also stand willing to supply technical information and documentation on contaminant effects to the biota. However, the magnitude of the problems we encountered with the document will not easily be overcome prior to the document's scheduled release in December. Therefore, we recommend that the draft Plan not be released for public review as scheduled until the above concerns are addressed.

If you have any questions concerning our comments, please contact Dave Best or Tim Kubiak at (517) 337-6650. Thank you for this opportunity to review this draft document.

Sincerely yours,

Robert D. Pacific
Field Supervisor

Attachments



IN REPLY REFER TO

United States Department of the Interior

FISH AND WILDLIFE SERVICE

EAST LANSING FIELD OFFICE (ES)
1405 S. Harrison Road, Room 302
East Lansing, Michigan 48823



January 15, 1988

Mr. William Creal
Great Lakes Environmental Assessment Section
Surface Water Quality Division
Michigan Department of Natural Resources
P.O. Box 30028
Lansing, MI 48909

Dear Mr. Creal:

We have completed our review of the Second Draft of the Remedial Action Plan for the Kalamazoo River issued in December 1987. We have determined that there have been few changes made in this second draft from the first draft we previously reviewed. Therefore, we are resubmitting for your review the attached copy of our November 9, 1987 letter which commented on the first draft of September 1987. The issues discussed in that letter are still in need of consideration by your agency.

The only major change in the second draft is the inclusion of the State of Michigan's Water Quality Standard of 0.012 ng/l PCBs in the water column as a specific goal for the document. However, as is indicated in Table 26, none of the alternative remedial actions evaluated by the PCB distribution model are depicted as meeting this goal for water column PCB concentration in any of the ten river reaches. This finding is not presented in the textual discussion of the model results. Yet a remedial action (Alternative B) and an apparent variant of another (Alternative C1) are recommended for implementation.

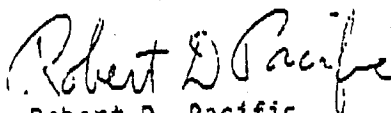
Section 7.2 of the document indicates that Alternative C1, or a variant thereof, is a remedial action in progress at the Trowbridge, Otsego and Plainwell impoundments with completion scheduled in 1989. These efforts have been funded under the Michigan Environmental Response Act (P.A. 307). Proposed actions for 1988-89 call for dredging, limited capping, and disposal of contaminated sediments/soils onsite. Based on considerations discussed in the attached letter, we believe that these upcoming actions will not provide adequate environmental protection. We strongly recommend that these actions not be initiated at this time by the Michigan Department of Natural Resources until major problem areas with the draft document are addressed. Should these projects proceed as proposed, then we intend to reiterate these comments on all applicable State and Federal permit applications for dredge/disposal work in these areas.

In addition, information on the presence of priority pollutants in nearshore fish at the mouth of the Kalamazoo River should be included in the document. A copy of the paper is attached.

In conclusion, we recommend that the draft document not be submitted to the International Joint Commission for review until our concerns are addressed. We will be contacting you shortly to explain the technical information and documentation on contaminant effects to the biota that should be included in future iterations of this document.

Thank you for this opportunity to review this second draft document.

Sincerely yours,


Robert D. Pacific
Field Supervisor

Attachments

cc: Tom Martin, Michigan Department of Natural Resources, Office of the Great Lakes, Lansing, MI
Gary Guenther, Michigan Department of Natural Resources, Environmental Response Div., Lansing, MI
Dennis Hall, Michigan Department of Natural Resources, Land and Water Management Div., Lansing, MI
Warren Cook, Southcentral Michigan Planning Commission, Portage, MI