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TRANSMITTAL LETTER

TO: Ms. Patricia J. Polston

USEPA - Region 5

Corrective Action Section, DW-8J

77 West Jackson

Chicago, Illinois 60604

RE: Vernay Laboratories,

Inc.

OHD 004 243 002

ENVIRON Case #0211247A

WE ARE SENDING YOU HEREWITH THE FOLLOWING:

	Reports	Samples	Letters	Other	Drawings
Quantity			De	escription	
4	RC	RA CA725	Environme	ntal Indic	ators Report
	Vei	rnay Labora	tories, Inc.		
	875	Dayton Str	reet		
	Yel	llow Springs	, Ohio		
4	Re	sponse to US	SEPA Com	ments on	Draft RCRA CA 725
BY: Christophe	er M. Buzgo	1		DA	TE: July 14, 2004
BY: Christopho		al Express	Messenge		

02-LOA:WP\907_1.DOC

Responses to U.S. EPA's Comments

Environmental Indicator Report for Human Health CA 725 Vernay Laboratories, Inc. Yellow Springs, Ohio

EPA ID: OHD 004 243 002

1. At the Vernay facility, two consolidated bedrock aquifers are used by some private well users for potable and non-potable purposes in the Yellow Springs area. It would seem that a discussion of both aquifers is relevant to this CA725 determination, yet the statement is made on page 6 that "a discussion is not pertinent of the lowermost aquifer (and aquitards) since the nature and extent of contamination has been defined to risk-based levels in the uppermost aquifer." There has been no decision on whether or not to proceed with the Phase II of the RCRA Facility Investigation (RFI) which would include the lowermost aquifer. That is to be decided after completion of the Cedarville aquifer and storm sewer investigation and submittal of the Phase I RFI Report. Please clarify this statement and provide a provision to review and/or modify the EI Report for Human Health depending on the decision whether or not to pursue the Phase II investigation of the lowermost aquifer.

Response 1

The CA725 states that the two consolidated bedrock aquifers are used by some private well users for potable and non-potable purposes in the Yellow Springs area. However, based on the results of the water well survey presented in the RFI Phase I Report, the lowermost aquifer is not used by any private well users within the Vernay water well survey area. Further, based on the results of the RFI Phase I investigation, Vernay has concluded that investigation of the lowermost aquifer is not warranted. Therefore, even if a Brassfield Aquifer investigation is conducted, there is not a complete pathway for human exposure to the lowermost aquifer within the identified survey area.

2. It is stated that "seasonal grass mowing" takes place at AOI-1 as a routine facility activity. Although this exposure pathway is mentioned throughout this CA725 document, it isn't specifically described in the routine worker comment section of the site conceptual model in Table 1-1. Is the "inhalation of particulates in air from surface soil" exposure pathway based on the exposure of a worker mowing the grass or the exposure of a worker simply walking in the unpaved areas? Please include statements in the site conceptual model to clarify these routine worker activities and identify whether this exposure pathway was covered by the existing screening procedures and risk calculations.

Response 2

Table 1-1 has been modified to include a reference to seasonal grass mowing. The inhalation of particulates in air from surface soil during seasonal grass mowing was considered as an exposure

pathway in the existing screening procedures and risk calculations as follows. The screening criteria and risk calculations used to evaluate potential exposures to routine workers in AOI-1 are the USEPA Region IX Preliminary Remediation Goals (PRGs), which in addition to incidental ingestion and dermal contact, include inhalation of soil vapors and particulates. The PRGs assume an exposure frequency of 250 days/year and a concentration of respirable soil particulates (10 µm or smaller, i.e., PM₁₀) of 0.008 mg/m³, which is based on 50% bare soil. Vernay estimates that seasonal grass mowing occurs approximately ten times per year, which is considerably less than the 250 days/year exposure frequency assumed for the PRGs. Further, as the lawn in the undeveloped portions of the site is well established, exposure to PM₁₀ concentrations is expected to be minimal and, therefore, is reasonably estimated by the concentration of 0.008 mg/m³ assumed in the PRGs. Therefore, exposures to workers during seasonal grass mowing is conservatively estimated by the screening criteria and risk calculations.

- 3. Bolded statements in this document refer to work that was being done at the time that this document was submitted to EPA. These statements are in regards to whether current human exposures to off-site groundwater contamination were under control. For example:
- \$ page ES-1: "To be verified for off-Facility Cedarville Aquifer ground water."
- page 10: "Abandonment of wells and connection to the public water supply will be performed for certain residences by Vernay." "Potable water well sampling results are currently being evaluated to verify that VOC concentrations are below the drinking water standards." "Non-potable use water well sampling results are currently being evaluated to verify that VOC concentrations are below acceptable risk-based levels."

The next draft of this CA725 document should include an update on the status of these potential off-site exposures. Further, this document cannot be approved in order to make the CA725 determination until it is shown that these exposures are under control.

Response 3

The CA 725 document has been updated to reflect the current status of off-site exposures, which are as follows. Based on the results of the water well survey and private water well sampling conducted by Vernay, VOC concentrations are below the drinking water standards in each of the potable water wells sampled and below the conservative non-potable "kiddie pool" criteria in each of the non-potable water wells sampled.

4. Please be sure to specify when adjustments have been made to screening levels. For instance, on page 14, the statement is made that "As discussed above, the screening criteria used to identify "contamination" in this evaluation are based on the EPA Region 9 preliminary remediation goals (PRGs) for soil at industrial and residential sites." The assumption is that the PRGs have been adjusted to a TCRL of 10⁻⁵, but this fact is not included in the statement above. Also, see page 19 and page 24, where the same correction needs to be made.

Response 4

The CA 725 document has been modified to indicate when adjustments have been made to screening levels.

5. The activities of the maintenance worker need to be better defined, either in the site conceptual model or in some other appropriate section within the document, in order for EPA to understand the 5 day/year exposure frequency.

Response 5

The site conceptual site model (Table 1-1) has been modified to include activities of the maintenance worker. According to information provided by Vernay, quarterly maintenance inspections of the utility tunnel are performed (duration of approximately 15-20 minutes per inspection) and the sump pump situated in the utility tunnel is occasionally repaired (repair takes one day or less) as needed. In addition, Vernay's records indicate that in the past approximately 15 years the following four excavations were performed at the site, each limited to a duration of approximately 5 days or less:

- UST removal
- Replacement of power line to Fire suppression system pump
- Dentist office septic tank removal
- Excavation in Maintenance department for bridge crane base

Therefore, the exposure frequency of 5 days per year assumed for the excavation/maintenance worker is conservative.

6. On page 19, a discussion of Table 2-12 includes the statement "For inorganics, such ratios are highlighted to facilitate identification of AOIs where sediment is considered to meet the definition of "contaminated". Table 2-12 doesn't list inorganics. Is it possible that part of the table is missing?

Response 6

The inclusion of the "For inorganics" portion of the statement is a typographical error and has been deleted from the CA 725 document. Sampling for inorganics in sediment was not performed.

7. On page 28, "off-Facility recreators" are discussed under Section 2.4.3, Surface Waters/Sediments. This receptor population was not included in the site conceptual model in Table 1-1. In fact, it appears that this is the first mention of this particular scenario. More detail needs to be provided on this scenario and it should be included in Table 1-1.

Response 7

The off-Facility recreator scenario has been added to Table 1-1. The evaluation of potential exposures to surface water and sediment in the Unnamed Creek of an off-Facility recreator is described in detail in Appendix F.

8. Trespassers are included as a receptor population in Table 1-1, but don't appear to be discussed throughout the document. This scenario must be addressed in the CA725 document.

Response 8

A discussion regarding trespassers has been added to the CA725 document. However, exposures to trespassers would be than less than routine workers. Potential trespasser exposures are not evaluated separately, however, potential routine worker exposures discussed in the CA 725 can be assumed to represent a highly conservative estimate of potential trespasser exposures.

9. The last column of Table 2-1 is labeled "Ratio of Maximum Detect to Industrial Screening Criteria." This column label is a misnomer for calculations involving metals because the maximum concentration is not the actual number that is being used in the numerator. For metals, the listed site-specific background is subtracted from the maximum concentration in the specific AOI and the difference is used as the numerator in the ratio. The problem with this methodology is that, in the August 7, 2003 meeting between GM, Environ, and EPA, there was an agreement that background concentrations of metals could be subtracted from site-specific concentrations prior to risk-based screening on the condition that two types of information are provided: 1) a table that shows all metals concentrations in background samples and; 2) a table accounting for HI and cancer risks on a constituent-by-constituent basis for each metal due to background for each GM facility. Although a table listing cancer risks and hazard quotients for background metals in surface soil is provided (Table B-2), it is impossible to incorporate those values into Question 2 because risk calculations aren't performed until Question 4. The result is that AOI's may be eliminated from further consideration in Question 2 as a result of screening, when these AOI's should have been carried forward until Question 4. Therefore, the agreed upon resolution of providing tables with background values doesn't appear to be functional in the CA725 document.

EPA would like to know which AOI's were eliminated in Question 2 from further consideration in Question 3 and Question 4 based upon the subtraction of background concentrations for metals from site-specific maximum concentrations for metals and the subsequent lower numerator that results in a lower ratio.

Response 9

Regarding Table 2-1, a footnote will be added to clarify that "Ratios of metal concentrations to the screening criteria include only site-related contributions."

The background contribution to metal concentrations in soil was addressed in the EI CA725 Report consistent with the agreements from the August 7, 2003 meeting, and with the format that USEPA Region 5 has found acceptable for other RFI and EI reports that ENVIRON submitted after the meeting. The format of Table B-2 is designed to allow USEPA to see the cancer and noncancer risk estimates associated with the background metals concentrations, and to consider their magnitude relative to the site-related cancer and noncancer risk estimates for each AOI. Specifically, the results on Table B-2 show that the estimates of background cancer and noncancer risks are 9 x 10⁻⁶ and 0.06, respectively. If it desires, USEPA can compare these estimates (and even add them) to the estimates for all the AOIs evaluated in the EI CA725 Report, which are summarized on Table 2-16a.

As other contaminants were identified in each AOI, none of the AOIs were eliminated in Question 2 from further consideration in Question 3 and Question 4 based upon the subtraction of background concentrations for metals from site-specific maximum concentrations for metals.

10. Appendix E, Vernay Health & Safety Policy for On-Facility Excavations, was not included in the draft EI Report for Human Health. This policy is referenced in the Section 2.4, Significance of Potential Exposures, and used in making the decision that contamination "does not pose an unacceptable risk to potential on-Facility receptors under current conditions". This statement cannot be approved without review of the Appendix E policy. Please submit the Health & Safety Policy for On-Facility Excavations for review.

Response 10

Appendix E has been included in the revised CA725 document.

Recommendations:

The Region 5 RCRA program has conducted additional discussion with a number of Region 5 state agencies on acceptable approaches for risk-based screening of indoor air contaminant concentrations within on-site industrial buildings. As a result of these discussions, the Region 5 RCRA program is adopting the following policy for addressing the risk-based screening of indoor air contaminant concentrations within on-site industrial buildings:

A) For Environmental Indicator determinations (i.e., CA 725 - Current Human Exposures Under Control and CA 750 - Migration of Contaminated Groundwater Under Control), the Region 5 RCRA program will recognize the use of OSHA-PEL values as appropriate health based screening levels for indoor air within on-site industrial buildings under the direct control of the Responsible Party (RP). This recognition is based on a policy adopted by the Office of Solid Waste at EPA Headquarters. If the site also contains a building(s) which is not obviously industrial (e.g., cafeteria, day-care center, commercial space) or not obviously under the control of the RP, then Region 5 may request the RP to provide evidence that the building(s) is regulated under OSHA for the contaminants of concern.

B) For site remedial decisions beyond the EI determinations (e.g., RFI determinations; CMS requirements; Statement of Basis), OSHA-PEL values will not be recognized as the appropriate health based screening levels for indoor air within on-site industrial buildings. EPA's risk-based screening levels for exposure to air contaminants will be applied according to the document titled: "DRAFT GUIDANCE FOR EVALUATING THE VAPOR INTRUSION TO INDOOR AIR PATHWAY FROM GROUNDWATER AND SOILS" (http://www.epa.gov/correctiveaction/eis/vapor/complete.pdf). The RP may apply this guidance to demonstrate that vapor intrusion to indoor air is not a complete exposure pathway for an on-site building(s). If vapor intrusion of all applicable contaminants cannot be eliminated as a pathway of concern by the screening procedures recommended in the guidance then additional work to address the pathway will be required. The additional work could include vapor migration modeling using site-specific parameters soil gas sampling, sub-slab sampling, indoor air sampling of a combination of these approaches.

Response to Recommendations:

- A) The site does not contain a building that is not obviously industrial or not obviously under the control of the RP. Therefore, the CA 725 is based on the use of OSHA-PEL values as appropriate health based screening levels for indoor air within the on-site industrial buildings
- B) This recommendation does not explain EPA's rationale for accepting the use of OSHA PELs for EI determinations and then not accepting their use in determining when corrective measures are warranted. Vernay is also not aware of any written EPA policy that explains the rationale for this position. In principle, Vernay believes that the use of OSHA PELs should be evaluated in the same manner as other aspects of future land use in decisions about the need for corrective measures. The evaluation would be analogous to the evaluation of whether an assumption of future industrial land use rather than residential land use is appropriate in making remedial decisions at a particular site. Just as the assumption of future industrial land use is not rejected automatically in RCRA corrective action decisions, the assumption of OSHA applicability also should not be rejected automatically.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION5 77 WEST JACKSON BOULEVARD CHICAGO, IL 60604-3590

SEP 2 3 2004

REPLY TO THE ATTENTION OF

Douglas L. Fisher
Environmental Affairs and
Safety Manager
Vernay Laboratories, Inc.
120 E. South College
Yellow Springs, Ohio 45387-1623

RE: Approval with Conditions El 725 Report Vernay Laboratories, Inc. Yellow Springs, Ohio OHD 004 243 002

Dear Mr. Fisher:

The United States Environmental Protection Agency (U.S. EPA) received and reviewed your responses to our June 18, 2004, comments on your Environmental Indicator (EI) Report for Human Health (CA 725), dated April 9, 2004. The U.S. EPA will be approving the EI Report and form for Human Health (CA 725) with conditions.

Our previous comment in regards to the subtraction of site-specific background levels from detected soil concentrations for inorganics in Question #2 on the EI CA 725 form has not been completely resolved by your response. At this time, it does not appear that Vernay Laboratories, Inc., eliminated any AOI's in Question #2 from further consideration in Questions #3 and #4. Screening procedures should still be done by comparing chemical concentrations that include both contaminant and background concentrations to risk based screening levels. The concern is that Areas of Interest (AOI's) may be eliminated from further consideration as a result of screening, when these AOI's should be carried through and further evaluated in Questions #3 and #4 of the EI form. The following condition will provide a solution and still provide us with the necessary information on all AOI's where there might be exposure issues:

 If Vernay Laboratories, Inc. subtracts out background for inorganics at AOI's in Question #2 (prior to risk based screening);

Then Vernay Laboratories, Inc. will be required to provide us with a list of all AOI's where this subtraction of background was the driver for elimination of the AOI in Question #2 from further consideration in Questions #3 and #4; and

If there are AOI's where this subtraction resulted in elimination of a specific AOI in Question #2, that we may require additional exposure information in order to make a determination on whether that AOI is an exposure concern.

The CA 725 Environmental Indicators Form for Human Health will be finalized based on the EI Report for Human Health dated April 9, 2004; U.S. EPA's comments dated June 18, 2004; Vernay's Response to U.S. EPA's comments dated July 16, 2004; and the e-mail including further clarifications from Chris Buzgo, Environ Corp., dated August 24, 2004. Once the EI form is officially approved, signed, and dated a copy will be sent to you for your records.

The comments that highlight our policy on evaluating indoor air using appropriate health based screening levels for environmental indicator purposes and for site remedial decisions beyond the El determinations has not changed. If you have any questions, please do not hesitate to contact me at 312-886-8093.

Sincerely

Patricia J. Polston

Corrective Action Project Manager

cc: C. Olsberg, U.S. EPA, WMB

J. Morris, U.S. EPA, ORC

D. Contant, The Payne Firm

David C. Contant

From: Chris Buzgo [CBuzgo@environcorp.com]

Sent: Tuesday, August 24, 2004 6:26 PM

To: Polston.Patricia@epamail.epa.gov

David C. Contant; DougFisher@Vernay.com; Kevin D. Kallini; Nielsen, Jon M (Mark); Steve

Washburn

Subject: Vernay Laboratories, Inc. - Response to USEPA Additional Comments on CA725

Trish -

Cc:

ENVIRON's response to EPA's additional comments on the CA725 for Vernay Laboratories, Inc. are provided below. I've included Colleen's email in italics so you can see her comments. Our response follows Colleen's email.

Please feel free to contact me if you have any additional comments or questions.

Thanks

Chris

Christopher M. Buzgo, Ph.D.
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Trish-

I have reviewed Vernay's response to EPA comments on the CA725. In general, the responses were adequate. However, I do require some additional information on some of these comments.

For response #1, Vernay needs to include more explanation about the results of the RFI Phase I investigation that leads them to conclude that there is no further need for investigation of the lowermost aquifer. For response #7- Vernay needs to recheck Table 1-1 for inclusion of the recreator scenario. For response #8- Vernay needs to include more explanation regarding exposure of the potential trespasser. At this point, there is no way to tell if the routine worker is a conservative surrogate for the trespasser in terms of assessment of risk. For response #9- The column label should be changed, as specified in EPA comments, to appropriately describe the numerator. Despite the fact that no AOI's were eliminated in Question 2 from consideration in Question 3 and 4, the screening procedure in Question 2 should still be done by comparing chemical concentrations that include both contaminant and background concentrations to risk based screening levels. Discussions of background would be more appropriate to include in question #4.

Let me know if you have any questions on the above recommendations.

Colleen Olsberg, Ph.D.
Environmental Health Scientist
U.S. Environmental Protection Agency- Region 5
Waste, Pesticides and Toxics Division (DW-8J)
77 West Jackson Blvd.
Chicago, Illinois 60604
Telephone: (312) 353-4686

Response to Comments

For response #7- Vernay needs to recheck Table 1-1 for inclusion of the recreator scenario.

Table 1-1 was modified previously to include a brief discussion of the Recreator scenario in the comments section of the Table. The attached revised Table 1-1 has been modified to include the Recreator as a separate row under "Receptor Population".

<<Tables1VernayLaboratoriesrev081704.pdf>>

For response #8- Vernay needs to include more explanation regarding exposure of the potential trespasser.

The attached documents provide additional information regarding trespasser exposures.

<<RWvsTresComp081704.pdf>> <<XFactorsIndust.pdf>>

For response #9- The column label should be changed, as specified in EPA comments, to appropriately describe the numerator.

The referenced column was modified previously to include a footnote. The attached table modifies the column to appropriately describe the numerator.

<<Table2-1_rev082304.pdf>>

With respect to the adjustment of detected soil concentrations for background, Question #2 of the Environmental Indicators CA725 form specifically asks "Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be "**contaminated**" above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?" According to Footnote 1 to Question #2 "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

The phrases "subject to RCRA Corrective Action" and "subject to RCRA" in these excerpts from EPA's CA725 Form refer to concentrations in excess of natural or anthropogenic background levels that may be attributable to site activities (i.e., site-related). These are the same concentrations that are subject to RCRA corrective measures (see OSWER Directive 9355.0-30). As such, site-specific background levels were established for certain metals at the Vernay facility to ensure that decisions regarding the need for characterization and remediation recognize the difference between a release of a hazardous constituent which requires action and the natural or non-site-related occurrence of the same constituent which requires no action on the part of the Vernay facility. In this approach for assessing the need for corrective action and to avoid unnecessary data collection and/or evaluation needed to complete later portions of the CA725 assessment, only the site-related component of

metals in the soil characterization data is accounted for in Question #2 to assess those constituent concentrations that are subject to RCRA corrective action to identify if complete pathways (Question #3) exist, and if so, the significance of potential exposures (Question #4).

		Table 1-1: \$	Table 1-1: Scenarios for Potential Human Exposure Laboratories, Inc 875 Dayton Street, Yellow Springs, Ohlo	an Exposure	gs, Ohlo	
Exposure Area &	Receptor	Exposure	Exposure	Possible	Possible in	Comments
Exposure Point(s)	Population	Koute	On-Facility	Carreniny	Ainin	
Vernay Laboratories, Inc	Routine Workers	ingestion and dermal contact	surface soil	Yes	Yes	The main (eastern) portion of the facility is covered with building
875 Dayton Street Facility		inhalation	particulates in air from surface soil	Yes	Yes	portion of the facility. Potential exposure of workers may occur at
		Inhalation	vapor released to ambient air from soil (surface and subsurface), subsurface water and Cedarville Aquifer ground water	Yes	Yes	iunpaved areas, and (in the future) at areas where pavement is removed. Potential inhalation exposures of workers may also occur due to vapor migration to ambient air and indoor air from VOCs in soil, subsurface water and Cedarville Aquifer ground water. Potential some may occur as and frontine artivities.
		inhalation	vapor intrusion to indoor air from soil (surface and subsurface), subsurface water and Cedarville Aquifer ground water	Yes	Yes	water, rotering exposure may occur as part of occurs and/or seasonal grass mowing (grass mowing occurs approximately ten times per year).
	Trespassers	ingestion and dermal contact	surface soil	Yes	Yes	The facility is not fully fenced, therefore, trespassers may cross the property. The main (eastern) portion of the facility is covered with building and property. The property many of the facility is considered with property many of the facility of the property many of the property
		inhalation	particulates in air from surface soll	Yes	Yes	building and paventien. The largest unjaven area is in the unissed western portion of the facility. Potential exposure of trespassers may occur at unpaved areas, and (in the future) at areas where
		inhalation	vapor released to ambient air from soil (surface and subsurface), subsurface water and Cedarville Aquifer groundwater	Yes	Yes	pavement is removed. Potential inhalation exposures may also occur due to vapor migration to ambient air from VOCs in soil, subsurface water and Cedarville Aquifer ground water (in unpaved areas).
	Occasional Excavation/Maintenance	Ingestion, dermal contact and surface and subsurface soil inhalation	surface and subsurface soil	Yes	Yes	Potential exposure of Vernay maintenance workers is possible to soil and subsurface water and Cedarville Aquifer ground water during expending activities in subsurface water during
	Workers	ingestion, dermal contact and inhalation	subsurface water, sewer backfill water, and Cedarville Aquifer ground water	Yes	Yes	during excavation activates, to sussentiate many family maintenance in the utility tunnel, and to surface water during maintenance of the on-Facility sever system. Current maintenance activities consist of quarterly inspections (15-20 minutes per
		Ingestion, dermal contact and inhalation	surface water (storm sewer system)	Yes	Yes	inspections) of the utility tunnel and occasional repair of the sump pump in the tunnel as need. Excavation activities have been limited to four events in past 15 years, each limited to approximately 5 days or less. Thus, exposure frequency is conservatively assumed to be 5 days per year for Vernay maintenance worker.
	One-Time Building Construction Workers	ingestion, dermal contact and inhalation	surface and subsurface soil	ON O	Yes	Vernay has no current plans for building construction. Future commercial/industrial site use could include the construction of a
		ingestion, dermal contact and inhalation	subsurface water, sewer backfill water and Cedarville Aquifer	No	Yes	new building.

		Table 1-1:	Table 1-1: Scenarios for Potential Human Exposure	an Exposure		
		Vernay Laboratorie	lay Laboratories, Inc 875 Dayton Street, Yellow Springs, Ohio	fellow Sprin	gs, Ohio	
Exposure Area &	Receptor	Exposure	Exposure	Possible	Possible in	Comments
Exposure Form(s)	ropulation	Alnou	Mediuii	Culleniny	- atalo	
			OIIITACIII			
Local Off-Facility Residential Residents	Residents	Ingestion, dermal contact and	ingestion, dermal contact and Cedarville Aquifer ground water	Yes	Yes	Residential areas border the facility to the east and south. Several
Area		Innalation	during potable nouseroid use			Of these residential properties have ground water wells. Foreither
			Cedarville Aquifer ground water	Yes	Yes	exposure of residents may occur from potable and nonpotable
			during nonpotable/outdoor use			(e.g., lawn watering) use; emissions from unpaved on-Facility soils;
		Inhalation	vapor intrusion to indoor air from	Yes	Yes	vapor intrusion into indoor air from subsurface water; and
			subsurface water and Cedarville			Cedarville Aquifer ground water in areas where VOCs exist.
			Aquifer ground water			
	·	Inhalation	vapor and particulates in ambient	Yes	Yes	
			air from soils on the facility			
	Doctootor	ingestion dermal contact and	nacetion dermal contact and surface water and sediments in	γολ	Yes	The Off-Eacility Recreator scenario evaluates potential residential
		inhalation	Unnamed Creek	3	3	exposures to surface water and sediments in an Unnamed Creek
						located in the study area as described in detail in Appendix F.
	Occasional	ingestion, dermal contact and	ingestion, dermal contact and subsurface water, sewer backfill	Yes	Yes	A municipal storm sewer line crosses the facility property and
	Excavation/Maintenance	inhalation	water, and Cedarville Aquifer			discharges to an Unnamed Creek northeast of the facility.
	Workers		ground water			Potential exposure of off-facility utility maintenance and
						construction workers is possible to subsurface water, sewer backfill
				,	,	water and Cedarville Aquiller ground water in excavations, to surface water in maintenance of the off-Eaclifty storm sewer
		ingestion, dermal contact and sunace water and sediments inhalation	sunace water and sediments	se .	S 482	system; and in sediments and surface water in the Unnamed Creek

Comparison of Exposure Assumptions in EPA Region 9 Soil PRGs for Industrial Land Use with Potential Exposures of Routine Workers and Trespassers

Comparison of Exposure Assumptions in EPA Region 9 Soil PRGs for Industrial Land Use with Potential Exposures of Routine Worker and Trespassers

The EPA Region 9 Preliminary Remediation Goals (PRGs) for soil at industrial sites are based on standard default exposure factors that EPA (1991) recommends for evaluating reasonable maximum exposures (RME) to soil in commercial/industrial settings. As such, the PRGs are appropriate for evaluating potential exposures of workers to soil during routine activities at industrial facilities. In addition, the PRGs are also appropriate for evaluating potential exposure of other receptors that may be present at industrial facilities and have lower potential exposures to soil such as trespassers. The purpose of this document is to describe the typical activities of such receptors at the Vernay facility and to show that their potential exposures to soil are unlikely to exceed the exposures assumed in deriving the PRGs.

The typical activities of routine workers and trespassers at the Vernay facility are described below.

Routine Workers

The largest receptor population at the Vernay facility consists of workers who are engaged in routine manufacturing and related activities. Most of these workers spend most of their work day indoors within the site manufacturing buildings. During their limited time outdoors, these workers could contact surface soil in unpaved areas. Potential routes of exposure to surface soil would include incidental ingestion, dermal contact, and inhalation of soil vapor and airborne particulates.

Trespassers

Based on the location of the facility and information provide by site personnel, trespassing at the Vernay property is not common. The duration of any unauthorized access as well as the types of activities while on-site are expected to be limited. Trespassers are assumed to be adolescents between ages 9 to 18. While trespassing, they could come into contact with surface soil in unpaved areas. Potential routes of exposure would include incidental ingestion, dermal contact, and inhalation of soil vapor and airborne particulates.

Exposure factors appropriate for quantifying these receptors' potential exposures are summarized on Table A1 and discussed below. Also included on Table A1 for comparison are the exposure factors used in deriving the PRGs for commercial/industrial settings.

Routine Workers

- Ingestion rate: The soil ingestion rate of 50 mg/day is EPA's recommended value for evaluating RME in industrial settings (EPA 1991).
- Dermal contact rate: The dermal contact rate is the product of the exposed skin surface area and the soil adherence factor. The surface area of 3,300 cm² and adherence factor of 0.2 mg/cm² are EPA's recommended values for evaluating RME in industrial settings (EPA 2001).
- Breathing rate: The breathing rate of 20 m³/day is EPA's recommended value for evaluating RME in industrial settings (EPA 1991).
- Fraction contacted: The fraction contacted term is less than 1 because workers at the Vernay facility generally do not spend an entire work day outdoors, and are unlikely to work without absences due to sickness, holidays, and inclement weather.
- Exposure frequency: The frequency of 250 days/year is EPA's recommended value for evaluating RME in industrial settings (EPA 1991). The value is based on a 5-day work week and 50 weeks per year.
- Exposure duration: The duration of 25 years is EPA's recommended value for evaluating RME in industrial settings (EPA 1991). The value is the 95th percentile number of years workers work at one location.
- Body weight: The body weight of 70 kg is the standard EPA-recommended value for assessing exposure of adults (EPA 1989).
- Averaging time: The averaging time for evaluating exposures to carcinogens is 70 years. The averaging time for evaluating exposures to noncarcinogens is the exposure duration (EPA 1989).

Trespassers

- Ingestion rate: The soil ingestion rate of 50 mg/day is based on EPA's recommended value for evaluating RME in industrial settings (EPA 1991).
- Dermal contact rate: The exposed skin surface area of 5,700 cm² is conservatively based on EPA's recommend value for evaluating RME of adults in residential settings (EPA 1991). The adherence factor of 0.2 mg/cm² is EPA's recommended value for evaluating RME in industrial settings (USEPA 2001).

- Breathing rate: The breathing rate of 20 m³/day is EPA's recommended value for evaluating RME in industrial settings (EPA 1991).
- Fraction contacted: The fraction contacted term is 0.25 (or 2/8) because trespassers are assumed not to spend more than a couple hours in one particular area.
- Exposure frequency: The frequency of 100 days/year is based on professional judgment considering the Vernay facility location and reported infrequency of trespassers. This value assumes 2 days per week and 50 weeks per year.
- Exposure duration: The duration of 10 years corresponds to the number of years from ages of 9 to 18.
- Body weight: The body weight of 51 kg is the average for adolescents between the ages of 9 to 18 (EPA 1997).
- Averaging time: The averaging time for evaluating exposures to carcinogens is 70 years. The averaging time for evaluating exposures to noncarcinogens is the exposure duration (EPA 1989).

Using these exposure factors, the doses per mg/kg of chemical in soil or per mg/m³ in air have been calculated and are shown on Table A1 to facilitate comparison of the exposures assumed for each receptor with the exposures assumed in the PRGs. These cancer- and noncancer-based doses are shown on Table A1 in bold and are labeled as normalized lifetime average daily dose (LADD) and average daily dose (ADD), respectively.

For the purposes of determining whether the PRGs are adequately protective, the normalized cancer- and noncancer-based doses for each receptor can be compared with the corresponding normalized doses assumed in the PRGs. A direct comparison of the normalized doses on Table A1 shows that the normalized cancer- and noncancer-based doses for each route and receptor are lower than the corresponding normalized doses assumed in derivation of the PRGs. For routine workers, the normalized doses are lower than those assumed in the PRGs because these workers do not spend an entire work day at one area of exposed soil. For trespassers, the normalized LADDs are approximately 10 to 20 times lower than those assumed in the PRGs, and the normalized ADDs are approximately 4 to 7 times lower.

These comparisons show that the exposure frequency (EF) and/or exposure duration (ED) for trespassers shown on Table A1 can be increased significantly without affecting the outcome of the comparisons. A trespasser would have to have an exposure frequency higher than the routine worker in order to equal the exposure of a routine worker.

References

- U. S. Environmental Protection Agency (EPA). 1989. Office of Emergency and Remedial Response. Risk Assessment Guidance for Superfund. Volume I, Human Health Evaluation Manual. Washington, DC. EPA/540-1-89-002. OSWER Directive 9285.7-01a. December.
- U. S. Environmental Protection Agency (EPA). 1991. Human health evaluation manual, supplemental guidance: "Standard default exposure factors." Memorandum from T. Fields, Jr., Office of Emergency Remedial Response, to B. Diamond, Office of Waste Programs Enforcement. OSWER Directive 9285.6-03. March 25.
- U. S. Environmental Protection Agency (EPA). 1997. Office of Health and Environmental Assessment. Exposure Factors Handbook. EPA/600/P-95/002Fa. August.
- U. S. Environmental Protection Agency (EPA). 2001. Office of Emergency and Remedial Response. Risk Assessment Guidance for Superfund. Volume I, Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). Interim. Review Draft-For Public Comment. Washington, DC. EPA/540/R/99/005. OSWER Directive 9285.7-02EP. September.

Table A1
Comparison of Exposure Factors for Receptors at the Vernay Facility

		T	EPA Region	า 9	Routine		Adolesce	nt
			PRGs		Workers		Trespasse	rs
Soil Ingestion								
Ingestion Rate	mg-soil/day	IR	50	•	50		50	е
Conversion Factor	kg/mg	CF	1E-06		1E-06		1E-06	
Fraction Contacted	unitless	FC	1		< 1		0.25	
Exposure Frequency	days/year	EF	250		250		100	
Exposure Duration	years	ED	25		25		10	е
Body Weight	kg	BW	70	а	70	а	51	С
Averaging Time, cancer	days	AT _c	25,550	а	25,550	а	25,550	а
Averaging Time, noncancer	days	ATnc	9,125	а	9,125	а	3,650	а
Normalized LADD	kg-soil/kg/day		1.75E-07		< 1.75E-07		9.59E-09	
Normalized ADD	kg-soil/kg/day		4.89E-07		< 4.89E-07		6.72E-08	
Soil Dermal Contact							771	
Adherence Factor	mg-soil/cm ²	AF	0.2	d	0.2	d	0.2	d
Exposed Skin Surface Area	cm ² /day	SA	3,300	d	3,300	d	5,700	b
Conversion Factor	kg/mg	CF	1E-06		1E-06		1E-06	-
Absorption Fraction	unitless	ABS _d	0.1	f	0.1	f	0.1	f
Fraction Contacted	unitless	FC	1		< 1		0.25	
Exposure Frequency	days/year	EF	250	b	250	b	100	е
Exposure Duration	years	ED	25	b	25	b	10	е
Body Weight	kg	BW	70	а	70	а	51	С
Averaging Time, cancer	days	AT _c	25,550	а	25,550	а	25,550	а
Averaging Time, noncancer	days	AT _{nc}	9,125	а	9,125	а	3,650	а
Normalized LADD	kg-soil/kg/day		2.31E-07		< 2.31E-07		2.19E-08	
Normalized ADD	kg-soil/kg/day		6.46E-07		< 6.46E-07		1.53E-07	
Ambient Air Inhalation								
Breathing Rate	m³/day	BR	20	b	20	b	20	b
Fraction Contacted	unitless	FC	1		< 1		0.25	
Exposure Frequency	days/year	EF	250	b	250	b	100	е
Exposure Duration	years	ED	25	b	25	b	10	е
Body Weight	kg	BW	70	а	70	а	51	С
Averaging Time, cancer	days	ATc	25,550	а	25,550	а	25,550	а
Averaging Time, noncancer	days	AT _{nc}	9,125	а	9,125	а	3,650	а
Normalized LADD	m³-air/kg/day		6.99E-02		< 6.99E-02		3.84E-03	
Normalized ADD	m³-air/kg/day		1.96E-01		< 1.96E-01		2.69E-02	
Doforonos	1.00							

References

- a. RAGS, Volume I: Human Health Evaluation Manual, Part A (EPA 1989)
- b. Standard default exposure factors. OSWER Directive 9285.6-03 (EPA 1991)
- c. Exposure Factors Handbook (EPA 1997)
- d. RAGS, Volume I: Human Health Evaluation Manual: Part E (EPA 2001)
- e. Based on professional judgment and site-specific considerations discussed in the text
- f. The default value is 0.1 for semivolatile organics and 0 for all other chemicals.

Min Mean M	r r			
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190 1 6.00E-02 6.00E-02	-02 2.6E+02	1.2E+03	5.3E-05	1.2E-05
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5.40E-03	-02	-		5.5E-06
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									ENVIRON Industrial Soil	100	Ratio of Max Conc to ENVIRON	Ratio of Max Site- Related
			Carc	pəziləu	Min Detected		Max Detected	Site Specific Background	to Indoor Air Criteria	Screen- ing Criteria		Industrial Screening
1	Chemical	CASRN C	Class	-	4 1 50E-03	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	1 7E+03 n	nc 4.8E-06	2.9E-05
	1, 1-Dichlorettlene	75-35-4	0	3 6	_				2.2E+02	ī		1.5E-05
- 1	1.2-Dichloroethene (total)	540-59-0	,	138	34 5.20E-03	-			2.0E+04	1.5E+02 r		3.7E-02
	cis-1,2-Dichloroethene	156-59-2	۵						3.1E+04	Г-Т		1.5E-01
	trans-1,2-Dichloroethene						2.10E-01		2.0E+04		1.1E-05	9.1E-04
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	Ethyl Benzene	100414	_	3 2	2 8 50E-04				+0+3C.7	1		1.0E-06
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	Mothulousishesses	108-10-1	5	200	2 1 10F-0	-					2	2.9E-07
	Methylene Chloride	75-09-2	8	1	11 2 10E-03	3 2 40E-01	2.30E+00		2.7E+03	7	c 8.7E-04	1.1E-02
	Tetrachlomethene		C-82	1		4 5.70E+00 8.20E+01	8.20E+01		2.3E+04	1		2.4E+00
	Toluene		۵		16 5.40E-04		1.60E-01		7.9E+04	2.2E+03 r	nc 2.0E-06	7.3E-05
	Trichloroethene	+	C-B2	L	59 9.00E-04		4.00E+01		3.4E+04		c 1.2E-03	3.3E+01
	1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1			16 1.60E-03		4.70E+00 4.90E+01		9.3E+04		nc 5.3E-04	7.1E-04
	Vinyl Chloride	75-01-4	A		25 1.40E-03	3 1.50E-01			1.4E+01	\neg		1.3E-01
	Xylenes (total)	1330-20-7	۵	96	7 1.40E-0	1.40E-03 2.80E-02			9.2E+04		nc 1.1E-06	1.1E-04
2000	Acenaphthene	83-32-9	,	125	1 9.30E-02	2 9.30E-02				2.95+04	JI C	7 05 06
	Acenaphthylene	208-96-8	ء د	2 2	2 2 40E-02	2 30E-01	4 40E-01				2 0	1.8E-07
	Anthracene	56-55-3	3 6	1	20 5 60F-0						2 0	2.7E-01
	Benzo(a)anullacerie Renzo(a)nvrene	50-32-8	8 2		16 5.40E-03	3 6.00E-01				+	U	2.7E+00
1	Benzo(b)fluoranthene	205-99-2	22	125	22 1.80E-0					-	0	2.6E-01
SVOC	Benzo(g,h,i)perylene	191-24-2	۵		12 7.80E-0	3 2.90E-01	1.60E+00				nc	5.5E-05
SVOC	Benzo(k)fluoranthene	Ш	B2	125	20 2.00E-03	3 1.80E-01	2.20E+00			-	O	1.0E-02
1	bis(2-Ethylhexyl)phthalate	117-81-7	B2		9 6.90E-0	9 6.90E-02 6.70E-01 3.30E+00	3.30E+00		2.7E+12		c 1.2E-12	2.8E-03
	Chrysene	218-01-9	B2		25 7.50E-0	25 7.50E-04 4.10E-01	6.00E+00			-	0	2.9E-03
	Dibenz(a,h)anthracene	53-70-3	B2	125	4 9.70E-0	2 8.70E-01	2.40E+00		1, 0			4.25.00
SVOC	Di-n-butylphthalate	84-74-2	Δ	39	1 8.20E-02	2 8.20E-02	8.205-02		6.4E+11		nc 1.3E-13	1.3E-00
	Di-n-octylphthalate	117-84-0	c	5 2	1 6.60E-02	0.00E-02	4 70E-02			2 2E+04	200	7.7F-04
2000	Fluorente	86-73-7	2 0	L	2 8 40E-03	3 2 20E-02	3 60F-02			1	nc nc	1.4E-06
200	Indepo(1.2.3-cd)byrene	193-39-5	83 C		18 2.50E-0	3 3.80E-01				1	0	1.7E-01
SVOC	2-Methylnaphthalene	91-57-6	₽	119	1 2.30E+0	2.30E+01 2.30E+01 2.30E+01	2.30E+01			1.9E+02 r	nc	1.2E-01
1	Naphthalene	91-20-3	ပ		4 4.50E-0		7.40E-02		7.5E+05	\neg	nc 9.8E-08	3.9E-04
	Phenanthrene	85-01-8	۵		10 7.55E-03	3 2.20E+00	1.90E+01			\neg	nc	6.6E-04
SVOC	Pyrene	129-00-0	۵		44 5.90E-0		2.10E+01			2.9E+04 r	ou.	7.2E-04
PDIST	Petroleum Hydrocarbons (recoverable)	68334-30-5R			35 1.00E+01	1 2.00E+03	1.30E+04	-		$^{+}$		7
NORG	Arsenic	7440-38-2	<	I	17 1.10E+0		2.28E+01	1.5E+01		\neg	0	10-11-0
NORG	Barium	7440-39-3	ا د		97 1.22E+01	1 6.50E+01	1.00=+02			0./E+04	DC C	2.5E-03
NORG	Cadmium	7440-43-9	ā	200	9 3.70E-02		3.10E-01 1.50E+00			Т	2 2	20-15. e
	Chromium (total)	7440-47-3	c		30 4.00E+00		1.20E+01 2.32E+01	2.5E+01			2 2	20.2
		7439-92-1	2 6	1 86	98 1 20F+00		1.02E+02	1			2	1.4E-01
NORG	Mercin	7439-97-6	10		6 3.40E-02				2.2E+03	1	nc 2.5E-04	4.0E-02
NORG	Selenium	7782-49-2	0		10 5.00E-01	1 6.60E-01					nc	1.8E-04
INORG	Zinc	7440-66-6	۵	22	22 8.30E+0	8.30E+00 4.90E+01	7.38E+01	7.1E+01		_	20	9.3E-06
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7439-92-1 B2

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				Tay	ble 2-	1: On	-Facility (Table 2-1: On-Facility Soil Screening Results Vernay Laboratories Inc., Yellow Springs, Ohio	ning Res	ults Ohio				
4	Area	Chem	Chemical	CASRN	Carc	bəzylsnA	Defected Min (mg/kg)	Mean d Detected	Max Detected (mg/kg)	Min Mean Max Site Specific Detected Detected Background (mg/kg) (mg/kg) (mg/kg)	ENVIRON Industrial Soil Volatilization to Indoor Air Criteria (mg/kg)	Industrial Screen- ing Criteria (mg/kg)	Ratio of Max Conc to ENVIRON Industrial Soil Volatilization to Indoor Air	Ratio of Max Site- Related Detect to Industrial Screening
<u>:[``</u>	74	١	Selenium	7782-49-2	۵	64	3 6.50E-01	1 6.90E-01	7.30E-01			5.1E+03 nc		1.45-04
	ส	NORG	Zinc	7440-66-6	۵		31 2.92E+C	31 2.92E+01 5.10E+01 8.98E+01	8.98E+01	7.1E+01		3.1E+05 nc		0.1E-03
Ш					+	-								
		Notes:	1.		100	- 0	Corocada	Critoria at:						
		The Scree	The Screening Criteria for residential and Industrial S	Idustrial soil is the lower of the integrated occeening criteria at	ille ill	agrate	ocieei III o	Ciliana.						
			target cancer risk =	1E-05		-								
			target hazard quotient ≖	-				-				1		
L	ĺ	*For the R	+For the Ratio of Max Site-Related Detect to Industrial Screening Criteria the ratios of metal concentrations to the screening criteria include only site-related contributors	al Screening Crit	eria the	ratios	of metal co	ncentrations t	to the scree	ning criteria inc	Slude only site-rei	ated contribution	Suc	
L		The soil st	The soil screening level for soil to ground water is presented in the PRG table for migration to ground water with a DAF =	sented in the P	3G tabl	e for m	igration to c	ground water	with a DA	11	70			
1	ľ	The Scree	The Screening Criteria for Pyrene were used as surrogates for Phenanthrene and Benzo(g,h,l)perylene.	ogates for Phena	inthren	and E	3enzo(g,h,i)	perylene.						
L		The Scree	The Screening Criteria for Phenol were used as surrogates for Phenols (total).	ogates for Pheno	Is (tota									
<u>L</u>		The Scree	aning Criteria for Naphthalene were used as	s surrogates for	2-Methy	Inapht	halene.							
L		The Scree	The Screening Criteria for cis-1,2-Dichioroethene were used as surrogates for 1,2-Dichloroethene (total)	re used as surro	gates fo	r 1,2-[Dichloroethe	ene (total).						
		The Scree	The Screening Criteria for Chromium VI was used as a surrogate for Chromium (total)	a surrogate for	Chromi	um (to	tal).							
L		The Scree	The Screening Criteria for Mercury was calculated by	culated by ENVIRON to account for the vapor inhalation pathway using:	count f	or the	vapor inhala	ation pathway	, using:					
<u>L.</u>		EPA Rec	EPA Region 9 equations. RfC from IRIS, and chem	and chemical properties from EPA's Soil Screening Guidance	m EP	's Soil	Screening	Guidance.						
		NA - The	NA - The calculated Cow. DAF is greater than the Solubility	ubility.										
		c - The Sc	c - The Screening Criterion is based on cancer risk.											
1_		nc - The S	nc - The Screening Criterion is based on noncancer effects.	effects.										
_		Chem Gr	Chem Group - Chemical Group											
		Carc Clas	Carc Class - EPA Weight-of-Evidence Cancer Classification	fication	-	-								



Supplemental Response to USEPA Comments Resource Conservation and Recovery Act CA725 Environmental Indicators Report

Vernay Laboratories, Inc. Plant 2/3 Facility 875 Dayton Street Yellow Springs, Ohio

OHD 004 243 002

September 23, 2004

The Environmental Indicators (EI) CA725 Report for the Vernay Laboratories, Inc. ("Vernay") Facility (the "Facility") located in the Village of Yellow Springs, Ohio was submitted to USEPA on July 14, 2004. This submittal included responses to USEPA's June 29, 2004 comments on the draft EI CA 725 Report provided to USEPA on April 9, 2004. The EI CA725 Report evaluated and discussed information that is pertinent to the RCRA CA725 determination, and included data collected during the Phase I Facility Investigation and from prior investigations that were summarized in the Facility Current Conditions Report. Based on these data, and a consideration of potential exposure pathways and site-specific conditions, current human exposures were determined to be under control according to the provisions of CA725.

On August 5, 2004, USEPA requested additional information and/or clarification of the responses to the June 29, 2004 comments. The requested information/clarification was submitted to USEPA on August 24, 2004. Based on subsequent discussions between USEPA and Vernay, Vernay understands that USEPA is requesting that, despite the fact that no areas of interest (AOIs) were eliminated in CA725 Question 2 from consideration in CA725 Questions 3 and 4, the screening procedure for responding to Question 2 should include comparison of soil concentrations with risk based screening levels without accounting for background contributions to these concentrations.

Supplemental Response to USEPA Comments

In the approach presented in the July 2004 EI CA725 Report for the Vernay Facility, only the site-related component of metals in the soil was accounted for in Question 2 to identify those metal concentrations that are subject to RCRA corrective action and warranted further evaluation in the CA725 determination. Those AOIs with constituents concentrations identified in Question

2 for further evaluation were then assessed to identify if complete pathways (Question 3) exist, and if so, the significance of potential exposures (Question 4). However, to address USEPA's additional comments on the approach used for the Vernay Facility, Vernay is providing supplemental information for CA725 Question 2, specifically, the results of the screening of soil concentrations with risk-based screening criteria without accounting for background contributions to these concentrations.

As described in the EI CA 725 Report, the identification of contamination for soil is based on comparison of the Phase I RFI characterization data with generic risk-based screening criteria. The following is a list of screening criteria that were selected based on the conceptual site model for current human exposures to identify contamination in each of the environmental media investigated during the Phase I Facility Investigation:

Soil

- Risk-based screening levels calculated using the methodology and conservative exposure factors for deriving USEPA Region 9 Preliminary Remediation Goals (PRGs) for industrial and/or residential land use (set at a TCRL of 10⁻⁵ for carcinogenic constituents and a target HQ of 1 for non-carcinogenic constituents); and
- For on-Facility areas, risk-based screening levels for evaluating soil vapor migration to indoor air based on meeting OSHA criteria for industrial chemical exposures, or in the absence of an OSHA criterion, risk-based screening levels calculated using the methodology and conservative exposure factors published by Michigan Department of Environmental Quality (MDEQ) for evaluating the soil to indoor air pathway for industrial land use (set at a TCRL of 10⁻⁵ for carcinogenic constituents and a target HQ of 1 for non-carcinogenic constituents) (see Appendix C of the July 2004 EI CA725 Report).

The results of the comparison of detected constituent concentrations in on-Facility and off-Facility soil with these criteria are discussed below. In addition, the significance of these screening results is also evaluated taking into consideration background concentrations of three commonly occurring metals (As, Cu and Zn) in soil (see Appendix B of the July 2004 EI CA725 Report).

The Phase I RFI soil characterization data are summarized on Table 2-1a and Table 2-2a by AOI for on-Facility and off-Facility soils, respectively. The data on Tables 2-1a and 2-2a include only valid data (i.e., no R-qualified data), and concentrations among duplicate pairs have been averaged to obtain a representative concentration for each pair. For each AOI, Table 2-1a and

-2-

Table 2-2a lists the detected constituents, the detection frequencies, the ranges of detected concentrations, and the ratios of the highest measured concentrations to the screening criteria.

Constituents are identified for further evaluation in each AOI when the ratio of the highest measured Facility-related concentration at the AOI to the screening criterion exceeds 1. Such ratios are highlighted on Table 2-1a and Table 2-2a. The constituents with concentrations exceeding screening criteria in each of the AOIs are:

AOI-1 – Undeveloped Western Fill Area¹

- 1,2-dichloropropane
- benzo(a)pyrene
- arsenic

AOI-2 – Developed Area of Facility

- tetrachloroethene
- trichloroethene
- benzo(a)pyrene
- dibenz(a,h)anthracene
- arsenic

AOI-2A - On-Facility Sewer Lines Area

- tetrachloroethene
- trichloroethene
- arsenic

AOI-3 – Off-Facility Soils

arsenic

AOI-3A - Off-Facility Sewer Lines Area

- tetrachloroethene
- trichloroethene

"Contamination" as defined in the EI CA725 form is identified in each AOI when the ratio of the highest measured Facility-related concentration at the AOI to the screening criterion exceeds 1 (for inorganics, Facility-related concentrations are those that are higher than the site-specific

¹ Note that certain delineation data for AOI-1 are identified as Off-Facility soil samples and are reported on Table 2-2a.

background levels). Such ratios are highlighted on Table 2-1b and Table 2-2b to facilitate identification of AOIs where soil is considered to meet the definition of "contaminated" for further evaluation under Questions 3 and 4 of the CA725. Question 3 of the CA725 form asks whether there are complete exposure pathways between "contamination" identified under Question 2 and human receptors such that exposures can be reasonably expected under current conditions. Question 4 of the CA725 form asks whether exposures from the complete exposure pathways identified under Question 3 can be reasonably expected to be "significant" or unacceptable.

As indicated on Table 2-1b, when background soil concentrations are considered in the risk-based data screening, potential Facility-related contributions of arsenic in AOI 2 and 2A soils are below these risk-based screening criteria. As a result, arsenic concentrations in these AOIs do not meet the definition of Facility-related "contamination" warranting further evaluation under Questions 3 and 4 of the CA725. Similarly, as indicated on Table 2-2b, when background soil concentrations are considered in the risk-based data screening, potential Facility-related contributions of arsenic in AOI 1 and 3 soils are below these risk-based screening criteria. As a result, arsenic concentrations in these AOIs do not meet the definition of Facility-related "contamination" warranting further evaluation under Questions 3 and 4 of the CA725.

It should be noted that all of the AOIs listed above as having constituent concentrations above screening criteria were evaluated under Question 4 of the CA725; the significance of any potential exposures to Facility-related concentrations is discussed in Section 2.4 of the July 2004 EI CA725 Report, and the cumulative cancer risk and hazard index for all AOIs are presented on Tables 2-16a and 2-16b of the EI CA725 Report. Therefore, the conclusion of the EI CA725 evaluation is unaffected by the adjustment for background concentrations in the screening level assessment conducted for the purpose of answering Question 2 of the CA725 form.

ATTACHED TABLES

Table 2-1a:	On-Facility Soil Screening Results - Without Adjustment for Background Levels
	of Arsenic, Copper and Zinc
Table 2-1b:	On-Facility Soil Screening Results - With Adjustment for Background Levels of
	Arsenic, Copper and Zinc
Table 2-2a:	Off-Facility Soil Screening Results - Without Adjustment for Background Levels

of Arsenic, Copper and Zinc

Table 2-2b: Off-Facility Soil Screening Results - With Adjustment for Background Levels of Arsenic, Copper and Zinc

-4-

	Ratio of Max Detect to Industrial Screening Criteria	7.7E-06	2.2E-04	1.4E-07	2.1E-06	2.3E+01	2.3E-06	3.7E-04	7.4E-02	4.3E-01	4.9E-04	1.2E-06	1.5E-05	1.0E-06	2.25-01	2.3E-01	7.2E-05	1.0E-02	1.6E-04	2.1E-04	1.7E-03	6.4E-06	5.9E-04	1.3E-01	1.1E-04	7.4E-03	1.1E-04	6.7E-01	3.0E-U3	4 RE-04	6.4E-02	8.8E-03	1.6E-04	1.9E-04	1.1E-04	1.7E-06	1.2E-05	9.2E-04	5.5E-06	2.4E-08	2.9E-05
	Ratio of Max Cone to ENVIRON Industrial Soil Volatilization to Indoor Air Criteria	3.4E-08	2.1E-05	00 10 0	2.5E-08	7.4E-03	6.2E-09	2.9E-05	1.1E-04	1.5E-05	2.6E-04	1.2E-08							7.0E-14							2 6F-07						5.5E-05			5.0E-07		5.3E-05			3 9F-07	4.8E-06
ગ	Industrial Screen- ing Criteria (mg/kg)	6.0E+03 nc			2.3E+02 nc	1	-		3.4E+01 C	1.2E+00 c	7.5E+00 c	9.0E+02 nc		2.4E+05 nc	2.15+01 0		ļ=	-	_	8.6E+02 c	2.1E+03 c	+	1		2.9E+04 nc	7.4F+00 c	+	-	9.5E+04 nc	_	$\overline{}$	1	_		1.3F+01 c	+	-		2.0E+03 nc	3.2E+04 nc	
pper and Zir	ENVIRON Industrial Soil Volatilization to Indoor Air Criteria (mg/kg)	1.4E+06	1.4E+02	70.	2.0E+04	2.3E+04	7.5E+04	2.7E+03	2.3E+04 7.9E+04	3.4E+04	1.4E+01	9.2E+04							2.7E+12							2.2F±05						2.2E+03			1.4E+U6		2.6E+02			1 RF+05	1.1E+04
Arsenic, Co	Site Specific Background (mg/kg)																											1.5E+01		2 5F+01				/.TE+01							
evels of	Max Detected (mg/kg)	4.60E-02	2.90E-03	3.80E-03	4.90E-04	1.70E+02	4.60E-04	7.82E-02	1.30F-03	5.10E-01	3.70E-03	1.10E-03	4.40E-01	2.50E-01	4.50E+00	4.80E+00	2.10E+00	2.10E+00	1.90E-01	1.80E-01	3.60E+00	1.60E-01	1.30E+01	2.80E+00	3.10E+00	5.50F-02	7.40E-03	1.07E+01	1.99E+0Z	1 97F±01	4.82E+01	1.20E-01	8.00E-01	5.83E+U1	2.40E-03	4.50E-02	1.40E-02	6.00E-02	1.10E-02	7.70E-04	5.00E-02
ground L Ohio	_ p m			3.80E-03	4.90E-04		4.60E-04	1.10E-02	7.00F-04		3.70E-03	1.10E-03	4.20E-01	1.30E-01	1.005+00	1.40E+00	6.80E-01	6.20E-01	1.20E-01 1.90E-01	1.80E-01 1.80E-01	7.10E+00 3.60E+00	1.10E-01		8.30E-01	1.00E+00		7.40E-03	7.40E+00	4.30E+01 1.99E+02	1 50F+01	2.40E+01		8.00E-01	4.80E+U1	1.00E-01 6.80E-01	1.50E-02				7.70E-04	1.70E-02
for Backe Springs,	Min Detected (mg/kg)	9.80E-03	2.90E-03		4.90E-04				3.80F-04	3.60E-03			3.90E-01	2.70E-02	1.30E-02	2.20E-02	1.20E-02	20 9.10E-03	3 5.50E-02	1.80E-01	1.40E-02		3.50E-02	1.70E-02	4.80E-02	5.70E-02	7.40E-03	20 5.50E+00 7.40E+00 1.07E+01	7 50E+01	6 1 18F+01 1 50F+01 1 97F+01	14 1.12E+01	1.20E-01 1.20E-01	8.00E-01	_	4 4 50E-04			6.00E-02		7.70E-04	1.50E-03
tment Yellow	Detected	9	1		0	3			0 40		1			4 8							<u>0</u>		22			3 -			4 1			1		ľ	N	-			2	- «) 4
Adjus s Inc.	5 % bezylsnA	Н	-	+	38	H				<u> </u>	\vdash			+		\vdash				-	3 3	+		Н	35	+	-	20	+	- 4	+	H	+	+	190	╁╌	190	190	+	+	+
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g Results - Without Adjustment for Backgroun Vernay Laboratories Inc. Yellow Springs, Ohio	CASRN	67-64-	71-43-2	78-93-3	156-60-5	78-87-5	100-41-4	75-09-2	108-88-3	79-01-6	75-01-4	1330-20-7	208-96-8	120-12-7	50-32-8	205-99-2	191-24-2	207-08-9	117-81-7	86-74-8	218-01-9	117-84-0	206-44-0	193-39-5	85-01-8	1336-36-3	72-55-9	7440-38-2	7440-39-3	7440-50-8	7439-92-1	7439-97-6	7782-49-2	7440-00-0	71-43-2	78-93-3	75-15-0	75-00-3	98-82-8	110-82-7	75-34-3
Table 2-1a: On-Facility Soil Screening Results - Without Adjustment for Background Levels of Arsenic, Copper and Zinc Vernay Laboratories Inc. Yellow Springs, Ohio	Chemical	VC Acetone		T	trans-1,2-Dichloroethene			T	C Toluene	T	C Vinyl Chloride				DC Reprofabilitations						OC Chrysene	T		П		CB PCBs (total)	T	\neg	KG Chromium (total)	1	1				C Benzene	Γ	П	П			C 1,1-Dichloroethane
Tab	Chem	NOC	VOC	000	× ×	NOC	200	× \$	3 8	VOC	VOC	Noc	SVOC	SVOC	2000	SVOC	SVOC	SVOC	SVOC	SVOC	SVOC	SVOC	SVOC	SVOC	SVOC	P/PCB	P/PCB	INORG	INORG	INORG	INORG	INORG	NORG	SON.	300	2	700	Noc	200	200	NOC.
	Area	-	-	- -	-	-	- -			_	-		-	- -	- -	-	-	-	-	-	-	-	-	-		- -	-	-	- -		-	-	-	-	7 0	2	2	7	~	2 0	2

			_									
		ě	рәzʎլ	pəşəs	Min		Max		Ind a	Industrial Screen-	Ratio of Max Conc to ENVIRON Industrial Soil Volatilization to	Ratio of Max Detect to Industrial
Group	Chemical	CASRN Class		Dete	Detected (mg/kg)	Detected (mg/kg)	Detected (mg/kg)	Background (mg/kg)	Criteria (mg/kg)	ing Criteria (mg/kg)	Indoor Air Criteria	Screening Criteria
Noc.	1,1-Dichloroethene	75-35-4 C		1 6	6.20E-03	6.20E-03	6.20E-03		2.2E+02	4.1E+02 nc	2.8E-05	1.5E-05
200	cis-1.2-Dichloroethene	156-59-2 D	+		1	1.50E+00			3.1E+04			1.5E-01
200	trans-1,2-Dichloroethene	L	+		- I	3.40E-02			2.0E+04	_		9.1E-04
VOC	1,2-Dichloropropane	78-87-5 B2	Н		1.70E-03	1.50E-02	3.20E-02		2.3E+04	7.4E+00 c		4.3E-03
200	Ethyl Benzene	100-41-4 D	+	2		1.90E-02			7.5E+04	$\neg \top$	5.1E-07	1.9E-04
200	Methyl Acetate	108 10 1	100		8.50E-02	8.90E-02	9.30E-02			9.2E+04 nc		3.0E-06
	4-wetty-z-pentanone Methylovolohevane	\perp				4.00E-03 1.40E-02	2.50E-02			8 7E+03 nc		2.0E-03
200	Methyleycollexane Methylene Chloride	75-09-2 B2	+			2.40F-01	2.30F+00		2.7F+03	\neg	8.7F-04	1.1F-02
	Tetrachloroethene	12	Ŀ		75 6.50E-04 5.70E+00 8.20E+01	5.70E+00	8.20E+01		2.3E+04	+		2.4E+00
	Toluene	108-88-3 D	1_	İ	5.40E-04	1.30E-02	1.60E-01		7.9E+04	_		7.3E-05
	Trichloroethene	79-01-6 C-B2	Ľ.		9.00E-04	2.90E+00 4.00E+01	4.00E+01		3.4E+04	1		3.3E+01
	1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	52	16		4.70E+00 4.90E+01	4.90E+01		9.3E+04	6.9E+04 nc	5.3E-04	7.1E-04
	Vinyl Chloride	_	+			1.50E-01			1.4E+01			1.3E-01
200	Xylenes (total)	1330-20-7 ID	-	,					9.ZE+04		1.1E-06	1.1E-04
	Acenaphmene Acenaphthylene	208-96-8	125	- 4		3.30E-02 9.30E-02	9.30E-02			2.9E+04 nc		3.2E-06
	Anthracene		╁			3.30E-02	4.40E-02			~		1.8E-07
Г	Benzo(a)anthracene	ļ	125				5.60E+00			_		2.7E-01
П	Benzo(a)pyrene		Н		16 5.40E-03 6.00E-01	6.00E-01	5.60E+00			1		2.7E+00
T	Benzo(b)fluoranthene		-		1.80E-03	4.20E-01	5.40E+00					2.6E-01
	Benzo(g,h,i)perylene	_	+		12 7.80E-03 2.90E-01	2.90E-01	1.60E+00			_		5.5E-05
	Benzo(k)tluoranthene	_	125	,,		1.80E-01	2.20E+00		07.12	2.1E+02 c		1.0E-02
SVOC	DIS(Z-Ethylnexyl)phthalate	117-81-7 BZ		9 2	6.90E-02	6.90E-02 6.70E-01 3.30E+00	3.305+00		Z./E+12	_	1.2E-12	2.8E-03
Ì	Oliyasile Dibenz(a blanthracene	53-70-3 R2	125		4.30E-04	9 70F-02 8 70F-01	2 40F+00			2.15+03 6		4.8E-US
	Di-n-butylohthalate		}			8.20E-02	8.20E-02		6.4E+11		1.3E-13	1.3E-06
	Di-n-octylphthalate	117-84-0	39	٦	6.60E-02	6.60E-02	6.60E-02			2.5E+04 nc		2.6E-06
	Fluoranthene		_			9.40E-01	1.70E+01					7.7E-04
1	Fkuorene		+		8.40E-03	2.20E-02 3.60E-02	3.60E-02					1.4E-06
SVOC	Indeno(1,2,3-cd)pyrene	193-39-5 BZ	+	20 7	2.50E-03	3.80E-01	3.50E+00			2.1E+01 c		1./ 1.01
T	Naphthalene		+		4.50F-03	4.30F-02	7.40F-02		7.5F+05		9.8F-08	3.9F-04
Τ	Phenanthrene	l	-			2.20E+00	1.90E+01			-		6.6E-04
	Pyrene	129-00-0	125		5.90E-03 7.50E-01		2.10E+01			2.9E+04 nc		7.2E-04
\neg	Arsenic		+		1.10E+00 8.60E+00	8.60E+00	2.28E+01	1.5E+01				1.4E+00
T	Barium	\perp	+	55		6.50E+01	1.66E+02			\neg		2.5E-03
Т	Cadmium	7440-43-9 B1	+		3.70E-02	3.105-01	1.60E+00					3.6E-03
NORG	Chromium (total)	7440-47-3	88 6		32 4 100E+00 1.20E+01	1.20E+01	2.32E+01	2 55404		2.5E+03 nc		9.31-03
T		J.	+		1 20F+00	1 20F±01	1 02F+02	Z-2-101		\neg		1.4E.01
7	Mercury	4.	╁		3.40F-02	1 50F-01 5 50F-01	5 50F-01		2.2F±03		2.5F.04	4 DE-02
Т	Selenium	┸	+-		5.00E-01	6.60E-01	9.30E-01		00.111	7		1 8F-04
П	Zinc		╀		22 8.30E+00 4.90E+01	4.90E+01	7.38E+01	7.1E+01		$\overline{}$		2.4E-04
	Acetone	67-64-1 ID	_		6.40E-03	5.50E-02	4.84E-01		1.4E+06		3.6E-07	8.1E-05
	Benzene				4.40E-04	7.00E-04	9.60E-04		1.4E+02	1.3E+01 c		7.4E-05
VOC	2-Bufanona	GI 00 02		Ĩ								

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CASRN Class
75-15-0
67-66-3
74-87-3
98-82-8
110-02-7
75.34.3
75-35-4
540-59-0
156-59-2
156-60-5
78-87-5
100-41-4
591-78-6
108-10-1
75-09-2
127-18-4
108-88-3
79-01-6
76-13-1
75-01-4
1330-20-7
120-12-7
56-55-3
50-32-8
205-99-2
191-24-2
207-08-9
218-01-9
5-07-50
86-73-7
193-39-5
91-20-3
85-01-8
129-00-0
7440-38-2
7440-39-3
7440-43-9
7440-47-3
7440-50-8
7439-92-1
7439-97-6
7782-49-2
2

	Table 2-	Table 2-1a: On-Facility Soil Screening Results - Without Adjustment for Background Levels of Arsenic, Copper and Zinc	sults - With	out Adj	ustmer	nt for Bac	kground	Levels o	f Arsenic, C	opper and Zin	2		
			Vernay Laboratories Inc. Tellow Springs, Onio	Les In	C. Tell	o oprinç	gs, Onlo						
				· · · · · · · · · · · · · · · · · · ·		···						Ratio of Max	
										ENVIRON		Conc to	Ratio of
										Industrial Soil	in desirable	ENVIRON	Max Detect
					bəz bət	E	Mean	Max	Site Specific	to Indoor Air	Screen.	Volatilization to	to Industrial
	Chem			Carc	aly tec	Detecte	d Detecte	Detected Detected Detected	Background		ing Criteria	Indoor Air	Screening
Area	Group	Chemical	CASRN	Class	nA —	(mg/kg)) (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	Criteria	Criteria
	Notes:												
	The Screen	The Screening Criteria for residential and industrial soil is the lower of the integrated Screening Criteria at:	is the lower of	the integ	rated Sc	reening Crit	eria at:						
		target cancer risk =	1E-05				-					-	
		target hazard quotient =	-										
	The Screeni	The Screening Criteria for Pyrene were used as surrogates for Phenanthrene and Benzo(g,h,i)perylene.	gates for Phena	threne	nd Benz	o(g,h,i)pery	lene.						
	The Screeni	The Screening Criteria for Naphthalene were used as surrogates for 2-Methylnaphthalene.	surrogates for 2	-Methyln	aphthale	Je.							
	The Screeni	The Screening Criteria for cis-1,2-Dichloroethene were used as surrogates for 1,2-Dichloroethene (total)	used as surrog	ates for	1,2-Dichl	oroethene (total).						
	The Screeni	The Screening Criteria for Chromium VI was used as a surrogate for Chromium (total)	surrogate for C	hromiun	(total).								
	The concent	The concentrations for all PCB isomers were summed before comparing to Polychlorinated biphenyls (PCBs) for cancer effects	before compari	ng to Pol	ychlorina	ted bipheny	/ls (PCBs) f	or cancer el	fects				
	and Aroclo	and Aroclor 1254 for noncancer effects.											
	The concent	The concentrations for the Xylene isomers (m/p and o) were summed before comparing to the Screening Criteria.	were summed	before co	mparing	to the Scre	ening Crite	ria.					
	The Screeni	The Screening Criteria for Mercury was calculated by ENVIRON to account for the vapor inhalation pathway using:	ENVIRON to ac	count for	the vapo	r inhalation	pathway us	sing:					
	EPA Regio	EPA Region 9 equations, RfC from IRIS, and chemical properties from EPA's Soil Screening Guidance.	al properties fro	n EPA's	Soil Scre	ening Guid	ance.						
	c - The Scre	c - The Screening Criterion is based on cancer risk.											
	nc - The Scr	nc - The Screening Criterion is based on noncancer effects.	fects.	-									
	Chem Group	Chem Group - Chemical Group	The state of the s										
	Carc Class -	Carc Class - EPA Weight-of-Evidence Cancer Classification	ation		_								

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****												Ratio of Max	Ratio of
				pəz/	pəşc	Mi	Mean	Мах	Site Specific	ENVIRON Industrial Soil Volatilization to Indoor Air	Industrial Screen-	Conc to ENVIRON Industrial Soil Volatilization to	Max Site Related Detect to Industrial
Area	Chem	Chemical	CASRN Class	ည် ကို Anal)	oetec D	_	Detected De	Detected (mg/kg)	Background (mg/kg)	Criteria (mo/kg)	ing Criteria	Indoor Air Critoria	Screening
1	200	Acetone	4-1	_	1 6	9.80E-03 2.3	+	4.60E-02	(Bu/Biii)	1.4E+06	6.0E+03 nc	3.4E-08	7.7E-06
-	VOC	Benzene	71-43-2 A		-	-	-	2.90E-03		1.4E+02	1.3E+01 c	2.1E-05	2.2E-04
-	VOC	2-Butanone	78-93-3 ID		Ψ-	3.80E-03 3.8	3.80E-03 3.	3.80E-03			2.7E+04 nc		1.4E-07
_	VOC	cis-1,2-Dichloroethene	156-59-2 D	38	က		\rightarrow	6.00E-02		3.1E+04		2.0E-06	4.0E-04
-	NOC S	trans-1,2-Dichloroethene		-			4.90E-04 4.0	4.90E-04		2.0E+04	\rightarrow	2.5E-08	2.1E-06
		1,z-Dicnioropropane	/8-8/-5 BZ	88				1./0E+02		2.3E+04		7.4E-03	2.3E+01
-	200	Methylene Chloride	75-09-2 R2	-	- a	1 00E-04 4.0	4.00E-04 4.0	4.00E-04		7.55+04	2.0E+02 C	9.2E-09	2.3E-Ub
-	X	Tetrachloroethene		_) LC		7 90F-01 2 F	2 50F+00		2.75+03	1	1 15-04	7.4F-02
-	Noc	Toluene	_	1	9		0E-04 1.	30E-03		7.9E+04	-	1.7E-08	5.9E-07
-	voc	Trichloroethene	O	32 37	4	3.60E-03 1.6	1.60E-01 5.	5.10E-01		3.4E+04	1.2E+00 c	1.5E-05	4.3E-01
-	VOC	Vinyl Chloride	75-01-4 A	Н	1			70E-03		1.4E+01		2.6E-04	4.9E-04
-	000	Xylenes (total)			1	1.10E-03 1.1	1.10E-03 1.	1.10E-03		9.2E+04	9.0E+02 nc	1.2E-08	1.2E-06
	SVOC	Acenaphthylene			2		20E-01 4.	40E-01					1.5E-05
-	SVOC	Anthracene	_	35	4		1.30E-01 2.	2.50E-01			-+		1.0E-06
-	2000	Benzo(a)antinacene		+	70		1.00E+00 4.60E+00	90E+00			+		2.2E-01
- -	2000	Benzo(h)flioranthene	50-32-8 BZ	35	2 00	1.10E-02 1.2	1.20E+00 4.50E+00	2011-00			2.1E+00 c		2.1E+00
	SVOC	Benzo(a.h.i)pervlene		+	15	1.20E-02 6.8	6.80F-01 2.1	2.10F+00			2.1E.101		7.2F-05
-	SVOC	Benzo(k)fluoranthene	_	35				2.10E+00			7		1.0E-02
_	svoc	bis(2-Ethylhexyl)phthalate	_	⊢		3 5.50E-02 1.2		1.90E-01		2.7E+12		7.0E-14	1.6E-04
_	SVOC	Carbazole			1	1.80E-01 1.8	1.80E-01 1.8	1.80E-01			8.6E+02 c		2.1E-04
	SVOC	Chrysene			19	\rightarrow	0E+00 3.6	30E+00			2.1E+03 c		1.7E-03
- ,	SVOC	Dibenz(a,h)anthracene	53-70-3 B2	+		1.10E-02 7.1	7.10E-01 1.6	1.60E+00			7		7.6E-01
- -	2000	Ui-n-octylphthalate	_	+	ľ	2 6.90E-02 1.10E-01 1.60E-01	10E-01 1.	60E-01					6.4E-06
	2000	Fluoranmene Indepo(1.2.3-pd)wyses	206-44-0 D	+		22 3.50E-02 2.40E+00 1.30E+01	2.40E+00 1.30E+01	30=+01			\neg		5.9E-04
	SVOC	Phenanthrene		32		10 4 ROF-02 1.0	0F+00 3 1	101-100			2.1E+01 C		1.35-01
1	SVOC	Pyrene	129-00-0 D	+		23 2.70E-02 2.50E+00 1.80E+01	0E+00 1.8	30E+01			-		6.2E-04
-	P/PCB	PCBs (total)				5.50E-02 5.5	5.50E-02 5.5	5.50E-02		2.2E+05		2.6E-07	7.4E-03
-	P/PCB	4,4'-DDE				7.40E-03 7.4	7.40E-03 7.40E-03	40E-03			H		1.1E-04
-	NORG	Arsenic	7440-38-2 A	20		20 5.50E+00 7.40E+00 1.07E+01	0E+00 1.C)7E+01	1.5E+01		1.6E+01 c		
	NOKG	Barium	_	+		14 4.68E+01 8.30E+01 1.99E+02	0E+01 1.5	39E+02			\neg		3.0E-03
- -	S C C C C C C C C C C C C C C C C C C C	Carper (Caper	7440-47-3	4 4	4 9	4.50E+00 1.10E+01 1.68E+01	1.TUE+01 1.6	385+01	2 5 5 5 7 7 7				6.7E-03
-	NOBO	Lead	7430 00 4	+	2 5		7.40E±04 4.97E±04	1.37 E+01	4.0E+01		4.1E+04 IIC		00 11
	NORG	Mercury	4.	+	-		1 20F-01 13	1 20E-01		2.2E±03	1.3E+02 IIC	5 5E_05	9.4E-02
	INORG	Selenium	L	╀				8.00E-01				0.01-00	1.6E-04
1	INORG	Zinc	_	9		3.62E+01 4.8		5.83E+01	7.1E+01		$\neg \neg$		
	VOC	Acetone		-	27			6.80E-01				5.0E-07	1.1E-04
2	000	Benzene	71-43-2 A	H	4		1.30E-03 2.4	2.40E-03		1.4E+02	1.3E+01 c	1.7E-05	1.8E-04
+	200	2-Butanone	78-93-3 ID	+	14	_	-	50E-02			2.7E+04 nc		1.7E-06
_	Š	Carbon Dienleide	75 15 0	-	•	٠	ŀ				Т	The state of the s	
+	3 5	Calcol County	0-GL-G/	180	2			1.40E-02		2.6E+02		5.3E-05	1.2E-05
\parallel		Chloroethane		++	7 - 0	-	\rightarrow	1.40E-02 6.00E-02		\top	1	5.3E-05	1.2E-05 9.2E-04
		Chloroethane Cumene		+++	2 - 2		7.70E-03 1.4 6.00E-02 6.0 6.40E-03 1.1	1.40E-02 6.00E-02 1.10E-02			1 1 1 1 1 1	5.3E-05	1.2E-05 9.2E-04 5.5E-06
		Cyclohexane Cyclohexane Cyclohexane 1 2-Dichlorhenzene	75-19-0 75-00-3 98-82-8 110-82-7 10-82-7	++++	2 1 2		7.70E-03 1.40E-02 6.00E-02 6.00E-02 6.40E-03 1.10E-02 7.70E-04 7.70E-04 2.50E-03 7.00E-03	1.40E-02 6.00E-02 1.10E-02 7.70E-04				5.3E-05	1.2E-05 9.2E-04 5.5E-06 2.4E-08

	Ratio of Max Site Related Detect to Industrial Screening Criteria	1.5E-05	3.7E-02	1.5E-01	9.1E-04	1 95-03	1.0E-06	2.0E-05	2.9E-07	1.1E-02	2.4E+00	7.3E-05	3.3E+01	7.1E-04	1.3E-01	1.1E-04	3.2E-06 7.9E-06	1.8F-07	2.7E-01	2.7E+00	2.6E-01	5.5E-05	1.0E-02	2.8E-03	1.15+00	1.3E-06	2.6E-06	7.7E-04	1.4E-06	1./E-01	3.9E-04	6.6E-04	7.2E-04	5.1E-01	2.5E-03	3.6E-03	9.3E-03	1.4E-01	4.0E-02	1.8E-04	9.3E-06	8.1E-05	7.4E-05 1.4E-05
	Ratio of Max Conc to ENVIRON Industrial Soil Volatilization to Indoor Air Criteria	2.8E-05	2.9E-04	7.2E-04	1.1E-05	5.15.07	0.15		***************************************	8.7E-04	3.6E-03	2.0E-06	1.2E-03	5.3E-04	6.7E-02	1.15-05							07 110 7	1.2E-12		1.3E-13					9.8E-08								2.5E-04			3.6E-07	6.8E-06
	Industrial Screen- ing Criteria	4.1E+02 nc			2.3E+02 nc	2 0E+02 c	-		8.7E+03 nc		_		-	-+			2 95+04	-	1	1	2.1E+01 c	2.9E+04 nc	-	1.2E+03 c	2.1E+00 c	+	2.5E+04 nc		\pm	1 9F+02 nc	$\overline{}$						2.5E+03 nc		_	Т.			1.3E+01 c 2.7E+04 nc
er and Zinc	ENVIRON Industrial Soil Volatilization to Indoor Air Criteria (mg/kg)	2.2E+02	2.0E+04	T	2.0E+04	T					\top		†	T	1	9.2E+04				-				2.7E+12		6.4E+11					7.5E+05								2.2E+03				1.4E+02
Screening Results - With Adjustment for Background Levels of Arsenic, Copper and Zinc Vernay Laboratories Inc. Yellow Springs, Ohio	Site Specific Background (mg/kg)																																	1.5E+01		+	0 AE+01	Z.0E+01			7.1E+01		
evels of A	Max Detected (mg/kg)				2.10E-01	30505-02				2.30E+00	8.20E+01	1.60E-01	4.00E+01	4.90E+01		1.00E-01	9.30E-02			5.60E+00	5.40E+00	1.60E+00	2.20E+00	3.305+00	2.40F+00	8.20E-02	6.60E-02	1.70E+01	3.60E-02	3.30E+01	7.40E-02	1.90E+01	2.10E+01	2.28E+01	1.66E+02	1.60E+00	2.32E+01	1.02E+02	5.50E-01	9.30E-01	7.38E+01	4.84E-01	9.60E-04 3.76E-01
ground Less, Ohio	Mean Detected (mg/kg)	6.20E-03			3.40E-02				1.80E-03				2.90E+00	4.70E+00		2.805-02	3.30E-02 3.30E-02		4.60E-01	6,00E-01			1.80E-01	6.70E-01			6.60E-02	9.40E-01	2.20E-02	2.30E-03 3.80E-01 3.30E+00		2.20E+00 1.90E+01	7.50E-01		6.50E+01	3.10E-01	1.20E+01			6.60E-01	8.30E+00 4.90E+01	5.50E-02	7.00E-04 5.70E-02
for Backe	Min Detected (mg/kg)	1 6.20E-03		73 9.00E-04	7 1.10E-03				2 1.10E-03	11 2.10E-03	75 6.50E-04	16 5.40E-04		16 1.60E-03	5 1.40E-03		4 3 30F-02		5.10E-02	16 5.40E-03	22 1.80E-03	2 7.80E-03	20 2.00E-03	9 6.90E-02 6.70E-01	4 9 70F-02 8 70F-01	1 8.20E-02	1 6.60E-02		2 8.40E-03	2 2.50E-03	4.50E-03	10 7.55E-03	44 5.90E-03	7 1.10E+00	7 1.22E+01	9 3.70E-02	3 4.00E+00	4. IVE 100	6 3.40E-02	5.00E-01	8.30E+00	7 6.40E-03	2 4.40E-04 7 2.30E-03
stment c. Yello	Analyzed Detected				190		52				190		190			190						125 1:		39 9	`					110					98 97	ľ	98 98						169
Adju ries Ir	Carc	Ľ.	H	۵	· .	+	+	<u>`</u>		\perp	7	+	C-85	+	+	⊒ .		+-	-	-	Н	- 1	+	22 6	+	+-			+	2 2	+	H	۵	4	_ _ ;	9	-	2 22	10	٥	۵		A ID
ng Results - With Adjustment for Background Vernay Laboratories Inc. Yellow Springs, Ohio	CASRN	4	540-59-0	156-59-2	156-60-5	100-01-0	79-20-9	108-10-1	108-87-2					76-13-1	75-01-4	1330-20-7	208-32-9	120-12-7		_	ш	- 1	_	117-81-7	53-70-3	84-74-2	117-84-0	206-44-0		91-57-6	91-20-3	85-01-8	129-00-0	7440-38-2	7440-39-3	7440-43-9	7440-47-3	7439-92-1	7439-97-6	<u> </u>		-	71-43-2
Table 2-1b: On-Facility Soil Screening F Verr	Chemical	1,1-Dichloroethene	1,2-Dichloroethene (total)	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Ethyl Benzene	Methyl Acetate	4-Methyl-2-pentanone	Methylcyclohexane	Methylene Chloride	Tetrachloroethene	Toluene		1,1,2-Trichloro-1,2,2-trifluoroethane	Vinyl Chloride	Ayienes (total)	Acenaphmene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	bis(2-Ethylhexyl)phthalate	Dibenz(a h)anthracene	Di-n-butylphthalate	Di-n-octylphthalate	Fluoranthene	Fluorene	nideno(1,2,3-cd)pyrene 2-Methylpanhthalene	Naphthalene	Phenanthrene	Pyrene	Arsenic	Barium	Cadmium	Chromium (total)	Lead	Mercury	Selenium	Zinc	Acetone	Benzene 2-Butanone
Table	Chem	voc	Noc	VOC	200	200	200	voc	VOC	VOC			200	Noc	200	200	3000	SVOC	SVOC	SVOC	SVOC			SVOC	SVOC	SVOC	SVOC	- 1		3000			SVOC		Т	NORG	NORG	Т	NORG	Т	П		VOC
	Area	2	2	2	2 0	7	2	2	2	2	2	2	2	2	2	7 (2 0	0	2	2	2	2	2	7 0	2 6	2	2	2	7	7 ^	2	2	2	2	2	7 2	2 6	2	2	2	2	2A	2A

	Table	Table 2-1b: On-Facility Soil Screening Results - With Adjustment for Background Levels of Arsenic, Copper and Zinc Vernay Laboratories Inc. Yellow Springs, Ohio	ing Results - With Adjustment for Background Vernay Laboratories Inc. Yellow Springs, Ohio	Adju	stment nc. Yell	for Backg	round Levels of s, Ohio	Arsenic, Cop	per and Zinc			
	C			Carc	jected jected	Min	Mean Max Detected Detected	Site Specific Background	ENVIRON Industrial Soil Volatilization to Indoor Air Criteria	Industrial Screen- ing Criteria	Ratio of Max Conc to ENVIRON Industrial Soil Volatilization to Indoor Air	Ratio of Max Site Related Detect to Industrial Screening
Area	Group	Chemical		Class		(mg/kg)	(mg/kg)		(mg/kg)	=	Criteria	Criteria
Z,	200	Carbon Disulfide	75-15-0	É	170	1 2.40E-03		20 00	2.6E+02	1.2E+03 nc	9.15-06	2.0E-00
2.A	200	Chloromethane	74-87-3	2 0	170	1 2.90E-02	9.30E-03 2.90E-02	2 2	8.0E+02	2.7E+01 c	3.6E-05	1.1E-03
ZA	NOC	Cumene	98-82-8	۵	63	5 6.50E-04		_		ТΠ		8.5E-05
2A	Noc	Cyclohexane	110-82-7	₽	8 8		2.00E-03 2.00E-03	3	1 05+04	3.2E+04 nc	8 0E-06	6.3E-08
47 47		Uchiorodiffuoromethane	75-34-3	U	169	6 8.70E-04	2.70E-02	2	1.1E+04		9.4E-06	5.8E-05
Z &	200	1,1-Dichloroethene	75-35-4	ပ	170			3	2.2E+02	1	9.0E-06	4.9E-06
2A	NOC	1,2-Dichloroethene (total)	540-59-0				2.00E+00 8.30E+00	0	2.0E+04			5.5E-02
2A	200	cis-1,2-Dichloroethene	156-59-2	۵	170	59 7.00E-04	3.80E-04 1.50E+00 8.30E+00 3.80E-03 4.40E-02 1.10E-01	- 0	3.1E+04 2.0F+04	2.3E+02 nc	2./E-04 5.6E-06	5.5E-02 4.8E-04
2 A	200	1.2-Dichloropropane	78-87-5	B2			~-	- 2	2.3E+04			1.3E-02
2A	000	Ethyl Benzene	100-41-4	۵	170		9.10E-02	1	7.5E+04	2.0E+02 c	3.6E-06	1.4E-03
ZA	VOC	2-Hexanone	591-78-6		170		1.00E-03 1.00E-03	3				1
2A	XOC :	4-Methyl-2-pentanone	108-10-1	₽	170		3.80E-03	8		2.8E+03 nc		3.3E-06
2A	200	Methylcyclohexane Methylcyc Chlorida	76.87-2	2	5 63	7 2.70E-03	2.70E-U3 2.70E-U3 2.70E-U3 1.00E-U3 2.00E-U3 1.77E-U1	7	2 7F+03	2.1E+02 nc	4.0F-05	5.16-04
2A	200	Tetrachloroethene		C-82		99 7.30E-04	3.90E+01 1.10E+03	. 2	2.3E+04	_	4.8E-02	3.2E+01
2A	VOC	Toluene		۵			4.20E-04 2.00E-02 3.00E-01	1	7.9E+04	-		1.4E-04
2A	Noc	Trichloroethene		C-B2	170	43 5.60E-04	1.80E+00	-	3.4E+04	1	9.2E-04	2.6E+01
2A	NOC	1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	1.		20 2.08E-03	7.30E+01 1.20E+03	9	9.3E+04	-	1.3E-02	1.7E-02
2A	200	Vinyl Chloride	1330-20-7	∀ ⊆	170	3 3 00F-03	3.00E-03 2.30E-01 1.00E+00	0 0	1.4E+01 9.2E+04	9.0E+02 nc	7.0E-02	1.8E-03
Z	SVOC	Acenaphthylene	208-96-8	٥	75		6.30E-01	0				8.3E-05
2A	SVOC	Anthracene	120-12-7	۵	75			8		-		3.4E-08
2A	SVOC	Benzo(a)anthracene	56-55-3	B2		10 7.30E-03	4.60E-02			-		1.1E-02
85 85	SVOC	Benzo(b)fluoranthene	205-99-2	B2 B2	0 22	10 8.20E-03	5.80E-03 4.30E-02 1.30E-01			2.1E+01 c		1.0E-02
2A	SVOC	Benzo(g,h,i)perylene	191-24-2	0		7 1.10E-02		2		-		2.3E-06
2A	SVOC	Benzo(k)fluoranthene	207-08-9	82		17 2.40E-03	-	2				4.5E-04
4 5 S	SVOC	Chrysene Diberz/a h)awhracana	218-01-9	2 62	0 12	4 6 20E-03	6.20E-03 4.10E-02 2.50E-01			2 15+00		7.6E-02
5 8	SVOC	Fluoranthene	206-44-0	3 0			1.20E-01	-				3.2E-05
2A	SVOC	Fluorene	86-73-7	۵		1 2.30E-02		2		2.6E+04 nc		8.8E-07
2A	SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	B2	75		3.80E-02 1.00E-01	-	10.11	2.1E+01 c		4.8E-03
2A	SVOC	Naphthalene	91-20-3	ט כ	35	3 4.20E-02 7 2 50E-03	4.20E-02 1.10E+00 3.20E+00	2 -	7.3E+03	2 9F+04 nc	4.ZE-U0	1.7E-02
2 A	SVOC	Pyrene	129-00-0	0				. 0		7		4.1E-05
2A	INORG	Arsenic	7440-38-2	4		89 2.80E+00 8.20E+00	8.20E+00 2.53E+01	1.5E+01		1.6E+01 c		6.6E-01
2A	INORG	Barium	7440-39-3	_		60 1.78E+01	6.60E+01	2		$\neg \tau$		1.8E-03
ZA	NORG	Cadmium	7440-43-9	듄	64	3 7.90E-02 1.30E-01	1.30E-01 1.70E-01			4.5E+02 nc		3.8E-04
44 74	NORG GRON	Conner Conner	7440-50-8			31 8 40E+00	1.50F+01 2.87E+01	1 2.5E+01				8.8E-05
8	INORG	Lead	7439-92-1	82 B2		34 3.70E+00	9.60E+00			7.5E+02 nc		2.2E-02
2A	INORG	Mercury	7439-97-6	٥		3 2.30E-02	3.10E-02 3.90E-02	2	2.2E+03		1.8E-05	2.9E-03
2A	INORG	Selenium	7782-49-2	<u>۔</u>	64	3 6.50E-01	6.90E-01 7.30E-01	1				1.4E-04
ZA	INORG	Zinc	7440-66-6			31 2.92E+01	31 2.92E+01 5.10E+01 8.98E+01	7.1E+01		3.1E+05 nc		6.1E-05
				1	-							

Table		esults - Wit	h Adjt	stmen	nt for Ba	ackgrou	and Lev	els of A	rsenic, Cop	per and Zinc			
	Vern	nay Laborato	ries li	ic. Yel	low Spr	rings, C	hio						
									i			(i)	O cito
										ENVIRON		Conc to	Max Site
										Industrial Soll Volatilization	Industrial	Envisor Industrial Soil	Detect to
5			Jar.			ii Cfed	lean fected		Site Specific	to Indoor Air Criteria	Screen-	Volatilization to Indoor Air	Industrial Screening
Group	Chemical	CASRN	Class	•		/kg) (m	g/kg) (i	mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	Criteria	Criteria
Notes:													
The Screenin	ng Criteria for residential and industrial soil i	is the lower of t	he integ	rated So	creening (Criteria a	t.					- Contracting the Contracting	
	target cancer risk =	1E-05											
	target hazard quotient =	-											
The Screeni	ng Criteria for Pyrene were used as surroga	ates for Phenan	threne	and Ben	id(i'ų'b)oz	erylene.							
The Screening	ng Criteria for Naphthalene were used as su	urrogates for 2-	Methylr	aphthale	ene.	_							
The Screeni	ng Criteria for cis-1,2-Dichloroethene were u	used as surroga	ates for	1,2-Dich	loroethen	ie (total).							
The Screeni	ng Criteria for Chromium VI was used as a	surrogate for C	hromiur	n (total).									
The concent		before comparir	g to Po	ychlorin	ated biph	enyls (P(CBs) for ca	ancer effe	cts				
and Aroclo	r 1254 for noncancer effects.												
The concent	trations for the Xylene isomers (m/p and o) v	were summed !	efore c	omparin	g to the S	creening	Criteria.						
The Screeni		NVIRON to acc	ount for	the vap	or inhalat	ion pathy	vay using:						
EPA Regio	n 9 equations, RfC from IRIS, and chemical	I properties fror	ı EPA's	Soil Sci	reening G	uidance.							
						-							
c - The Scre	ening Criterion is based on cancer risk.					-							
nc - The Scr	eening Criterion is based on noncancer effe	ects.				-							
Chem Group	o - Chemical Group												
Carc Class -	· EPA Weight-of-Evidence Cancer Classifica	ation											
	Chem Group Notes: The Screeni	Chem Group Group Group Group Group Group Chemical The Screening Criteria for residential and industrial soil larget cancer risk = larget cancer risk	Chem Group Chemical Group Chemical The Screening Criteria for residential and industrial soil is the lower of target hazard quotient = 1E-05 Itarget hazard 1E-05 Itarget hazard	Chem Chem Chemical Group Chemical The Screening Criteria for residential and industrial soil is the lower of the integlated cancer risk = 15-05 The Screening Criteria for Pyrene were used as surrogates for Phenanthrene a The Screening Criteria for Nephthalene were used as surrogates for Chromiun The Screening Criteria for Mercury was calculated by ENVIRON to account for The Screening Criteria for Mercury was calculated by ENVIRON to account for ETA Region 9 equations, RCf from RIS, and chemical properties from EPA's chem Group Criterial Griterion is based on cancer risk. Chem Group - Chemical Group Chem Group - Chemical Group Charc Class - EPA Weight-of-Evidence Cancer Classification	Chem Chemical Group Chemical Chemical Chemical CasRN Class Crac Carc Cast Cast Cast Cast Cast Cast Cast Cast	Table 2-1b: On-Facility Soil Screening Results - With Adjustment for Expension of the Company Laboratories Inc. Yellow Spinched Chemical C	Table 2-1b: On-Facility Soil Screening Results - With Adjustment for Baakgrou Vernay Laboratories Inc. Yellow Springs, Care Group Chem Chem Chem Chemical Cass Group Care Cass Group Chemical Chemical Cass Group Ingest cancer first = IE-05 Itarget cancer first = IE-05 Itarget hazard quotient = IE-05 The Screening Criteria for residential and industrial soil is the lower of the integrated Screening Criteria at Itarget hazard quotient = IE-05 The Screening Criteria for Dyrene were used as surrogates for 2-Methylnaphthalene. The Screening Criteria for Set-12-Dichloroethene were used as surrogates for 12-Dichloroethene (total). The Screening Criteria for Set-12-Dichloroethene were used as surrogates for 12-Dichloroethene (total). The Screening Criteria for Set-12-Dichloroethene were used as surrogates for 12-Dichloroethene (total). The Screening Criteria for Set-12-Dichloroethene were used as surrogates for Chronium (total). The Screening Criteria for Set-12-Dichloroethene were used as surrogates for Phenanthrene and Benzo(gh,i)perylene. The Screening Criteria for Set-12-Dichloroethene (total). The Screening Criteria for Mylere isomers were summed before comparing to Polychlorinated biphenyls (Pland Acolor 1254 for noncancer effects. The Screening Criteria for Mylere isomers (m/p and o) were summed before comparing to the Screening Gridance Cascening Criteria for Mylere isomers (m/p and o) were summed before comparing to the Screening Gridance Cancer risk. The Screening Criteria for Mylere isomers (m/p and o) were summed before comparing to the Screening Gridance Chemical Properties from EPA's Soil Screening Gridance. Chem Group - Chemical Group Carc Class - EPA Weight-of-Evidence Cancer Classification	Table 2-1b: On-Facility Soil Screening Results - With Adjustment for Background Lev Vernay Laboratories Inc. Yellow Springs, Ohio Chem Chem Chem Chemical Chemical CASRN Class Creening Criteria at: Itaget cancer risk = 1	Table 2-1b: On-Facility Soil Screening Results - With Adjustment for background Levels of Vernay Laboratories Inc. Yellow Springs, Ohio Chem Chem Chemical Chemica	Chem Chem Chem Chem Chemical Ch	Laboratories Inc. Yellow Springs, Ohio Laboratories Inc. Yellow Springs, Ohio ASRN Class C C (mg/kg) (mg/kg) (mg/kg) (mg/kg) Ele.05 Laboratories Inc. Yellow Springs, Ohio Laboratories Inc. Yellow Springs, Ohio Carc A Min Mean Max Site Specific to Indoor Air or Order of the Integrated Screening Criteria at: Carc A (Marky) (mg/kg) (mg/kg) (mg/kg) (mg/kg) Fle.05 Fle.05 Fle.05 Fle.05 Fle.05 Fle.06 Fle.07 Fle	Laboratories Inc. Yellow Springs, Ohio Laboratories Inc. Yellow Springs, Ohio Carc	

		Table 2-2a: Off-Facility Soil Screening Results - Without Adjustment for Background Levels of Arsenic, Copper and Zinc Vernay Laboratories Inc. Yellow Springs, Ohio	ening Resu Vernay	lts - W Labo	/ithout ratorie:	Adjus s Inc.	g Results - Without Adjustment for Backgroun Vernay Laboratories Inc. Yellow Springs, Ohio	or Back Springs,	ground , Ohio	Levels of A	\rsenic, Co∣	pper and Zin	υ	
													:	
	Chem			Carc	alyzed	tected	Min N Detected De	Mean Detected D	Max Detected	Site Specific Background	Residential Screen- ing Criteria	Ind Screen- ing Criteria	Ratio of Max Detect to Residential Screening	X Katio or Max Detect to
Area	Group	Chemical	CASRN	Class	3	_		\rightarrow	(mg/kg)	(mg/kg)	_	(mg/kg)	Criteria	Criteria
-	200	Toluene	108-88-3		က	2 3.9		-	4.20E-04		6.6E+02 nc	2.2E+03 nc	6.4E-07	1.9E-07
	SVOC	Anthracene	120-12-7	ء د	7 0	2. 4	4 90F-02 4 9	4 90F-02 4	4 90F-02		7	2.4E+05	2.2E-06	2.0E-07
	SVOC	Benzo(a)anthracene	56-55-3		2 1	1 6.4	-		6.40E-01		7	2.1E+01	1.0E-01	3.0E-02
-	SVOC	Benzo(a)pyrene	50-32-8		2	1 9.1	_	4	9.10E-01		\vdash	2.1E+00	1.5E+00	4.3E-01
-	svoc	Benzo(b)fluoranthene	205-99-2		2		-	10E+00 1	1.10E+00			2.1E+01	1.8E-01	5.2E-02
-	SVOC	Benzo(g,h,i)perylene	191-24-2		2	1.5.6			5.90E-01		-	2.9E+04	2.6E-04	2.0E-05
	SVOC SVOC	Benzo(k)fluoranthene	207-08-9	29 62	7 6	7.4	8.30E-01 8.3	8.30F-01 8	8.30F-01		6.2E+01 c	2.1E+03 c	1.3E-03	4.0E-04
-	SVOC	Dibenz(a h)anthracene	53-70-3		1 0	1.7		+-	1.70E-01		$^{+}$	2.1E+00	2.7E-01	8.1E-02
-	SNOC	Fluoranthene	206-44-0		2	1.3		30E+00 1	1.30E+00		-	2.2E+04	5.7E-04	5.9E-05
-	SVOC	Indeno(1,2,3-cd)pyrene	193-39-5		2	1 5.2	5.20E-01 5.2	5.20E-01 5	5.20E-01			2.1E+01	8.4E-02	2.5E-02
-	svoc	Phenanthrene	85-01-8		2	1 2.3	2.30E-01 2.3		2.30E-01		$\overline{}$	2.9E+04	1.0E-04	7.9E-06
-	SVOC	Pyrene	129-00-0		2	1.1	1.10E+00 1.1	1.10E+00 1	1.10E+00	-	\neg	2.9E+04	4.8E-04	3.8E-05
	INORG	Arsenic	7440-38-2		7	2 6.0		30E+00 1	.06E+01	1.5E+01	3.9E+00 c	1.6E+01	2.7E+00	6.6E-01
-	NORG	Copper	7440-50-8	ء د	7 6	2 9.8	3.40E+00 1.1	3.70F+01 4	1.20E+U1	7.1F±01	3.1E+03 nc		1.9F-03	3. IE-04
- 6	200	2.Butanone	78-93-3	L	7				1.90E-03		\top	2.7E+04	2.6E-07	7.0E-08
, m	NOC N	Methylene Chloride	75-09-2	1_	7				1.10E-02		1	2.1E+02	1.2E-04	5.2E-05
3	voc	Toluene	108-88-3	۵	7	1 5.8		5.80E-04 5.80E-04	.80E-04		6.6E+02 nc		8.8E-07	2.6E-07
ო	INORG	Arsenic	7440-38-2	4	-	1 6.8	6.80E+00 6.8	6.80E+00 6.	6.80E+00	1.5E+01	\neg	1.6E+01	1.7E+00	4.3E-01
ო	INORG	Barium	7440-39-3	۵	F	1 3.2	3.25E+01 3.30E+01 3.25E+01	30E+01 3	.25E+01		Т	6.7E+04	6.0E-03	4.9E-04
m .	NORG	Chromium (total)	7440-47-3	8	- -	1 9.6	9.60E+00 9.6	9.60E+00 9.60E+00	.60E+00		2.2E+02 nc	2.5E+03 nc	4.4E-02	3.8E-03
2	INORG	1 9 Dishlershamons	1439-92-1	20	- 60	4 0.3		705 02 4	875.02		7	A 25±04	1.1E-02	2.7E-05
4 8 8	300	1.4-Dichlorobenzene	106-46-7	ن د	33	1 1.6	1.68E-03 1.7	1.70E-03	1.68E-03			7.9E+01	4.8E-05	2.1E-05
3A	VOC	1,1-Dichloroethene	75-35-4	ပ	33	1 2.1		-	2.10E-03		1.2E+02 nc	4.1E+02	1.8E-05	5.1E-06
3A	XOC	cis-1,2-Dichloroethene	156-59-2	Ω	33	2 2.9	-	_	8.10E-03		4.3E+01 nc		1.9E-04	5.4E-05
3A	VOC	trans-1,2-Dichloroethene	156-60-5		33		-		1.00E-03			2.3E+02	1.4E-05	4.3E-06
3A	NOC	Tetrachloroethene	127-18-4	C-B2	33		_	5.10E+01 4.	4.00E+02		1.5E+01 c	3.4E+01 c	2.75.401	1.2E+01
4 8 8	300	Trichloroethene	79-01-6	ပ	3 8	3 4.2	4.20E-04 4.0		1.20E+01			1.2E+00	2.3E+01	8000
	Notes:					\dashv								
	The Screen	ntial and industrial soil	is =	the inte	grated 5	creenir	ng Criteria	at:						
		target cancer risk =	1E-05		1									
	F	target hazard quotient =	1		- 6	- 4	- dead							
	The Screen	The Separating Criteria for size 1.2 Displayed the Comments for 1.2 Displayed (Add)	ates for Fileria	otor to	4 2 De	Horoet	hone (fotal							
	The Screen	The Screening Otteria for Cis-1,z-Distributed tells used as surrogates for 1,z-Distributed tells. The Screening Criteria for Chromium VI was used as a surrogate for Chromium (total).	surrogate for C	hromiu	m (total)		ione (rota							
	Tho	The Concern Officeign is been an economical			1	-	+	+						
	nc - The Sc		ects.			+								
	Chem Grou	Chem Group - Chemical Group												
	Carc Class	Carc Class - EPA Weight-of-Evidence Cancer Classification	ation			\dashv								

		Table 2-2b: Off-Facility Soil Screening Results - With Adjustment for Background Levels of Arsenic, Copper and Zinc	eening Res	ults - V	Vith Ac	Jjustmen	t for Back	ground L	evels of Ar	senic, Cop	per and Zinc		
			Vernay	Labor	atories	Inc. Yel	Vernay Laboratories Inc. Yellow Springs, Ohio	s, Ohio					
						r				Residential		Ratio of Max Detect to	Ratio of Max
	Chem			Carc	nalyze	etected Detected			S &	Screen- ing Criteria	<u> </u>	Screening Screening	Detect to
Area	dno.	Tolliene	108-88-3	Class	cr	2 3.90F-04	1) (mg/kg)	4.20E-04	(mg/kg)	6.6E+02 n	nc 2.2E+03 nc	6.4E-07	1.9E-07
-	SVOC	Acenaphthylene	208-96-8	۵	2			~		_	2.9E+04	4.1E-05	3.2E-06
-	SVOC	Anthracene	120-12-7	٥	2	1 4.90E-02	-			-	2.4E+05		2.0E-07
-	SVOC	Benzo(a)anthracene	56-55-3		2	1 6.40E-C	-				\vdash	1.0E-01	3.0E-02
1	SVOC	Benzo(a)pyrene	50-32-8	_	2	1 9.10E-01				\dashv	\rightarrow	1.5E+00	4.3E-01
	SVOC	Benzo(b)fluoranthene	205-99-2	B2	2	1 1.10E+00					2.1E+01	1.8E-01	5.2E-02
-	SVOC	Benzo(g,h,i)perylene	191-24-2	۵	2	1 5.90E-01	11 5.90E-01			\neg	2.9E+04	2.6E-04	2.0E-05
-	SVOC	Benzo(k)fluoranthene	207-08-9		2	1 4.80E-01	11 4.80E-01			+	2.1E+02	7.7E-03	2.3E-03
-	SVOC	Chrysene	218-01-9	82	2 0	1 8.30E-01	31 8.30E-01	8.30E-01		6.2E+UZ 6	c 2.1E+03 c	1.3E-03	8 1E-02
- -	2000	Diberiz(a,ri)ariunacene Flioranthene	206-44-0	20 0	2 0	1 1 30F+(-	2.2E+04	5.7E-04	5.9E-05
	SVOC	Indeno(1.2.3-cd)pyrene	193-39-5	L	2	1 5.20E-01	11 5.20E-01	5.20E-01		7	2.1E+01	8.4E-02	2.5E-02
	SVOC	Phenanthrene	85-01-8		2	1 2,30E-01				T	2.9E+04	L	7.9E-06
-	SVOC	Pyrene	129-00-0	<u> </u>	2	1 1.10E+(1.10E+00 1.10E+00				2.9E+04	4.8E-04	3.8E-05
-	INORG	Arsenic	7440-38-2	4	2	2 6.00E+(6.00E+00 8.30E+00	1.06E+01	1.5E+01		c 1.6E+01 c		
-	INORG	Copper .	7440-50-8	۵	2	2 9.80E+(9.80E+00 1.10E+01	1.26E+01	2.5E+01		4.1E+04		
-	INORG	Zinc	7440-66-6	۵	2		01 3.70E+01	4.35E+01	7.1E+01			_	
က	VOC	2-Butanone	78-93-3	₽	7						2.7E+04	+	7.0E-08
က	VOC	Methylene Chloride	75-09-2	B2	7	4 3.90E-03	3 6.90E-03	1.10E-02			2.1E+02	_	5.2E-05
9	200	Toluene	108-88-3	Ω	/	1 5.80E-0	5.80E-04 5.80E-04 5.80E-04	5.80E-04			2.2E+03	8.8E-07	Z.6E-07
m	INORG	Arsenic	7440-38-2	4	-	1 6.80E+(1.5E+01	_	1.6E+01	_	10,
က	NORG	Barium	7440-39-3		-	1 3.25E+01	3.30E+01	3.25E+01		5.4E+03 n	6.7E+04	-	4.9E-04
m (NORG	Chromium (total)	7440-47-3	2	-	1 9.60E+	1 9.60E+00 9.60E+00 9.60E+00	9.505+00			7.55+03	-	3.85-03
6	INORG	Lead	7439-92-1	22 0	- 8	1 6.90E+1	6.90E+00 6.90E+00	6.90E+00			7.3E+02	1.7E-02	9.ZE-03
A S	200	1,3-Uichlorobenzene	106.46.7	2 0	33 63	1 1.67E-U3	1.6/E-03 1./UE-03	1.67E-03		3.55+01	7 9F+01 C	_	2.7E-05
AS S	200	1.1-Dichloroethene	75-35-4	0	33	1 2.10E-0				1	4.1E+02		5.1E-06
34	VOC	cis-1,2-Dichloroethene	156-59-2		33	2 2.90E-03	3 5.50E-03	8.10E-03		4.3E+01 n		1.9E-04	5.4E-05
3A	voc	trans-1,2-Dichloroethene	156-60-5		33	1 1.00E-03	3 1.00E-03	1.00E-03				1.4E-05	4.3E-06
34	Noc.	Tetrachloroethene	127-18-4	ပ			2 5.10E+01	~~			3.4E+01	2.7E+01	1.25+01
34	200	Loluene	108-88-3		-			1.50E-U3			2.2E+03	2.3E-U0	0.8E-U/
AS.	200	i nchloroethene	0-10-67	79-5 C-97	જ	3 4.2UE-U4		4.00E+00 1.20E+01		9.35-01	C 1.2E+00 C	LOTTO.	353
	Notes:												
	The Screeni	The Screening Criteria for residential and industrial soil i	soil is the lower of the integrated	the integ	rated Sc	Screening Criteria at:	riteria at:						
		target cancer risk =	1E-05										
		target hazard quotient ==	-				_						
	The Screeni	The Screening Criteria for Pyrene were used as surrogates for Phenanthrene and Benzo(g,h,i)perylene.	ates for Phena.	nthrene a	and Ben.	zo(g,h,i)per	ylene.						
	The Screeni	The Screening Criteria for cis-1,2-Dichloroethene were used as surrogates for 1,2-Dichloroethene (total)	used as surrog	lates for	1,2-Dich	loroethene	(total).						
	The Screeni	ng Criteria for Chromium VI was used as a	surrogate for (Shromiun	ι (total).								***************************************
	The Scre	c - The Screening Criterion is based on cancer risk											
	nc - The Scr		ects.										
	Chem Group	Chem Group - Chemical Group											
	Carc Class -	Carc Class - EPA Weight-of-Evidence Cancer Classification	ation										

David C. Contant

From: Mark Nielsen [MNielsen@environcorp.com]

Sent: Thursday, September 23, 2004 2:07 PM

To: Polston.Patricia@epamail.epa.gov

Cc: Chris Buzgo; nielsenj@battelle.org; dougfisher@vernay.com; David C. Contant

Subject: Vernay Laboratories - El CA725 Report

Trish.

At the request of Doug Fisher of Vernay Laboratories, I have attached supplemental data screening results associated with Vernay's Environmental Indicators CA725 Report. Please call me if you should have any questions.

Thanks

Mark Nielsen

Office: (215) 504-5059 Cell: (215) 778-6586 e-Fax: (614) 458-6621

<<RCRACA725Report(VernayLab)Supplemental Response 09-23-04.pdf>>

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION5 77 WEST JACKSON BOULEVARD CHICAGO, IL 60604-3590

SEP 2 8 2004

REPLY TO THE ATTENTION OF

Douglas L. Fisher Environmental Affairs and Safety Manager Vernay Laboratories, Inc. 120 E. South College Yellow Springs, Ohio 45387-1623

> RE: Approval with Conditions El 725 Report Vernay Laboratories, Inc. Yellow Springs, Ohio OHD 004 243 002

Dear Mr. Fisher:

The United States Environmental Protection Agency (U.S. EPA) received and reviewed your responses to our June 18, 2004, comments on your Environmental Indicator (EI) Report for Human Health (CA 725), dated April 9, 2004. The U.S. EPA will be approving the EI Report and form for Human Health (CA 725) with conditions.

Our previous comment in regards to the subtraction of site-specific background levels from detected soil concentrations for inorganics in Question #2 on the EI CA 725 form has not been completely resolved by your response. At this time, it does not appear that Vernay Laboratories, Inc., eliminated any AOI's in Question #2 from further consideration in Questions #3 and #4. Screening procedures should still be done by comparing chemical concentrations that include both contaminant and background concentrations to risk based screening levels. The concern is that Areas of Interest (AOI's) may be eliminated from further consideration as a result of screening, when these AOI's should be carried through and further evaluated in Questions #3 and #4 of the EI form. The following condition will provide a solution and still provide us with the necessary information on all AOI's where there might be exposure issues:

 If Vernay Laboratories, Inc. subtracts out background for inorganics at AOI's in Question #2 (prior to risk based screening);

Then Vernay Laboratories, Inc. will be required to provide us with a list of all AOI's where this subtraction of background was the driver for elimination of the AOI in Question #2 from further consideration in Questions #3 and #4; and

If there are AOI's where this subtraction resulted in elimination of a specific AOI in Question #2, that we may require additional exposure information in order to make a determination on whether that AOI is an exposure concern.

The CA 725 Environmental Indicators Form for Human Health will be finalized based on the EI Report for Human Health dated April 9, 2004; U.S. EPA's comments dated June 18, 2004; Vernay's Response to U.S. EPA's comments dated July 16, 2004; and the e-mail including further clarifications from Chris Buzgo, Environ Corp., dated August 24, 2004. Once the EI form is officially approved, signed, and dated a copy will be sent to you for your records.

The comments that highlight our policy on evaluating indoor air using appropriate health based screening levels for environmental indicator purposes and for site remedial decisions beyond the EI determinations has not changed. If you have any questions, please do not hesitate to contact me at 312-886-8093.

Sincerely.

Patricia J. Polston

Corrective Action Project Manager

cc: C. Olsberg, U.S. EPA, WMB

J. Morris, U.S. EPA, ORC

D. Contant, The Payne Firm



DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control

Facility Name:	Vernay Laboratories, Inc.
Facility Address:	875 Dayton Street, Yellow Springs, Ohio 45387
Facility EPA ID #:	OHD 004 243 002
groundwater, su	e relevant/significant information on known and reasonably suspected releases to soil, rface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste nits (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been considered in ation?
<u>X</u>	If yes - check here and continue with #2 below.
***************************************	If no - re-evaluate existing data, or
	if data are not available skip to #6 and enter"IN" (more information needed) status code.
BACKGROUND	
The following documents	were considered:
Current Condition	ons Report(Payne Firm 2002)
First Quarter 20	03 Progress Report (Payne Firm 2003a)
Second Quarter	2003 Progress Report (Payne Firm 2003b)
Third Quarter 20	003 Progress Report (Payne Firm 2003c)

- Fourth Quarter 2003 Progress Report (Payne Firm 2004a)
- RCRA Corrective Action Technical Memorandum No. 3 Groundwater Monitoring (Payne Firm 2003d)
- RCRA Corrective Action Technical Memorandum No. 4 Soil Confirmation (Payne Firm 2004b)
- First Ouarter 2004 Progress Report (Payne Firm 2004c)
- RCRA Phase I Facility Investigation Report (Payne Firm 2004d)
- El Report for Human Health dated April 9, 2004
- U.S. EPA's comments dated June 18, 2004
- Vernay's Response to U.S. EPA's comments dated July 16, 2004
- e-mail including further clarifications from Chris Buzgo, Environ Corp., dated August 24, 2004

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" El determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Current Human Exposures Under Control Environmental Indicator (EI) RCRIS code (CA725)

Page 2

Relationship of EI to Final Remedies

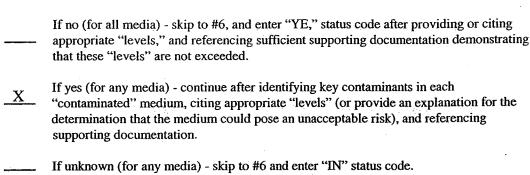
While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

2. Are groundwater, soil, surface water, sediments, or air media known or reasonably suspected to be "contaminated" above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	<u>No</u>	<u>?</u>	Rationale / Key Contaminants
Groundwater (Cedarville	X			See Section 2.2 of EI Report
Aquifer)				
Soil	X			See Section 2.2 of EI Report
Air (indoors) ²		X		See Section 2.2 of EI Report
Subsurface	X			See Section 2.2 of EI Report
Water(unconsolidated)				
Surface Water	X			See Section 2.2 of EI Report
Sediment		X		See Section 2.2 of EI Report
Storm Sewer Water		X		See Section 2.2 of EI Report
Air (outdoors)		X		



Rationale and Reference(s): Contamination has been identified in on-Facility and off-Facility soils, unconsolidated subsurface water and Cedarville Aquifer groundwater, and surface water. Section 2.2 of the EI Report (Environ 2004) discusses screening criteria used to identify the presence of contamination in soil, subsurface water, groundwater and surface water. The primary contaminants identified include tetrachlorethene and trichloroethene. Section 2.2.1 identifies all constituents that meet the definition of "contamination" in soil. Section 2.2.2 identifies all constituents that meet the definition of "contamination" in the unconsolidated subsurface water and Cedarville Aquifer groundwater. Section 2.2.5 identifies all constituents that meet the definition of "contamination" in surface water.

Current Human Exposures Under Control Environmental Indicator (EI) RCRIS code (CA725) Page 3

Foot	
notes	

¹ "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

²Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

Potential Human Receptors (Under Current Conditions)

"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food ³
Soil	_No	_Yes	No_	_Yes	Yes	No	_No
Subsurface Water	_No	_No	No_	Yes	No	No	No
Groundwater (Cedarville)	_Yes	No_	No_	_No	_No	_No	_No
Surface Water	No_	No_	No .	No	No_	_Yes	_No
Sediment					 		
Storm Sewer Water							
Air (indoors and outdoors)							

Instructions for **Summary Exposure Pathway Evaluation Table**:

- 1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated" as identified in #2 above.
- 2. enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

 If no (pathways are not complete for any contaminated media-receptor combination) -
skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s

Current Human Exposures Under Control Environmental Indicator (EI) RCRIS code (CA725) Page 4

in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional <u>Pathway Evaluation Work Sheet</u> to analyze major pathways).

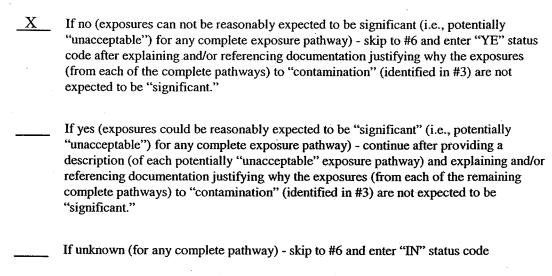
<u>X</u>	If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.
	If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):

The potential for current human exposure to media that meet the definition of contamination is discussed in Section 2.3 of the EI Report (ENVIRON 2004). Section 2.3.1 addresses exposure pathways for soil. Section 2.3.2 addresses exposure pathways for subsurface water and groundwater. Section 2.3.3 addresses pathways for for surface water.

³ Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be "significant" (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?



Rationale and Reference(s): Under current conditions, exposures to site-related contamination for complete pathways has been determined to not be significant. Section 2.4 of the EI Report (ENVIRON 2004) discusses the significance of potential current exposures of excavation workers to contaminated soil and subsurface water, exposures of residents to groundwater, and exposures of recreators to surface water. The evaluation of potential exposure of on-Facility routine and excavation workers to contaminated soil and excavation workers to subsurface water determined that these exposures are not expected to be significant under current conditions. Evaluation of

Current Human Exposures Under Control Environmental Indicator (EI) RCRIS code (CA725)

Page 5

potential exposure of off-Facility recreators to contaminated surface water determined that these exposures are not expected to be significant under current conditions. Evaluation of potential exposures of residents to off-Facility potable and non-potable well water from the Cedarville Aquifer determined that these exposures are not to be significant under current conditions.

TC 4	•_	Later the item (in the interest of the interes
		on whether the identified exposures are "significant" (i.e., potentially "unacceptable") tisk Assessment specialist with appropriate education, training and experience.
Onsui		cant" exposures (identified in #4) be shown to be within acceptable limits?
•		
		If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why
		all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-
		specific Human Health Risk Assessment).
		If no (there are current exposures that can be reasonably expected to be "unacceptable")-
		continue and enter "NO" status code after providing a description of each potentially
		"unacceptable" exposure.
		If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status
	•	code.
		Rationale and Reference(s):
		Rationale and Reference(s).
•	(CA725), and ol	opriate RCRIS status codes for the Current Human Exposures Under Control EI event code btain Supervisor (or appropriate Manager) signature and date on the EI determination below
	(and attach appr	opriate supporting documentation as well as a map of the facility):
	<u>X</u>	YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a
		review of the information contained in this EI Determination, "Current Human
		Exposures" are expected to be "Under Control" at Vernay Laboratories, Inc. facility, EPA ID # OHD 004 243 002 located in Yellow Springs, Ohio under current and
		reasonably expected conditions. This determination will be re-evaluated when the
		Agency/State becomes aware of significant changes at the facility.
		NO - "Current Human Exposures" are NOT "Under Control."
		±
		IN - More information is needed to make a determination.
		1/2.1
		MH WIX
	Completed by	(signature) Date 9/28/04
		(print) Patricia J. Polstoh
		(title) CA Project Madager

Supervisor

(signature)
(print) Hak Cho
(title) Section Chief
(EPA Region or State) Region 5

Locations where References may be found:

U.S. EPA Region 5 has the documents listed, which support this determination..

Current Conditions Report(Payne Firm 2002)

First Quarter 2003 Progress Report (Payne Firm 2003a)

Second Quarter 2003 Progress Report (Payne Firm 2003b)

Third Quarter 2003 Progress Report (Payne Firm 2003c)

Fourth Quarter 2003 Progress Report (Payne Firm 2004a)

RCRA Corrective Action Technical Memorandum No. 3 Groundwater Monitoring (Payne Firm 2003d)

RCRA Corrective Action Technical Memorandum No. 4 Soil Confirmation (Payne Firm 2004b)

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e-mail including further clarifications from Chris Buzgo, Environ Corp., dated August 24, 2004

Contact telephone and e-mail numbers

 (name)
 Patricia J. Polston

 (phone #)
 312-886-8093

 (e-mail)
 polston.patricia@epa.gov

FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.