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June 23, 1998

Reference No. 4770

Mr. Mony G. Chabria
U.S. EPA Region V
Office of Regional Counsel
77 West Jackson Boulevard
Mail Code: CS-29A
Chicago, Illinois 60604-3590

Dear Mr. Chabria:

Re: Selection of Cleanup Criteria for Removal Action
Textile Road Site, Washtenaw County, Michigan

This letter has been prepared pursuant to our conference call of May 26, 1998 to provide the U.S. EPA with information on the human health risk associated with the cleanup criteria selected for the Removal Action (RA) at the Textile Road Site (Site). As outlined in Conestoga-Rovers & Associates' (CRA's) letter to Mr. P.C. Lall and Mr. Mony Chabria dated January 22, 1998 (see Attachment A), the Textile Road Site Cooperating Parties Group (Group) has proposed revisions to the RA which would achieve the maximum area of property suitable for a variety of development options. The Group's efforts to initiate a RA which achieves the maximum flexibility for redevelopment were to facilitate a solution to comments received by the U.S. EPA from the Charter Township of Ypsilanti (Ypsilanti Township).

Recently, CRA was contacted by Mr. Afif Marouf, a toxicologist with U.S. EPA Region V. Mr. Marouf inquired with respect to the proposed amendments and requested that additional information be supplied to the U.S. EPA in order to assess the feasibility of the proposed revisions to the RA. The purpose of this letter is to summarize the discussions that have taken place with respect to cleanup goals at the Site and to provide a response to the questions identified by the U.S. EPA. This letter is presented in the following titled sections:

1.0 INTRODUCTION

The revised RA outlined in CRA's January 22, 1998 letter to the U.S. EPA provided for a range of cleanup criteria at the Site to be consistent with the Residential and Commercial zoning of the property. The primary concern of Ypsilanti Township was maximizing the potential for redevelopment of the property. To facilitate redevelopment, the Group and Ypsilanti Township, agreed that the northern 10 acres of the Site would be remediated to

an "unrestricted industrial" land use scenario and that the remaining 51 acres of the property would be remediated to an "unrestricted residential" land use scenario. As a result, the following PCB cleanup criteria were proposed:

Commercial Zoning Area -	Michigan Act 451, Part 201 Generic Industrial Soil Direct Contact Value of 21.0 mg/kg
Residential Zoning Area -	Michigan Act 451, Part 201 Generic Residential Soil Direct Contact Value of 2.3 mg/kg

It should be noted that these criteria are Michigan's land based standards applied throughout the State. In addition, the proposed industrial standard on the commercially zoned portion of the property is more restrictive than the Michigan commercial standards which could be applied (i.e., Commercial Category IV standard of 58.0 mg/kg).

1.1 History of Discussions/Investigations

The following summarizes the discussions and investigations that led to the selection of the above referenced PCB cleanup criteria.

- In February 1994, the Group submitted an Extent of Contamination (EOC) Study for the Site pursuant to the requirements of an Administrative Order by Consent. The EOC study which summarized the existing conditions, and provided a characterization and delineation of the nature and extent of affected or potentially affected media at the Site.

- In November 1994, the Group submitted an Engineering Evaluation and Cost Analysis (EE/CA) Report for the Site which provided a number of feasible alternatives for removal activities at the Site. The basis for the selection and evaluation of alternatives was Ypsilanti Township's Master Plan for Future Land Use, which indicated that the most reasonable and foreseeable future land use for the entire Site was "light industrial". Based on the reasonably foreseeable future land use of the Site, a streamlined risk assessment was conducted for the Site that considered child trespasser exposure to surface soils, worker exposure to surface and subsurface soil, and the risk associated with groundwater consumption. The streamlined risk assessment identified unacceptable carcinogenic and/or non-carcinogenic risks for potential future land use scenarios for the groundwater of the upper water table zone (i.e. greater than 10^{-4} risk). Other risks were below the 10^{-4} level.

- In December 1995, an Additional Investigation Study Report was submitted by the Group which provided the results of additional analytical information collected for the Site concerning PCBs in the area north of Pond 1 and in the northwest area of the Site. The additional information collected was used to develop a more precise estimate of the volume of soil which contains PCB concentrations in the ranges of 21 to 50 mg/kg, and greater than 50 mg/kg. This information was used to support development of cost estimates for the various removal alternatives identified in the EE/CA.

- Based on the information provided in the EOC, EE/CA, and the Additional Investigation Report, on-Site capping was proposed as the initial alternative for the Site. However, a decision was postponed until the U.S. EPA finalized the approval of a local TSCA landfill. As a result, the cost effectiveness of the off-Site disposal alternative was increased making off-Site disposal a more feasible alternative.

- In July 1997, at the request of the U.S. EPA, the Group prepared and submitted a Removal Action Work Plan (Work Plan) for the Site, which proposed excavation and off-Site disposal as a protective and cost effective alternative. The Work Plan proposed to remove PCB contaminated material above 21.0 mg/kg for off-Site disposal at a Michigan Type II sanitary landfill or TSCA permitted facility depending on PCB concentration. In addition, a groundwater monitoring and contingency plan would be initiated to monitor the effectiveness of the removal action at protecting groundwater.

- On July 30, 1997 the U.S. EPA issued a Proposed Plan for the Site and initiated a 30 day (which was later extended to 60 days) public comment period which included a public meeting on August 13, 1997. The Proposed Plan selected excavation and off-Site disposal as the best balance of effectiveness, implementability, and cost. The U.S. EPA proposed the use of soil cleanup criteria established by the MDEQ for commercial/industrial cleanup.

- In January, 1998, the Group, with the consent of Ypsilanti Township, submitted proposed revisions to the U.S. EPA Proposed Plan to incorporate a mixed cleanup of residential/industrial land use consistent with the current zoning boundaries. Additional information on the selection of PCB cleanup criteria is provided in Section 1.2.

- On April 21, 1998, Mr. Afif Marouf, a toxicologist with U.S. EPA Region V, contacted CRA to discuss issues relating to the Group's proposed amendments to the U.S. EPA Proposed Plan. Mr. Marouf was asked by Mr. Mony Chabria and Mr. P.C. Lall to review CRA's January 22, 1998 letter to the U.S. EPA that suggested revisions to the

Proposed Plan and the RA Work Plan (see Attachment A). During the telephone conversation, Mr. Marouf indicated he had the following questions with respect to the revised RA:

1. U.S. EPA requires a demonstration that groundwater will not be adversely impacted by the material left on-Site in the 2.3 mg/kg to 21.0 mg/kg range in the northeast portion of the Site;
2. The proposed revisions must clarify what controls will exist to prevent future disturbance of the cap which is proposed for the northeast portion of the Site; and
3. Control measures to prevent dust and particulate from impacting neighbors must be addressed during construction.

With respect to item 1, CRA indicated that the Michigan Act 451, Part 201 cleanup criteria for PCBs are considered protective of groundwater because PCBs do not leach under most soil conditions (as identified in MDEQ guidance on cleanup standard application). In addition, CRA pointed out that in the MDEQ-ERD Operational Memorandum No. 8 and 14, the discussion on soil criteria protective of groundwater indicates that *"for certain chemicals which strongly adsorb to soil and are known not to leach at significant concentrations (i.e., PCBs, carcinogenic polynuclear aromatic hydrocarbons, and some chlorinated pesticides), the direct contact value is accepted as the soil cleanup criterion to protect groundwater in addition to the protection against long-term, systemic direct contact hazards".*[1] As a result, the use of the Michigan Act 451, Part 201 generic residential and industrial soil direct contact criteria are considered protective of groundwater. Mr. Marouf responded by indicating that the U.S. EPA would want to see the numbers calculated using the U.S. EPA Soil Screening Guidance to prove that the MDEQ approach is protective.

With respect to item 2, CRA indicated that the proposed revisions are consistent with the current zoning and deed restrictions (if required) would be arranged for the Site in order to ensure future land uses are consistent with the RA. In addition, the Revised RA Work Plan which will be submitted by the Group to reflect the proposed changes, will address long-term operation and maintenance requirements for the proposed cap area.

With respect to item 3, CRA indicated that fugitive emissions control and air monitoring procedures were outlined in the July 1997 draft Removal Action Work

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[1] Michigan Department of Natural Resources, Interoffice Communication, Interim Environmental Response Division Operational Memorandum #8, Revision 4: Generic Residential Cleanup Criteria, June 5, 1995.

Plan. CRA forwarded relevant pages to Mr. Marouf of the July 1997 draft Removal Action Work Plan pertaining to fugitive emissions and monitoring.

- A joint telephone call between CRA, Mr. Marouf, and Mr. Lall, was initiated on April 27, 1998 to further discuss issues relating to Mr. Marouf's review of the proposed revisions to the RA. During the call, Mr. Marouf and Mr. Lall indicated that they would like to see the calculation of a soil cleanup value for PCBs to be protective of groundwater using the U.S. EPA Soil Screening Guidance. Furthermore, Mr. Marouf and Mr. Lall indicated that the U.S. EPA would like to see a risk assessment or the risk calculations to support the use of the 2.3 mg/kg cleanup criteria for the residential portion of the Site. Mr. Marouf indicated that a 10^{-6} residual cancer risk and a child exposure scenario would be the U.S. EPA's preferred assumptions for the risk evaluation.

- A conference call between the U.S. EPA, CRA, and members of the Textile Road Group was conducted on May 26, 1998 to clarify the U.S. EPA's request and current status of the Proposed Plan. As a result of the call, it was agreed that the Group would provide available information to assist the U.S. EPA in the review of the proposed RA.

1.2 Selection of Cleanup Criteria

As discussed in Section 1.1 of this letter, the initial cleanup criteria for the RA was selected on the basis of light industrial future land use for the Site (at the time of the EOC, EE/CA, and RA Work Plan). As a result, delineation studies of the extent of contamination at the Site were conducted using the Michigan Act 451, Part 201 Generic Industrial Soil Direct Contact Criteria of 21.0 mg/kg.

Following discussions with Ypsilanti Township, and after consideration of the redevelopment potential for the Site, it was determined that a generic cleanup of residential and industrial land uses under Michigan Act 451, Part 201 would provide for the most flexible future land use while balancing the cost of the remediation. Therefore, Part 201 cleanup criteria were chosen for the Site: 2.3 mg/kg for the residential portion and 21.0 mg/kg for the commercial portion.[1]

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[1] It should be noted that the current zoning of the northern portion of the Site is consistent with the Michigan Act 451, Part 201 Generic Commercial Category IV and therefore a Soil Direct Contact Criteria of 58.0 mg/kg.

In selecting the appropriate cleanup criteria for the Site, consideration was made to the development of the property following the RA. As a result, the need for joint approval of the RA, by both the U.S. EPA and the MDEQ, is critical to the timely implementation of the RA and resulting development opportunities.

2.0 PROTECTION OF GROUNDWATER UNDER COMMERCIAL SCENARIO

As discussed in Section 1.1 and during the conference call on May 26,1998, the U.S. EPA has requested that Group demonstrate that the cleanup standard chosen for the commercial portion of the Site will be protective of groundwater. Section 2.5.1 of the U.S. EPA Superfund Soil Screening Guidance: User's Guide, July 1996 (Publication 9355.4-23) outlines procedures for calculating soil screening levels (SSL) for a variety of exposure pathways. Equation 10 (page 29) of Section 2.5.1 provides the SSL partitioning equation for migration to groundwater.

Equation 10 is provided as follows:

$$SSL(mg/kg) = C_w\left[k_d + \frac{(\theta_w + \theta_a H')}{\rho_b}\right]$$

where:
- C_w - target soil leachate concentration (mg/L)
- k_d - soil-water partition coefficient (L/kg)
- k_{oc} - soil organic carbon/water partition coefficient (L/kg)
  - $k_{oc} = k_d \times f_{oc}$
- f_{oc} - fraction organic carbon in soil (g/g)
- θ_w - water-filled soil porosity (L_{water}/L_{soil})
- θ_a - air-filled soil porosity (L_{air}/L_{soil})
- ρ_b - dry soil bulk density (kg/L)
- H' - dimensionless Henry's law constant

Attachment B contains a detailed calculation of the SSL based on the above equation for the commercial portion of the Site. As presented in Attachment B, the SSL for protection of groundwater at the Site is 27.5 mg/kg which is greater than the 21.0 mg/kg Michigan Act 451, Part 201Generic Industrial Soil Direct Contact Criteria proposed in CRA's January 22, 1998 letter, and the revised Michigan Act 451, Part 201 Generic Commercial Category IV Soil Direct Contact Criteria of 26.0 mg/kg provided in the MDEQ-ERD training materials, February 1998. Furthermore, the cleanup criteria of 21.0 mg/kg in the commercial portion of the Site represents the maximum concentration that will remain on-Site following the RA. The average concentration of material that will be

consolidated on-Site is estimated as 8.5 mg/kg, as shown in Attachment B, which is significantly lower than the 27.5 mg/kg SSL for the protection of groundwater.

It should be noted that, as discussed in the Soil Screening Guidance, Site-specific data or published data can be substituted for the default values provided in the guidance for the following parameters used in the soil/water partition equation:

- Fraction organic carbon;
- Water-filled soil porosity; and
- Dry soil bulk density.

The default value for the fraction of organic carbon used in the SSL calculation is 0.2 g/g which is based on a study conducted by Carsel et al, 1988[1]. In the study, Carsel collected information from approximately 3,000 soil samples from throughout the United States and conducted statistical characterization of the data. The data collected was based on native soil material at various depths below ground surface (bgs) and determined that the percent of organic carbon in soil material ranges from 0.10 percent to 1.45 percent depending on depth and soil type. The 0.2 percent (or g/g) utilized in the SSL calculation is intended to represent a native sandy loam at a depth of 2 to 4 feet bgs.

Sources of information suggest that the use of a higher organic carbon content is appropriate at contaminated Sites. For example, studies conducted by Wester et al, 1996[2], to investigate the absorption properties of PCBs and herbicides, used soil with an organic carbon content of 0.9 percent.

Since the material at the Site is a fill material of a sandy/gravely nature, rather than a native material, a conservative central value for the fraction of organic carbon of 0.9 g/g was used in the SSL calculation to more accurately reflect the type of material present at the Site. The selected value is consistent with the source cited by U.S. EPA in establishing the default value and other published data.

It should be noted that the groundwater at the Site is shallow and generally prohibited under Michigan law from use for potable purposes. In addition, the Group will

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[1] Carsel, R.F., Parrish, R.S., Jones, R.L., Hansen, J.L. and Lamb, R.L., 1988. Characterizing the uncertainty of pesticide leaching in agricultural soils. Journal of Contaminate Hydrology, 2: 111-124.

[2] Wester, R.C., Melendres, J., Logan, F., Hui, H., Mailbach, H.I., Wade, M., and Huang, K.C., 1996. Percutaneous absorption of 2,4-dichloro-phenoxyacetic acid from soil with respect to soil load and skin contact time: invivo absorption in rhesus monkey and in vitro absorption in human skin. Journal of Toxicology and Environmental Health, 47: 335-344.

implement deed restrictions that will restrict groundwater use on Site. Finally, a monitoring program will be implemented to demonstrate the effectiveness of the RA.

3.0 PROTECTION OF HUMAN HEALTH UNDER RESIDENTIAL SCENARIO

During the conference call on May 26, 1998, the U.S. EPA expressed concern over the cancer risk associated with the residential portion of the Site following the proposed RA. CRA indicated that the cancer risk would be at most 10^{-5} based on the MDEQ Operational Memorandum 8, Revision 4 which outlines the assumptions used to develop the generic cleanup criteria. The U.S. EPA indicated that it would be more appropriate to determine the risk using the U.S. EPA Superfund methods and not the method outlined by the MDEQ-ERD.

The method outlined in the Soil Screening Guidance for calculating the SSL for the exposure pathway to surface soils considers three components: direct ingestion, dermal contact, and inhalation of fugitive dusts. The Soil Screening Guidance states that the *"U.S. EPA believes that since the ingestion route should always be considered in screening decisions for surface soils, and ingestion SSLs appear to be adequately protective for inhalation exposures to fugitive dusts for organic compounds, the fugitive dust exposure rout need not be routinely considered for organic chemicals in surface soils."*[1]

In addition, the Soil Screening Guidance discusses that the absorption via the dermal route must be greater than 10 percent to equal or exceed the ingestion exposure. According to the guidance, previous studies have illustrated that the only chemical to show dermal absorption greater than 10 percent is pentachlorophenol, and therefore is the only chemical in which the U.S. EPA considers dermal absorption.

With respect to direct ingestion, the Soil Screening Guidance provides the following calculation for determining the SSL for ingestion of carcinogenic contaminants in residential soil (Equation 2):

$$SSL(mg/kg) = \frac{TR \cdot AT \cdot 365 d/yr}{SF_o \cdot 10^{-6} kg/mg \cdot EF \cdot IF_{soil/adj}}$$

where:
- TR - target cancer risk (unitless)
- AT - averaging time (yr)
- SF_o - oral slope factor $(mg/kg\text{-}d)^{-1}$
- EF - exposure frequency (d/yr)
- $If_{soil/adj}$ - age adjusted soil ingestion factor mg/yr/kg-d)

[1] U.S. EPA. Soil Screening Guidance: User's Guide, Second Edition. 1996. Office of Solid Waste And Emergency Response, U.S. EPA Publication 9355.4-23

The age adjusted soil ingestion factor used in the Soil Screening Guidance is 114 mg/yr/kg-d, which corresponds to a child living in the area from birth to age 31. It should be noted that the same age adjusted soil ingestion factor is used by MDEQ-ERD in developing the Michigan Act 451, Part 201 Generic Residential Soil Direct Contact Criteria.

By setting the SSL equal to the proposed cleanup criteria for the residential portion of the Site, which represents the Michigan Act 451, Part 201 Generic Residential Soil Direct Contact Criteria, the cancer risk for an average on-Site concentration of 2.3 mg/kg can be determined. The corresponding risk under this scenario is 7.18×10^{-6} (less than 10^{-5}) as shown in Attachment C. It should be noted that this scenario represents an exaggeration of the risk associated with the Site as it assumes an average (emphasis added) concentration throughout the entire residential portion of the Site of 2.3 mg/kg. In fact, 2.3 mg/kg would represent the maximum level of contamination in any residential area of the Site following the RA. The majority of the residential portion of the Site would remain undisturbed during the RA and maintain a contamination level that is well below 2.3 mg/kg and typically non-detect (thereby indicating that a 2.3 mg/kg level is very conservative for this Site).

To demonstrate this point, CRA calculated the current and post RA average PCB concentration in the residential portion of the Site. The current average PCB concentration in the residential portion of the Site was determined by calculating the weighted average of the PCB concentrations in borehole samples collected during 1993 and 1995. This was done using the Environmental Visualization System (EVS) which calculates concentration contours and the associated area. The post RA average PCB concentration was calculated using the same method, however, the maximum PCB concentration used in the calculation was 2.3 mg/kg (i.e. all values greater than 2.3 mg/kg were substituted with 2.3 mg/kg). Under these two scenarios, the following average concentrations and associated cancer risks were determined for the Site.

Current Average PCB Concentration = 1.03 mg/kg Cancer Risk = 3.21×10^{-6}

Post RA Average PCB Concentration = 0.317 mg/kg Cancer Risk = 9.89×10^{-7}

4.0 SUMMARY AND CONCLUSIONS

In CRA's January 22, 1998 letter to the U.S. EPA, CRA and the Group recommended, as a result of discussions with the Ypsilanti Township, an amendment to the Proposed RA to incorporate a mixture of residential and commercial land cleanup criteria which is more

consistent with the current zoning and the development currently considered for the Site. The proposed cleanup levels were the Michigan Act 451, Part 201 Generic Residential and Industrial Soil Direct Contact Critiera of 2.3 mg/kg and 21.0 mg/kg. The Group's proposal represents a more restrictive (i.e. protective) RA in comparison to U.S. EPA's Proposed Plan.

Questions were identified by the U.S. EPA with respect to the protection of groundwater in the commercial portion of the Site and the protection of children in the residential portion of the Site. In the preceding sections of the letter, CRA has demonstrated that the required level of PCB soil contamination at the Site to adversely impact groundwater is 27.5 mg/kg which is higher than the maximum proposed cleanup criteria of 21.0 mg/kg (in the northern portion of the Site). Furthermore, CRA has illustrated that the maximum risk in the residential portion of the Site following the RA will be 7.18×10^{-6}. The risk associated with the average PCB concentration remaining post-RA on the residential portion of the Site was determined to be less than 10^{-6}.

CRA and the Group believe that the information provided in this letter further demonstrates the protectivness of the proposed changes to the U.S. EPA Proposed Plan.

Should you have any questions on the above, or require additional information, please do not hesitate to contact us.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

Glenn Turchan, P. Eng.

GC/cm/1
Encl.

c.c.: P.C. Lall (U.S. EPA)
Afif Marouf (U.S. EPA)
Textile Road Cooperating Parties Group
Greg Carli (CRA)

ATTACHMENT A

CRA LETTER DATED JANUARY 22, 1998
TO U.S. EPA

CRA

CONESTOGA-ROVERS & ASSOCIATES
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January 22, 1998

Reference No. 4770

Mr. P.C. Lall
U.S. EPA Region V
Emergency Response Branch
9311 Groh Road, Room 216
Grosse Ile, Michigan 48138-1697

Mr. Mony G. Chabria
U.S. EPA Region V
Office of Regional Counsel
77 West Jackson Boulevard
Mail Code CS-29A
Chicago, Illinois 60604-3590

Gentlemen:

Re: Revisions to Proposed Removal Action
Textile Road Site, Washtenaw County, Michigan

As you are aware, the Textile Road Site Cooperating Parties Group (Group) has been in discussion with officials from the Charter Township of Ypsilanti (Township) regarding the proposed Removal Action (RA) at the Textile Road Site (Site) located in Washtenaw County, Michigan. The basis for these discussions has been the Removal Action Work Plan (Work Plan) prepared by Conestoga-Rovers & Associates (CRA) and submitted to the United States Environmental Protection Agency (U.S. EPA) on behalf of the Group on July 21, 1997 and the Proposed Plan issued by the U.S. EPA on July 30, 1997 (Proposed Plan).

The purpose of this letter is to summarize proposed amendments to the Work Plan and the Proposed Plan. These suggested amendments have been agreed to by the Group and the Township. The suggested amendments are intended to optimize the redevelopment potential of the property following the RA. This letter is presented in the following Sections:

1.0 INTRODUCTION

Following submittal of the Work Plan to the U.S. EPA, and during the public comment period for the Proposed Plan, the Township raised the issue of the interplay between the property zoning and the cleanup standards proposed. The Work Plan and Proposed Plan were both developed based on the Ypsilanti Township Future Land Use Plan which indicated that the future land use of the

Site was light industrial. The current zoning of the property indicates that the north portion of the Site (430 feet along Bunton Road) is zoned B-1: Local Business, this represents approximately 10 acres of the property. The remaining approximately 51 acres of the property is zone R-4: One Family Residential. The current Site zoning is illustrated on Figure 1. The Proposed Plan used Michigan Act 451, Part 201 industrial cleanup criteria because light industrial or commercial use was viewed as the most reasonable and foreseeable future land use for the property. However, the Township suggested that further consideration be given to the potential for redevelopment of at least part of the property for residential purpose. As a result of discussions between the Group and the Township, the Group is now suggesting changes to the RA. The Township supports these changes to the RA which are described in Section 2.0.

2.0 PROPOSED AMENDMENTS TO REMOVAL ACTION WORK PLAN

All elements of the RA, as outlined in the Work Plan submitted July 21, 1997, will remain as components of the RA. These basic elements, as outlined in the Work Plan, are summarized as follows:

- construction of required support facilities and temporary controls;
- clearing and grubbing of required areas;
- Site security;
- environmental controls;
- Site-specific health and safety and contingency and emergency response planning;
- perimeter air monitoring;
- on-Site wastewater management;
- excavation of contaminated material to Michigan Act 451, Part 201 Generic Industrial Soil Direct Contact Value for PCBs of 21.0 mg/kg;

- transportation and disposal of material contaminated with PCBs in concentrations between 21.0 mg/kg and 50.0 mg/kg at a Michigan Type II (Act 451, Part 115) landfill;

- transportation and disposal of material contaminated with PCBs in concentrations greater than 50.0 mg/kg at a permitted TSCA facility (EQ's TSCA Landfill);

- verification sampling to ensure cleanup goals have been achieved;

- backfilling of excavations and final grading of the Site with material from on-Site borrow area; and

- progress and final reporting.

The suggested amendments to the RA Work Plan are intended to optimize the redevelopment potential of the Site. The suggested amendments include additional excavation and consolidation of soils with PCB concentrations between 2.3 mg/kg (unlimited residential) and 21.0 mg/kg (unlimited industrial). Specifically, the suggested amendments include the following components:

- Material south of the portion of the Site zoned local business which is contaminated with PCBs above the Michigan Act 451, Part 201 Generic Residential Soil Direct Contact Value of 2.3 mg/kg will be excavated;

- Additional material located in the northwest corner of the Site which is contaminated with PCBs above the Michigan Act 451, Part 201 Generic Residential Soil Direct Contact Value of 2.3 mg/kg will be excavated;

- Excavated material containing PCB concentrations between 2.3 mg/kg and 21.0 mg/kg will be consolidated to the area north of Pond 1 (see Figure 2). This material will be used as backfill in place of "clean" on-Site borrow material as proposed in the RA Work Plan, as applicable;

- Areas of Site in the residential portion and northwest corner where the above excavations occur will be backfilled with "clean" on-Site borrow area material; and

- Areas of the Site which continue to contain material contaminated with PCBs between 2.3 mg/kg and 21.0 mg/kg (the consolidation area) will be covered/capped with "clean" on-Site material, six inches of topsoil, and a vegetative cover, or other capping system (eg. commercial building and/or parking lot) which supports future development of the property and is approved by the U.S. EPA.

The additional excavation, consolidation, and capping areas discussed above are illustrated on Figure 2. The contours presented on Figure 2 were developed based on the PCB isoconcentraiton contours from 2-4 feet below ground surface (bgs) and 6-8 feet bgs and represent the estimated maximum lateral extent of contamination at the Site.

3.0 BASIS FOR AMENDMENTS TO REMOVAL ACTION WORK PLAN

The intent of the suggested amendments to the proposed RA Work Plan is to achieve the maximum area of property suitable for all development options. The result of the suggested amendments would be to achieve approximately 51 acres of "unrestricted residential" property and 10 acres of "unrestricted industrial" property. The consolidation of contaminated material permits a more flexible redevelopment of the property.

We suggest that the U.S. EPA incorporate the suggested amendments into the Proposed Plan for the Site. In order to implement the amendments, revisions to the Work Plan and project specifications are required. CRA is prepared to quickly revise these documents. With your consent, CRA will reissue the revised version promptly.

January 22, 1998 Reference No. 4770

Should you have any questions, or require additional information, please contact the undersigned.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

Glenn Turnhan, P. Eng.

GC/gc/3
Encl.

c.c.: David Novello (HS)
Harvey Maness (HS)
Bob Murphy (HS)
Troy Taylor (GM)
Elizabeth Zatina (GM)
Ed Peterson (GM)
Al Aguwa (GM)
Doug Winters (Ypsilanti Township)
Greg Carli (CRA)

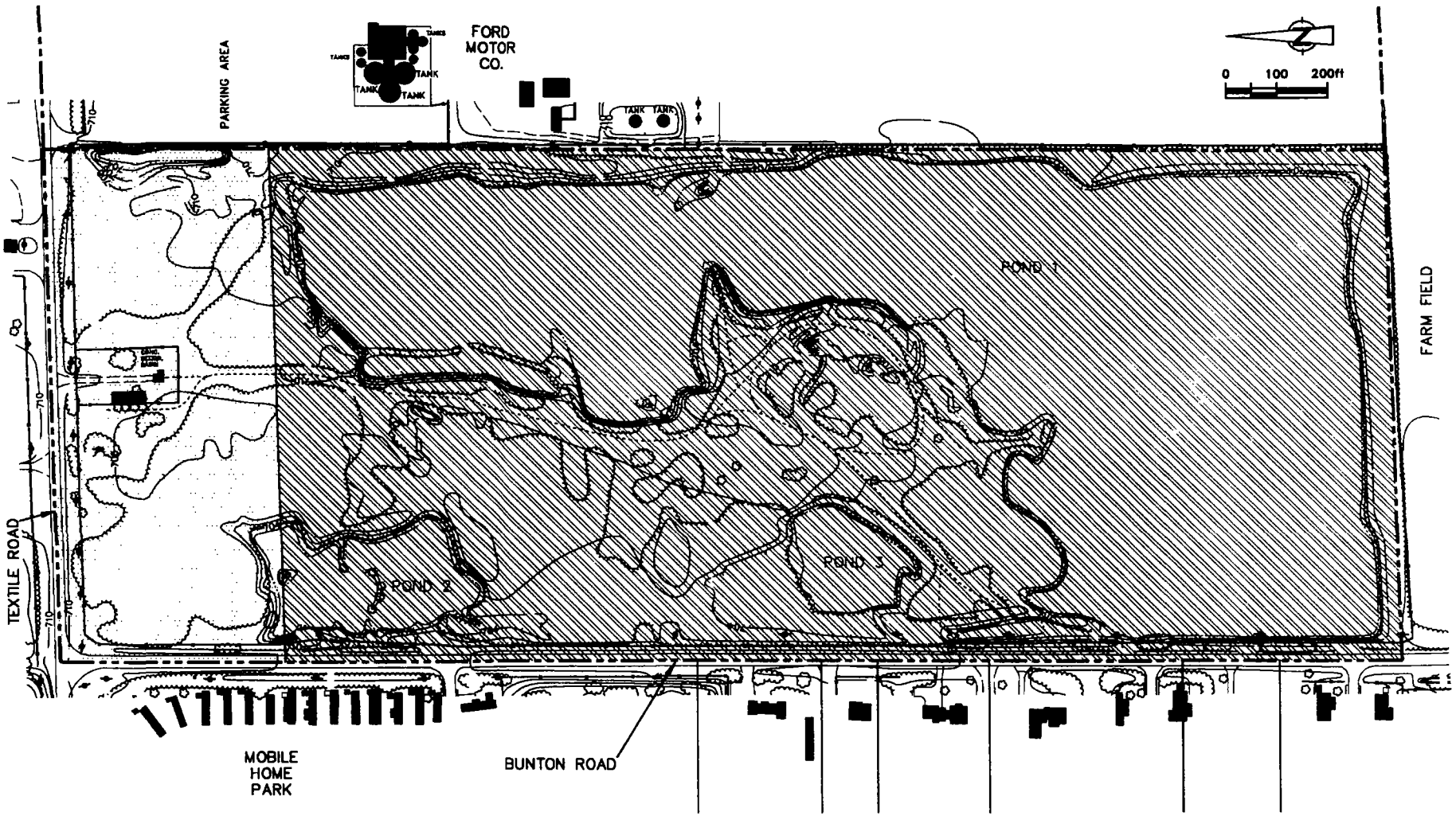


figure 1
CURRENT ZONING PLAN
TEXTILE ROAD SITE
Washtenaw County, Michigan

CRA

4770 (L) JAN 09/98(W) REV.0 (P102)

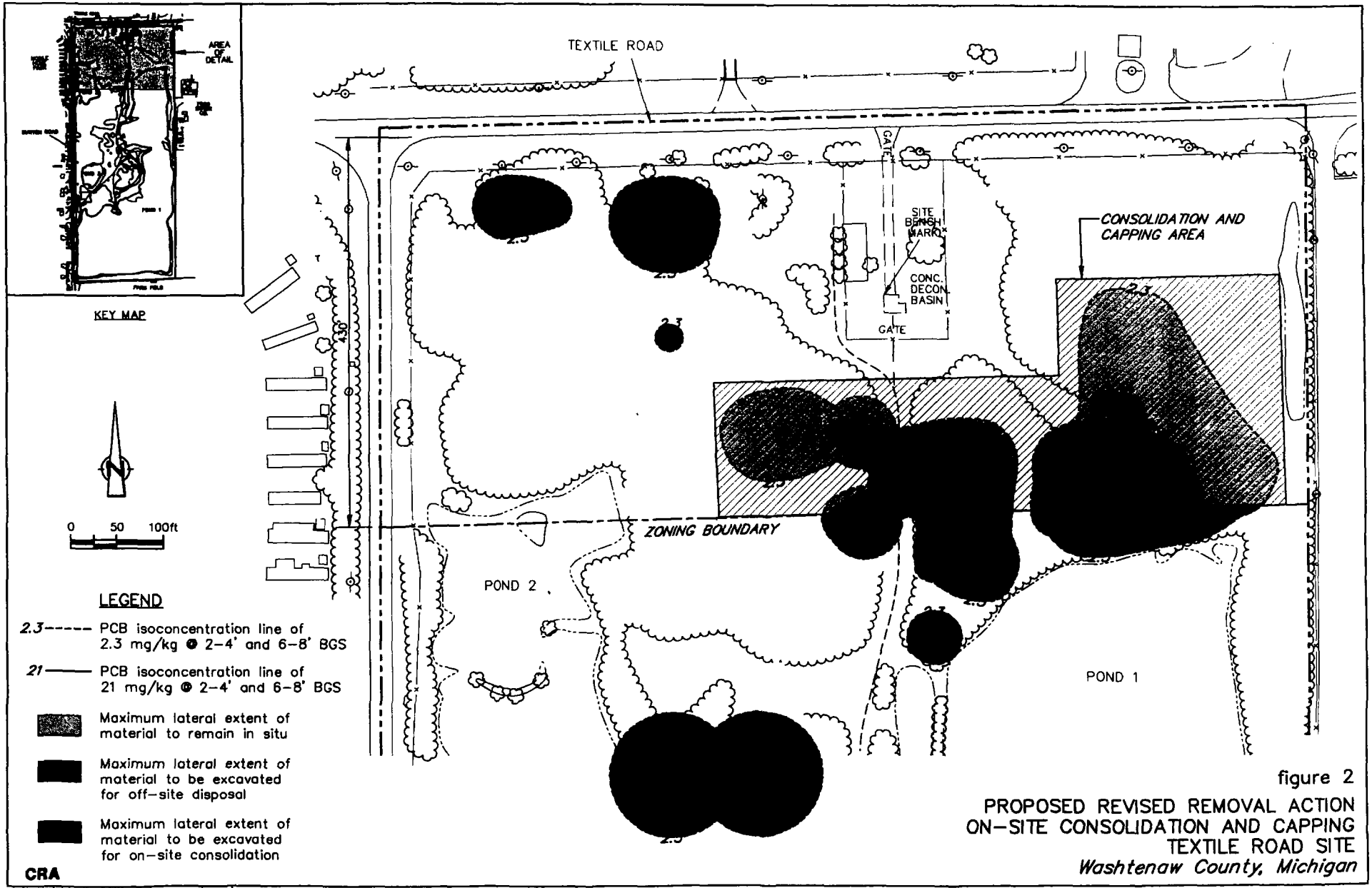


figure 2

PROPOSED REVISED REMOVAL ACTION
ON-SITE CONSOLIDATION AND CAPPING
TEXTILE ROAD SITE
Washtenaw County, Michigan

CRA

4770 (L) JAN 09/98(W) REV.0 (P103)

ATTACHMENT B

CALCULATION OF SOIL SCREENING LEVEL
FOR MIGRATION TO GROUNDWATER

CRA CONESTOGA-ROVERS & ASSOCIATES	PROJECT No.: 4770 PROJECT NAME: Textile Road Site SSL for Migration to GW DATE: 06/08/98	DESIGNED BY: G Carli CHECKED BY: _____ PAGE 1 OF 2

Calculation of Screening Level for Migration to GW

Source: Soil Screening Guidance: User's Guide, July, 1996

Equation 10 - Soil Screening Level Partitioning for Migration to Groundwater

C_t = Screening Level in Soil (mg/kg)

$$C_t = C_w \left(K_d + \frac{\theta_w + \theta_a H'}{\rho_b} \right)$$

C_w = target soil leachate Concentration
= nonzero MCLG, MCL, or HBL x Dilution Factor
= 0.00005 mg/L (MCL)
= 0.0005 mg/L (Michigan Act 451, Part 201 Residential Drinking water Criteria)

K_d = Soil-water partition coefficient

For Organic Constituents (see Section 2.5.2 of Technical Background Document)

$K_d = K_{oc}^{*} \cdot f_{oc} = 3.09 \times 10^{5} \cdot 0.009^{(1)}$

$= 2745$

* Table C-1 of Soil Screening Guidance: User's Guide

θ_w = water-filled soil porosity = 0.3

θ_a = air-filled soil porosity = $n - \theta_w$

$n = 1 - \left(\frac{\rho_b}{\rho_s}\right) = 1 - \left(\frac{1.5}{2.65}\right) = 0.434$

CRA CONESTOGA-ROVERS & ASSOCIATES	PROJECT No.: 4770 PROJECT NAME: TEXTILE ROAD SITE DATE: 06/08/98	DESIGNED BY: G Carli CHECKED BY: _____ PAGE 2 OF 2

ρ_b = dry soil bulk density = 1.5 $\frac{kg}{L}$

ρ_s = Soil particle density = 2.65 $\frac{kg}{L}$

H' = dimensionless Henry's Law constant

H' = H · 41 where H = Henry's Law Constant ($atm \cdot m^3/mol$)
41 = Conversion factor

$H = 8.64 \times 10^{-4}$ $atm \cdot m^3/mol$

$\therefore H' = 8.64 \times 10^{-4} \cdot 41 = 0.035424$

$$C_L = 0.0005 \cdot 20 \left(27.5 + \frac{0.3 + (0.434 - 0.3)(0.035424)}{1.5} \right)$$

Note: Dilution Factor = 20 (default value)

C_L = 27.5 mg/kg ⇐

(1) Carsel, R.F., Parrish, R.S., Jones, R.L., Hansen, J.L. and Lamb, R.L., 1988. Characterizing the Uncertainty of pesticide in agricultural soils. J. Contam. Hydrol., 2: 111-124.

TABLE B.1
CALCULATION OF SOIL CONCENTRATION REMAINING ON-SITE (2.3-21.0 mg/kg)
TEXTILE ROAD SITE, YPSILANTI, MICHIGAN

Depth	*Area*	*Max PCB* (mg/kg)	*Area* (ft^2)	*Volume (1)* (cu. Yd.)	*Average(2) Concentration* (mg/kg)	*Weighted Average* (mg/kg-cu.yd.)	*Average Concentration* (mg/kg)
2-4'	1	21.0	5,238	970	11.7	11,301	
	2	21.0	6,826	1,264	11.7	14,726	
	3	21.0	15,995	2,962	11.7	34,508	
	4	21.0	11,097	2,061	11.7	24,011	
	5	6.3	2,783	515	4.3	2,216	
	6	6.5	15,101	2,796	4.4	12,305	
			57,040	10,569		99,066	9.4
6-8'	1	2.5	734	136	2.4	326	
	2	6.5	5,081	941	4.4	4,140	
	3	2.3	734	136	2.3	313	
	4	21.0	4,705	871	11.7	10,151	
	5	4.2	5,081	941	3.3	3,058	
	6	21.0	3,037	562	11.7	6,552	
	7	21.0	34,169	6,328	11.7	73,716	
	8	6.0	15,102	2,661	4.2	11,042	
			68,643	12,576		109,298	8.7
10-12'	1	5.1	2,580	478	3.7	1,768	
	2	5.5	2,580	478	3.9	1,863	
	3	3.2	2,580	478	2.8	1,314	
	4	4.0	2,580	478	3.2	1,505	
	5	5.4	2,580	478	3.9	1,839	
			12,900	2,389		8,289	3.5
					Average Concentration (All Depths)		**8.5**

Notes:

(1) - Assume value represents concentration over 5 feet of depth.

(2) - Represents average value between 2.3 mg/kg and maximum concentration.

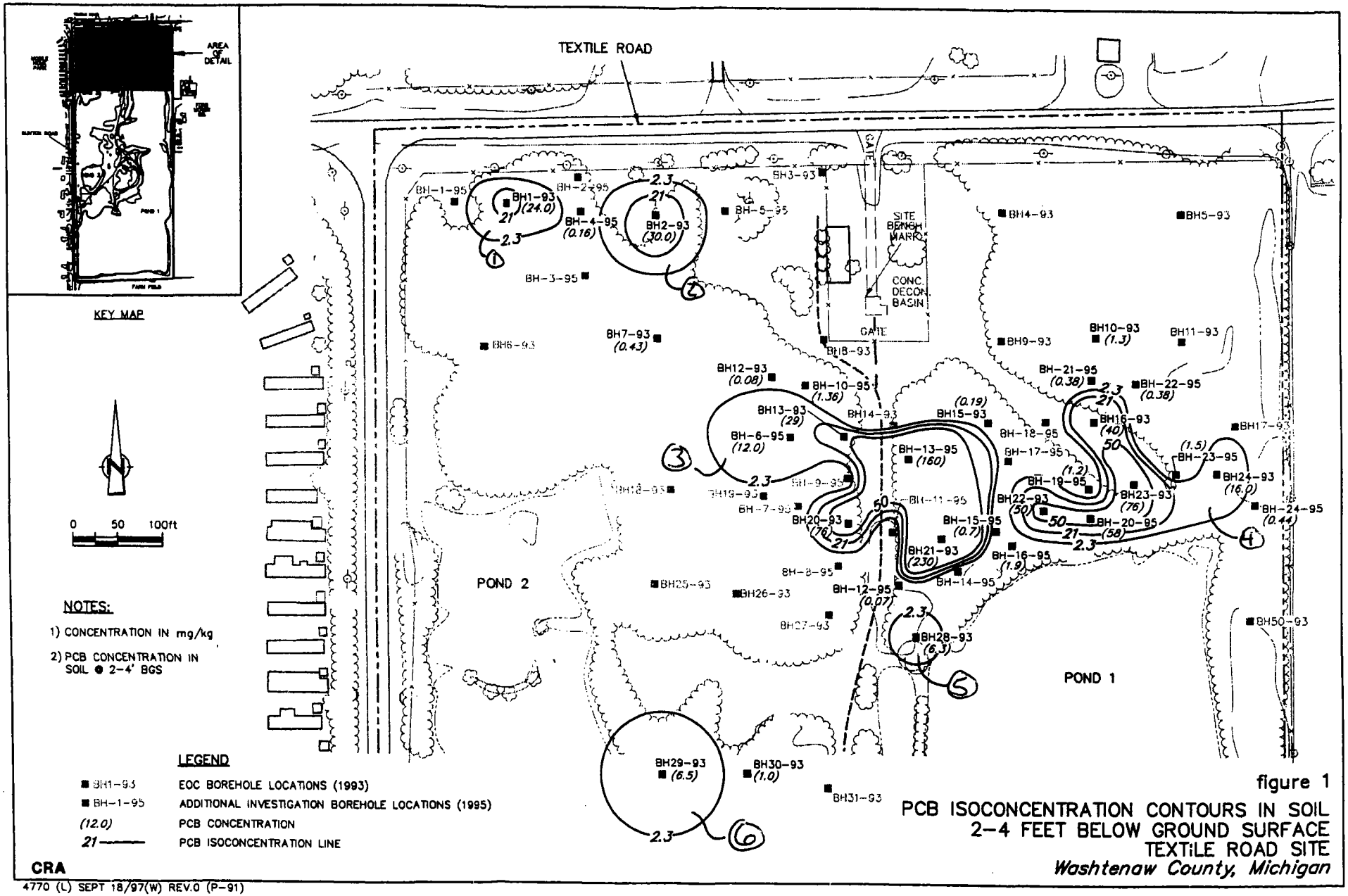
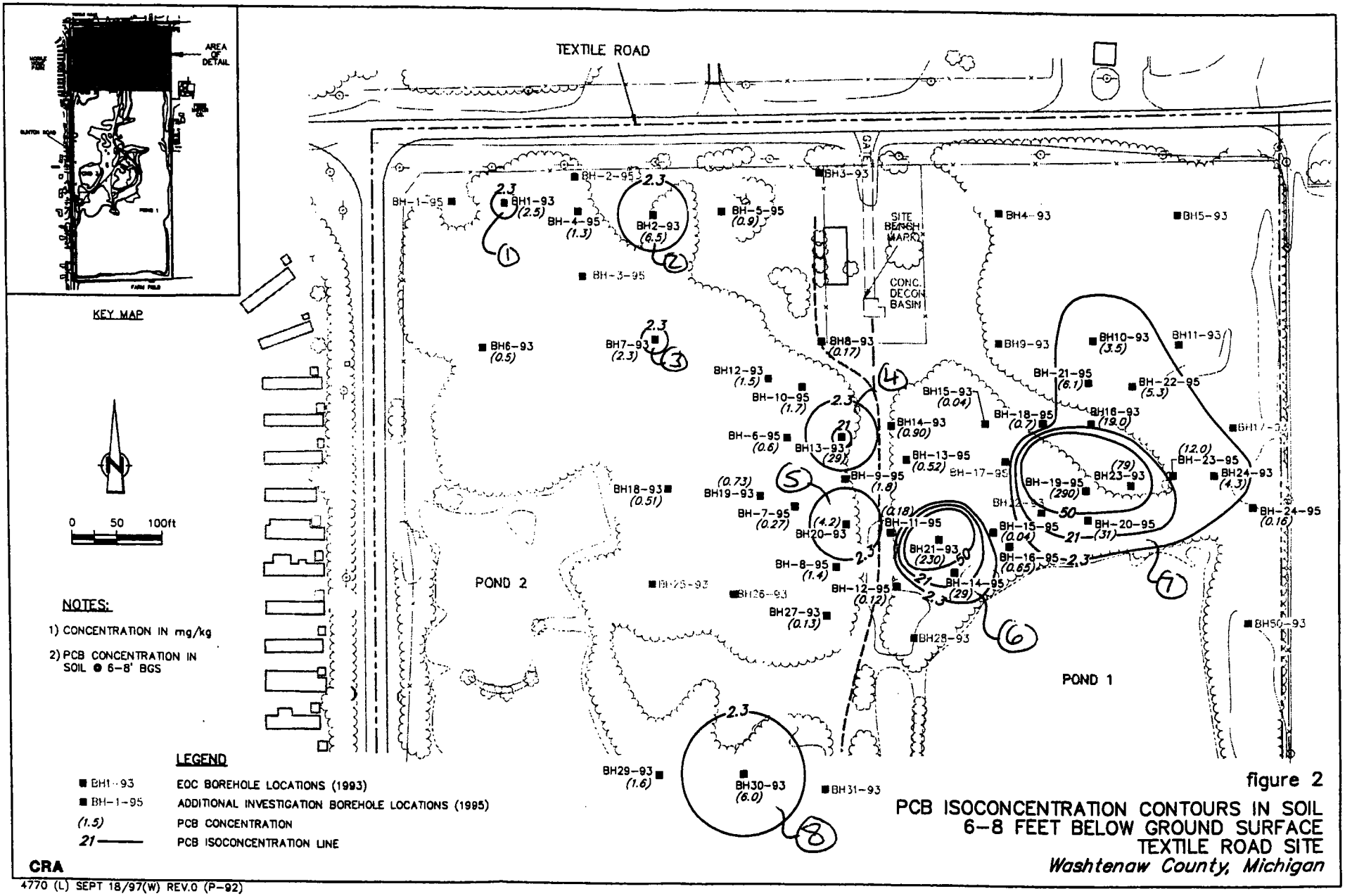


figure 1

PCB ISOCONCENTRATION CONTOURS IN SOIL
2-4 FEET BELOW GROUND SURFACE
TEXTILE ROAD SITE
Washtenaw County, Michigan

CRA

4770 (L) SEPT 18/97(W) REV.0 (P-91)



NOTES:

1) CONCENTRATION IN mg/kg

2) PCB CONCENTRATION IN SOIL @ 6-8' BGS

LEGEND

■ BH1-93	EOC BOREHOLE LOCATIONS (1993)
■ BH-1-95	ADDITIONAL INVESTIGATION BOREHOLE LOCATIONS (1995)
(1.5)	PCB CONCENTRATION
21 ——	PCB ISOCONCENTRATION LINE

CRA

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figure 2

PCB ISOCONCENTRATION CONTOURS IN SOIL
6-8 FEET BELOW GROUND SURFACE
TEXTILE ROAD SITE
Washtenaw County, Michigan

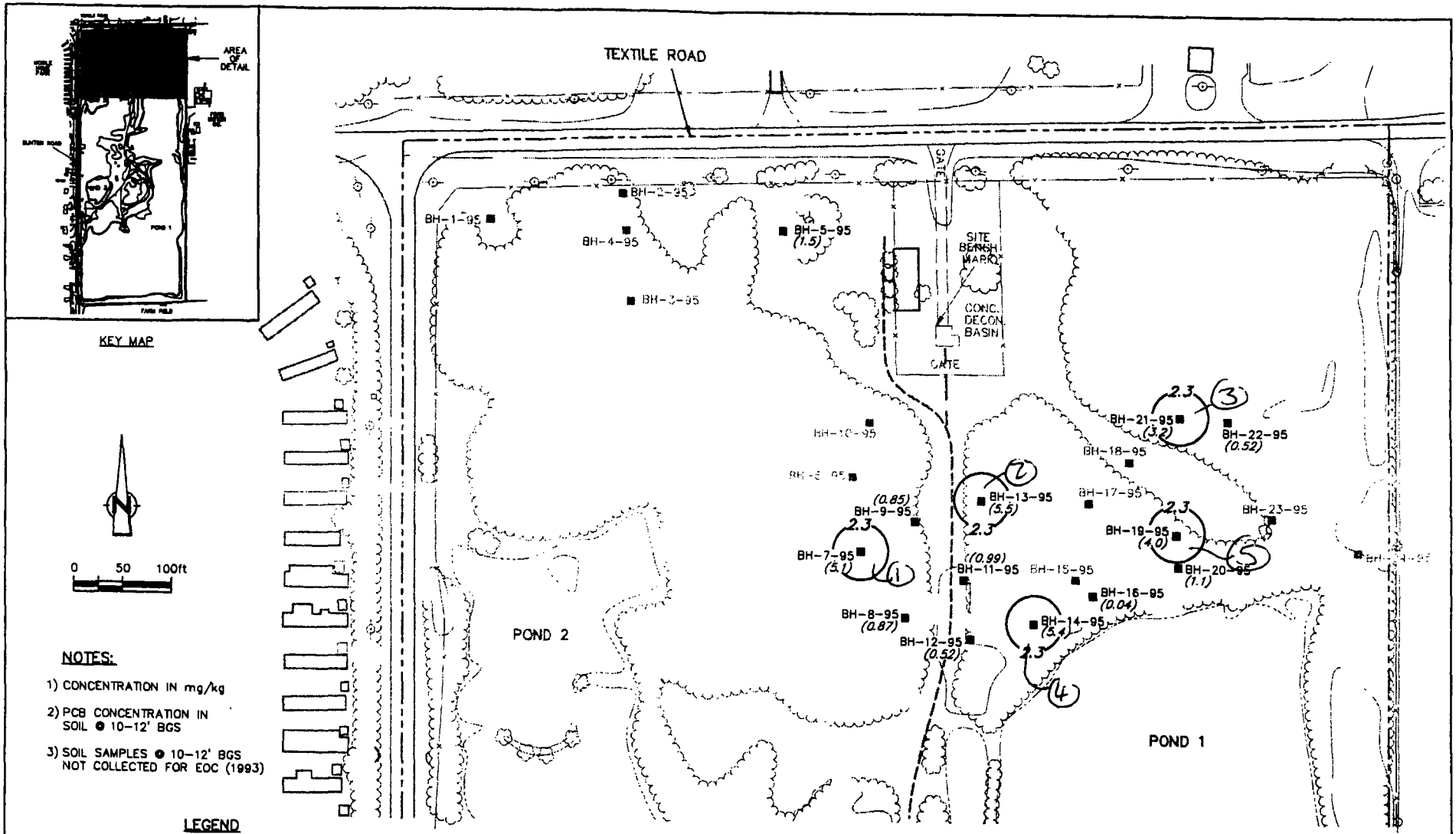

figure 3

PCB ISOCONCENTRATION CONTOURS IN SOIL
10–12 FEET BELOW GROUND SURFACE
TEXTILE ROAD SITE
Washtenaw County, Michigan

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ATTACHMENT C

CALCULATION OF CANCER RISK FOR
MICHIGAN ACT 451, PART 201 GENERIC RESIDENTIAL
SOIL DIRECT CONTACT CRITERIA OF 2.3 mg/kg

CRA CONESTOGA-ROVERS & ASSOCIATES	PROJECT No.: 4770 PROJECT NAME: TEXTILE ROAD SSL CALCULATIONS DATE: 06/03/98	DESIGNED BY: G CARLI CHECKED BY: _____ PAGE 1 OF 1

SSL - SURFACE SOILS - DIRECT INGESTION

FROM SOIL SCREENING GUIDANCE: USER'S GUIDE - JULY 1996

EQUATION 2: SCREENING LEVEL EQUATION FOR INGESTION OF CARCINOGENIC CONTAMINANTS IN RESIDENTIAL SOIL

$$SLL\ (mg/kg) = \frac{TR \times AT \times 365\ d/yr}{SF_o \times 10^{-6}\ kg/mg \times EF \times IF_{soil/adj}}$$

where:		Default
TR	- target cancer risk (unitless)	
AT	- averaging time (yr)	70
SF_o	- oral slope factor $(mg/kg\text{-}d)^{-1}$	2.0
EF	- exposure frequency (d/yr)	350
$IF_{soil/adj}$	- age adjusted soil ingestion factor (mg-yr/kg-d)	114

SOLVE FOR TR $\quad TR = \frac{SLL \times SF_o \times 10^{-6} \times EF \times IF_{soil/adj}}{AT \times 365}$

$$= SLL \times 3.12 \times 10^{-6}$$

IF SLL = 2.30 THEN TR = 7.18×10^{-6}

= 1.03 = 3.21×10^{-6}

= 0.317 = 9.89×10^{-7}