0006004

December 9, 1999
VIA REGISTERED MAIL
RETURN RECEIPT REQUESTED

NOTICE OF INTENT TO SUE

Addressed to:

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Washington, D.C. 20500

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members, with an office at 116 ½ S. College, Bloomington, Indiana, intend to bring suit, for injunctive relief, civil penalties and other appropriate relief, under the above named citizen suit provisions of the Resource Conservation and Recovery Act (RCRA), the Comprehensive Environmental Response Compensation and Liability Act (CERCLA, a.k.a. Superfund), the Toxic Substances Control Act (TSCA), the Endangered Species Act (ESA), and the Clean Water Act (CWA) as well as under the Administrative Procedures Act (APA), the National Environmental Policy Act (NEPA), and Indiana laws mandating protection of public health and the environment and prohibiting, inter alia, nuisances and air pollution, against the U.S. Environmental Protection Agency (EPA), the EPA Administrator, the EPA Regional Administrator, and Westinghouse/CBS for the specific violations and failures to perform mandatory duties described in the Counts listed below. The suit intended and noticed herein will be brought on the grounds, among others, that the present Record of Decision (ROD) amendment for Neal's Landfill, and a proposal to similarly amend the original ROD of Lemon Lane Landfill, and resulting limitation of the cleanup of the Bloomington PCB sites to PCB "hotspots" only, would allow to continue present and predictable future releases of PCBs and other hazardous substances from these landfills via uncontrolled ground and surface water migration due to KARST, presenting an imminent and substantial danger to public health, welfare, and the environment.

Bennett's Quarry Dumps are included in the NOTICE OF INTENT TO SUE because we have reason to suspect that other locations in which Westinghouse capacitors, other PCB solid wastes, trichloroethylene (TCE), and other toxic chemicals were dumped have not been investigated at this site. Bennett's Dumps were burned and Products of Incomplete Combustion

substantial contamination at the sites is completely contrary to what EPA originally told the federal court was feasible and contrary to the complete excavation of contamination that EPA told the Court was necessary to protect public health and the environment. (Attachment 56).

The EPA and Westinghouse have also completely failed to address the critical fact that open burning took place at the sites with most of the waste being burned at Lemon Lane and Neal's Landfill. These sites are essentially hazardous waste ash dumps in addition to being chemical waste dumps which raises important unaddressed issues regarding contamination by ultra-toxic dioxin-like compounds and other products of incomplete combustion. The EPA and Westinghouse do not have the data to support their position that their PCB hotspot cleanup plan is protective and they have not performed the syudies to collect the necessary data. The detailed grounds for the intended suit are presented below.

I

THE NATURE AND EXTENT OF CHEMICAL CONTAMINATION HAS NOT BEEN DETERMINED, ALTERNATIVE REMEDIES HAVE NOT BEEN ADEQUATELY ASSESSED, AND NO EIS OR RI/FS HAS BEEN PREPARED BY EPA FOR THE BLOOMINGTON PCB SUPERFUND SITES AS REQUIRED BY LAW

The nature and extent of chemical contamination has not been determined for the Bloomington NPL sites nor have alternative remedies been adequately assessed. No Environmental Impact Statement (EIS) under NEPA or Remedial Investigation/ Feasibility Study (RI/FS) under CERCLA was prepared on the "HOTSPOTS" remedial decision negotiated by EPA and Westinghouse for Neal's Landfill and Lemon Lane Landfill although as Superfund National Priorities List (NPL) sites the proposed remedial "Hotspot" removal actions represent major federal actions significantly affecting the quality of public health and the environment.

Westinghouse," but did not give a reference or titles of the two studies. This reply, which was referencing studies done on the non-incineration remedial plans originally selected by EPA, was not relevant to the then-existing situation under the negotiated agreement (Consent Decree) in which excavation and incineration was to be the source control remedy for all 6 Bloomington area PCB sites. No RI/FS for the incineration remedy for any Bloomington PCB Site was in EPA's document repository in the Monroe County Public Library (or anywhere else), nor were there any documents that could be interpreted as a "functional equivalent". (Attachment 5).

A motion by InPIRG to intervene in the EPA and City versus Westinghouse cases was denied by Judge Dillin as untimely. Later suits were filed separately by Sarah Elizabeth Frey and People Against The Incinerator (PATI) , and David Schalk and Ronald Smith seeking an order requiring the preparation of an EIS or an RI/FS. These suits were filed first in Washington, D.C. where the Judge venued the suits to the U.S. District Court for the Southern District of Indiana where the Consent Decree was filed. There the suits were dismissed for lack of jurisdiction by Judge Dillin, the Judge in the EPA and City of Bloomington suits against Westinghouse which had resulted in the Consent Decree. The decision was appealed to the 7th Circuit Court of Appeals in Chicago where the Court affirmed the dismissal for lack of Jurisdiction, without hearing the cases on their merits. The dismissal was based on the Court's interpretation of a timing restriction Congress had placed on citizen suits which the Court read as requiring postponement of a citizen suit challenging an EPA Superfund remedial plan until after a stage of the cleanup is finished, regardless of how illegal or harmful EPA's remedial plan might be.

Public opposition to incineration as a remedy had sufficient strength that citizens were *able to get laws regulating and restricting use of incineration passed by their representatives* in

determination of whether a "functional equivalent" of an RI/FS was prepared for their PCB SUPERFUND SITES to establish once and for all whether EPA had illegally failed to prepare an RI/FS or its "functional equivalent" for Bloomington CERCLA NPL SITES. William Sanjour of the EPA Ombudsman's Office undertook the investigation which ended with his Finding that no Functional Equivalent of an RI/FS had ever existed for the Bloomington PCB sites.

Sanjour's letter of February 15, 1996 to Robert Martin relates his effort with Region V EPA to find an RI/FS, which couldn't be found. (Attachment 7). In his letter of June 12, 1997 to Carol Browner, Administrator, U.S.EPA, Mr. Sanjour quotes from a memo from EPA Assistant Administrator Elliott Laws: "Bill Sanjour reported no documentation relating to the performance of an RI/FS or the 'functional equivalent' and recommended that one be prepared notwithstanding the judgement of the court." (Attachments 7, 8).

Sanjour later asked Dan Hopkins, EPA Project Manager for Monroe County Superfund Sites at the time, why EPA did not do an RI/FS in order to quell public complaints, to which Hopkins replied, "because Westinghouse did not want it done." This was later corroborated by a Westinghouse spokesman in conversation with Bob Martin, EPA's Ombudsman.

Many citizens on EPA's Citizens Information Committee (CIC) made an effort to secure an RI/FS so as to have a voice in decision-making for the remedy for the cleanup of the major Superfund sites. CIC members were dismayed to learn at a meeting in the 1990s that EPA was proposing a PCB > 500 ppm "HOTSPOTS ONLY' remedy for cleanup of Lemon Lane Landfill. This PCB "hotspots proposal," a dramatic change from the original plan for removal of all of the contaminated material at the sites, was vigorously opposed by CIC members as "dangerously inadequate." The CIC members insisted on complete excavation of the

Central Springs and other vantage points during rainy, windy, and hot humid weather.

William Sanjour's letter of August 2, 1996 to Bob Martin and Tim Fields reports various grievances of citizens concerning the handling of their concerns about Lemon Lane Landfill including air pollution by PCBs and other contaminants. (Attachment 11). The long-time concern of citizens for a RI/FS to help them achieve complete removal of the contaminated wastes at Lemon Lane Landfill was totally justified, and the conduct of an RI/FS was long overdue.

Thomas Alcoma, present Project Manager for the Bloomington PCB NPL Sites, informed the CIC Committee on December 9, 1997 that any changes to the scope of the cleanup would be done by new remedy selection with an RI/FS, public comment, and a new ROD. However, on February 3, 1998, Alcamo told the CIC that his previous statement was in error and there would be no RI/FS. (Attachment 13).

Laramie Wilson, in a letter of February 17, 1998, and James Cartmell, in a letter of February 18, 1998, expressed their concerns to Judge Magistrate Foster about the inadequacy of a PCB only "hotspot" cleanup, and other matters. Ms. Wilson requested that Westinghouse be required to do complete excavations as required in the Consent Decree. (Attachment 12). Mr. Cartmell pointed out that the Magistrate had an obligation to see that the aims of the Consent Decree were carried out and that leaving substantial PCB contamination in the soil at the sites was inconsistent with the underlying premise of the Consent Decree which was removal of the contamination. Both reminded the Magistrate that the Consent Decree itself requires that alternative remedies achieve a level of removal equivalent to that required in the original Consent Decree plan.

The logic of citizen concerns for the Lemon Lane Landfill PCB hotspot cleanup plan apparently were lost on Region V EPA for they selected Neal's Landfill for the first PCB "Hotspot" only cleanup, even though the citizen concerns expressed regarding the Lemon Lane plan are essentially the same for Neal's Landfill which is considerably larger in size. A containment remedy was announced but **no RI/FS** was prepared for Neal's Landfill. Although the Tetra Tech site investigation report was given a title that implied that the data collected would eventually be used to prepare a Remedial Investigation/Feasibility Study, the RI/FS was never done and the data collected was grossly inadequate. Tetra Tech affirmed this in its Report in noting that there was still a need for a "comprehensive soil sampling and analysis program to determine the volume of material that contains PCB concentrations that equal or exceed 500 ppm and will need off-site disposal." (Attachment 35).

III

THE APPOINTMENT BY JUDGE DILLIN OF A MAGISTRATE JUDGE TO OVERSEE AND EXPEDITE ACTIONS OF THE CONSENT DECREE PARTIES HAS RESULTED IN A RUSH TO IMPLEMENT THE ILL-CONCEIVED PCB HOTSPOT ONLY CLEANUP PLAN

On November 21, 1997, Judge Hugh Dillin issued a Court Order appointing Magistrate-Judge Kennard P. Foster as Special Master in the Bloomington PCB Sites litigation with primary duties to see that the aims of the Consent Decree were carried out expeditiously and to resolve possible disputes between the parties. (Attachment 16).

Work at the Bloomington Consent Decree Sites began quickly after the Court Order with work at Winston-Thomas, Neal's Dump, and Bennett's Quarry dumps now deemed by the EPA to be completed, notwithstanding that no RI/FS was prepared on these cleanup actions and serious

environment to continue unabated. These EPA failures will result in the need for an expensive *real* cleanup to be done in the future when it becomes apparent that the instant sham cleanup has failed.

Westinghouse (CBS) sent a MEMORANDUM OF LAW IN SUPPORT OF A REMEDY INVOLVING THE CONSOLIDATION OF WASTE FROM THE BLOOMINGTON SITES AT NEAL'S LANDFILL to Magistrate Judge Kennard P. Foster on February 5, 1998 asserting that its "piggyback" proposal, which consisted of excavating, transporting and "piggybacking" the hazardous wastes of Lemon Lane Landfill, Bennett's Quarry Dumps, and Neal's Dump, on Neal's Hazardous Waste Landfill, is "technically feasible, environmentally protective, and cost-effective." (Attachment 17). Three of the four documents previously referred to were sent to the Magistrate Judge Kennard P. Foster by EPA in regard to this Westinghouse "piggyback" proposal for cleanup of Monroe County's PCB Superfund NPL Sites. These documents are:

1. Memorandum of Points and Authorities of the United States and State of Indiana regarding requirements for offsite disposal submitted by Lois J. Schiffer, Assistant Attorney General, Environment and Natural Resources Division, February 5, 1998 (Attachment 18).

2. Letter of February 5, 1998 from Thomas Alcamo, Project Manager, Region V EPA to Magistrate Judge Kennard P. Foster. (Attachment 19).

3. Letter of February 12, 1998 from Thomas Alcamo, Project Manager, Region V EPA to Magistrate Judge Kennard P. Foster.(Attachment 20).

The fourth document is a Report and Recommendations of the Magistrate Judge and Special Master Kennard P. Foster of January 20, 1999 in the United States District Court, for Southern District of Indiana, United States of America Plaintiff which addresses issues of great concern to the public which the plaintiffs believe should have been addressed in an RI/FS. (Attachment 21).

Region V EPA's Memorandum of February 5, 1998 makes many points that also should have

Monitoring Systems; (7) Leachate Collection.

7. PAGE 19. EPA notes RCRA hazardous waste landfill requirements are similar to those of TSCA landfill requirements, one difference being that RCRA requires a double liner.

EPA is cognizant of many hazardous substances listed in MEMORANDUM Of THE CITY OF BLOOMINGTON IN OPPOSITION TO THE RELIEF REQUESTED IN THE MOTION FOR A STATUS CONFERENCE 1985; and IDEM's FEASIBILITY STUDY OF ALTERNATIVE TREATMENT TECHNOLOGIES FOR SIX SITES IN BLOOMINGTON, INDIANA (1995), that are present at Neal's and Lemon Lane Landfills and are not chemically compatible with PCBs. See Attachments 22 and 23. EPA shows concern in the Memorandum for obeying the environmental laws, e.g., CERCLA, RCRA, and TSCA, and above all the CERCLA mandate that ALL remedial actions be protective of public health and the environment. EPA's concern was short-lived and discarded in the negotiated agreement concluded with Westinghouse.

The remedial action recently completed at Neal's Landfill by Westinghouse which is characterized as a "source control" remedy and removal of the "Principal Threat" of the landfill, was only for PCB "hotspots" identified in the Tetra Tech study of March 1998, which Tetra Tech itself found insufficient, recommending an additional comprehensive soil sampling and analysis program because of the variability in analytical data observed during their investigation.

The EPA's and Westinghouse's asserted confidence that they have identified all the hotspots is unsupported by the sampling and analysis to date as well as belied by the experience of EPA and Westinghouse in implementing the recent actions at the sites. There is 100 feet between many of the sample points, enough space to drive 10 semi tractor trailors abreast through (or enough nntested space to contain 10 semi loads full of capacitors. Further, after the sampling had purportedly

EPA has previously acknowledged that, notwithstanding data on the 1994 storm, that there is currently an insufficient evidentiary basis to conclude the landfill is above the level impacted by large-scale storm events or even of events of short duration but high-intensity. However, now, EPA is putting faith in an on-site engineering solution which requires precise and relevant monitoring, precise and appropriate leachate collection and efficient operation of water treatment facilities, which even if required, cannot be depended upon in actual execution to protect public health and the environment. Proper timing for sampling for toxic substances during storm events is essential but is scarcely ever done.

EPA has performed an about face from its original position stated to the Court (Attachment 56) and ignored the advice of its geochemists and karst hydrogeologists and the scientific opinions of consultants of COPA and Protect Our Woods, who are experts in the same general areas. Their opinions and recommendations would have carried weight and been a significant factor in decision-making had an RI/FS been prepared. Complete removal of the wastes at Neal's Landfill and Lemon Lane Landfill would also have been given proper consideration in an RI/FS rather than the short shrift EPA gave it as its #5 alternative in its Proposed Plan For Source Control Record of Decision Amendment at Neal's Landfill. KARST would have had to be considered in an RI/FS as a prime factor in decision-making.

EPA felt it necessary to mention in the Memorandum that both TSCA and RCRA required landfill liners with RCRA requiring double liners for toxic waste landfills. For EPA to turn around and not require a liner at Neal's Landfill WHICH REMAINS A TOXIC WASTE LANDFILL OVER KARST is unconscionable.

EPA mentions that the organic solvent carcinogen Trichloroethylene is present at Neal's

located on karst geology), as proposed by CBS, will not fail, the following ground control procedures are needed to 1) verify competence and 2) stabilize the bedrock surface immediately beneath the proposed fill area. Assuming a 10-acre area on site, the following is necessary:

> Removal of unconsolidated soils and waste down to the bedrock surface;
>
> Visual inspection for purposes of determining the integrity of the cleaned bedrock surface for sinkholes, open and clay-filled crevices and collapse sinkholes. Karst features found must be stabilized by sound engineering practices.

The last action EPA proposed were test borings for stability by pressure testing and subsequent grouting, concluding that by using the above protocol that a possibility exists that a engineered landfill could be placed at Neal's Landfill, but:

> Without the assurance of a competent bedrock surface to place large quantities of PCB contaminated waste, the U.S. EPA will not support the placement of large quantities of waste on Neal's Landfill surface. Moreover such placement would be contrary to Federal and State law and will inappropriately threaten public health or the environment.

The February 12, 1998 letter of Tom Alcamo to Judge Foster (Attachment 20) was a response to Westinghouse's technical summary submitted to the Judge on February 5, 1998 and was essentially a rebuttal of points discrediting Westinghouse's proposal to "piggyback" Lemon Lane, Bennett's Quarry Dumps, and Neal's Dump on Neal's Landfill. Nevertheless EPA's comments are pertinent in many instances to the present state of Neal's landfill which also involved "piggybacking" of contaminated waste with similar problems remaining of unknown severity after removal of an unknown quantity of "hotspots".

EPA first objected to Westinghouse calling Neal's a "municipal landfill" and mentioned that it was "more related to an uncontrolled dump."(which is still not accurate as it was A PRIVATELY

opportunity to evaluate new and innovative technologies or remedial approaches. This essentially eliminates the public from evaluating and commenting on, at an appropriate time in the decision-making process, the subject of controlling surface water flow, controlling and treating groundwater discharge from springs and seeps, groundwater contamination, residential well contamination, and other potential pathways of contaminant migration, significantly affecting public health and the environment.

Most of Alcamo's letter of February 12, 1998 to Judge Foster was a detailed rebuttal of points raised in Westinghouse's February 5th Memorandum of problems associated with piggybacking with considerable space given on pages 4-6 on a response to groundwater issues, noting that in EPA's view the most reliable data that exists on water level at the site is from an April 10, 1994 rain event and that it is not reasonable to assume that the 782.1 water level of that date in monitoring well 5A at Neal's Landfill is the highest that might occur and that in fact it was prudent to assume that that level had been exceeded in the past and will be exceeded in the future whenever precipitation exceeds the conditions documented for that date. Higher rainfall events in Bloomington than the April 1994 event have occurred.

EPA on page 6 also notes that:

> Furthermore, the soils and upper bedrock conditions (e.g. epikarst development) have not been characterized and cannot be fully characterized unless the bedrock surface is exposed for inspection. In addition to the possibility of waste backflooding into the waste, there is also the problem of saturating the underlying karst and the resultant sapping of soil from solution enlarged fractures, joints and bedding planes. Progressive sapping of soil from beneath the waste will allow collapse of overlying waste materials.

This evaluation relates to the current situation as well as in terms of groundwater coming into contact with epikarst during storms and contributing to conditions conducive to sinkhole formation.

> and sediment removal aspects of remediation at Neal's Landfill and Lemon Lane Landfill, including negotiations for permanent water treatment solutions for these sites, approximately one year following the completion of source control activities at each site. Through the year following the completion of source control activities, water conduit and other relevant investigations shall continue and/or be initiated at each site as necessary or useful to determine the need for interim and permanent water treatment at each site and sediment removal.

A final RCRA Cap has been placed over Neal's Landfill but an RI/FS is still needed to decide whether it is necessary for protection of public health and the environment to remove the remainder of the Landfill or consider on-site treatment of the landfill wastes by one of the advanced technologies that has been chosen or used by other communities.

EPA recognized the importance of consideration of water treatment and sediment removal as an integral part of the targeted excavation scheme but EPA obviously did not prevail in negotiations, as noted in the Magistrate Judge's Report and Recommendations, but Westinghouse did get what it wanted: first, excavation of "hotspots", and second, reluctantly, negotiations on water treatment and sediment removal.

Again, A PIVOTAL ISSUE, mentioned many times, is WHETHER GROUNDWATER IN THE KARST CAN BE CONTROLLED? Groundwater contaminated with PCBs and other toxic substances from Neal's Landfill have been escaping in numerous directions including all directions monitored, such as from the northwest part of the site from springs and seeps via Conard's Branch thence into Richland Creek and other areas, and from the southern part of the landfill into Southwest Branch and thence into Richland Creek. The EPA made clear in its request to enter the Consent Decree that groundwater flow at the sites could not be tracked and controlled due to the Karst. (Exhibit 56 at p. 30).

A pertinent point is that interim remedial measures required of Westinghouse in the Consent

In EPA's Enforcement Confidential Summary of Remedial Alternatives Selection Neal's Landfill (ECS/RAS), EPA discusses other remedial measures evaluated as alternatives in 1983-84 including: an interceptor trench, an impermeable barrier around and under the site, and an impermeable barrier downgradient with treatment of ground water and leachate, and EPA again noted:

> Each of these alternatives was rejected by engineering and hydrogeologic experts as being infeasible for Neal's Landfill given the cavernous and fractured limestone setting. The experts unanimously agreed that none of the systems would reliably control contaminated ground-water migration from the site. The experts also concluded, based on their experience and knowledge about Neal's Landfill, that installation of a ground-water purge system was not feasible for the site. (Attachment 24).

The three expert consultants employed to help EPA with its suit against Westinghouse in 1982-84, Dr. Robert A. Griffin, Geochemist, Dr. Richard L. Powell, Karst Hydrogeologist, and Dr. Philip E. LaMoreaux, Hydrogeologist, rejected all remedial measures proposed for addressing groundwater contamination that involved attempts at containment of contamination on-site "as being infeasible for Neal's Landfill given the cavernous and fractured limestone setting.

Powell noted in a separate paper that:

> The installation of a grout curtain in fractures and solution voids around and under a site in cavernous bedrock is not feasible for several reasons. For example, it is difficult to establish the certainty of boring into all open voids, adequate sealing of large open passages or solution conduits is not assured, and replacement of sediments with grout in those voids that contain sediment is uncertain. (Attachment 25).

Powell in his Geology and Hydrology of Neal's Landfill, Monroe County, IN of August 3, 1983, describes in detail subterranean features at or near Neal's Landfill, including about 30 sinkholes and swallowholes not shown on the Whitehall topographic quadrangle. Also reported were

Gareth J. Davies, Principal Scientist for Cambrian Groundwater Company, and consultant for COPA, in his Review of Neal's Landfill Stability Evaluation Technical Memorandum (TM) noted that:

> Modifying the surface expression of the landfill might have a deleterious effect on ground-water flow in the subsurface beneath the landfill. (Attachment 31)

Such a change has recently been reported at South Spring where its normal flow has increased 2 1/2 times since recent excavation and earth-moving activities at Neal's Landfill. The first instance of such a change was reported by the F&WS in a 1990 letter to Dan Hopkins after they inspected the Westinghouse water treatment facility and found that it failed to collect all the water from the four seeps and springs and found that one of the seeps had changed where it emanated from the ground as a result of attempts to collect it.

Davies further noted that despite the caution expressed in the TM about the stability or potential instability of the landfill, the documented presence of "voids" and discussion about bedrock collapse should be evaluated only against the fact that 99% of the subsidence sinkholes form in soils that cover karst terranes, and that this site meets the criteria, despite the bedrock situation. This site (Neal's), based upon the Waltham (1994) discussion has a significant potential for soil subsidence and collapse and this, in combination with the lack of reliability of the evaluation of the waste and its consolidation, makes the prospect for an appropriate remedy more remote than is being professed. (Attachment 31). During interim measures John Foster personally observed subsidence occurring at Neal's Landfill.

Joseph G. Hailer, Geochemist, and Consultant for Protect Our Woods, notes in his letter to Magistrate Judge of March 27, 1999 page 2, under the heading Consent Decree:

EPA PROMISES "FUTURE OPERABLE UNIT DECISION DOCUMENTS"

EPA notes on page 5 in the ROD Amendment:

> The release and threatened releases of PCBs from Neal's Landfill which have contaminated sediments and groundwater and produced unacceptable risk will be addressed through future operable unit decision documents.

This is unacceptable because of unanswered questions regarding response to groundwater during storms of different intensity and length, site stability, questions of formation of sinkholes, and other geologic concerns and the need for an RI/FS. There is an immediate need to assess and stop discharges of PCBs and other contaminants from the Bloomington PCB sites during storm events and non-storm periods and to more thoroughly assess groundwater contamination including contamination of residential wells at all the sites.

A water treatment/sediment removal decision expressed in an "operable unit decision document" is not the issue, it is the judgment of expert scientists as to whether leaving most of the hazardous wastes on site over karst is protective or whether complete removal is in the public interest. It is certainly in the public interest to consider new technologies and for the public to have its say before, not after, EPA and Westinghouse have negotiated a settlement that they do not agree with. EPA has decided that water treatment will be done without first determining that it is feasible, and in the face of abundant evidence including EPA's prior representations to the Court, that it is in fact not feasible.

VIII

WESTINGHOUSE STATEMENT OF WORK ISSUED BEFORE ROD

of other contaminants.

Gareth Davies, an expert consultant for COPA noted deficiencies in the design of EPA's study which made it "totally untenable" as a reliable method for determining "hotspots."(Attachment 36).

Joseph Hailer, a consultant for Protect Our Woods, noted:

> Inadequate lateral and vertical sampling and the failure to address epikarst and groundwater, make any conclusion as to the distribution and extent of contamination unsupportable,

and,

> A correct application of hotspot sampling requires an understanding of the size of the hotspot target, and using DQO-PRO at a 90% confidence that the hotspot would be detected, indicates that on the square grid array for the site a 100-foot spacing could reliably detect a hotspot only if it were about 55 feet in diameter. Hailer noted further that the PCB Final Rule in June 1998 prescribed as the minimum for this type of investigation a spacing of about 9 feet. (Attachment 32).

Government Parties and Westinghouse decided to start removal of "hotspots" WITHOUT FURTHER SAMPLING IGNORING THE RECOMMENDATION OF TETRA TECH (page 23, Tetra Tech Report). Therefore, EPA cannot declare as it does that Alternative 4, the excavation and removal of "hotspots" and capacitors which Westinghouse performed at Neal's Landfill represents a removal of the principal threat of PCBs to the public and the environment. Nor can EPA call the remaining waste on site a "low level threat" as EPA does on page 3 of the Record of Decision Amendment, because of the inadequacy of the sampling of the landfill and because there is no known threshhold for effects of contamination as previously cited by EPA.

There is another major flaw in the EPA hotspot approach. The analysis for PCBs was not done in a manner that allows the toxicity of the actual PCB mixtures present to be determined.

been confirmed in an official document in the Administrative Record. Considering that a large amount of the PCBs dumped are no longer in capacitors but are in soil, fullers earth, rags and other material at the sites, and the sampling was inadequate to reliably determine PCB hotspots, a large amount of PCBs are virtually certain to remain at the site.

Nevertheless, ca 278,000 cubic yards of soil contaminated with PCBs, products of incomplete combustion (PICs), numerous organic solvents, toxic metals and other toxic contaminants remain over KARST, without a liner, and with insufficient data on whether it will remain high and dry during storms. It is not an acceptable prospect. A notable omission in the Proposed Source Control Plan is the lack of assessment of recently developed treatment technologies now in use or in process of being tested for destruction of persistent organic pollutants (POPs) and chemical warfare agents. Such an analysis of alternatives is required as part of an RI/FS or EIS and this omission supports the need for preparation of an RI/FS.

Gas-phase chemical reduction appears to represent a substantive qualitative improvement over combustion (Incineration), which EPA is still using for destruction of POPs (Persistent Organic Pollutants) chemicals and POPs contaminated wastes. Isolation of Neal's Landfill's highly toxic wastes by vaulting until a destruction technology or technologies are selected, should be considered if a decision cannot be reached immediately on a specific technology. (Attachment 37).

X

EPA RESEARCH AND DEVELOPMENT REPORT ON PRODUCTS OF INCOMPLETE

fraction of only 10% that of chlorine can potentially produce quantities of brominated PICs at levels comparable to those of the chlorinated PICs, and increases in feed bromine concentration dramatically impact emissions of many chlorinated organics including PCDDs/PCDFs.

Pauline Ewald of Environmental Compliance Organization (ECO), in a letter of July 13, 1995 to Mike Baker, COPA, noted:

> Recent research information suggests that there are many potentially toxic contaminants that may be co-located with PCBs, especially where as is the case with Lemon Lane, there has been incomplete and uncontrolled burning.
>
> These substances include dioxin and furan-like compounds where bromine and sulfur substitute for the chlorine associated with dioxins and furans. Although these compounds are not fully understood to date, research data tends to suggest that these relatively unknown chemicals, almost universally excluded from routine site characterization and risk assessment have likely greater toxic potential in regard to human health and the environment than the dioxins and furans. (Attachment 55).

Ewald concluded with the remark that any truly comprehensive characterization of the Bloomington sites should provide for identification and quantification of 15 listed chemicals, from co-planer PCBs and polychlorinated dibenzothiophenes to polybrominated biphenylenes and chlorobenzenes.

Burning of PCBs and other materials in such quantities as occurred at Neal's Landfill and Lemon Lane in association with other hazardous organic chemicals and a wide variety of heavy metals makes testing only for PCBs (and as the Tetra Tech study makes clear, inadequately at that) unacceptable and has not defined the toxicity of these sites even for PCBs. This, coupled with the fact that Karst is unpredictable, makes trying to control pollutant migration via water monitoring for PCBs and water treatment for PCBs a fool's errand.

EPA, in its February 5, 1998 letter to Magistrate Judge Foster, notes that Westinghouse's

DESTRUCTION OF POHCS AND PICS

EPA makes frequent references in its PROPOSED PLAN FOR THE SOURCE CONTROL RECORD OF DECISION AMENDMENT AND RECORD OF DECISION AMENDMENT SOURCE CONTROL OPERABLE UNIT to public rejection of incineration as a remedy as called for in the Consent decree, **implying that failure to accept incineration is part of the problem in the current decision to remove only "hotspots" and leave most of the toxic contamination in place over karst, without considering other treatment options**. At page 6 of the PROPOSED PLAN FOR SOURCE CONTROL (PPSC) EPA states:

> [b]ased upon the difficult schedule of completing the remediation of CBS sites, **the opposition to thermal treatment by the community**, and the need for an alternative to the incineration remedy, **treatment options were not considered** and screened out of the detailed cost analysis. (Attachment 39).

EPA states in the RECORD OF DECISION SOURCE CONTROL AMENDMENT (ROD), page 3 (Attachment 33):

> Off-site landfilling of PCB contaminated landfill material does not reduce the toxicity, mobility, or volume through treatment but is justified based upon the large quantities of municipal landfill waste disposed of at the site along with the court mandated deadline **and community opposition to on-site thermal treatment**.

And on page 6 of the ROD AMENDMENT:

> Accordingly, **although the incineration remedy would have satisfied the nine criteria (pages 10,11) had it been built, under current conditions the incineration remedy fails to meet the implementability, community acceptance, and State acceptance criteria.** Because the incinerator currently does not exist and in light of the court mandated deadline, the following discussion of the source control alternatives excludes incineration as contemplated in the Consent Decree.

The Monroe County Community, because of its opposition to incineration, appears to be used as a scapegoat by EPA, for the current "Hotspot" removal remedy for Neal's Landfill, which

would construct a pilot plant to test burning of contaminated soils with MSW but a pilot plant was never constructed and an attempt of Westinghouse to use its Panama City, FL plant as a "pilot plant" did not attempt to duplicate the "remedy" as proposed.

The use of MSW as fuel for the incinerator was widely opposed by citizens interested in recycling of their municipal wastes to the extent possible, as well as by citizens generally on the basis that MSW would constitute an additional hazard to burning of highly complex wastes of the Superfund Sites, particularly the NPL sites, Neal's Landfill, Lemon Lane Landfill and Bennett's Quarry Dumps all of which had been burned as part of landfill management.

Citizens also protested that the landfill from incineration of the soil would produce a hazardous waste landfill from the heavy metals and PICs, POHCs, VOCs , whatever was retained in the baghouse filters, **exceeding in size all of the combined Superfund Site Landfills.** The site purchased by Westinghouse for the hazardous waste landfill was in an uncontaminated area of the County in a karst situation considered unacceptable on that ground alone. Little wonder that a massive citizen protest erupted when the hazardous waste landfill plan became known.

Proposed siting of the incinerator on city-owned land near the City's Sewage Treatment Facility on south 37, in close proximity to Lake Monroe, the City/County water supply reservoir, was also strongly opposed.

Monroe County citizens visited some communities with incinerators and researched the operation of hazardous waste incinerators in other communities all of which had serious concerns about incinerator emissions and health problems possibly associated with the incinerators. Workshops were attended on incineration and speakers were brought to Bloomington to learn first hand why so many communities were opposing incinerators.

Monroe County Commissioners publicly recognized the dangers of EPA's current 'hotspot" cleanup plan for Neal's Landfill. In public statements the Commissioners have said they found Alternative 4, selected by EPA for the Record of Decision Amendment to the Consent Decree -- consisting of excavation of "hotspots" greater than 500 ppm with off-site disposal, consolidation of landfill material to the center portion of the landfill and placement of a RCRA Subtitle C compliant cap over the reduced landfill surface — "**totally unacceptable**" in that it "fails to provide a long term solution to PCB contamination and places public health at risk." (Attachments 40).

The Commissioners, in their statement of April 19, 1999:

1) Emphasized that Alternative 4 violated existing standards for the disposal of hazardous waste since Neal's illegal dump is located on karst terrain and no landfill, hazardous or non-hazardous may be located on karst and all are required to provide bottom liners as well as impervious caps;

2) Emphasized that consolidating hazardous materials on a geologically unstable foundation is irresponsible and ensures that future generations will be exposed to further health risks and will be forced to mediate the site a second time;

3) Questioned why the Record of Decision Amendment was allowed to violate the procedures for amending the Consent Decree, since any amendment was to provide a level of removal and protection at least as rigorous as those in the original agreement and were to be negotiated without cost as a factor; and

4) Declared only complete excavation is acceptable, which the County plainly stated in letters from its Health Department dated March 3, 1998 and December 30, 1998. (Attachments 1, 2, 3, 4,). (Attachments 40)

period. She finally turned to the Indiana State Board of Health (ISBH) after securing 200 signatures, nearly 100% of residents of the area, seeking closure of the dump. In a letter of February 1968 she described the current situation: "There is consistent burning. It is rat infested, there are packs of dogs which feed there. Also it's causing highway littering which is hazardous. Open dumping of septic tank sewage is allowed. Also, cattle run in this area, eating of the garbage." (Attachments 42A, 42B) (Note: Neal's herd of cattle roamed the dump for 20 years or more.)

Mrs. Heine and Mrs. Kinser, adjoining property owners lodged a serious public health complaint on May 5, 1969 with ISBH. T. E. Cunningham of ISBH who received the complaint and noted in an Intra-Department Memo that:

> Complaints have been received again from Mrs. Heine and Mrs. Kinser, adjoining property owners to the Ray Neal dump. We have prior complaints from these parties in our files. Monroe County adopted the Model Ordinance in 1968. However, the Monroe County Health Department apparently refuses to enforce it as to Neal. Apparently he is burning tires and plastic TV cases again. (Attachment 42C).

Ray Neal applied for State of Indiana permits for the landfill but his applications were denied. Samuel Moore, Industrial Waste Disposal Section, Division of Water Pollution Control, Indiana State Board of Health (ISBH) said to Neal in a letter of October 30, 1968:

> We cannot certify your method of handling waste material from the Westinghouse Corporation, Bloomington, is done in a manner that would be considered acceptable. Your current disposal practices include making a pile of the oil absorbing compounds containing a material called Inerteen (PCBs) and then placing on top of this several truck loads of waste cardboard, broken wooden pallets, waste paper, and defective transformer coils. You then set fire to the pile and allow all combustible material to burn as completely as it will naturally do.
> Westinghouse Corporation recognizes the potential toxicity of this material and claims to have a special method for disposing of Inerteen (PCBs) contaminated wastes. The method they have chosen calls for controlled burial. In fact, the method of disposal outlined during a phone conversation with Mr. Shoaf does not appear to be at all feasible in the Bloomington area because of the local geology. (Attachment 42 D).

BLOOMINGTON SUPERFUND SITES

The U.S. Fish and Wildlife Service has conducted studies and written letters, papers and Reports that documented PCB migration from the Superfund sites into streams and ecosystems posing serious risks to the environment and the public. The release of PCBs into the Bloomington /Monroe County environment is exactly what was intended to be prevented by the EPA and City lawsuits against Westinghouse via the 1985 Consent Decree. In the EPA and City of Bloomington Motion to enter the Consent Decree in 1985, EPA and the City asserted that PCBs are highly toxic, that relying on engineering controls is inappropriate for highly toxic persistent compounds such as PCBs, that there is therefore a need to clean up the Bloomington PCB sites so that the sites are virtually PCB free, that the geology of the area including limestone cracks and other karst features at the Bloomington sites makes containment of the PCBs in place infeasible, and that landfilling the PCB waste locally or elsewhere simply postpones the toxic cleanup problem to another day.

The history of efforts to secure complete removal of PCBs and other toxic wastes at Neal's site must include not only that of EPAs early consultants but Fish & Wildlife Service (F&WS) and other scientists who have contributed substantially to our knowlege of local contamination and its effect on our natural resources.

The F&WS, in a letter of June 13, 1990 from James Rewald for Dave Hudak, Supervisor, to Dan Hopkins, EPA, notes their collaboration with U.S. EPA and Department of Justice in 1982 on an evaluation of off-site migration of PCBs expressing continuing concern for the valuable fish and wildlife habitats in and adjacent to this site, and the potential for adverse impacts to Conard's Branch, Richland Creek, and the White River, noting specifically:

> [T]he wetlands/floodplain habitat for many species of migrating waterfowl,

to Gene A. Lucero, Office of Waste Programs Enforcement, U.S. EPA, Washington, D.C. concerning F&WS studies conducted in Richland Creek and Conard's Branch on fish, isopods, crayfish and turtles, noting all aquatic organisms tested were found to contain some level of PCBs, as did the down-stream water and sediments in Conard's Branch and Richland Creek. (Attachment 45).

In November 1991 the F&WS published a Biological Report on PCBs in Richland Creek Downstream from Neal's Landfill April, 1991 based on 2 composite whole fish samples collected near Highway 48 bridge and 2 sediment samples from the upper end of Conard's Branch. Concern was for the impact of fish contaminated with PCBs on fish-eating birds common to the area, belted kingfisher, great blue and green-backed herons, concluding that they were probably experiencing reproductive impairment associated with levels of PCBs in the forage fish of 1.25 to 1.95 ppm weight.

Mink is one of the most sensitive mammalian species to PCBs and the F&WS concluded that the level of PCBs in the forage fish collected downstream of Neal's Landfill is sufficiently high to preclude a viable mink population.

Based on the 1991 study, the F&WS concluded that IDEM and ISBH should address the need for a consumption advisory (human) on Richland Creek.

The F&WS also considered the implications of the findings of its 1991 study on the NPDES Permit for Neal's Landfill water treatment plant and recommended that:

> Therefore, to adequately protect fish and wildlife resources from the bioaccumulation hazards associated with PCBs, IDEM should impose the minimum chronic standard of 0.014 ppb criteria on the Neal's Landfill NPDES Permit (from the established 1 ppb). (Attachment 46).

A F&WS letter of August 27, 1990 from David C. Hudak, Supervisor (Daniel W. Sparks, Acting), Bloomington Field Office, to Dan Hopkins, Project Manager PCB Sites, EPA, Bloomington, was concerned with 1) Investigation of all possible groundwater discharge points to assess if PCBs and other contaminants are leaving LEMON LANE LANDFILL, noting F&WS willingness to cooperate with review of the design of the monitoring plan (and possibly to assist in implementation), and that biological data should be a significant part of the monitoring plan; also, 2) F&WS was critical of EPA's erroneous interpretation of the lack of significance of its air monitoring data from FELL IRON and LEMON LANE and noted its likely significance on the biota in those areas; and, 3) reiterated its concern for follow-up investigation to assess current status of offsite migration of PCBs at NEAL'S LANDFILL and expressed concern with data IDEM used to remove Richland Creek from fish advisory; 4) asked what hydrogeological information had been collected for BENNETT'S QUARRY, noting fishery resources in surrounding quarries and Stout's Creek should be evaluated.; and 5) expressing extreme concern for migratory birds such as waterfowl and wading birds being attracted to the WINSTON-THOMAS TREATMENT PLANT site. (Attachment 48).

A F&WS letter of March 11, 1991 from David Hudak to the Field Solicitor in the Twin City, MN Regional Office requesting rescindment of Natural Resource Damage release for Potentially Responsible Parties of the Consent Decree sites, provides extensive documentation of the politics that work against protection of the public health and the environment in solution of severe environmental problems.

Hudak expressed his opinion that natural resources under their protection were being impacted by the subject sites and the selected remedial actions would not sufficiently remediate

the Winston-Thomas Sewage Treatment Plant as the experimental environment.

A significantly greater percentage of tree swallow early embryos, were abnormal (greater than 30%) at the PCB contaminated site than the reference site. The embryonic abnormalities at the contaminated site were similar to those seen with TCDD-injected chicken embryos. The PCB/TCDD-related abnormalities observed in the embryos taken from the contaminated site include tubular, edematous hearts, delays in heart folding, visceral arch anomalies, and twisting of the embryo just below the level of the heart. (Attachment 51).

In the second study on passerine productivity, initial assessment indicates that significant differences were detectable between sites. The tree swallow nestlings at the contaminated site had significantly smaller mean weights of heart, lung, kidney, and spleen compared to those at the reference site. Gross abnormalities included abnormal hearts (house wren most frequent) abnormal beaks, (especially tree swallow) and gonadal abnormalities in several species. (Attachment 52).

EPA also notes in the same paragraph on page 3 that there has been 1) extensive documentation of ecological effects from PCB and related compounds on fish eating birds in the Great Lakes Region: GLEMDS (Great Lakes Embryo, Mortality, Deformities, Syndrome) and, 2) the December 3, 1997 "Ecological Risk Evaluation for Clear Creek" by Dr. Mark Springer, presented to the Court, shows that PCB contaminant levels in Clear Creek Fish would pose a risk to fish-eating mammals such as river otters, and that fish levels would have to be below 0.1 ppm PCB to avoid risk to other wildlife. Data collected to date show that Clear Creek, Richland Creek and Stout's Creek exceed the 0.1 ppm PCB value approximately 10X.

EPA's citing of these papers, which document the multifaceted insidious harmful effects and life-threatening results of local PCB contamination to a wide range of animals (including humans)

The above named persons and groups intend to bring suit against the U.S. Environmental Protection Agency (EPA), the EPA Administrator, and the EPA Regional Administrator pursuant to 42 U.S.C. § 6972(a)(1)(B), to enjoin the ongoing and imminent hazards posed by the current hazardous waste excavation, storage, disposal, and transportation activities at the Bloomington Westinghouse CERCLA NPL and non-NPL contaminated sites (Neal's Landfill, Lemon Lane Landfill, Bennett's Quarries, Neal's Dump, Winston Thomas Sewage Treatment Plant Sites, and numerous other named and unnamed sites). The hazardous waste excavation, storage, disposal, and transportation activities pose a serious imminent hazard to human health and the environment for the reasons detailed herein which include:

1) the failure of the above named to adequately test and characterize the toxic and hazardous contaminants in the soil, sediment, ash, air and water at the sites, including the failure to reliably identify the locations, concentrations, and form of contaminants present in the face of affirmative evidence of substantial open burning of chemical waste and the virtual certainty that numerous products of incomplete combustion will be present including dioxin-like compounds;

2) the failure of the above named to adequately analyze and identify the toxic and hazardous contaminants expected to be present in the air, water and particulate emissions and releases from the sites before, during and after planned remediation activities;

3) the failures of the above named to properly evaluate the risks to public health and the environment posed by the air, water and particulate emissions and releases from the sites before, during and after planned remediation activities expected from the sites;

4) the inability of the above named parties' PCB hotspot cleanup and consolidation on site of contaminated material to adequately destroy or contain the PCBs and hazardous wastes and hazardous constituents including dioxin at the sites;

5) the inadequacy of existing and planned pollution control measures at the site for controlling toxic releases from the sites via air, particulate and water;

6) the nature and complexity of the chemical contaminants at the sites and

> or past or present owner or operator of a treatment, storage, or disposal facility, who has contributed or who is contributing to the past or present handling, storage, treatment, transportation, or disposal of any solid or hazardous waste which **may present an imminent and substantial endangerment to health or the environment**.

42 U.S.C. § 6972(a)(1) [emphasis added]. Similar language is contained in an equivalent section designed to empower the EPA to prevent or remedy imminent threats to public health or the environment.

> Notwithstanding any other provision of this chapter, upon receipt of evidence that the past or present handling, storage, treatment, transportation or disposal of any solid waste or hazardous waste **may present an imminent and substantial endangerment to health or the environment**, the Administrator may bring suit on behalf of the United States in the appropriate district court against any person (including any past or present generator, past or present transporter, or past or present owner or operator of a treatment, storage, or disposal facility) who has contributed or who is contributing to such handling, storage, treatment, transportation or disposal to restrain such person from such handling, storage, treatment, transportation, or disposal, to order such person to take such other action as may be necessary, or both.

42 U.S.C. § 6973(a) [emphasis added]. The plain language of these two RCRA provisions establishes that relief should be granted when the evidence demonstrates that activities involving solid or hazardous waste "may present an imminent and substantial endangerment to health or the environment." 42 U.S.C. §§ 6972(a)(1)(B); 6973(a). RCRA's imminent hazard provision does not put an unreasonable burden of proof on citizens to prove harm with certainty.

The case law interpreting the imminent hazard provisions of RCRA support the plain meaning analysis. Only threatened harm is required, not actual harm, in order to support a claim of imminent endangerment under RCRA, either 42 U.S.C. § 6972(a)(1)(B) (citizen plaintiff) or 42 U.S.C. § 6973 (government plaintiff). Reserve Mining Company v. EPA, 514 F.2d 492, 519 (8th Cir. 1975). Where concepts of potential harm are applicable due to scientific uncertainty, it is

749 F.Supp. 441, 445 (E.D.N.Y.1990). Plaintiff maintains that defendant's stress on the lack of evidence regarding harm to human health and the environment misconstrues RCRA's requirements in s 6972(a)(1)(A) governing suits against persons who have violated RCRA with the separate requirements of § 6972(a)(1)(B). This latter subsection authorizes citizen suits against any person contributing to "the handling, storage, treatment, transportation, or disposal of any solid or hazardous waste which may present an imminent and substantial endangerment to health or the environment." To the extent defendants contend that plaintiff must show an incontrovertible "imminent and substantial" harm to health and the environment defendant misreads the statute. The operative word in s 6972(a)(1)(B) is "may." Plaintiff need only show that the conditions at the landfill may present an imminent and substantial endangerment to human health or the environment.

Gache v. Town of Harrison, 813 F.Supp. 1037, 24 Envtl. L. Rep. 21023, 1993 WL 30476, *6 (S.D.N.Y. 1993).

> By enacting the endangerment provisions of RCRA and [Safe Drinking Water Act], Congress sought to invoke the broad and flexible equity powers of the federal courts in instances where hazardous wastes threatened human health. S.Rep.No.96-172, 96th Cong., 1st Sess., at 5, reprinted in, (1980) U.S. Code Cong. & Ad. News 5019, 5023. Indeed, these provisions have enhanced the courts' traditional equitable powers by authorizing the issuance of injunctions when there is but a risk of harm, a more lenient standard than the traditional requirement of threatened irreparable harm. H.R.Rep.No.96-191, 96th Cong., 1st Sess., at 45 (1979); H.R.Rep.No.93-1185, 93rd Cong., 2nd Sess., reprinted in (1974) U.S. Code Cong. & Ad. News 6454, 6488.

United States v. Price, 688 F.2d 204, 211 (3d Cir. 1982). The Price court went on to specifically discuss the "imminent and substantial endangerment" language.

> The expansive language of [the imminent and substantial endangerment] provision was intended to confer "overriding authority to respond to situations involving a substantial endangerment to health or the environment." [citation to and quote from committee report omitted] ... The unequivocal statutory language and this legislative history make it clear that Congress ... intended to confer upon the courts the authority to grant affirmative equitable relief to the extent necessary to eliminate any risks posed by toxic wastes.

Price, 688 F.2d at 213 - 214. The Price court then concluded that-

> Congress, in the endangerment provisions of RCRA ... sought to invoke nothing less than the full equity powers of the federal courts in the effort to protect public health,

basic structure. The differences among the individual "forms" (often called congeners) are based on the addition of chlorine atoms to the basic organic structure. Chlorine atoms may be added at one or more of eight positions on the basic chemical structure. Each one of the combinations of number and position of chlorine addition creates a different specific form of chlorinated dioxin. There are a total of 75 different such chlorinated "dioxin" forms. In addition, the basic structure to which chlorine is added may vary by the removal of an oxygen atom, to create a compound called a "furan." Furans are quite similar to dioxins. The resulting chlorinated furans are chemically and toxicologically similar (but not identical) to the dioxins. There are 135 possible chlorinated furans. The dioxins and furans together make up a group of chemicals formed from high temperature combustion, paper bleaching and certain high temperature industrial processes using chlorine and chlorinated materials, as is the case for the individual compound, TCDD.

A number of the dioxins and furans (at least 17), and a number of the PCBs, act in a common fashion, described and known largely by the way in which the most toxic form, 2,3,7,8 TetraChloroDibenzo-p-Dioxin (TCDD), acts on biological systems. Other compounds that act through this common mechanism also have toxicological properties similar to the dioxin-like compounds. The biological action of dioxin is based on the ability of the molecule to passively enter cells (because all cells have a fat-based cell membrane and dioxins dissolve in fat) and then bind to a specific protein (a receptor), forming a two-part complex within the cell. Once dioxin and protein bind, other events take place in the cell, the dioxin-protein complex moves into the nucleus and the complex acts on (or interacts with) the DNA (deoxyribonucleic acid), the genetic material in all cells. Once dioxin acts on the DNA, an entire array of effects may be stimulated. The most common one of which is increasing the number and activity of specific enzymes and chemical processes in the

eliminate half of the dioxin they ingest from their bodies. It can take ten years or more for half the dioxin present in soil to break down.

Numerous dioxin-like compounds may be created and emitted during combustion processes because of the chemical components in the waste being burned, which includes chlorine, bromine and sulfur. For example, when both chlorine and sulfur are present in the waste, the sulfur analogs of the polyhalogenated dioxins and furans are released during combustion (the sulfur replaces the oxygen in the dioxin and furan structure). Numerous of these dioxin-like compounds are expected to be present at the Bloomington sites but have not been addressed in the government site assessments or remedial plans and actions.

This omission of numerous dioxin-like compounds from the government assessments is of great import because the dioxin-like compounds exhibit extreme toxicity. This fact is even more disturbing given recent government studies showing that the U.S population is already suffering from excessive exposure to dioxin-like compounds, and that additional exposure would be expected to cause harm to public health. See EPA 1994 Dioxin Health Assessment Document.

Given dioxin's extreme toxicity, and given the quantity of dioxin-like compounds likely created from the years of open burning of PCBs and wastes at the Sites, it becomes a critical question as to the extent to which these poisons have been and will ultimately be released into the environment from the Sites and be captured in the food chain, inhaled, or otherwise result in human exposure. The extent of harm to public health will depend on the answer to this question. It is this type of question that proper risk assessments are designed to answer. However, no risk assessments have been prepared by EPA and released for public review that speak to this critical issue. However, notwithstanding the absence of a detailed health risk assessment, given certain well

and thus if the existing (background) exposure is added to the exposure resulting from releases from the Bloomington Sites, there can be no doubt that the resulting combined dioxin exposure would be greater than the 1 pg/kg-day RfD.

Releases of dioxin-like compounds are certain to be occurring from the Bloomington sites because, for example, putting aside for the moment the open burning of PCBs and other wastes which created dioxin-like compounds at the sites, PCB releases from the Sites have been confirmed and PCBs are themselves dioxin-like compounds.

> Another group of compounds that have dioxin-like properties is the polychlorinated biphenyls (PCBs). The PCBs, once manufactured and used in industrial electrical equipment (e.g. transformers), but no longer in use, are also formed from high temperature processes such as incineration and combustion. There are 209 different PCBs. Because of chemical similarities, some of the PCBs act in a toxicological mode similar to the dioxins; e.g., those PCBs that bind to the Ah receptor also have dioxin-like properties.
>
> The dioxins and the dioxin-like furans and PCBs are best evaluated together as a group and the total effects of the entire group are determined on the basis of the effectiveness in binding to the Ah receptor. Quantitatively, the procedure requires taking the numerical toxic equivalency factor (TEF) and multiplying the concentration of the dioxin compound in question to arrive at the dioxin toxic equivalent (TEQ). This approach has been endorsed by the Environmental Protection Agency (EPA) and the World Health Organization.

Expert Report of Dr. Peter deFur, September, 1999.

PCBs account for approximately half to two thirds of the current U.S. exposures to dioxin-like compounds according to U.S. EPA (considering chlorinated dioxins and furans and PCBs only). See EPA 1994. Once the existing exposure to a toxic chemical such as dioxin exceeds the danger level, the additional exposure that results from releases from contaminated sites such as the Bloomington Sites would be expected to increase the frequency and severity of illness. See EPA 1994 (Dioxin Health Assessment).

dioxins) cause developmental abnormalities in humans (see Patandin et al., 1999).

Low level exposures of humans to dioxin and related compounds can reasonably be expected to cause a range of problems from cancer to developmental abnormalities to immune system disorders to problems with reproductive systems.

The most sensitive endpoint for the effects of dioxin exposure thus far examined is the development of the fetus and the newborn. The EPA reassessment (EPA 1994a) and current publications (Birnbaum, 1994; Patandin et al., 1998) conclude that the fetus and developing child are the most sensitive to dioxin and that placental transfer and breast feeding are highly effective in transferring dioxin-like compounds. Additionally, the exposures during this time are proportionately much greater than at any other time in life.

Expert Report of Dr. Peter deFur, September, 1999.

Infants, on average, in the U.S. receive via breast feeding a dioxin dose of approximately 60 pg/kg/day of dioxin toxic equivalents (TEQs) from existing sources. This dose is 60 times higher than the current federal reference doses (the ATSDR MRL and EPA RfD). These current RfD values (1 pg/kg/day) may not be protective given recent research.

Clarke et al. (1992) examined the response of cell function to dioxin in isolated rat cells. The dose at which Clarke at el. (1992) found effects of dioxin on cell function was 10 pg/kg/day. This dose would be considered a LOAEL. Applying a safety factor of 1000 [a factor of 10 for test animal to human interspecies extrapolation, a second factor of ten for variability within species, i.e. sensitive subpopulations, and a third factor of ten for use of the LOAEL rather than the NOAEL] the 10 pg/kg/day results in an RfD of 0.01 pg/kg/day. Use of additional safety factors [e.g. for inadequacy in the database and resulting uncertainty or for endocrine disrupting effects] would lower the RfD accordingly.

* * *

EDC's are chemicals that interact with endocrine systems and alter normal body functions, notably reproduction and development (Colborn et al. 1993). The phenomenon is not entirely new to scientists, but has recently received a great deal of renewed attention in the popular press and in the scientific literature. Scientists have long known that some chemicals are sufficiently similar to some hormones, notably estrogen, that when administered to experimental animals or humans, these chemicals can mimic the action of estrogen. One of the more well-known examples is that of the pharmaceutical DES (diethylstilbestrol), used as a putative treatment for

> EDC's, an additional safety factor should be applied for estrogenic chemicals or those known to interfere with the thyroid.
>
> . . . [T]he harm from the ED effects is long term, permanent and irreparable, justifying additional measures to protect public health.
>
> For dioxin and related compounds, for EDC's and for compounds that act on hormone systems and development, the most sensitive members of the population will be fetuses and young children. Nursing infants are included in this group. This group is particularly vulnerable because the compounds in question are fat soluble and bioaccumulate in fat, especially breast milk. As noted above, breast feeding may be responsible for dioxin doses of 110-120 pg/kg/day, compared with the average daily adult dose of 4-6 pg/kg/day. Thus, a person may get 30-40% of their lifetime dioxin exposure during this time. What makes this worse is that the developing fetus and child is particularly susceptible to the effects. As noted by Mably et al. (1992) in rats, and Patandin et al. (1999) in humans and EPA (1994a) for humans, immune systems, the brain, reproductive systems are all exquisitely sensitive to the effects of dioxin, PCB's and other reproductive and developmental toxicants. Thus, the fetus and developing child receive the highest dose of dioxin when they are most sensitive to the effects.

See Expert Report of Dr. Peter deFur. Thus infants are already massively over-exposed to dioxin and PCBs. Breast feeding is one of the most dangerous routes of exposure. See ATSDR Toxicological Profile for 2,3,7,8-TCDD (dioxin), § 7.1, p. 76; EPA 1994, Estimating Exposures to Dioxin-like Compounds, Vol. I, p. 40-41. According to the federal Agency for Toxic Substances, breast milk results in dioxin exposures as much as 10,000 times higher than via inhalation, and 40 times higher than cow's milk. ATSDR Tox. Profile, § 7.1.

Children are also more at risk from toxic releases such as PCBs and dioxins in soil and sediment for a less obvious reason. EPA and ATSDR acknowledge that some children intentionally ingest soil -- a phenomena termed the PICA syndrome. The amount of soil ingested by a child with PICA syndrome is 1-2 orders of magnitude more than a non-PICA child.

accumulation in plants and animals in the food web, particularly in light of our current overexposure to these highly toxic compounds from existing and historical sources, is a very real threat -- more than sufficient to meet the modest standard under RCRA for showing an imminent hazard.

B. Count 3: Failure to Protect Public Health and the Environment

The above named persons and groups intend to bring suit against the U.S. EPA, the EPA Administrator, and the EPA Regional Administrator pursuant to 42 U.S.C. § 9659, for violation of requirements of CERCLA (and alternatively for failure to perform mandatory duties and for arbitrary and capricious agency action) by selection and implementation of a CERCLA remedy which involves inadequate hazardous waste excavation, unsafe storage and unsafe land disposal and incineration of PCBs and hazardous wastes and substances, with accompanying releases of PCBs and hazardous wastes and substances and toxic chemicals in quantities and of a duration that clearly violate CERCLA's requirement that remedies be protective of public health and the environment, as well as violating the CERCLA National Contingency Plan (NCP) regulations' acceptable risk standards and requirement that contaminated groundwater be returned to its beneficial uses. See 42 U.S.C. § 9621; 40 C.F.R. § 300.430. The facts stated above under Counts 1&2 (Imminent Hazard and Nuisance) are incorporated here by reference (e.g. facts regarding dioxin and PCB exposure and risk to children and infants) and support the conclusion asserted here that EPA has failed to protect public health and the environment in its actions regarding cleanup of the Bloomington Westinghouse PCB sites.

As part of the remedial action process, CERCLA and the NCP, 42 U.S.C. § 9621(b) and (d)

The offsite transport and disposal of hazardous substances or contaminated materials without such treatment should be the least favored alternative remedial action where practicable treatment technologies are available. The President shall conduct an assessment of permanent solutions and alternative treatment technologies or resource recovery technologies that, in whole or in part, will result in a permanent and significant decrease in the toxicity, mobility, or volume of the hazardous substance, pollutant, or contaminant. In making such assessment, the President shall specifically address the long-term effectiveness of various alternatives. In assessing alternative remedial actions, the President shall, at a minimum, take into account:

(A) the long-term uncertainties associated with land disposal;

(B) the goals, objectives, and requirements of the Solid Waste Disposal Act (42 U.S.C. 6901 et seq.);

(C) the persistence, toxicity, mobility, and propensity to bioaccumulate of such hazardous substances and their constituents;

(D) short- and long-term potential for adverse health effects from human exposure;

(E) long-term maintenance costs;

(F) the potential for future remedial action costs if the alternative remedial action in question were to fail; and

(G) the potential threat to human health and the environment associated with excavation, transportation, and redisposal, or containment. **The President shall select a remedial action that is protective of human health and the environment**, that is cost effective, and that utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. If the President selects a remedial action not appropriate for a preference under this subsection, the President shall publish an explanation as to why a remedial action involving such reductions was not selected.

(2) The President may select an alternative remedial action meeting the objectives of this subsection whether or not such action has been achieved in practice at any other facility or site that has similar characteristics. In making such a selection, the President may take into account the degree of support for such remedial action by parties interested in such site.

Under CERCLA, EPA has a mandatory duty to ensure public health and the environment are protected during remedial actions at Superfund sites. EPA does not have the discretion to choose

landfills (e.g. multiple liners and leachate collection and monitoring requirements) and the general requirement to prevent and minimize releases of hazardous wastes and substances into the environment.

The U.S. EPA is subject to citizen suits to enforce RCRA requirements just as corporations such as Westinghouse are, and EPA is subject to suits to compel performance of mandatory duties. The federal hazardous waste law, RCRA, provides:

> 6972. Citizen suits
> (a) In general.
> Except as provided in subsection (b) or (c) of this section, any person may commence a civil action on his own behalf
> (1)(A) against any person (including (a) the United States, and
> (b) any other governmental instrumentality or agency, to the extent permitted by the eleventh amendment to the Constitution) who is alleged to be in violation of any permit, standard, regulation, condition, requirement, prohibition, or order which has become effective pursuant to this chapter; or
> * * *
> (2) against the Administrator where there is alleged a failure of the Administrator to perform any act or duty under this chapter which is not discretionary with the Administrator. * * * The district court shall have jurisdiction, without regard to the amount in controversy or the citizenship of the parties, to enforce the permit, standard, regulation, condition, requirement, prohibition, or order, referred to in paragraph (1)(A), to restrain any person who has contributed or who is contributing to the past or present handling, storage, treatment, transportation, or disposal of any solid or hazardous waste referred to in paragraph (1)(B), to order such person to take such other action as may be necessary, or both, or to order the Administrator to perform the act or duty referred to in paragraph (2), as the case may be, and to apply any appropriate civil penalties under section 6928(a) and (g) of this title.

42 U.S.C. § 6972. Congress has made it clear, via the Federal Facilities Compliance Act, that federal agencies are required to comply with RCRA requirements and other environmental laws and are subject to injunctions and penalties for violations of same.

wastes in a manner that causes air pollution in violation of Indiana statutes and regulations. These violations are on-going and result from the release of PCBs, dioxins, PICs and other toxic and hazardous substances and wastes into the atmosphere in the Bloomington area. Indiana air pollution law prohibits the release of toxic vapors, fumes, particulate, and other air contaminants that may cause harm to humans, animals or plants. For the reasons detailed above in Section I and in the discussion of Counts 1&2 in Section II, the release of PCBs and dioxin-like PICs along with toxic solvents and other poisons from the Bloomington Westinghouse sites via surface and ground water with eventual volatilization and evaporation of these toxic compounds into the air and ultimate human and wildlife exposure via inhalation and consumption of PCBs and dioxin-like compounds that have accumulated into the food chain (via, e.g., accumulation in plants via air to plant transfer) would reasonably be expected to cause harm to humans and animals based on the scientific literature discussed above and in light of current human and wildlife (over)exposures from existing sources. This is in violation of Indiana air pollution law which provides:

> IC 13-11-2-3
>
> Sec. 3. "Air contaminant", for purposes of air pollution control laws, means:
>
> (1) dust; (2) fumes; (3) gas; (4) mist; (5) smoke; (6) vapor; or
>
> (7) any combination of the items described in subdivisions (1) through (6).
>
> IC 13-11-2-4
>
> Sec. 4. (a) "Air contaminant source", for purposes of air pollution control laws, means all sources of emission of air contaminants, whether privately or publicly owned or operated.
>
> (b) The term includes the following:
>
> (1) All types of business, commercial and industrial plants, works, shops, stores, heating plants, powerplants, and power stations.
>
> (2) Buildings and other structures of all types, . . .
>
> (8) Incinerators of all types, indoor and outdoor.
>
> (9) Refuse dumps and piles.

The above named persons and groups intend to bring suit against U.S. EPA, the EPA Administrator, and the EPA Regional Administrator for failing to complete an adequate Environmental Impact Statement (EIS) as required by NEPA and other applicable law and failing to complete an adequate Remedial Investigation/Feasibility Studies (RI/FS) as required by CERCLA to fully and properly evaluate the contaminants on site, threats of migration, all feasible remedial alternatives and all significant impacts on the environment and public health. CERCLA at 42 U.S.C. § 9616(d) and the NCP at 40 C.F.R. § 300.430, and NEPA at 42 U.S.C. § 4332, require an adequate RI/FS and/or an EIS to be prepared prior to selection and implementation of a remedial action at a CERCLA NPL site (which is a major federal action significantly affecting the quality of the environment).

EPA, by failing to perform a thorough Remedial Investigation to characterize the contamination at the Superfund Sites, has allowed Westinghouse, the PRP, to evade and reduce to an irrational minimum its responsibility for the degree of cleanup essential for present and future protection of public health and environment in Monroe County and beyond. Westinghouse has tried to limit its responsibility to testing for and select removal of PCBs, as if they were the only toxic substances they had dumped at the Superfund Sites, further presuming PCBs had retained their integrity and were isolated from the rest of the hazardous chemicals in the landfill. Tetra Tech established in 1998 through the most extensive sampling yet done on a Monroe County Superfund Site at Neal's Landfill that: "Analytical data obtained by Tetra Tech and PSARA indicate that PCB contamination extends throughout the landfill at various concentrations." Tetra Tech went on to acknowledge the limits of this sampling and recommended that follow-up comprehensive sampling be conducted. Westinghouse has sought to avoid and minimize its liability by not testing for dioxin-

of this title (relating to timing of judicial review), any person may commence a civil action on his own behalf -

* * *

(2) against the President or any other officer of the United States (including the Administrator of the Environmental Protection Agency and the Administrator of the ATSDR) where there is alleged a failure of the President or of such other officer to perform any act or duty under this chapter, including an act or duty under section 9620 of this title (relating to Federal facilities), which is not discretionary with the President or such other officer.

G. Count 8: Violation of CERCLA Remedy Selection Criteria

The above named persons and groups intend to bring suit against U.S. EPA, the EPA Administrator, and the EPA Regional Administrator for failing to adhere to the letter and spirit of the CERCLA remedy selection process by selecting a remedy that not only is unsafe but also does not significantly reduce the volume, toxicity and mobility of the wastes, and which does not have the support of a majority of the community. See 42 U.S.C. § 9621; 40 C.F.R. § 300.430. The EPA has attempted to justify sending large quantities of highly contaminated PCB capacitors and PCB soils off-site for land disposal of soils and incineration of capacitors. But neither approach reduces the toxicity (incineration may exacerbate it) of the waste. Landfilling does not reduce the volume of the waste. Incineration increases, rather than decreases, the mobility of the chemical poisons by putting them in the air along with toxic PICs. Land disposal in a lined landfill may delay the ultimate release of the PCBs, dioxins and other contaminants into ground and surface waters as compared with leaving the contaminants in place over Karst, but this is merely a postponement of the release/mobility, not an absolute reduction in the amount of toxic chemicals released. Moving persistent highly toxic poisons from a landfill in one community to a landfill in another community

Sec. 1538. Prohibited acts

(a) Generally

(1) Except as provided in sections 1535(g)(2) and 1539 of this title, with respect to any endangered species of fish or wildlife listed pursuant to section 1533 of this title it is unlawful for any person subject to the jurisdiction of the United States to -

* * *

(B) take any such species within the United States or the territorial sea of the United States;

Sec. 1532. Definitions

For the purpose of this chapter -

* * *

(19) The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.

The toxic releases from the Superfund Sites have and will continue to kill and harm endangered Indiana Bats and Bald Eagles directly via poisoning of their food and via habitat destruction and contamination.

I. Count 10: Clean Water Act Violation

The above named persons and groups intend to bring suit against U.S. EPA, the EPA Administrator, and the EPA Regional Administrator pursuant to 33 U.S.C. § 1365 for discharge of PCBs, dioxins, and other water pollutants into the waters of the United States without a permit. 33 U.S.C. § 1311(a) makes illegal any discharge of a pollutant into the navigable waters of the United States without having a permit for such discharge. PCBs, dioxins, PICs, solvents and other pollutants are being discharged from various point sources at Neal's Landfill, Lemon Lane Landfill, and the other Superfund sites and neither EPA nor any other party has obtained an NPDES Clean Water Act permit for these discharges.

* * *

(2) Public participation

(A) Filing of proposed judgment

At least 30 days before a final judgment is entered under paragraph (1), the proposed judgment shall be filed with the court.

(B) Opportunity for comment

The Attorney General shall provide an opportunity to persons who are not named as parties to the action to comment on the proposed judgment before its entry by the court as a final judgment. The Attorney General shall consider, and file with the court, any written comments, views, or allegations relating to the proposed judgment. The Attorney General may withdraw or withhold its consent to the proposed judgment if the comments, views, and allegations concerning the judgment disclose facts or considerations which indicate that the proposed judgment is inappropriate, improper, or inadequate.

(3) 9604(b) agreements

Whenever the President enters into an agreement under this section with any potentially responsible party with respect to action under section 9604(b) of this title, the President shall issue an order or enter into a decree setting forth the obligations of such party. The United States district court for the district in which the release or threatened release occurs may enforce such order or decree.

* * *

(i) Settlement procedures

(1) Publication in Federal Register

At least 30 days before any settlement (including any settlement arrived at through arbitration) may become final under subsection (h) of this section, or under subsection (g) of this section in the case of a settlement embodied in an administrative order, the head of the department or agency which has jurisdiction over the proposed settlement shall publish in the

hazardous substances.

* * *

(l) Civil penalties

A potentially responsible party which is a party to an administrative order or consent decree entered pursuant to an agreement under this section or section 9620 of this title (relating to Federal facilities) or which is a party to an agreement under section 9620 of this title and which fails or refuses to comply with any term or condition of the order, decree or agreement shall be subject to a civil penalty in accordance with section 9609 of this title.

(m) Applicability of general principles of law

In the case of consent decrees and other settlements under this section (including covenants not to sue), no provision of this chapter shall be construed to preclude or otherwise affect the applicability of general principles of law regarding the setting aside or modification of consent decrees or other settlements.

The failure of EPA to comply with these statutory procedures is enforceable via a citizen suit.

Sec. 9659. Citizens suits

(a) Authority to bring civil actions

Except as provided in subsections (d) and (e) of this section and in section 9613(h) of this title (relating to timing of judicial review), any person may commence a civil action on his own behalf -

(1) against any person (including the United States and any other governmental instrumentality or agency, to the extent permitted by the eleventh amendment to the Constitution) who is alleged to be in violation of any standard, regulation, condition, requirement, or order which has become effective pursuant to this chapter (including any provision of an agreement under section 9620 of this title, relating to Federal facilities); or

(2) against the President or any other officer of the United States (including the Administrator of the Environmental Protection Agency and the Administrator of the ATSDR) where there is alleged a failure of the President or of such other officer to perform any act or duty under this chapter, including an act or duty under section 9620 of this title (relating to Federal

XVI. CONCLUSION

EPA has improperly relied on a guidance document, A Guide On Remedial Actions at Superfund Sites with PCB Contamination (Directive: 9355.4-01 FS), as the authority for its decision to remove only hotspots (PCBs >500 ppm) from Neal's Landfill and Lemon Lane Landfill. EPA describes the hotspot only cleanup plan as a "principal threat removal," while characterizing the great majority of soils to be left on site as a "low level threat." (See Attachment 53).

This guidance document notes however, that "Site-specific conditions may warrant departures from this basic framework," and "if stabilization is considered, the long-term effectiveness of stabilization should be evaluated carefully," and further noting "Other factors that may affect these levels include the potential for PCBs to migrate to ground water and to affect environmental receptors."

A factor that EPA should have considered decisive in its decision making for Neal's Landfill and Lemon Lane Landfill is that they were both burned as part of their "management." The production of PICs should have been investigated along with heavy metals and organic solvents etc., for that is what made these Superfund sites very complex.

The CERCLA NCP regulations at section 300.430(2)(b) Remedial Investigation/Feasibility Study notes "The investigative and analytical studies should be tailored to site circumstances so that the scope and detail of the analysis is appropriate to the complexity of the site being addressed. (Attachment 54).

Both Neal's Landfill and Lemon Lane Landfill are complex sites, made so not only by burning but siting over Karst with a long history of contamination of groundwater with PCBs (and

according to Dr. Donald Barnes, Director U.S. EPA Science Advisory Board. EPA defined the principle as "assuring that there will be no untoward effects associated with a proposed action." Certainly EPA cannot guarantee that there will not be any "untoward effects" even short term for its remedy for Neal's Landfill and that proposed for Lemon Lane Landfill.

The recently published book "Protecting Public Health & The Environment, Implementing the Precautionary Principle," Island Press, 1999, page xxiii notes that The Precautionary Principle as used today asserts that:

> [P]arties should take measures to protect public health and the environment, even in the absence of clear, scientific evidence of harm. It provides for two conditions. First, in the face of scientific uncertainties, parties should refrain from actions that might harm the environment, and second, that the burden of proof for assuring the safety of an action falls on those who propose it. This is sympathetic to the philosophy of NEPA: to assure that those who promote an action assess the environmental and health impacts before proceeding.

Sweden adopted THE PRECAUTIONARY PRINCIPLE well-over a decade ago and that the principle has generally been accepted in Europe, but that the United States is already under obligation to operate by the precautionary principle having signed and ratified the Rio Declaration from the 1992 United Nations Conference on Environment and Development, which says:

> In order to protect the environment, the precautionary approach shall be widely applied by States (meaning nations) according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost effective measures to prevent environmental degradation.

The Precautionary Principle is also embedded in numerous international treaties and conventions: The Second North Sea Declaration, the Bergen Declaration on Sustainable development, the Ministerial Declaration of the Second World Climate Conference, and others. As

to avoid this obligation.

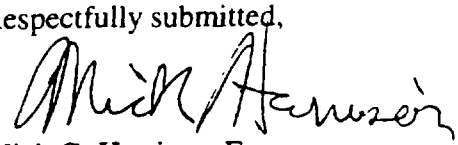
EPA, Westinghouse, and the Court have thrust a remedy replete known dangers and great scientific uncertainties on the public and the environment. The EPA and Westinghouse has compromised on their initial promises to the Court that all the contamination would be excavated and left large quantities of persistent toxic chemicals in the soil over KARST as a toxic legacy to future generations (similar to the nuclear waste legacy our government and njuclear industries have created). As the City of Bloomington stated prior to entry of the 1985 Consent Decree: "Basic Premise No. 1: The PCB Contaminated Material Must Be Excavated. The material cannot stay buried at the sites. The sites contain abandoned capacitors, contaminated soil, and/or other PCB contaminated material containing concentrations up to several thousand parts per million PCB. It is the consensus of the federal EPA, State of Indiana, and the City's public health and hydrogeologic experts that leaving the materials at the site posed an unacceptable long-term public health hazard becauase the high levels of PCB contaminated materials will continue to leak PCBs for thousands of years." 1985 Memo from City Attorney Karaganis to County Attorney Welch.

The City went on to state "The need for removal was agreed upon by the State, federal EPA and the City. Significantly, Westinghouse strenuously argued that the PCBs should just be left in place. This decision to excavate has been made. Even if local authorities opposed excavation, the fedeal and state authorities have found excavation to be necessary to protect public health." Id. As the EPA pointed out to the Court in its request to enter the Consent Decree, leaving the hazardous waste in place or transporting it to an off-site landfill just "postpones the problem until another day."

Superfund Sites, and CERCLA remedy selection activities at and regarding these sites. The addresses and phone numbers for the Plaintiffs filing this notice are as attached.

If you are interested in contacting these Plaintiffs regarding this Notice, or discussing the substance of this matter, please contact the attorneys listed below. They will arrange a conference with appropriate Plaintiffs' representatives. It is the sincere hope of the Plaintiffs, consistent with the Congressional intent in enacting the Notice provisions of the federal environmental statutes, that the Addressees listed above will be inclined to discuss a mutually satisfactory resolution of the concerns referenced herein in order to prevent the need for litigation. Prompt action is required to stop the ongoing imminent hazard to public health and the environment from release of PCBs, dioxins, and other toxic compounds from the Bloomington Westinghouse PCB Superfund Sites.

Respectfully submitted,



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ATTACHMENTS

1. Bennett's (Packinghouse) Quarries and Stoute's Creek Drainage, with 3 sites identified by Steve Hacker on June 6, 1983 at EPA Press Conference.

2. Interview with Steve Hacker for INDOT EA on Interchange Construction at SR 37 and 46, September 22, 1993 by SIECO, Inc.

3. Applicable or Relevant and Appropriate Requirements (ARARs) for the Five Alternatives at Neal's Landfill which are also applicable for Bennett's Quarries Cleanup.

4. Enforcement Decision Document Remedial Alternative Selection, Westinghouse Sites, Bloomington , IN December 4, 1984, and, Position Document for Remedial Issues in Westinghouse Case Proposed Settlement, August 7, 1984.

5. Letter of May 1, 1987 of J. Winston Porter, Assistant Administrator, U.S. EPA, to Mrs. David G. Frey, Bloomington, IN

6. Affidavit of Hugh Kaufman, Assistant to Director, Hazardous Site Control Division, U.S. EPA, November 24, 1986

7. Memorandum of William Sanjour of February 15, 1996 to Bob Martin, Ombudsman, concerning Region V's inability to find an RI/FS for Monroe County/City of Bloomington (MC/CB) PCB Sites.

8. Letter of William Sanjour of June 12, 1997 to Carol M. Browner, Administrator, U.S. EPA, calling her attention to illegal influence of Westinghouse in Region V EPA's decision-making regarding cleanup of MC/CB PCB Sites.

9. Bloomington, Indiana PCB Inventory, Phase I Report (Draft) prepared for C.O.P.A. by Melissa Valentin, P.E. October 1997.

10. Letter of November 22, 1996 of Joseph G. Hailer, Geochemist, to Michael Baker, C.O.P.A. on Lemon Lane Sampling Plan.

11. Letter of August 2, 1996 of William Sanjour to Tim Fields and Bob Martin, Ombudsman, reporting various grievances of citizens to Region V's handling of Lemon Lane Landfill.

12. Letter of February 17, 1998 of Laramie Wilson, Citizen Information Committee (CIC) member to Magistrate Judge Kennard P. Foster, U.S. District Court requesting that Westinghouse be required to make a safe cleanup with total excavation and removal of toxic wastes.

13. Letter of April 16, 1998 of Greg Moore, Jim Cartmell, and Laramie Wilson, Citizen Information Committee (CIC) members, to Robert Martin, Ombudsman, requesting emergency assistance

26. Deposition of Richard L. Powell, EPA's Department of Justice Suit v. Westinghouse Electric Corporation, 1982 pp. 505-508.

27. Geology and Hydrology of Neal's Landfill, Monroe County, Indiana, August 8, 1983, Richard L. Powell, Geosciences Research Associates, Inc.

28. Memorandum of Philip E. Lamoreaux, Sr. EPA/Bloomington Sites, August 1, 1984.

29. Memorandum of P.E. Lamoreaux, re: Field Inspection of Neal's Landfill/Neal's Dump, October 28-30, 1982.

30. Affidavit of Robert A. Griffin, Geochemist, December 21, 1982.

31. Review of: Neal's Landfill Stability Evaluation Technical Memorandum, CH2MHILL, 1999 and Comments on that Document by Gareth J. Davies, Cambrian Groundwater Co. 1999.

32. Letter of March 27, 1999 of Joseph G. Hailer to Magistrate Judge Kennard P. Foster, concerning EPA/Westinghouse/District Court remedial decision of removal of "hotspots " only from Neal's Landfill.

33. RECORD OF DECISION AMENDMENT, SOURCE CONTROL OPERABLE UNIT, NEAL'S LANDFILL, March 29, 1999.

34. STATEMENT OF WORK FOR THE SOURCE CONTROL OPERABLE UNIT REMEDIAL DESIGN AND REMEDIAL ACTION AT NEAL'S LANDFILL MONROE COUNTY, INDIANA, March 5, 1999.

35. FINAL DATA EVALUATION REPORT FOR REMEDIAL INVESTIGATION / FEASIBILITY STUDY, SAMPLING AND ANALYSIS ACTIVITIES NEAL'S LANDFILL SITE, MONROE COUNTY, INDIANA, TETRA TECH EM Inc. 1998.

36. COMMENTS RELATING TO THE REPORT: FIELD DATA EVALUATION REPORT FOR REMEDIAL INVESTIGATION/FEASIBILITY STUDY SAMPLING AND ANALYSIS ACTIVITIES, NEAL'S LANDFILL SITE, MONROE COUNTY, INDIANA, VOLUME I, Gareth J. Davies, Principal Scientist, Cambrian Ground Water Co. February 3, 1999.

37. Technical Criteria for the destruction of stockpiled persistent organic pollutants, Greenpeace, Pat Costner, 7 October 1998.

38. EPA RESEARCH AND DEVELOPMENT of a Hazardous Waste Incinerator Target Analyte List of Products of Incomplete Combustion. Prepared for Office of Solid Waste by National Risk Management Research Laboratory, Research Triangle Park, N.C.

39. REGION V EPA PROPOSED PLAN FOR THE SOURCE CONTROL RECORD OF DECISION AMENDMENT AT NEAL'S LANDFILL, 1999.

40. A. MONROE COUNTY BOARD OF COMMISSIONERS Response to the

C. Hudak, Supervisor, F&WS, to Dan Hopkins, Region V EPA, summarizing biological concerns at PCB sites in Bloomington, Indiana.

49. Letter of March 11, 1991 of David C. Hudak. Supervisor, F&WS, Bloomington, Indiana, to Field Solicitor's Office, Twin Cities, MN requesting rescindment of Natural Resource Damage release for potentially responsible parties for Monroe County's PCB Sites.

50. ORGANOCHLORINE ACCUMULATION BY SENTINEL MALLARDS AT THE WINSTON -THOMAS SEWAGE TREATMENT PLANT, BLOOMINGTON, INDIANA. August 1995. Archives of Enviromental Contamination and Toxicology. T.W. Custer, D.W. Sparks, S.A. Sobiech, R.K. Hines, M.J. Melancon.

51. EFFECTS OF IN OVO PCB EXPOSURE ON EARLY EMBRYONIC GROWTH AND DEVELOPMENT IN TREE SWALLOWS. Presented at the Society of Environmental Toxicology and Chemistry 18th Annual Meeting, November 17-20, 1997. Henshel, D.S., D.W. Sparks, S.A. Sobeich, M. Weber, C.A.A. Meyer, M.J. Melancon, A. Yorks, C. Fox, K. Benson, and Y. Lam.

52. *PCB EFFECTS ON PASSERINE PRODUCTIVITY*, REPRODUCTIVE SUCCESS, GROWTH AND DEVELOPMENT; A MULTI-SPECIES COMPARISON. Presented at the Society of Environmental Toxicology and Chemistry at the 18th Annuual Meeting, November 17-20, 1997. Henshel, D.S., D.W. Sparks, S.A. Sobiech, C.A.A. Meyer, M.J. Melancon, A. Yorks, C. Fox, Y.Lam and K. Benson.

53. EPA: A GUIDE ON REMEDIAL ACTIONS AT SUPERFUND SITES WITH PCB CONTAMINATION AUGUST 1990. DIRECTIVE: 9355. 4-01 FS

54. CERCLA RULES AND REGULATIONS, FEDERAL REGISTER /Vol. 55, No. 46/ Thursday, March 8, 1990. Section 300.430 Remedial investigation/feasibility study and selection of remedy.

55. Memorandum from Pauline Ewald, Environmental Compliance Organization (ECO) to Mike Baker, COPA, on CONSTITUENTS OF CONCERN AT BLOOMINGTON SITES.

Plaintiff's Address:

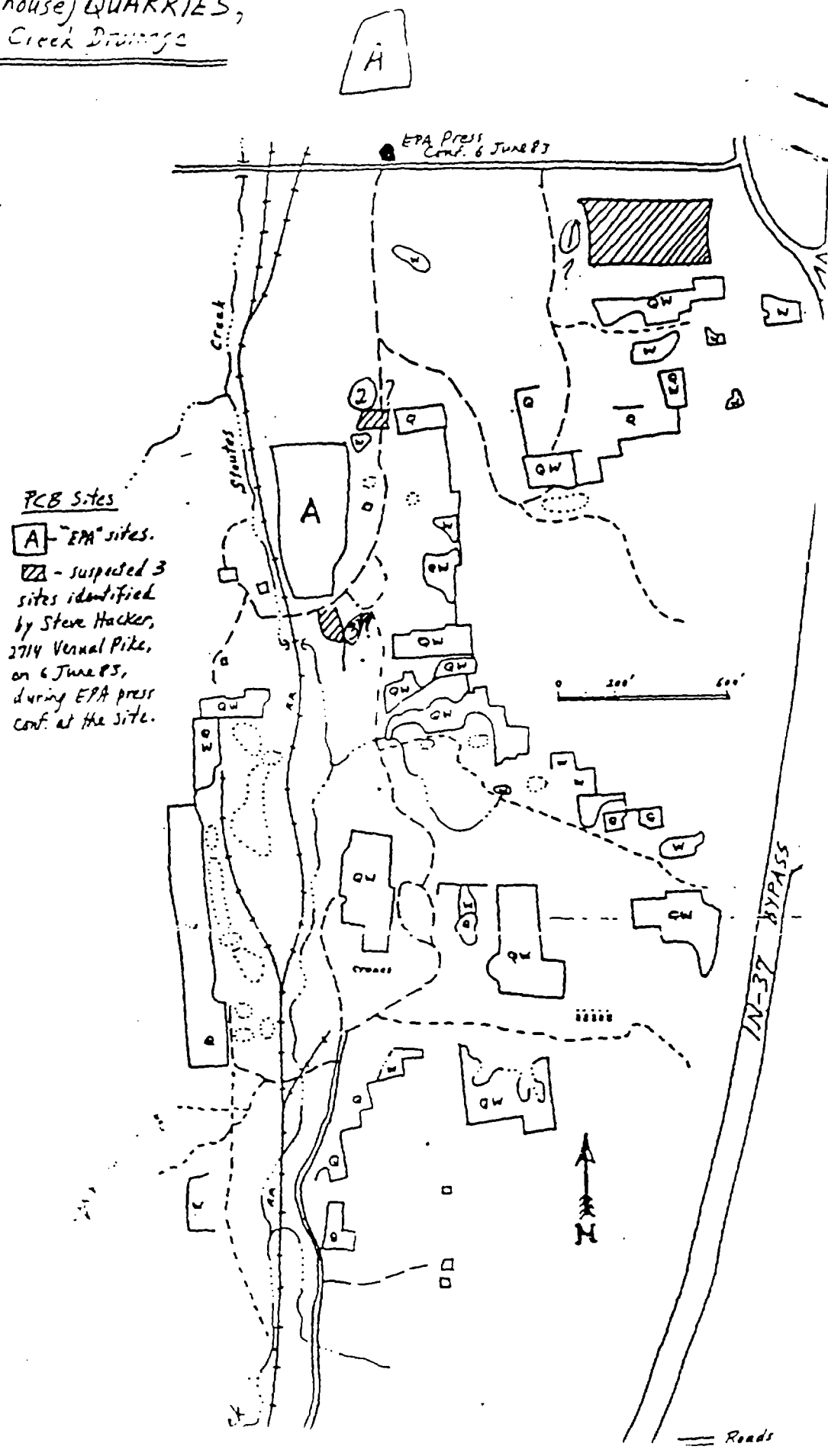
Sarah Elizabeth Frey
2625 S. Smith Road
Bloomington, IN 47401

Plaintiff's Address:

Protect Our Woods, Inc.
116 ½ South College
Bloomington, IN 47403

Att. 1

BENNET'S (Packinghouse) QUARRIES, and Stoutes Creek Drainage



AH. 2

INITIAL SITE ASSESSMENT
INTERCHANGE CONSTRUCTION AT STATE ROADS 37 AND 46
INDOT PROJECT NH-062-4 (008)
MONROE COUNTY, INDIANA

FOR:

ENVIRONMENTAL ASSESSMENT PROGRAM
DIVISION OF PROGRAM DEVELOPMENT
INDIANA DEPARTMENT OF TRANSPORTATION
100 NORTH SENATE AVENUE, ROOM N 775
INDIANAPOLIS, INDIANA 46204-2249

BY:

SIECO, INC.
629 WASHINGTON STREET
P.O. BOX 407
COLUMBUS, INDIANA 47202

September 22, 1993

Prepared By:

Douglas M. Montgomery, C.P.G.
Project Manager

Approved by:

James E. McNulty, C.P.G.
Geologist

Reviewed by:

David M. Wagner
Executive Vice President

identified a quarry road at Bennett's Dump, which paralleled (to the south) Hunter's Road, as similarly littered with capacitors and trash. This area, just north of the proposed northwest cloverleaf has not been characterized by regulatory agencies for potential contamination. Quarries typically are not filled after removal of stone. According to Mr. Hacker, prior to the EPA's site investigation of the Bennett Dump, bulldozers were active filling quarries and moving soil. Mr. Hacker said that several days of "unusual bulldozer work" occurred north and east of Bennett's Dump (now proposed as a regional shopping mall) adjacent to the proposed northwest cloverleaf. Mr. Hacker, Ms. Shaw, and Mr. Montgomery walked the area east of Bennett's dump and discovered quantities of solid waste and demolition debris near quarry access roads and at the edges of old quarries. No capacitors were discovered during the cursory walkover at that time.

Mr. Hacker was asked whether the area proposed as the northeast cloverleaf may have been a potential PCB dumping ground and Mr. Hacker replied that the area was owned by the Reed family who were very particular about keeping their property free of debris. In Mr. Hacker's opinion, there is little probability that the Reed Quarry or its immediate vicinity represents any potential environmental threat. When asked about the quarry in the southwest quadrant of the proposed interchange next to State Road 37, Mr. Hacker identified that quarry as H-Hole (due to a limestone bridge between two holes that formed an H). Mr. Hacker said that before State Road 37 was built, H-Hole was accessible only by a path down a steep slope and therefore had never been used as a capacitor dump.

In summary, Mr. Hacker discounted the possibility that quarries in the proposed right of way south of the Bennett's Dump, other than Mule Hole #2 (now under State Road 37), had been used for PCB capacitor or waste disposal purposes, due to lack of access and due to the presence of established dumping areas. The popular disposal routes were identified as Hunter Road and the northern access to Bennett's Dump and Gourley Pike to Mule Hole #2. Mr. Hacker identified the quarried area east of Bennett's Dump and west of State Road 37 (the location of a proposed shopping mall) as an area where capacitors had been scattered and where the Bennetts had employed bulldozers to move soil and fill quarries before the EPA investigation.

Mr. Patrick Gray, a former resident of the Lemon Lane Landfill area and former scrapper of PCB containing capacitors, was contacted to determine if the Mule Hole quarry had received trash or capacitors. Mr. Gray said "the Mule hole quarry is about half full of a menagerie of trash of which approximately 10 percent is probably capacitors." Mr. Gray

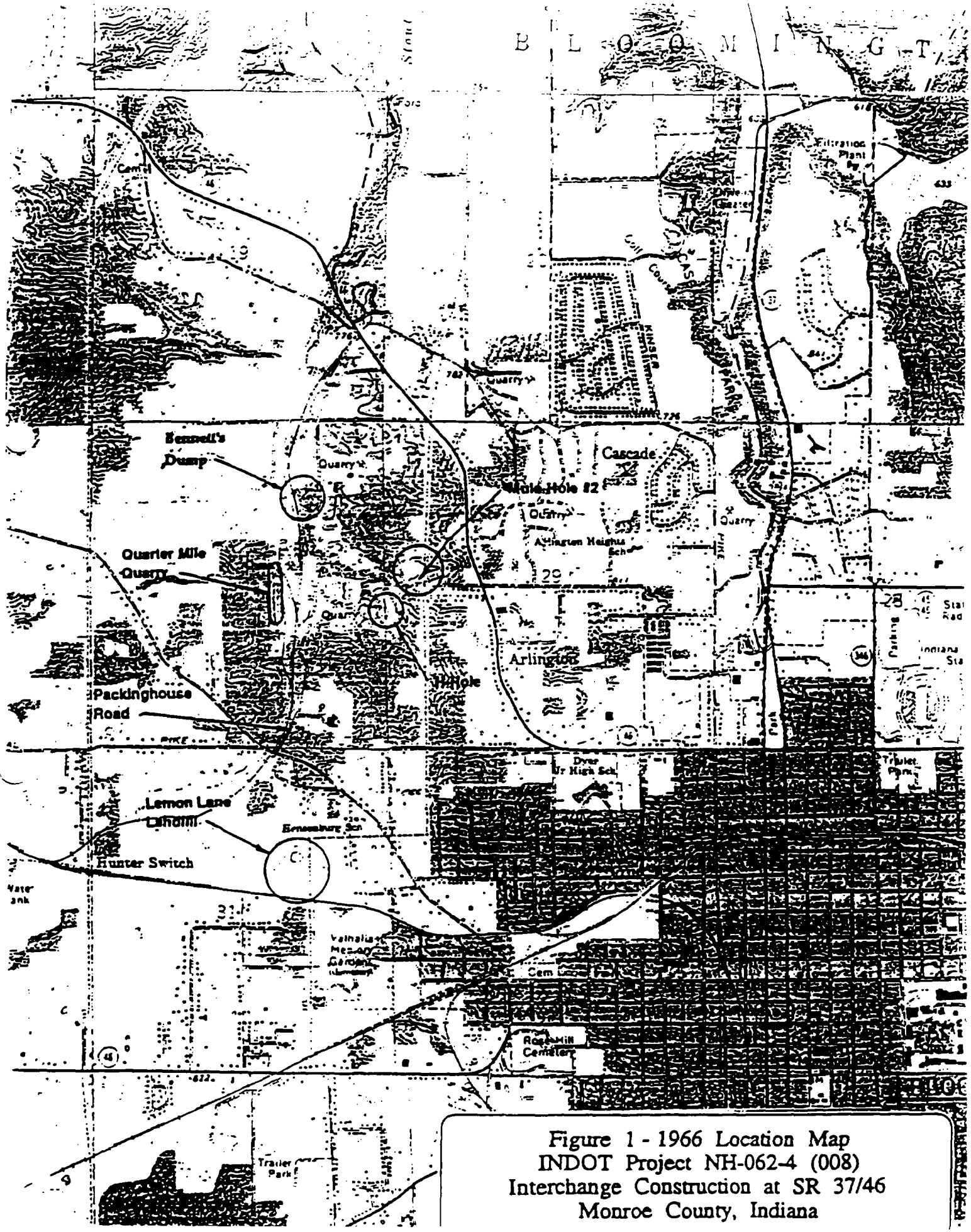


Figure 1 - 1966 Location Map
INDOT Project NH-062-4 (008)
Interchange Construction at SR 37/46
Monroe County, Indiana

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO IL 60604-3590

1000056
Att. 3

is complete

REPLY TO THE ATTENTION OF
SR-6J

DATE: December 2. 1998

TO: File

FROM: Thomas Alcamo. Remedial Project Manager

SUBJECT: Applicable or Relevant and Appropriate Requirements (ARARs) for the Five Alternatives at Neal's Landfill

Alternative 1 - No Action

The No Action alternative does not meet ARARs and will not be evaluated.

Alternative 2 - Installation of a Resource Conservation Recovery Act (RCRA) Subtitle C Compliant Cap with Groundwater Monitoring

Surface Water Quality Criteria	CWA 33 USC 1251
Water Quality Standards	327 IAC 2-1-6
Storm Water Discharges	40 CFR Parts 122. 123.124
Surface Water Quality Standards	327 IAC 15-5 & 15-6
Fugitive Dust Control	326 IAC 6.4 - 6.5
Chemical Waste Landfills	40 CFR 761.75
TSCA Spill Policy	40 CFR 761.120-139 - Not an ARAR but a To be considered
PCB Remediation Waste	40 CFR 761.61
Design & Operating Requirements	40 CFR 264.301
Monitoring & Inspection	40 CFR 264.303
Closure & Post Closure Care	40 CFR 264.310
Landfill Capping Requirements	40 CFR 264.310
Post Closure	40 CFR 264.117
Prevent Run On & Run Off	40 CFR 264.228

Surface Water Quality Criteria	33 USC 1311, 1312, 1313, 1314, 1317
Ambient Water Quality Criteria	40 CFR 129.105
Water Quality Standards	327 IAC 2-1-6
Storm Water Discharges	40 CFR Parts 122.6, 33 USC 402(p)
Transportation	49 CFR 171
Transportation of PCBs off-site	329 IAC 3.1-1-13
Fugitive Dust Control	326 IAC 6.4 - 6.5
Transportation Off-site	329 IAC 3.1-8-1 & 2
Incineration of PCBs	40 CFR 761.70 & 40 CFR 264
Chemical Waste Landfills	40 CFR 761.75
TSCA Spill Policy	40 CFR 761.120-139 - Not an ARAR but a To be considered
PCB Remediation Waste	40 CFR 761.61
Alternative Disposal for PCBs	40 CFR 761.60(e) & 329 IAC 4-1-5(7)
Waste Characterization	329 IAC 3.1 - 6.1
Hazardous waste manifests	329 IAC 3.1-7-1 through 13
Land Disposal of non-hazardous solid waste	40 CFR 241
Manifest Requirements	40 CFR 761.207, 208, 209
Management of Solid Waste	329 IAC 10-4-2 & 329 IAC 10-2-174
Disposal of PCBs	40 CFR 761.60
Off-site Disposal Regulations	40 CFR 300.440
Large Quantity Generator	40 CFR 262
Transporter requirements	40 CFR 263
Land Disposal Restrictions	40 CFR 268.40
Design & Operating Requirements	40 CFR 264.301
Monitoring & Inspection	40 CFR 264.303
Closure & Post Closure Care	40 CFR 264.310
Land Disposal Restrictions	40 CFR 268

Alternative 5 - Total Removal of 320.00 Cubic Yards of PCB Contaminated Material and Off-site Disposal and a Soil Cover Placed Over the Existing Landfill Surface.

Water Discharge Criteria	40 CFR 122.4 and State regulations approved under 40 CFR 131
Surface Water Quality Standards	327 IAC 15-5
Surface Water Quality Criteria	33 USC 1311, 1312, 1313, 1314, 1317
Ambient Water Quality Criteria	40 CFR 129.105
Water Quality Standards	327 IAC 2-1-6
Storm Water Discharges	40 CFR Parts 122.6, 33 USC 402(p)
Transportation	49 CFR 171
Transportation of PCBs off-site	329 IAC 3.1-1-13
Fugitive Dust Control	326 IAC 6.4 - 6.5
Transportation Off-site	329 IAC 3.1-8-1 & 2

Att. 4

6/5/87 ltr

ENFORCEMENT DECISION DOCUMENT
REMEDIAL ALTERNATIVE SELECTION

Site: Westinghouse Sites, Bloomington, IN
Neals Landfill
Neal's Dump
Lemon Lane Landfill
Bennett's Quarry
Winston Thomas Sewage Treatment Plant
Anderson Road Landfill

Analysis Reviewed

I am basing my decision on the following documents describing the analysis of remedial alternatives for the above sites in the Bloomington, Indiana area.

1. Summary of Remedial Alternatives Selection (6 documents for each of the six listed sites above).

2. Memorandum dated 8/3/84 from Val V. Adamkus to Lee M. Thomas "Recommendation of Selected Remedial Activities at Westinghouse Sites".

3. Memorandum dated 8/27/84 from Robert A. Schaefer and Basil G. Constantelos to Lee M. Thomas "Position Document for Remedial Issues in Westinghouse Case Proposed Settlement".

4. Enforcement Record of Decision, Remedial Alternative Selection, Neals Landfill, signed by Gene A. Lucero 7/22/83.

5. Enforcement Record of Decision, Remedial Alternative Selection, Neal's Dump, signed by Gene A. Lucero 7/22/83.

In addition, I have discussed the issues involved in this case with my staff and considered their recommendations.

The State of Indiana has been consulted and agrees with the remedy. Settlements have been reached between EPA and the responsible party based on the selected remedy.

Lee M. Thomas
Assistant Administrator for
Solid Waste and Emergency Response

DEC. 4 1984

Date

22

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 5
230 SOUTH DEARBORN ST
CHICAGO ILLINOIS 60604

REPLY TO ATTENTION OF

rec'd 8/5/87 - 8 pp

AUG 2 7 1984

MEMORANDUM

SUBJECT: Position Document for Remedial Issues in Westinghouse Case Proposed Settlement -

FROM: Robert A. Schaefer and Basil G. Constantelos
Regional Counsel Director, Waste Management Division

TO: Lee M. Thomas
Assistant Administrator for Solid Waste and Emergency Response

As discussed during our August 7, 1984 briefing, there are five remedial issues within the proposed settlement of the Westinghouse case which require the determination of Agency positions at this time. Those issues, along with the conclusions reached during the briefing and a statement of the justification for those positions, are described below.

1. Cap Design - During the briefing, the question arose as to the conformance of the final caps included in the proposed remedial activities with the regulatory requirements under the Resource Conservation and Recovery Act (RCRA). The regulations at 40 CFR § 264.310 have been reviewed and it is clear that the final caps contemplated in the settlement comply with each of the relevant performance standards delineated in that section.1/ The provisions for each of the caps were drafted with the RCRA regulations as well as the geological setting of each site, in mind. It must be remembered that virtually no PCBs should remain in the sites after removal and prior to capping.

1/ Each of the caps is designed with a compaction rate to eliminate or minimize the migration of liquids through the site, with a slope to promote drainage and minimize erosion and to accomodate settling and subsidence through maintenance measures. Since there is no bottom liner system at any of the sites, the cap will have a lower permeability than the base of the site. Each cap will also be maintained in accordance with the post-closure requirements in 40 CFR §264.310.

Consequently, the "buffer zone" concept was developed with a conservative educated estimate as to the depth of excavation needed to secure the necessary clean up. To further protect health and the environment, each site will be capped, and subsequently monitored for up to thirty years. EPA will undertake confirmatory sampling efforts as part of its compliance monitoring program.2/

During the briefing session, the Office of General Counsel brought up the concern that if these sites are viewed as storage facilities that are being closed, then under the RCRA regulations all hazardous wastes and residues must be removed. It is highly improbable that anyone would view these landfills as storage facilities rather than disposal sites. The only site involved which might conceivably be considered a storage facility would be the Winston-Thomas Treatment Plant. At that facility, the proposed settlement would require Westinghouse to remove all stored materials so that the RCRA regulatory requirements would be met if they were deemed to be applicable. However, given the 40 CFR §261.4(a)(ii) exclusion for wastes mixed with domestic sewage, it is clear that RCRA does not apply to the Plant. In addition, it seems clear that the RCRA regulations would not apply to any of

---

2/ Excavation at the Lemon Lane Landfill site follows a slightly different pattern. Westinghouse will excavate all material down to the level of the landfill in 1958 which was the year in which Westinghouse commenced operations in Bloomington. Prior to 1958, Lemon Lane had been operated as a municipal landfill for some years. Westinghouse will remove that portion of the Landfill that has become contaminated by PCBs. Once Westinghouse has removed material to the 1958 level, they will take samples and analyze them for PCBs. All material containing 50 ppm or more of PCBs will be removed. Westinghouse will then excavate an additional three foot "buffer zone" (or to bedrock if less than three feet of materials remains) into whatever refuse (two feet in natural soils) remains below the 50 ppm surface.

settlement, Westinghouse will be required to monitor groundwater at all sites, both at onsite and offsite wells. If the monitoring program indicates the presence of PCBs in any offsite well, Westinghouse will be required to provide an alternative permanent water supply to all well users in the anticipated flow path. In addition, source removal will eliminate or minimize the volume of PCBs available to the groundwater systems and caps will control infiltration at each site so that that potential driving force for migration is minimized. At Neal's Landfill, the only site known to have a direct linkage between a groundwater discharge and a surface stream, the spring discharges of groundwater will be treated by a treatment system before it enters the stream. The final element of the groundwater approach is that Westinghouse will not be released for liability as to groundwater except to the extent that they supply alternative water to well users and only then as to liability for supplying water within the one mile radius of the sites that is subject to monitoring.

4. Extention of TSCA One Year Storage Limitation - Under the interim measures and initial removal requirements in the proposed settlement, Westinghouse will be removing PCB contaminated materials from uncontrolled areas such as stream beds and unprotected surfaces, before the incinerator permitting is completed. The settlement would permit Westinghouse to store these materials in a building at the Winston-Thomas Plant until the incinerator is on line. According to 40 CFR §761.65(a), PCB materials may only be stored for one year prior to disposal: in this instance storage will be necessary for more than one year. In order for EPA to waive the one year storage limit Westinghouse will be required to comply with all other elements of the TSCA regulations as well as more stringent inspection and reporting responsibilities. This waiver will enable Westinghouse to remove PCBs from uncontrolled areas to a secure storage location more quickly and result in the incineration of PCB materials which might otherwise be simply landfilled elsewhere in accordance with 40 CFR § 761.75.

health and the environment.6/ That provision, as well as the EPA policy would clearly be met here since allowing Westinghouse to proceed would eliminate two years of delay in removing PCBs from areas in which they present documented hazards to the environment and health.

The rationale for the pre-construction ban concerned the desire to insure public participation in siting decisions and public comment on a proposed permit, and to avoid the argument that a permit should not be denied given the capital investment already made by the permit applicant in constructed facilities. In this instance, the opportunity for public participation is well protected both through the comment period on the Consent Decree as well as through the usual comment periods during the permitting processes. The EPA, State and City of Bloomington will all conduct public meetings prior to the signing of the Decree so that ample opportunity

---

6/ Alternative mechanisms for allowing Westinghouse to construct the incinerator prior to receipt of the RCRA permit would be to say that the incinerator will not be used to burn any hazardous wastes and therefore does not need a RCRA permit to operate, or to view the incinerator as a municipal waste facility when built that only later will become a hazardous waste incinerator. Neither of these positions is tenable in this instance. The first possiblity is not appropriate since we can not reliably conclude that no hazardous waste will be contained in the excavated materials to be incinerated. Adoption of the second position would set an undesirable precedent for the Agency: we are aware of Westinghouse's intention to burn more than municipal solid waste, and to "pretend" that the incinerator is for destruction of those solid wastes only would be to open a loop-hole that other entities could take advantage of.

Att. 5
Attachment I -4

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAY - 1 1987

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

Mrs. David G. Frey
2625 S. Smith Road
Bloomington, Indiana 47401

Dear Mrs. Frey:

I am writing in response to your letter to EPA Administrator Lee M. Thomas about the PCB-contaminated sites in Monroe County, Indiana. Please accept my apology for the tardiness of this response.

I appreciate your concerns about incineration, appropriate treatment and disposal of the resulting ash, and administrative procedures followed for these sites. However, as stated to you in an earlier letter from the Regional Administrator, Valdas Adamkus (October 1, 1986), at the time of the proposed settlement, a feasibility study was not required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) nor the National Contingency Plan (NCP). The equivalent of such a study was performed on the two sites subject to the United States' suit against Westinghouse. Additional information on the other sites was reviewed by both in-house and outside experts. Furthermore, the method of high temperature incineration proposed in the Consent Decree underwent extensive public review. Similarly, the incineration remedy ultimately selected was subject to lengthy review and assessment at the Federal, State and local levels.

Based upon this review and comments received from all interested parties, it was determined that the remedy pursuant to the consent decree will provide adequate protection to public health and the environment. Therefore, I stand behind the consent decree entered in this case on August 22, 1985 in the U.S. District Court for Southern Indiana.

Thank you for your concern.

Sincerely,

J. Winston Porter
Assistant Administrator

cc: Robert Knox
Office of the Ombudsman

Att. 6

AFFIDAVIT OF HUGH KAUFMAN

I, Hugh Kaufman, being first duly sworn, do depose and state as follows:

1) I am currently Assistant to the ~~Administrator~~ DIRECTOR HBK, Hazardous Site Control Division, United States Environmental Protection Agency (EPA). I have worked with the EPA since 1971. Through my training and experience I have become familiar with EPA regulations and policy in the areas of hazardous waste management and enforcement. I was involved in both the development of the Resource Conservation and Recovery Act (RCRA) and the development of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) for the EPA.

2) I have reviewed the Consent Decree entered by the Federal District Court, Southern District of Indiana, governing the cleanup of PCB and hazardous waste in Bloomington, Indiana. I have spoken with local elected officials concerning the history and terms of the Consent Decree.

3) My experience in working with the CERCLA (Superfund) program and with EPA's administration of it, as well as my reading of the National Contingency Plan regulations implementing CERCLA, lead me to conclude that a Remedial Investigation and Feasibility

comment period be held on the draft Feasibility Study prior to finalizing the study and prior to selection of a remedy. This draft FS must provide a detailed analysis of alternatives.

5) The NCP requires, and it is incumbent on EPA to assure, that CERCLA remedial actions comply with the requirements of other federal environmental laws. This includes the Resource Conservation and Recovery Act (RCRA). If hazardous waste is to be excavated and moved from a CERCLA remedial site to an off-site storage facility, then the RCRA requirements would have to be met, including the storage permit and incineration permit requirements. These permits would have to be obtained prior to construction of the storage facility or the incinerator, respectively. Any incinerator intended, from the beginning, to burn hazardous waste from a CERCLA site would be required to obtain a RCRA permit prior to construction, just as a new commercial incinerator for hazardous waste in Arkansas, or elsewhere, would. The Consent Decree requires a RCRA permit for the interim storage facility to be obtained.

6) It is my understanding that it has been the policy of the EPA Superfund program that off-site transport of hazardous substances is to be avoided. The waste is to be dealt with on-site unless transport to another facility is more cost-effective,

MSW as a fuel.

8) The Consent Decree agreement gives Westinghouse monopoly control over the waste stream of Bloomington. The waste disposal fees provided Westinghouse through this agreement will allow Westinghouse to be more than fully compensated for the costs incurred in building the incinerator to remedy a hazardous situation which they created.

Further affiant sayeth not.

[signature] 11.24.86
Mail Stop
WH 548E
US EPA Wash. D.C. 2406[illegible]

DISTRICT OF COLUMBIA :ss:

Subscribed and sworn to before me this 24 day of Nov, 1986

[signature]
Notary Public

My Commission Expires ______

My Commission Expires August 14, 1990

Phone 1-202-382-4491

AH. 7

Date: Tuesday, March 5, 1996 9: 10pm Electronic Mail
From: IN:SANJOUR.WILLIAM @EPAMAIL.EPA.GOV
To: Lou
Re: February 15, 1996
(Copy by Mrb, Fw by Mike)

February 15, 1996

MEMORANDUM

Subject: Bloomington RI/FS

To: Bob Martin

From: William Sanjour

Msg#: 1605

The complaintants in the Bloomington case have charged that EPA had agreed to a consent decree with Westinghouse in 1984 without having conducted an RIFS contrary to law and EPA procedures (see my memos of August 21, 1995 and September 7, 1995). Their complaint is supported by several facts:

Dan Hopkins, Regional Project Manager of the Bloomington site told me there was no RI/FS and none was required but the equivalence of an RI/FS was performed but the region has been unable to find one (see my memo of October 5, 1995).

A FOIA request to Region 5 was unable to produce an RI/FS or its functional equivalence. Instead the region gathered all the documents it could find and called it the "equivalent" of an RI/FS (see my memo of October 5, 1995).

A request to OERR and OGC for the RI/FS or the functional equivalent met with no initial response (see my memo of September 7, 1995).

I had a lengthy conversation on this issue with Charles Openchowski of OGC on October 4, 1995. He said that there was no requirement in 1983-4 in the NCP to do an RI/FS for enforcement lead sites. He did concede that EPA was required to do the functional equivalent of an RI/FS and did indeed do so with documents called EE/CAs (Engineering Evaluation/Cost Analysis). The EE/CAs were submitted with the Consent Decree in 1984. The brief filed with the consent decree specifically referred to them. Although he doesn't remember the substance of the EE/CAs, he specifically remembers seeing them as part of the documentation accompanying the consent decree. He remembers this

an RIFS was always required without exception. Mr. Hookins explained that although these events predated him, his understanding is that because this case had been in litigation it didn't follow the customary RI/FS path. The only discussion of a rationale for selecting the incinerator which he was aware of was in a four page Enforcement Decision Document and he does not know where the document is. And, as explained earlier, Mr. Openchowski is certain that the functional equivalent requirement was met by the EE/CAs, which no one can find.

There is also concern about the fact that, in the negotiations for the consent decree, Westinghouse was represented by former EPA General Counsel Jody Bernstein and that the EPA representative, Barbara Magel, left EPA after the consent decree was signed to work for the attorney who represented the City of Bloomington which, along with Westinghouse, was the Potentially Responsible Party.

Considering the efforts that the complainants have made to find "the functional equivalent of an EIS" and the fact that no such document can be produced by EPA or found in the court records and the fact that the court and EPA litigators may not have been too friendly to the public interest, we should seriously consider the possibility that the "functional equivalence" was never performed. In any event, it is my recommendation that EPA should either produce documentation of the functional equivalence of an EIS or perform an RI/FS, the court's judgement not withstanding. I also recommend a legal review of the issue of whether the consent decree is valid if the functional equivalence had not been performed.

cc: Tim Fields

Att. 8

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

June 12, 1997

Hon. Carol M. Browner Administrator
U.S. Environmental Protection Agency
Washington, DC 20460

Dear Ms. Browner:

In light of the Inspector General's recent concern over the inappropriate influence of regulated industries on EPA decisions, I would like to call to your attention to an apparent violation of the law by EPA Region 5 at the behest of the Westinghouse Corporation.

Westinghouse had disposed of capacitors containing the toxic chemical PCB in several sites in the area of Bloomington, Indiana. After several years of negotiation, EPA reached a consent agreement with Westinghouse and the town of Bloomington in 1985. Contrary to the requirements of the law, no analysis of the alternative ways of treating the hazardous waste was performed and the citizens were outraged at the agreement from which they were excluded (see attached memo dated February 15, 1996).

Bloomington citizens have fought the consent agreement for years. They succeeded in blocking its implementation as originally drafted but they have failed to get EPA to perform the legally required analysis of alternatives (called an RI/FS). Even a stern rebuke by the Assistant Administrator for Solid Waste and Emergency Response failed to move them. In a September 25, 1996 memorandum to William Muno, Region 5 Superfund Division Director, Elliott Laws wrote:

> "As background, I requested that the National Ombudsman look into allegations that an RI/FS or equivalent had not been performed prior to the signing ofthe consent decree. Upon further study, Bill Sanjour reported finding no documentation relating to the performance of an RI/FS or the "functional equivalent." He recommended that an RI/FS be completed,notwithstanding the judgement of the court. OGC and OERR were involved in subsequent discussions of this issue. At the request of the Regional Counsel, we entered into a more substantive discussion with OGC, OERR and the Office of the Ombudsman. Bob Martin met with Doug Bellotti, the newly appointed Regional Ombudsman, in Kansas City, during June at a training meeting for Regional Ombudsmen. Doug and Bob agreed to work together to address the issues raised by citizens at the Bloomington sites."

In spite of this nothing has been done. Some time ago I asked Dan Hopkins, Regional Project Manager of the Bloomington sites why they did not do an RI/FS in order to quell community complaints. He told me they wouldn't do it because Westinghouse did not want it done. A later meeting with Westinghouse representatives, at which Bob Martin was present, confirmed this.

Thus, William Muno and his superiors, are apparently willing to violate the law, perpetuate public ire, and withstand the rebuke of an assistant administrator in order please the Westinghouse Corporation. However, those of us who are acquainted with Mr. Muno's willingness to bend and break any number of rules and laws in order to permit

Bloomington, Indiana PCB Inventory
Phase I Report

Draft

Prepared for

COPA
Citizens Opposed to PCB Ash in Monroe County
Bloomington, Indiana

by
Melissa Valentin, P E
MVA Consulting, Inc

October 1997

Disposal of PCBs in Local Dumps

Manufacturing and disposal rates for 1966 through 1972 are contained in the Kacir memo (Kacir 1983) This memo contains data for estimating the amount of PCBs deposited in Neal's Dump and Neal's Landfill This information is used below to estimate the amount of PCBs deposited in Lemon Lane Landfill Anderson Road Landfill and Benetts Quarry

Data for Neal's Landfill in Attachment 2

Year	Lbs of Inerteen	
1966	162,205	(12 months)
1967	151,689	(12 months)
1968	137,310	(10 months)
Total	451,204	

Data for Neal's Dump in Attachment 2

Year	Lbs of Inerteen	
1968	32,887	(2 months)
1969	108,251	(12 months)
1970	69,554	(12 months)
1971	50,474	(12 months)
1972	15,552	(5 months)
Total	276,717	

Note universal draining commenced in 1970 but only removed 50% of Inerteen

Annual Average PCBs placed in landfills in capacitors.

From 1966 to 1968	159,249	lbs per yr	Neal's LF
Late 1968 and 1969	120,975	lbs per yr	Neal's Dump
From 1970 to 1977	56,102	lbs per yr	Neal's Dump

Clay

Approximately 15 tons per year of clay soaked in PCBs was disposed of annually
The PCB concentration in the clay is unknown
Assuming a concentration of 100,000 ppm,
100,000 mg PCB per kg of clay = 200 lbs of PCB per ton of clay or
3000 pounds of PCB annually.

Assumed disposal of PCBs at local dump sites (in pounds)
(using the annual average disposal rates shown above)

Year	Anderson Road	Bennetts Quarry	Lemon Lane Landfill	Neal's Dump	Neal's Landfill	Total
1958	0	0	162,249	0	0	162,249
1959	0	0	162,249	0	0	162,249
1960	0	0	162,249	0	0	162,249
1961	0	0	162,249	0	0	162,249
1962	0	0	162,249	0	0	162,249
1963	0	0	162,249	0	0	162,249
1964	0	0	162,249	0	0	162,249
1965	0	0	0	0	162,249	162,249
1966	0	0	0	0	162,249	162,249
1967	0	0	0	0	162,249	162,249
1968	12,398	12,398	0	49,590	49,590	123,975
1969	12,398	12,398	0	99,180	0	123,975
1970	5,910	5,910	0	47,282	0	59,102
1971	5,910	5,910	0	47,282	0	59,102
1972	5,910	5,910	0	47,282	0	59,102
1973	0	59,102	0	0	0	59,102
1974	0	59,102	0	0	0	59,102
1975	0	59,102	0	0	0	59,102
1976	0	59,102	0	0	0	59,102
1977	0	59,102	0	0	0	59,102
Total (lbs)	42,526	338,035	1,135,743	290,615	536,337	2,343,255
Total (tons)	21	169	568	145	268	1,172

Att. 10

ENVIRONMENTAL GEOCHEMISTRY & QUALITY ASSURANCE
Joseph G. Haller
650 Dittemore Rd.
Bloomington, IN 47404
812-876-6774

November 22, 1996

Mr. Michael Baker
COPA
205 N. College Ave.
Suite 713
Bloomington, IN
47402-0665

Mike:

I have looked over the documents sent to me over the Internet and in the mail from Mitch Rice. I have not concentrated on the details of the sampling plan. Too many larger issues are apparent in what is planned. I have tried to summarize them as succinctly as possible, but they are the recurring issues surrounding waste location in a karst environment and the resistance of the investigators to adequately address the real problem. Much of what is being done qualifies as window-dressing. It gives the appearance of energy and effort being applied to a problem, yet is little more than marching in place. Work being done, but little forward progress.

Issues of Concern
Lemon Lane Sampling Plan

1. Study Objectives - The overall objectives of the investigation do not appear to be suitable to meet the intent of a remedial investigation. A remedy (containment) has been selected despite that the intent of an RI is to characterize the extent and degree of contamination. Nothing in the plan addresses the containment issue and yet the analyses, for example, for TCLP, focus on regulatory requirements surrounding removal of the waste and disposal in a RCRA hazardous waste landfill. Investigation for containment would focus on location of contamination and routes of its escape off-site.

2. Sampling Points - The selection of sampling points does not appear to support study objectives addressing either containment, or understanding the extent of contamination. Sampling will duplicate previous investigations of "hotspots". By duplicating previous work and staying away from relatively unknown areas, this effort avoids producing new evidence of contamination. Little new information will be collected.

3. Compositing - The homogenization of samples from multiple locations is inconsistent with accumulation of data indicating the levels and distribution of contamination. Compositing always reduces the maximum levels from an individual point by dilution with less contaminated materials. Additionally, the resulting lower average value is then applied to a larger volume of material than the result for the individual sample. AHotspots@ get damped out. This reduces the information on contaminant distribution. The resulting effect is to decrease the perceived level of a hazard, but it does not reduce the reality.

4. Addressing Containment - Controlling the impact of a hazardous waste by containment requires an understanding of the location of the contamination and the potential routes of off-site movement. The sampling plan, as noted above, does not increase our information on the distribution of contamination, and does not address escape pathways. Our awareness

delineate sampling points for PCB contamination suggests a misunderstanding of the technique. Electromagnetic surveys for hazardous waste detection are best when the detectable metallic component in the waste is either massive, or close to the surface, and only detectable when the matrix surrounding the source is non-magnetic. The PCB capacitor casings were often removed from the waste during scavenging. The remnant casings are relatively small in mass (and, only weakly magnetic). They are buried to some depths (and, the landfill itself has additional cover added to prevent infiltration). The landfill also contains huge quantities of metallic debris including food cans and industrial waste from local electronics and metal fabricators. Running this survey gives the impression that something potentially useful is underway, but little of practical benefit is likely to result.

I recommend that we review the cited USEPA documents supporting municipal landfill containment. I believe that they will not support the developing plan to contain the hazardous material in place. Hazardous waste landfills in karst are unlikely to be allowed by Indiana regulations. I would like to review the data gathered in this effort for quality and relevance to site issues. I would also recommend sending the water and sediment sampling plan and data. It is that work that is more crucial to understanding contamination at Lemon Lane in terms of release and impact on human health and the environment.

If you have any additional questions, please contact me at 210-633-1308 or at 210-348-9366.

Sincerely, Joseph G. Hailer

Att. 11

August 2, 1996
MEMORANDUM
Subject: Bloomington, Indiana
To: Tim Fields and Bob Martin
From: William Sanjour

The complainants in the Bloomington case have charged that EPA has shown callous disregard for human life and health in the handling of the Lemon Lane Landfill. They offer the following documentation to support their claim.

An EPA field inspection report dated July 15, 1981 identified the Lemon Lane Landfill as a seven acreland fill owned by the City of Bloomington onto which both municipal and industrial wastes had been dumped. The landfill was unfenced and contained a great many capacitors, many of which had been broken open by scavengers. Children had been reported playing in the area of the exposed capacitors.

A plan for the clean-up of the Lemon Lane Landfill was submitted by EPA's contractor on July 27,1981. Among other things, this plan called for the site to be fenced and capped and warning notices posted.

On August 4, 1981, the director of the Region 5 Enforcement Division sent a letter to the Mayor of Bloomington stating that "The U. S. EPA is very concerned about the unrestricted access unknowing and unauthorized individuals have to the PCB contaminated areas of the Lemon Lane site." The letter recommended that capacitors be gathered in one central location and covered until removed and that the contaminated areas be capped and the site fenced and warning notices posted.

Nevertheless, in spite of EPA's concern, and in spite of continual reports of children playing among the capacitors, two years elapsed before the dump was fenced. The fence and warning signs were finally put up on July 8, 1983 with EPA "emergency" funds at a cost of $22,752.48. It would be several more years before the other measures recommended by EPA in 1981 would be carried out.

However, complainants state that the most egregious example of EPA's callous indifference is contained in memo from the Indiana State Board of Health which says:

> Based upon air monitoring results forwarded to this office by U.S. EPA, Mr. Greg Steele, Indiana State Board of Health Epidemiologist, and Mr. Virgil Konopinski, Industrial Hygiene,have recommended that staff wear respiratory protection whenever on-site at Lemon Lane Landfill, Neal's Landfill, Neal's Dump, and Bennett's Stone Quarry. Air release levels, which EPA has requested remain confidential because of preparation for litigation, exceed the NIOSH weekly exposure limit of one microgram for PCBs. Frequent changing of cartridges based upon manufacturer's instructions is also recommended.

The memo does not say how high the PCB levels are in the air but only that they exceed one microgram which is already fifteen times greater that the Superfund target risk level of one per million'.

An earlier report of measurements made at the Lemon Lane Landfill during June and July of 1983 for EPA states:

> At Lemon Lane Landfill, ambient air PCB levels measured at 180 cm above three hot spots during 8-hour daytime sampling periods ranged from 6 to 193 ug/scm. Over the 4-day monitoring period, upwind airborne PCB were fairly constant at approximately 0.05 ug/scm and levels measured downwind of the landfill ranged from 0.3 to 0.8 ug/scm.

Thus, it would appear that EPA was aware, at least since 1983, that there were dangerously high ambient airlevels of PCB in the vicinity of the Lemon Lane Landfill but took no action, other than to protect its own personnel, and did not warn the public of the danger.

OR QUOTE).

7. Private conversation with Jim Cogliano, ORD Human Health Assessment Group, May 20, 1996.

8. D.L. Sgontz and J.E. Howes Jr., Ambient Air Monitoring for PCB Near Three Landfills in the Bloomington, Indiana Area, Report by Battelle Columbus Laboratories for the EPA Environmental Monitoring Systems Laboratory, undated but based on work performed during June and July, 1983.
9. Seyed Dastgheyb, United States Testing Co., Inc., letter to Environ Corporation, February 9,1987.

10. Private conversation with complainants attorney Mick Harrison, June 10, 1996.

Att. 12

February 17, 1998
P.O. Box 2301
Bloomington, IN 47402

Hon. Kennard P. Foster
U.S. District Court
Rm 277 U.S. Courthouse
46 E. Ohio St.
Indianapolis, IN 46204

RE: Cause No. IP 83-9-C-D/F and
Cause No. IP 81-448-C-D/F

Bloomington PCB Cleanup

Dear Judge Foster;

This letter is to express my concern regarding what have been publicized as decisions now before you in the matter of the PCB cleanup in and around Bloomington, Indiana.

I have been a resident of Bloomington for 26 years and have been involved with working for a safe, just PCB cleanup for a good number of those years. I am a member of Clean Land, Air and Water (CLAW), a local group actively working toward that cause.

Of utmost concern to me is that the volume of contaminated material, from all of the consent decree sites, needed to be removed and treated or disposed of to attain a safe cleanup not be compromised in the "negotiating" process. I am enclosing two EPA documents (12-4-84 Enforcement Decision Document and 8-27-84 memo "Position Document for Remedial Issues in Westinghouse Case Proposed Settlement") which together show that the EPA's original decision and the corresponding consent decree were based on the premise of attaining a 1 parts per million (ppm) cleanup by a level of removal excavation, including buffer zones, explicitly defined in the consent decree.

The consent decree itself calls for adherence to these levels of removal excavation, even though the treatment technology be changed from the planned incineration treatment.

> (i) Westinghouse retains the right to demonstrate to the Court that there exists in whole or in part a more cost-effective method of remedying the PCB contamination of the sites and areas, or any of them, by reason of technological developments affecting the disposal of PCBs, that will: (1)

I heartily endorse Judge Dillin's decision to set a two-year deadline for the cleanup and appoint a Magistrate Judge to implement the aims of the consent decree. Thereby, the need to further erode the cleanup standards in compromising with Westinghouse to attain their compliance is eliminated.

Your action in compelling Westinghouse to move forward with cleanup activities, including complete removal excavations as already delineated in the consent decree, is requested and will be welcomed by the citizens of Bloomington and Monroe County.

Respectfully,

Larime Wilson

Larime Wilson

AH. 13

April 16, 1998

Mr. Robert Martin
MC 5101
EPA Headquarters RCRA/Superfund Ombudsman
U.S. Environmental Protection Agency
401 M St., SW
Washington, DC 20460

Re: Petition for Investigation and Corrective Action Regarding EPA Region V's Improper Handling of the Bloomington, Indiana, National Priorities List PCB Contaminated Sites and Non-National Priorities List PCB Sites (July 28, 1997)

Dear Mr. Martin:

We are writing to request your **immediate** and **emergency** assistance and **presence in Bloomington**. Since the time of Bloomington petitioners' July 28, 1997, Petition for Investigation, much has happened to accelerate the need for your immediate intervention and relief.

In November 1997, Judge S. Hugh Dillin ordered the remaining consent decree sites to proceed simultaneously and to be cleaned up by the year 2000. He also appointed Magistrate Judge Kennard P. Foster "to see that the aims of the consent decree . . . are carried out expeditiously." Since that time the consent decree parties (including the EPA) have been rapidly renegotiating the consent decree.

On December 9, 1997, Thomas Alcamo, EPA Region V Project Manager, informed the Citizen Information Committee (CIC) that any changes to the scope of the cleanup will be done by new remedy selection with an RI/FS (Remedial Investigation/ Feasibility Study) and public comment, and a new ROD (Record of Decision). At the next and only following CIC meeting, February 3, 1998, Alcamo informed us that his previous statement was in error and that there would be no RI/FSs. On April 1, 1998, the Mayor's PCB Advisory Committee was informed that the parties intend to proceed in major scope of work changes by stipulated agreement and order of the court. There will be no public hearings or comment periods on these changes, which are indicated to be all in the nature of reducing cleanup requirements and ignoring legal protections to human health and ecology.

Further, the Region V responses fail to address many of petitioners' complaints including, specifically, Count V, EPA's failure to provide a legal decision process for remedy selection of the Bloomington Superfund sites. The decision process in fact before us now is an inappropriate and secret, nonpublic process without regard for legal requirements designed to protect human health and ecology. Count V, EPA's proceeding without a legal or appropriate decision process is the cause of our need for your immediate involvement.

We therefore request your emergency presence in Bloomington to investigate and intervene in matters of remedy selection, site boundaries, sampling and contaminants of concern on an emergency basis. If it is to be "soon enough to matter," it will need to be immediate.

We remain hopeful and willing to assist your investigation in any way we can.

Respectfully,

Greg Moore
P.O. Box 53
Unionville, IN 47468
(812) 988-2886

James Cartmell
5994 E. State Rd. 46
Bloomington, IN 47401
jcart@bloomington.in.us

Larime Wilson
P.O. Box 2301
Bloomington, IN 47402
(812) 333-9705
larime@bloomington.in.us

Att. 14

GUEST COLUMN

Cleanup plan for Lemon Lane Landfill short of what's needed

The following guest column was submitted by all the citizen members and attendees of the EPA Citizens Information Committee. They are Mike Baker, Diane Henshel, David Porter, John Foster, George Hegeman, Sally Hegeman, Michael List, Lou Schwitzer, Flynn Picardal, Lanme Wilson, Mitch Rice, Dawn Hewitt and Jim Cartmell.

In 1985 a consent decree was signed by the Westinghouse Corporation, the City of Bloomington, the State of Indiana, Monroe County, and U.S. EPA providing for the cleanup of an estimated 650,000 cubic yards of soil and other material contaminated with PCBs — toxic chemicals used by the Westinghouse Corporation (now CBS) in the manufacture of electrical capacitors in their plant on the west side of Bloomington. All parties agreed that it was necessary to completely excavate the material — it was then to be treated in an incinerator to be built and operated by Westinghouse, at a profit. Years of public protest followed, and in 1994 this remedy was abandoned, the parties agreeing to seek a safer solution. In November of 1997 Federal Judge S. Hugh Dillin issued an order to expedite the process and appointed Magistrate Kennard P. Foster to oversee the cleanup. Under pressure to meet deadlines established by Judge Dillin, the parties are contemplating a "cleanup" that differs so shockingly from the original intent of the consent decree parties that we the undersigned feel it is time once more for the community to register its protest in the strongest terms.

The largest contaminated site — one of the worst PCB sites in the United States — is the old city dump known as the Lemon Lane Landfill, located on the east side of Ind. 37 near its intersection with Vernal Pike. As a temporary measure the site was capped with a sheet of plastic in 1987. It was later discovered that PCBs were flowing out of LLL and emerging in alarming concentrations at Illinois Central Spring (ICS), near the intersection of Adams Street and West Fifth. The plan that is emerging for dealing with PCB contamination at LLL is not the total excavation that the community was promised, but rather a very limited removal of what U.S. EPA terms "hotspots," followed by re-capping of the site and continuing treatment of the water emerging at ICS for decades to come. It has been promised that a "re-opener" agreement will provide for further cleanup measures if periodic review shows that the cleanup has been inadequate.

Although it seems clear that the abandonment of the total excavation of contaminated material at LLL is based on the reluctance of Westinghouse/CBS to spend money that will not be returned through incinerator tipping fees, it is now claimed that a "hotspot" excavation (no precise definition of just what constitutes a "hotspot" has yet been provided) is all that is necessary to protect public health and environmental quality; that what is left in LLL is not important as long as what emerges is monitored, captured and treated to remove its toxicity.

We feel this approach is dangerously inadequate for the following reasons:

- The soil sampling at LLL has not been done systematically or thoroughly, nor has the location of samples taken into account historical information about where scrapped capacitors and other toxic materials were dumped. Based on this half-hearted mapping of the site, the "hotspot" excavation seems a mere token effort.
- LLL is located above a geological system known as "karst" — unstable limestone riddled with cracks and channels through which water flows. Long-term residents of southern Indiana are familiar with the appearance of new surface sinkholes where none existed before. This is graphic evidence of the changing and unpredictable nature of karst. To suggest that ICS is, or will be, the only route for the escape of toxins from LLL is absurd.
- Bloomington's PCB problem was first discovered over 20 years ago.

If the proposed cleanup proves inadequate and is reopened, the process could drag on for 20 more, while fish in area streams remain too contaminated for human consumption and our community is exposed to chemicals shown to cause cancer, reproductive disorders, and neurological effects —including learning disabilities.

We urge you to contact your local and state political leaders, U.S. EPA, Magistrate Foster and Judge Dillin and insist on:

- Complete excavation of the contaminated material at Lemon Lane Landfill as well as the other consent decree sites to at least the levels that all the parties originally agreed were necessary to protect human health and environmental quality.
- A thorough and diligent effort to identify as many paths as possible for PCBs to emerge from the sites, where even if all contaminated soil is removed, much dangerous material will remain within the bedrock channels.
- Permanent monitoring and treatment of all identifiable points of discharge, starting immediately.

ATT. 15

The Herald-Times

OUR OPINION

Concerns about cleanup are real

In 1985, when governmental officials on four levels joined with Westinghouse on a plan to clean up PCB contamination in our area, there was not unanimous support.

At first the opposition was confined to a pretty small group of people. Many of them were known to be activists, and their rhetoric was sometimes more than the general public wanted to hear.

But as time went on, this group of vocal citizens proved to be on target. The larger community joined them in their opposition to the plan, which was based on construction of an incinerator to burn PCB-contaminated materials. And in time the incinerator plan died a welcome death.

This brief history lesson is offered today in conjunction with the guest column printed on the other side of this page. Many of the signers of the column were among the early and persistent critics of the incinerator plan. They were, and are, activists. In their activism they have amassed an impressive amount of knowledge and expertise about issues related to PCB disposal.

Our guest columnists — the entire EPA-established Citizens Information Committee — should not be underestimated. They might not all have the academic degrees that the government- and Westinghouse-employed scientists and experts have. But they have tenacity and a strong desire to see that their community is cleaned up correctly.

We won't pretend to be experts on the science involved in this cleanup. There are enough experts on all sides of this issue to go around, and some of them no doubt will disagree with the positions taken in the guest column.

But a lot of experts said an incinerator would be the best thing for this community, too.

They were wrong.

The CIC members make a strong case that the cleanup at the Lemon Lane Landfill is not being done as well as it should be. They refer to an inadequate "hotspot" excavation, as opposed to complete excavation deemed necessary in the original cleanup agreement. They point up concerns about the karst topography. These are significant issues of public health.

A few of these folks have protested so much over the years that sometimes it is tempting to discount what they are saying — Chicken Little and all that.

But they've proven before that they know what they're talking about. Judge S. Hugh Dillin, Magistrate Kennard P. Foster, and our local officials should take them seriously.

It's always good for public officials to hear what people think about issues. Local officials need to hear, and so do these two judges who will have a great deal to say about what kind of cleanup ultimately occurs at the Lemon Lane Landfill.

If you want to offer input to them, you can write:

Hon. Kennard P. Foster, U.S. District Court, Room 277, U.S. Courthouse, 46 E. Ohio St., Indianapolis, IN 46204.

Hon. S. Hugh Dillin, U.S. District Court, Room 255, U.S. Courthouse, 46 E. Ohio St. Indianapolis, IN 46204.

Att. 16

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF INDIANA
INDIANAPOLIS DIVISION

UNITED STATES OF AMERICA,

Plaintiff,

and

THE STATE OF INDIANA and THE ENVIRONMENTAL MANAGEMENT BOARD OF THE STATE OF INDIANA,

Intervening Plaintiffs,

v.

WESTINGHOUSE ELECTRIC CORPORATION,

Defendant and Third Party Plaintiff,

v.

MONSANTO COMPANY,

Third Party Defendant,

and

THE CITY OF BLOOMINGTON, INDIANA, THE UTILITIES SERVICE BOARD OF BLOOMINGTON, INDIANA, and MONROE COUNTY, INDIANA,

Plaintiffs,

v.

WESTINGHOUSE ELECTRIC CORPORATION, MONSANTO COMPANY,

Defendants.

NO. IP 83-9-C

PHOTOCOPY AND SEND TO:
Mayor & Bar Ltr.
DATE DONE: 12/1/97 BY: MC

RECEIVED: 12-2-97
REC'D: Ltr. PC
FILE #
SUB:
CC

ORDER

This cause came before the Court on November 18, 1997 to consider the Joint Status Report submitted by the parties on

It is therefore ordered that data collection, risk assessment, determination of remedy, and all other preliminary matters, as well as the implementation thereof go forward simultaneously as to Neal's Landfill, Neal's Dump, and Bennett's Dump. To the extent that a public notice may be required, the Court sees no reason why more than one notice need be given, covering the proposed remedies as to each of said sites. The taking and analyzing of core samples and making a risk assessment should surely take but a few weeks, and should be commenced immediately (*i.e.*, don't wait for warm weather).

The Court appoints Magistrate-Judge Kennard P. Foster as Special Master in this case, with all of the powers enumerated in Rule 53, F.R.Civ.P. His primary duties, of course, are to see that the aims of the consent decree, as modified by the orders of the Court, are carried out expeditiously and to resolve possible disputes between the parties. The parties may or may not desire to continue the services of the facilitator in light of this appointment.

All of which is considered and ordered this 21st day of November, 1997.

S. Hugh Dillin, Judge

Att. 17

IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF INDIANA
INDIANAPOLIS DIVISION

UNITED STATES OF AMERICA, et al., Plaintiffs, v. CBS CORPORATION, Defendant.	Civil Action No. IP 83-9-C
	And
THE CITY OF BLOOMINGTON, INDIANA, et al., Plaintiffs, v. CBS CORPORATION, et al., Defendants.	Civil Action No. IP 81-448-C MAGISTRATE JUDGE KENNARD P. FOSTER

CBS CORPORATION'S MEMORANDUM OF LAW IN SUPPORT OF A REMEDY INVOLVING THE CONSOLIDATION OF WASTE FROM THE BLOOMINGTON SITES AT NEAL'S LANDFILL

Among all the alternative approaches to remediating the Bloomington sites under consideration, one of the most promising is the consolidation of excavated material from the other Bloomington sites at Neal's Landfill. A properly constructed Neal's Landfill on-site consolidation unit can contain excavated material from the other sites safely and effectively, allowing for local disposal of the waste without creating a new landfill in the Bloomington area. This approach enables the parties to minimize the problems and costs of transportation and

CERTIFICATE OF SERVICE

I hereby certify that, on this 5th day of February, 1998, I caused to be served by first-class mail, postage prepaid, a copy of the foregoing Memorandum of Law in Support of a Remedy involving the Consolidation of Waste from the Bloomington Sites at Neal's Landfill upon counsel for the parties at the following addresses:

David R. Berz

Steven D. Ellis
Environmental Enforcement Section
Environment and Natural
Resources Division
United States Department of Justice
P.O. Box 7611
Ben Franklin Station
Washington, D.C. 20044

Charles Goodloe
Assistant United States Attorney
U.S. Courthouse
46 East Ohio Street
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Jeffrey A. Cahn
Associate Regional Counsel
U.S. Environmental Protection Agency
Region V
77 West Jackson Boulevard
Chicago, Illinois 60604

Myra P. Spicker
Deputy Attorney General
219 State House
Indianapolis, Indiana 46204

Feb. 5, 1998 AH. 18

FOR THE SOUTHERN DISTRICT OF INDIANA
INDIANAPOLIS DIVISION

UNITED STATES OF AMERICA, Plaintiff, and THE STATE OF INDIANA and THE ENVIRONMENTAL MANAGEMENT BOARD OF THE STATE OF INDIANA, Intervening Plaintiffs, v. CBS CORPORATION, f/k/a WESTINGHOUSE ELECTRIC CORPORATION, Defendant and Third Party Plaintiff, v. MONSANTO COMPANY Third Party Defendant, and THE CITY OF BLOOMINGTON, INDIANA, THE UTILITIES SERVICE BOARD OF BLOOMINGTON, INDIANA, and MONROE COUNTY, INDIANA, Plaintiffs, v. CBS CORPORATION, f/k/a WESTINGHOUSE ELECTRIC CORPORATION and MONSANTO COMPANY, Defendants.	Civil Action No. IP 83-9-C and Civil Action No. IP 81-448-C JUDGE S. HUGH DILLIN MAGISTRATE JUDGE KENNARD P. FOSTER, SPECIAL MASTER

MEMORANDUM OF POINTS AND AUTHORITIES OF THE UNITED STATES AND STATE OF INDIANA REGARDING REQUIREMENTS FOR OFFSITE DISPOSAL

of Decision ("RODs") providing for the clean-ups of all consent decree sites no later than December 31, 1999.

I. BACKGROUND

This civil action is governed by the provisions of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. § 9601 et seq., as amended by the Superfund Amendments and Reauthorization Act of 1986 ("SARA"), Pub. L. No. 99-499, 100 Stat. 1613 (collectively, "CERCLA").

Congress enacted CERCLA in response to widespread concern over the severe environmental and public health effects resulting from improper disposal of hazardous wastes and other hazardous substances.[1] Investigations, cleanup planning, and all cleanup activities under CERCLA are referred to as "response actions" under CERCLA since such activities are conducted to "respond" to releases or threats of release of hazardous substances at a particular location. See 42 U.S.C. §§ 9601(23)-(25). Permanent or long-term response actions are generally known as "remedial actions." 42 U.S.C. § 9601(24). The National Contingency Plan ("NCP"), 40 C.F.R., Part 300, provides "'the organizational structure and procedures' for responding to hazardous waste threats. 40 C.F.R. § 300.1. It is the means by which EPA implements CERCLA." State of Ohio v. EPA, 997 F.2d 1520, 1525

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[1] See generally United States v. R.W. Meyer, Inc., 889 F.2d 1497, 1500 (6th Cir. 1989), cert. denied, 494 U.S. 1057 (1990); United States v. Akzo Coatings of Am. Inc., 949 F.2d 1409, 1416-18 (6th Cir. 1991); Eagle-Picher v. U.S. EPA, 759 F.2d 922, 925 (D.C. Cir. 1985); United States v. Seymour Recycling Corporation, 679 F. Supp. 859(S.D. Ind. 1987).

Act ("TSCA"), 15 U.S.C. §§ 2601 et seq. and Subtitle C (Subchapter III as codified) of the Resource Conservation and Recovery Act ("RCRA"), 42 U.S.C. §§ 6921 et seq.[2/] See 42 U.S.C. § 9621(d)(3); 40 C.F.R. § 300.440(a)(4); 40 C.F.R. § 300.440(b). In addition, CERCLA waste may only be transferred after EPA determines that the unit within the facility to which the CERCLA waste is transferred is not releasing any hazardous waste or constituent of a hazardous waste into the groundwater, surface water, or soil. 42 U.S.C. § 9621(d)(3)(A) and (B). See also 40 C.F.R. § 300.440(b). If any releases occur from a different unit at the same hazardous waste facility, they must be controlled by a corrective action program approved by EPA under RCRA subtitle

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[2/] Section 121(d)(3) of CERCLA states:

> In the case of any removal or remedial action involving the transfer of any hazardous substance or pollutant or contaminant offsite, such hazardous substance or pollutant or contaminant shall only be transferred to a facility which is operating in compliance with section 3004 and 3005 of the Solid Waste Disposal Act [42 U.S.C. § 6924 and 6925, also known as RCRA] (or, where applicable, in compliance with the Toxic Substances Control Act [15 U.S.C. § 2601 et seq.] or other applicable federal law) and all applicable State requirements. Such substance or pollutant or contaminant may be transferred to a land disposal facility only if the President determines that both of the following requirements are met:
>
> > (A) The unit to which the hazardous substance or pollutant or contaminant is transferred is not releasing any hazardous waste, or constituent thereof, into the groundwater or surface water or soil.
> >
> > (B) All such releases from other units at the facility are being controlled by a corrective action program approved by the Administrator under Subtitle C [Subchapter 3 as codified] of the Solid Waste Disposal Act [42 U.S.C. §921 et seq.].

factors, such as density of population or whether wastes at different facilities are similar or identical. 55 Fed. Reg. at 8690, including n.4. After EPA promulgated that regulation, it was challenged by numerous parties as "expand[ing] the permit exemption of section 121(e)(1) beyond its intended scope" in a petition for review of the regulation in State of Ohio v. EPA, 997 F.2d at 1549. The United States Court of Appeals for the D.C. Circuit upheld the regulation, but cautioned that "the ability of the statute to accommodate a broader, more functional definition of `onsite' is not limitless." Id. at 1549. The court suggested that a later challenge might be sustained if based on its case-by-case application of the definition, "EPA has abused its flexible definition of `onsite' to deliberately bypass other environmental laws or to implement response activities far afield of contaminated areas." Id. at 1549-50.[1/]

[1/] The Court in State of Ohio v. EPA deemed unripe for judicial review a challenge to the possibility that EPA might in some cases treat non-contiguous, but reasonably related facilities as a single site under its regulation. See 997 F.2d at 1550. In the preamble to its final rule, EPA asserted its "discretion to treat non-contiguous facilities as one site for the purpose of taking response action," based on an assessment of the particular circumstances involved, including whether the "facilities are reasonably close to one another" and whether the "wastes are compatible for the selected treatment or disposal approach." 55 Fed. Reg. at 8690 (emphasis added). EPA emphasized that it would make such assessments "on a case-by-case basis." Id. For the reasons set forth in this Memorandum, EPA has declined throughout the history of its involvement with the six Consent Decree sites to use its discretionary authority to treat the sites as a single site. EPA's treatment of the sites as separate sites in this manner is consistent with CERCLA and the logic of State of Ohio v. EPA.

Part 300, App. B(1997)(showing continued separate listing for each site). Similarly, EPA separately determined that Winston-Thomas and Anderson Road should not be listed on the NPL.[5/] In addition, as noted above, EPA has treated the six sites as separate sites in the Consent Decree and throughout this litigation, particularly in the process of finding alternative remedies for each site. See Schedule and Amended Schedule submitted to the Court for determination of alternative remedies, attached to Status Reports, filed February 12, 1996 and February 13, 1997, respectively. Appropriate deference should be shown for EPA's consistent treatment of the various sites as separate sites. Chevron U.S.A., Inc. v. Natural Resources Defense Council, Inc., 467 U.S. 837, 843-44, 865)(1984)((1) agency rules to fill gap in congressionally created program given controlling weight absence showing as "arbitrary, capricious, or manifestly contrary to the statute" and (2) principle of deference to agency's administrative interpretations of a statutory scheme, particularly when scheme is technical and complex); Bethlehem Steel Corporation v. Bush, 918 F.2d 1323, 1327-28(deference to

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[5/](...continued)
21054, 21071(June 10, 1986)(final rule, NPL listing for Neal's Dump). These notices are attached hereto as Exhibit A.

[6/] Like EPA, CBS has always considered the sites to be separate. As it (then known as Westinghouse Electric Corporation) explained in its 1991 permit application for the planned ash landfill at Bottom Road, "[i]n accordance with the consent decree, Westinghouse is required to remediate six sites in and around Bloomington, Indiana." Westinghouse Landfill Permit Application at B-1-2(August 14, 1991).

which was spilled or poured into the drain at CBS's former manufacturing plant in Bloomington, reached the wastewater treatment facility through the sewers, and was processed into sewage sludge. In fact, given the variety of different kinds of wastes disposed of at Lemon Lane and Neal's Landfill, it is indeed possible that the waste contained at the different sites may not be compatible if disposed of together. See 40 C.F.R. § 761.75(b)(8)(TSCA regulation requiring, among other things, to segregate "other wastes placed in the landfill that are not chemically compatible with PCBs and PCB Items including organic solvents....")

Moreover, the sheer distance between each of the sites shows that EPA's classification of the sites under CERCLA and its governing regulations was not arbitrary and capricious. As noted above, the definition of "onsite" set forth in the National Contingency Plan encompasses only "the areal extent of contamination and all suitable areas in very close proximity to the contamination necessary for implementation of the response action." 40 C.F.R. § 300.5(emphasis added). The five remaining sites are miles from each other. One site, Lemon Lane, is adjacent to a trailer park, whereas Neal's Landfill is in a more rural location and Bennett's Dump is in the middle of an area of stone quarries. Neal's Dump is located approximately fifteen miles from Neal's Landfill, and potentially threatens a different watershed, in a different county, and on the other side of small population centers, such as Elletsville. Any effort in this case

State of Indiana Monroe County, or City of Bloomington to issue a permit or take approval action. See Consent Decree at ¶¶ 102-03.

For all of these reasons, EPA's decision to treat the sites separately had a compelling basis and was certainly not arbitrary and capricious and should be accorded appropriate deference.

III. EVEN IF ALL REMEDIATION ACTIVITIES ARE CONSIDERED "ONSITE" CERCLA REQUIRES FULL COMPLIANCE WITH ALL SUBSTANTIVE REQUIREMENTS OF ALL APPLICABLE LAWS AND REGULATIONS.

As noted above, even if EPA could reasonably consider the transfer of CERCLA wastes from the five separate sites to Neal's Landfill as activity "entirely onsite," CERCLA still requires compliance with all substantive applicable federal environmental laws, standards, requirements, and limitations, plus any promulgated state standards more stringent than the federal standards and that are timely identified by the State. 42 U.S.C. § 9621(d)(2). See also 40 C.F.R. 300.430(f)(1)(ii)(B); Ohio v. EPA, 997 F.2d at 1526. These requirements are generally known as "applicable or relevant and appropriate requirements" or "ARARs." The NCP limits the definition of ARARs to substantive requirements of the applicable or relevant and appropriate requirements. See 40 C.F.R. § 300.5 (definitions of "applicable requirements" and "relevant and appropriate requirements.)" See also Ohio v. EPA, 997 F.2d at 1526. Applicability of these provisions is consistent with the statutory exception for portions of a remedial action conducted entirely onsite. See 42 U.S.C. § 9621(e)(1). As such, and although an approval or permit for a landfill meeting the requirements of TSCA and RCRA subtitle

949 F.2d 1409, 1438-50 (6th Cir. 1990). If EPA's waiver of an ARAR is successfully challenged, such as by a state pursuant to 42 U.S.C. § 9621(f), "the court is required to conform the remedial action to that ARAR." 949 F.2d at 1448.

requirements in the absence of a properly obtained waiver, which may sometimes be secured as part of the process of obtaining permission; and (3) that the proponent of permission also meet any site-specific requirements imposed as necessary to ensure that operation of the site does not impose an unreasonable risk to health or the environment. 40 C.F.R. §§ 761.75(a,c)(written approval); 761.75(b)(technical requirements); 761.75(c)(4)(waiver); and 761.75(c)(3)(ii)(site specific requirements). An example of such a written approval for a chemical waste landfill for the Wayne Disposal facility in Belleville, Michigan, which is under consideration in this case as a possible disposal facility, is attached hereto as Exhibit D.

The technical requirements which must be met for a landfill to obtain approval as a disposal site are as follows, as summarized in Township of Van Buren v. EPA, 965 F. Supp. 959, 964-65 (E.D. Mich. 1997).

> (1) Soils. The landfill must be located in thick, relatively impermeable formations, such as large-area clay pans.;
>
> (2) Synthetic Membrane Liners. Synthetic membrane liners must be used when the Regional Administrator determines the hydrologic or geologic conditions require one in order to meet soil permeability requirements;
>
> (3) Hydrologic Conditions. The bottom of the landfill shall be above the historic high groundwater table. Floodplains, shorelands, and groundwater recharge areas shall be avoided. There shall be no hydraulic connection between the site and standing or flowing surface water. The site shall have monitoring wells and leachate collection. The bottom of the landfill liner system or natural in-place soil barrier shall be at least fifty feet from the historical high water table;
>
> (4) Flood protection. The landfill must provide structures for diverting all surface water runoff from a 24-hour, 25-year storm.

waiver, including all findings, must be specified in writing in the authorization. Id.

B. The Resource Conservation and Recovery Act

EPA expects that waste material to be excavated from at least some of the sites will not only exceed the TSCA thresholds for PCBs, but will also contain other hazardous substances which render the material "hazardous waste" subject to disposal in accordance with RCRA Subtitle C (Subchapter III as codified) and regulations promulgated thereunder. See generally 42 U.S.C. § 6922-24; 40 C.F.R. § 264.301. The RCRA hazardous waste landfill requirements are similar to TSCA requirements with certain variations, such as a requirement of a double bottom liner system. In accordance with Section 3006 of RCRA, 42 U.S.C. § 6926, EPA authorized the State of Indiana to administer its own RCRA program, including the permitting of RCRA subtitle C landfills. Pursuant to that authority, Indiana has promulgated regulations for RCRA hazardous waste landfills that are at least as stringent as EPA's. See 329 Ind. Admin. Code § 3.1. EPA retains enforcement authority for violations of any state-issued permit pursuant to 42 U.S.C. § 6928. See 61 Fed. Reg. 43009, 43017 (Aug. 20, 1996).

JUDITH A. STEWART
United States Attorney
Southern District of Indiana

CHARLES GOODLOE
Assistant U.S. Attorney
U.S. Courthouse
46 East Ohio Street, Fifth Floor
Indianapolis, Indiana 46204
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Counsel for the
State of Indiana:

JEFFREY A. MODISETT
Attorney General for the State
of Indiana

By: /s/

MYRA P. SPICKER
Deputy Attorney General
Indiana Government Center
South
402 W. Washington
Indianapolis, Indiana 46204
(317) 232-6241

Att. 19

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

SR-6J

February 5, 1998

VIA TELECOPIER
& U.S. MAIL

Magistrate Judge Kennard P. Foster
United States Court House
Room 277
46 East Ohio Street
Indianapolis, IN 46204

FAX: 317.229.3629

RE: United States, et al. v. CBS Corporation, Civil Action Nos. IP-83-9-C and IP-81-448-C, consolidated (S.D. Ind.)

Dear Judge Foster:

The United States Environmental Protection Agency (U.S. EPA) hereby submits its proposed sampling and analysis program for Neal's Landfill. In addition, the governmental parties have outlined their geotechnical requirements for placement of a Toxic Substances Control Act (TSCA)/Resource Conservation Recovery Act (RCRA) landfill at Neal's Landfill.

Neal's Landfill

The governmental parties and CBS Corporation (CBS) disagree as to the scope of the sampling and analysis for Neal's Landfill. CBS has proposed to do 13 borings in the southeast corner of Neal's Landfill for PCB analysis. The U.S. EPA and the other governmental parties are of the opinion that the 13 borings are inadequate to characterize "hot spots" at Neal's Landfill. The U.S. EPA and the other governmental parties are proposing 78 additional borings, for a total of 91 borings within Neal's Landfill. All borings would be analyzed for PCBs and a small portion will include volatile organic compounds, based upon field screening data. The proposed test borings are located on the enclosed diagram. The borings CBS has agreed to perform are shown in blue and are designated CBS-1 to CBS-13. The additional borings U.S. EPA requires are referenced in red and are designated NL-14 to NL-91.

unstable nature of the geology at the site, the governmental parties have concluded that CBS's approach is not sound. The governmental parties will complete the sampling and analysis by the June 1, 1998, deadline, in the event that CBS declines to do so.

The U.S. EPA and the other governmental parties request that CBS fund the entire sampling and analysis program within Neal's Landfill, based upon the requirements of CERCLA. Due to the critical nature of the information, U.S. EPA will fund the 78 borings if CBS continues to refuse to complete the sampling and analysis program. U.S. EPA will then have a claim that CBS, as a liable party, is jointly and severally liable for all such costs and EPA reserves all such rights to pursue CBS for such claim.

Storm Water Sampling at Neal's Landfill

Related to sampling within Neal's Landfill, U.S. EPA reports to the Court that CBS has agreed to perform storm water sampling at Neal's Landfill. The purpose of the storm water sampling is to determine the threat of PCB migration from Neal's Landfill to locations outside of Neal's during storm events. EPA is concerned that a hydrogeologic link between storm events and volumes and concentrations of escaping PCBs may exist at Neal's Landfill, as has already been established at Lemon Lane Landfill.

Sediment, Surface Water, Fish and Crayfish Sampling

CBS has agreed to complete the sediment, surface water and fish/crayfish sampling for Stout's Creek, Conard's Branch and Richland Creek that was described in the U.S. EPA conceptual sampling plans that were submitted to you on January 13, 1998. Discussing the fish and crayfish sampling with U.S. EPA ecological experts and U.S. Fish and Wildlife Service, sampling should not take place until mid-April or early May due to the inactivity of those species prior to mid-April. Sediment sampling will not be affected by this delay.

Geotechnical Sampling Requirements for Neal's Landfill

During our last meeting with the Consent Decree parties on January 22, 1998, you requested a sampling protocol to determine karst features under Neal's Landfill. From our recent discussions with CBS, we have learned that CBS proposes to conduct a geophysical resistivity survey to identify the presence of larger karst features underlying the existing waste material. U.S. EPA and the other governmental parties have concluded that a survey through a waste-material containing a random distribution

that the following, at a minimum, is necessary for a protective cleanup for three of the sites:

- Neal's Dump - Excavate the entire site to 10 parts per million for PCBs with an 18 inch soil cover. The estimated volume is 14,000 cubic yards.

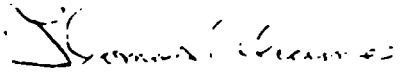
- Bennett's Dump - Excavate the entire site to 25 parts per million for PCBs with an 18 inch soil cover. The estimated volume is 55,000 cubic yards.

- Lemon Lane Landfill - Excavate to 50 parts per million for PCBs without further sampling within the landfill. Based upon sampling to date, approximately 75,000 cubic yards would be removed and a RCRA cap would be placed over the remaining material. Full scale water treatment at Illinois Central Spring sufficient to treat up to ten-year storm events, would also be required.

U.S. EPA has asked the other governmental parties and CBS to put forth their positions as soon as possible so that these critical discussions can begin immediately.

U.S. EPA appreciates the opportunity to submit its views on these important matters. U.S. EPA looks forward to meeting with you on February 18, 1998.

Sincerely,



Thomas Alcamo
Chemical Engineer

Enclosures transmitted under separate cover dated February 4, 1998

Att. 20

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:
SR-6J

February 12, 1998

VIA TELECOPIER
& FEDERAL EXPRESS

Magistrate Judge Kennard P. Foster
United States Court House
Room 277
46 East Ohio Street
Indianapolis, IN 46204

FAX: 317.229.3629

RE: United States, et al. V. CBS Corporation, Civil Action Nos. IP-83-9-C and IP-81-448-C, consolidated (S.D. Ind.)

Dear Judge Foster:

The United States Environmental Protection Agency (U.S. EPA) has reviewed the CBS Corporation (CBS) technical summary that was submitted to you on February 5, 1998. In response to your Judicial Order, dated February 6, 1998, the U.S. EPA and the other governmental parties submit the following response to CBS's technical summary. Based upon our review, U.S. EPA's position has not changed and we are of the opinion that sampling over the entire site at Neal's Landfill is essential to be able to develop a protective cleanup. As stated in our February 5, 1998, U.S. EPA correspondence, the U.S. EPA has already begun the steps in preparation to complete the sampling, if CBS refuses. U.S. EPA reserves its rights to pursue CBS for the cost of the boring program.

As discussed herein, reviewing the geophysical/geotechnical investigation proposed by CBS, U.S. EPA still rejects the Neal's Landfill "piggybacking" concept on substantive environmental grounds, because it would not provide the necessary assurance that placement of PCB and RCRA waste from the other sites would be protective of human health and the environment.

1. Response to Sampling of the Potentially Affected Water Ways

The U.S. EPA completely disagrees with CBS and its interpretation of U.S. EPA guidance. First, Neal's Landfill can only loosely be considered a municipal landfill and is more related to an uncontrolled dump. Please see enclosed historical correspondence in Attachment 1. Even if

the sampling within Neal's Landfill will help the Consent Decree parties make informed decisions about excavation within Neal's Landfill.

CBS mentions the Tri-City Industrial Disposal Site and the Red Penn Site as two sites where U.S. EPA applied a limited approach to sampling in the landfill. CBS fails to mention that Tri-City is over 324 acres, that volatile organic compounds are the contaminants of concern, not PCBs, that a emergency removal was completed to remove drums, free liquids and contaminated soils. Most importantly, numerous trenches were dug to determine waste disposal areas over the 324 acres. Enclosed in Attachment 4 is a summary of the Tri City Disposal Record of Decision. Regarding the 85-acre Red Penn site, an emergency removal of 85 drums and 207 cubic yards of contaminated soil was completed. During the Remedial Investigation for the Red Penn site, a soil gas survey was completed inside the landfill to determine "hot spots". Based upon the results of a Remedial Investigation for the Red Penn site, the U.S. EPA determined that a No Action Record of Decision was appropriate based upon a completed risk assessment. Enclosed in Attachment 4 is a fact sheet providing more information on the Red Penn site. As stated previously, the U.S. EPA has enclosed in Attachment 2 a list of landfills where the U.S. EPA investigated for "hot spots". In another example, at the Wright Patterson Air Force Base in Dayton, Ohio, the U.S. Air Force, under the direction of the U.S. EPA, performed numerous on-site soil borings within 13 landfills that received both municipal and industrial wastes. The purpose of these borings was to characterize soil/waste and leachate "hot spots" and the resulting risk to human health and the environment. In addition to these borings, test pits and leachate monitoring wells were installed within these landfills.

The U.S. EPA does not agree that the search for "hot spots" should be avoided, as stated by CBS. The PCBs in Neal's Landfill are mobile, as established by the PCB levels appearing in north spring, south spring, southwest seep, and overflow spring. Landfilling is a common disposal option for PCBs, but in permitted facilities with bottom liners, leachate collection, etc. To conclude that Neal's Landfill is somehow equivalent to a permitted TSCA facility is to ignore the facts.

On page 3, paragraph one, CBS states that the Bloomington PCB sites, "even in their current condition do not present a threat". The U.S. EPA disagrees with this conclusion.

The fact that the Indiana State Department of Health (ISDH) issues fish consumption advisories for streams harmed by the Bloomington PCB sites demonstrates a current public health concern (ISDH, 1997 Indiana Fish Consumption Advisory). To protect the public from exposure to PCBs, the Agency for Toxic Substances and Disease Registry (ATSDR) of the United States Public Health Service recommended taking appropriate measures in the Bloomington area to eliminate the ingestion of contaminated fish and game from PCB contaminated streams (ATSDR 1996, vol III, Page 6). ISDH has fish consumption advisories for Richland Creek, downstream of Neal's Landfill. Currently, the water treatment plant at Neal's Landfill cannot treat all PCB contaminated water now being released from the landfill and it must be bypassed into Richland Creek. ISDH fish consumption advisories are also in place for Clear Creek which receives PCB

not measured at one time or another. Rainfall and water level data in monitoring wells were lacking most of the time. Furthermore, the CBS paragraph implies that the only area where fill material is subject to groundwater backflooding is the southeast corner of the site. This conclusion by CBS is based upon limited data. The highest measured groundwater levels in monitoring wells were recorded for the April 9-10, 1994 storm event, particularly in monitoring well 5A where the water level was recorded at an elevation of 782.1 feet. Enclosed in Attachment 5 is Plate 1 which shows contours on the bedrock surface as interpreted from test boring and monitoring well data, and the areas at the site that were likely wetted by groundwater backflooding during the April 1994 storm event. Clearly the southeast corner of the site was not the only area susceptible to backflooding during this storm event. Note on Plate 1 that there are two other areas beneath the waste where test boring data indicates the presence of depressions in the bedrock surface (possible sinkholes). Additional test boring data might identify other depressional areas under the waste that may be subject to backflooding.

The data collected by CBS for the April 1994 storm event are presented on Plate 2 (enclosed in Attachment 5). This data documents that the high water level in monitoring well 5A is in direct response to a precipitation event of about 2.9 inches on April 9, and 10, 1994. It is important to note that prior to this rainfall event, the soil was very wet owing to over an inch of rain during the previous 7 days and by over 0.75 inches of rain over the previous 5 days. This event is substantially less than a 10 year storm event, which would require 4.5 inches of precipitation in 24 hours. Therefore, the existing data show that storms substantially less than a 10 year event have the potential to backflood into the waste in more than one area of the site.

CBS includes the November 1993 storm event, shown in Attachment 5 as Plate 3, to suggest that even a 7 inch rainfall event will not result in groundwater backflooding of the site. This storm event illustrates the extreme complexity of the hydrologic conditions of the Neal's Landfill site. The 7 inch rainfall occurred over a period of six days (Plate 3) and produced three peaks in groundwater and surface water flow. No precipitation occurred during the nine days preceding this storm event which would result in very dry soil conditions in advance of the storm. The first peak occurred in response to a 1.06 inch rain (November 13) and apparently the rain stopped for a long enough period of time for groundwater and surface water flows to subside to near base level flow. The second peak occurred in response to a 2.34 inch rain (November 14) and the peak was sustained by a 1.57 inch rain (November 15). Only a trace of rain fell on November 16 and groundwater and surface water flows again subsided to near base level. The third peak occurred in response to a 1.90 inch rain on November 17. Because of the dry conditions preceding these rain events and the sporadic occurrence of rain, the groundwater at monitoring well 5A did not get as high as it did for the April 1994 storm event. The November 1993 event was essentially a series of 1 to a little over 2 inch rainfall events, not a seven inch event, and it was not a historic event at the site as implied by CBS.

Therefore, the most reliable data that exists for the site is from an April 1994 rain event of 2.86 inches, which resulted in a groundwater elevation of 782.1 feet at monitoring well 5A. No groundwater data from the site exists for other, more major, storm events that have occurred in

3.1 Response to Surface Geophysical Data Collection

The foremost question is whether the geophysical survey methods proposed can answer the critical questions about the location and size of karst features around and underneath the landfill. On Page 4, Paragraph 6, CBS proposes natural potential (also known as self-potential or streaming potential) and multiple-array resistivity as methods that will "detect those larger voids and the water that causes them." On Page 5, Paragraph 1, CBS states that large voids in the bedrock underlying the site will be identified to assess overall interconnectedness of the karst system ...." CBS has correctly identified the problem as defining the karst system and its capacity for piping soil from beneath the landfill. If the landfill is to remain stable and the overlying "piggybacked" liner and fill are to retain their integrity, the solution channels must be identified and remedial measures (such as grouting or use of geotextiles) should be taken. However, serious questions remain regarding CBS' heavy reliance on geophysics to accomplish these goals.

CBS, in its proposal, describes the concept of "piggybacking" of municipal landfills and describes its own proposal for Neal's Landfill as consistent with that concept. CBS' proposal, however, is not consistent with how the concept has been implemented in the past. "Piggybacking" has been used for municipal landfills. According to Joyce Muni of the Illinois EPA, who is an individual familiar with the examples given by CBS, a demonstration must be given that groundwater will not be contaminated beyond 100 feet from the site, over a 100 year period before piggybacking can be implemented. Clearly, this cannot be demonstrated at Neal's Landfill because PCB releases are occurring and waste brought from the other PCB Bloomington sites contains both PCBs and RCRA waste.

"Natural potential" and "resistivity" methods are certainly appropriate methods for detection of karst features, and CBS should apply them in the areas around the landfill as a first step in identifying these features. However, using these methods on a landfill is problematic, and various CBS statements indicate why. On Page 2, Paragraph 2, while arguing against an effort to define the distribution of PCB contaminants, CBS states that containment is the presumptive remedy for the site because of "the heterogeneous nature of the material" and "the large volumes of material." Landfills, particularly old, unregulated, municipal and industrial landfills, contain a wide variety of wastes with varying physical, chemical, and electrical properties. Neal's Landfill has a large amount of such wastes that are unevenly distributed throughout. One soil boring log indicates over 25 feet of fill, and maps that are produced in the early 1980s show a highly variable thickness of fill. CBS admits this on Page 2, Paragraph 4, when it states that "there is no uniformity to the material to begin with." This nonuniform accumulation of varied wastes will make meaningful interpretation of geophysical data very difficult, if not impossible using the methods proposed by CBS.

For example, it is unclear how geophysicists will differentiate between anomalies resulting from karst features and those resulting from capacitors, refrigerators, household garbage, and so on. All these waste items generate electrical potential by virtue of their interaction with surrounding

performed at the site, it should also be used to locate groundwater flow channels emanating directly from the site because theses channels may convey contaminated groundwater.

Page 4, Paragraph 6, CBS has not defined the terms "large" and "small." As CBS notes, landfill liners can bridge small voids, and it is not necessary to identify "every small crack in the rock." CBS then states that the investigation will focus on finding the "larger voids." But CBS has apparently not undertaken a preliminary engineering study to define how large a void will cause instability in the proposed vertical expansion. As described by Lange and Quinlan (1988), the natural potential was successfully used to identify a very large conduit (16 to 20 cubic feet per second) at depth, but it missed a smaller and yet significant conduit (1 to 2 cubic feet per second) nearby. In karst terrain, groundwater level fluctuation may cause small soil voids to quickly grow into large voids.

3.1.2 Response to Multiple Array Resistivity

It is likely that the heterogeneous nature of the fill material will make interpretation of resistivity survey data difficult. In a resistivity survey, whether it is a multiple-array survey or not, a current is introduced to the earth, and the conductivity or resistivity (they are inverse survey functions) of the intervening ground is measured. The electrical effect produced when the current encounters metal waste, capacitors, PCB-contaminated soil, perched water, household garbage, and so on in the landfill will be substantial. EPA describes noise as a significant problem with this method (EPA 1993). Again, the problem will be to differentiate the signals caused by the waste items from those caused by solution channels. Vertical profiling of the site will almost certainly be done using a variety of electrode spacings, but the wider the spacing, the lower the resolution, making it more difficult to identify individual features. CBS makes much of recent advances in resistivity survey technology. However, as CBS notes in Page 7, paragraph 1, and based upon the limited information provided by CBS, we cannot evaluate whether this new technology expands the applicability of the method. It is U.S. EPA's understanding that this method is still limited to detecting resistivity anomalies and is subject to geophysical noise as would be found in a landfill. This would make interpretation of the data difficult.

On Page 7, Paragraph 2, CBS states that resistivity data will be used to locate relatively large voids in the underlying bedrock, potential sinkholes, and other karst features. Because the technology to be used relies on electrical current injection and voltage measurements, and because the multitude of metallic debris buried throughout the site can interfere with such measurements, the results of the survey will be only speculative.

3.1.3 Response to Ground Truth Quality Assurance and Quality Control Measures

On Page 7, Paragraph 4, CBS states that quality assurance/quality control (QA/QC) investigative activities will be conducted only on the perimeter of the landfill and not within the known limits of the landfill. This approach may result in a good correlation between the geophysical survey results and the borings drilled to investigate anomalies outside the landfill. However, geophysical

cover system might jeopardize the integrity of the proposed landfill cell to be built on the landfill. As a result, after valuable time and resources have been spent designing and building the landfill cell, the landfill might well continue to be a source of PCB contamination and a threat to human health and the environment.

3.2.1 Response to Field Exploration Program

On Page 8, Paragraph 2, CBS states that the field exploration program will consist of drilling and sampling at about 15 locations to provide a statistically significant evaluation of geotechnical survey data. First, the text does not specify where drilling and sampling will take place. As discussed above, several of the proposed borings should be drilled within the landfill, both for "ground truthing" and for geotechnical property testing of base soils and underlying bedrock. Second, these drilling locations should be selected after the geophysical survey data are evaluated. Based on these data, more or less than 15 borings may be needed depending on the number of large voids identified. In addition, CBS should specify the number of samples from each boring location that will be used for geotechnical evaluation of soils and bedrock. Therefore, the field exploration program is inadequate as proposed because sufficient justification is not presented as to the number and location of borings.

3.2.2 *Response to Geotechnical Laboratory Testing Program*

In this section, CBS describes the geotechnical tests that will be performed on cohesive, fine-grained soils. It is unknown how the geotechnical properties, integrity, and structural stability of the bedrock will be evaluated, especially in areas where cavities are identified during the geophysical surveys. In addition, the number of samples to be tested at the geotechnical laboratory is missing but is critical information.

In conclusion, the geophysical and geotechnical programs put forth by CBS may provide some useful information, but to base a remedy decision on interpretations and unknowns such as subsidence is risky. The U.S. EPA continues to oppose this "piggybacking" approach. Our requirements as described in our initial submittal to you is the only sure way to ensure that PCB

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Att. 21

REPORT AND RECOMMENDATIONS
of the Magistrate Judge and Special Master
Jan 20, 1999 .

In the
United Sates District Court
for Southern District of Indiana
Indianapolis Division
UNITED STATES OF AMERICA,
Plaintiff,

The STATE OF INDIANA and the INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT,

Intervening plaintiffs,

vs.

CBS CORPORATION, f/k/a WestinghouseElectric Corporation,

Defendant.

The CITY OF BLOOMINGTON, INDIANA; The UTILITIES SERVICE BOARD OF BLOOMINGTON, INDIANA; and MONROE COUNTY, INDIANA,

Plaintiffs,

vs.

CBS CORPORATION, f/k/a Westinghouse Corporation, and MONSANTO COMPANY,Defendants.

REPORT AND RECOMMENDATIONS

of the Magistrate Judge and Special Master.

By order of November 21, 1997, the Court appointed this magistrate judge to serve as a Special Master "to see that the aims of the consent decree, as modified by the orders of the Court, are carried out expeditiously and to resolve possible disputes between the parties." Pursuant to Rule 53 of the Federal Rules of Civil

other materials were landfilled. Excavation and site restoration has been completed.

- The governmental parties provided oversight for the remedial activities implemented by CBS atthe Interim Storage Facility, Winston Thomas, and Neal's Dump during 1998.

In September 1998, the E.P.A. began efforts to implement a spring water treatment system at Illinois Central Springs, located about 2000 feet southeast of the Lemon Lane Landfill. Such a treatment system was not provided for in the original Consent Decree.

In addition to the above remediation work, several significant data gathering events have occurred, including:

- In March 1998, the E.P.A. and CBS undertook sampling of landfill material at Neal's Landfill.
- In April 1998, CBS undertook water, sediment, and biota sampling at Conard's
- In April 1998, CBS began a geologic investigation to locate groundwater conduits around Lemon Lane Landfill. The purpose of the investigation is to obtain data that could be used indeveloping water control or treatment measures. This investigation is continuing.
- In July 1998, the E.P.A. began a treatability study for treating contaminated groundwater at IllinoisCentral Springs (from Lemon Lane Landfill).

C. Plans.

The parties have engaged in substantial discussions concerning the remediation work to be performed at the remaining three sites: Bennett's Dump, Lemon Lane Landfill, and Neal's Landfill. At a pre-trial conference on November 16, 1998, the parties indicated that they had reached consensus about excavation work to be performed at Bennett'sDump and Lemon Lane Landfill, subject to preparing mutually agreeable Statements of Work andConsent Decree amendments and submission of those documents for formal approval in accordance with the approval processes of each of the parties. The parties further informed me at that time that they had made substantial progress toward consensus on an approach to the excavation of certain materials from Neal's Landfill and consolidation of excavated material from other sites at Neal's Landfill.

D. Outstanding Issues.

Outstanding issues among the parties remain, but can be addressed separately from the current excavation work at the sites. These unresolved issues chiefly concern treatment of water at Lemon LaneLandfill, additional water treatment at Neal's Landfill, removal of sediments from certain streambeds, andthe governments' potential claims for natural resource damages and cost recovery. CBS contends that these claims are barred by the Covenant Not to Sue in the Consent Decree and are not included within the parties' current agreements. The governments contend that the parties agreed or understood that the consideration

- undertake and complete the excavation work, surface water control measures, and capconstruction at Lemon Lane Landfill.

I also propose that the governments' proposal of a schedule for negotiations on water treatment and sediment removal be accepted.

While this proposed schedule would call for work to be completed on the excavation of these sites a year later than contemplated in the order of November 21, 1997, this schedule is both practical and expeditious, considering the work to be performed. Discussions regarding water treatment and sediment removal will occur both while the excavation work is underway and after excavation is completed. Accordingly, I recommend that the Court approve this proposed schedule.

This schedule takes into consideration practical problems affecting the excavation of the two largest sites, Neal's Landfill and Lemon Lane Landfill. Under the proposed schedule, the Neal's Landfill remediation project would take two years; however, it is expected that, during the first year, 1999, all of the material to be excavated would be removed, and material remaining on the site would be consolidated. When this work is done, a landfill footprint would be developed for designing the cap, but the cap would not be installed until the second year, 2000. This would allow CBS to base its cap designon the actual landfill contours following excavation and consolidation, rather than on hypothetical assumptions about the landfill contours made before the excavation and consolidation work is complete. Also, this schedule would allow CBS to construct the cap in warmer rather than colder weather which might affect the integrity of the cap. The end result is expected to be a better designed cap.

With respect to Lemon Lane Landfill, the proposed schedule calls for the commencement of excavation work in the year 2000. The parties have different reasons for wishing to begin work at Lemon Lane Landfill at that time. The E.P.A. is constructing a system to treat groundwater at Illinois Central Springs which is expected to be in operation by the late summer of 1999 and the governmental parties believe that it would be beneficial to have this system operational before the excavation work begins at Lemon Lane Landfill. CBS believes that it is preferable to defer the excavation of the landfill until the year 2000 so that 1999 can be used to design surface water control measures around the landfill that can be implemented at the same time excavation is occurring.

Also, there are practical advantages in not scheduling the excavation work for Lemon Lane Landfill at the same time as excavation work at Neal's Landfill, Bennet's Dump, and Winston Thomas,which are all scheduled for 1999. To perform the excavation work properly at these sites, CBS needs both experienced personnel in-house and experienced contractors; ordinary construction contractors are not qualified for much of this work. CBS would also need to engage substantial transportation resources to move all the excavated material safely from four sites at the same time. If work at all of these sites were going on simultaneously, it would strain CBS's in-house and available contractor resources to a point where the quality of the work could be compromised. CBS believes that staging excavation work at the sites sequentially over a two year period would allow for better overall project management.

III.Recommendations.

AH.22

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF INDIANA
INDIANAPOLIS DIVISION

THE CITY OF BLOOMINGTON, INDIANA; THE UTILITIES SERVICE BOARD OF BLOOMINGTON, INDIANA; and MONROE COUNTY, INDIANA, Plaintiffs, v. WESTINGHOUSE ELECTRIC CORPORATION, a Pennsylvania corporation; and MONSANTO COMPANY, a Delaware corporation, Defendants.	Civ. No. IP 83-9-C Judge S. Hugh Dillin

MEMORANDUM OF THE CITY OF BLOOMINGTON IN OPPOSITION TO THE RELIEF REQUESTED IN THE MOTION FOR A STATUS CONFERENCE

INTRODUCTION

Though styled as a "motion for a status conference", Westinghouse's motion really seeks to overturn the basic substantive and procedural requirements of the Consent Decree -- and seriously jeopardize the health and safety of community residents. Westinghouse's motion seriously misstates the facts in the record before the Utilities Service Board. A careful examination of that record demonstrates that Westinghouse's motion is without merit. As discussed below in greater detail:

1. By its motion, Westinghouse seeks to evade the procedural framework of the Consent Decree. In essence Westinghouse is asking this Court to overturn a decision of the Utilities Service Board essential to protect the public health – *before* the Board has even made the decision. Moreover, Westinghouse is asking this Court to overturn a yet-to-be-made decision on the basis of factual and legal arguments which Westinghouse has not presented to the Utilities Service Board. For Westinghouse to come before this Court *de novo* – without having first presented its arguments to the Board – plainly

and polychlorinated dibenzo dioxins. Some or all of these materials are known to exist at Lemon Lane Landfill, Neal's Landfill, and Anderson Road Landfill and are inextricably mixed up with the PCB materials.[9] There is no question that some or all of these materials will be released into the air during excavation, clearing and grubbing activities.

There is an important analytical distinction to be applied here which emphasizes the critical public health decisionmaking role of the Utilities Service Board. It may very well be the Board's decision that these and similar toxic materials can -- with pollution control procedures established by the Utilities Service Board -- be safely excavated, the sites cleared and grubbed, and the toxic wastes transported and stored without any unacceptable risk to public health. However there is no way that the Utilities Service Board (or indeed this Court, the EPA, or the State) can protect the public health without specific information as to:

1. the specific identity of these and other toxic compounds at the various sites;

2. the specific location of these and other toxic compounds at the various sites; and

3. the concentration of these compounds at the various sites.[10]

Without this information, it is impossible for the Utilities Service Board -- which Westinghouse agreed under the Consent Decree would be the local decisionmaking body to protect public health -- to determine if the numerical limits and other safety procedures proposed by Westinghouse are too weak to protect public health or are sufficient.

---

[9] Conard's Branch, which is also to be excavated as an interim measure, receives runoff flow from Neal's Landfill.

[10] Much of the current information is spotty at best. For example, the Lemon Lane site only has two surface samples for dioxin, and both of those were taken at locations far away from the most concentrated spots for PCB disposal and open burning -- the activities which lead to the production of the dioxins. There may be higher concentrations at these locations and, as explained below, the higher concentrations could lead to the need to adopt more stringent pollution controls at either the sites or the storage facility.

1984 (Hybrid

AH.24

ENFORCEMENT - CONFIDENTIAL

SUMMARY OF REMEDIAL ALTERNATIVE SELECTION

NEAL'S LANDFILL

Westinghouse Electric Corporation

Site Location and Description

The Neal's Landfill site refers to the PCB contaminated landfill located in Richland Township, Monroe County, Indiana (fig. 1). The site is located in a sparsely populated rural area approximately 4½ miles west of Bloomington and 500 feet north of Indiana State Highway 48 (fig. 1). The landfill site is mostly within SE¼SW¼ sec. 33, T. 9 N., R. 2 W., Second Principal Meridian, but a portion of it is also within SW¼SE¼ sec. 33, T. 9 N., R. 2 W.

The site lies on top of a ridge in the eastern margin of the Crawford Upland physiographic province of Indiana. The Crawford Upland is a dissected plain with steep hills, rounded ridge tops, and narrow valleys. In the landfill area the topography is also typified by numerous karstic features such as sinkholes, karst valleys, and springs. Surface drainage in the vicinity of the landfill is northwest and south of the landfill via two streams (Conard's and Southwest Branches) which eventually discharge to Richland Creek. The regional direction of ground-water flow is generally west. However, at the landfill, ground water flows to the northwest as controlled by a local geologic structure.

Neal's Landfill is underlain by Paoli and Ste. Genevieve Limestones of the Mississipian period. These rocks dip west or southwest at 25 to

FEASIBILITY STUDY OF

ALTERNATIVE PCB TREATMENT TECHNOLOGIES

FOR SIX SITES IN BLOOMINGTON, INDIANA

FINAL REPORT

Prepared for the

Indiana Department of Environmental Management

June 27, 1995

TABLE 2-5

NEAL'S LANDFILL SITE CONTAMINANT CONCENTRATIONS

Medium	Contaminant of Concern[a]	Concentration
Surface Water (On-site Springs)	PCBs	3 to 7 ppb
	Trichloroethylene	34 to 56 ppb
	Aluminum	< 50 to 49,200 ppb
	Arsenic	< 10 to 31 ppb
	Boron	< 10 to 9,400 ppb
	Chromium	< 10 to 76 ppb
	Cobalt	< 10 to 22 ppb
	Heptachlor	< 0.1 ppb
	Lead	< 40 to 122 ppb
	Sodium	< 20 to 165,000 ppb
	Vanadium	< 10 to 21,500 ppb
	Zinc	< 10 to 112,000 ppb
Groundwater	PCBs	ND[b] to 9.8 ppb
	Chloroethane	5.2 ppb (maximum)
	1,1,1-Trichloroethane	890 ppb (maximum)
	Trichloroethylene	25,700 ppb (maximum)
	Vinyl chloride	2,360 ppb (maximum)
Surface Soil	PCBs	79,000 to 136,000 ppm
	Dioxins and furans	0.01 to 11 ppb
Ambient Air	PCBs	0.4 to 21 $\mu g/m^3$
Sediment (Conard's Branch to Richland Creek)	PCBs	ND to 12 ppm
Soil Borings	Dioxins	0.2 to 6 ppb

Notes:

a Contaminant of concern as determined by ISDH

b ND = Not detected

Source: ISDH 1994

ATT. 2 S

0000032

A Report On Some Problems Associated With Removal Of Groundwater From Karst Terrains At Bloomington, Indiana

by

Richard L. Powell, Ph.D.
Senior Geologist
Geosciences Research Associates, Inc.

The feasibility of cleaning up groundwater beneath a capped hazardous waste is diminished by several variable factors common to karst terrains developed on limestone bedrock. The Neals Landfill and Lemon Lane sites are on karst terrain on soil mantled limestone bedrock, the dump at Bennett Quarry is on limestone and into a quarry, and the Winston-Thomas site is on alluvial materials on limestone. A groundwater purge system, in my opinion, would not be a feasible or reliable method to control the migration of contaminants into the groundwater or controlling groundwater migration from these sites, owing to their geologic settings.

The limestone bedrock units of the sites in the Bloomington area do not have a uniform permeability or transmissivity. They do not constitute a homogeneous medium. Some strata are more porous, more broken by joints and fractures, or more soluble than others. Similarly, an individual lithologic unit may have lateral variations in transmissivity, especially where some open joints have been enlarged by solution along particular subterranean routes.

Cavernous voids, solution conduits, and open joints that transmit large volumes of groundwater constitute a small volume within the limestone bedrock. The solution enlarged zones are commonly along sinuous routes and usually not detectable from the surface. Consequently, they are difficult to locate by boring.

Groundwater levels in limestone bedrock, particularly along cavernous routes, commonly fluctuate highly following heavy precipitation in the area. Some sinkholes temporarily flood until the conduits can drain the waters after the storm abates. Temporary high water levels in caverns may rise into sinkholes and soils contaminated with refuse, thus the water would become contaminated. A cap over a filled sinkhole would not prevent a temporary high storm water or groundwater level from flooding a sinkhole or saturating the adjacent soils. Similarly, any unconsolidated sediments within the solution conduits would be temporarily saturated.

Purge wells completed in bedrock with a low transmissivity probably would not effectively drain adjacent cavernous voids. Wells completed in cavernous openings at one elevation may not effectively drain similar openings and smaller voids more remote from the boring, and would not affect such openings at lower elevations. Some wells in cavernous voids might be replenished with such a large volume of transient groundwater that an effective drawdown would not be accomplished without installation of a grout curtain around the site.

The installation of a grout curtain in fractures and solution voids around and under a site in cavernous bedrock is not feasible for several reasons. For example, it is difficult to establish the certainty of boring into all open voids, adequate sealing of large open passages or solution conduits is not assured, and replacement of sediments with grout in those voids that contain sediment is uncertain.

Richard L Powell

30 July 1984

Deposition of Richard Powell in Dept of Justice suit against Westinghouse — 1482-84 pp505-508

to off-site sources.

A I'm afraid I still don't understand.

2255 Q Have you ever had any involvement whatsoever in a removal operation of a landfill?

A No.

2256 Q Do you have any idea what's involved in the removal operation of a landfill?

A Not technically, no.

2257 Q And what input did you have in the government's articulation of its final remedy with respect to Neal's Landfill? You're going to testify to it. Do you understand that?

A Yes. That as long as the materials are there, that there is a possibility that groundwater would continue to come in contact with it.

2258 Q There is a possibility that groundwater will continue to come in contact with them? Did you consider or evaluate other potential remedies for Neal's Landfill?

A Yes.

2259 Q What other potential remedies did you consider or evaluate?

A The effects of just putting a cap on it by itself.

2260 Q You considered that?

some of the drainage from the sinkholes could drain over and come into contact with the materials in the landfill.

2265 Q Now, are you aware of what the cost is, the comparative costs are, of capping a landfill versus removing materials from the landfill?

A I don't remember the exact figures.

2266 Q Fairly substantial though, aren't they?

A Yes.

2267 Q On the order of several tens of millions of dollars?

A I don't remember the exact numbers but that could be right.

2268 Q Given those cost differentials, do you feel altogether comfortable with your view that removal is required because of the possibility that these things could happen? By that I mean, Dr. Powell, you have indicated that it's possible that these various things could happen and these various groundwater systems could come into contact with the landfill; but you have, as I understand it, not performed any studies or reached any definitive conclusions as to whether that phenomenon is happening or not, have you?

A I have not.

Att. 27
Received
5/13/83 TRC

0000017

Geology and Hydrology

of

NEAL's LANDFILL

Monroe County, Indiana

Richard L. Powell
Geosciences Research Associates, Inc.
414 South Walnut Strett
Bloomington, Indiana 47401

8 August 1983

(about 728 feet asl), 6A (about 736 feet asl), and 8A (about 728 feet asl). The chert is highest in Borings 6A, 3A, and 1A and lowest in Boring 4A. The altitudes in Borings 6A, 8A and 4A show a slope from 6A towards 4A. The altitudes in Borings 1A, 5A, and 3A suggest a low area or slight trough between Borings 1A and 3A. The Fredonia chert slopes from 1A and 3A, which have a similar altitude, towards 4A, the lowest altitude for the chert. The slopes are slight and additional boring or geophysical data should be used to determine any structure on this unit which is not commonly used for structural purposes.

The Lost River Chert Bed occurs about 90 feet below the Bryantsville Breccia Bed in Boring 1A, and from about 7 to 12 feet below the Fredonia Chert in the four borings in which it was identified. This chert occurs in fossiliferous limestone (biomicrite), and is essentially a fossiliferous chert, which contains fenestrate bryozoans. It is commonly a few feet thick in Monroe County.

The Lost River Chert was identified in Borings 1A (about 720 feet asl), 2A (about 718 feet asl), 5A (about 713 feet asl) and in 8A (about 718 feet asl). The Lost River Chert was probably lost in coring in Boring 3A and not reached by Borings 6A and 4A.

The Lost River Chert is highest in Borings 1A, 2A and 8A, with little difference in altitude, and is lowest in Boring 5A. Data suggests that the Lost River Chert probably has about the same dip as the overlying Fredonia Chert, but more information is needed to show the true dip of the bedrock at the position of the Lost River Chert.

The use of additional boring data to obtain more datum points could aid in the correlation of strata at the site. Electrical or gamma ray logging would provide valuable depth control for structural mapping in intervals where core loss is high.

Weathering and Solution Features Seen in Cores:

Numerous examples of rock weathering and actual cavities enlarged by solution are present in the cores from the borings (Figure 5). The evidence of weathering and solution indicates that although a few beds or rock units have relatively few solution features, weathering and solution features are present in some of the rocks in places to depths as much as 25 feet below the water table (Borings 1A and 2A), and as much as 18 feet below the level of South Spring (i.e., the void near the bottom of Boring 5A). Stated another way, the strata in the Fredonia Member in the zone below the water table are

SUMMARY

The geologic and hydrologic investigation of the characteristics of Neal's Landfill site and vicinity clearly show that:

1. The limestone bedrock at the site is much fractured and has been weathered and dissolved by descending and laterally flowing groundwater.
2. The slope of the limestone bedrock beneath the site is to the northwest towards the South Spring.
3. The flow from the South Spring is greater than that available exclusively from the site.
4. Known extensive cavern systems in the area around Neal's Landfill contain streams that discharge at springs similar to South Spring.
5. The most likely source for additional subterranean drainage is to the southeast of the site in sinkhole pitted terrain.
6. The presence of PCBs in waters from the South and North Springs is an indication of movement of contaminated waters from the landfill into Conard Branch and Richland Creek.

Att. 28

0000033

PELA

MEMORANDUM cc: Barbara Magel, EPA

TO: For The Record

FROM: Philip E. LaMoreaux, Sr.

SUBJECT: EPA/Bloomington Sites - Remedial Alternative
(PELA File No. 451000)

DATE: August 1, 1984

On the basis of data obtained to date on the geology and hydrology of Neal's Landfill, Lemon Lane Landfill, Bennett's Dump and the Winston-Thomas Treatment Plant, it is concluded that pumping and purging of groundwater and leachate is not an economically feasible remedial action at those sites. Neal's Landfill and Lemon Lane Landfill are in a karst region typified by sinkholes, solution channels, fractures and cavernous limestone. Although these karstic features are not readily apparent on the surface near Bennett's Dump and the Winston-Thomas Treatment Plant, it is probable that solution channels, fractures and cavernous limestone underlie the sites (literature references indicate that the geologic formation underlying the sites are karstified in other areas in the vicinity.)

Pumping and purging of groundwater and leachate is a complex problem in a karst area due to the groundwater flow system. Groundwater flow is via numerous discrete, solution channels oriented along joint/fracture and bedding planes. Also, the location of the discharge points of groundwater in karst regions may vary with changes of storage of groundwater in the system. For example, as water levels rise or decline, the direction and rate of groundwater movement may change as the zone of saturation within the solution channels may be increased or decreased in the groundwater flow system network. Placement of wells and pumps at appropriate locations in a karst system is therefore very difficult due to:

Att. 29

PELA

MEMORANDUM

TO: For the Record

FROM: P. E. LaMoreaux

SUBJECT: Neal's Landfill/Neal's Dump (Bloomington, IN)
E&E, Inc. Contract TDD F5-8109-03B

DATE: Field Inspection, October 28-30, 1982

At the request of Attorney Barbara Magel, U.S. EPA and Attorney Debra Schmall of the U.S. Justice Department at a meeting in Washington on October 16, 1982, a second field inspection trip was made to Neal's Landfill and Neal's Dump, Bloomington, Indiana on October 28-30, 1982, for additional geologic studies, to review progress on the hydrogeologic report by Dr. Richard Powell, and to carry out a field inspection of the monitoring structures installed by the USGS at the site.

Conferences were held with Mr. Gerry Butch, U.S.G.S., who was installing the surface water flumes on Conard's Creek and the continuous water level recorders on all E&E, Inc. deep wells. These installations will be completed by the end of the month and will provide excellent dynamic water level and flow data. The installations are well engineered.

We also observed the drilling of shallow seepage water wells at Neal's Landfill by E&E, Inc. These wells should be completed by the end of the first week in November. Water levels should be taken and water samples collected immediately on their completion. NOTE: Two of the wells were reported to have standing water levels by the E&E, Inc. geologist on site and should provide excellent water quality data for the perched water zone above the water table. The well logs and data for these wells should be forwarded to me at the earliest possible date.

2 10 1.5
Att. 30

Dec. 21, 1982

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF INDIANA

UNITED STATES OF AMERICA Plaintiff v. WESTINGHOUSE ELECTRIC CORPORATION, et al., Defendants	Civil Action No. AFFIDAVIT

AFFIDAVIT

I, Robert A. Griffin, being first duly sworn, do depose and say as follows:

1. I am a geochemist currently employed as the Head of the Geochemistry Section of the Illinois State Geological Survey; a position I have held since 1978. In my position with the Geochemistry Section, I am responsible for supervising and conducting research experiments dealing with interrelationships between various soil materials and the transport migration and fate of chemicals. In addition, I have made evaluations of adequacy chemical waste disposal alternatives, particularly, evaluations of the adequacy of remedial options for the containment of leachate from landfills, for private industry and Federal and State agencies. I received my Doctor of Philosophy Degree in soil chemistry from Utah State University in 1973. In 1968, I received a Master of Science Degree in soil science from the University of California at Davis; two years earlier, I had received a Bachelor of Science Degree in soil science from that same university.

2. I have written numerous articles on the effects of specific

became exposed. The surface drainage system carries the runoff directly into the springs forming Conard's Branch or into sink holes which connect to groundwa flows which ultimately surface as springs. Analysis of a surface soil sample from the area of an exposed capacitor reported by EPA found a PCB level of at least 136,400 parts per million, which is equivalent to 13.6 of the total weight of that soil sample. Erosion of such highly contaminated soil is contributing to the PCB contamination in the waters, sediments, and aquatic life below Neal's Landfill in Conard's Branch and Richland Creek.

9. On October 6, 1982, I also visited a site known as Neal's Dump in Owen County, Indiana. That site is located in close proximity to occupied residentia trailers and is totally open to animals and people. During my visit I observed two areas of exposed capacitors. A soil sample from one area of exposed capacito was found by U.S. EPA to contain at least 88,000 parts per million of PCBs. The is a potential for surface erosion at this site which might transport PCBs into other areas around the site. Due to the fact that the soil is sandy and has low organic content matter there is a prospect that PCB contained in Dump my migrate down through the soil to perched water zones and move laterally with the groundw This prospect should be investigated further with a groundwater sampling monitor program.

10. Based on my observation, review of data and consultation with other experts involved in this project for each of these sites, I believe that immedi remedial action is necessary to eliminate or minimize the on going migration o PCBs from Neal's Landfill into the environment. It is my opinion that the fina remedy at the Landfill will entail complete excavation of all capacitors and contaminated soil and placement of a cap over the site. However, since the fin remedy can not be implemented immediately, I strongly recommend the immediate placement of straw bale berms, or an equivalent device, to prevent off-site migration of PCBs through runoff into the springs, sink holes and/or exposed

and analysis to determine the extent of contamination and exact magnitude of the problem to be addressed.

11. Based on my observations, review of the data and consultation with other experts involved in this project, it is my opinion that immediate measures should also be undertaken at Neal's Dump site due to the serious actual and potential migration of PCBs at the site. Straw bale berms should be immediately installed to prevent migration of PCBs offsite through surface runoff. In addition, the site should be fenced and posted so as to restrict access and warn people of the hazards. As at the Landfill, a groundwater sampling and monitoring program should be initiated immediately to determine the nature and extent of the contamination problem. Final remedial action at this site would include at a minimum the installation of a cap over the Dump area.

Further affiant sayeth not.

Dr. Robert A. Griffin

Sworn to and signed before me
this 21 day of December, 1982.

Notary Public

My commission expires: 1985

Att. 31

Review of:
Neal's Landfill Stability Evaluation Technical Memorandum, and
Responses to EPA Comments on that Document by CH2MHill

by

Gareth J. Davies M.Sc., P.G.
Cambrian Ground Water Co.
109 Dixie Lane,
Oak Ridge TN 37830

(The Technical Memorandum will be hereafter referred to as "TM.")

In the TM Introduction (1, 1.1 Site Background) there is reference made to the final remedy. Cambrian Ground Water Co. has reviewed the final remedy and the site was clearly not representatively sampled. Whatever the issue of the stability of the landfill area, knowledge on the composition of the waste and what should be removed and what can remain carry little if any statistical confidence.

TM Section 1.2 (Objective of this Technical Memorandum)

Modifying the surface expression of the landfill might have a deleterious effect on ground-water flow in the subsurface beneath the landfill.

TM Section 3., 3.1.1. Native Clay Layer

The thickness of this layer as cited is 0 - 3.4 meters (0 - 11 feet). Waltham (1994, p. 58) in a

discharging elsewhere at some lower elevation. The South Spring as is known might be an adequate monitoring point but only in high flow conditions as an underflow component would always be discharging elsewhere, that might not be monitored.

The cross-sectional area of a conduit is calculated based upon this discharge as 5.7 m^2 (60 ft^2). However, the relationship inferred (linear Q = VA) is incorrect as there is mostly turbulent flow and the relationship is described by the Darcy-Weisbach equation that is quadratic (Ford and Williams, 1989, p. 143- 146). The velocity from well 10SS to South Spring is quoted as 0.3 m/s (1 ft/sec) and is quite typical of velocities from sinking streams to springs, and the geometric mean of these data is 0.022 m/s (Worthington et al., 1999). Also, although implied in the TM it cannot be assumed that the "void" encountered during drilling is the conduit carrying the cave stream that discharges at South Spring. However the void (which is most probably not simply a "void, " but a channel or a cave passage) might carry an overflow component.

The point should also be made that with the extremely low probability of intersecting a conduit by drilling into the subsurface (Benson and La Fountain, 1984) the channel/conduit intersected in well MW-3 may represent the general nature of the subsurface. The Optimisti_eskaja Cave in a gypsum aquifer in the Ukraine is the densest conduit network in the world, in a drilling project in this setting the probability of intersecting a conduit is only 7 % (Alexander Klimchouk, personal communication). This implies that there are probably more channels in the subsurface that would not be very detectable by drilling or geophysics because of their depths. Also, the fact that a conduit was intersected by drilling in one case should not be taken to mean that the only conduit to the spring has been found. The highly variable discharge at South Spring shows it to be an overflow spring

The suggestion that the conduit feeding the spring is either at or below the elevation of the

601 p

Michael McCann, CBS Corporation, Personal Communication, 1999.

Palmer, A.N., 1991, Origin and Morphology of Limestone Caves, Geological Society of America Bulletin, v. 103, 1-21

Waltham, A.C., 1994, Foundations of Engineering Geology, Blackie Academic and Professional, 88 p

Worthington, S.R.H., Davies, G. J., and Ford, D. C., 1999, Quantification of matrix, fracture and channel contributions to storage and flow in a Paleozoic Carbonate aquifer. Chapter in: Approaches to Understanding Groundwater Flow at Contaminant Transport in Carbonate Aquifers *(in press, to be published by Balkema, Rotterdam).*

5

Att. 32

ENVIRONMENTAL GEOCHEMISTRY & QUALITY ASSURANCE
650 Dittemore Rd. Bloomington, IN 47404
812-876-6774

March 27, 1999

Magistrate Judge Kennard P. Foster
United States Court House
Room 277
46 East Ohio Street
Indianapolis, IN 46204

Re: United States, et al. V. CBS Corporation, Civil Action Nos.
IP-83-9-C and IP-81-448-C, consolidated (S.D. Ind.)

Judge Foster:

As a property owner and long-time resident of Monroe County, I have a strong interest in the quality of the community's environment, and its continued existence as a good place to live. I am a professional environmental geochemist involved in restoration of hazardous waste sites for the United States government under both RCRA and Superfund. I have knowledge and experience with the technical and regulatory aspects of environmental restoration that may provide some help to you in addressing the restoration at the Superfund sites in the Monroe County area. Although the Statement of Work for the consolidation at Neal's Landfill appears to be underway, in my opinion numerous technical and regulatory process flaws have led to a poor decision. I would like to share my observations and recommendations on the proposed solution at Neal's to provide some assistance in improving the remedy at Neal's Landfill and to find effective remedies at the other sites.

Introduction

I believe that the proposed consolidation on-site at Neal's of debris containing levels of PCBs and other suspected contaminants (dioxins/furans. metals, and solvents) reported as disposed there, or detected during previous investigations appears to constitute a violation of a significant provision of the consent decree and of environmental waste disposal regulations. The site was an unregulated dump sited on karst receiving municipal and industrial waste that was reduced in mass by open burning. The residues were bulldozed around the site and only minimally covered. Numerous visits and reports by the Indiana State Department of Health in response to complaints from nearby residents document the unsafe practices at this operation.

The materials disposed there, the burning, and the geological structure of the site have led to significant contamination of the soils and ground water. The approach taken in the site characterization is inadequate to determine the nature and extent of contamination, and fails to comply with standard regulatory procedure for adequate site investigations under Superfund regulations. Further, the project is concluding with a site closure remedy that bypasses the comparison process of the feasibility study phase. It is technically weak, and conflicts with the

Environmental Regulations

The site characterization and remedy selection at Neal's in my opinion does not meet the basic requirements of the remedial investigation protocol under CERCLA to assess the extent of contamination at the site and choose an effective remedy. Other regulations also apply. The December 2, 1998 letter-to-file from Thomas Alcamo presents a significant summary of the applicable or relevant and appropriate state and federal regulations involved in this type of investigation and remediation. It is important to note that in no published document are these requirements addressed, or in the decisions reached. Also germane to the remediation of PCB waste is the US EPA's Final Rule on Disposal of Polychlorinated Biphenyls, published June 29, 1998 as Parts 750 and 761 of the Code of Federal Regulations.

The CERCLA process ensures properly addressing waste sites and, although seemingly slow and tortuous, is designed to be technically rigorous, and to be legally defensible in terms of assessing obligations for site remediation. Although accepting responsibility for the remedy, CBS and the regulatory agencies have not achieved technical validity either in assessing the problem or in remedy selection. It is quite probable that the compromises will allow the problem and danger will persist long after the selected remedy is in place. The persistence will lead to continued harm and future costs for new solutions.

Site Characterization

The remedial investigation is required to measure the full extent of contamination. That is, the types of contaminants, their concentration, and their distribution in the affected media. These data contribute to a site conceptual model, or understanding of the level of contamination, its distribution, pathways of potential exposure, and the potentially affected population (human and other). Without this understanding, it is not possible to suggest solutions that remedy the problem. The site characterization at Neal's does not meet this objective. The nature and extent of contamination, and pathways of escape are not sufficiently known, yet a remedy has been selected. The government's reservations about this are clearly evident, yet they have acceded to a flawed remedy.

With preliminary information on the disposal of PCBs, their burning, and potential generation of dioxins and furans, the disposal of metals, and hydrocarbon and chlorinated solvents indicates that, at least these contaminants should have been included in the analysis plan. For a landfills such as these, it is standard EPA practice to require analyses for a suite of hazardous metals, volatile and semi-volatile organics, and PCBs and pesticides. Because the necessary contaminants were not analyzed, the nature of contamination at the site is unknown. A refusal by the responsible party to correctly characterize the site and concurrence by the EPA is so rare as to be unique. This sets a significant negative precedent for the government, and should be considered carefully.

Inadequate lateral and vertical sampling and the failure to address epikarst and ground water, make any conclusions as to the distribution and extent of contamination unsupportable. The gridded sampling pattern was ostensibly designed to detect hotspots. It is inadequate for this purpose. First, the material was moved around the site after burning. Hotspots from disposal in a

- Threshold criteria which a remedy must meet in order to be considered a) the remedy must be protective of human health and the environment, and b) must satisfy applicable or relevant and appropriate requirements of federal and state laws (or justify a variance).

- Primary balancing criteria for those technologies passing the threshold are: a) long-term effectiveness and performance, b) reduction of toxicity, mobility, or quantity through treatment, c) short-term effectiveness, d) implementability, and e) cost.

- Modifying criteria include a) state acceptance, and b) community acceptance.

The three sets of criteria are tested sequentially with decreasing importance, that is, the various remedies must meet the threshold criteria before being considered under the second and the third groups. I believe that the intended remedy, removal of highly contaminated (>500 ppm PCB) material, and consolidation on-site of < 500 ppm material does not meet the threshold criteria. It fails to protect human health and the environment and does not meet other applicable environmental regulations. It is likely that the lower-ranked criteria would also have called for rejection of this remedy due to its implementability problems in meeting the effectiveness obligations. Installing an adequate basal containment is difficult, if not impossible at this site.

With regard to the threshold criteria, removal of the highly contaminated material off site does meet the basic requirement to reduce the threat to human health and the environment. However, the remainder of the plan appears to violate a number of relevant regulations. As made clear on page. 16 of Mr. Ellis's submission, 40CFR Section 762.60 requires that waste exceeding the 50 ppm threshold go to a chemical waste landfill structure meeting the technical requirements of 40 CFR Section 761.75. Because this off-site removal represents a transfer of the problem to another community, other alternatives such as vaulting in an effective containment structure should also be evaluated as a remedy.

It is the consolidation of materials with <500 ppm levels on site that is seriously problematic. Both RCRA and TSCA classify PCB material at > 50 ppm as hazardous, and require disposal in an engineered facility. The PCB Final Rule sets limits to the levels that can be consolidated on site and specifies the minimum of protective systems needed to permit the on site disposal. Even these are violated in the proposed plan. RCRA Section 761.61 describes the limits and site management criteria for the various concentration ranges and the extent of human occupancy and potential exposure to bulk waste at Neal's Landfill. Only two classifications are defined, high-occupancy where individual exposure without protection is greater than 335 hors per year, or an average of 6.7 hours a week. Low-occupancy is less than 6.7 hours a week.

The on-site disposal limits for a low-occupancy site such as Neal's are: 1)<25 ppm without engineered controls; 2) >25 ppm to 50 ppm if surrounded by a marked fence; 3) >25 ppm to 100 ppm if the site is covered with a cap meeting the requirements of sections (a)(7) and (a)(8) which address thickness, construction materials and deed restrictions; 4) >100 ppm cannot be left on site. There is no provision for an industrial clean up standard of 500 ppm as cited in the EPA's discussion of alternatives in the Proposed Plan for the Source Control Record of Decision Amendment at Neal's Landfill.

that this proposal represents.

The inadequacy of the waste characterization has led to an ignoring of significant interactions of the waste materials that also jeopardizes this remedy's slight potential for success. The mix of PCBs (and also very likely, dioxins and furans, which are regulated even more stringently than PCBs) with the powerful and toxic solvents trichloroethylene and toluene makes the slightly soluble PCBs, dioxins and furans much more mobile. The penetrating potential of the mixture is much greater than if separately disposed. Add in the reported presence of the solvents toluol and xylol, which enhance the water solubility of organics, and what were insoluble substances are now readily mobile. This is the basis for the TCLP testing and general prohibition on disposal of PCBs with solvents.

In the short-term it is also possible that this remedy will worsen the release of all contaminants On-site redistribution stirs up the debris and exposes organic material to new sources of oxygen and moisture. This promotes biological activity, producing carbon dioxide. In water this yields carbonic acid, the primary solution agent dissolving limestone, which enlarges the drainage pathways. A hazardous waste disposal facility without a subsurface liner and leachate collection system is difficult to justify in light of the requirements of RCRA for landfill construction and waste management, and particularly so in karst.

The arguments presented in the Department of Justice's Memorandum to Judge Foster clearly lay out the regulatory basis for disallowing the consolidation of waste from other sites onto Neal's because of the mix of contaminants and the difficulty of securing a permit for this site. What should also be concluded from this memorandum, is if Neal's does not constitute an adequate disposal facility for any other site's waste, how can it be considered adequate for its own waste? The mix of waste already on site and the permeability of the site preclude its use.

The selected remedy does not address water quality. In my experience, the remedy selection process frequently does separate source control from the problem of contaminated ground water. However that is usually done when no immediate impact to human health and the environment is occurring (usually only in slow, diffuse flow circumstances), and the remedy is technically, or jurisdictionally separate from source control. None of which is justified in the decision to defer water protection to the future at Neal's. In fact, the greatest threat from these sites is the rapid, severe release of contaminants that deleteriously affect human health and the environment. To ignore the problem as if the current treatment system, the limited monitoring planned, and fishing advisories are adequate to protect human health and the environment is difficult to comprehend.

The ongoing release of contaminated water from this site to Conard's Branch and Richland Creek once this remedy is in place will constitutes landfill leachate. In any other landfill remediation, this would represent a violation of the Clean Water Act Section 402, which specifically disallows point-source discharges of this type without an NPDES permit. Because the remedy will be an engineered pollution control system, its discharges become a permittable component, and must be addressed to remove threats to the receiving waters. The interim treatment system (1 ft^3/sec or about 450 gal/min) currently installed above Conard's Branch has a number of deficiencies and cannot be relied upon to treat the leachate:

Att. 35

Rec'd 4/13/

RECORD OF DECISION AMENDMENT
SOURCE CONTROL OPERABLE UNIT
NEAL'S LANDFILL
MONROE COUNTY, INDIANA

PURPOSE

This decision document presents the source control operable unit remedial action for the Neal's Landfill site and amends the Enforcement Decision Document (EDD), dated August 3, 1984. The cleanup remedy for Neal's Landfill has been developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (CERCLA), and, to the extent practicable, the National Oil Hazardous Substances Pollution Contingency Plan (NCP) and Agency Policy.

The State of Indiana concurs with the cleanup decision in the Record of Decision (ROD) Amendment.

BASIS

The decision to amend the Neal's Landfill EDD and to select a modified remedial action for source control is based upon the administrative record for the site. The attached indexes lists the items that comprise the administrative record for the ROD Amendment.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from Neal's Landfill, if not addressed by implementing the response action selected in this ROD Amendment, may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE MODIFIED REMEDY

The original remedy for Neal's Landfill called for the excavation of 320,000 cubic yards of polychlorinated biphenyls (PCBs) contaminated landfill material and treatment through the construction of a permitted, Toxic Substances Control Act (TSCA) approved, municipal solid waste-fired incinerator. The modified remedy for the source control operable unit at Neal's Landfill consists of the following:

- Excavation and removal of selected areas of contamination (referred to as "hot spots") contaminated with greater than 500 ppm PCBs, and disposal of the excavated landfill soils and materials in a TSCA approved commercial chemical waste landfill. The estimated volume of material to be excavated is 7,000 cubic yards of material.

- An additional 41,000 cubic yards of soil and materials will be excavated and sampled to determine if the excavated soil and materials are contaminated with greater than 500 ppm

remedy thereby, meeting the requirement of reduction in toxicity, mobility, or volume through treatment. Off-site landfilling of PCB contaminated landfill material does not reduce the toxicity, mobility, or volume through treatment but is justified based upon the large quantities of municipal landfill waste disposed of at the site along with the court mandated deadline and community opposition to on-site thermal treatment. The low level threat waste remaining on-site will be contained under a RCRA Subtitle C compliant cap.

The source control operable unit remedial action selected in the ROD Amendment does result in hazardous substances remaining on-site above health-based levels but these will be contained under a landfill cap. Subsequent actions are planned to address fully the principal threats posed by this site. Future remedial decisions will be made regarding additional interim and final water treatment and sediment removal. A long-term inspection and maintenance plan along with a groundwater and surface water monitoring plan will be implemented. A Five-Year Review will be conducted after commencement of the remedial action to ensure that residual PCBs do not pose a threat to public health and the environment.

Wm. E. Muno 3/29/99

William E. Muno, Director — Date
Superfund Division

Conard's Branch and Richland Creek, springs located near the landfill, soils on-site, residential wells in the vicinity of the landfill, monitoring wells on-site and off-site, air monitoring upwind and downwind of the landfill, and sampling of vegetation and fish in Conard's Branch and Richland Creek. The most recent sampling occurred in March/April 1998, when 105 borings were placed within Neal's Landfill. A total of 271 samples were analyzed for PCBs. Values of PCBs ranged from non-detect to 34,796 ppm[1] PCBs. Figure 2 shows the boring locations within Neal's Landfill and Table 1 shows the locations where levels of PCBs were equal to or greater than 500 ppm.

Pursuant to a Stipulation and Order of Preliminary Injunction, CBS conducted interim remedial measures at Neal's Landfill, which were completed in 1984. The interim remedial measures included the following:

- Removal of 122 exposed capacitors and associated contaminated soil with off-site disposal. A total of 80 capacitors at 8 locations were reburied at the site during the interim remedial measures.
- Upgrading the cover over the refuse area, including grading and re-vegetating the surface of the landfill.
- Fencing the perimeter of the site.
- Performing sediment sampling, aerial photographic interpretations, and water balance calculations.
- Placement of sediment filter fences.
- Construction of diversion ditches.

The 1985 Consent Decree required CBS to complete additional interim remedial measures to protect public health and the environment. These measures included the following:

- Sampling of monitoring wells, springs, seeps, and streams both on-site and off-site. Included in the monitoring were selected residential wells within a 5,000-foot radius of the site.
- Capture and treatment in an on-site water treatment plant of the combined flows from South Spring, North Spring and Southwest Seep up to 1.0 cubic feet per second (approximately 448 gallons per minute) to an effluent standard of 1 part per billion PCBs.
- Installation of erosion control fencing.
- Posting of PCB contamination warning signs along Conard's Branch and Richland Creek which flow through the Conard's farm.
- Removal of sediments from Conard's Branch from Neal's Landfill to its confluence with Richland Creek and within Richland Creek from 25 feet upstream of its confluence with Conard's Branch to a point 200 feet downstream from the confluence.

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[1] See Neal's Landfill Sampling Report from Tetra Tech, dated November 30, 1998 for complete results from the March/April 1998 sampling event.

On June 3, 1997, the United States lodged with the U.S. District Court the first amendment to the Consent Decree, memorializing the agreement of the parties to the Consent Decree to the response action selected in the action memorandum. On August 18, 1997, the Court entered the first amendment, thus substituting the response action selected in the action memorandum for certain of the units at Winston-Thomas for the incinerator. Further amendments (or stipulations) for other units at Winston-Thomas, as well as the other Consent Decree sites, have been submitted to the Court as appropriate.

On January 30, 1998, U.S. EPA issued an action memorandum in response to a judicial order issued on November 21, 1997 for the clean-up of the interim storage facility, which stored PCB contaminated soil and sediment from other Bloomington, Indiana, sites. CBS implemented the selected response action upon approval by all of the parties, and with the knowledge of the court, of a work plan.

On May 12, 1998, U.S. EPA issued an action memorandum for the completion of the clean-up of Winston Thomas. The units addressed include the abandoned lagoon, trickling filter and the tertiary lagoon. The clean-up of the tertiary lagoon, which covers 17 acres and is filled with water, involves dredging of PCB contaminated sludge. All material excavated from the tertiary lagoon and the abandoned lagoon will be landfilled. On May 18, 1998, the United States lodged with the U.S. District Court the stipulation changing the terms of the Consent Decree, and memorializing the agreement of the parties to the Consent Decree to the response action selected in the action memorandum. The changes provide for the clean-up of the largest and most complicated units at Winston Thomas - the abandoned lagoon and the tertiary lagoon. On June 8, 1998, the Court entered the stipulation, thus substituting the response action selected in the action memorandum for certain of the units at Winston-Thomas for the incinerator.

On October 16, 1998, the U.S. EPA issued a ROD Amendment for alternative remedies for both Neal's Dump and Bennett's Dump. On February 8, 1999, the Court entered an amendment to the Consent Decree memorializing the change to the remedy for Neal's Dump.

Having already adopted a response action other than incineration for Winston-Thomas, Bennett's Dump, and Neal's Dump and, because the incinerator still has not been constructed and is unavailable to address the PCB contaminated soils and materials, the parties explored alternatives to incineration for Neal's Landfill.

In November 1997, Federal Judge Hugh Dillin issued a judicial order directing the six Consent Decree sites to be remediated by December 1999 and assigned Magistrate Judge Kennard Foster to oversee the progress of the parties toward meeting the December 1999 deadline. On February 1, 1999 Judge Dillin issued a new judicial order directing that the Consent Decree parties have until December 31, 2000 to complete all the source control remedies for the Consent Decree sites. The judicial order also provided for further negotiations between the governmental parties and CBS regarding water treatment, sediment removal, and other matters.

V. DESCRIPTION OF THE NEW ALTERNATIVES

The original remedial action for Neal's Landfill called for the excavation and incineration of an estimated 320,000 cubic yards of PCB contaminated landfill waste. During discussions with Magistrate Judge Foster regarding sampling within Neal's Landfill for PCBs, a disagreement arose between CBS and the governmental parties regarding the scope and extent of the sampling within Neal's Landfill. On February 13, 1998, Magistrate Judge Foster issued a judicial order requiring CBS to complete its proposed sampling within Neal's Landfill of 13 borings in the southeast corner of the site and for U.S. EPA to complete 78 borings over the remainder of the landfill. This sampling was completed in March/April 1998 and, based upon the March/April 1998 sampling event, five remedial alternatives were identified for the source control operable unit. The alternatives were developed by the U.S. EPA in consultation with the other governmental parties and ranged from no action to complete excavation.

In the Record of Decision Amendment for Bennett's Dump and Neal's Dump, U.S. EPA, in consultation with the other governmental parties, evaluated three landfill disposal options for materials containing, or contaminated with, PCBs. The three disposal options included constructing a chemical waste landfill at Bottom Road, placing the PCB-contaminated material from the Consent Decree sites on top of Neal's Landfill and off-site disposal in a chemical waste landfill. In evaluating the disposal options for both Neal's Dump and Bennett's Dump, the U.S. EPA determined that off-site disposal of excavated PCB-contaminated soils and materials in a chemical waste landfill was the best alternative. During discussions with the other governmental parties and CBS regarding the disposal option alternatives for Neal's Landfill, it was agreed that disposal in an off-site TSCA-approved, commercial, chemical waste landfill was appropriate and that local disposal would not be considered.

Neal's Landfill Alternatives

For the reasons already discussed, the incineration remedy originally called for is not a viable treatment alternative for the PCB contaminated soil and materials at Neal's Landfill. Accordingly, although the incineration remedy would have satisfied the nine criteria had it been built, under current conditions the incineration remedy fails to meet the implementability, community acceptance, and State acceptance criteria. Because the incinerator currently does not exist and in light of the court mandated deadline, the following discussion of the source control alternatives excludes incineration as contemplated in the Consent Decree.

Alternative 1 - No Action

The "no action" alternative would leave the Neal's Landfill interim cap in place without modifications and would not require the removal of PCB-contaminated soils and materials. CBS would develop a long-term monitoring plan that would be subject to the approval of governmental parties approval for monitoring groundwater and surface water at and near Neal's Landfill.

Figure 3 shows the locations of the PCB "hot spots" contaminated with equal to or greater than 500 ppm PCBs, based upon the March/April 1998 sampling event at Neal's Landfill. The estimated volume of material to be excavated and disposed of off-site is 7,000 cubic yards of material. In addition, all visible contamination, such as capacitors, capacitor parts, and oil-stained material shall be excavated from the landfill and disposed of at, or treated in, an off-site facility. Pursuant to TSCA, capacitors containing PCB oil, and all free oil, must be incinerated in a TSCA approved incinerator pursuant to 40 CFR 761.70. In addition to removal and off-sit disposal of the areas contaminated with equal to or greater than 500 ppm PCB, a RCRA Subtitl C compliant cap, as described in Alternative 2 and meeting the permeability requirements of 1 10^{-7} cm/sec, will be placed over the entire 18-acre landfill to address the low level threat wastes remaining. Also, eight locations have been identified where capacitors were reburied during th interim action and these capacitors will be excavated and disposed of through off-site incineration if they contain PCB oil.

Areas outside the landfill cap, but still within the Site fence line, may contain levels of 25 ppm PCBs on average with a maximum value of 50 ppm, but must have a 6-inch soil cover. As described in Alternative 2, areas located in drainage waterways (both naturally occurring and man made) outside the cap will be remediated to 1 ppm PCBs. Even though no known areas outside the Site fence are contaminated with PCBs, if it is discovered that contamination is present outside the fence line, the area will be remediated to residential/high occupancy PCB standard of 5 ppm PCBs, and covered with a 6-inch clean-soil cover. CBS will be required to develop a long-term inspection and maintenance plan for the landfill cap along with a groundwater and surface water monitoring program for governmental parties approval.

Alternative 4 - Excavation of 'Hot Spots" Contaminated with Equal to or Greater than 500 ppm PCBs with Off-site Disposal, Consolidation of Landfill Materi to the Center Portion of the Landfill and Placement of a RCRA Subtitle Compliant Cap over the Reduced Landfill Surface

This alternative consists of excavating and removing 7000 cubic yards of material estimated to be contaminated with equal to c greater than 500 ppm PCBs as described in Alternative 3. In addition to the excavation and disposal of the identified "hot spot" areas, the March/April 1998 sampling suggest that other, additional landfill areas may contain PCB contamination at levels equal to or greater than 500 ppm PCBs. The contour lines drawn in Figure 4 represent possible areas equal to or greater than 500 ppm PCBs and those areas will be excavated and sampled. T estimated volume of material within the contours is 41,000 cubic yards and this material will b sampled to determine if material is contaminated with equal to or greater than 500 ppm PCBs. sampling demonstrates that the material is contaminated with equal to or greater than 500 ppm PCBs, then this material will be disposed of off-site in a TSCA-approved commercial chemical waste landfill. If the sampling establishes that the material is contaminated with less than 500 ppm PCBs, then the material may be consolidated on the elevated rock surface in the center pa of the landfill. For cost purposes, EPA estimates that 13,000 cubic yards of material will be taken off-site for disposal, in addition to the 7,000 cubic yards described above. Based upon th

landfill footprint. With appropriate deed restrictions limiting use of the areas outside of the new, smaller landfill footprint to industrial/low occupancy uses, then the existing fence surrounding the Site may be removed.

Alternative 5 - Total Excavation of Neal's Landfill to a Residual PCB Level of 25 ppm and Placement of a Soil Cover Over the Excavated Area.

In this alternative, the entire landfill would be excavated to industrial cleanup standard of 25 ppm PCBs on average and the excavated soils and materials disposed of off-site. The capacitors will again be excavated and disposed of by incineration. The remaining soils with PCBs on average of less than 25 ppm would be covered with a minimum of a 10-inch soil cover. Under this alternative, the estimated volume of material to be excavated is 320,000 cubic yards. A groundwater and surface water monitoring plan would be developed and would continue for at least 5 years. As part of the Five-Year Review process the monitoring program will be reevaluated and either discontinued, continued, or modified and continued as modified.

With respect to each of these alternatives, if hazardous substances are left on-site, appropriate deed restrictions will be required.

VI. EVALUATION OF ALTERNATIVES

The U.S. EPA uses nine evaluation criteria as set forth in the National Contingency Plan, 40 CFR Part 300.430, to evaluate the fundamental change and the different alternatives associated with the change in remedy. The selected alternative is the alternative for each fundamental change that complies with Criteria 1 and 2, achieves the best balance among Criteria 3-7, and considers Criteria 8 and 9.

The nine evaluation criteria are listed below:

Criteria 1 - Overall Protection of Human Health and Environment addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

Criteria 2 - Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) addresses whether or not a remedy will meet all other Federal and State environmental statutes and/or provide grounds for issuing a waiver.

Criteria 3 - Long-Term Effectiveness and Permanence refers to the amount of risk remaining at a site and the ability of a new remedy to maintain reliable protection of human health and the environment over time once cleanup standards have been met.

Criteria 4 - Reduction of Toxicity, Mobility, or Volume through Treatment is the anticipated

capacitors, defined as containing less than 3 pounds of PCBs (40 CFR 761.3), and fille with PCB oil, can be disposed of in a municipal landfill (40 CFR 761.60). On the othe hand, large capacitors (40 CFR 761.3) must be incinerated (40 CFR 761.60). It is anticipated that mainly large capacitors will be present at Neal's Landfill. It is unknow if the capacitors will be filled with PCB containing oil or if the capacitors will be empty There is environmental benefit to disposing small PCB oil-filled capacitors in a TSCA approved compliant landfill, and CBS does not object to this requirements with respect small capacitors. PCB-contaminated soils and materials excavated from the two sites c be landfilled in TSCA approved and compliant landfill. Consistent with TSCA, large a small capacitor carcases that are broken or cracked open, and do not contain any PCB o constitute debris and are not capacitors within the meaning of 40 CFR 761.60, may be disposed of in a TSCA approved and compliant landfill.

- Long-Term Effectiveness and Permanence

Comparing Alternatives 2 through 5 for the source control operable unit, Alternative 5 i the most permanent and effective of the four alternatives evaluated even though without further evaluation of water treatment and sediment removal, the long-term effectiveness is limited for all the alternatives. Alternative 5 removes PCB contaminated landfill material to 25 ppm PCBs on average and disposes of the material in a chemical waste landfill along with incinerating the PCB oil and PCB oil-filled capacitors. Alternative 4 removes principal threat PCB landfill material equal to or greater than 500 ppm and take landfill areas more prone to backflooding and consolidates the landfill material under a RCRA cap. As with Alternative 5, PCB oil and PCB oil filled capacitors will be permanently destroyed by incineration under Alternative 4, though Alternative 5 may incinerate a greater number of capacitors. Alternative 3 will also remove PCB contaminated landfill material to a chemical waste landfill and permanently destroy PCI oil and PCB oil filled capacitors through incineration even though not to the extent of Alternative 5 or Alternative 4. Capping the landfill as described in Alternative 2 and Alternative 3 will not be as effective as Alternative 4 since PCB contaminated landfill material will be suspectu e to backflooding.

- Reduction of Toxicity, Mobility, or Volume Through Treatment

Alternatives 3, 4 and 5 all use incineration as treatment for the capacitors containing PC oil. Since Alternative 5 excavates the entire landfill, more capacitors may possibly be incinerated compared to Alternative 4 or Alternative 3. The majority of the material for Alternatives 2 through 5 is PCB containing soil/material and will not undergo treatment but will be disposed of in a chemical waste landfill. Treatment is not a component of Alternative 2.

locations that even with a RCRA Subtitle C compliant cap, migration of PCBs will not be reduced due to areas subjected to backflooding. Implementing Alternative 5 would be difficult due to the large quantities of material that would have to be disposed of off-site and U.S. EPA's concern of moving entire landfills to other communities. In addition, the cost of Alternative 5 is approximately 5 times more expensive than Alternative 4 and without the further evaluation of water treatment and sediment removal, Alternative 5 may still not be protective.

The following are the major ARARs for Alternative 4 for the source control operable unit at Neal's Landfill.

Surface Water Quality Standards	327 IAC 15-5
Surface Water Quality Criteria	33 USC 1311, 1312, 1313, 1314, 1317
Ambient Water Quality Criteria	40 CFR 129.105
Water Quality Standards	327 IAC 2-1-6
Storm Water Discharges	40 CFR Parts 122.26, 33 USC 402(p)
Transportation	49 CFR 171
Fugitive Dust Control	326 IAC 6-4-2
Incineration of PCBs	40 CFR 761.70 & 40 CFR 264
Chemical Waste Landfills	40 CFR 761.75
TSCA Spill Policy	40 CFR 761.120-139 - Not an ARAR but a "to be considered"
PCB Remediation Waste	40 CFR 761.61 - Not an ARAR but a "to be considered"
Alternative Disposal for PCBs	40 CFR 761.60(e) & 329 IAC 4-1-5(7)
Waste Characterization	329 IAC 3.1 - 6.1
Hazardous waste manifests	329 IAC 3.1-7-1 through 13
Manifest Requirements	40 CFR 761.207, 208, 209
Management of Solid Waste	329 IAC 10-4-2 & 329 IAC 10-2-174
Disposal of PCBs	40 CFR 761.60
Off-site Disposal Regulations	40 CFR 300.440
Large Quantity Generator	40 CFR 262
Transporter requirements	40 CFR 263 and 329 IAC 3.1-8-1 & 2
Land Disposal Restrictions	40 CFR 268.40
Closure & Post Closure Care	40 CFR 264.310(a)
Land Disposal Restrictions	40 CFR 268

The listed ARARs are associated with this source control operable unit. Other ARARs may be identified in connection with other operable units.

VII. STATUTORY DETERMINATION

The modified remedy for the Source Control Operable Unit at Neal's Landfill includes the excavation and off-site disposal of principal threat material and consolidation and capping of

Table 1

SUMMARY OF PCB DETECTIONS EQUAL TO OR EXCEEDING 500 PPM

Boring No.	Date Data Collected	Sampling Depth (feet bgs)	PCB Concentration (ppm)[a]
CBS-SB3	03/30/98	0 - 3	1,200
		3 - 6	1,000
CBS-SB4	03/30/98	5 - 6.5	500
CBS-PZ5[b]	03/31/98	10 - 12.5	2,600
		10 - 12.5S	577
CBS-SB8	03/31/98	5 - 8	2,500
CBS-SB9	03/31/98	15 - 18.5	900
CBS-SB13	03/31/98	15 - 16 D	516
		15 - 16 S	514
NL-SB19	03/27/98	2 - 3	15,152
		2 - 3 D	7,792
NL-SB26	03/26/98	5.5 - 9 D	952
NL-SB44	03/25/98	10 - 12.5	9,211
		10 - 12.5 D	34,796
		13 - 13.5	642
NL-SB50	03/23/98	10 - 13	7,979
NL-SB52	03/24/98	15 - 18	3,766
		18 - 21	1,805
NL-SB58	03/23/98	13 - 16	4,993
NL-SB59	03/23/98	10 - 13	925
NL-SB77	03/24/98	1 - 4	2,778
NL-SB80	03/26/98	1 - 3	6,588
NL-SB84	03/27/98	0.5 - 1	1,436
NL-SB92	03/26/98	3 - 6	505
NL-PZ93[b]	03/28/98	10 - 12.5	12,516
		15 - 16	5,017
		15 - 16 D	17,483
		17 - 17.5	511

Att. 34

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

MAR 8 1999

LEGAL DEPT.

REPLY TO THE ATTENTION OF:

FROM: Jeffrey A. Cahn
Associate Regional Counsel

REGARDING: Neal's Landfill SOW

DATE: March 5, 1999

TO:			
	Geoff Grodner	FAX	812.333.0083
	Steven Ellis	FAX	202.616.6584
	Steven Griffin	FAX	317.232.7979
	Catherine Gibbs	FAX	317.233.5517
	David Hensel	FAX	317.233.5517
	David Berz	FAX	202.682.7212
	Bill Steger	FAX	812.349.2982
	Linda Kelley	FAX	412.624.3923
	Dorothy Alke	FAX	412.642.3008
	John Carlucci	FAX	202.208.3877

Attached please find the SOW for Neal's Landfill.

Please distribute copies to your project-manager clients.

This final version reflects corrections to typographical errors.

This FAX consists of 1 pages, including this cover.

Att. 35

Final Data Evaluation Report for Remedial Investigation/Feasibility Study Sampling and Analysis Activities Neal's Landfill Site Monroe County, Indiana

Volume I

Prepared for
U.S. Environmental Protection Agency
Region 5
Chicago, Illinois

Tetra Tech EM Inc.

2.2 SITE GEOLOGY AND HYDROGEOLOGY

The Neal's Landfill site is situated on a col or saddle that overlies a watershed divide on an east-west oriented ridge; therefore, natural surface drainage is generally north and south into tributaries of Richland Creek, which is located about 0.75 mile downstream of the site. The col is predominantly underlain by limestone bedrock that is mostly within the upper portion of the Mississippian-aged St. Genevieve Limestone, a formation within the Blue River Group (Perry and Smith 1958). The St. Genevieve Formation is characterized by numerous joint patterns, resulting in an aquifer with karst characteristics. Numerous sinkholes exist in the site area and are believed to exist beneath the landfill. Valley bottoms immediately north and south of the col are eroded into lower parts of the St. Genevieve and the entire area is underlain with the St. Louis Limestone, the lowest unit of the Blue River Group.

Strata in the region generally dip or slope from the crest of the Cincinnati Arch to the west or southwest into the Illinois Basin at a rate of about 25 to 30 feet per mile. Local variations of this regional trend are not uncommon (Perry and Smith 1958). Bedrock units more than 1 mile south of the site generally dip west, but the strata at the site dip or slope northwest. Strata northwest of Richland Creek, which is northwest of the site, probably dip west-southwest.

A number of springs surface north of the site and flow into Richland Creek. These springs also discharge groundwater to Conrad's Branch at about 4,500 feet north of the site before Conard's Branch joins Richland Creek.

Groundwater flow beneath the Neal's Landfill site is controlled by limestone bedrock. Bedrock samples collected during previous investigations indicate that solution cavities are forming in the limestone at depths of up to 25 feet below the groundwater surface. Based on measurements of outcropping bedrock, jointing is occurring both at the surface and at depth in the bedrock, resulting in vertical and horizontal components to groundwater infiltration into the bedrock aquifer (Powell 1983). A buried valley stream traverses the southeast corner of the site.

Data from monitoring wells screened in the limestone bedrock indicate that subterranean passages transport groundwater. Groundwater elevation and dye-tracing study information indicates that groundwater flow is northwest. Seeps occurring throughout the landfill are a discharge point for water that

5.4 ANALYTICAL RESULTS

PCB concentrations of site soils and wastes range from nondetected (or less than 6.7 ppm) to as high as 34,796 ppm (in a sample collected from 10 to 12.5 feet bgs at boring NL-SB44). Figure 5-5 shows all boring locations with PCB detections. Table 5-4 summarizes borings with PCB detections. Analytical laboratory data sheets are presented in Attachment B.

As shown in Table 5-4, the highest PCB concentrations occur in a series of borings drilled in the central area of the site north of the east-west bedrock ridge. In addition to boring NL-SB44, these borings include (in descending order of PCB concentration) NL-PZ93 (17,483 ppm at 15 to 16 feet bgs), NL-SB50 (7,979 ppm at 10 to 13 feet bgs), NL-SB58 (4,993 ppm at 13 to 16 feet bgs), and NL-SB52 (3,766 ppm at 15 to 18 feet bgs). High PCB concentrations were also detected in several borings in the north area of the site, including borings NL-SB80 (6,588 ppm at 1 to 3 feet bgs), NL-SB77 (2,778 ppm at 1 to 4 feet bgs), and NL-SB84 (1,436 ppm at 0.5 to 1 foot bgs).

Contaminant concentrations detected at depth in these borings are indicative of the wastes, mainly black cinders disposed of in these areas. Contaminants detected in surficial soils such as at borings NL-SB80 and NL-SB84 are likely the result of soil erosion, transport in runoff during rainfall events, and deposition downgradient from original disposal areas. Bedrock was encountered in borings NL-SB80 and NL-SB84 at shallow depths, and little waste encountered during drilling (see boring logs in Appendix C).

South of the east-west bedrock ridge, high PCB concentrations were detected in borings NL-SB19 (15,152 ppm at 2 to 3 feet bgs) and NL-SB26 (952 ppm at 5.5 to 9 feet bgs). Several borings in this area such as borings NL-PZ14, NL-SB15, NL-SB16, NL-SB17, NL-SB18, NL-SB20A, NL-SB21, and NL-SB22 contained waste, including black cinders and capacitor paper. However, analytical results, including results for samples submitted for reanalysis, did not indicate high PCB concentrations even though borings containing these materials north of the bedrock ridge exhibited the highest PCB concentrations. In accordance with the FSP, no borings were drilled south or southwest of borings NL-SB15, NL-SB16, and NL-SB24 where capacitor paper was encountered. Therefore, the source of contamination indicated by historical PCB groundwater detections (Earth Tech 1998) is not fully defined in this area. Even though PCBs were not historically detected in monitoring wells north and northwest of the site, analytical data from soil borings NL-SB77 and NL-SB84 suggest that PCB contamination may

6.0 EXTENT OF PCB CONTAMINATION AND DELINEATION OF HOT SPOTS

This section discusses (1) the extent of PCB contamination based on soil and waste sampling analytical results, (2) the occurrence of PCB hot spots exceeding the removal action criteria, and (3) the estimated volume of soil and waste to be excavated based on negotiations between the governmental parties and CBS.

6.1 EXTENT OF PCB CONTAMINATION

Analytical data obtained by Tetra Tech and PSARA indicate that PCB contamination extends throughout the landfill at various concentrations. Data also suggest that the horizontal and vertical extent of contamination has been defined properly in the majority of the borings drilled. However, in several borings completed around the perimeter of the landfill, the areal extent of contamination is undefined because no borings were drilled and no samples were collected outside landfill boundaries. In addition, native clay material collected from the bottom of some borings contained PCBs at concentrations equal to or exceeding the removal action criteria. Therefore, the vertical extent of contamination in these borings is undefined.

As shown in Figures 6-1 and 5-4, the areal and vertical extent of areas where removal action criteria are equaled or exceeded have not been fully defined in several borings based on the SA approach presented in the FSP implemented during this investigation. The areal extent of contamination was investigated based on the 100-foot sampling grid discussed in the FSP. In addition, as described in the FSP, borings were advanced only 1 to 3 feet within the native clay material underlying the waste and fill interface at no more than 30 boring locations throughout the site. Borings adjacent to the buried waste limits where removal action criteria were equaled or exceeded include, in a counterclockwise direction, borings NL-SB84, NL-SB77, NL-PZ24, NL-SB18, CBS-SB3, CBS-SB2, CBS-SB1, CBS-SB4, CBS-PZ12, and NL-SB33. Therefore, the areal extent of PCB contamination in areas adjacent to the borings equal to or exceeding removal action criteria will have to be determined during the RA.

Borings where the vertical extent of soil equal to or exceeding removal action criteria was not fully defined include borings NL-SB80, NL-SB58, NL-PZ93, NL-SB44, CBS-SB4, and NL-SB33. Therefore, the

7.0 SUMMARY OF FINDINGS AND RECOMMENDATIONS

SA activities helped gather useful information regarding the nature and types of buried wastes and fill, the landfill cover, naturally occurring native material beneath the waste and fill, the nature of bedrock, and, more importantly, the distribution and magnitude of PCB contamination at the site. In addition, soil borings drilled throughout the site revealed the presence of various wet intervals not only in the southeast portion of the site which is subject to backflooding, but also in the central and south portions of the site. Data collected from the piezometers also indicate that the occurrence of perched saturated zones in the landfill is somewhat random, with no identifiable saturated zone that extends throughout the landfill. Limited piezometer data indicate that water elevations in the saturated zone trend to the northwest in the central portion of the landfill and southwest in the south portion of the landfill. Monitoring of water (leachate) level over a 2-week period (April 2 and 16) in piezometers installed during the EPA and CBS field work indicates that water (leachate) levels in these piezometers did not change appreciably except in piezometers at borings NL-PZ60 and NL-PZ61, where water levels increased after a significant rainfall event (greater than 2 inches of rain over a 24-hour period) in the Bloomington area. More recent piezometer watetr elvation data provided by CBS (CBS 1998) indicate that, except for the rainfall events during which monitoring was performed, groundwater backflooding in the southeast corner of the site may be saturating buried waste and transporting PCBs off site. However, based on the monitoring data backflooding is not evident in other areas of the site.

Contaminant data suggest that PCB concentrations vary from nondetected (or less than 6.7 ppm) to 34,796 ppm (in boring NL-SB44). Significant concentrations of PCBs in dry and wet areas are located in the southeast and central portions of the site. Overall, analytical data suggest an order-of-magnitude variability between sample concentrations, duplicate concentrations, split sample concentrations, and reanalyzed sample concentrations.

Based on data collected by Tetra Tech and PSARA, the estimated volume of contaminated soil and waste that will require off-site disposal or on-site consolidation is 105,365 yd^3. Because of the variability in analytical data observed during the investigation and to conduct the RA in a cost-effective manner, Tetra Tech recommends that a comprehensive soil sampling and analysis program be implemented during the RA to determine the volume of material that contains PCB concentrations that equal or exceed 500 ppm and will need off-site disposal. Tetra Tech also recommends that confirmation soil sampling be performed

accordance with a sampling protocol to be presented in the remediation work plan for the site. Sampling and testing results of this material will be consolidated on site under the RCRA cap or disposed of off site at a TSCA compliant facility.

AH.36

Date: Wed, 03 Feb 1999 12:18:16 -0600
From: Mike Baker <mrb@mcni.net>
To: profile@list.cpa.org
Subject: Draft Comments from G Davies on Neal's

COMMENTS RELATING TO THE REPORT: FIELD DATA EVALUATION REPORT FOR REMEDIAL INVESTIGATION/FEASIBILITY STUDY SAMPLING AND ANALYSIS ACTIVITIES, NEAL'S LANDFILL SITE, MONROE COUNTY, INDIANA, VOLUME I,

by

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Please Note:

All readers of this document should become familiar with the literature cited, the references cited in that literature, and other relevant literature. Only then can the necessity and validity of the comments made in this document be appreciated. Refutation of comments made in this review should also be backed by their own references or otherwise cited literature.

Introduction

The Neal's Landfill disposal site and its vicinity have been evaluated by CBS Corporation (CBS Corp., U.S. EPA and its consultants with regards to so-called Source-Control Alternatives, as described in a report: Field Data Evaluation Report for Remedial Investigation/Feasibility Study Sampling and Analysis Activities, Neal's Landfill Site, Monroe County, Indiana, Volume I, (Tetra Tech EM Inc., 1998) (in addition to associated documents and appendices).

Currently a Source-Control Remedy that is preferred by the parties involves removal and consolidation of hot spots of PCB contamination and installation of a RCRA cap on the landfill. Another alternative was to completely remove the contents of the landfill, but was not preferred as the calculated costs were considered excessive when compared to the hot-spot alternative.

Discussion

PCB sources in the landfill have been characterized as "hot" (> 500 ppm, dry or > 50 ppm, wet) by taking discrete samples, see Figures 1, 2, and 3 of Tetra Tech EM Inc. report (1998). The location of samples is shown in relation to a grid that was surveyed in place.

The major factor associated with this alternative, is how representative are the samples that are assumed to characterize the hot spots. If some of the remaining landfill waste is actually more contaminated that it appears to be (based upon assumptions made from the limited sampling and interpretation of those results), the landfill and its contents might be as big a problem in the

enough PCB waste that

was "hot" (>500 or > 50 ppm) that even using this unrepresentative and statistically untenable method there was some success.

When only a limited number of samples are collected for evaluation of any site caution should be advised. Huff (1991, p. 20) cites an example of the psychiatrist who proclaims "all people are neurotic." The bias in his interpretation can only be recognized when it is realized that "normal" people would never visit him.

The awareness required during evaluation of any scientific data such as these landfill data is stated eloquently again by (Huff, 1991, p. 20 -21):

"It is worth keeping in mind also that the dependability of a sample can be destroyed just as easily by invisible sources of bias as by these visible ones. That is, even if you can't find a source of demonstrable bias, allow yourself some degree of skepticism as long as there is a possibility of bias somewhere. There always is." [the bias referred to is statistical sampling bias and does not imply chicanery]

The lack of good fit of the high-concentration data in the inverse normal distribution plot should not be ignored, as it is the only statistical evaluation of those data. The statement made by Tetra Tech quoted above on the extent of contamination being "defined properly" must also be questioned in the context of the words of Lord Kelvin (1883) who said (paraphrasing) ...."if you cannot express it (the problem) in numbers, your knowledge is of a meager and unsatisfactory kind....," - Tetra Tech EM Inc., do not show any statistical confidence that the waste has been defined properly. In fact when evaluated in the way it has been in this document the sampling method used appears to not stand up to statistical scrutiny and raises very serious questions about the crux of the matter - the characterization of the hot spots.

Ground-Water Issues

Based upon topography and surface hydrology in the vicinity of the Neal's Landfill ground water could be predicted, in the vicinity of the site, to flow or discharge in either a northwesterly or westerly/ southwesterly direction. Ground-water tracing done at Neal's Landfill is reported to flow in generally the same directions as predicted by topography and hydrology (M. McCann, CBS Corp., personal communication).

If the true hot spots have been inadequately sampled and significant quantities of PCBs are inadvertently left in place then the ground water resources northwest and southwest of the landfill area will forever be potentially in jeopardy, however much treatment is attempted. Even though a cap would be in place ground water under the landfill would be subject to variations in hydraulic head caused by flooding and draining of conduits (cave passages), and might still reintroduce contaminants to the ground-water and eventually the surface water system in the future, and at possibly grossly unpredictable concentrations. Unless a massive drilling program

protection of human health, which should be ultimate goal of such an endeavor regardless of cost.

References

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GREENPEACE

TECHNICAL CRITERIA FOR THE DESTRUCTION OF STOCKPILED PERSISTENT ORGANIC POLLUTANTS

7 October 1998

By Pat Costner
Greenpeace International Science Unit
with Darryl Luscombe, Greenpeace Australia
and Morag Simpson, Greenpeace Canada

ISBN: 90-73361-47-8

Executive Summary

Governments of the world have agreed to negotiate a global, legally binding instrument to protect human health and the environment from persistent organic pollutants (POPs). One important way these pollutants enter the general environment is by escaping from stores, stocks and environmental reservoirs (including contaminated soils and sediments) of obsolete POPs chemicals (PCBs, pesticides, etc.) and of POPs-contaminated wastes (dioxins, PCBs, etc.).

There is now a growing consensus that stocks, stores and environmental reservoirs of obsolete chemicals and POPs-contaminated wastes must be rapidly identified, properly collected and properly destroyed in order to stem their continued migration into the general environment. This, in turn, opens up a debate on what constitutes proper means for the collection and destruction of these obsolete chemicals and wastes.

Many technologies are being commercialized to address the destruction of POPs and POPs-contaminated materials. The field is rapidly changing and much information is still not available. For that reason, this paper cannot be considered complete or final, but rather it is a contribution to an ongoing investigation. It is an evolving document exploring criteria for the destruction of persistent organic pollutants. It also looks at several destruction technologies, both historic and recently developed, including brief descriptions of their capabilities and, where available, their costs.

Greenpeace has concluded that to afford adequate protection of both local and distant populations of humans and wildlife, the technologies used for destroying stockpiles of persistent organic pollutants (POPs) must meet the following fundamental performance criteria:

- **Destruction efficiencies of effectively 100 percent for the chemicals of concern.** The determination of 100 percent destruction efficiency is necessarily based on findings of no detectable concentrations of the chemicals of concern in any and all residues, using the most sensitive analytical techniques available worldwide. Analyses of the unmodified residues must be carried out sufficiently frequently to ensure compliance with this criterion during startups, shutdowns and routine operations.

- **Complete containment of all residues** for screening and, if necessary, reprocessing to ensure that no residues contain detectable levels of chemicals of concern or other harmful constituents, such as newly formed persistent organic pollutants or other hazardous substances.

- **No uncontrolled releases.**

2.1.3 United States Department of Defense

As part of the U.S. Department of Defense program to destroy existing stockpiles of unitary chemical warfare agents, U.S. Army representatives and a panel of experts evaluated eleven non-incineration destruction technologies. Their objective was to identify non-incineration technologies for destroying chemical agent HD, an organochlorine, at one stockpile site and VX, an organophosphate, at a second site. The following three received a unanimous recommendation from the panel as well as U.S. Army Major General Orton:[112]

- High temperature gas phase reduction (Eco Logic International, Inc.),
- Molten metal (M4 Environmental L.P.), and
- Electrochemical oxidation (Sub Sea International, Inc.)

In addition to these processes, the U.S. Army is evaluating three other destruction technologies: supercritical water oxidation, ultraviolet oxidation and electron beam oxidation.

2.1.4 United States Department of Energy

The U.S. Department of Energy (DOE) and Office of Technology Development have been evaluating appropriate waste destruction technologies for a variety of waste streams as well. DOE explained their reasons for engaging in this process as follows:[113]

> *... DOE is concerned about the current difficulty of permitting and siting incinerators. Public acceptance and perceptions associated with air emissions of toxic metals and organics are major issues. ... [T]echnologies capable of treating DOE organically contaminated mixed wastes and which may be more easily permitted ... have the potential of alleviating stakeholder concerns by decreasing off-gas volumes and the associated emissions of particulates, volatilized metals and radionuclides, PICs, NO_x, SO_x, and recombination products (dioxins and furans).*

DOE has evaluated approximately 30 alternative technologies, based on information gleaned from the open literature, government reports, and discussions with principal investigators and developers. Evaluation criteria included the following: a) capability of treating a variety of wastes with varying constituents with minimal pretreatment or characterization; b) secondary waste stream volumes that are significantly smaller than the original waste stream volumes and which contain no toxic reaction byproducts; c) complete mineralization of organic contaminants; d) offgas and secondary waste composition; e) cost; and f) risk.[114]

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United States
Environmental Protection
Agency

EPA-600/R-98-076
July1998

EPA

Research and Development

Development of a Hazardous Waste Incinerator Target Analyte List of Products of Incomplete Combustion

Prepared for:

Office of Solid Waste

Prepared by:

National Risk Management Research Laboratory
Research Triangle Park, NC 27711

PETITIONER'S
EXHIBIT
NO. 1

1.0 INTRODUCTION

1.1 - Focus

Assessing the risk posed by combustor emissions requires sampling and analysis of what is leaving the stack. The chemical analysis must be compound specific in order to consider the toxicity of each compound. Efficient and cost effective sampling and analysis for routine regulatory control requires a target analyte list to focus the effort. A list of Products of Incomplete Combustion (PICs) suitable for focusing this effort is not well developed. The primary goal of this project is to develop such a list. This list will help serve as a basis for EPA's Office of Solid Waste (OSW) to pursue a PIC-based regulatory approach.

In the past, the Appendix VIII[1] list of hazardous compounds has become the *de facto* list for hazardous waste combustor (HWC) investigations. The Appendix VIII list was generated by appending lists of chemicals that were previously regulated by other government agencies (U.S. Department of Transportation (DOT) shipping labels, etc.). And, as such, it is not a list of compounds well focused to HWC stack emissions. Moreover, this list focuses on compounds possessing hazardous characteristics that are most often the Primary Organic Hazardous Constituents (POHCs). As a result, existing required analytical methodologies focus on measuring the POHC. Very few PICs that are formed are targeted by current analytical methodologies. Analytical methodologies capable of identifying and quantifying PICs are required. This effort avoids the focus provided by Appendix VIII by approaching the task with an open mind in order to establish a list of compounds of importance to HWC emissions.

As a starting point, this study used existing trial burn data, laboratory-scale research literature, and, where relevant, target analyte lists based on Appendix VIII and the hazardous air pollutant (HAP) list from the 1990 Clean Air Act Amendments[2]. It must be stressed, though, that this was only a starting point. The vast majority of the effort for this study was consumed in identification and quantification of unknown compounds.

1.2 - Regulatory Basis

HWCs have been regulated by the Resource Conservation and Recovery Act (RCRA),[3] based on the destruction and removal efficiency (DRE) of POHCs as defined in a trial burn. This approach used the initial decomposition of the POHC, the first step in converting the organic POHC molecule to carbon dioxide (CO_2) and water (H_2O), as a surrogate for the extent of complete conversion to CO_2 and H_2O. The goal of reducing the toxicity of the hazardous constituents requires many reactions (chlorobenzene has 12 bonds to break and 18 new bonds to make) to completely react to CO_2 and H_2O. If the reaction sequence goes to completion, the toxicity is reduced completely (i.e., CO_2 and H_2O are not toxic). However, partial destruction can mute the reduction in toxicity, and reformation reactions can occur that cause molecular size growth; these can also mute the reduction in toxicity or, in some cases, increase the toxicity from that of the original organic molecule being incinerated[4]. Additionally, chlorine from the hazardous waste, released in the form of hydrochloric acid (HCl) or diatomic chlorine (Cl_2), can react with naturally occurring hydrocarbons in the cool end of some incineration facilities (e.g., cement kilns) and generate potentially toxic hazardous organic compounds[5]. A new PIC-based approach can potentially avoid these problems associated with the POHC DRE approach.

compounds are toxic. Because of this, risk assessment uncertainties can be influenced not only by not detecting PICs that are important from a toxicological point of view, but also by not detecting harmless compounds that potentially comprise much of the mass of stack emissions. Sampling and analytical methodologies may not be sufficiently developed to generate reliable emissions data. Compounds that fall into this category are the brominated and bromochloro analogs to PCDDs/PCDFs (the polybrominated dibenzo-p-dioxins and polybrominated dibenzofurans [PBDDs/PBDFs] and mixed bromochloro dibenzo-p-dioxins and mixed bromochloro dibenzofurans [PXDDs/PXDFs]), and polycyclic aromatic hydrocarbons (PAHs) substituted with various species (oxygen, chlorine, sulfur)[8]. Another issue is the measurement of compounds such as phthalates, which are frequently detected in HWC emissions, but may be artifacts of sampling and analytical treatments.

1.5 - Limitations

The experiments were performed on EPA's rotary kiln incinerator simulator (RKIS) located in Research Triangle Park, NC. Exact quantification of concentrations was not a primary goal for this study. A more important goal was to derive a detailed list of target compounds that can be found at levels above the detection limits. The existing database of PIC data from bench, laboratory, pilot, and full-scale was used as a starting point for development of this list.

It is critical to understand that all quantified PICs generated in this study are based on the pilot-scale RKIS, burning the chosen waste mix, at the given conditions, prior to any flue gas cleaning equipment. The RKIS is a small pilot-scale kiln, and many of the fluid mechanical features of full-scale kilns that can produce excess emissions are not present in the RKIS. As such, the system sometimes needs to be operated slightly outside what would constitute normal incinerator operating conditions in order to properly quantify important emission trends and measure subtle phenomena. It is believed that this system generates qualitatively applicable data, although emissions results from the RKIS should not be quantitatively compared to full-scale systems.

provide the greatest opportunity to reduce uncertainty in risk assessment calculations with minimal expenditure.

Additional testing is recommended that incorporate these techniques. This additional testing should use as a foundation, EPA's Total Organics Approach (TOA). Particular emphasis should be placed on characterization of the semivolatile and nonvolatile fractions. This would equate to total chromatographable organic (TCO) and gravimetric organic (GRAV) fractions of the TOA. Each sample fraction should be segregated or fractionated, based on polar characteristics, to provide a first step towards deconvoluting the sample. This can be quantitatively accomplished using High-Performance Liquid Chromatography (HPLC). Each segregated fraction should then be re-subjected to the TCO and GRAV analyses to ensure mass recovery. Then each sample fraction should be reanalyzed by GC/MS as well as MDGC/MS. This will not only improve compound identification and quantitation, but also demonstrate this particular approach as a potential method for characterizing incinerator emissions.

This testing should also include separate efforts to identify the components present in the GRAV fraction. Theoretically, the GRAV fraction includes primarily nonvolatile organics possessing high molecular weight compounds. It is possible, even probable, that a considerable portion of these compounds are not amenable to conventional GC analyses. However, the ability to characterize this fraction has met with mixed results. This fraction typically remains uncharacterized, with only a small percentage of the mass being identified.

It is the authors' strong contention that the GRAV fraction may consist of organic and/or inorganic mass not directly attributable to organic incinerator emissions. This artifact may be comprised of inorganic salts, super-fine particulate, fractured XAD-2 resin, or some other unknown. This artifact may account for the inability to identify a significant percentage of the GRAV fraction. Experiments can be designed to further determine the representativeness of the GRAV fraction. Based on these results, more efficient analytical approaches can be devised to characterize the GRAV fraction, thereby improving the potential for identifying a larger percentage of the GRAV fraction.

Finally, it may be possible to develop a multi-tiered approach to measuring PICs from incineration systems. Some incineration systems may exhibit a relatively small number of identifiable PICs, whereas others may have an exceedingly complex mixture in the stack. This multi-tiered approach could be performed by commercial analytical laboratories on a routine basis. The multi-tiered approach would consist of the following:

Tier 1: First Pass Analysis

The first pass analysis would focus on using existing analytical methodologies that focus more on potential PICs. The MM5 samples would be extracted and analyzed conventionally using a Method 8270C analysis, directed at the Method 8270C targets. The existing target list should be expanded to include common PICs that are amenable to GC/MS analysis. Aliquots from these same extracts would be subjected to further analyte-specific analyses for chlorobenzenes and chlorophenols (Method 8041), PAHs (CARB Method 429), and nitroaromatics and cyclic ketones

Att. 39

PROPOSED PLAN FOR THE SOURCE CONTROL RECORD OF DECISION AMENDMENT AT NEAL'S LANDFILL

Introduction

The United States Environmental Protection Agency (U.S. EPA) is proposing to change the remedy for the Neal's Landfill site near Bloomington, Indiana. The proposed remedy changes the original remedy for Neal's Landfill, as described in the Enforcement Decision Document (EDD), dated August 3, 1984, for a group of polychlorinated biphenyls (PCBs) contaminated sites. The original remedy called for, among other things, excavation of PCB contaminated soils and materials from the site (source control measures), incineration of those soils and materials in a permitted, TSCA-approved, dedicated, municipal solid waste-fired incinerator, and water treatment. This document is the source control Proposed Plan for the Record of Decision Amendment, and describes and summarizes the recommended changes to the original remedy at Neal's Landfill, as described in the EDD. This Proposed Plan only addresses source control measures, and future remedial decisions will be made regarding water treatment at Neal's Landfill and sediment removal in Conard's Branch and Richland Creek. The U.S. EPA is required to publish this Proposed Plan and make it available for public review and comment by Section 117(a) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986. The changes described in this Proposed Plan are subject to public review and comment. The information repository at the Monroe Public Library, 303 E. Kirkwood, Bloomington should be consulted for in-depth details on the development and evaluation of the changes being proposed.

Public input on the proposed changes and the information that support these changes is an important contribution to the cleanup remedy selection process. Based upon new information or public comments, U.S. EPA may modify the recommended changes described here, or may select another alternative presented in the Proposed Plan. The public comment period is from December 21, 1998 to January 20, 1999. A public meeting to discuss the proposed changes to the remedy at Neal's Landfill is scheduled for January 13, 1998, at 7:00 P.M., in the Monroe County Public Library, 303 East Kirkwood, Bloomington, Indiana.

Site Description and History

On January 4, 1983, the United States filed a civil action against Westinghouse Electric Corporation, now known as CBS Corporation (CBS), pursuant to Section 7003 of the Resource Conservation and Recovery Act (RCRA) and Sections 104, 106, and 107 of CERCLA, alleging an imminent and substantial endangerment due to improper disposal of PCBs at two sites in the Bloomington area. During the fall of 1983, CBS expressed its interest in negotiating a settlement of that suit as well as a civil action filed by the City of Bloomington for improper PCB disposal

response action selected in the action memorandum. The changes provide for the clean-up of the largest and most complicated units at Winston Thomas - the abandoned lagoon and the tertiary lagoon. On June 8, 1998, the Court entered the stipulation, thus substituting the response action selected in the action memorandum for certain of the units at Winston Thomas for the incineration remedy.

Having already adopted a response action other than incineration for Winston Thomas, and because the incinerator still has not been constructed and is unavailable to address the PCB contaminated soils and materials, the parties explored alternatives to incineration for the Consent Decree sites. In addition, in November 1997, Federal Judge Hugh Dillin issued a judicial order stating that the six Consent Decree sites must be remediated by December 1999 and assigned Magistrate Judge Kennard Foster to oversee the progress of the parties toward meeting the December 1999 deadline.

In short, the amendments to the remedial decisions for the Consent Decree sites, which includes Neal's Landfill, are driven in part by the need for an alternative to the incineration remedy and in part by the consensus of the Parties that an alternative is necessary. After discussions with the governmental parties and CBS Corporation, the U.S. EPA issued a Proposed Plan addressing two of the Consent Decree sites (Neal's Dump and Bennett's Dump) for public comment. The public comments were considered and were addressed in the Responsiveness Summary. On October 16, 1998, U.S. EPA issued a Record of Decision Amendment adopting new remedial actions for Neal's Dump and Bennett's Dump in which Neal's Dump will be remediated to residential PCB cleanup standards and Bennett's Dump will be remediated to industrial PCB cleanup standards.

This Proposed Plan for Neal's Landfill is a result of the further discussions among the parties as an alternative to the incineration remedy.

Neal's Landfill was operated as a sanitary landfill from 1950 to 1972. In 1966 and 1967, PCB filled capacitors and PCB contaminated rags, sawdust and filter clay were disposed of at the landfill. It has been estimated that between 10,000, and as many as 40,000 capacitors may have been disposed of at the site, and there was extensive on-site salvaging of capacitors for the metal components. The current size of the landfill is approximately 18 acres. Mr. Ray Neal, the previous owner and operator of the landfill, hauled PCB contaminated capacitors and materials to Neal's Landfill under contract from CBS. Mr. Ray Neal owned the site until 1977 and from 1977 to 1980, the site was owned by Mr. Richard Neal. The site is now owned by the Taylor Farm Limited Liability Corporation.

Since 1981, numerous field inspections and investigations have been conducted at Neal's Landfill by both U.S. EPA and CBS. Sampling included sediment/surface water sampling in Conard's Branch and Richland Creek, springs located near the landfill, soils on-site, residential wells in the vicinity of the landfill, monitoring wells on-site and off-site, air monitoring upwind and downwind of the landfill, and vegetation and fish sampling in Conard's Branch and Richland Creek. The most recent sampling occurred in March and April 1998, when 105 borings were

Table 1

SUMMARY OF PCB DETECTIONS EQUAL TO OR EXCEEDING 500 PPM

Boring No.	Date Data Collected	Sampling Depth (feet bgs)	PCB Concentration (ppm)[a]
CBS-SB3	03/30/98	0 - 3	1,200
		3 - 6	1,000
CBS-SB4	03/30/98	5 - 6.5	500
CBS-PZ5[b]	03/31/98	10 - 12.5	2,600
		10 - 12.5S	577
CBS-SB8	03/31/98	5 - 8	2,500
CBS-SB9	03/31/98	15 - 18.5	900
CBS-SB13	03/31/98	15 - 16 D	516
		15 - 16 S	514
NL-SB19	03/27/98	2 - 3	15,152
		2 - 3 D	7,792
NL-SB26	03/26/98	5.5 - 9 D	952
NL-SB44	03/25/98	10 - 12.5	9,211
		10 - 12.5 D	34,796
		13 - 13.5	642
NL-SB50	03/23/98	10 - 13	7,979
NL-SB52	03/24/98	15 - 18	3,766
		18 - 21	1,805
NL-SB58	03/23/98	13 - 16	4,993
NL-SB59	03/23/98	10 - 13	925
NL-SB77	03/24/98	1 - 4	2,778
NL-SB80	03/26/98	1 - 3	6,588
NL-SB84	03/27/98	0.5 - 1	1,436
NL-SB92	03/26/98	3 - 6	505
NL-PZ93[b]	03/28/98	10 - 12.5	12,516
		15 - 16	5,017
		15 - 16 D	17,483
		17 - 17.5	511

Alternative 1 - No Action

The No Action alternative would leave the Neal's Landfill interim cap in place without modifications and would not require the removal of PCB-contaminated soils and materials. Long-term groundwater monitoring adjacent to the Neal's Landfill would occur.

Alternative 2 - Placement of a RCRA Subtitle C Compliant Cap Over the Landfill Surface.

Alternative 2 consists of installing a Resource Conservation Recovery Act (RCRA) Subtitle C compliant cap over the existing 18-acre landfill. A Subtitle C compliant cap consists of a multi-layer design. Conceptually, the cap consists of 6-inches of top soil, 2-feet of clean fill to prevent the clay layer from being affected by frost, a minimum of 40 millimeter flexible membrane liner and 2-feet of compacted clay. Areas outside the landfill cap may contain levels as high as 25 ppm PCBs on average but must contain a 10-inch soil cover. Areas located in drainage waterways outside the cap will be remediated to 1 ppm PCBs. In addition, a long-term groundwater monitoring plan will be developed.

Alternative 3 - Excavation of "Hot Spots" Greater Than 500 parts per million PCBs with Off-site Disposal and Placement of a RCRA Subtitle C Compliant Cap over the Landfill Surface

Alternative 3 consists of removing "hot spot" areas contaminated with greater than 500 ppm PCBs and disposal of the excavated soils and materials in a chemical waste landfill capable of accepting PCB materials contaminated at levels greater than 500 ppm PCBs. Figure 2 shows the locations of the PCB "hot spots" greater than 500 ppm PCBs, based upon the March/April 1998 sampling event at Neal's Landfill. The estimated volume is 7,000 cubic yards of material. In addition, any visible contamination, such as capacitors, capacitor parts and oily stained material shall be excavated and disposed of off-site. Pursuant to Toxic Substances Control Act (TSCA) requirements, capacitors containing PCB oil and any free oil must be incinerated in a TSCA compliant incinerator. In addition to removal of the areas contaminated with greater than 500 ppm PCB ("hot spots"), a RCRA Subtitle C compliant cap, conceptually described in Alternative 2, will be placed over the entire 18-acre landfill. Also, eight locations have been identified where capacitors were reburied during the interim action and these capacitors will be excavated and disposed of by incineration. Areas outside the landfill cap may contain levels as high as 25 ppm PCBs on average, but must have a 10-inch soil cover. Areas located in drainage waterways outside the cap will be remediated to 1 ppm PCBs. In addition, long-term groundwater monitoring plan will be developed.

Criteria 1 - Overall Protection of Human Health and Environment addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

Criteria 2 - Compliance with Applicable of Relevant and Appropriate Requirements (ARARs) addresses whether a remedy will meet all other Federal and State environmental statutes and/or provides grounds for issuing a waiver.

Criteria 3 - Long-Term Effectiveness and Permanence refers to the amount of risk remaining at a site and the ability of a new remedy to maintain reliable protection of human health and the environment over time once cleanup standards have been met.

Criteria 4 - Reduction of Toxicity, Mobility, or Volume through Treatment is the anticipated performance of the treatment technologies that may be employed in a remedy.

Criteria 5 - Short-Term Effectiveness refers to the speed with which the remedy achieves protection, as well as the remedy's potential to create adverse impacts on human health and the environment that may result during the construction and implementation period.

Criteria 6 - Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the chosen solution.

Criteria 7 - Cost addresses the estimated capital and operation and maintenance costs, as well a present-worth cost. Present worth is the total cost of an alternative in terms of today's dollars.

Criteria 8 - Support Agency Acceptance indicates whether, based on its review of the Proposed Plan Amendment, the support agency (principally the State of Indiana, although the views of Monroe County and the City of Bloomington are being informally considered) concurs with, opposes, or has no comment on the recommended alternative.

Criteria 9 - Community Acceptance will be assessed in the Record of Decision Amendment (the document that outlines and memorializes the selected cleanup plan) following a review of the public comments received on the Proposed Plan.

Recommended Changes

The recommended remedy change for Neal's Landfill only addresses source control and future remedial decisions will be made regarding water treatment and sediment removal. Using the nine criteria to evaluate the source control alternatives, the U.S. EPA proposes that Alternative 4 - hot spot removal, consolidation and installation of a RCRA Subtitle C compliant cap - best meets and balances the nine criteria. Table 2 shows how the 5 alternatives compare with each other. Excluding the No Action Alternative, the remaining four alternatives meet the criteria of

approximately 5 times as expensive than Alternative 4, and Alternative 5 goes against U.S. EPA direction, which recommends "hot spot" removal rather than completely excavating landfills and moving them to other communities[6]. Alternatives 2 and 3 are not as protective as Alternative 4 and only approximately $6 million and $3 million lower in cost compared to Alternative 4.

TABLE 2
EVALUATION OF SOURCE CONTROL REMEDY
FOR
NEAL'S LANDFILL

Evaluation Criteria	ALT. 1 No Action & Monitoring	ALT. 2 RCRA CAP	ALT. 3 Hot Spot & RCRA Cap	ALT. 4 Hot Spot & Consolidation & RCRA Cap	ALT 5 Total Removal
1. Overall Protection Human Health & Environment	☐	■	■	■	■
2. Compliance with ARARs	☐	■	■	■	■
3. Long-term Effectiveness and Permanence	☐	▣	▣	■	■
4. Reduction of Toxicity, Mobility, or Volume through Treatment	☐	☐	▣	▣	▣
5. Short-term Effectiveness	☐	■	■	■	■
6. Implementability	☐	■	■	■	■
7. Total Cost - Present Worth (in millions)	$.66	$10.72	$13.12	$16.03	$80.24
8. Support Agency Comments				IDEM Supports ALT 4	
9. Community Acceptance	Community Acceptance of the recommended option will be evaluated after the public comment period.				

■ - Fully meets criteria ▣ - Partially meets criteria ☐ - Does not meet criteria

[6] See Region V Landfill Remedy Summary and U.S. EPA Municipal Landfill Guidance, dated February 1991.

approximately 5 times as expensive than Alternative 4, and Alternative 5 goes against U.S. EPA direction, which recommends "hot spot" removal rather than completely excavating landfills and moving them to other communities[6]. Alternatives 2 and 3 are not as protective as Alternative 4 and only approximately $6 million and $3 million lower in cost compared to Alternative 4.

TABLE 2
EVALUATION OF SOURCE CONTROL REMEDY
FOR
NEAL'S LANDFILL

Evaluation Criteria	ALT. 1 No Action & Monitoring	ALT. 2 RCRA CAP	ALT. 3 Hot Spot & RCRA Cap	ALT. 4 Hot Spot & Consolidation & RCRA Cap	ALT 5 Total Removal
1. Overall Protection Human Health & Environment	☐	■	■	■	■
2. Compliance with ARARs	☐	■	■	■	■
3. Long-term Effectiveness and Permanence	☐	▣	▣	■	■
4. Reduction of Toxicity, Mobility, or Volume through Treatment	☐	☐	▣	▣	▣
5. Short-term Effectiveness	☐	■	■	■	■
6. Implementability	☐	■	■	■	■
7. Total Cost - Present Worth (in millions)	$.66	$10.72	$13.12	$16.03	$80.24
8. Support Agency Comments				IDEM Supports ALT 4	
9. Community Acceptance	Community Acceptance of the recommended option will be evaluated after the public comment period.				

■ - Fully meets criteria ▣ - Partially meets criteria ☐ - Does not meet criteria

[6] See Region V Landfill Remedy Summary and U.S. EPA Municipal Landfill Guidance, dated February 1991.

Att. 40

Monroe County Board of Commissioners

Courthouse
Bloomington, IN 47404
Phone: 349-2550

Iris Kiesling ■ Brian O'Neill ■ Kirk White

April 19, 1999

Response to The Proposed Plan For the Source Control Record of Decision Amendment At Neal's Landfill

The remedy for Neal's Landfill proposed by EPA fails to provide a long term solution to PCB contamination and places public health at risk.

Neal's Landfill is an 18 acre illegal dump which began in 1950. Between 10,000 and 40,000 capacitors containing Polychlorinated Biphenyl (PCB) may have been disposed of at this site. Readings as high as 34,796 parts per million (ppm) have been documented by EPA. Under the original Consent Decree, CBS (formerly Westinghouse) is required to excavate the entire site. Under the present amendment to that decree, EPA has reviewed five alternatives ranging from "No Action" to "Complete Excavation." In spite of formal statements from Monroe County Government endorsing Alternative 5 "Complete Excavation," EPA has selected Alternative 4:

> **Excavation Of "Hot Spots" Greater Than 500 ppm With Off-Site Disposal, Consolidation Of Landfill Material To The Center Portion Of The Landfill And Placement Of A RCRA Subtitle C Compliant Cap Over The Reduced Landfill Surface.**

The Monroe County Board of Commissioners finds this alternative totally unacceptable.

First, it violates existing standards for the disposal of hazardous waste. Neal's illegal dump is located on karst (terrain characterized by sinkholes). Under present regulations, no landfill (hazardous or non-hazardous) may be located on karst, and all are required to provide bottom liners as well as impervious caps. Alternative 4 violates both these standards. The notion of consolidating hazardous materials on a geologically unstable foundation is irresponsible and ensures that future generations will be exposed to further health risks and will be forced to remediate the site a second time. Only complete excavation is acceptable, which the County plainly stated in letters from its Health Department dated March 3, 1998 and December 30, 1998.

Second, the Board of Commissioners has yet to hear a compelling explanation of why this Record of Decision Amendment has been allowed to violate the procedures for amending the original Consent Decree. Under that decree, any subsequent amendments were to provide a level of protection at least as rigorous as those in the original agreement and were to be negotiated without cost as a factor. The selection of Alternative 4 violates both of these criteria.

The Board of Commissioners stands behind the original Consent Decree which requires total excavation of each site. With the elimination of incineration as a disposal option, contaminated soils must be transported to properly licensed hazardous waste landfills. Consolidating and capping toxic chemicals over sinkholes in an illegal dump is not an option.

Cleanup plan worries officials

▼Cleanup / from A1

west of Bloomington. But massive public opposition led to the elimination of the planned incinerator.

The EPA and Westinghouse then proposed a hazardous waste landfill for all PCB-contaminated material from the various county PCB sites. It was to be located in the deep soil of the Bean Blossom Creek valley off Bottom Road northwest of Bloomington.

That plan also fell through.

So now work has begun on an amended and less ambitious Neal's Landfill cleanup plan. The new proposal is to excavate a number of "hot spots" with 500 or more parts per million of PCBs and ship that material to a hazardous waste landfill in Michigan. All other materials between 25 and 500 parts per million would be dug up, relocated and reburied on a rise in the center of Neal's Landfill and covered with an impermeable cap but will have no containment under it.

Change or amendment?

The Monroe County commissioners are furious at the plan and at the EPA's insistence that the change is not an "amendment" to the consent decree.

O'Neill says it's double talk, because if the EPA admitted it was an amendment, it would require the approval of all parties to the consent decree. And that would mean approval by the county as well as the EPA, the Indiana Department of Environmental Management and CBS, the corporate owner of Westinghouse.

In addition, under the consent decree, any amendment to it must include provisions at least as rigorous as the original, with cleanup cost not a permissible consideration.

But cost is a major factor in the current Neal's Landfill plan.

To totally excavate the Neal's site and truck it all to Michigan would take 22,000 tractor-trailer loads of dirt and cost $80 million. The current plan costs only $16 million.

"I consider the price (to CBS) irrelevant, given the contamination here," White said Monday morning.

"They'd be getting a hell of a deal at $80 million," O'Neill argued.

Future risk feared

But what really angers the commissioners is the idea of permanently burying the less-contaminated PCB materials with no bottom liner in a karst area — one riddled with sinkholes, caves and underground streams.

"This all drains down to the White River eventually, and PCBs eventually move," said Kiesling.

O'Neill charged that EPA regulations prevent any landfill, toxic or nontoxic, in karst areas, much less without a bottom liner.

"The notion of consolidating hazardous materials on a geologically unstable foundation is irresponsible and ensures that future generations will be exposed to further health risks and will be forced to remediate the site a second time," he charged.

Only total excavation and removal to a licensed hazardous waste landfill is acceptable, he said. Otherwise, "we're just rolling the dice here, putting off a problem that will come back to haunt the future."

Deadline approaching

The EPA official working m closely with the Neal's project been chemical engineer T Alcamo with EPA's Region 5 of in Chicago. He defended the p again Monday morning, as he against previous criticisms.

Alcamo maintained that ma EPA Superfund landfills have b developed over the past years, a none have bottom liners.

Asked if the EPA has pri what a bottom liner would cost replied, "We didn't look at it spe ically."

Instead, he pointed to secc and third phases of the project t will include water treatment a sedimentation control, thou Kiesling said earlier Monday does not think the plans for deal with surface runoff will be a quate.

Alcamo also said he believes the previously propo Bottom Road landfill would h been a better, safer site because not in a karst area.

But even the revised Ne Landfill plan improves the sit tion, he argued, because "t landfill has been sitting there o 30 years leaking PCBs."

Meanwhile, he said, anot pressing factor is at work: a fed court order mandating that long-awaited cleanup be comp ed by the end of 2000.

The bottom line, he said, is t "the judge has issued us a cc order, and we have to comply w it."

Reporter Kurt Van der Duss can be reached at 331-4372 or by e-mail at vanderdussen @heraldt.com.

Discuss the PCB cleanu plan at www.Hoosier-Times.com.

The Herald-Times

The policy of this paper is to strive for accuracy! Like perfection, total accuracy may be unattainable; however it will remain our primary goal and we will not feel satisfied until it is within our grasp.

Scott Clark Schurz Publisher and Editor-in-Chief
Robert S. Zaltsberg Editor
Michael J. Hefron General Manager

1900 South Walnut Street, P.O. Box 909
Bloomington, Indiana 47402, Phone: 332-4401

OUR OPINION

Neal's Landfill plan inadequate

Not completely sealing PCB storage site in a sinkhole area asks for trouble

Sometimes we wonder whether Monroe County's nightmare with its PCB contamination and cleanup will ever end.

The latest chapter in this saga of woe is the Monroe County commissioners' angry criticism of the U.S. Environmental Protection Agency for a change in the plans for the cleanup for the PCB cleanup at Neal's Landfill.

From where we sit, the criticisms appear largely justified. We would expect more from the EPA under a supposedly environmentally-conscious Clinton-Gore administration.

For those who aren't familiar with the problem, the landfill, about four miles west of the Ind. 37 Bypass just north of Whitehall Pike (Ind. 48) was one of six dumping sites for Westinghouse capacitors before about 1970. That was before PCBs were shown to be a potential carcinogen and the cause of other health risks.

Estimates of the number of capacitors dumped in the 18-acre site, which never was licensed as a landfill, range from 10,000 to 40,000. As for contamination levels, the EPA rates anything more than 25 parts per million of PCBs as a potential health risk; "hot spots" in Neal's Landfill have almost 35,000 parts per million.

The original PCB consent decree approved by Federal District Judge S. Hugh Dillin in the mid-1980s called for excavating the entire site — 22,000 truckloads worth of contaminated material — and trucking it to the incinerator on Dillman Road that was planned back then as the means of disposing of the PCBs until public opposition killed the idea.

The plan now in the works calls for excavating all of Neal's Landfill with more than 500 parts per million PCBs for shipment to a Michigan toxic landfill. Then all remaining material with 25 to 500 parts per million would be consolidated on a high spot on the Neal's Landfill site and then covered with an impermeable liner to prevent any further groundwater contamination.

The county commissioners, Brian O'Neill in particular, find this plan totally unacceptable. They point to EPA regulations they maintain prohibit siting *any* landfill, much less toxic ones, in so-called "karst" topography with sinkholes, caves and underground streams. And they point to failure of the plans to include any bottom liner for the site.

About the only good thing we can say about this plan is that it at least would be an improvement on the current mess. But the idea of putting a hazardous waste storage site in a karst area strikes us as even dumber than one in a flood-prone area unless stringent precautions are taken.

Even if a top cap enveloped the materials like an inverted bowl down to a level even with their lowest point, we fear groundwater could migrate into it, especially during heavy rains when the ground is saturated and water tables in karst areas can do strange things. At minimum, we think the PCB material ought to be completely encapsulated in an impermeable package to prevent any water from getting into it.

If the current cleanup proposal, including a top cap, costs Westinghouse corporate owner CBS $16 million and total excavation and transport of the material to Michigan would cost $80 million, complete encapsulation shouldn't cost as much as total removal.

When CBS bought Westinghouse, it bought this problem, too. It has a moral duty to pay for a proper cleanup.

Att. 41

Former Neal's Landfill manager: 'You're going to run into everything'

By Steve Hinnefeld
H-T Staff Writer

Bloomington attorney David McCrea that the oily liquid he had dumped on the ground hundreds of times was called PCB, or polychlorinated biphenyl. The U.S. Environmental Protection Agency says the chemicals cause skin and liver disorders and have been linked in animal studies to birth defects and cancer.

"We didn't know then it was dangerous," Anderson said. "If I'd known that chemical stuff could make me feel like I do today, I'd never have worked one day there. But I was young then. I had three daughters to put through school."

What he knew about the PCB fluid was that "it was a good bolt loosener. Put it on a rusty bolt and it'd loosen right up. We called it 'bolt knocker.'"

McCrea brought Anderson, who now lives in Ellington, Mo., to a Bloomington Utilities Service Board meeting Monday to answer questions about the PCB contamination of Neal's Landfill, which is slated for cleanup by Westinghouse.

The attorney called him "probably the only witness who can give you a first-hand account of what happened there."

Anderson said Westinghouse will find much more than capacitors at

Charles Anderson didn't get paid to manage Ray Neal's Landfill west of Bloomington for several years in the 1960s, but Neal let him keep half the money he could make by scavenging trash from the landfill and selling it to junk dealers and salvage yards.

And among the best finds in the truckloads of other people's wastes were the worn-out electrical capacitors that were sent to the landfill from the Westinghouse Electric Corp. plant on Curry Pike.

Anderson and his helpers would break the metal capacitor shells open with a lawn mower blade and a hammer. They would dump the oily fluid that filled the boxes on the ground. Then they would set the boxes on a wooden pallet and light a fire under them, catching melting solder compound in a metal cup. They would sell the casings, the solder and the copper coils that were packed inside the capacitors.

"That was our main thing, was from Westinghouse," Anderson recalled Monday night, "because that's where we'd get our most metal. I'd say we cut down about 200 of them a week."

It wasn't until recently that An-

Former Neal's Landfill manager: 'You're going to run into everything

Landfill, from page **A1**

the landfill," which is about five miles west of Bloomington on Ind. 48. He said junked cars and trucks ("Ray let 'em dump them as long as you had a dollar and the title"), old refrigerators and stoves, and barrels of who-knows-what are also there.

"You're going to run into everything when you start digging it up," he said.

Anderson said he worked "six, seven or eight" years at the landfill. He lived right on the site, in a house provided by Neal, who is now deceased. And he helped care for Neal's cattle, which grazed among the trash.

"Ray always had his cows there," he said. "There was one old cow that was 20 years old that was born and raised there."

When he started working at the dump, Anderson said, he set fire to the trash every evening to reduce its volume and keep away rats. Then health officials made Neal convert it to a landfill and cover trash daily with earth. Still, he said, the trash sometimes caught fire and burned for days. Barrels would ignite and explode "like Roman candles."

State inspectors visited "about once a month. I don't know how Ray found out, but he'd come and tell me, don't set no fires tomorrow, the state guys are coming."

Anderson left the landfill about a month before it was closed, around 1970. For a time, he sold fruit at roadside stands around Bloomington and worked as a janitor. He worked off and on as a carnival roustabout for the last five years.

Recently he joined those who are suing Westinghouse over damage to their health from PCBs. Westinghouse officials have said repeatedly that the company only followed accepted practice of the time when it allowed trash haulers to take capacitors to dumps and landfills in the 1960s and early 1970s.

"I don't know, my bones ached the time," Anderson said. "I always blamed it on arthritis or something. Still, at 54 years of age, I shouldn't ache like this.

"That's why I want to go to a doctor and find out what it is," he said. "I just want to feel good again."

ATT. 92A

1401
Bloomington, Ind.
Feb. 28, 1968

Dr. Robert O. Yoho
Ind. State Board of Health
Indianapolis, Ind.

DearrDr. Yoho:

In accordance with the suggestion made during our conversation, recently, we are writing in regard to the private owned open dump. This dump is located on State Road 48, west of Bloomington and is owned by Ray Neal.

This open dumping has been in existence in this place for about 12 years. Of this time, it was used by the county for approximately 6-8 years. However, as of January 1, 1968, the Monroe County Commissioners did not renew this contract.

During the time the county used this open dump, there was a petition circulated with approximately 200 signing. This petition is now on file with the Monroe County Auditor. Of the people contacted living within a two mile radius, just short of 100% were willing to sign the petition.

Residents and taxpayers of this vicinity, consider this to be a very definite health hazard, a nuisance and it greatly reduces the value of our properties. Therefore, we would like to see that this is covered and properly disposed of.

There is consistent burning. It is rat infested, there are packs of dogs which feed there. Also, it's causing highway littering, which is hazardous. Open dumping of septic tank sewage is allowed. Also, cattle run in this area, eating of the garbage.

We have not been able to get any satisfactory results, locally. We would appreciate any assistance you could offer. Upon investigation, Im sure you will understand the deep concern over this health and fire hazard. Thank you for your interest and assistance.

Yours truly
Jeanita Abram R,6 Box 166 K Rt. 3.
Roberta J Paine R,6 Box 269 BG 47
Beverly Kincaid R #6 Ph. 33296 Bloomington

428

July 11, 1968
Thursday

Dear Sir,

I am writing concerning the private dump on Highway 446 West of Bloomington Indiana. (Whitehall Pk.). Numerous complaints have been made to several offices and petitions have been drawn up and signed to close this dump. Monroe County now has a new dump & an incinerator. There is no need for this dump. The conditions are terrible. They burn at least twice a day and last night they burned all night. The debris in our yard this morning was awful. We have a barn full of hay and several horses. They are going to burn us down someday. We cannot even enjoy our property because of these terrible conditions. Please advise if anything is being done about this dump.

Thank you

Mrs. Paul Kemper
R.R. #6 Bloomington, Ind.

Att. 42c

STATE BOARD OF HEALTH

INDIANAPOLIS

INTRA-DEPARTMENT MEMO

DATE: May 5, 1969

FROM: T. E. Cunningham

TO: R. H. Kocher

SUBJECT: Complaint - Open Burning Dump
Ray Neal - Monroe County

Complaints have been received again from Mrs. Heine and Mrs. Kinser, adjoining property owners to the Ray Neal dump. We have prior complaints from these parties in our files. The dump is on Indiana 48 five miles west of Bloomington.

Monroe County adopted the Model Ordinance in 1968. However, the County Health Department apparently refuses to enforce it as to Neal.

Apparently he is burning tires and plastic TV cases again.

Could this be investigated by someone when time schedule allows.

TECunningham/car
cc: Chester Canham
Harry Williams

Att. 42D

October 30, 1968

Richard Neal Trucking
Rural Route 6
Bloomington, Indiana

Attention: Mr. Neal

Gentlemen:

Re: Disposal of Solid Wastes
from Westinghouse Corporation

We cannot certify that your method of handling waste material from the Westinghouse Corporation, Bloomington, is done in a manner that would be considered acceptable.

Your current disposal practices include making a pile of the oil absorbing compounds containing a material called Enterteen and then placing on top of this several truck loads of waste cardboard, broken wooden pallets, waste paper, and defective transformer coils. You then set fire to the pile and allow all combustible material to burn as completely as it will naturally do.

Enterteen is a chlorinated phenolic fluid that has been deliberately compounded to possess a high resistance to burning. Since the method you use incorporates a bonfire type of uncontrolled burning, you may well be producing some of the very toxic gases such as phosgene from this incompletely burned chlorinated compound.

Westinghouse Corporation recognizes the potential toxicity of this material and claims to have a special method for disposing of Enterteen contaminated wastes. The method they have chosen calls for controlled burial. In fact, the method of disposal they outlined during a phone conversation with Mr. Shoaf does not appear to be at all feasible in the Bloomington area because of the local geology.

Very truly yours,

Samuel L. Moore, Chief
Industrial Waste Disposal Section
Division of Water Pollution Control

SLM/pjk
cc: Westinghouse Corporation
Hon. John J. Hooker, Mayor
Mr. Harry Williams
[illegible] Cuthan

Att. 42E

STATE OF INDIANA

INDIANAPOLIS

STATE BOARD OF HEALTH

Address Reply to:
Indiana State Board of Health
1330 West Michigan Street
Indianapolis, IN 46206

May 26, 1972

Mr. Ray Neal
708 Cory Lane
Bloomington, Indiana 47401

Dear Mr. Neal:

Re: Report, Sanitary Landfill Project
S 1/2, Section 33, T.9N., R.2W.
Monroe County

We have completed our review of the above-referenced report which was submitted to the State Board of Health on May 9, 1972, by DeWitt, Richards and Manahan.

Geologic limitations of this site are of such severity as to preclude favorable consideration of sanitary landfilling on this area.

The sloping areas on this site have a very thin cover and could not support a sanitary landfill. The subsurface drainage in this area is through dissolved crevasses in the limestone bedrock, and contamination of ground and surface water is a serious concern.

Based upon geologic studies and observations made of the area it appears that the earth cover of the limestone bedrock on the north side of the ridge would approximate the depth of cover of that on the south side of the ridge. On the south side of the ridge bedrock has been exposed in several instances by excavations for refuse cover material.

While soil borings were reportedly made and depths to which these borings were taken were alluded to in the report, no log of borings accompanied the report.

In view of the foregoing this office cannot consider an approval of this site for the disposal of solid waste.

Very truly yours,

Roland P. Dove

Roland P. Dove, Chief
General Sanitation Section
Division of Sanitary Engineering
AC 317/633-4393

OTC/mkt
cc: DeWitt, Richards and Manahan
Monroe County Health Department
Monroe County Plan Commission
Monroe County Commissioners
Mr. Chester H. Canham

Attachment 23. Att. 44

United States Department of the Interior

FISH AND WILDLIFE SERVICE
BLOOMINGTON FIELD OFFICE (ES)
718 North Walnut Street
Bloomington, Indiana 47401
(812)334-4261

IN REPLY REFER TO:

June 13, 1990

Dan Hopkins
U. S. Environmental Protection Agency (5HS-11)
230 South Dearborn Street
Chicago, Illinois 60604

Dear Mr. Hopkins:

This regards the PCB sites in Bloomington, Indiana, and specifically Neal's Landfill, Section 33, T9N R2W, Monroe County, Indiana.

Recently, the Fish and Wildlife Service (Service) commented on a proposed modification to the existing NPDES permit for Neal's Landfill. The modification would have allowed the removal of the monitoring of lbs/day of total PCBs, and daily flow rate for the plant. Upon file review and preparation of our comments the Service decided to conduct a site visit of the treatment plant, and downgradient areas in order to evaluate existing conditions. As a result of our site visit, we would like to offer the following comments. These comments are of a technical assistance nature only and do not necessarily reflect the views of the Department of the Interior.

There are at least three groundwater seeps on the northern side of the landfill within a few feet of the fence which encircles the primary portion of the landfill, and another spring located approximately 200 feet north of the three seeps. Water from these seeps/springs is apparently collected and piped through gravity flow (pumped over from the north spring) to the treatment plant which Westinghouse has built. This treatment plant as it currently exists, and the manner in which it is being operated:

1) fails to collect all water from these four seeps/spring at normal flows (one of the seeps has even changed where it emanates from the ground as a result of attempts to collect it);

2) fails to transport and contain water that is collected (pipe joints are not all secure);

3) does not appear to be operating even though flows are less than the required 1 cfs;

4) bypasses water during highflows at both the seep/spring collection sites as well as (by design) within the collection system framework;

Att. 45

2-2-84

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

ER-83/1366

JAN 20 1984

HOWARD

Mr. Gene A. Lucero, Director
Office of Waste Programs Enforcement
Environmental Protection Agency
Washington, D.C. 20460

Dear Mr. Lucero:

Pursuant to your request the Department has conducted a preliminary natural resources survey of the Neal's Landfill and Dump sites in Indiana to determine whether there are any resources under Interior's trusteeship at stake and, if so, whether they have been damaged by releases of hazardous substances from the sites.

Our survey determined that no lands, minerals or Indian resources under the Secretary's trusteeship are affected by these sites. However, migratory birds frequent the immediate vicinity of the Landfill site and appear to have been affected.

Over the past two years in support of EPA's remedial action enforcement program the U.S. Fish and Wildlife Service has undertaken several studies of the Neal's Landfill site and in the surrounding area with the goal of ascertaining the extent of contamination by polychlorinated biphenyls (PCBs) in the study area and of identifying impacted populations. The studies included a caged fish study in Richland Creek and one of its tributaries, Conrad's Branch; and sampling of native fish, isopods, crayfish and turtles along with sediment and water from these same two streams. In addition, the FWS has sampled vegetation at the site and participated in a laboratory study of PCB uptake by longear sunfish. The field work cited above was undertaken by personnel of our Bloomington (Indiana) and Rock Island (Illinois) Field Offices. The laboratory study was conducted by personnel of our Columbia National Fisheries Research Laboratory. All aquatic organisms tested were found to contain some level of PCBs as did the downstream water and sediments in Conrad's Branch and Richland Creek. A detailed assessment of FWS study findings was provided to the EPA regional office in Chicago.

Based on the above analytical data, we are not prepared to grant a release from claims for damages to natural resources under Interior's trusteeship caused by releases at the Neal's Landfill site, Monroe County, Indiana. We may be able to reconsider this position if we are involved in the development, review and approval of the remedial action plan for the site.

On the other hand we are prepared to grant such a release for the Neal's Dump site, Owens County, Indiana, providing that the agreed-upon remedial action plan is consistent with the National Contingency Plan.

Sincerely,

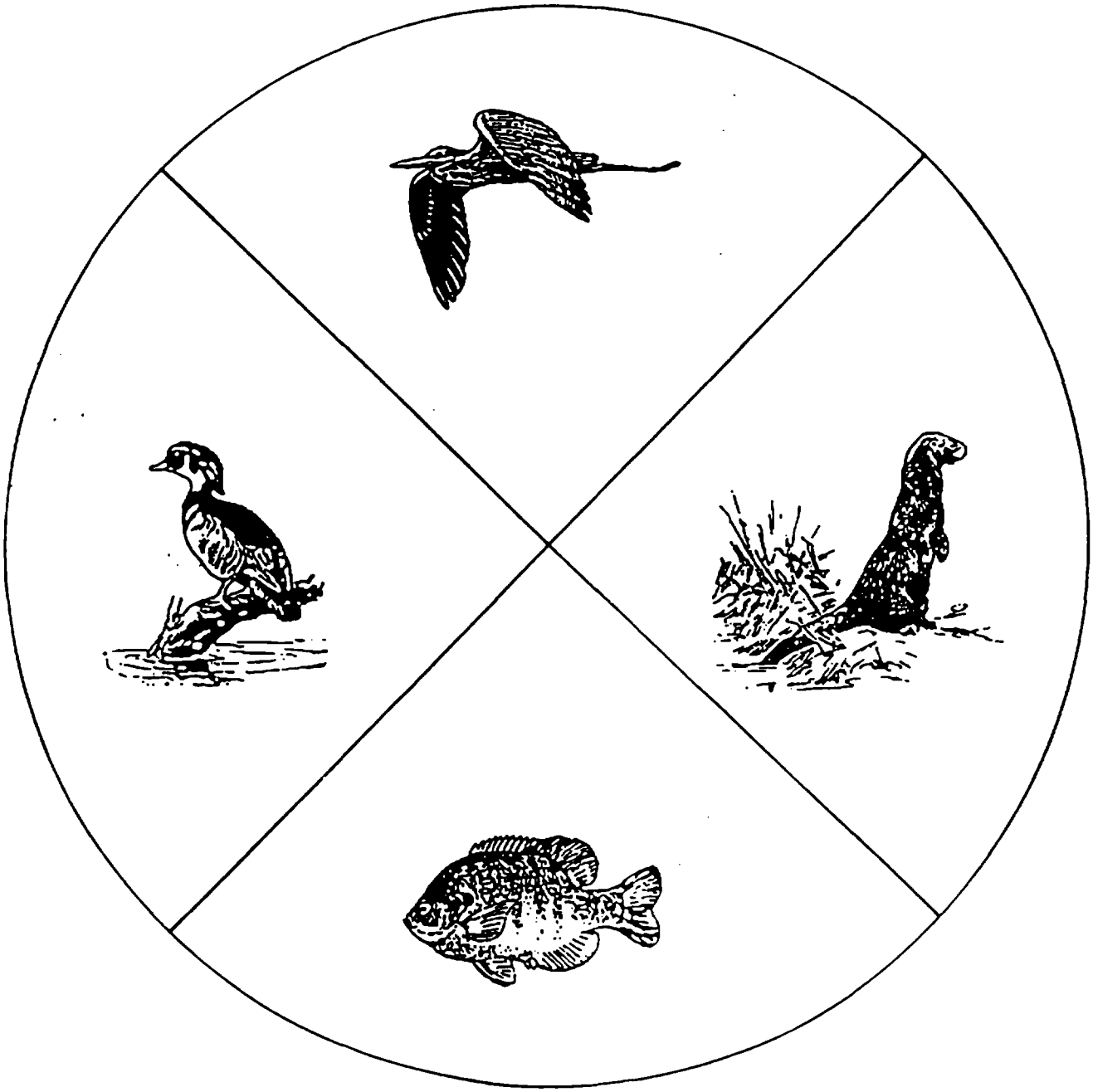
Bruce Blanchard, Director
Environmental Project Review

Att. 46

Biological Report
November 1991

Bloomington Field Office
Bloomington, Indiana

PCBs in Richland Creek Downstream from Neal's Landfill April, 1991



U.S. Fish and Wildlife Service
U.S. Department of the Interior

Table of Contents

Introduction

April 1991 Sampling Effort

The Bloomington Field Office has been concerned with the potential impacts to fish and wildlife resources of Richland Creek resulting from Neal's Landfill for many years. As early as 1981, the Service collected biological samples to determine the extent of PCB migration from Neal's Landfill (Ruelle 1986). The Service continues to have concerns regarding the potential for fish and wildlife impacts resulting from Neal's Landfill despite the interim remedial measures taken to date. There is a lack of useful, up-to-date data regarding PCBs in fish and sediments of Richland Creek, thus we initiated this cursory study.

This study consists of 2 composite whole fish samples and 2 sediment samples. All fish were collected within 100 yards of the Highway 48 bridge over Richland Creek in Monroe County. Sediment samples were collected from the upper end of Conards Branch.

Neal's Landfill Background

Neal's Landfill is 1 of 7 PCB sites in the Bloomington area (Monroe and Owen County), Indiana. It is a National Priority List (NPL) site that has never had a Remedial Investigation (RI) and Feasibility Study (FS) conducted (although it is claimed that the functional equivalent of an RI/FS has been done). In 1985, USEPA, Westinghouse, the City of Bloomington, Monroe County, and the State of Indiana signed a Consent Decree [U.S.A., et al. v. Westinghouse, et al. (Civil Action No. IP 83-9-C and IP 81-448-C)] for the cleanup of these sites. The Consent Decree established how the subject sites were to be remediated, establishing clean-up levels, scope and extent of remedial actions, further monitoring needs, and closure guidelines for each of the sites. One of the requirements in the Consent Decree mandated that Westinghouse build a water treatment plant to treat groundwater discharges from the South Springs, North Spring, and Southwest Seep of Neal's Landfill up to 1.0 cubic foot per second (cfs) [paragraph 59 (a)]. Effluent from the treatment plant was to be less than 1 part per billion (ppb).

Methods

Fish Collection and Sample Preparation

Temperature and conductivity were measured to assist in the effective use of the electrofishing equipment. Electrical output of the electrofishing equipment was adjusted to maximize effectiveness with existing environmental conditions and recorded (amperes, pulse width, and DC volts).

Two composite fish samples consisting of 3 whole fish (1 composite of white suckers and 1 composite of creek chubs) were collected. Target species were retained alive in holding tanks on the raft after capture and kept alive until samples were prepared. Holding tanks containing live fish were transported to the laboratory for sample preparation within an hour of the completion of sample collection. All fish used in the composite samples were measured (length to the nearest cm, and mass to the nearest gram using an OHaus portable electronic balance). A cursory evaluation was made of each fish and any observable external abnormalities (lesions, growths, etc.) were recorded.

Table 1. PCBs in fish and sediment from Conards Branch and Richland Creek, April 1991.

Fish Samples[1]	Individual Data: Mass (g)	Individual Data: Length (cm)	Composite Sample: Percent moisture	Composite Sample: Percent Lipid	Composite Sample: PCB Concentration (ppm)
white sucker	298, 227, 227	29, 29, 27	75.96	3.11	1.95
creek chub	184, 121, 106	24, 22, 21	81.04	1.12	1.25

[1] - whole fish composite samples

Sediment Samples	Mass (g)	PCB Concentration (ppm)
sediment-spring collection overflow basin	> 500	13.99
sediment-midpoint of Conards Branch	> 500	2.85

Utilizing the BMFs in Table 3, multiplied by the average concentration of PCBs in fish from this study (1.6 ppm), could potentially give concentrations of PCBs in bird eggs from 24 ug/g to 355.2 ug/g. These estimated concentrations in eggs are 4-59 times higher than the LOAEL for PCBs in eagle eggs and 28-408 times higher than the LOAEL for PCBs in chicken eggs. Hoffman et al. (1986) associated mean total PCBs of 4.1 ppm in black-crowned night herons with reduced embryonic weight in eggs, which could possibly reduce egg and/or nestling survival. In a laboratory feeding study using Aroclor 1254, Peakall et al. (1973) determined that residues of less than 16.0 mg/kg in bird eggs were not associated with reproductive impairments. Although these BMFs are not specific to great blue heron, green-backed heron, and belted kingfisher, (the species of interest in this study), based on the information presented here, it is likely that fish-eating birds consuming fish from Richland Creek are probably experiencing reproductive impairments associated with the levels of PCBs in forage fish (1.25 to 1.95 ppm wet weight).

Table 3. Biomagnification factors (BMFs) for total PCBs using whole fish to bird eggs.

Bird	Forage Species	Location	BMF	Reference
eagle	chinook salmon	Thunder Bay Lake Huron	59	Kubiak and Best 1991
herring gull	alewife	Lake Ontario	93	Braune and Norstrom 1989
olivaceous cormonant	sheepshead minnow	Galveston Bay	15	King 1989a
black skimmers	sheepshead minnow	Galveston Bay	15	King 1989b
herring gulls	alewife	Great Lakes	111-222	Clark et al. 1988

Implications For the Neal's Landfill Treatment Plant National Pollution Discharge Elimination System (NPDES) Permit.

The first NPDES permit was issued June 7, 1988 with a limit on total PCBs of 1 part per billion (ug/l), which is almost 100 times higher than the U.S. Environmental Protection Agency's Ambient Water Quality Criteria for the protection of freshwater aquatic life (0.014 ppb). The impact of past uncontrolled discharges of PCBs into Conards Branch to the aquatic ecosystem have been well documented (Ruelle 1986); therefore, it would seem prudent to work toward reducing continuing PCB inputs. Since the recent establishment of more stringent new Indiana Water Quality Standards (adopted in December 1989), the adequacy of this permit should be revised to comply with the new Standards. In discussions with IDEM staff, a new NPDES permit limit for PCBs would currently be written for 0.1 ug/l). The existing permitted discharge of 1.0 ppb PCBs in no way reflects compliance with all federal laws.

An attempt was made to modify the NPDES permit in June 1990 to allow bypassing of influent which was 1.0 ppb or less, delete the requirements to monitor and report average or daily maximum lbs/day of total PCBs, and delete reporting of daily maximum flow rate from outfall 001. In essence, this would allow the permittee to discharge as much "treated" water as possible provided the total concentration of total PCBs in the effluent is less than or equal to 1 ug/l, with no records kept to estimate total loading. Based on information learned during an interagency visit to the site and treatment plant on November 26, 1990, it is our understanding that the only way the plant would be capable of "treating" more than 1 cfs would be to bypass that fraction of the influent which is currently less than 1 ppb. At a discharge rate of 1 cfs with PCB effluent concentrations of 1 ug/l, this would allow continued loadings to Conards Branch, Richland Creek, and ultimately the White River at a rate over 70 grams of PCBs every month.

Based on observations made during a second interagency site visit to the treatment plant and water collection system on November 27, 1990, it is obvious that during high flows (i.e. greater than 1 cfs which likely occurs after most substantial rainfall events), much contaminated water is bypassing the collection system. During this visit, we could smell the presence of what appeared to be unnatural chemical odors in the ambient air in the area surrounding Conards Branch. Although we were not able to precisely determine the chemical constituents present, it is an established fact that contaminated groundwater from a National Priorities List site discharges to surface water in this area. IDEM has water quality data from 1988 for Conards Branch and Richland Creek which substantiates the presence of PCBs, dichloroethene, trichloroethane, trichloroethylene, and tetrachloroethylene in this area.

These high-flow surges of contaminants could pose episodic acute toxicity to aquatic life in Conards Branch and Richland Creek, and add to the contaminant loads already in these aquatic habitats. This will only continue to promote chronic adverse impacts to fish and wildlife resources described in this study. It is probable that piscivorous migratory birds and piscivorous mammals are being adversely impacted by the contaminants bypassing the system at high-flows. Insectivorous migratory birds and insectivorous mammals (i.e. bats, possibly including the endangered Indiana bat) which feed primarily on aquatic insects in the Richland Creek area, are also at risk.

Based on the ecological hazards to fish and wildlife discussed in this report, we have calculated a more realistic NPDES permit limit for Neal's Landfill utilizing NOAELs, LOAELs, and BMFs reported herein, and back-calculated an

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Appendix I

Analytical Results from Patuxent Analytical Control Facility

ANALYTICAL REPORT (6-4)
Procedural Blanks - CATALOG: 3020002

Lab Name: PACF

06/05/91

P.O.#: PACF-1-0064

Analyte: PCB-TOTAL

Lab Sample No.	Result Total UG
2058	0.

Average Total UG	-	Standard Deviation	-

ANALYTICAL REPORT (6-5)
Duplicates - CATALOG: 3020002

Lab Name: PACF

06/05/91

P.O.#: PACF-1-0164

Analyte: PCB-TOTAL

Sample Number	Sample Matrix	Initial Result (ppm Wet Wt.)	Duplicate Result (ppm Wet Wt.)	Average	Relative % Difference
2	Sediments	2.85171	2.27272	2.56221	22.59697

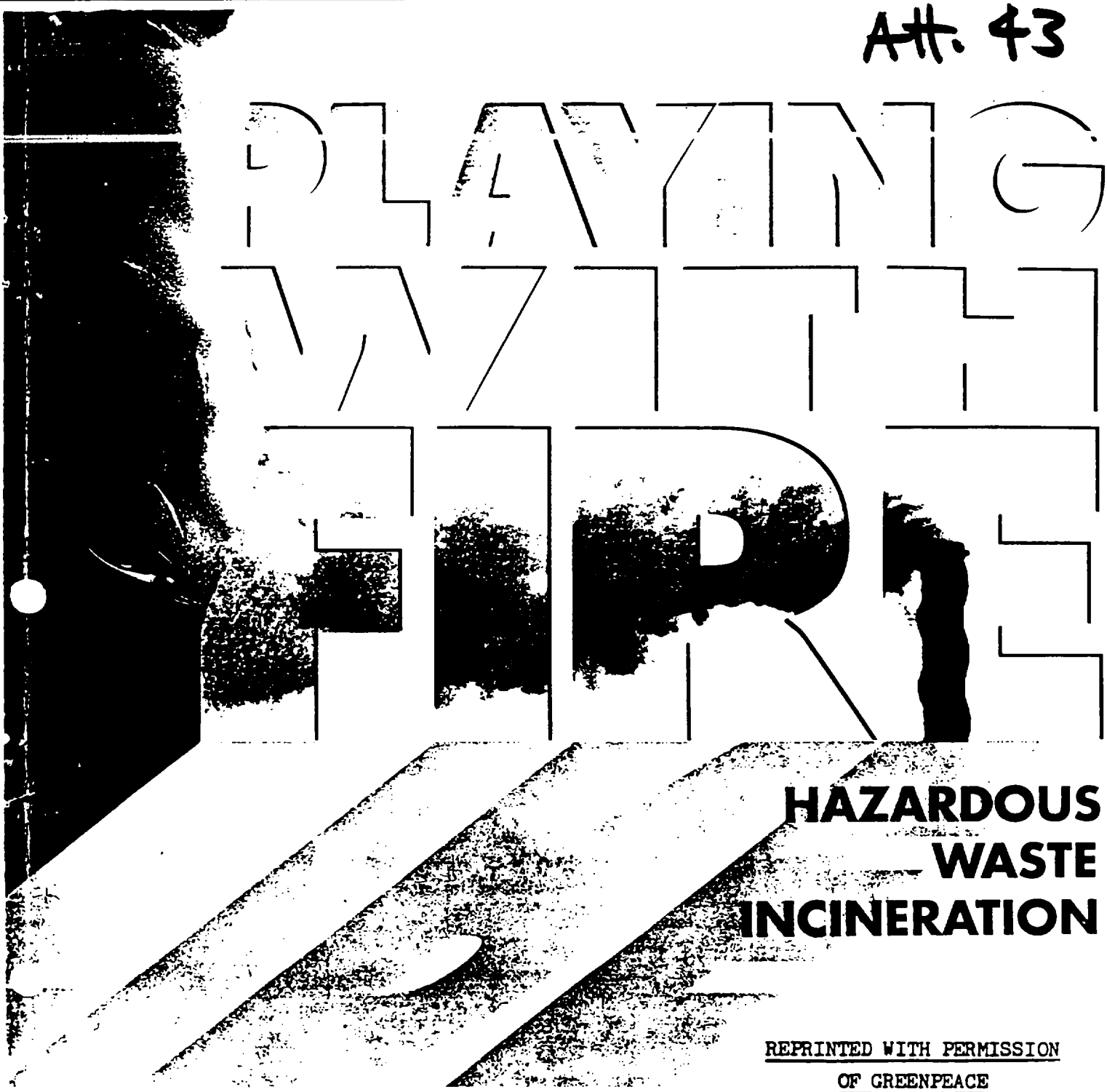
ANALYTICAL REPORT (6-8)
QA/QC Comments - CATALOG: 3020002

Lab Name: PACF 06/05/91 P.O.#: PACF-1-0064

The chromatographic identification of PCBs was confirmed by mass spectrometry in sample 2059. JM
QA/QC APPROVED. CPR

Att. 43

PLAYING WITH FIRE



HAZARDOUS WASTE INCINERATION

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By Pat Costner and Joe Thornton

A *GREENPEACE* REPORT

Products of Incomplete Combustion

During incineration, fragments of partially burned waste chemicals stabilize or recombine to form new chemicals, called PICs. Although these chemicals are estimated by U.S. EPA to number in the thousands, only approximately 100 have been fully identified.

Many of these PICs pose far greater health and environmental threats than the original wastes. PICs identified in incinerator emissions include the polychlorinated dioxins and furans, PCBs, hexachlorobenzene, and other complex organochlorines that are highly toxic, persistent, and bioaccumulative.

According to U.S. EPA, as much as 1 percent of the mass of waste chemicals fed into an incinerator may exit the stack unburned or incompletely burned. Based on these data, an average-sized commercial incinerator (70 million pounds per year), emits these chemicals, predominantly PICs, into the air at the rate of 700,000 pounds per year.

Releases of Heavy Metals

Metals cannot be destroyed by combustion. Moreover, incineration changes some metals into forms that are more toxic, more easily inhaled or ingested by living organisms, or more easily leached from incinerator ashes.

Nonetheless, metals are common constituents in the wastes burned in commercial incinerators. At least 19 metals have been identified in the stack gases, ashes, and other residues of hazardous waste incinerators.

The pattern of distribution among air emissions, ashes, and residues of pollution control devices not only differs for each metal, it also varies with incineration temperature and the chlorine content of the waste. For the more volatile metals, such as lead, cadmium, and mercury, as much as 50 percent of the metal fed into the incinerator may be emitted in stack gases. For most metals, the proportion emitted in stack gases increases with higher temperatures and higher chlorine content in the wastes.

Based on estimates of the average metals content of incinerated hazardous waste and average partitioning factors of those metals to air emissions and residuals, a commercial incinerator burning 70 million pounds of hazardous waste per year emits 204,000 pounds per year of heavy metals in its stack gases, and deposits another 670,000 pounds per year of heavy metals in solid and liquid residues.

Recommendations

Greenpeace recommends that federal and state governments implement the following policies:

- A ten-year moratorium on siting, permitting, or increasing the capacity of hazardous waste incinerators and all other waste-burning facilities, including cement and aggregate kilns and other industrial furnaces and boilers;
- An immediate prohibition of the incineration of wastes containing metals, chlorine or other halogens at all waste-burning facilities currently permitted;
- The establishment of a mandatory pollution prevention program requiring all existing or potential sources of pollution, including manufacturers and government-owned facilities, to take the following steps:
  - Assess all products and processes to identify and quantify all toxic substances+ used, emitted, discharged, or otherwise released from each facility;
  - Discontinue the use and generation, both deliberate and unintentional, of all chemicals that are highly persistent or bioaccumulative or are associated with persistent or bioaccumulative by-products or metabolites.
  - Prepare a detailed plan for phasing-out the manufacture, use, emission, and discharge of all toxic substancesss with a specified timeline not to exceed ten years for 100 percent elimination.

+ A toxic substance is defined as any substance that causes harm to or threatens human or environmental health through it overt toxicity, either acute or chronic, or through its inordinate quantity or concentration.

Table 1.2

Partial Catalog of Known Errors in DRE Measurement

Parameter	Percent Error
Volumetric flow of mixture	5.0%
Concentration of POHC species	4.5%
Specific gravity of POHC	0.7%
Density of water	0.2%
Temperature of stack gas	3.3%
Pressure of stack gas	0.3%
Volumetric flow of stack gas	1.5%
Concentration of POHC in stack gas	20.0%

Source: Welch 1986.

chemical most difficult to destroy. However, under three other incineration ranking systems, from 7 to 12 of the 28 chemicals are more difficult to destroy than carbon tetrachloride (see Table 1.1).

Furthermore, scientists found the incinerability of chemicals to vary in a complex and somewhat unpredictable way with incinerator temperature, available oxygen, waste feed rates, and waste composition:

> Because of the inevitable catalytic and inhibitive interactions between species, the rates of reaction or destruction of hazardous compounds in a mixture can be considerably different from those observed under single-compound conditions....[I]t is clear that any destruction criteria based upon single-compound studies would be overly simplistic as a tool for assessing the relative ease or difficulty of thermal destruction of real hazardous materials. If inhibitory interactions exist, single-component destruction data will be inadequate for assessing the behavior of the system. In this case, the extent of destruction of some species in the mixture will be less than that observed in single-component experiments. Consequently, additional data...will be needed to assess the situation. However, the amount of data needed to clearly describe the behavior of all possible mixtures would be prohibitively large and costly. (Senkan 1988)

In summary, there is no sound basis for assuming that the demonstration of a DRE of 99.99 percent during a trial burn of one or more POHCs proves that this level of destruction will be achieved during the daily incineration of complex waste mixtures over years or even decades. Furthermore, POHCs presumed to be relatively easy to destroy may produce PICs that are extremely difficult to incinerate (Staley 1986).

Propagation of Error

Ignoring the propagation of errors in the computation of a DRE can lead to the derivation of a nominal DRE that deviates radically from the actual DRE. At present, DREs are calculated through a multi-step process using data gathered from numerous sources by a variety of techniques. There is inherent imprecision and inaccuracy in each step of this process, ranging from sampling and analytical procedures to experimental design and human implementation of that design. For example, one survey of the sampling trains commonly used to collect stack gas during trial burns found the accuracy of the devices in trapping POHCs for DRE determinations to vary by +/- 50 percent or more (Jakanty 1989). In another study, researchers found that "recovery efficiencies of selected POHCs from the VOST [sampling device] ranged from...37.82%...for methyl vinyl ketone...to 118.1% for chloroform." (Robb 1986)

Once analysts have attempted to quantify the POHC captured in the sample, that concentration is multipled by the total flow rate of gases out of the smokestack in order to calculate the final DRE. Flow rates, too, are extremely imprecise, according to an evaluation of eight full-scale incinerators:

> Even the stack gas flow rate measurements are subject to large errors, which, in turn, increase errors in such critical measurements as residence times and oxygen concentrations....[S]tack gas measurements

High temperatures, however, cannot be relied upon to provide complete combustion. As noted above, incinerators that appear to provide ideal combustion conditions always contain localized pockets within the furnace where temperature and other conditions vary, resulting in PIC emissions (U.S. EPA 1990).

Furthermore, extensive evidence suggests that PICs form after combustion products have left the furnace and entered cooler parts of the incinerator, such as the smokestack, the pollution control devices, or even the ambient air outside the stack. One study of incinerator PICs concluded:

> [I]t is quite likely that trace amounts of the above species [a range of PICs, including dioxins] could be formed in the cooling combustion gases if the composition of the system corresponded to those assumed. One can also speculate that chemically simpler species...would be more likely to be formed at detectable concentrations than those which require a longer sequence of elementary reaction steps. (Chang 1987)

In these cooler zones of the incinerator, PIC formation reactions appear to dominate the intended oxidation reactions within the furnace. According to another review:

> Once in the cool zone, temperatures may be sufficiently low that radical-molecule reactions with stable combustion end products now present in high concentrations, e.g., CO_2, H_20, and HCl, occur at a much slower rate. As a result, radical-radical recombination routes may now become kinetically significant....Once formed, these molecules are not subjected to high temperatures and may exit the incinerator undestroyed. (Dellinger 1988)

The formation of dioxins and furans occurs on fly ash within pollution control devices long after combustion gases have left the high-temperature furnace. In its regulatory proposal for hazardous waste incinerators, U.S. EPA concluded as follows:

> Specifically, laboratory data have shown increases in CDD/CDF [chlorinated dibenzodioxin/dibenzofuran] concentrations in fly ash exposed to combustion gases in the range of 250 to 350 degrees C, and full scale tests have shown increases in CDD/CDF concentrations across boilers and high temperature ESPs [electrostatic precipitators]. These suggest that incomplete destruction of organic material in the combustion zone and adsorption of this material on entrained fly ash significantly increases the possibility of subsequent formation of CDD/CDF on downstream surfaces that have temperatures in the range of 250 degrees to 350 degrees C. (U.S. EPA 1989b)

In several studies of municipal waste incinerators, only a fraction of the PCDD found exiting pollution control devices—ranging from 1 to 11 percent—were present as the flue gases left the combustion chamber (Hagenmeier 1987; Commoner 1987). One reviewer wrote, "Because these reactions take place in the cooler parts of the incinerator which are downstream of the furnace, PCDD/PCDF [polychlorinated dibenzo-*p*-dioxin/polychlorinated dibenzofuran] are not affected by the destructive influence of the high temperatures that occur in the incinerator furnace." (Commoner 1987).

On the other hand, increasing temperatures in an incinerator may create more problems than it solves. Elevated temperatures have been associated with puff upsets, in which wastes volatilize too quickly and escape unburnt. According to one reviewer, "Increasing kiln temperature and rotation speed can adversely affect puff intensity, due to increased devolatilization and liquid evaporation rates." (Linak 1987) As discussed in Chapter 4, higher temperatures may also increase emissions of heavy metals.

In full-scale tests of operating incinerators, high temperatures have not prevented PIC formation and release. A U.S. EPA review of available data on toxic emissions from waste incinerators found that the 15 most common PICs were released "from incinerators, boilers, and kilns over a wide range of process conditions. For example, temperatures ranged from 700 to 1,500 degrees C, residence times from 0.2 to 6 seconds, and oxygen concentrations from 2 to 15 percent." (Trenholm 1986)

Oxygen Availability

Incinerators must also provide an adequate supply of oxygen to allow for oxidation reactions to proceed. As with temperature, however, attempts to provide adequate oxygen may create new problems and result in increased toxic emissions.

Two studies of oxygen supply in hazardous waste incinerators under conditions of relatively constant temperature and waste feed found that increasing oxygen levels resulted in both decreased DRE and increased PIC emissions. While the incinerator appeared to require a certain minimum of available oxygen (approximately 130 percent of the stoichiometric quantity), adding more oxygen resulted in combustion upsets (Staley 1985, Staley 1986). According to one of the studies:

Fugitive Emissions

Fugitive emissions are waste constituents accidentally released during storage and handling. The immediate effects of such releases may be severe. Because fugitive emissions escape close to the ground, the "sum of all fugitive emissions inflicts 10 to 40 times as much environmental damage as total routine smokestack emissions," according to one analysis (Flam 1991). The Science Advisory Board of U.S. EPA cautioned:

> Fugitive emissions and accidental spills may release as much or more toxic material to the environment than direct emissions from incomplete waste incineration....A potential exists for environmental and human exposures as chemicals are removed from storage containers at the generator site, moved to transportation vehicles, shipped to the incinerator, and moved about within the incineration facility." (U.S. EPA 1985)

At one large commercial incinerator burning pesticide-related wastes, gross fugitive emissions were estimated at 10,000 pounds per year. Ninety-three percent of the chloroform and 62 percent of the toluene in the air at this incinerator were identified as fugitive emissions (Travis 1984).

At a large cement kiln burning commercial hazardous wastes at the rate of 9,600 pounds per hour, fugitive emissions were estimated at approximately 36,000 pounds annually (Systech 1990). Because fugitive emissions are unplanned and escape from multiple locations across a large facility area, precise quantifications are difficult, if not impossible, to provide.

Catastrophic releases through fires and explosions also pose a risk to neighboring communities. Hazardous waste incinerators in the U.S. have been beset by occasional catastrophic events (Petzinger 1985). Commercial incineration facilities may typically store several million pounds of waste on-site at any one time (Stein 1990). According to U.S. EPA's Science Advisory Board,

> Catastrophic accidents, especially near incineration sites where large quantities of liquid hazardous wastes are stored and burned, require the ability to mount rapid emergency responses. Typically, an emergency plan will need to consider the probability of chemical spills, fires and explosions, and atmospheric dispersion and exposures of chemicals, and incidences of poisonings and injuries. These plans should also include the development of population evacuation procedures. (U.S. EPA 1985a)

Releases During Waste Transport

Hazardous wastes may be released into the environment during transport to an incinerator from waste generators or treatment/blending facilites. An average incinerator burning 70,000,000 pounds of waste per year will receive over 1,500 tanker/truck shipments per year, or more than 28 trucks per week. According to the Science Advisory Board of U.S. EPA:

> The greater the traffic between a source and an incinerator, the more likely is the incidence of spills....The likelihood of exposure...will be influenced by the total annual amount of material incinerated in a region and the capacity of the transport vehicles. (U.S. EPA 1985a)

The U.S. Office of Technology Assessment reported more than 78,000 incidents involving the release of hazardous materials during transport in the years 1976-1984 (OTA 1986). In testimony presented before a U.S. Congressional committee, a New Jersey official reported that New Jersey State Police inspected 8,700 trucks carrying hazardous materials in 1987. Of that number, about 36 percent were immediately pulled out of service and not allowed to leave the inspection site without repair or correction of violations (Long 1989).

A probability analysis for a large cement kiln burning hazardous wastes found that a tanker accident associated with a major toxic release was likely to occur once every five years (Murphy 1984). The public health and environmental impacts associated with such releases during transport may be significant.

compounds. Fossil fuels contain little or no halogens and associated compounds. As detailed in Chapter 5, PICs resulting from the incineration of halogenated material (such as the chlorinated dioxins, furans, and PCBs) are far more toxic than PICs from fossil fuel burners.

PICs in Ash Residues

One study of incinerator bottom ash identified 37 PICs, some of which were chlorinated species. The concentrations of these PICs in the ash ranged from 0.1 to 500 parts per million (ppm) (Van Buren 1985).

Table 3.3

Products of Incomplete Combustion From Hazardous Waste Incineration

Acetone (1,3)
Acetonitrile (5)
Acetophenone (1)
Benzaldehyde (1,4)
Benzene (1,3,4,5)
Benzenedicarboxaldehyde (1)
Benzofuran (4)
Benzoic acid (1)
Bis(2-ethylhexyl) phthalate (1,5)
1-Bromodecane (4)
Bromofluorobenzene (4)
Bromoform (3)
Bromomethane (3,5)
Butylbenzyl phthalate (1)
Isooctane (3)
Carbon tetrachloride (1,2,3,4,5)
Chlorobenzene (1,3,4)
1-Chlorobutane (4)
Chlorocyclohexanol (1)
1-Chlorodecane (4)
Chlorodibromomethane (3)
2-Chloroethyl vinyl ether (3)
Chloroform (1,2,3,4,5)
1-Chlorohexane (4)
Chloromethane (3,5)
1-Chlorononane (4)
1-Chloropentane (4)
Cyclohexane (1)
Cyclohexanol (1)
Cyclohexene (1)
1-Decene (4)
Dibutyl phthalate (1)
Dichloroacetylene (2)
Dichlorobromomethane (3)
1,2-Dichlorobenzene (4,5)
1,4-Dichlorobenzene (4,5)
1,1-Dichloroethane (5)
1,2-Dichloroethane (3,4,5)
1,1-Dichloroethylene (3,5)
Dichlorodifluoromethane (5)
Dichloromethane (1,3,4,5)
2,4-Dichlorophenol (5)
Diethyl phthalate (1)
Dimethyl ether (3)
3,7-Dimethyloctanol (4)
Dioctyl adipate (1)
Ethenylethylbenzene (1)
Ethylbenzaldehyde (1)
Ethylbenzene (1,3)
Ethylbenzoic acid (1)
Ethylphenol (1)
(Ethylphenyl)ethanone (1)
Ethynylbenzene (1)
Formaldehyde (5)
Heptane (4)
Hexachlorobenzene (2,5)
Hexachlorobutadiene (2)
Hexanal (4)
1-Hexene (4)
Methane (3)
Methylcyclohexane (4)
Methyl ethyl ketone (5)
2-Methyl hexane (4)
3-Methyleneheptane (4)
3-Methylhexane (4)
5,7-Methylundecane (4)
Naphthalene (1)
Nonane (4)
Nonanol (4)
4-Octene (4)
Pentachlorophenol (5)
Phenol (5)
Polychlorinated biphenyls (PCBs) (2)
Polychlorinated dibenzo-*p*-dioxins (PCDDs) (2,5,6)
Polychlorinated dibenzofurans (PCDFs) (2, 5, 6)
Pentanal (4)
Phenol (1,5)
Phenylacetylene (1)
Phenylbutenone (1)
1,1'-(1,4-Phenylene) bisethanone (1)
Phenylpropenol (1)
Propenylmethylbenzene (1)
1,1,2,2-Tetrachloroethane (4,5)
Tetrachloroethylene (1,2,3,4,5)
Tetradecane (4)
Tetramethyloxirane (1)
Toluene (1,3,4,5)
1,2,4-Trichlorobenzene (4,5)
1,1,1-Trichloroethane (1,3,5)
1,1,2-Trichloroethane (5)
Trichloroethylene (1,2,4,5)
Trichlorofluoromethane (3)
Trichlorotrifluoroethane (4)
2,3,6-Trimethyldecane (4)
Trimethylhexane (1)
2,3,5-Trichlorophenol (5)
Vinyl chloride (3,5)

(1) Trenholm 1986 (eight full-scale hazardous waste incinerators)
(2) Dellinger 1988 (turbulent flame reactor)
(3) Trenholm 1987 (full-scale rotary kiln incinerator)
(4) Chang 1988 (turbulent flame reactor)
(5) U.S. EPA "PIC database" in U.S. EPA 1989b (review of available data at varied units)
(6) U.S. EPA 1987c (two full-scale rotary kiln incinerators).

lifetime dose for approximately 73 million humans, based on that agency's cancer risk specific dose of 0.006 picograms per kilogram of body weight per day (pg/kg/day) (U.S. EPA 1985b). Of course, not all dioxins emitted from an incinerator will be directly consumed by humans. However, these complex organochlorines are highly persistent in the environment while their tendency to bioaccumulate leads to their concentration in the food chain.

In 1983, tests at the Kommunekemie hazardous waste incinerator in Denmark found total PCDD emissions at the rate of 51.5 ng/m^3 from one of the facility's three incinerators. No congener-specific data were available. Based on an average total stack gas flow rate of 170,000 m^3/hour for all three Kommunekemie incinerators, dioxin emissions from the entire facility can be estimated at 61 grams per year, assuming annual operating time of 7,000 hours (Bergstrom 1983).

PCDDs and PCDFs have also been identified in the air emissions of cement kilns burning chlorinated waste. In 1988 and 1990, a waste-burning kiln in California, U.S.A., was emitting PCDDs and PCDFs at rates as high as 0.145 grams and 0.346 grams per year, respectively, expressed as TCDD equivalents (KAPCD 1989; Stein 1990). At another U.S. kiln burning hazardous waste, chlorinated dioxins and furans were detected in stack emissions at a total concentration of 44.8 ng/m^3 (U.S. EPA 1987c). Dioxin emissions at lower concentrations have been documented at a cement kiln in Norway that burned chlorinated wastes (Davis 1987).

Little research has been carried out in quantifying PCDD/PCDF concentrations in incinerator residues. However, U.S. EPA's National Dioxin study noted that PCDDs/PCDFs, including TCDD, were detected in ash from several incinerators (U.S. EPA 1987c). Because disposal of contaminated ash endangers groundwater and surface water, PCDs that reduce air emissions of dioxin by increasing ash contamination provide little improvement from an overall environmental perspective.

One rotary kiln incinerator burning mixed chlorinated wastes produced fly ash with an average PCDD/PCDF content of 323 ppm; average concentration of the TCDD congener was 1.9 ppm (U.S. EPA 1987c). Dioxin concentrations in the ash from this kiln remained high even when the incinerator's afterburner was operating (U.S. EPA 1987b). Dioxins were also found at 148.2 ppb in bottom ash from the industrial waste incinerator burning chlorinated waste (U.S. EPA 1987c). Greenpeace tests of fly ash from the Kommunekemie incinerator found a total PCDD/PCDF content of 22 ppb (Rasmussen 1990)].

Table 4.5

Air Emissions of Heavy Metals from U.S. Hazardous Waste Incinerators

Incinerator type (quantity burned)	Emissions (lbs/yr)
Average commercial incinerator *(70 million lbs/yr)*	203,700
Total U.S. commercial incinerators *(1.3 billion lbs/yr)*	3,783,000
Total U.S. commercial and on-site incinerators *(3.6 billion lbs/yr)*	10,476,000

Note: based on 1.5 percent average metals content in hazardous waste (Systech 1990) and average air releases of 19.4 percent of metals fed to incinerator (Carroll 1989).

Air Emissions of Metals

Only limited information is available to quantify total releases of heavy metals from hazardous waste incinerators. Such quantities vary directly with the quantity of metals fed to the incinerator.

In its review of available literature, U.S. EPA noted that "insufficient testing for metals levels in incinerator emissions has been conducted to determine the average, or reasonable worst-case levels of metal emissions to be expected from hazardous waste incinerators." (U.S. EPA 1990)

In one study of eight incinerators, emissions of airborne lead were as high as 23 pounds per day at one incinerator, almost 6,000 pounds per year at average operating rates. Cadmium emissions were 67 pounds per year, and the rate for nickel was as high as 452 pounds per year at average operating rates. "All of these metals are known to be detrimental to human health at extremely low concentrations," the authors wrote (Trenholm 1984).

An average commercial hazardous waste incinerator (70 million pounds per year), burning waste containing an average metal content of 1.50 percent (Stein 1990), would release approximately 204,000 pounds of heavy metals in

Table 4.6

Metals in Hazardous Waste Incinerator Ash

Metal	Concentration (ppm)
Antimony	8.0
Arsenic	<2.0
Barium	150
Beryllium	<0.2
Cadmium	2.0
Chromium (hexavalent)	0.083
Chromium (total)	71.0
Copper	13,800
Lead	30.0
Mercury	0.2
Nickel	190
Selenium Silver	0.4
Thallium	2.0
Zinc	280
Total	14,576.9

Source: Boegel 1987.

dinarily toxic, persistent, and bioaccumulative contaminants are now ubiquitous in the environment and the human population.

At the lowest doses tested—in the low parts per trillion and even quadrillion range—TCDD has caused cancer (U.S. EPA 1988b), birth defects and reduced fertility (U.S. EPA 1985a), immune suppression (Sonawane 1987), and neurological/developmental/behavioral impairment (Schantz 1986, Bowman 1989a, Bowman 1989b) in laboratory animals. One of U.S. EPA's dioxin scientists, Dr. Donald Barnes, has described TCDD's biological interactions as being like those of hormones, which can initiate a chain reaction within a cell when only one molecule is present (Luoma 1990)

"In terms of low dose potency, 2,3,7,8-TCDD and the HxCDD [hexachlorodibenzo-*p*-dioxin] mixture are the two most potent carcinogens evaluated by the U.S. EPA's Carcinogen Assessment Group," according to a comprehensive U.S. EPA review of dioxins (U.S. EPA 1985b). A single gram of dioxin is sufficient to pose a one-per-million lifetime cancer risk for 93 million adults, based on U.S. EPA's calculated risk specific dose of 0.006 pg/kg/day (U.S. EPA 1985b). In addition to its direct ability to cause cancer, TCDD also enhances the carcinogenicity of other chemicals. According to the former head of U.S. EPA's Carcinogen Assessment Group:

> There is no theoretical basis for making even ballpark estimates of the risk posed by promoters and cocarcinogens to exposed persons because the mechanism for promotion is not well understood and the degree of total exposure of the human population to the numerous carcinogens in the environment cannot be well quantified. However, it is possible that TCDD could significantly increase human cancer as a promoter or cocarcinogen at exceedingly low levels of TCDD exposure. (Albert 1980)

TCDD and similar halogenated PICs may have profound long-term effects on behavior and intellect. For example, when female rhesus monkeys were fed TCDD at doses of 5 to 25 parts per trillion, their infants exhibited neurological and behavioral effects, including impaired response to visual stimuli, impaired performance in learning tasks, increased aggression in peer groups, and altered relationships with their mothers (Schantz 1986, Bowman 1989a, Bowman 1989b)

Structurally similar to the chlorinated dioxins and furans, PCBs are also similar, although less potent, in their biological effects. One study found statistically significant impairment of cognitive functioning among human infants born to mothers consuming Great Lakes fish contaminated with PCBs at levels ubiquitous in that ecosystem. Effects included sluggish emotional responses, impaired visual, verbal, and quantitative memory function, and reduced birth weights and skull sizes (Fein 1984, Jacobson 1988, Jacobson 1990). The degree of impairment increased with greater doses and was primarily caused by cross-placental transfer of PCBs from the mother to the child (Jacobson 1990).

A scientific task force reviewing the literature to date on humans exposed to TCDD in Agent Orange found conclusive statistical associations between exposure to that herbicide and its contaminants and elevated rates of non-Hodgkin's lymphoma and soft tissue sarcoma (forms of cancer), skin disorders, subclinical toxicity to the liver, and porphyria cutanea tardia (a metabolic disorder). The authors also found that a weight-of-evidence evaluation favored statistically significant associations between exposure and Hodgkins' disease, neurological effects and reproductive/ developmental effects. Finally, the authors found suggestive evidence which lacked statistical significance that the exposed group exhibited elevated rates of leukemia, cancer of seven different sites, psychosocial effects, immunological abnormalities, and other effects (Clapp et al. 1990).

The link between TCDD and cancer in humans has been further corroborated by a study of 5,172 male chemical workers at twelve facilities that manufactured TCDD-contaminated chemicals. In the most exposed subgroup of these workers, scientists from the National Institute of Safety and Health found a 1.5-fold increase in all cancers, with a 9-fold increase in soft tissue sarcoma and a 1.5-fold increase in respiratory cancer (Fingerhut 1991).

Other halogenated aromatic compounds such as the other PCDDs, PCDFs, chlorophenols, chlorobenzenes, polychlorinated biphenyls (PCBs), polybrominated biphenyls (PBBs), and chloronaphthalenes, appear to exert effects similar to those of TCDD, possibly by a similar mechanism. However, these effects are generally manifested at greater doses than those required for TCDD to produce the same effects (Webster 1990, U.S. EPA 1985b).

Many halogenated PICs—ranging from carbon tetrachloride to the PCDFs—are also known or suspected carcinogens (U.S. OTA 1987). In few cases, if any, has the ability of these com-

grazing in contaminated areas (U.S. EPA 1988a).

According to a Canadian study, 93.1 percent of dioxin intake among Canadians is via food ingestion. In the accompanying market basket study, animal products were found to contribute more than 98 percent of dietary intake of dioxin, with specific contributions as follows: milk products, 53.3 percent; eggs, 18.4 percent; beef, 17.8 percent; and poultry, 8.6 percent. This same report identified air inhalation as the second most important pathway of dioxin exposure, contributing 4.3 percent of total exposure (OMAF 1988).

Cows grazing near municipal waste incinerators in Switzerland have shown significantly elevated levels of dioxins in their milk—up to ten times the levels found in milk from cows raised far from incinerators (Rappe 1987). Hexachlorobenzene and other halocarbons have also shown a tendency to accumulate in dairy products from areas near industrial sources using chlorine (Rappe 1987). Similarly elevated PCDD levels in cow's milk produced near garbage incinerators were also documented in the Netherlands (MPH 1989).

Metals, too, may enter dairy products, but usually in lower ratios than those associated with complex halocarbons. The exposure assessment for a waste-burning cement kiln in a rural area found that milk and meat ingestion would account for approximately 14 percent of total exposure for mercury and thallium, and 12 percent of total exposure for selenium and iron (Stein 1990).

Table 5.3 summarizes estimated routes of exposure for the area surrounding that facility. It should be noted that this exposure assessment was in an area with few freshwater ecosystems, resulting in very low estimates for intake via fish consumption.

Role Of Incinerators in Global Halocarbon Contamination

> [C]ombustion is the only source of sufficient size and ubiquity to account for the PCDD and PCDF in human adipose tissue. (Eitzer 1986)

Because of their persistence, PCDDs/PCDFs are now ubiquitous in the world's air, water, and soil, even in areas remote from potential sources of these pollutants. Once dispersed into the environment, these and other persistent pollutants may remain intact and fully toxic for years. For example, one study has estimated the half-life of TCDD in soil to be about 29 years (U.S. EPA 1988a). Furthermore, PCDDs/PCDFs are also ubiquitous in the food web and in many species, including humans, around the entire planet (C. Travis 1989).

PCDDs, PCDFs, PCBs, chlorobenzenes, chlorophenols, and a range of chlorinated methanes, ethanes, and ethylenes found in incinerator emissions have been identified as ubiquitous contaminants in the tissues of the U.S. population (Stanley 1986). Samples of human adipose tissue in Sweden, (Stanley 1986) and southern Vietnam (Commoner), have also been found to carry a full spectrum of PCDDs and PCDFs. The average U.S. citizen now carries 1,178 parts per trillion (ppt) of dioxins and furans in his or her fatty tissues (C. Travis 1989), including at least 6 ppt of TCDD (Stanley 1986).

Calculated average exposures suggest that humans in industrialized nations are ingesting PCDDs and PCDFs in quantities that are the toxic equivalent of 1 to 3 nanograms TCDD per kilogram of body weight per day (Roberts 1991). Based on U.S. EPA's cancer potency estimate for TCDD, such an intake poses cancer risks to the general population of 166 to 500 per million—far in excess of the one per million *"de minimis"* regulatory standard. Such a cancer risk amounts to 600 to 1,200 cancer deaths each year in the U.S. due to dioxin exposure. Furthermore, it raises the possibility of subtle but widespread occurrence of birth defects, immune suppression, and developmental impairment.

Nursing infants who ingest PCDDs/PCDFs and other complex halocarbons with their mothers' milk suffer perhaps the highest levels of exposure to these substances. It has been estimated that in just one year of breast feeding, an average infant in the U.S. will accumulate 189 times the lifetime PCDD/PCDF dose associated with a one per million cancer risk (Schechter 1987). Mother's milk samples from the general population have shown significant levels of other halocarbons emitted from incinerators, including PCBs and hexachlorobenzene (Jensen 1983, Jensen 1987).

Hazardous waste incinerators are important sources of complex halocarbons to the environment. Combustion of halocarbons and/or carbon-based substances with halogen sources—in garbage and hazardous waste incinerators, industrial furnaces and metal smelters burning

Table 6.1

Quantities of Hazardous Waste Burned in U.S.

Incinerator Type	Number of Facilities	Quantity of Hazardous Waste Burned, lbs/yr
Commercial incinerators	17	1.3 billion (1)
Captive/on-site incinerators	154	2.3 billion (1)
Cement kilns	25-30	1.8 billion (2)
Aggregate kilns	6	1.2 billion (2)
Boilers/other furnaces	900+	1.0 billion (2)
Total	1,100+	7.6 billion

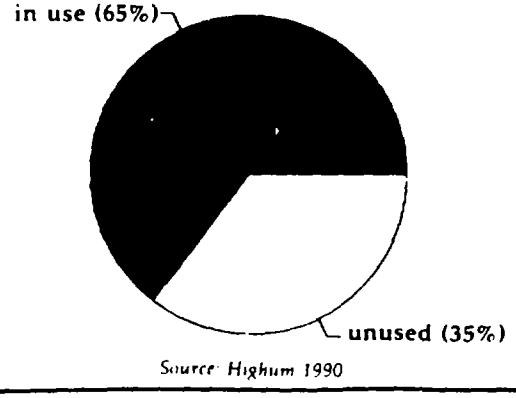
(1) Highum 1990. Data from review of states' capacity assurance plans.(2) Holloway 1990. Data from U.S. EPA's Office of Solid Waste and Emergency Response.

cineration capacity necessary (Oppelt 1986). According to U.S. EPA data, however, even with the land ban there will be overwhelming excess incineration capacity for liquid hazardous wastes (Ott 1990).

There is also excess capacity for solid hazardous waste displaced by the land ban. U.S. EPA has reported that, when solid wastes banned from land disposal are redirected to commercial incineration, only 658 million pounds of the 844 million pounds of present annual capacity will be used (see Figure 6.4). Meanwhile, a new commercial facility in Texas is expected to provide an additional 200 million pounds of incineration capacity for solid hazardous waste (Ott 1990). Consequently, with the land ban in effect, from 22 to 37 percent of total capacity for the incineration of solid hazardous waste will remain unused. Even when petroleum industry wastes temporarily exempted from the land ban were included, U.S. EPA found incineration capacity to be more than adequate (Ott 1990). This estimate excluded additional solids capacity at on-site incinerators (totaling 1.4 billion pounds) (Highum 1990).

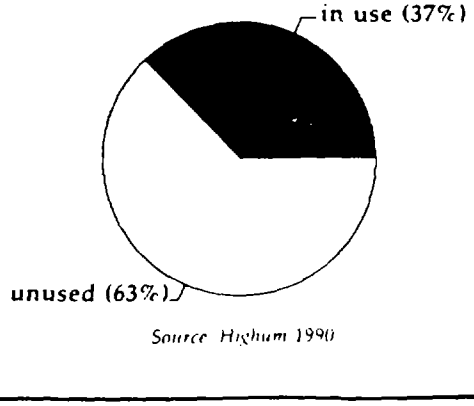
These estimates do not, of course, reflect the potential for reducing the quantity of wastes produced through pollution prevention: changing products and processes to avoid the generation of waste. Furthermore, U.S. EPA's capacity estimates are based on the assumption that all "incinerable" wastes will and must be burned, although many of these can be—and are—treated with other methods, including steam stripping, solvent recovery, and other methods of chemical or biological treatment. As a consequence, U.S. EPA's estimates of the amount of waste for which capacity is "needed" greatly overestimate that "need."

Figure 6.2
Capacity for All Hazardous Wastes at Commercial Incinerators



Source: Highum 1990

Figure 6.3
Capacity for Solid Hazardous Wastes at All Incinerators



Source: Highum 1990

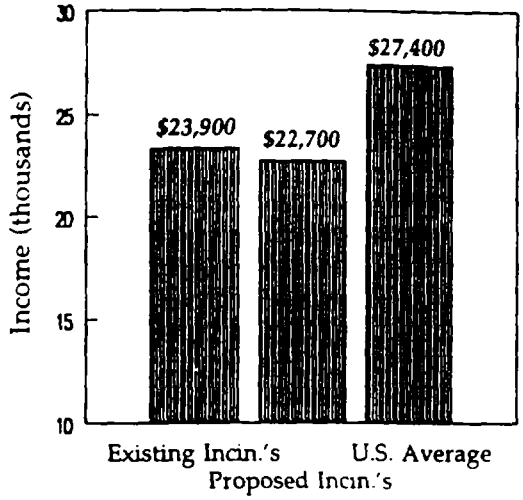
geting communities that are politically and economically disadvantaged—has been used to site hazardous waste incinerators.

According to U.S. census data (shown in Table 6.2 and Figures 6.5, 6.6, and 6.7), communities where hazardous waste incinerators have been sited tend to have large minority populations, low incomes, and low property values:

- The minority portion of the population in communities with existing incinerators is 89 percent higher than the national average. Communities where incinerators are proposed have minority populations 60 percent higher than the national average (see Figure 6.5).
- Average income in communities with existing incinerators is 15 percent less than the national average. In communities where incinerators are proposed, average income is 17 percent below the national average (see Figure 6.6).
- Property values in communities host to incinerators are 38 percent lower than the national average. In communities where incinerators are proposed, average property values are 35 percent lower (see Figure 6.7)

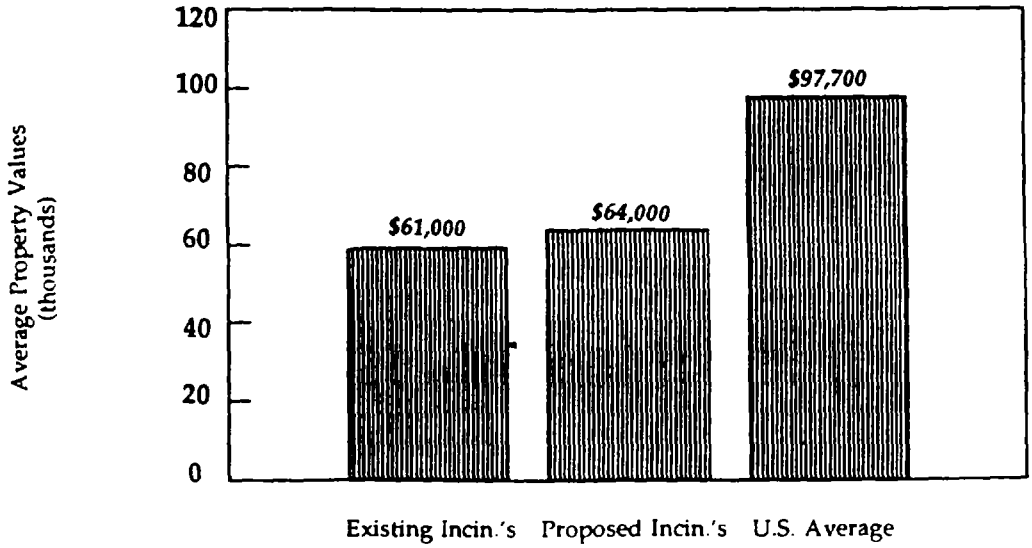
Protection of public health and the environment is, in its entirety, a matter of political and social justice. This fact is starkly illustrated by government's participation in the aggressive expansion of the hazardous waste disposal industry—an economic opportunism that specifically targets poor, rural, and minority communities.

Figure 6.6
Average Income in Incinerator Communities vs. U.S. Average



Source: U.S. Census Data 1980

Figure 6.7
Property Values in Incinerator Communities vs. U.S. Average



Source: U.S. Census Data 1980

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Appendix 1

Commercial Hazardous Waste Incinerators, Existing

Location	Owner	Status
El Dorado, AR	Ensco	
Chicago, IL	CWM	
Sauget, IL	CWM	
Coffeyville, KS	Aptus	
Brandenburg, KY	Olin	Closed in 1990
Calvert City, KY	LWD	
Baton Rouge, LA	Rhone-Poulenc	
Baton Rouge, LA	Rollins	
Bridgeport, NJ	Rollins	
Grafton, OH	Ross	
Cleveland, OH	GSX	Closed in 1990
RockHill, SC	ThermalKem	
Roebuck, SC	GSX/Laidlaw	
Deer Park, TX	Rollins	
Houston, TX	Rhone-Poulenc	
Port Arthur, TX	CWM	
Eau Claire, WI	Waste Research and Reclamation	

Appendix 2

Commercial Hazardous Waste Incinerators, Proposed or Under Construction

Location	Owner	Status
Emelle, AL	CWM	
Maricopa Co., AZ	Ensco	
Kettleman Hills, CA	CWM	
Martinez, CA	Rhone Poulenc	
Vernon, CA	California Thermal Treatment Services	
"Eastern CO," CO	Combustion Technology, Inc.	
Madison, FL	Waste Tech	
Polk Co., FL	Florida First	
Taylor Co., GA	State-sponsored	
Oahu, HI	Advanced Technology, Inc.	On Hold
Bloomington, IN	Westinghouse	TSCA
Hammond, IN	Rhone-Poulenc	
Augusta Township, MI	Envotech, Inc.	
Kimball, NE	Waste Tech	
Northampton, NC	ThermalKem	
Deepwater, NJ	Dupont	
Linden, NJ	GAF	
Las Vegas, NV	Environmental Technology of Nevada	
Pioche, NV	Disposal Control Services	
Lewiston, NY	CWM	
E. Liverpool, OH	Von Roll/WTI	
Nova, OH	Ohio Technologies	
Choctaw Reservation, OK	National Disposal Corp.	
Morris, OK	Heritage Env. Services	
Clarion Co., PA	Concord Resources	
Union Co., PA	USPCI	
Memphis, TN	CWM	
Devers, TX	Envirosafe	Moratorium
Houston, TX	American Envirotech	Moratorium
Pasadena, TX	Houston Chem. Services	Moratorium
Tooele, UT	Aptus	
Tooele, UT	USPCI	
Adams Co., WA	ECOS	
Grant Co., WA	Rabanco/Environmental Security Corp.	

Appendix 3

Cement/ Aggregate Kilns Now Burning Hazardous Wastes

Location	Owner
Demopolis, AL	Lafarge
Gadsden, AL	M and M Aggegate
Ragland, AL	National Cement
Foreman, AR	Ash Grove
Lebec, CA	National Cement
Green Cove, FL	Solite
Miami, FL	Rinker Cement
Greencastle, IN	Lonestar/Systech
Logansport, IN	Coplay
Chanute, KS	Ash Grove
Fredonia, KS	LaFarge
Independence, KS	Patchem/Heartland Cement
Brooks, KY	Solite
Louisville, KY	Southdown/Kosmos
Amelia, LA	Marine Shale Processors
Union Bridge, MD	Lehigh
Thomaston, ME	Dragon
Alpena, MI	Lafarge
Clarksville, MO	Holnam
Festus, MO	River Cement
Hannibal, MO	Continental
Louisville, NE	Ash Grove
Albermarle, NC	Solite
Cohoes, NY	Norlite
Fairborn, OH	Southdown
Paulding, OH	Lafarge
Bath, PA	Keystone
Wampum, PA	Medusa
Harleyville, SC	Giant
Holley Hill, SC	Holnam
Knoxville, TN	Southdown/Dixie Cement
Midlothian, TX	Gifford-Hill
Midlothian, TX	Texas Industries
Arvonia, VA	Solite
Cascade, VA	Solite

Appendix 4

Cement/Aggregate Kilns Proposing to Burn Hazardous Waste

Location	Owner	Status
Tehachapi, CA	Calaveras	
Florence, CO	Holnam	
Ft. Collins, CO	Holnam	
Lyons, CO	Southdown	
Brooksville, FL	Southdown	
Oglesby, IL	LoneStar	
Louisville, KY	Southdown	Test-burning
Detroit, MI	St. Mary's Cement	
Artesia, MS	LaFarge/United Cement	
Butte, MT	Holnam	
Cementon, NY	Lehigh Cement	
Ravena, NY	Blue Circle	
Pittsburgh, PA	Southdown	
Rapid City, SD	South Dakota Cement/CWM	
New Braunfels, TX	Lafarge	Moratorium
Odessa, TX	Southdown	Moratorium
Waco, TX	Lehigh	Moratorium
Devil's Slide, UT	Holnam	Moratorium
Leamington, UT	Ash Grove	Moratorium

AH. 47

United States Department of the Interior

TAKE PRIDE IN AMERICA

IN REPLY REFER TO

FISH AND WILDLIFE SERVICE
BLOOMINGTON FIELD OFFICE (ES)
620 South Walker Street
Bloomington, Indiana 47403-2121
(812) 334-4261 FAX 334-4273

January 25, 1994

Dr. Greg Steele
Indiana State Department of Health
Environmental Epidemiology Section
1330 W. Michigan Avenue
Indianapolis, Indiana 46202

Dear Dr. Steele:

This constitutes our comments on the Indiana State Department of Health's (ISDH) November 1993 draft report entitled: "Preliminary Data Evaluation and Pathway Analyses Report for Consent Decree PCB Sites, Bloomington, Monroe County and Spencer, Owen County, Indiana."

These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.) and are consistent with the intent of the National Environmental Policy Act of 1969, the Endangered Species Act of 1973, and the U.S. Fish and Wildlife Service's (FWS) Mitigation Policy.

We wish to commend ISDH on this effort. This document is an important first step in attempting to understand the environmental consequences associated with the inappropriate disposal of more than a million pounds of PCBs and PCB-contaminated materials in Monroe and Owen Counties. In the absence of Remedial Investigations/ Feasibility Studies (RI/FS) for these Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) National Priority List (NPL) sites, this appears to be the most comprehensive reference on fate and extent of contamination available to the public.

FWS's involvement with these sites began in 1981 when we provided technical assistance to the U.S. Environmental Protection Agency (EPA) via sampling Richland Creek and Conards Branch to determine the environmental impacts of PCBs. FWS continued to have concerns regarding the ecological ramifications of these sites. Our comments are based on contaminant investigations that our office conducted in 1991 and 1992. Despite all the efforts that have been undertaken to "contain" these sites through "interim measures" we suspect that natural resources have been impacted by these sites via as yet unstudied pathways, to on-site and off-site receptors.

Limitations of this Study

On page 173, under the All Sites section, conclusion number 1 states that: "it is possible that pertinent environmental data may have been inadvertently left out of this document." This type of disclaimer should preface this entire effort, probably not so much for what data has been inadvertently left out, but by what data does not exist. In several instances throughout the site-specific review and risk assessment, pathways remain unidentified largely because sampling efforts were

samples collected from Richland Creek in 1991 and 1992, we calculated a cancer risk associated with consuming these fish using EPA's Superfund PHE guidelines of 3.5×10^{-4}, or approximately 3 additional cancer cases in 10,000. This is much higher than the precautionary risk level of 1 additional case in 1,000,000. Incidentally, the FDA action level (2.0 ppm) translates to approximately 8 additional cancers in 10,000 population following PHE risk assessment guidelines (see Appendix 1 for the calculations and methodology used to develop PHE risk for Richland Creek, Clear Creek, Stouts Creek, and Bean Blossom Creek).

Other methodologies have been developed and utilized for the assessment of risk associated with the consumption of contaminated fish (Foran et al. 1989; EPA 1992; EPA 1993a; EPA 1993b). As an alternative to developing a Superfund PHE or similar risk assessment, site-specific surface water data can be compared to EPA's PCB ambient water quality criteria of protection of human health for consumption of aquatic organisms and drinking water 0.079 ng/l (ppt): this is associated with a 1×10^{-6} cancer risk. (EPA 1986). Unfortunately, all of these sites do not even come close to meeting this standard, with the current handling of the Neal's Landfill NPDES permit being the most obvious example of this failure.

The fish consumption advisories may have been removed for Richland Creek (1991) and more recently Clear Creek (justification unknown considering all our 1992 samples exceeded even FDA action levels), but the risks have not been alleviated.

PCB Chemistry and Bioavailability

The general information presented about PCBs in this document is somewhat confusing and several basic facts concerning the chemistry of PCBs should be presented. PCBs result from the chlorination of a biphenyl molecule. Ten possible chlorine molecules can attach to a biphenyl molecule, giving rise to PCB congener classes based on the degree of chlorination. There are 209 different chemical isomers of PCBs, each a unique combination of the degree of chlorination and position of chlorine attachment. Each of these 209 PCB isomers has differing degrees of toxicity, persistence, and even modes of action. Aroclors, on the other hand, are industrial grade mixtures of these 209 different PCB isomers. Aroclors were marketed based on the percent chlorine content as this is the primary indicator of the mixture's beneficial uses.

Recent initiatives in environmental chemistry have led to the development of a ranking system to estimate the toxicity of PCB isomers, dioxin isomers, and furan isomers since there are similarities in chemical form and structure among the dioxins, furans, and PCBs (Safe 1990). This ranking system, called "toxic equivalency factors" (TEFs) ranks all isomers relative to 2,3,7,8-TCDD, the most toxic isomer of dioxin. Unfortunately, accurate interpretation of the toxicological properties of environmental samples of PCBs at these sites is very difficult because specific isomers are not identified.

Additionally, the discussion of bioavailability of PCBs at and downstream of these sites (pages 47, 108, 109, 112) is misleading at best. While it is true that PCBs have a high affinity for sediments, there is likely a constant equilibria between sediment and water. PCBs, whether sediment-bound or not, are readily bioavailable in the environment. It is incorrect to suggest that sediment-bound PCBs do not cause dermal exposure problems to people participating in water-related recreational activities. Additionally, PCB wastes dumped in these sites have likely intermingled with all the industrial degreasers (solvents) such as tetrachloroethene, trichloroethylene, and trichloroethane that have also been identified in surface water, groundwater, and soil samples at these sites. Because PCB wastes buried in several of these dumps are found at or below the groundwater table, PCBs could

Table 51 on page 149 should state that Bennett's Quarry (Stouts Creek) does exceed FDA action levels and Winston-Thomas should also include an advisory on waterfowl that use Clear Creek and the sludge lagoon. Table 51 does not appear to be consistent with the 1994 ISDH Consumption Advisory report just issued as Clear Creek is absent from the list. On page 152 ISDH states that:

> "No human and/or animal studies link dermal exposure to PCBs with the following adverse health effects: neurological, developmental, or reproductive. No animal studies link dermal exposure to PCBs with adverse health effects in the blood, liver, kidney, or the immune system."

Since PCBs are readily absorbed through the skin (Eisler 1986a), and all of these effects have been linked with the consumption of PCBs by humans and in animals, it seems somewhat irresponsible to conclude that dermal exposure could not also be a factor in these effects. While the degree of uptake may vary between ingestion and dermal contact, the toxicity of PCBs would not decrease, and the manifestation of impacts would remain a function of reaching the threshold effects level. In extreme cases of dermal exposure, dermal uptake could exceed typical ingestion exposures.

Within the context of this human health risk assessment for pollutants emanating from these sites, it is safe to eliminate the evaluation of the toxicological impacts of sodium. It is very likely that sodium detected in the spring samples are an artifact of road salt and the only potential toxicological impacts would be to aquatic organisms in streams and/or karst features.

Anderson Road Landfill Site Specific Comments

Off-site contamination emanating from Anderson Road landfill is potentially significant, however, no hydrogeology data exists to determine the fate and extent of groundwater contamination. The "murky, uninviting pond of water" (page 35) was presumably the replacement to the previously unlined pit that was the subject of enforcement actions because it had overflowed to Bean Blossom Creek, even as recently as 1989. Because there is no data for off-site surface waters, the most likely eventual receptor of any contaminated groundwater moving off-site, the completion of this pathway is unknown and the risk is unidentified. Additional potential risks for this site include: fish consumption, and dermal contact of Bean Blossom Creek downgradient of Anderson Road Landfill.

Bennett's Quarry Site Specific Comments

Sediment and water samples taken in 1988 (the year after sediment was removed) did not indicate contamination. Yet, 1988 fish tissue samples contained 6 ppm PCBs. It is evident from the field visits our staff has conducted, and the samples collected in 1992, that Stouts Creek has a continuing, high-level source of PCBs and potentially other organic contaminants. Fish collected from both Stouts Creek, and Bean Blossom Creek downstream of its confluence with Stouts Creek, contained high levels of PCBs, up to 3.34 ppm (Sparks, in prep.). Therefore, it is logical to assume that these water and sediment samples in 1988 are suspect: high tissue levels would not persist without continuing inputs. Because Stouts Creek is a relatively high-gradient stream in its uppermost reaches, very little sedimentation occurs north of Acuff Road. A more appropriate measure of potential contamination in Stouts Creek would be water samples (after measurable rainfall), and fish tissue. And now 6 years later, it is likely that the continuing inputs from Bennett's Dump have recontaminated the "remediated" areas once again.

As previously discussed, ambient air near Lemon Lane Landfill and the ICS area and the intermittent stream corridor should be identified as a potential present and future inhalation risk.

Neal's Dump Site Specific Comments

We are concerned with the apparent definition of the "nearest recreational unit" when trying to estimate risks. It is likely that persons involved in activities such as watching birds, hunting, fishing, or even children just playing outside could be at risk from this site, especially on the northwest side of the site. In 1976, 275 ppm PCBs were found in sediments on the north-northwest side of Neal's Dump. This appears to be near where groundwater occasionally seeps out from Neal's Dump toward an intermittent tributary to the White River. This area is likely still a present risk.

There are estimated to be 232,000 pounds of PCBs dumped in Neal's Dump, and data now seems to indicate that PCBs are making their way into the deeper aquifer. How long will it take for this contamination to reach the White River via the sand aquifer? This would seem to indicate that there is significant risk for present groundwater and a future risk to the surface waters of the White River. How many downstream commercial fishermen, sport fishermen, and drinking water intakes are there? What type of remediation will succeed if this is not addressed soon? Off-site sediment, off-site surface water, and off-site fish should be included as potential future risks.

Neal's Landfill Site Specific Comments

On page 88 we suggest the following revision: "the Fish and Wildlife Service (NPDES) report ~~implies~~ states that human health and the environment are not being adequately protected under the current NPDES permit limits...." Whether ISDH, IDEM, EPA and/or the State Supreme Court (who overturned the Appeal's Court ruling) choose to accept this is quite another matter. EPA's PCB ambient water quality criteria of protection of human health for consumption of aquatic organisms and drinking water is 0.079 ng/l (ppt): this is associated with a 1×10^{-6} cancer risk (EPA 1986). There is a significant difference between 1 ppb (current NPDES permit) and 0.079 ppt.

On page 109 ISDH states that "off-site sediment is a past potential exposure pathway." We collected sediments in 1991 from Conard's Branch that contained PCBs ranging from 2.85-13.99 ppm (Sparks 1991).

Because bioaccumulation occurs more rapidly and to much higher levels in the aquatic food chains, bioaccumulation in herbivorous terrestrial wildlife is, except in extreme cases (such as this site prior to its temporary cap), likely to be insignificant. Therefore, risk assessment efforts should probably focus on aquatic food chain pathways.

Off-site surface water an sediment, present and future risk still exist because mass-loading of PCBs in water by-passing the 1 cfs treatment plant is significant. Our fish residue data indicate that the fishery is still sufficiently contaminated to adversely impact piscivorous wildlife and exhibits an additional human cancer risk of 3.5×10^{-4} (see appendix 1). This is well above a target of 1 additional case in a million.

Fell Iron Site Specific Comments

Although this site is not a "consent decree" site, it is likely that the eventual remediation of the contaminated materials excavated and stockpiled here will be treated in the same manner as the rest of the contaminated material from the other sites. Data collected in 1991 revealed 53 ppm in sediments along the railroad track east of Fell Iron, indicating a present risk. Past exposure routes for this site include on-site soils and ambient air. This site has likely contributed to the contamination of Clear Creek.

Conclusions and Recommendations

In order to evaluate the highest risks associated with these sites, 2 studies should be implemented. First, a study of all living, past and present Westinghouse (ABB) plant workers and their families should be conducted. It should include an investigation of complete medical history as well as current monitoring of serum residue levels of PCBs, dioxins, furans, and enzyme chemistries. It is unfortunate that ISDH did not have a Birth Problems Registry prior to 1987, especially during the years 1960-1985. Birth problems involving exposures of PCBs, dioxins, and furans associated with these sites (including the plant) during this time period potentially could have been significant yet remain undocumented. If it is not too late to try to retrofit this registry, it would likely be very valuable.

For the rest of the potentially exposed public, implementation of comprehensive Remedial Investigations at these sites should be done to fill all the existing data gaps, and to ascertain what contaminants have entered the groundwater, surface water, sediments, and the food chain since these sites were first discovered.

If you have any questions regarding these comments, or require further technical assistance, please contact Dan Sparks of my staff at (812) 334-4261, extension 219.

Sincerely Yours,

David C. Hudak
Supervisor

cc: Regional Director, FWS, Twin Cities, MN (FWE-EC) - Miller
U.S.EPA, Chicago, IL - Hopkins (HSRL-6J)
Indiana Department of Environmental Management, Indianapolis, IN - Osborn
Indiana Department of Environmental Management, Indianapolis, IN - J. Smith
Indiana Department of Natural Resources, Indianapolis, IN - Faatz
FWS, DEC, Washington, DC - Escherich/Nims
Honorable Tomilea Thompson, Mayor, Bloomington, IN
Senators Lugar and Coats, ATTN: Lane Ralph; Indianapolis, IN
Congressman McCloskey, Bloomington, IN

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Calculations for streams associated with the Consent Decree sites

Streams	Geometric Mean Fish Tissue Concentrations	mg PCBs in fish consumed/day[1]	converted to mg/Kg/day[2]	potential cancer risk[3]	target cancer risk
Richland Creek	0.88 mg/Kg	5.72×10^{-3}	8.17×10^{-5}	3.5×10^{-4}	1×10^{-6}
Stouts Creek	2.03 mg/Kg	1.31×10^{-2}	1.89×10^{-4}	8.2×10^{-4}	1×10^{-6}
Bean Blossom Creek	0.39 mg/Kg	2.54×10^{-3}	3.62×10^{-5}	1.6×10^{-4}	1×10^{-6}
Clear Creek	3.11 mg/Kg	2.02×10^{-2}	2.89×10^{-4}	1.3×10^{-3}	1×10^{-6}
FDA Action level	2.00 mg/Kg	1.30×10^{-2}	1.86×10^{-4}	8.1×10^{-4}	1×10^{-6}

[1] - fish concentrations multiplied 6.5 g/day (0.0065 Kg/day) (EPA 1984)

[2] - mg PCBs consumed/day divided by 70 Kg [average weight of adult (EPA 1984)] to arrive at dose in mg/Kg/day

[3] - multiplied dose (mg/Kg/day) by cancer potency factor of 4.34×10^{0} (EPA 1986a)

Attachment 24. Att. 48

United States Department of the Interior

FISH AND WILDLIFE SERVICE

IN REPLY REFER TO

BLOOMINGTON FIELD OFFICE (ES)
718 North Walnut Street
Bloomington, Indiana 47401
(812) 334-4261 FAX 334-4273

August 27, 1990

Dan Hopkins
U. S. Environmental Protection Agency (5HS-11)
230 South Dearborn Street
Chicago, Illinois 60604

Dear Mr. Hopkins:

This regards a meeting between you and Dan Sparks of my staff on July 23, 1990. The purpose of the meeting was to discuss natural resource concerns at several PCB sites in Bloomington, Indiana. The following is a brief summary of biological concerns that we are aware of at this time for each site and/or issue.

Lemon Lane Landfill

Dye tracer studies have indicated that there is a potential for groundwater to migrate offsite. Investigation into all possible groundwater discharge points should be conducted to assess if PCBs and other contaminants are leaving the site. We would like to be involved in review of the design (and possibly assist in the implementation) of the monitoring plan. Biological data should be a significant part of the monitoring plan.

The Service is concerned about stormwater control at this site. Significant ponding seems to occur on the east side of the site after heavy rains, and it would seem that this could enhance infiltration around the "capped" material and promote leachate generation (not to mention possible routes for human health risks due to dermal contact).

Since it is not within the Service's authority or mission to evaluate human health effects, the following comments are intended only to be extrapolated to natural resource concerns. Air monitoring conducted in July 1989 at Lemon Lane and Fell Iron indicated 38 ng/m^3 at Lemon Lane and 56 ng/m^3 at Fell Iron. The rationale behind statements that these levels were safe were due at least in part to the fact that they were 80,000 times lower than U.S. Occupational Safety and Health Administration (OSHA) standards. Unfortunately, OSHA standards are set for an 8-hour work day and a 40-hour work week for adult humans. It does not consider every day, greater than 8 hours/day, and it does not consider children. Considering that an estimated bioconcentration factor

Winston-Thomas Treatment Plant

This site is of extreme concern to the Service. Migratory birds such as waterfowl and wading birds are being attracted to this site. I would like to schedule a field trip to this site in the near future to assess what actions could be taken immediately to reduce this hazard to migratory birds. Additionally, we would like to find out what actions, if any, are currently being taken regarding the quality of water leaving this site. Is there an NPDES permit current for this facility? Does the interim storage facility at this site have similar PCB concentrations in air? If so, is storm water run-off from the building's vents being managed properly in lieu of a RCRA permit?

Westinghouse (ABB) Plant

There are several wetlands on this site, two on the north side of the property and the pond on the east side of the property. The pond on the east side of the property by design has been very effective in trapping contaminants on-site. There is a great deal of concern however, that removal actions at the site will only address the most heavily-contaminated areas. As you pointed out there is more recent data showing PCB-contaminated soils some distance south and east of the east pond. There appear to be areas outside the boundaries of most of the "consent decree remedial areas" which are likely impacting fish and wildlife resources. As a natural resource trustee, this is cause for serious concern. Have any investigations been conducted in the forested wetland south of the east pond below the historic NPDES outfall for this facility? It would be logical to expect this area to have levels of concern to natural resources. We suggest that a further investigation of this area be implemented.

Also regarding the proposed remedial actions for this site, we are uncertain if it is wise to rush the excavation of the wetlands onsite in order to complete the activities prior to the effective date of the RCRA land-ban restrictions later this fall. Excavating the wetlands will cause at least temporary increases in airborne contaminant levels and if the storage methods are not significantly improved upon from Lemon Lane, or Fell Iron, then it is likely that further airborne releases will continue. If there would be some way to treat water currently leaving these wetlands, and a method (i. e. a cover) of preventing them from continuing to act as attractive nuisances to wildlife, it might be better than contaminating another "interim storage area". Because this action is a remedial action and not an emergency action, the remedial action of these wetlands should be required to obtain a Section 404 permit from the Army Corps of Engineers, and the wetlands losses would need to be replaced.

Other Potentially Contaminated Sites

The Service is not aware of any additional PCB-contaminated sites in this area that are currently impacting natural resources. However, there is a great deal of suspicion regarding widespread historic capacitor salvage areas and other

Att 49

United States Department of the Interior

FISH AND WILDLIFE SERVICE
BLOOMINGTON FIELD OFFICE (ES)
716 North Walnut Street
Bloomington, Indiana 47404
(812) 334-4261 FAX 334-4273

Date: March 11, 1991

To: Field Solicitor, Field Solicitor's Office, DOI, Twin Cities, MN

Thru: Assistant Regional Director, FWE, FWS, Twin Cities, MN

From: Supervisor, BFO, FWS, Bloomington, IN (ES)

Subject: Request to rescind Natural Resource Damage release for Potentially Responsible Parties (PRPs) for Neal's Landfill, Neal's Dump, Lemon Lane Landfill, Bennett's Dump, and Winston Thomas Sewage Treatment Plant, Monroe and Owen Counties, Indiana

This office received on February 8, 1991, copies of pertinent memoranda that seem to indicate that a release from claims for damages was granted for the subject sites. Upon further review of the new scientific information, and other new information available to this office, we request the Natural Resource Damage issues formerly waived for the subject sites be reopened.

We believe that natural resources under our trusteeship are currently being impacted by the subject sites. The selected remedial actions per the Consent Decree ~~will~~ not sufficiently remediate impacts to these resources, and it is likely that the selected remedy (garbage-fueled hazardous waste incineration) will adversely impact the bald eagles nesting and wintering on Monroe Reservoir. This determination is based on new information that has been generated and made available to us since we granted a release (October 1984), especially as it relates to the bald eagle hacking program initiated by the Indiana Department of Natural Resources in 1985. It should also be pointed out that the events leading up to the granting of natural resource damage releases were less than ideal. Attached is a history of the granting of natural resource damage releases (Attachment 1), and a summary for each of the sites pertaining to natural resource injuries that have occurred, are occurring, and likely will occur as result of historic releases and future actions (Attachment 2). The following is a summary from the Service's viewpoint of the current flaws in the Consent Decree.

Problems with the Consent Decree

The Consent Decree, U.S.A., et al. v. Westinghouse, et al. (Civil Action No. IP 83-9-C and IP 81-448-C), established how the subject sites are to be remediated (Attachment 20). The Consent Decree established clean-up levels, scope and extent of remedial actions, further monitoring needs, and closure

Decree.... However, presently unknown or unforeseen conditions may present an imminent and substantial endangerment to health, welfare or the environment in the future." Furthermore, "nothing in this Section or in this Consent Decree is intended to affect the statutory rights of the United States to seek appropriate relief to abate a release or threat of release of hazardous wastes or substances... where such release may present an imminent and substantial endangerment to health, welfare or the environment and results from previously unknown or unforeseen conditions that arise or are discovered after entry of the Consent Decree."

Based on the information generated and made available to us since our October 1984 determination to grant a release for these sites, we believe that there are now conditions at several of these sites which pose an "imminent and substantial endangerment to the environment." (See Attachment 2 which substantiates this claim). Additionally, we believe that this is sufficient to rescind our previous determination, and that this section of the Consent Decree allows for such reopening.

Paragraph 120 of the Consent Decree states that the Consent Decree is consistent with the National Contingency Plan (NCP). If this were the case, the Service would not currently have concerns with Winston-Thomas Sewage Treatment Plant, Lemon Lane Landfill groundwater discharges to 22 or more seeps/springs around Monroe County, Bennett's Quarry groundwater discharges to Stout Creek, and Neal's Landfill groundwater discharges to Conard's Branch of Richland Creek during highflows. (See Attachment 2 for further explanation).

Summary

Considering the aforementioned and the attached site-specific concerns, we believe that natural resources under our trusteeship have been, are being, and will continue to be impacted by contaminants emanating from the subject sites. We have never been comfortable with the Consent Decree, and no longer believe that the it is: protective of the environment, consistent with the National Contingency Plan (40 CFR 300), nor will it adequately resolve all of the concerns described herein. This position is based on new information that has been generated for these sites since our original review during the Preliminary Natural Resource Surveys.

Having documented several instances of potential natural resource injury in the public record in recent months (letters to EPA) (Attachments 21,22 and 26), and only recently receiving copies of the Department's officially-granted release, without reopeners, we are sensitive to the delicate legal ramifications of future actions or inactions. It is also possible that the Service (and the Department) could be sued for failure to protect natural resources under our trusteeship impacted by these sites, especially in light of all the new information now available. The Bloomington (Westinghouse) PCB sites have been and are continuing to be actively litigated by many environmental organizations, et al. The disparity between our historical release and our current concerns may eventually be discovered, and it is imperative that we receive guidance on how to proceed. Can we legally pursue these damage investigations? Can we request that EPA move to take protective

List of Attachments

Attachment 1. History of Natural Resource Damage Releases

Attachment 2. Site-Specific Concerns

Attachment 3. OEPR-Washington November 2, 1983 memo to FWS (ER83/1366)

Attachment 4. FWS Region 3, December 2, 1983 memo to OEPR-Chicago (ER83/1366)

Attachment 5. OEPR-Chicago December 23, 1983 memo to OEPR Washington

Attachment 6. OEPR-Washington January 30, 1984 letter to EPA, Office of Waste Programs Enforcement

Attachment 7. OEPR-Washington April 23, 1984 memo to FWS (ER84/526)

Attachment 8. BFO May 4, 1984 memo to FWS, Region 3 (ER84/536)

Attachment 9. FWS Region 3, May 8, 1984 memo to OEPR-Chicago (ER84/526)

Attachment 10. OEPR-Washington June 25, 1984 letter to EPA, Office of Waste Programs Enforcement

Attachment 11. OEPR-Washington June 26, 1984 memo to FWS (ER83/1366 and ER84/526)

Attachment 12. FWS-Washington July 13, 1984 memo to OEPR-Washington

Attachment 13. FWS-Washington August 30, 1984 memo to OEPR-Washington

Attachment 14. OEPR-Washington October 17, 1984 memo to FWS (ER83/1366 and ER84/526)

Attachment 15. BFO October 22, 1984 memo to FWS, Region 3 (ER83/1366 and ER84/536)

Attachment 16. FWS Region 3, September 26, 1984 memo to FWS-Washington (ER83/1366 and ER84/526)

Attachment 17. FWS-Washington November 2, 1984 memo to OEPR-Washington (ER83/1366 and ER84/526)

Attachment 18. DOI, Office of the Secretary, November 7, 1984 memo to DOI, Office of the Solicitor

Attachment 19. DOI, Office of the Solicitor, November 9, 1984 memo to DOJ

Attachment 20. Excerpts from Consent Decree, United States vs. Westinghouse et al., Civil Action No. IP 83-9-C and IP 81-448-C

Attachment 21. BFO December 23, 1987 letter to Indiana Department of Environmental Management

Attachment 22. BFO June 6, 1990 letter to Indiana Department of Environmental Management

History of Natural Resource Damage Releases

1. ER-83/1366 Neal's Landfill and Neal's Dump

The Department of Interior, Office of Environmental Project Review (OEPR), sent a November 2, 1983 memorandum to BFO (ER-83/1366) at Office of Waste Programs Enforcement, U.S. Environmental Protection Agency's (EPA) request for a preliminary natural resource survey (Attachment 3). The Service responded on December 2, 1983, "the potential exists for adverse impacts to fish and wildlife resources" (Attachment 4). OEPR responded (January 30, 1983) to EPA that "we (DOI) are not prepared to grant a release from claims for damages to natural resources under Interior's trusteeship caused by releases at the Neal's Landfill site, Monroe County, Indiana." Further, OEPR stated "On the other hand we are prepared to grant such a release for the Neal's Dump site, Owen County, Indiana, providing that the agreed-upon remedial action plan is consistent with the National Contingency Plan" (Attachment 6).

2. ER-84/526 Lemon Lane Landfill, Bennett's Quarry, and Winston Thomas Sewage Treatment Plant

OEPR sent the Service a April 23, 1984 memorandum (ER-84/526), at Office of Waste Programs Enforcement, U.S. EPA's request for a preliminary natural resource survey (Attachment 7). The Service responded on May 8, 1984 that "It is our recommendation that the Department reserve the option to submit a claim for damages at a future time if data become available that documents the natural resources (sic) damages due to hazardous substances from Lemon Lane Landfill, Bennetts Quarry, and/or Winston Thomas Sewage Treatment Plant, Bloomington, Monroe County, Indiana" (Attachment 9). OEPR responded to EPA on June 25, 1984 that "we (DOI) are not prepared to grant a release from claims for damages to natural resources under Interior's trusteeship caused by releases at the Bennetts Quarry and Winston Thomas Sewage Treatment Plant sites." Further, OEPR stated "On the other hand we are prepared to grant such a release for the Lemon Lane Landfill site, provided that the agreed-upon remedial action plan is consistent with the National Contingency Plan" (Attachment 10).

3. OEPR sent a June 26, 1984 memorandum to the Service transmitting a copy of the Draft Consent Decree, and requested that the Service "provide us with your advice about the sufficiency of the proposed remedy to eliminate or reduce to negligible risks any potential damages to migratory birds at these sites." OEPR requested the Service to respond by July 13, 1984 (Attachment 11). The Service responded on July 13, 1984, "the field office (BFO) will be reviewing this complex document over the next few weeks. When their technical review is completed, we will be in a better position to advise you on the sufficiency of the proposed remedy" (Attachment 12). The Service responded again on August 30, 1984, "Our preliminary review of the document (consent decree) suggests that the decree will mitigate the impact on fish and wildlife sufficiently for the Service to recommend a waiver of natural resource claims" (Attachment 13).

4. OEPR sent an October 17, 1984 memorandum to the Service stating "The EPA and DOJ have requested the Department to review the enclosed consent decree concerning the so-called Westinghouse Sites in and near Bloomington, Indiana,

Attachment 2.

Site-Specific Concerns

Neal's Landfill

The Consent Decree required that Westinghouse build a water treatment plant to treat groundwater discharges from the South Spring, North Spring, and Southwest Seep up to 1.0 cubic foot per second (cfs) [paragraph 59 (a)]. Effluent from the treatment plant must be less than one part per billion (ppb).

As pointed out in our letter of October 8, 1987 to Indiana Department of Environmental Management (Attachment 21), the NPDES permit limit of 1 part per billion (ug/l) is almost 100 times higher than the U.S. Environmental Protection Agency's Ambient Water Quality Criteria for the protection of freshwater aquatic life (0.014 ppb). The impact of historic discharges of PCBs into Conard's Branch to the aquatic ecosystem have been well documented; therefore, it would seem prudent to work toward reducing continuing PCB inputs. Since the recent establishment of more stringent new Indiana Water Quality Standards, it would be hoped that the adequacy of this permit could be reevaluated for compliance with the new Standards. (Currently a new NPDES permit would be written such that the limit for PCBs would be 0.1 ug/l). The existing permitted discharge of 1.0 ppb PCBs in no way reflects compliance with all federal laws.

Furthermore, an attempt was made to modify the NPDES permit in June 1990. The Public notice and briefing memo for this proposed permit modification stated "The lbs/day effluent limits for PCBs could potentially limit the permittee from treating flows above 1 cfs, which is now possible, when the effluent is at the daily maximum concentration of 1 ug/l." Additionally, the requirement to monitor and report average or daily maximum lbs/day of total PCBs, and daily maximum flow rate from outfall 001 would be removed. In essence, this would allow the permittee to discharge as much "treated" water as possible provided the total concentration of total PCBs in the effluent is less than or equal to 1 ug/l.

At a discharge rate of 1 cfs with PCB effluent concentrations of 1 ug/l, this allows for over 70 grams of PCBs to be added to Conard's Branch every month. At this currently allowed rate, an additional 1.5 tons of sediment could become sufficiently contaminated to be classified as hazardous waste (greater than 50 ppm) every month. It is commendable that "IDEM does not want to restrict the amount of springwater which can be treated above the 1 cfs rate", but to allow continued loadings of PCBs to Conard's Branch, Richland Creek, and ultimately the White River at this rate is totally unacceptable. Instead, IDEM should investigate improving the treatment technologies currently being used at this facility to require that the permittee reduce the effluent concentrations in order to remain within the lbs/day limitation. Additionally, it would seem from a "total system loading" standpoint, the removal (and subsequent exceeding) of the lbs/day limit would constitute backsliding, thus violating "Anti-Backsliding" provisions of the Clean Water Act (Attachment 22).

Based on information learned during an interagency visit (November 26, 1990)

of actions taken by Westinghouse's contractors (Attachment 27). This additional injury to the environment could possibly have been avoided if simple conservation measures would have been adhered to.

Neal's Dump

Our interagency site visit November 27, 1990 included a trip to Neal's Dump. This site is very small (less than 2 acres), and sits atop a small hill overlooking the West Fork of the White River. The best available information for the site indicates that approximately 14,000 PCB-filled capacitors were disposed of here. The northwest portion of this site lies on the edge of a small ravine which opens to the White River floodplain approximately 100 yards away. There is a small, intermittent tributary draining this ravine that is less than 300 yards long from its origin in the ravine to the White River. Based on this direct pathway and the natural resources associated with the White River in this area, we believe that trustee resources are potentially being impacted. No monitoring has taken place in this intermittent stream to-date, and it does not appear that EPA has any plans to do so.

Lemon Lane Landfill

The following concerns are based on a report prepared by Westinghouse on Lemon Lane Landfill entitled "High Flow Tracer Test, Lemon Lane, Bloomington, Indiana, September 1989". Of the groundwater seeps/springs tested for the various dyes injected into Lemon Lane monitoring wells during high-flow events, 16 seeps/springs were determined to be positively connected to the groundwater system beneath Lemon Lane Landfill. Six other seeps/springs also appeared to be connected to this groundwater system, and tests at 5 other seeps/springs were either inconclusive or determined to be unconnected. Additionally, detection of dye at Stout Creek West spring indicates that one or more of the 3 unmonitored springs located along Woodyard Road (NW 1/4 SW 1/4 of Section 30 T9N R2W) may also be connected to the Lemon Lane Landfill groundwater system. These groundwater seeps/springs discharge to surface water anywhere from 2,000 feet to over 2 miles away from Lemon Lane Landfill. Because this information was not generated until September 1989, there was no way we would have been able to adequately review the potential natural resource impacts to biological resources at these 22 or more seep/spring locations. We would like to also point out that if PCBs have actually been discharged to surface water at these locations, impacts to natural resources are highly likely.

Only with further monitoring, including monitoring of biological parameters, will we be able to assess the injury to natural resources. We are not aware of any efforts to monitor these seeps at this time.

Bennett's (Quarry) Dump

These concerns are based on our participation in an interagency site visit on November 26, 1990, and our recent review of a Westinghouse generated report entitled "Quarterly Ground-water sampling results, Quarterly Sampling Events 1 and 2 of 4, March 8-10 and June 6-9, 1988 Bennett's Dump an Winston Thomas Facility, Supplemental Hydrologic Investigation Bloomington, Indiana, August 1988."

PCBs were detected in a monitoring well located on the western boundary of Bennett's Dump in March 1988 at 1,100,000 ppb and 430,000 ppb (MW-5, and MW-5 Dup., respectively). This monitoring well is located within 30 feet of Stout

percent) in the deeper sediments (total depth of sediment is approximately 2 feet).

The bioconcentration factor of PCBs from water to aquatic invertebrates such as daphnids, midge, scud, and mosquito larvae which are likely to be found in this lagoon range from 18,000 to 47,000 (EPA 1980). Based on average water concentrations of 1 ppb, these fish and waterfowl food items could easily contain 18 to 47 ppm or more of PCBs. For those macroinvertebrates that live in the sediments, concentrations can range even higher. PCB levels of freshwater oligochaete worms from the Niagara River were positively correlated with sediment PCB levels (Fox et al. 1983). Uptake of PCBs by chironomid larvae was also directly related to the concentration of PCBs in sediment (Larsson 1984), with concentrations in the invertebrates ranging from one to two times ambient sediment concentrations. Based on sediment concentrations of PCBs in lagoon sediments, aquatic invertebrates could likely have PCB concentrations between 222 to 444 mg/kg fresh weight, and possibly as high as 8,800 mg/kg. Additionally, incidental ingestion of contaminated sediment during consumption of invertebrates could add substantially to fish and waterfowl's total PCB intake.

Fish diets containing 1.2 mg of PCBs per kg fresh weight produced pathological changes in the kidneys and produced progressive degenerative changes in the livers of trout in less than a year of exposure (Roberts et al. 1978). Dietary exposures of 5 and 10 mg/kg resulted in reproductive impairment in chickens and mourning doves (Tori and Peterle 1983; as quoted in Heinz et al. 1984). Estimated concentrations of PCBs in the macroinvertebrates in the lagoon exceed by several orders of magnitude dietary concern levels previously mentioned.

Piscivorous birds consuming fish even infrequently from this lagoon are at a high risk of latent PCB toxicity. When PCBs are ingested, they are stored in fatty tissues of birds. When a bird is stressed (e.g. sudden weather change), or during migration, fat stores are metabolized, thus mobilizing previously stored PCBs. This can lead to excessive levels of contaminants in the brain, ultimately causing death (Ecobichon and Saschenbrecker 1969; Van Velzen et al. 1972; Falandysz and Szefer 1984). Concentrations in excess of 310 mg/kg brain fresh is strong evidence of PCB poisoning (Stickel et al. 1984). In our estimation the projected PCB concentrations in fish of the lagoon are sufficient to cause, after only one season of utilization by piscivorous birds, toxic brain-levels of PCBs.

We have informally brought these concerns to EPA in the form of proposed analytical investigations and special studies (Attachment 28). We have also informally suggested that the lagoon should be dewatered (water treated to remove PCB contamination), and an impervious cap placed over the sediments to avoid future injury to fish and wildlife resources. We have not yet pursued this formally, and have yet to hear an answer from EPA regarding our informal proposals.

Garbage-Fueled PCB Incinerator

The proposed incinerator site is located a few miles west northwest of Monroe Reservoir, and most, if not all of the following bald eagle wintering areas are within the potential impact area. One, perhaps two nests (Lake Greenwood), are also located in close proximity to the proposed incinerator site. The Service is concerned with the potential for adverse impacts to bald eagles resulting from bioaccumulation in the food chain of persistent

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Organochlorine Accumulation by Sentinel Mallards at the Winston-Thomas Sewage Treatment Plant, Bloomington, Indiana

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Abstract. Farm-raised 12-month-old female mallards (*Anas platyrhynchos*) were released at the Winston-Thomas sewage treatment plant, Bloomington, Indiana. Five mallards were sacrificed at the start of the study and at approximately 10-day intervals through day 100. Concentrations of polychlorinated biphenyls (PCBs) in carcasses increased linearly with time of exposure and exceeded 16 μg/g wet weight by day 100; PCBs in breast muscle exceeded 3.9 μg/g by day 100. These PCB values are among the highest recorded for wild or sentinel waterfowl. PCB concentrations in breast muscle (26–523 μg/g lipid weight) were 50–1,000 times greater than human consumption guidelines for edible poultry in Canada (0.5 μg/g lipid weight) and 9–176 times greater than consumption guidelines for edible poultry in the United States (3.0 μg/g lipid weight). Additionally, PCB concentrations in carcass and breast muscle exceeded the threshold of the Great Lakes Sport Fish Consumption Advisory 'do not eat' category (1.9 μg/g wet weight) by day 20 and day 50, respectively. Hepatic cytochrome P450-associated monooxygenases including BROD (benzyloxyresorufin-*O*-dealkylase), EROD (ethoxyresorufin-*O*-dealkylase), and PROD (pentoxyresorufin-*O*-dealkylase) were induced over 5-fold compared to reference mallards. BROD, EROD, and PROD were each significantly correlated to total PCBs and to the toxicity of selected PCB congeners, relative to 2,3,7,8-tetrachlorodibenzo-*p*-dioxin.

The Winston-Thomas sewage treatment plant, Bloomington, Indiana (Figure 1) was operated by the city of Bloomington for nearly 50 years until its closure in 1982. In 1975, Westinghouse Electric Corporation of Bloomington advised the city that it had been discharging polychlorinated biphenyls (PCBs) into the city sewer system (*Indiana State Department of Health* 1994). The United States Environmental Protection Agency identified the Winston-Thomas facility as containing a large volume of PCB-contaminated materials and is addressing this site under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended.

Several hectares of contaminated soils exist on the grounds of the Winston-Thomas facility. PCB concentrations in sludge at the site were up to 4,000 μg/g dry weight (*EPA* 1994). In addition, the site has an inactive 7-hectare tertiary treatment lagoon that is used by migratory waterfowl during fall and spring (*Indiana State Department of Health* 1994; D.W. Sparks, pers. observation). Waterfowl survival and reproduction may be adversely affected if they accumulate certain organochlorine (OC) contaminants during their stay (White and Stickel 1975). Moreover, waterfowl that reside at this site could pose a health risk to raptors, scavengers, and humans who may consume them (Kim *et al.* 1984, 1985; Foley and Batcheller 1988).

Sentinel (*i.e.*, captive) waterfowl have recently been used to monitor chemical contamination at several wetland locations (Dobos *et al.* 1991, Gebauer and Weseloh 1993, Weseloh *et al.* 1994). The objective of this study was to assess the bioavailability and toxicity of OC contaminants in the Winston-Thomas lagoon using sentinel waterfowl.

Methods

Seventy-two 12-month-old female mallards (*Anas platyrhynchos*) were purchased from Whistling Wings, Inc., Hanover, Illinois. All birds were pinioned (right wing) prior to shipment so they were unable to fly. On 14 July 1992, the mallards were delivered, marked with uniquely numbered nasal saddles, and released on the Winston-Thomas lagoon. A fence (1.5 m high, 18 cm mesh) prevented the mallards from escaping from the lagoon.

Five birds were sacrificed on 14 July 1992 (day 0) as controls. The control birds were euthanized by cervical dislocation. Using a shotgun (steel shot), we collected 5 of our marked birds approximately every 10 days from day 10 to day 100. Immediately after death, a small patch of

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Henshel, D.S.[1], D.W. Sparks [2], S.A. Sobiech [2], M. Weber [1], C.A.A. Meyer [1], C. Fox [1], K. Benson [1], and Y. Lam [1]. 1997. Effects of *in ovo* PCB exposure on early embryonic growth and development in tree swallows. Presented at the Society of Environmental Toxicology and Chemistry 18th Annual Meeting, Bridging the Global Environment: Technology, Communication and Education, November 17-20, 1997.

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ABSTRACT

Tree swallows are being used to evaluate potential ecosystem effects due to exposure to PCBs from a contaminated sewage treatment lagoon. Nest boxes were placed around the contaminated lagoon, as well as around a "reference" pond in another part of the county. Nest boxes were observed daily. Two freshly laid eggs were taken from each nest, transported to the laboratory, and incubated (99.5°F dry bulb, 86°F wet bulb) for 48 or 72 hours (two time points per nest). The early embryos were then sacrificed, fixed, and assessed for developmental stage and organ/tissue abnormalities, based on Hamburger and Hamilton's staging of chick embryos. The embryonic abnormalities were also compared to abnormalities observed in TCDD-injected chicken embryos of similar developmental stages. Of the early embryos, significantly more were abnormal (>30%) at the contaminated site compared to at the reference site (<10%). The embryonic abnormalities at the contaminated site were similar to those seen in the TCDD-injected chicken embryos. Reference site abnormalities were unlike any typically associated with TCDD-exposure. The PCB/TCDD-related abnormalities observed in the embryos taken from the contaminated site include tubular, edematous hearts, delays in heart folding, visceral arch anomalies (long, thin first arch), and twisting of the embryo just below the level of the heart. Data from a previous study indicated that PCBs were taken up by birds at the site, and were being deposited in eggs of birds nesting in the area (Custer et al, 1995; Henshel et al, SETAC Abstract #PMP151). Thus, it is likely that the TCDD-like deformities observed in these embryos were caused by *in ovo* PCB exposure.

METHODS

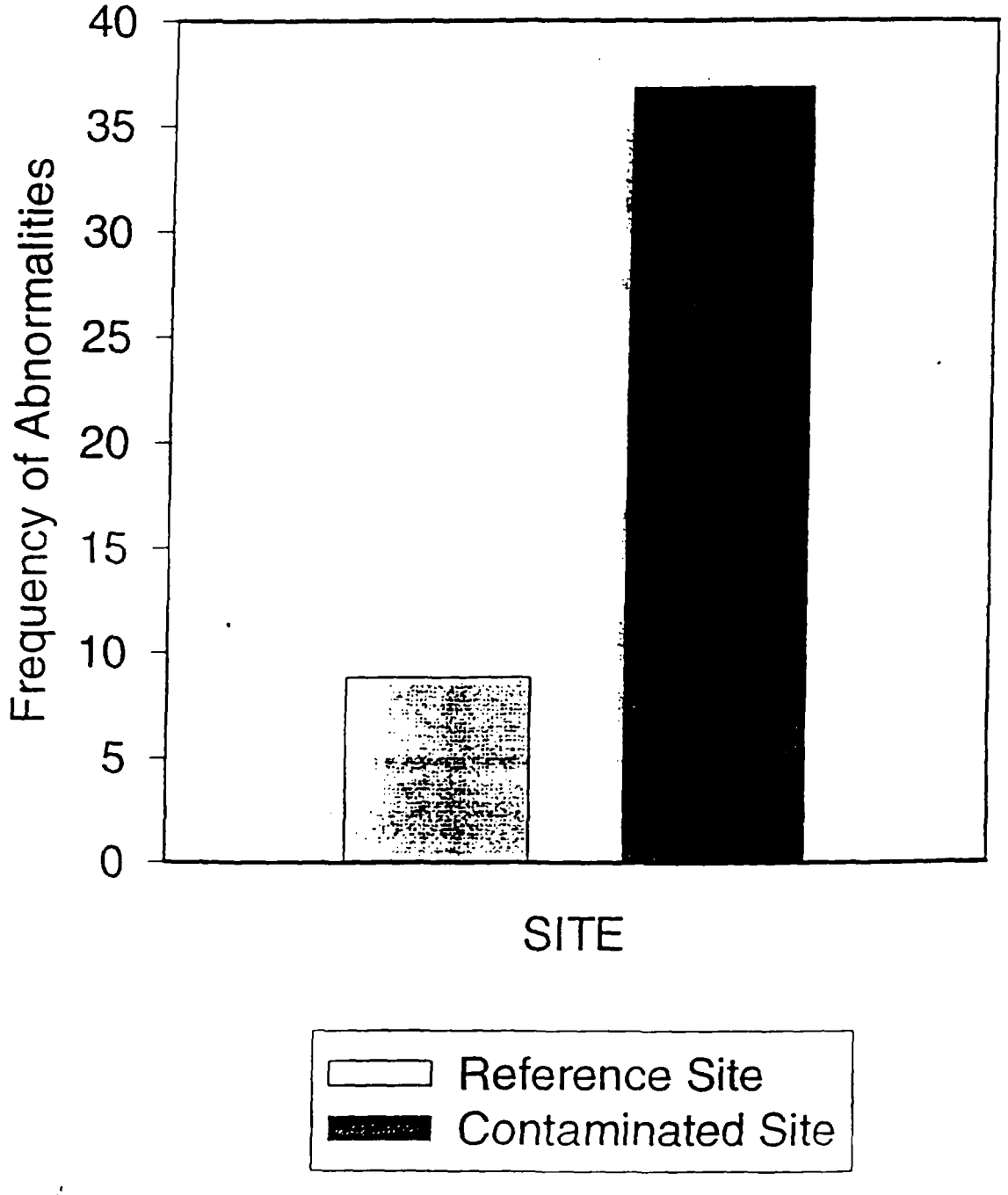
FIELD WORK

Nest boxes were placed in the PCB-contaminated study areas and a "reference" site. Although these boxes were utilized by several species of passerines, this study focused on just tree swallows. Daily observations of nests were recorded. After the first two eggs were laid in a nest (almost always on successive days), a freshly laid egg was collected from the nest on two successive days. We collected the mid- to last eggs laid in each clutch so as not to cause nest abandonment. Freshly laid eggs were transported to the laboratory in 0.8L foam-lined Rubbermaid™ containers placed into the shade and protection of a cooler to protect against overheating.

LABORATORY WORK

Upon receipt in the laboratory, eggs were incubated at 99F dry bulb, 90F wet bulb In 1995, eggs were incubated for 48 (E2) and 72 (E3) hours, incubating one egg per nest per sacrifice day. In 1996, after

EARLY EMBRYO ABNORMALITIES
1995



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[2] - U.S. Fish and Wildlife Service, Ecological Services Field Office, Bloomington, IN 47403.
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ABSTRACT

In order to assess relative ecotoxicological effects of *in ovo* post-hatching exposure to PCBs, we compared multiple effect endpoints in five passerine species nesting at PCB-contaminated sites versus at a "reference" site The five species examined include tree swallows, carolina chickadees, bluebird, red-winged blackbird, and house wren. Nest boxes were placed around the sludge lagoon, and around a "reference" pond in a different watershed on the other side of the county. Red-winged blackbird nests were identified in each area. Nests were observed daily, and productivity measures were recorded, including number of nests per site, number of eggs per nest, percentage of eggs hatched, nestling survival to just before fledging (8 - 14 days, depending on the species). After collection, the nestlings were weighed, sacrificed, necropsied, and assessed for gross abnormalities and individual and organ growth. Livers were weighed and used for EROD analysis, and the rest of the organs were weighed and archived for future histological analysis. Initial assessment indicates that significant differences were detectable between sites. The tree swallow nestlings at the contaminated site had significantly smaller mean weights of heart, lung, kidney, and spleen (corrected for body weight), compared to those at the "reference" site Gross abnormalities included abnormal hearts (house wren was the most frequent), abnormal beaks (especially tree swallow), and gonadal abnormalities in several of the species. We will compare the preliminary biochemical, reproduction, productivity and necropsy data between species to determine relative sensitivity.

METHODS

FIELD WORK

Nest boxes were placed in the PCB-contaminated study areas and a "reference" site. These boxes were utilized by tree swallows, eastern bluebirds, house wrens and carolina chickadees. In addition, surveys were conducted in these areas to locate red- winged black bird nests. Daily observations of nests were recorded. All chicks that remained in the nest were collected just prior to fledging on days 14, 14, 11, 14 and 8, respectively. Sibling chicks were transported to the laboratory together in 0.8L vented Rubbermaid™ containers placed into the shade and protection of a cooler to protect against overheating.

LABORATORY WORK

Necropsies

Chicks were weighed then sacrificed by decapitation Blood was collected in heparinized tubes, vortexed to mix the blood with the heparin, and centrifuged to isolate the plasma The plasma was rapidly frozen, and stored at -

RESULTS

FIELD OBSERVATIONS

- Significantly increased concentrations of PCBs were detected in red-winged black bird eggs at the contaminated compared to the reference site (>100X difference).
- Clear nest abnormalities were observed in tree swallow nests at the contaminated site, but not at the reference site (see photos).
- Serpentine predation occurred at the reference site, but not at the contaminated site.

PRODUCTIVITY AND NESTING SUCCESS

- Once predated nests were removed from the dataset, there were no significant differences in hatching success, nest survival, or the probability of nesting success.

ORGANS

- Heart, lung, kidney, and spleen were significantly smaller at the contaminated site compared to those at the reference site (tree swallow)

BIOCHEMISTRY

- By t-test BROD and EROD activities were both elevated significantly in tree swallows from the contaminated site as compared to the reference site ($p<0.001$).
- BROD and EROD activities were not significantly different in red-winged blackbirds from these two sites.
- MROD activity was significantly lower in red-winged blackbirds from the contaminated site as compared to the reference site ($p< 0.05$)

PRODUCTIVITY*

Measure	1995-ref[1]	1995-cont[2]	1996-ref[1]	1996-cont[2]
Hatch Success	0.8095	0.8857	0.9489	0.9315
Nest Survival	0.9406	1.0	1.0	0.9509
Probability of Success	0.7614	0.8857	0.9489	0.8858
n (nests)	17	11	26	21

* - With predated nests excluded

Measure	1995/1996 Reference Site[1]	1995/1996 Contam. Site[2]
Hatch Success	0.8944	0.9167
Nest Survival	0.9762	0.9667
Probability of Success	0.8731	0.8861
n (nests)	43	32

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United States Environmental Protection Agency | Solid Waste and Emergency Response | Directive: 9355.4-01 FS
August 1990

EPA

A Guide on Remedial Actions at Superfund Sites With PCB Contamination

Office of Emergency and Remedial Response
Hazardous Site Control Division (OS-220)

Quick Reference Fact Sheet

GOALS

This fact sheet summarizes pertinent considerations in the development, evaluation, and selection of remedial actions at Superfund sites with PCB contamination. It provides a general framework for determining cleanup levels, identifying treatment options, and assessing necessary management controls for residuals. It is not a strict "recipe" for taking action at PCB-contaminated sites, but it should be used as a guide for developing remedial actions for PCBs. Site-specific conditions may warrant departures from this basic framework. A more detailed discussion of these issues can be found in the *Guidance on Remedial Actions for Superfund Sites with PCB Contamination*, OSWER Directive No. 9355.4 - 01.

SUPERFUND GOAL AND EXPECTATIONS

The Superfund program goal and expectations for remedial actions (40CFR 300.430 (a)(1)(i) and (iii)(1990)) should be considered during the process of developing remedial alternatives. EPA's goal is to select remedies that are protective of human health and the environment, that maintain protection over time, and that minimize untreated waste. The Agency expects to develop appropriate remedial alternatives that:

- Use treatment to address the principal threats at a site, wherever practicable
- Use engineering controls, such as containment, for waste that poses a relatively low long-term threat or where treatment is impracticable
- Use a combination of treatment and containment to achieve protection of human health and the environment as appropriate
- Use institutional controls to supplement engineering controls for long-term management and to mitigate short-term impacts
- Consider the use of innovative technology when such technology offers the potential for comparable or superior treatment performance or implementability, fewer or lesser adverse impacts than other available approaches, or lower costs for similar levels of perfomance than more demonstrated technologies
- Return usable ground waters to their beneficial uses wherever practicable, within a timeframe that is reasonable, given the particular circumstances of the site

The following sections are organized to follow the Superfund decision process from scoping through preparation of the ROD

DETERMINE DATA NEEDS – Consider Special Characteristics of PCBs

Considerations to note during scoping and when developing potential remedial alternatives for PCBs, include the following:

- Applicable or relevant and appropriate requirements (ARARs) for PCBs are relatively complex because PCBs are addressed by both TSCA and RCRA (and in some cases, state regulations). Figure 1 illustrates primary regulatory requirements that address PCBs.
- PCBs encompass a class of chlorinated compounds that includes up to 209 variations or congeners with different physical and chemical characteristics. PCBs were commonly used as mixtures called Aroclors. The most common Aroclors are Aroclor-1254, Aroclor-1260, and Aroclor-1242.
- PCBs alone are not usually very mobile. However, they are often found with oils, which may carry the PCBs in a separate phase. PCBs may also be carried with soil particulates to which they are sorbed.
- Although most PCBs are not very volatile, they are very toxic in the vapor phase. Consequently, air sampling and analytical methodologies should be selected that will allow for detection of low levels of PCBs.
- Certain remedial technologies will require specific evaluations and/or treatability studies. If biotreatment is considered, the mobility and toxicity of possible by-products should be assessed. If stabilization is considered, the volatilization of PCBs during and after the process should be evaluated. Also, the long-term effectiveness of stabilization should be evaluated carefully. If incineration is considered, the presence of volatile metals should be addressed.

Table 1
Recommended Soil Action Levels–
Analytical Starting Point

Land Use	Concentration (ppm)
Residential	1
Industrial	10 – 25

The 1 ppm starting point for sites in residential areas reflects a protective quantifiable concentration. (Also, because of the persistence and pervasiveness of PCBs, PCBs will be present in background samples at many sites.) For sites in industrial areas, action levels generally should be established within the range of 10 to 25 ppm. The appropriate concentration within the range will depend on site-specific factors that affect the exposure assumptions. For example, at sites where exposures will be very limited or where soil is already covered with concrete, PCB concentrations near the high end of the 10-to-25 ppm range may be protective of human health and the environment.

Ground Water

If ground water that is, or may be, used for drinking water has been contaminated by PCBs, response actions that return the ground water to drinkable levels should be considered. Non-zero maximum contaminant level goals (MCLG) or maximum contaminant levels (MCL) should be attained in ground water where relevant and appropriate. State drinking water standards may also be potential ARARs. Proposed non-zero MCLGs and proposed MCLs may be considered for contaminated ground water. The proposed MCL for PCBs is .5 ppb. Since PCBs are relatively immobile, their presence in the ground water may have been facilitated by solvents (e.g., oils) or by movement on colloidal particles. Thus, the effectiveness of PCB removal from ground water, i.e., ground-water extraction, may be limited. In some cases, an ARAR waiver for the ground water may be supported based on the technical impracticability of reducing PCB concentrations to health-based levels in the ground water. Access restrictions to prevent the use of contaminated ground water and containment measures to prevent contamination of clean ground water should be considered in these cases.

Sediment

The cleanup level established for PCB-contaminated sediment may be based on direct-contact threats (if the surface water is used for swimming) or on exposure assumptions specific to the site (e.g., drinking water supplies). More often, the impact of PCBs on aquatic life and consumers of aquatic life will determine the cleanup level. Interim sediment quality criteria (SQC) have been developed for several non-ionic organic chemicals, including PCBs and may be considered in establishing remediation goals for PCB-contaminated sediments. The method used to estimate these values is called the equilibrium partitioning approach. It is based on the assumptions that: (1) the biologically available dissolved concentration of a chemical in interstitial water is controlled by partitioning between sediment and water phases that can be estimated based on organic carbon partition coefficients; (2) the toxicity of a chemical to, and bioaccumulation by benthic organisms is correlated with the bioavailable concentration of the chemical in pore water; and (3) the ambient aquatic life water quality criteria (WQC) concentrations are appropriate for the protection of benthic communities and their uses. Table 2 presents the sediment quality criteria and derived PCB sediment concentrations based on the SQC for freshwater and saltwater environments and two organic carbon (OC) concentrations. These criteria are to be considered in establishing remediation goals for contaminated sediments.

Table 2 – Sediment Cleanup Levels

	Aquatic Environment	
	Freshwater	Saltwater
Sediment Quality Criteria (SQC)	19	33
(Concentrations expressed as ug/g of sediment)		
OC = 10%	1.90	3.30
OC = 1%	0.19	0.33

DEVELOP REMEDIAL ALTERNATIVES

The potential response options at any site range from cleaning up the site to levels that would allow it to be used without restrictions to closing the site with full containment of the wastes. Figure 2 illustrates the process for developing alternatives for a PCB-contaminated site.

Primary Alternatives

It is the expectation of the Superfund program that the primary alternatives for a site will involve treatment of the principal threats and containment of the remaining low level material. For residential sites, principal threats will generally include soils contaminated at concentrations greater than 100 ppm PCBs. For industrial sites, principal threats will include soils contaminated at concentrations greater than or equal to 500 ppm PCBs.

Treatment Options

Liquid and highly concentrated PCBs constituting the principal threats at the site should be addressed through treatment. Treatment options that are currently available or are being tested include incineration, solvent washing, KPEG (chemical dechlorination), biological treatment, and solidification. Compliance with TSCA ARARs requires that PCBs, at greater than 50ppm, be incinerated, treated by an equivalent method, or disposed of in a chemical waste landfill. Equivalence to incineration is demonstrated when treatment residues contain <2 ppm PCB. If treatment is not equivalent to incineration, compliance with TSCA ARARs must be achieved by implementing long-term management controls consistent with the chemical waste landfill requirements. (Liquid PCBs at concentrations greater than 500 ppm cannot be landfilled under TSCA.)

Containment of Low-Threat Materials

Long-term management controls should generally be implemented for treatment residuals and other low level contaminated materials remaining at the site. Example scenarios for the use of long-term management controls appropriate for particular PCB concentrations are shown in Table 3. The substantive requirements of a chemical waste landfill specified in TSCA regulations (761

SELECTION OF REMEDY

Criteria and Balancing

The analysis of remedial alternatives for PCB-contaminated Superfund sites is developed on the basis of the following nine evaluation criteria provided in the NCP (300.430[e][a][iii]; 300.430[f][i][i]). Considerations unique to PCBs are noted.

Threshold Criteria

- **Overall protection of human health and the environment.** Are all pertinent exposure pathways being addressed? Are highly concentrated PCBs being treated? Are remaining PCBs and treatment residuals being properly contained, as outlined in Table 3?

- **Compliance with ARARs.** Does the action involve disposal of PCBs at concentrations greater than or equal to 50 ppm? Is the action consistent with TSCA treatment requirements? Is the action consistent with chemical waste landfill requirements, with appropriate TSCA waivers specified for landfilling of material that does not meet treatment requirements? Is a RCRA hazardous waste present? Do California List land dis-

Table 3 – Selection of Long-Term Management Controls To Be Considered for PCB-Contaminated Sites

posal restrictions (LDRs) apply? Is the action consistent with LDRs or treatability variance levels where appropriate? Is contaminated ground water that is potentially drinkable being returned to drinkable levels or is support for a technical impracticability waiver provided?

Balancing Criteria

- **Long-term effectiveness and permanence.** Are highly concentrated PCBs being treated? Are low concentration PCBs being properly contained, as outlined in Table 3? Is the site in a location that geographically limits the long-term reliability of containment (e.g., high water table, floodplain)?

- **Reduction of toxicity, mobility, or volume through treatment.** Is there a high degree of certainty that the treatment methods selected will achieve at least a 90 percent reduction of PCBs? Does treatment increase the volume of PCB-contaminated material that must be addressed either directly (e.g., solidification) or through the creation of additional waste streams (e.g., solvent washing)?

- **Short-term effectiveness.** Is the short-term inhalation risk resulting from volatilization of PCBs properly addressed? What is the relative timing of the different remedial alternatives?

- **Implementability.** Does the treatment selected require construction of a system onsite (e.g., KPEG, solvent washing)? Does the action require extensive study to determine effectiveness (e.g., bioremediation)? Are permitted facilities available for alternatives involving offsite treatment or disposal?

- **Cost.**

Modifying Criteria

- **State acceptance**
- **Community acceptance**

Likely Tradeoffs Among Alternatives

Primary tradeoffs for PCB-contaminated sites will derive from the type of treatment selected for the principal threats and the determination of what material can be reliably contained. Alternatives that require minimal long-term management will often provide less short-term effectiveness and implementability because large volumes of contaminated material must be excavated and treated. They will generally be more costly but will provide high long-term effectiveness and permanence and achieve significant reductions in toxicity and volume through treatment. Alternatives that involve containment of large portions of the contaminated site will generally have lower long-term effectiveness and permanence and achieve less toxicity or volume reduction through treatment. However, they will generally be less costly, more easily implemented, and have higher short-term effectiveness.

DOCUMENTATION

A ROD for a PCB-contaminated Superfund site should include the following components under the *Description of Alternatives* section:

- Remediation goals defined in the FS for each alternative, i.e., concentrations above which PCB-contaminated material will be addressed and concentrations above which material will be treated.

- Treatment levels to which the selected action will reduce PCBs before redepositing residuals. The consistency of these levels with TSCA requirements and other ARARs should be indicated.

- Long-term management controls that will be implemented to contain or limit access to PCBs remaining onsite. The consistency with RCRA closure and TSCA chemical waste landfill requirements (and justification for appropriate TSCA waivers) should be indicated.

NOTICE

Development of this document was funded by the United States Environmental Protection Agency. It has been subjected to the Agency's review process and approved for publication as an EPA document.

(ii) All appropriate Fund-financed response under CERCLA has been implemented, and no further response action by responsible parties is appropriate; or

(iii) The remedial investigation has shown that the release poses no significant threat to public health or the environment and, therefore, taking of remedial measures is not appropriate.

(2) Releases shall not be deleted from the NPL until the state in which the release was located has concurred on the proposed deletion. EPA shall provide the state 30 working days for review of the deletion notice prior to its publication in the Federal Register.

(3) All releases deleted from the NPL are eligible for further Fund-financed remedial actions should future conditions warrant such action. Whenever there is a significant release from a site deleted from the NPL, the site shall be restored to the NPL without application of the HRS.

(4) To ensure public involvement during the proposal to delete a release from the NPL, EPA shall:

(i) Publish a notice of intent to delete in the Federal Register and solicit comment through a public comment period of a minimum of 30 calendar days;

(ii) In a major local newspaper of general circulation at or near the release that is proposed for deletion, publish a notice of availability of the notice of intent to delete;

(iii) Place copies of information supporting the proposed deletion in the information repository, described in § 300.430(c)(2)(iii), at or near the release proposed for deletion. These items shall be available for public inspection and copying; and

(iv) Respond to each significant comment and any significant new data submitted during the comment period and include this response document in the final deletion package.

(5) EPA shall place the final deletion package in the local information repository once the notice of final deletion has been published in the Federal Register.

§ 300.430 Remedial investigation/feasibility study and selection of remedy.

(a) *General*—(1) *Introduction.* The purpose of the remedy selection process is to implement remedies that eliminate, reduce, or control risks to human health and the environment. Remedial actions are to be implemented as soon as site data and information make it possible to do so. Accordingly, EPA has established the following program goal, expectations, and program management principles to assist in the identification and implementation of appropriate remedial actions.

(i) *Program goal.* The national goal of the remedy selection process is to select remedies that are protective of human health and the environment, that maintain protection over time, and that minimize untreated waste.

(ii) *Program management principles.* EPA generally shall consider the following general principles of program management during the remedial process:

(A) Sites should generally be remediated in operable units when early actions are necessary or appropriate to achieve significant risk reduction quickly, when phased analysis and response is necessary or appropriate given the size or complexity of the site, or to expedite the completion of total site cleanup.

(B) Operable units, including interim action operable units, should not be inconsistent with nor preclude implementation of the expected final remedy.

(C) Site-specific data needs, the evaluation of alternatives, and the documentation of the selected remedy should reflect the scope and complexity of the site problems being addressed.

(iii) *Expectations.* EPA generally shall consider the following expectations in developing appropriate remedial alternatives:

(A) EPA expects to use treatment to address the principal threats posed by a site, wherever practicable. Principal threats for which treatment is most likely to be appropriate include liquids, areas contaminated with high concentrations of toxic compounds, and highly mobile materials.

(B) EPA expects to use engineering controls, such as containment, for waste that poses a relatively low long-term threat or where treatment is impracticable.

(C) EPA expects to use a combination of methods, as appropriate, to achieve protection of human health and the environment. In appropriate site situations, treatment of the principal threats posed by a site, with priority placed on treating waste that is liquid, highly toxic or highly mobile, will be combined with engineering controls (such as containment) and institutional controls, as appropriate, for treatment residuals and untreated waste.

(D) EPA expects to use institutional controls such as water use and deed restrictions to supplement engineering controls as appropriate for short- and long-term management to prevent or limit exposure to hazardous substances, pollutants, or contaminants. Institutional controls may be used during the conduct of the remedial investigation/feasibility study (RI/FS) and implementation of the remedial action and, where necessary, as a component of the completed remedy. The use of institutional controls shall not substitute for active response measures (e.g., treatment and/or containment of source material, restoration of ground waters to their beneficial uses) as the sole remedy unless such active measures are determined not to be practicable, based on the balancing of trade-offs among alternatives that is conducted during the selection of remedy.

(E) EPA expects to consider using innovative technology when such technology offers the potential for comparable or superior treatment performance or implementability, fewer or lesser adverse impacts than other available approaches, or lower costs for similar levels of performance than demonstrated technologies.

(F) EPA expects to return usable ground waters to their beneficial uses wherever practicable, within a timeframe that is reasonable given the particular circumstances of the site. When restoration of ground water to beneficial uses is not practicable, EPA expects to prevent further migration of the plume, prevent exposure to the contaminated ground water, and evaluate further risk reduction.

(2) *Remedial investigation/feasibility study.* The purpose of the remedial investigation/feasibility study (RI/FS) is to assess site conditions and evaluate alternatives to the extent necessary to select a remedy. Developing and conducting an RI/FS generally includes the following activities: project scoping, data collection, risk assessment, treatability studies, and analysis of alternatives. The scope and timing of these activities should be tailored to the nature and complexity of the problem and the response alternatives being considered.

(b) *Scoping.* In implementing this section, the lead agency should consid the program goal, program manageme principles, and expectations containec in this rule. The investigative and analytical studies should be tailored t site circumstances so that the scope a detail of the analysis is appropriate tc the complexity of site problems being addressed. During scoping, the lead a support agencies shall confer to iden the optimal set and sequence of actio necessary to address site problems. Specifically, the lead agency shall:

(1) Assemble and evaluate existing data on the site, including the results any removal actions, remedial

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Professional Waste Management Consultants
106 Robinson Street Ashland, Virginia 23005 (804) 798-4305

MEMORANDUM VIA FACSIMILE

TO MIKE BAKER

FROM PAULINE EWALD

RE CONSTITUENTS OF CONCERN AT BLOOMINGTON SITES

COPIES DAN CORTES, MELISSA VALENTIN, JOE HAILER

DATE July 13, 1995

I am in receipt of Dan Cortes' information regarding chlorobenzenes, and have re-reviewed some of the past sampling data for Lemon Lane in that regard. Several chlorobenzenes are included in the routine sampling parameters utilized in past site work. However, the analytical parameters list is by no means comprehensive. Recent research information suggests that there are many potentially toxic contaminants that may be co-located with PCBs, especially where as is the case with Lemon Lane, there has been incomplete and uncontrolled burning. In the past, I have sent along copies of some research articles documenting the existence of these substances, but would be happy to duplicate the information to any interested parties, or provide copies for the bulletin board upon request

These substances include dioxin and furan-like compounds where bromine and sulfur substitute for the chlorine associated with dioxins and furans Although these compounds are not fully understood to date, research data tends to suggest that these relatively unknown chemicals, almost universally excluded from routine site characterization and risk assessment have likely greater toxic potential in regard to human health and the environment than the dioxins and furans. Any truly comprehensive characterization of the Bloomington sites must provide for the identification and quantification of each of the organic chemicals listed below:

co-planer PCBs

polychlorinated dibenzothiophenes

polychlorinated dibenzoxanthenes

polybrominated dibenzo-p-dioxins

polybrominated dibenzo-furans

bromo-chloro- dibenzo-p-dioxins

bromo-chloro-dibenzo-furans

brominated dibenzo-thiophenes

brominated dibenzo-xanthenes

chloro-bromo-dibenzo-thiophenes

chloro-bromo-dibenzo-xanthenes

co-planer PBBs

polychlorinated biphenylenes

polybrominated biphenylenes

chlorobenzenes

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IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF INDIANA
INDIANAPOLIS DIVISION

THE CITY OF BLOOMINGTON, INDIANA and THE UTILITIES SERVICE BOARD OF BLOOMINGTON, INDIANA,	Consolidated Cases
Plaintiff,	IP 81-448-C
v.	
WESTINGHOUSE ELECTRIC CORPORATION and MONSANTO COMPANY,	
Defendants.	
and	
UNITED STATES OF AMERICA,	
Plaintiff,	
and	
THE ENVIRONMENTAL MANAGEMENT BOARD OF THE STATE OF INDIANA,	
Plaintiff-Intervenor,	
v.	IP 83-9-C
WESTINGHOUSE ELECTRIC CORPORATION,	Judge S. Hugh Dillin
Defendant and Third Party Plaintiff,	
v.	
MONSANTO COMPANY,	
Third Party Defendant.	

RESPONSE OF THE UNITED STATES TO
PUBLIC COMMENTS ON CONSENT DECREE AND
REQUEST TO ENTER CONSENT DECREE

and prosecution of the lawsuit. The State of Indiana intervened as a plaintiff. Monsanto was joined by Westinghouse as a third party defendant. In 1981 a separate suit had been filed by the City of Bloomington against Westinghouse involving several other sites (Lemon Lane Landfill and Winston Thomas Treatment Plant), City of Bloomington, et al. v. Westinghouse Electric Corporation, et al., IP 81-448-C, now consolidated with the United States case.

After extensive negotiations in the spring and summer of 1983, Westinghouse and the United States agreed to a Stipulation and Order, which was entered by the Court on March 12, 1984, that essentially resolved the matters raised by the United States' motion for preliminary injunction. Westinghouse was required to perform a variety of interim clean-up measures at Neal's Landfill and Neal's Dump.

Beginning in December, 1983, the parties (other than Monsanto Corporation) agreed to conduct settlement discussions and to stay the litigation for that purpose. Those discussions resulted in an agreement, embodied in the proposed Consent Decree, that provides for comprehensive remedial measures at six sites in the Bloomington area. The six sites include the four sites covered by these consolidated cases, i.e. Neal's Dump, Neal's Landfill, Lemon Lane Landfill and Winston Thomas Treatment Plant, and two additional sites which the parties agreed Westinghouse should clean up -- Bennett's Dump and the Anderson Road Landfill. */

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*/ A description of these sites is set forth below at pp. 8-10.

II.

The PCB Problem

A. PCBs

PCBs are a family of chemical compounds which were widely used by the electrical industry as an insulating fluid until their manufacture was banned in 1979. */ PCBs are extremely stable, fire resistant and electrically non-conductive. They are persistent, that is they do not readily degrade in the environment. They are also toxic. See e.g. Environmental Defense Fund v. Environmental Protection Agency, 636 F.2d 1267, 1270 (D.C. Cir. 1980). Their persistence allows PCBs to accumulate in living tissues so that the levels of PCBs in organisms exposed to PCBs increase over time to much higher levels than the level of exposure. Exposure to PCBs may cause a substantial risk of harm to health and the environment. Environmental Defense Fund v. Environmental Protection Agency, supra, 636 F.2d 1270, 1271; Environmental Defense Fund v. Environmental Protection Agency, 598 F.2d 62, 85-90 (D.C. Cir. 1978).

Congress has made several legislative findings that PCBs pose substantial risks to human health or the environment. Congress enacted TSCA in response to the dangers associated

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*/ The PCB ban rule, required by Congress under the Toxic Substances Control Act ("TSCA"), 15 U.S.C. §2605(e), was promulgated by EPA on May 31, 1979, and is codified at 40 C.F.R. §761.1 et seq.

capacitors are exposed on the surface and buried beneath the surface, and there is stream and stream sediment contamination at one or more sites. There is also evidence of the presence of other hazardous substances, e.g., trichloroethylene and toluene at the sites. Several of the sites are underlain by fractured limestone bedrock which readily allows chemicals migrating from the site to move into the groundwater. There is evidence of groundwater contamination at two of the sites which are the subject of this settlement, Neal's Landfill and Lemon Lane Landfill, and the potential is there for all of the sites underlain by fractured limestone. A brief description of the sites follows.

Neal's Landfill

Neal's Landfill is a site of approximately 18 acres in a rural section of Monroe County, Indiana, approximately six miles west of Bloomington Indiana. North of the Neal's Landfill site is Conard's Farm. Conard's Branch is a surface stream which flows from the northwestern corner of the site. The water of a spring that feeds Conard's Branch and the Branch itself are contaminated with PCBs. There is a second spring in the southwestern part of the site that also is contaminated with PCBs. There is evidence of groundwater contamination beneath the site. The sediment and banks of Conard's Branch are contaminated with PCBs. Conard's Branch flows into Richland Creek where local residents catch fish both for sport and food. Fish sampling data

Winston Thomas Treatment Plant

Winston Thomas Treatment Plant is the City of Bloomington former sewage treatment plant. During the 1960's and 1970's Westinghouse effluent, contaminated with PCBs, ran through the plant and contaminated it. Clear Creek runs by this site. The Treatment Plant includes a large (approximately 17 acres) lagoon, digester tanks, sludge drying beds, trickling filters and buried lagoons, all of which are contaminated with PCBs.

Anderson Road Landfill

The Anderson Road Landfill in Monroe County, Indiana, is owned by Monroe County and is presently operated as the County municipal landfill. Only a portion of the site, where PCBs have been exposed on the surface, is being cleaned up under the settlement.

III.

The Terms of the Proposed Consent Decree

The proposed Consent Decree provides for a more comprehensive and environmentally sound remedy than the United States originally sought in the litigation and encompasses not only Neal's Landfill and Neal's Dump, but four other sites as well.

designed to burn municipal trash supplied by the City and Monroe County as a fuel source. If sufficient municipal trash is not available or the trash is not a usable fuel, Westinghouse must use conventional fuels. Consent Decree, par. 15. The estimated time to incinerate all wastes from all sites once the incinerator is constructed and permitted is eleven years. The maximum allowable time is fifteen years. Consent Decree, par. 10. Westinghouse guarantees that its incinerator will be constructed and operated to burn at the efficiency required by state and federal law and to modify or rebuild it if necessary to meet those standards. Consent Decree, par. 6. Westinghouse agrees to apply for, obtain and comply with all permits, local, state and federal laws and requirements. Consent Decree, Section XXI. Westinghouse agrees to properly dispose of ash and other incineration byproducts. Consent Decree, Sections V, VII.

3. Westinghouse agrees to excavate and incinerate stream sediments in the vicinity of the sites. All stream sediments and portions of the bank in Conard's Branch near Neal's Landfill will be excavated, Consent Decree, Section VIII, pp. 32-36, and portions of sediments in Clear Creek, Richland Creek, Stout's Creek and Salt Creek will be excavated. There is also a provision for removing sediments a second time, if the PCBs levels are elevated, after excavation at the sites is completed. Consent Decree, Section VIII, pp. 35, 36.

undertake a monitoring program to detect possible offsite well contamination. Westinghouse agrees to provide a permanent alternative water supply source (hookup to public water system or carbon filter at the source) to any potentially affected well owner within a 5000 foot radius of each of the sites when a monitoring well in the same hydrologic zone of influence shows a detectable concentration of PCBs, without any proof of causation. Consent Decree, Section XIII. In exchange, the United States agrees not to pursue further groundwater remedies against Westinghouse for the problem of domestic well water contamination within the 5000 foot radius, e.g. pumping the aquifer, but does not so agree for problems outside that radius. Consent Decree, Section XIII, p. 66. */

7. Westinghouse agrees to provide independent financial security (cash bonds, letters of credit, e.g.) for its performance in an amount equal to 125% of the net cost of performance if its net worth (nearly $4 billion at present) drops by 50% at any time. Consent Decree, Section XIX. Westinghouse also agrees to purchase (or maintain through self insurance) and to require its contractors to purchase adequate insurance to cover its potential liability, including damage to the incinerator. Consent Decree, Section XX. The RCRA regulations also require insurance coverage for all hazardous waste facilities, including incinerators. 40 C.F.R. §264.147.

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*/ Due to the fractured limestone geology, groundwater pumping or containment remedies are not feasible at the sites which are the subject of groundwater monitoring. See the Affidavit of Dr. Richard Powell.

States is not precluded from seeking additional relief - equitable or cost recovery - in such circumstances. Consent Decree, Section XXIII, p. 85.

11. The Consent Decree provides for a federal on-scene-coordinator ("OSC") to oversee Westinghouse's work. The OSC's powers are quite broad. Consent Decree, Section XVII. The section allows Westinghouse or any party to judicially contest orders of the OSC, or failures to act, under certain conditions and provides that during any such contest the OSC's orders shall continue in force absent a judicial stay. The only grounds for reversal of an OSC order are if the order requires Westinghouse to do something that is not necessary to mitigate a threatened or actual release or if the order "involves significant activities not contemplated by the Consent Decree." Consent Decree, Section XVII, p. 72. In any case the section provides that it does not affect the OSC's powers under the National Contingency Plan, 40 C.F.R. Part 300. */ Consent Decree, Section XVII, p. 71.

12. The Decree provides that Westinghouse may propose an alternative method of disposal of PCBs (i.e., new technology) if one is developed. However, the method must be as efficient as and must result in as expeditious and environmentally sound a

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*/ The National Contingency Plan is a set of regulations promulgated by EPA on July 16, 1982, 47 Fed. Reg. 31202, as required by CERCLA, Section 105, 42 U.S.C. §9605, that govern the investigation of releases of hazardous substances, the development of interim and final cleanup remedies, and the implementation of those remedies, whether by private parties or by the government.

time will contribute significantly toward ultimate achievement of statutory goals." Metropolitan Housing, supra, at 1014, citing Patterson v. Newspaper and Mail Deliverers' Union, 514 F.2d 767, 771 (2nd Cir. 1975), cert. den., 427 U.S. 911 (1976).

As Judge Steckler held in approving a hazardous waste cleanup consent decree in Seymour, supra:

> The underlying purpose of the court in making these inquiries is to determine whether the decree adequately protects the public interest [citation omitted]. The court "must eschew any rubber stamp approval in favor of an independent evaluation," [citation omitted] but because of the clear public policy favoring settlements the court must not substitute its judgment for that of the parties. Id. at 1337-1338.

B. Public Comments

The United States received a total of 25 comments on the Consent Decree, including one letter attaching a newspaper advertisement ballot which it claimed was signed by 832 citizens opposed to the decree and 19 in favor. All but one of the comments were from citizens. One was from the Indiana Public Interest Research Group. Those public comments are attached hereto as Exhibit "A".

The public comments in the aggregate make several main points: (1) incineration is allegedly unsafe because it can produce toxic materials, thus substituting an air problem for a toxic waste disposal problem, and therefore nothing should be done until safer disposal methods (e.g., biological treatment)

conditions to assure compliance with the state and federal standards, that there is no requirement that Westinghouse comply with all applicable federal regulations, that there is no provision for enforcement of such regulations, that there should be a provision for citizen participation, oversight and enforcement in the Decree, and that the public comment process prior to and after the lodging of the Decree was inadequate.

V.

The United States Response to the Public Comments

A. Incineration remedy

1. Emissions: EPA regulates PCB and hazardous waste incinerators pursuant to TSCA and RCRA. Pursuant to TSCA, 15 U.S.C. §2605(e), EPA has promulgated regulations for the disposal of PCBs. Those regulations, codified at 40 C.F.R. §761 et seq., require that PCB incinerators meet stringent requirements for destruction efficiency, temperature, dwell time and other standards to insure virtually total destruction of the PCBs and PCB byproducts. Pursuant to RCRA, 42 U.S.C. §6924, EPA has promulgated regulations for the disposal or treatment of hazardous wastes */ that impose stringent requirements on

*/ Hazardous wastes are defined at 42 U.S.C. §6903(5) and 40 C.F.R. §261 and include some of the other wastes deposited at the dumpsites, e.g., toluene and trichloroethylene. PCBs are not currently regulated under Subtitle C of RCRA, see 45 Fed. Reg. 33086 (May 19, 1980), but are under TSCA, 15 U.S.C. §2605(e). PCBs are subject to the imminent and substantial endangerment section of RCRA, 42 U.S.C. §7003.

PCB incinerators (SCA in Chicago, Illinois, Rollins in Deer Park, Texas and ENSCO in El Dorado, Arkansas) has demonstrated that these regulatory standards are effective in controlling incinerator emissions. See the Affidavit of Y. J. Kim attached hereto as Exhibit "G". In addition, federal approvals require specific ranges for oxygen and turbulence (mixing of the waste and oxygen) within the combustion chamber. These elements further contribute to the efficiency of the combustion process. Further, the planned incinerator must install air pollution control devices beyond the combustion chamber in accordance with federal approval to provide additional protection from the release of harmful emissions from the incineration process. Affidavit of Y. J. Kim.

Federal PCB incinerator regulations also require that a PCB incinerator operate to destroy PCBs with a 99.9999% efficiency. 40 C.F.R. §761.70(b)(1). Therefore, for each million molecules of PCBs fed into the incinerator, only one molecule may remain after the combustion process. Affidavit of Y. J. Kim. The RCRA regulations require a destruction efficiency of 99.99% for principal organic constituents in the waste material. 40 C.F.R. §264.342 and §264.343. */ Given these basic operating

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*/ Those constitutents will be identified by the EPA in the RCRA portion of the permit. At this point, those constituents have not yet been determined. However, any permit issued will include a listing of the constituents and the basic destruction efficiency requirement should eliminate the risk of harmful emissions from their incineration. See Affidavit of Y. J. Kim.

V, VII. The metal content of the ash may render it hazardous so that the ash would have to be disposed of in an appropriate permitted facility. Id.; Affidavit of Howard Beard.

2. Risk Assessments/Trial Burns: A few commenters questioned whether a risk assessment would be performed prior to the initiation of incineration operation. It is the standard practice of EPA to require applicants for high temperature incinerator permits to conduct a risk assessment. Affidavit of Y. J. Kim. That assessment is submitted along with results of a trial or test burn for evaluation by the EPA as part of a permit application process. Generally, risk assessments evaluate the worst case scenario in terms of duration of exposure and concentrations and toxicity of emissions. For example, the SCA incinerator risk assessment was based on the assumptions that all dioxin emissions were of the most toxic type and exposure was continuous for twenty-four hours over a seventy year span. In fact, the most toxic form of dioxin was not detectable in the SCA stack emissions. The results of the SCA risk assessment showed that, even with those conservative assumptions, the incinerator would not adversely impact the health of residents near the facility. A similar evaluation will be conducted for the planned Westinghouse incinerator. Id.

In addition to the risk assessment, each incinerator permit applicant is required, under regulations at 40 C.F.R. §761.70 and 40 C.F.R. §§264 and 270 to conduct a trial or test burn. The permit applicant must demonstrate, using a specified amount

tentatively proposed the Dillman Road Treatment Plant as the desirable location for the incinerator. Consent Decree, par. 19. However, the final decision as to the appropriateness of any proposed site is still to be made by the City,*/ State, **/ and Federal agencies. ***/ Therefore, it is premature to conclude that the high temperature incinerator will necessarily be located in a specific location.

[redacted] Some of the comments refer to the Huber Process as a feasible alternative to the proposed high temperature incineration plan. The Huber Process refers to a method of incineration in which carbon electrodes are heated to extremely high temperatures by electricity within a hollow tube in which fine particles are allowed to fall. [redacted] Id. [redacted] sizes (1/10 - 1/100 of an inch) [redacted]

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*/ See Consent Decree, par. 7.

**/ The Indiana Siting Board has the authority to approve or reject any hazardous waste facility site proposed. IC 13-7-8.6-1 et seq.

***/ The siting issue is also a factor considered in approving or denying Federal permits or approvals. E.g., 40 C.F.R. §761.70(d)(1)(i).

efficacy of the Huber Process [redacted] safety of high temperature incineration, this increase in costs cannot be justified.

Therefore, given that the Huber Process cannot technically be used in this situation, and given the other factors discussed above, the commenters are incorrect in proposing the Huber Process as a currently feasible alternative to high temperature incineration.

2. Other Alternative Destruction or Treatment Systems: The United States, as well as the other parties to the proposed settlement, has also assessed the viability of other potential treatment or destruction systems for PCBs. A few commenters mentioned the possibility of [redacted] of the materials. [redacted] now under development and has determined that, at this point, [redacted] to justify the conclusion that they could successfully handle the materials at the Bloomington sites. See the Affidavit of [redacted] Moreover, if during the implementation of the proposed settlement it becomes clear that biological treatment (or any other treatment method) may safely and efficiently be used to destroy the wastes in Bloomington, the Decree permits Westinghouse to demonstrate to the other parties that this method is as expeditious, safe and efficient as incineration and the Decree may be so modified, if all the parties agree such modification is appropriate. Consent Decree, par. 114(i).

condition characterized by highly fractured limestone bedrock, sinkholes, seeps and springs. Due to the nature of these formations, groundwater does not flow in an established pattern of alternating layers of water, soils and rocks but rather in a maze of paths through cracks in the limestone. See the Affidavit of Dr. Richard Powell. There may be major channels at some points in the underlying system where the water has created what are in essence caves, but those channels carry only a portion of the groundwater which flows in the system.

[redacted] Id.

[redacted]

The proposed Decree requires Westinghouse to conduct groundwater monitoring both on-site and off, with monitoring to continue for up to thirty years after closure of each site. Consent Decree, Section XIII. In addition, if PCB contamination is found in excess of the detection limit */ at the offsite monitoring wells, or if during a residential well survey PCBs are found in excess of the detection limit in a drinking

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*/ The trigger level for the alternative drinking water supply provisions is defined in the proposed Consent Decree at paragraph 71(a). The concentration established to trigger Westinghouse's responsibility to supply alternative water supplies

[Footnote * continued on next page.]

The [redacted] Consent Decree Section XIII, pp. 57, 63. [redacted] See Affidavit of [redacted] attached hereto as [redacted] Given that Westinghouse is not released for groundwater problems beyond the 5000 foot radius (Consent Decree, par 82; Section XXIII; and par. 111(e)) and that monitoring of offsite drinking wells has not detected any PCB contamination, the radius is adequate. Affidavit of Tim O'Mara.

One commenter addressed the difference of approach to groundwater at the Neal's Dump site in comparison to the other sites involved in the proposed settlement. As has been already noted (supra at p. 14, fn.*), the Neal's Dump site was treated differently because of its different hydrogeology and soil composition and the absence of reliable evidence of groundwater contamination.

[redacted] The affidavit of [redacted] attached hereto as Exhibit "K", [redacted] Basically, a committee made up of local, state, federal and citizen representives is receiving

is less than 1 ppb, the fish show levels less than the FDA limit, or after five years, whichever is earlier. Consent Decree, p. 44. The 1 ppb effluent level (exceedance of which triggers carbon filtration) was based on the limit the State allows in discharge permits for PCBs. Affidavit of Howard Duckman, attached hereto as Exhibit "L".

G. Public Participation

One comment referred to the alleged lack of public participation opportunities in the decision process once the proposed Consent Decree is entered. The commenter fails to recognize that, by Federal and State regulation, proposed permits and approvals are subject to a period of public comment and, if appropriate, public hearings may be held. There are also established appeal procedures. See, e.g. 40 C.F.R. §124 (EPA permitting procedures applicable to RCRA permits, inter alia) and 40 C.F.R. §761.70 (the EPA procedures applicable to PCB incinerators); IC 4-22-1-1 et seq. and IC 13-7-10-1 et seq. Thus, federal and State laws and regulations provide numerous opportunities for participation at various stages of each decision-making process under the proposed settlement.

H. Medical Fund, Medical Monitoring

Several comments suggested that the proposed settlement is inadequate because it does not establish a trust fund or damages to pay for the expenses of anyone whose health has been or may be adversely affected by PCBs, or require medical monitoring. However, the United States does not have the authority to recover "damages" for private individuals under

in depth at each site as a "buffer zone". Consent Decree, Section VIII. */ The purpose of this "buffer zone" is to insure that once the PCB wastes are removed substantially all of the PCB contaminated soil at the sites will be removed as well, without the necessity of a massive sampling program. See the Affidavit of Dr. Robert A. Griffin, attached hereto as Exhibit "N". In the opinion of the United States experts, this "buffer zone" adequately provides for cleanup of the sites. Id.

2. Sampling protocol at Lemon Lane Landfill: One commenter stated that Westinghouse is not required to follow a sampling protocol at Lemon Lane Landfill in determining the 50 ppm line, citing par. 47(b) of the Consent Decree. This is a misreading of the Decree. Par. 47(b) of the Decree requires that Westinghouse conduct a sampling program at Lemon Lane Landfill, approved by the plaintiffs. That paragraph provides that a particular EPA sampling protocol is not applicable, thus allowing the plaintiffs to impose more site specific sampling requirements on Westinghouse. However, the provision does not relieve Westinghouse of compliance with sampling requirements satisfactory to the plaintiffs.

3. Interim measures at Winston Thomas Treatment Plant: One commenter suggested that the Decree does not provide for

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*/ At Lemon Lane Landfill Westinghouse must remove all wastes, all PCB contaminated soil equal to or greater than 50 ppm and then excavate an additional three feet of soil as the "buffer zone." Consent Decree, par. 47.

that there is no federal statutory requirement that this Consent Decree be subject to any pre-lodging public review. Generally there is no such review. The only requirement is that it be subjected to public comment after lodging. 28 C.F.R. §50.7. However, EPA did in fact hold a meeting on the Decree prior to its lodging and participated in many of the local and state public meetings. See the Affidavit of Barbara Magel, Exhibit "B" hereto. An outline of the public meeting schedule is attached to the Magel affidavit as Exhibit "B". Meetings were held on weekends to allow more public participation, an incinerator emissions expert was flown in from Washington twice to address concerns and several meetings lasted seven or eight hours at a stretch. Further, many of the meetings were videotaped for free access through a local television station. In addition, EPA has made basic source documents on the settlement available in the Monroe County Public Library (8 boxes of documents have been produced). Id.

In short, there was much more public involvement and review of the proposed consent decree than is required by law.

L. Public Comment Period

A few commenters complained that they were not aware of the commencement of the regulatory thirty (30) day comment period following lodging of the Consent Decree. However, it is established that notice in the Federal Register is legally

Legality

It is not disputed that the Decree fully complies with the Constitution and the federal statutes under which the action was brought. These statutes authorize the United States to bring suit to require cleanup of hazardous wastes sites and for cost recovery. CERCLA, 42 U.S.C. §9606(a) and §9607(a) and RCRA, 42 U.S.C. §6973(a). Further, the authority of the United States and the Attorney General to compromise litigation is settled. United States v. Seymour Recycling Corp., 554 F. Supp. 1334, 1338 (S.D. Ind. 1982); 5 U.S.C. §3106; 28 U.S.C. §§515, 516, 519. The Consent Decree, by requiring a comprehensive cleanup of six major PCB contaminated sites in the Bloomington area, interim measures, groundwater monitoring and other remedial and protective measures, fulfills the purposes of CERCLA and RCRA in the prompt and effective cleanup of the environment. E.g., United States v. Waste Industries, 734 F.2d 159 (4th Cir. 1984); United States v. Price, 688 F.2d 204 (3rd Cir. 1982); New York v. Shore Realty, 759 F.2d 1032 (2nd Cir. 1985). It is also consistent with the requirements of the federal regulations governing CERCLA cleanups. National Contingency Plan, 40 C.F.R. Part 300. See Consent Decree, par. 120. Moreover, all of the parties to the Consent Decree have consented to subject matter jurisdiction. Consent Decree, p. 1.

Fair and adequate

The parties to the Consent Decree, of course, do not object to the fairness or adequacy of the Consent Decree. The

excavated and the materials incinerated in the incinerator constructed by Westinghouse. Therefore the Decree represents a dynamic solution to present and future PCB problems in the area. The Consent Decree is quite comprehensive and fully resolves the principal environmental problems which occasioned the federal and state lawsuits. That it does not address potential future health problems directly, e.g., by provision for studies and/or damages, is of no moment given that the source of the contamination and of any potential health problems will be eliminated under the Consent Decree. Further, as noted, the federal Centers for Disease Control has already conducted two health studies and the National Institute for Occupational, Safety and Health and the State plan a followup study. Finally, aggrieved individuals are not precluded by this settlement from filing private damages action against Westinghouse for alleged personal or property damage, and several residents have filed such suits.

Several proposed intervenors, Peter Tescione, Jr., the Conards and Indiana Public Interest Research Group, seek to intervene, but their principal objections have been addressed above. They do not allege any evidence of unfairness or inadequacy not already addressed above.*/

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*/ The Conards seek to have Westinghouse excluded from performing the work required under the Consent Decree on the grounds that Westinghouse cannot be trusted, apparently. If the Conards' wish were granted, of course there would be no Consent Decree, the parties would return to the litigation and the cleanup would not commence for an indefinite period of time. In addition, assuming the United States was successful in that litigation, Westinghouse would still be required to perform the cleanup. Given the need for expeditious cleanup and the obvious desirablity of having the work performed at Westinghouse's expense rather than the taxpayers', this objection should be rejected by the Court.

The United States has already discussed both the technical soundness of the remedies to be required under the Decree and why they are superior to other possible alternatives. Moreover, the costs, delays and risks of litigation make the Consent Decree settlement remedy that more attractive because it can commence expeditiously once the Consent Decree is approved.

The Consent Decree thus furthers the goals of CERCLA and RCRA in an expeditious, safe environmental cleanup. Indeed Congress has expressed its preference for incineration over landfilling as a remedy for disposal of hazardous wastes. See footnote, p. 11, supra. Given all of the factors previously discussed, approval of this Consent Decree is certainly in the public interest. This is the most significant environmental settlement ever reached in a hazardous waste case and provides for incineration of the waste, which is the preferred remedy of the future. The public interest would be well served by expeditious entry of this Consent Decree, so that the nagging PCB environmental concerns in the Bloomington, Indiana area can finally be resolved.

U.S. v. WESTINGHOUSE

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